An investigation into how marketers cope with an environment of high complexity and turbulence, with special reference to the South African environment.

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ABSTRACT

This study investigated relationships between marketing success, the level of external environmental complexity and turbulence, and marketing mix tactics. The literature suggested that more successful companies in simple and stable environments use stabilising marketing tactics, while more successful companies in complex and turbulent environments use destabilising tactics, regardless of industry habits, management preferences or market sector. A marketing mix model for the different environments was developed using a chaos and complexity theory perspective.

The study was exploratory, using a qualitative, case study technique. Data was collected via depth interviews and document analysis from four companies in the information technology (IT) and packaging industries. These industries were identified as, respectively, the most complex and turbulent, and the simplest and most stable, South African environments. Two companies from each industry were chosen to reflect more successful and less successful companies.

The more successful company in the complex/turbulent environment was found to use destabilising tactics, as did the more successful company in the simple/stable environment. Therefore, contrary to expectations, it appears that destabilising tactics contribute more to success than stabilising tactics do, regardless of the environment. It was also found, contrary to expectations, that stabilising tactics were used by both the less successful companies.

The research concluded that destabilising tactics are related to more success and stabilising tactics to less success. The lack of clear differentiation between the two industries may be because the whole South African environment is complex and turbulent, because the

packaging industry is not sufficiently simple and stable to differentiate it from the IT industry or because packaging industry managers perceive their industry to be complex and turbulent and act accordingly. Despite these uncertainties, the research showed the marketing mix model to be reasonably accurate for the complex/turbulent environment, and therefore of potential value to South African companies.

To overcome the equivocal findings, further research is recommended in different industries, in countries with different levels of complexity and turbulence and into specific marketing mix tactics. Research into managers' perceptions of environmental complexity and turbulence and into co-evolution of marketing tactics and external environments would also be of value.

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CHAPTER 1 - INTRODUCTION

1.1 BACKGROUND TO THE RESEARCH STUDY

Marketing involves being able to anticipate, cope with and adapt to changes in the external environment. In a stable and predictable business environment this coping and adapting is relatively easy, but as the environment becomes more complex, and changes happen more rapidly, coping and adapting becomes more problematic and difficult. The environment of business on a global basis is becoming extremely complex (McKenna, 1991; Chattell, 1995; Ahmed et al., 1996; Narus and Anderson, 1996; Gilmore and Pine, 1997). The business environment is also experiencing continuous, rapid change as is highlighted by authors such as McKenna (1991), Patterson (1993) and Chattell (1995). This escalating rate of change is being experienced in South Africa to an equal, and probably greater, extent than elsewhere (Weeks, 1990; Nasser and Vivier, in Forsdick, 1995; Puth, 1996).

Planning tools such as strategic planning, scenario planning, strategic visioning, market research and forecasting are becoming inadequate to cope with the speed and volume of continuous change and with the unpredictability of discontinuous change (Wall and Wall, 1995; Lane and Maxfield, 1996; Edgar and Nesbit, 1996). Understanding and finding new ways of coping with such continuous and unpredictable changes have, therefore, become a priority for business people. One way of finding new methods of coping with this volatility is by applying theories from outside the field of marketing in order to obtain a fresh insight into the problem. Coffey and Atkinson (1996:157) stress the importance of using "concepts, theories, and ideas constructively and creatively … whether they come from our discipline or another." An ever-increasing number of authors believe that the new sciences, specifically chaos and complexity theories, can provide a better understanding of the current business and marketing environment. It is therefore possible that these theories can cast new light on marketing problems. Some work has been done internationally in applying these theories to strategic planning, but very little research has been done in applying them to marketing.

This paucity of research is especially true in South Africa, as will be discussed in more detail in Chapters 2 to 4 of this thesis. Since South Africa is experiencing extreme change in all aspects of the external environment it was decided to investigate the mechanisms that can, and should, be used by marketers in South Africa for coping with complexity and turbulence. The emphasis of the research is to identify which of the marketing mix elements are most

effective in coping with complexity and turbulence, such that the probability of marketing success is increased.

This thesis reports on the study of a highly complex and turbulent industry, namely Information Technology, in order to identify the marketing mix variables used, and to assess whether the extent of use of these variables correlates with success in the industry. South Africa, since the change of government in 1994, is an especially complex and turbulent environment. It was not possible to find an industry with a simple and stable environment with which to contrast the Information Technology industry. It was, therefore, necessary to use a 'less complex and turbulent industry' as a contrast, and for this the Packaging industry was chosen. These choices of industries will be justified in the literature review and methodology chapters of this thesis

The main objective of the research was to identify whether the marketing tactics used by successful companies in the Information Technology industry are different from those used by successful Packaging companies. It was also intended to identify if different marketing tactics are used by successful, as apposed to less successful, companies. Based on these findings a model of marketing tactics suitable for success in a complex and turbulent environment was developed.

1.2 RESEARCH PROBLEM AND PROPOSITIONS

1.2.1 Research problem

South Africa is a society that is experiencing both extreme complexity and extreme turbulence in most of the social, political, legal, competitive, cultural, economic and technological environments (Puth, 1996). This increase in complexity and turbulence is compounded by the need to cope with the transition from a closed, regulated and protected economy to a free market economy. During such a transitional period some sectors of the economy may experience more complexity and turbulence than others. For example, the technological environment of the furniture, packaging materials, bakery or cafe industries is probably more stable than the technological environments of the electronics or computer industries (Smit and Cronje, 1992). Therefore, irrespective of the sector in which they operate, all businesses in South Africa experience, to a greater or lesser extent, a turbulent environment. Consequently, South Africa makes a perfect 'laboratory' for examining how businesses cope simultaneously with increased complexity and increased turbulence.

Most of the literature on change and change management relating to this challenging environment concentrates on management and strategy in a broader sense. Very little literature focuses on the tactical activities in which companies engage, or should engage, to cope with such a complex and turbulent environment. For example, marketing textbooks such as Kotler (1997), Stanton, Etzel and Walker (1994) or Van der Walt et al. (1996) make no allowance for differing levels of environmental change in their discussion of the marketing mix.

The problem to be researched is, therefore, to identify whether South African companies operating in a complex and turbulent environment use different marketing tactics to those operating in a more simple and stable environment, and whether the use of such differing tactics benefits these companies in terms of marketing success.

1.2.2 Research Objectives

In order to solve the research problem spelt out above, the following three objectives were set:

- to develop a model of the marketing mix tactics that could be expected to be found in companies operating in complex and turbulent environments,
- to identify any differences in the marketing mix tactics between companies operating in complex/turbulent industries and those operating in simple/stable industries,
- to investigate the relationship between the different types of marketing mix tactics mentioned above and marketing success in complex and turbulent industries.

1.2.3 Propositions

In this section four propositions are presented in order to give the research study a “sense of orientation, a direction in which to look for facts” (Leedy, 1993:14).

Proposition 1: It is proposed that companies operating in an environment that is highly complex and turbulent will use a marketing mix made up of more destabilising variables, such as:

new product development and product innovation,

sales promotion,

price promotions (including price cutting).

Proposition 2: It is proposed that companies in simpler and more stable environments will use marketing mixes that are made up of more stabilising variables, such as:

relationship selling and relationship building,

corporate or image advertising,

'status quo' price policies.

Proposition 3: It is proposed that companies using a destabilising mix in a complex/turbulent environment will be more successful than those using a stabilising mix.

Proposition 4: It is proposed that companies using a stabilising mix in a simple/stable market will be more successful than those using a destabilising mix.

1.3 JUSTIFICATION FOR THE RESEARCH

A literature search identified only a handful of researchers and articles investigating marketing in terms of complexity and chaos theory (Herbig, 1990; Herbig and Golden, 1991; Diamond, 1993; Hibbert and Wilkinson, 1994; Winsor, 1995; Phillips and Kim, 1996). No research on the topic has emanated from South Africa, which emphasises the need for research in this area. Puth (1996: 12) refers to “the complex and dynamic South African marketing environment”; while Nasser and Vivier (in Forsdick, 1995: 11) indicate “that turbulence will continue unabated for the foreseeable future”. This further strengthens the case for research to be conducted in this area. Weeks (1990:3) states that “Almost every dimension of the South African organisation’s environmental context appears to be in a state of constant change”, this before the release of Nelson Mandela and the 1994 elections, which rewrote the South African environmental scenario! These factors highlight the need for researching marketing from a chaos and complexity viewpoint in the South African context.

The literature also emphasises the need for chaos and complexity based research in the field of marketing. For example, Winsor (1995) stresses the need for further research in the tactical marketing areas of advertising and channel relationships under conditions of chaos. Fortin (1995: 4) mentions the need for research in the area of advertising budget allocation, which he says is a function of "...past financial performance and competitive pressure, which behaves in a chaotic profile." Furthermore, Mix (1993: 445) highlights the need for research in areas such as "advertising dynamics, price dynamics." Therefore, it can be seen that concentrating on understanding marketing tactics in terms of complexity and turbulence is a valid area of research.

This research project set out to contribute to increasing scientific knowledge in various ways: With regard to the propositions, knowledge was intended to be created as follows.

- Proposition 1 and 2 - Relationship between complexity/turbulence and mix variables. This was expected to provide guidance to marketers as to which marketing mix tactics should be adopted in different environmental conditions.
- Proposition 3 - Relationship between success in a complex/turbulent industry and use of destabilising mix. This was intended to provide guidance for marketers in complex and turbulent environments, as to the type of marketing mix variables on which to place emphasis to increase the probability of marketing success in their specific industry.
- Proposition 4 - Relationship between success in a simple/stable industry and use of stabilising mix variables. This was expected to provide guidance to marketers in simple/stable industries, as to the type of marketing mix variables they should choose to increase the probability of success in their industry.

In addition to the above contributions, this research also aimed to increase knowledge of how marketers relate to the external environment. Although work has been done on change management, very little has been done in marketing, specifically looking at the variables of complexity and turbulence. In other words, those components that make marketing more challenging today than in the past were to be more clearly defined and identified.

Although some work is being done in South Africa on business as a complex adaptive system, virtually nothing has been done to look at the micro level of how marketing activities relate to the market as a complex adaptive system. Therefore, this study was intended to increase knowledge of marketing in terms of chaos or complexity theory.

The above discussion shows both a conceptual limitation, that is, complexity and turbulence not having been studied in terms of marketing tactics, and a contextual limitation, that is, very little research having been done in the South African environment. Clearly, therefore, the findings of this research project will contribute to both theoretical and applied marketing knowledge, and will therefore be of benefit to both marketing theoreticians and marketing practitioners.

1.4 OVERVIEW OF RESEARCH METHODOLOGY

Although the methodology used in this study is discussed in detail in Chapter 5, it is felt necessary to give a brief overview to facilitate an initial understanding of the thesis.

1.4.1 Research design

The research problem had inherent in it three difficulties that determined the research methodology to be used.

- The need to understand the application of the different marketing tactics in building a marketing mix by a company. This is not a problem where the frequency or application of a marketing tactic can be merely counted or identified. It requires discussion and interpretation to identify, for example, whether 'price' is being used as a 'stabilising' or 'destabilising' tactic.
- The assessment of the variable 'marketing success' requires the collection of data to do with sales, profit and/or market share, all of which are usually considered highly confidential by most companies. It was unlikely that this data could be collected satisfactorily from all the companies in a large sample. Although this data was available for companies listed on the stock exchange, there were not enough of these companies to constitute a suitable sample for a quantitative study.
- Almost no research had been done on this topic, and it was therefore impossible to develop adequate hypotheses and approaches for a quantitative study.

Consequently, based on these three difficulties, it became apparent that the research should be an exploratory study, attempting to obtain a deeper understanding of the use of marketing tactics in a complex and turbulent environment. It was therefore decided that a qualitative methodology should be used.

The research aimed to understand the different uses of marketing tactics between:

- different companies in complex/turbulent industries versus simple/stable industries,
- and more successful versus less successful companies.

There was no intention to measure the change in the use of the marketing tactics over time. Therefore, a cross sectional methodology, as opposed to a longitudinal methodology, was appropriate.

1.4.2. Qualitative method chosen

The study required the investigation and understanding of the use of marketing tactics in companies in complex/turbulent and simple/stable markets, and in companies that are either more successful or less successful. This research design implied a minimum of four companies as is shown in Table 1.1 below.

Table 1.1: Research design matrix

	More successful	**Less successful**
Complex/turbulent environment	Company 1	Company 2
Simple/stable environment	Company 3	Company 4

Therefore, the approach decided on was the case study method. Welman and Kruger (1999: 190) define the case study method as a "...limited number of units of analysis (often only one)..., such as an individual, a group or an institution (which) are studied intensively." Four companies were selected to represent the four cases in the matrix above, and each was intensively studied using various qualitative techniques.

1.4.3 Population researched

The population for this study was defined by the research question and therefore was defined a priori. Two industries were selected to cover areas of high and low complexity and turbulence via a Delphi technique that is explained in detailed in Chapter 5. The Information Technology industry was chosen to represent a complex and turbulent environment, and the Packaging industry was chosen to represent a simple and stable environment. Since it could

be expected that manufacturing and retailing businesses could differ significantly in terms of their use of marketing mix variables and what constitutes marketing success, it was decided to concentrate only on manufacturing companies.

1.4.4 Sampling

Purposive sampling was used to select the four companies. Welman and Kruger (1999:62) maintain, "Researchers rely on their experience, ingenuity and/or previous research findings to deliberately obtain units of analysis in such a manner that the sample they obtain may be regarded as being representative of the relevant population." A variation of purposive sampling referred to by Flick (1998:70) is "...maximal variation in the sample - to integrate only a few cases, but those which are as different as possible, to disclose the range of variation and differentiation in the field." The sampling method used was therefore a combination of purposive and maximal variation sampling.

Sample selection was a two-stage process.

- First, the two industries (complex/turbulent and simple/stable) were selected by means of a postal questionnaire sent to knowledgeable experts such as industry analysts in stock brokerage firms. The questionnaire results identified the most and least complex/turbulent industries, namely the Information Technology industry and the Packaging industry.
- Second, within each industry, the most successful and the least successful companies were identified, based on the opinions of numerous industry experts, using the Delphi technique.

The sampling unit was the individual company, while the sampling elements were managers and staff involved in the marketing activities of the company.

1.4.5 Data collection

According to Welman and Kruger (1999:192) triangulation is used "... to corroborate findings according to at least three different approaches." This not only increases the validity of the study, but increases the "...enriching and completing [of] knowledge...[and] increase[d] scope, depth and consistency of methodological proceedings." The techniques used to collect the empirical data were:

- depth interviews with a number of different, knowledgeable managers and staff in the companies, for example, managing directors, marketing managers and product managers,
- analysis of documents such as marketing plans, marketing research reports and advertising briefs,
- personal observation of discussions, topics and interactions in various marketing meetings,
- review of literature on the topic.

These four approaches include what Denzin (in Flick, 1998: 229) refers to as "data triangulation" and "methodological triangulation." Data was collected by means of audio tape recordings, note taking and collection of documents.

1.4.6 Data analysis

A combination of techniques was used for "...coding of the material with the aim of categorizing and/or theory development"(Flick, 1998:179). Thematic coding was used to categorise findings according to each of the four companies/perspectives being studied. Content analysis was used to paraphrase, summarise and reduce the mass of data to generalisations that were then compared with the research problem and propositions. In order to conduct this analysis tape recordings were transcribed into text, and these together with the research notes were analysed using the NVIVO computer package.

1.4.7 Validity and reliability

Flick (1998:229) questions the use of classical reliability and validity criteria in qualitative research (based on the work of Luders and Reichertz, 1986 and Glaser and Strauss, 1965). Such researchers maintain that method-appropriate criteria such as triangulation should replace the criteria of reliability and validity. As mentioned above in Section 1.4.5 data triangulation and methodological triangulation were used to validate the procedures used, and the results obtained, in this study.

1.5 LIMITATIONS AND DELIMITATIONS

This study was subject to the following limitations.

- It only covers two industries, namely, Information Technology and Packaging. Therefore extrapolation to other industries should be done with extreme circumspection.
- It concentrates on the marketing of goods only and not services. Therefore, only the traditional marketing mix of product, price, place and promotion were considered. The expanded marketing mix applicable to services (people, physical evidence and process as proposed by Booms and Bitner (in Zeithaml and Bitner, 1996) was consequently not studied.
- Chaos and complexity theory was applied as a metaphor in order to help gain a better understanding of marketing's relationship to the external environment. No attempt was made to measure whether chaos does exist in the chosen industries.
- No attempt was made to measure the profitability or market share of the participating companies. This limitation was imposed, as it was believed that most companies would not be willing to disclose confidential sales and profit figures.

1.6 ASSUMPTIONS USED IN THE RESEARCH

The study was based on the following assumptions.

- The industry analysts in stock broking firms and management consultants have the knowledge to accurately assess the complexity and turbulence of the various industries.
- The industry identified as complex and turbulent is subject to the principles of chaos and complexity theory.
- The industry identified as simple and stable is not subject to the principles of chaos and complexity theories.
- The managers in the selected companies have the knowledge to provide the data required for the study.
- The industry experts' perceptions of success are an accurate reflection of actual success in the two industries.

1.7 OUTLINE OF THE THESIS

The literature review is covered in three chapters, the methodology requires one chapter, analysis and interpretation of the findings take 2 chapters and the final chapter covers conclusions and recommendations. In more detail, the outline of the thesis is as explained below.

Chapter 2 explains the theories of chaos and complexity that underpin this thesis. Both theories are first discussed in general terms: they are defined and their origins are explained. They are then discussed in terms of their application to management, strategy and, finally, marketing.

Chapter 3 defines the external environment of business and literature relating to complexity and turbulence in these environments is discussed.

Chapter 4 sets out what the literature has to say, or what can be inferred from the literature, about coping with complexity and turbulence from a marketing perspective. There is an explanation of marketing tactics, namely the marketing mix and the stabilising and destabilising nature of these marketing mix variables. Based on this discussion, the expected marketing mix for a simple and stable environment and the expected marketing mix for a complex and turbulent environment were developed and presented as a marketing mix model in Chapter 7.

Chapter 5 provides a detailed account of the methodology used, including research design, definition of the population researched, justification of industries selected, data collection, discussion of the questionnaire, sampling and data analysis, and the trustworthiness and consistency of the empirical research.

Chapter 6 presents the findings of the study, including a detailed discussion of the findings from the depth interviews, the field notes analysis and the document analysis. The results of the quantitative analysis, namely the word analysis and the correspondence analysis, are presented.

Chapter 7 presents the chaos/complexity marketing mix model that was developed from the literature review and interprets the findings that were presented in Chapter 6 in terms of the model.

Chapter 8 gives the conclusions and recommendations of the study. These include relating the findings to the research problem, objectives and propositions. The implications of the findings for marketing theory and marketing practice are presented, as are recommended areas for further research.

1.8 DEFINITIONS

In this section various terms and concepts that are used throughout the thesis are defined. This is required as all researchers universally agree upon not all definitions and it is therefore necessary to specify the position that is taken in this thesis in regard to these terms and concepts.

- **Marketing** is defined by Van der Walt, et al. (1996: 32) as "...management tasks and decisions directed at successfully meeting opportunities and threats in a dynamic environment by effectively developing and transferring a need-satisfying market offering to consumers, in such a way that the objectives of the enterprise, the consumer and society will be achieved." This definition is preferred because it defines marketing in terms of the environment, a subtlety that few other definitions include.
- **Marketing mix** is defined by Kotler (1997: 92) as "... the set of marketing tools that the firm uses to pursue its marketing objectives in the target market." This 'mix' concept was originated by Borden, but refined by McCarthy to "...the four factor classification of these tools called the four P's: product, price, place (i.e. distribution) and promotion." This definition is used in this thesis for simplicity and since it appears to be the most commonly accepted classification of marketing activities or tactics.
- **Environment** is defined by Palmer and Hartley (1996: 27), quoting Kotler, as "...the actors and forces external to the marketing management function of the firm that impinge on the marketing management's ability to develop and maintain successful transactions with its customers." They further define the components of the environment as follows.
  - **External environment** "...comprises all of those forces and events outside the organisation that impinge on its activities."
  - **Micro environment** comprised "... events [which] impinge directly on the firms activities..." In the microenvironment, they include customers, suppliers, intermediaries, competitors and other stakeholders.
  - **Macro environment** comprised "Other events that are beyond the immediate environment [but which] nevertheless affect the organisation." These 'other events' they classify as political/legal forces, economic forces, social/cultural forces, demographic forces and technological forces. Because of the opening of the South African economy to the global market since 1994, it was felt necessary to include the international environment in the definition of the macro environment, as per the definition provided by Van der Walt, et al. (1996: 68).

- **Turbulence**, (or environmental turbulence to distinguish it from the mathematical concept of turbulence found in fluids) is best defined by Weeks (1990:3), who sees it as "a context characterised as being complex, dynamic, unpredictable, unstable, uncertain and subject to both rapid and multi-dimensional change."
- **Chaos**, according to Hibbert and Wilkinson (1994: 218) "... may be defined as a pattern of behaviour over time that is generated by a deterministic equation but which is extremely sensitive to the starting conditions such that no matter how close two starting conditions are they will diverge exponentially over time. Usually we expect that systems that start in very similar conditions will behave similarly over time, but this is not the case in chaos. A consequence of this behaviour is the impossibility of long-term prediction, which has important implications for a firm's forecasting and planning behaviour." According to Herbig (1990: 65) "Chaos has three dominant characteristics: 1) sensitive dependence on initial conditions; 2) patterns within seemingly randomness; and 3) self similarity." Clearly, therefore, chaos theory is not about chaos in the layman's terms, but is about order.
- **Complexity** is the behaviour a system exhibits when it "... develops in a way which shows both some continuity and also some novelty" (McKergow, 1996: 722) this differs from a chaos system which changes in an apparently random fashion, showing no apparent structure, although there are patterns hidden in the disorder. McKergow (1996: 722) further explains, "Such systems are self-referential (i.e. their elements interact in a systemic fashion) and contain elements of both positive and negative feedback. They are non-linear, so that a small change can lead too much larger effects in other parts of the system and at other times. Systems, which display these traits, have some interesting properties.

  They are non-deterministic. Wholly accurate predictions of future states cannot be made, however well the current and past states are known.

  They show emergent properties - patterns which result from the overall action of all the elements of the system."

  Some authors, for example Stacey (1992), refer to complexity as the 'edge of chaos.'
- **Complex adaptive systems**, according to Stacey (1996b: 10) "... consist of a number of components, or agents, that interact with each other according to sets of rules that require them to examine and respond to each others' behaviour in order to improve their behaviour and thus the behaviour of the system they comprise."

1.9 CONCLUSION

This chapter has given an overview of the chapters that follow, and has in this way laid the foundation for this thesis. It introduced the research problem, objectives and propositions upon which the empirical research is based, and justified the necessity for the research. Then the methodology used, the delimitation of scope and limitations of the study, and the key assumptions on which the study were based, were given. Finally, the structure of the thesis was presented and key concepts and terminology were defined.

On this basis the thesis now proceeds to the literature review in which the theories of chaos and complexity are explained, and how they are applied in management and business is discussed.

CHAPTER 2 - CHAOS AND COMPLEXITY THEORY

2.1 INTRODUCTION

The traditional mindset that has driven the development of business and industry over the past half millennium has been based on Newtonian physics, and over the past century, on principles of Scientific Management as developed by Frederick Taylor. According to Fitzgerald (1996), these methods no longer work because they were designed for a different world that no longer exists. Kelly and Allison (1999: 35) explain that until recently the universe was viewed as "a giant machine, generated by cause and effect - envisioned as being assembled by interlocking gears." Many other authors have highlighted the inappropriateness of this 'command and control' mode of management in a complex environment. Kelly and Allison (1999: 66) stress that it does not work because the commanded agents are "absolved ... of individual responsibility … [and because it] … sends natural self-organisation underground where it is harder to influence." Furthermore, Whiting (2001) explains that the machine metaphor of business is outdated and Tedesco Analytics (2001: 2), maintains that statistics, as used by marketers "...to provide scientific answers to their questions", is the wrong science.

The Newtonian/Taylorist paradigm is based on the assumption of a relatively stable, simple and linear environment, similar to Peters' (1999) type 1 – simple linear system wherein there is a direct correspondence between factors and there is predictability in both the long- and short-term. However, today's environment, as will be discussed in more detail in Chapter 3, is more similar to his type 2 system – non-linear dynamics (chaos), wherein there is high short-term and low long term predictability, or his type 4 system – complex, wherein there is high long term and low short term predictability. As a result many authors believe that the biological sciences of complexity and chaos theory, which emphasise flexibility and adaptability, are much richer sciences and are better metaphors for the evolution of today's businesses and for the development of frameworks to understand the customer (for example, Tedesco Analytics, 2001; Whiting, 2001)

Rather than as a simple machine, these theories see the universe as "a web of 'living', interconnected, self-organising parts that form a constantly co-evolving, morphing, and ever-more-complex whole" (Kelly and Allison, 1999: 35). Chaos theory shows that what looks incredibly complicated may have relatively simple, but non-linear origins, while complexity

theory shows that something apparently very simple can have very complex underlying patterns (Briggs and Peat, 1999; Goldberg and Markoczy, 1998). Tedesco (2000: 3) confirms that, based on the Santa Fe work, especially that of Kauffman, complex systems exhibit the following characteristics:

- Sensitivity to initial conditions
- A propensity toward self-organisation
- Interaction among the system components
- Reaction to feedback from previous behaviour.

Many authors over the past twenty years have applied these theories in the field of management and marketing. For example, Benhabib and Day's (1981) seminal article was one of the first to apply chaos theory to economics and to a marketing issue, while McGlone and Ramsey (1998) argue that non-linearity, sensitive dependence on initial conditions, complex adaptive systems, and feedback all apply to marketing strategy and organisational systems. In their paper, they applied these issues to customer satisfaction to show their applicability.

In many cases, authors have only used these theories metaphorically in their research. However, Nightingale (2000: 33) argues that "identical structures underlie (all) living processes," which he sees as including social, organisational and business processes. He therefore explains that universal Darwinism cannot only be used as a metaphor or as an analogy, but that it can also be seen as a valid theory of business. By extrapolation the same argument could be applied to chaos and complexity theories - in other words these theories can be seen as more than just metaphors, they can be seen as approaches that have a very real relevance to business, and therefore to marketing (Mathews, White and Long, 1999). Oliver, and Roos (1999), confirms this. They maintain that research applying complexity theory in organisations appears to be following two paths, namely the use of computer modelling or the use of metaphors and narrative.

In this research study, the latter, more metaphorical, approach was used: that is, using the concepts and metaphors underlying complexity and chaos theories to better understand businesses and markets as complex adaptive systems. In the sections that follow chaos and complexity theory will be explained, the implications of this new paradigm will be discussed, and finally it will be shown how chaos and complexity theory are applicable in business, management and marketing.

2.2 SYSTEMS APPROACH TO ORGANISATIONAL RESEARCH

2.2.1 Traditional closed systems

The shift from studying functions to studying organisations represented a shift from mechanistic thinking to systemic thinking, with the term system coming to mean both living and social systems (Capra, 1996). A system is a whole that arises from the relationships between its component parts, and system thinking implies differing levels of complexity in the system. Adler (in Enis and Cox, 1981: 388) defines the systems approach as "... more conscious and formal efforts to apply rational, fact-based methods of solving marketing problems". He saw the systems approach being applied to evaluating marketing strategies and mixes, developing marketing information systems, marketing planning and the design and sale of products and services. He further goes on to define the systems approach as "... an orderly, 'architectural' discipline for dealing with complex problems of choice under uncertainty" (Adler, in Enis and Cox, 1981: 389). Morgan (1997) maintains that virtually anything can be defined as a system by drawing a boundary, and shows that organisations can be investigated as systems. Battram (1996) concurs, stressing the importance of adopting a systems approach when thinking about, or implementing change in business organisations.

Traditional system thinking tries to identify and understand causal links in large systems (Farrell, 1998) and is based on Newtonian physics, seeking rational explanations, and is suited to simple behaviour in closed systems. Closed systems have relatively impermeable boundaries, and events happen in a linear fashion, resulting in their moving towards equilibrium. Because the system is closed and linear, deterministic outcomes can be expected. This is confirmed by Wheatley (1993), who explains that closed systems experience entropy according to the second Law of Thermodynamics, winding down to equilibrium, which minimises their capacity to change. In such systems stasis or stability is preferred, but for living systems such stasis is only perfectly obtained through death.

According to Jantsch (1975), most of the traditional system models, especially in economics, are deterministic-mechanistic types, which emphasise prediction and control. Farrell (1998) criticises most business models, such as Porter's five forces model, because of their relatively tight boundaries, the assumption of equilibrium and their assumption of their being time-independent, that is, they assume that tomorrow will be like today. The traditional

approach to marketing, namely defining the customers needs and wants and then fulfilling them, implies a linear, closed system.

Although business systems are recognised as non-linear, they are usually treated as linear because of the difficulty in measuring and handling non-linear systems. This is partly because, before computers, non-linear equations were too complex to solve (Kelly and Allison, 1999).

The development of chaos and complexity theories and the study of emergence in complexity systems have shown that these assumptions of organisations as closed systems are myths and are in fact dangerous (Farrell, 1998).

2.2.2 Open versus closed systems

In a social system, such as a business, the relationships are complex, involved and difficult to conceptualise. Businesses have therefore tended to simplify their environments and their relationships by treating them as linear systems. This has also resulted in them often treating businesses as closed systems, that is systems that are almost unaffected by happenings outside the firm, and which can be strictly and firmly controlled. Kelly and Allison (1999) maintain that many businesses are, in fact, partially open systems, limiting themselves to contact and information that is consistent with their perception of their environment. This view is supported by Alderson (in Anderson and Hoyer, 1991: 47) who observed that "organisations are neither fully open nor closed systems. Their members routinely cross the organisational boundary in both directions," and by Craig (in Skae, 1989) and Radzicki (1990), both of whom maintain that an open system interacts with its environment, continually receiving inputs from the environment, transforming them, and delivering outputs back into the environment.

To be successful, Kelly and Allison (1999) believe firms should open themselves to more information about the changing nature of their customers, markets and environments. This opening up can be achieved, they maintain, by creating more diversity in their environments, which results in systems that are more open. This approach is consistent with seeing living systems as open systems that engage their environment, growing and changing. Organisations, which consist of living things, should therefore be considered as open systems for whom equilibrium is not desirable and for whom command and control systems aimed at pulling the system back into equilibrium are not appropriate. Growth and change are the natural states of open systems, continuously adapting to their environments,

importing energy and staying in a state of non-equilibrium so that they can develop and grow. Therefore, complexity theory, which is an open systems theory, is a more valid means of understanding organisational systems than are the traditional economic, business or military theories normally used, which tend to view the organisation as a closed, mechanistic system (Wheatley, 1993).

2.2.3 Feedback

A key feature of systems theory is the role of feedback in the system. Feedback is also a key process in chaos and complexity theory, specifically in the self-organisation of systems. Feedback is "the action of feeding or reporting back to the originator of an action the results of that action" (Kelly and Allison, 1999: 14). A feedback loop is a series of such actions, building on previous actions - a form of recursion - reinforcing or changing the original action.

Systems have two types of feedback loops - negative and positive. Bardyn and Fitzgerald (1997) refer to negative feedback as control and positive feedback as change. Negative feedback tends to continuously ‘damp’ variations, bringing a system back to equilibrium, which, in closed systems is seen as the preferred state according to Glass (1996). This type of feedback, according to Nilson (1995), is typical of business control systems such as budgets, which try to keep expenditures within planned limits.

Positive feedback, on the other hand, enhances or increases change. In a non-linear system, 'positive amplifying feedback' is used to encourage small, insignificant issues to develop into major changes. As a result, in non-linear or chaos systems, equilibrium is seen as a state to be avoided Positive feedback is typically used in human resources management to encourage positive staff activities, for example, increasing efficiency (Nilson, 1995). Looked at from a complexity viewpoint, positive feedback pushes a system forward to growth and adaptation. Prigogine (in Wheatley, 1993) showed that open systems use such disequilibrium to change, develop and grow, and are known as self-organising systems.

2.2.4 Command and control

As has been shown, closed systems typically make use of negative feedback. This is consistent with the traditional ‘control and command’ style of management based on the Newtonian and Taylorist view of the organisation being a machine that is predictable, and therefore, can be controlled. Authors such as Skae (1989), Sculley (in Sanyal, 1993), Hock (in Waldrop, 1996), Hamel (2000) and McKelvey (2001) all maintain that management

overestimate their ability to achieve control and that the command and control style of management is archaic and no longer applicable for today's companies. Command and control management is not applicable, first, because the world today is so complex and uncertain that tight integration and control leads to ossification, a lack of ideas and creativity, and consequently a lack of flexibility to be able to handle rapid change. Second, such command and control management is not applicable because managers cannot command commitment from staff, because the generation now entering the workforce is more authority averse than any in history. Authoritarian management is sure to discourage and stifle the creativity and commitment of the individuals who comprise the organisations (Briggs and Peat, 1999). In fact, according to Baskin (1998b), many of the failures of attempted organisational improvements such as re-engineering or Total Quality Management, are due to managers attempting to change to organic systems while still maintaining mechanical, command-and-control mindsets.

Dick Morley, inventor of the floppy disk, the programmable logic computer and a chaos computer, summarises the value of the command and control approach, saying "You don't have a prayer in hell of ever understanding factories. You really don't have control. By striving to get control, you only make it worse." Since behaviour in factories is erratic, it is pointless to try to predict the problems through planning. What is required is a system that can solve problems that it cannot explain (Green, 1995: 30).

2.2.5 Organisation as an open system

Kelly (in Gibson, 1996: 251) maintains, "Corporations are starting to take on the complexity of biological systems." As a result, instead of seeing businesses in the traditional systems way as "... self-contained entities that are mechanical in their operation", they need to be understood as an "ecology of organisms." According to Senge (in Gibson, 1996), the traditional way of dealing with complexity is to break the whole down into smaller, more manageable pieces. Individual parts of a system may operate in a logical, linear way, but as the system self-organises a pattern emerges which is non-linear. In other words, the rules of the system develop from the dynamics created by the agents interacting in the system (Farrell, 1998). Therefore, this reductionist approach does not work any more because the sum of the parts does not equal the whole in a complex system. Mavondo (1999) concurs, highlighting the fact that treating the environment, organizational strategies, and functional strategies individually can lead to reductionism, which is pointless since complex systems need to be studied holistically.

Viewing corporations holistically, as organisms, is consistent with viewing organisations from a complexity perspective. According to Cilliers (1999), complex organisations are open systems, and as such, the boundaries are not definite. This encourages information flow, and so stable, closed systems are not desirable. This idea is supported by Kurtyka (2000a: 8) who explains that customer behaviour is not fully predictable because a marketing system, is always "enmeshed in a larger open system context" which means that knowledge about the system is constantly changing, and marketers are, therefore, constantly having to obtain new information to understand customers. Skae and Staude (1990) show that the external environment is an open system, while Stacey (1992) maintains that businesses are interactive systems that create each other's environments through feedback that creates self-reinforcing virtuous and vicious cycles. As a result an organisation cannot be understood without understanding its environment, since separating the organisational system from the environmental system is essentially not possible (Cilliers, 1999; Phelan, 1999).

Glass (1996: 99), adopting a holistic, open systems approach, describes the characteristics of organisations as follows.

- Complex, 'open systems', influenced by and influencing their environments, and with intended actions often being diverted off-course by external events.
- The environment changes so rapidly that management are unable to develop detailed strategies in time, as the environment will have changed by the time such strategies have been implemented.
- The linear cause and effect model does not work, with many actions leading to unexpected consequences.

This is consistent with Winsor's (1995) proposition that most marketing operates within his 'level 3 – chaotic system' environment. Such environmental systems exhibit sudden and unpredictable changes, including large amounts of randomness and less deterministic influences. Competitive dynamics are well understood, but there is great environmental uncertainty. Not understanding these realities can lead to seemingly logical, but in practice incompetent, decisions being made (Glass, 1996).

In trying to understand and deal with complex open systems, authors such as Senge (in Gibson, 1996), Wilkinson and Young (1998), McGlone and Ramsey (1998) and Briggs and Peat (1999) stress the necessity to understand the interconnectedness of complex systems. Each part of the system affects all other parts, resulting in a sum that is greater than the sum of the parts. These interactions create non-linear feedback that leads to self-organisation

emerging from the system in an unpredictable way. Thus, the outcomes of management actions and the behaviour, and change in behaviour, within the system cannot be predicted.

To cope with the unpredictability of complex open systems management has changed from attempting to control and direct the activities of the firm, to participating in the actions and responding to the results that emerge from the self-organisation (Wilkinson and Young, 1998). Baskin (1998b) refers to this as 'management by letting go'. This involves managers monitoring the system to ensure actions are continually realigned by taking action - by being creative, exploring, using trial and error, and learning from the responses and consequences, and then instituting further creative actions to deal with the consequences. This involves continuous and endless creativity, nudging the business system in the direction required (Stacey, 1991). This management style is very different from the command and control approach but is, according to Baskin (1998a), critical to success in a rapidly changing environment.

2.3 COMPLEXITY THEORY

2.3.1 Introduction

According to Conner (1998), it is axiomatic that living systems grow, and thus become more complex, or die. This is also true of organisational systems, as new initiatives and innovations are added to existing systems, without discarding old ones (Conner, 1998). There is a growing tendency to investigate firms and markets from a biological, organic viewpoint, rather than the traditional approach of seeing a firm as a type of machine, which managers adopted for ease of control (Kelly, in Petzinger, 1999b). For example, Joubert (1998) discusses businesses and their competitive strategies in terms of natural instincts, using the cheetah as a biological metaphor for business survival and competition (Joubert, 1998). Farrell (1998: 7) explains that complexity theory reflects a post-modern worldview, being "based on quantum physics and existentialist philosophy rather than Newtonian physics and Cartesian thought. Rather than analyse and break the world apart through a linear, top-down, mechanistic point of view - as we usually do - complexity theory rests on decentralisation and non-linear events. Randomness and chaos are not rejected but embraced."

Most authors correctly view chaos theory as a component of complexity theory. However, Kauffman (in Lewin, 1992) sees complexity theory as predominantly about non-linear systems that converge and produce structure, while chaos theory is about non-linear systems that diverge and become chaotic. For this reason the two theories will be reviewed separately, with complexity theory being covered first. In the following sections complexity theory will be discussed in terms of its main characteristics, followed by an explanation of how it has been applied in business and management.

2.3.2 Explanation of complexity theory

2.3.2.1 Introduction

According to Boisot (1999), there is no single theory of complexity. A collection of theories makes up the body of theory known as complexity theory. It is made up of ideas from many disciplines, such as physics, biology, chemistry, chaos theory, cybernetics and non-linear dynamics. The underlying idea "is that all things tend to self organise into systems" (Kelly and Allison, 1999: 5). These systems develop patterns that are created when a number of simple rules are applied over much iteration. This process is called recursion and explains why small differences at the start of a process can eventually result in very large differences in systems' performances. Many interactions in a system can produce unexpected patterns or behaviours (Goldberg and Markoczy, 1998) because stimulating one part of the system can have an unexpected effect in another, unanticipated, part of the system. Such unexpectedness is because of the nature of non-linear feedback networks (Stacey, 1996b) and the interconnected and interdependent nature of complex adaptive systems (Bar-Yam, 2000).

Langton (in Lewin, 1992) explains that complexity results from underlying simplicity, with simple systems generating complex patterns. Consequently, it is possible to identify the simple systems that generate the complexity and thus identify the systems that generate the creativity. As a result biologists, neuroscientists, psychologists, computer scientists and physicists are all studying complexity to understand how molecules, nerve cells, particles, and other components spontaneously organise themselves into complex adaptive systems such as a living animal, a thinking brain, or a business organisation (Waldrop, 1992). As an example of the complexity that can result from a simple system, Figure 2.1 shows a very complex illustration that results from the iteration of a simple mathematical equation.

Figure 2.1: Illustration of complexity created by a simple system

Source: Briggs, 1992: 26

In the next section, complex adaptive systems will be discussed in more detail.

2.3.2.2 Complex adaptive systems

Complex adaptive systems are defined as large systems consisting of many components, or agents, that interact with one another in a many different ways (Waldrop, 1992; Brown and Eisenhardt, 1998; Farrell, 1998). These agents could be birds, molecules, people or companies. To exhibit complex behaviour these systems must contain many agents and therefore do not follow simple principles, but exhibit complex behaviour - behaviour that is orderly, yet full of surprise. In other words, despite their apparent uncontrollable complexity, they are not totally chaotic, that is they do not operate in totally unpredictable ways. Their behaviour is adaptive because it adjusts to changes in the environment. Rules emerge from the interactions and behaviours of the agents and the environment, creating a 'hidden order' that requires the agents to consider and respond to each other's behaviour in order to improve their own behaviour, and therefore the behaviour of the system they comprise (Stacey, 1996b). The agents thus acquire properties and behaviours that they would not have acquired individually. These rules are part of the system, are not enforced by a single source or agent and cannot be predicted from examining any single agent. The system spontaneously self-organises as the various decentralised parts of the system interact. This emergence of adaptive behaviour happens at the edge-of-chaos where there is enough

stability to sustain existence, but enough turbulence for creativity to overthrow the *status quo* (Waldrop, 1992).

For a complex adaptive system to self-organise and adapt, punctuated equilibrium, the alternation between stable and chaotic states, must occur. After such a 'punctuation', or discontinuity, those who cannot adapt die off (Baskin, 1998a). Furthermore, Gould (in Baskin, 1998a: 29) maintains that survival happens because of what he calls “contingency,” some seemingly unimportant event that provides a major advantage after the punctuation, and “incumbency,” the likelihood that once a company is dominant, its dominance will be maintained until the next punctuation.

It should be noted however, that such dominance can be a disadvantage when a significant change is required as the organisation can be ‘locked-in’ to its dominant position through a culture or strategy that is difficult to change (Conner, 1998). This locked-in position can only be overcome by a major discontinuity at a different level in the industry – for example, a product or service being made obsolete by a development in another part of the industry. Finally, Baskin (1998a) maintains that stability in a system between punctuations is created by ‘succession’, that is, it starts at the lowest level, the level on which all elements of the system are dependant.

Complex adaptive systems present certain common characteristics as listed below (Gell-Mann, in Lewin, 1992; Combs, 1995; Rommes, 1999; Cilliers, 1999).

- Complex, global behaviour emerges from the interactions of many individual, simple agents, following a small set of relatively simple rules and constraints.
- Elements interact non-linearly and the interactions propagate through the whole system. Due to the non-linearity, the system’s behaviour cannot be predicted from the behaviours of each agent.
- Both negative (dampening initial fluctuations), and positive (amplifying initial changes), feedback operate at multiple levels.
- Complex adaptive systems are open systems that exchange energy or information with their environment and operate at far-from-equilibrium.
- The system has learning ability, which arises from its ability to change strategies in response to changes in the environment. Such systems identify patterns in the environment, learn from the experience and adapt to suit the new patterns.
- The system has productive ability that is it can exploit itself at different system levels, which are necessary for a large number of interacting agents.

- Memory, in the form of history, is distributed throughout the system and influences the behaviour of the system.
- Complexity increases because complex adaptive systems continually reorganise themselves to higher levels of complexity.
- Complex adaptive systems cannot be 'controlled'. Success comes from adapting to meet the needs of the network of relationships better than anyone else.

The personal computer industry is a good example of an organisational complex adaptive system. The event that 'punctuated the equilibrium' was the development of the microchip. As a result, manufacturers decided to buy parts for computers rather than make everything themselves. Microsoft became dominant because Apple decided not to license its operating system for use by other manufacturers. Therefore, Microsoft's survival was contingent on an outside factor, but once it became dominant, it maintained its dominance. Succession also applied, with hardware, then applications software and finally networking stabilising.
Some new discontinuity will punctuate Microsoft's current equilibrium: it may be the demand to break Microsoft into smaller businesses, Bill Gates' resignation or the development of the Java language. However, as with all complex adaptive systems, it is almost impossible to predict what the actual event will be (Baskin, 1998a).

Another example is the Three Mile Island nuclear plant near-disaster, which was caused by numerous, small, discrete events, which the humans in the system were not, and could not be, aware of. Any one minor event would not have caused the problem, but the way the individual events unexpectedly interacted led to a near catastrophe. Brown and Eisenhardt, (1998) see perfect competition in a market, and Farrell (1998) sees the emergence of buying patterns as consumers satisfy their needs and wants in the marketplace, as forms of complex adaptive systems.

Although complex adaptive systems cannot be predicted, they can be encouraged, by nurturing mutually beneficial relationships between parties in the system so that the relationships increase value to all members of the system (Baskin (1998a). These relationships are worthwhile because even if an individual or local component breaks down or dies, the global system continues - it survives. This is why an organisation run as a complex adaptive system is more successful in the long term than a rigidly planned and controlled organisation (Peters, 1999).

In the following sections, some of the key characteristics of complex adaptive systems will be discussed and explained in more detail.

2.3.2.3 Self organisation

In 1965 Kauffman discovered that a pattern of order based on simple rules emerged from a randomly interconnected network. He called this ‘order for free’ and it showed that the natural selection of Darwinian biology was not the only way of adapting to an environment. This became the central concept of complexity theory (Lewin, 1993). Hamel (2000: 244) applied this concept to business, maintaining that "order seems to have emerged in the absence of any central authority" and that this emergent order can be helpful to enable revolutionary business concepts to emerge. He stressed that "creating the right set of preconditions" is more important than "assembling grand strategies," which suggests that strategy should emerge from a system rather than being centrally planned!

Kelly and Allison (1999:4) explain that self-organising systems "use energy, material, and feedback from their internal and external environments to organise themselves." Wheatley (1993) stresses that this process can only be effective if it has a continuous flow of new information about its internal and external environment in order to be aware of alternatives and to decide how to respond to environmental changes. The process is not controlled by an outside party or ‘manager’, but spontaneously self-organises from the bottom up through the inter-relationships of the system's parts. As a result, individual managers cannot predict and plan the longer-term outcomes of relationship generating activities (Wilkinson and Young, 1998; Frederick, 1998; Kelly and Allison, 1999).

Each system or action that emerges is similar to, but not exactly the same as previous or other systems or actions. This resemblance is consistent with the chaos concepts of self-similarity and the bounded instability of a strange attractor, concepts that will be discussed in more detail in a later section in this chapter. Kelly and Allison (1999) also stress that a self organising system produces outcomes that are more powerful than can be produced by components of the system working by themselves.

Per Bak's ‘self organised criticality’ explains the point at which a system is ready to self-organise (Farrell, 1998). Criticality is the point at which the system is ready to change into another state, to 'bifurcate'. An example in a business system of this is "a temporary capacity overload that a company can't immediately absorb." Langton and Packard (in Lewin, 1993) maintain that by fine-tuning the simple rules, a system can be moved between stability and chaos and that at the ‘edge of chaos’ the system becomes extremely creative. The implication is self-organisation increases when systems, including organisational

systems, interact with their environments at the edge of chaos (Gault and Jaccaci, 1996). This continuous self-organisation allows and encourages creative responses to changing environments. This creativity is nature's self-organising response to changes in the environment (Briggs and Peat, 1999). Since human and business systems both interact with, and act on, their environments, they can be seen as self-organising systems (Jantsch, 1975; Kelly and Allison, 1999).

Kelly and Allison (1999:116), using their Complexity Advantage Evolutionary Fitness model, provide an example of how self-organisation progresses in a business sense. As organisations increase from minimal self-organisation to antipoetic self-organisation, the level of customer satisfaction increases from “dissatisfied, with strained relationships”, to “increased credibility between customer and supplier”, to "true customer-supplier partnerships", and eventually to a situation where the "customer is delighted, generating deep and committed loyalty."

2.3.2.4 Emergence

According to Mitleton-Kelly (2001a) emergence is a process whereby a few simple rules influence the many simple interactions of the individual components of a system, thereby creating complex new entities or processes. These few simple patterns or rules enable an infinite variety of alternatives to emerge from a complex adaptive system. It is the way the patterns combine that determines what emerges and since it cannot be known how the patterns will combine, it is not possible to predict the shape that will emerge (Pascale, 1999). The new emerged parts are greater than, and different from, the original components. According to Merry (1998b) complex adaptive systems continuously reorganise themselves into new patterns of relationships and from these new patterns, new forms and new possibilities for action continuously emerge.

According to Lewin and Regine (1998), emergence is ubiquitous in nature, and according to Lewin (1992), emergence is the central concept in the science of complexity. Quoting Wilson, he shows that complex social behaviour develops or emerges out of the interactions of the members of a society without overall control. In fact he sees sociality as a biological attractor, and that where such social behaviour emerges, the system is more successful than where the systems operate individually without greater social complexity emerging.

Understanding how emergence happens is therefore important for organisational success. Reason and Goodwin (1999) agree that order that emerges from a complex system is not

predictable from the system's components, and can only be discovered by iterating the rhythmic cycle of the system to see the patterns that emerge. This emergence of patterns happens when the system's parameters change, leading to a movement towards disorder. This movement toward disorder happens at the edge-of-chaos - if there is too much order, the system becomes ossified and is unable to respond flexibly through emergence. The implication is that to cope with change the system should be kept at the edge of chaos.

Goldspink (1998) and (Merry, 1998b) explain that emergence exists at different levels. It is identified at one level, but created by generative processes at one level lower. In other words, one system emerges from the agents at one level lower; for example, a flock emerges from a grouping of individual birds. For emergence to happen nested levels must exist, with close relationships and interactions between the agents of the lower level. Because it is not possible to observe the processes at the lower level that created the emergence, it is not possible to predict the changes that will emerge. Furthermore, since emergence happens through self-organisation no overall manager or controller can put them together to create the greater whole. It is therefore pointless trying to plan change. The change must be made in order to see what happens (Parker and Stacey, 1994). In fact, according to Zohar (1997), when such attempts are made there is a risk of the ensuing system getting out of control resulting in something different from what was planned.

2.3.2.5 Co-evolution

Eisenhardt and Galunic (2000: 92) define coevolving as "successive changes among two or more ecologically interdependent but unique species, such that their evolutionary trajectories become intertwined over time. As these species adapt to their environment, they also adapt to one another." Less formally, Brand (in Battram, 1996: 185) defines co-evolution as "evolution is adapting to meet one's needs. Co-evolution, the larger view, is adapting to meet each other's needs." It implies a symbiotic relationship wherein the two parties cannot survive without each other. According to Kauffman (1995), co-evolution involves mutualism, symbiosis or competition and as such is a powerful feature that enables an organism or species to change as it interacts with other organisms or species in the environment. Mitleton-Kelly (2001a) explains that co-evolution involves the way each element in a system influences, and is influenced by, other elements in the system. Such co-evolution can only take place in ecosystems, which, she maintains, also exist in the social environment.

This understanding of co-evolution is important because co-evolution is the force that underlies emergence and self-organisation, according to Holland (in Waldrop, 1992). It is co-

evolution that enables systems such as animals or economies to develop and adapt to their environment, and it is social behaviours that co-evolve in social and human systems such as business organisations. Capra (1996) maintains that species or systems do not simply evolve because they, and their environment, are shaped by the interacting adaptations of all the elements in the environment. One does not adapt to the other - they co-evolve. According to Lovelock (in Capra, 1996), the environment and its elements constitute a single evolutionary process, and it is this process of co-evolution that enables emergence and self-organisation to take place in complex adaptive systems (Holland, in Battram, 1996).

According to Oliver and Roos (2000: 93) co-evolution "occurs any time two or more systems are linked in such a way that changes to one 'feed back' into the other. The cycle continues when the resulting changes in the second system lead to still more changes in the first, which will in turn affect the second, and so on." Because of the inter-relating feedback, co-evolution hides the cause and effect relationships in systems. Causes can become effects and effects can become causes, thereby making uninvolved objectivity impossible - the environment is not something apart; the system and its environment are inter-relating, co-evolving partners in one dynamic system. Furthermore, according to Wheatley (1993) co-evolution means that any change in a larger system can cause changes throughout the system. Therefore, systems and their environments together co-evolve towards a better fit for each other. In other words, the environment does not determine the future of the system, but together they co-evolve to determine each other's future, succeeding only if the co-evolving elements are vital to the overall system (Oliver and Roos, 2000).

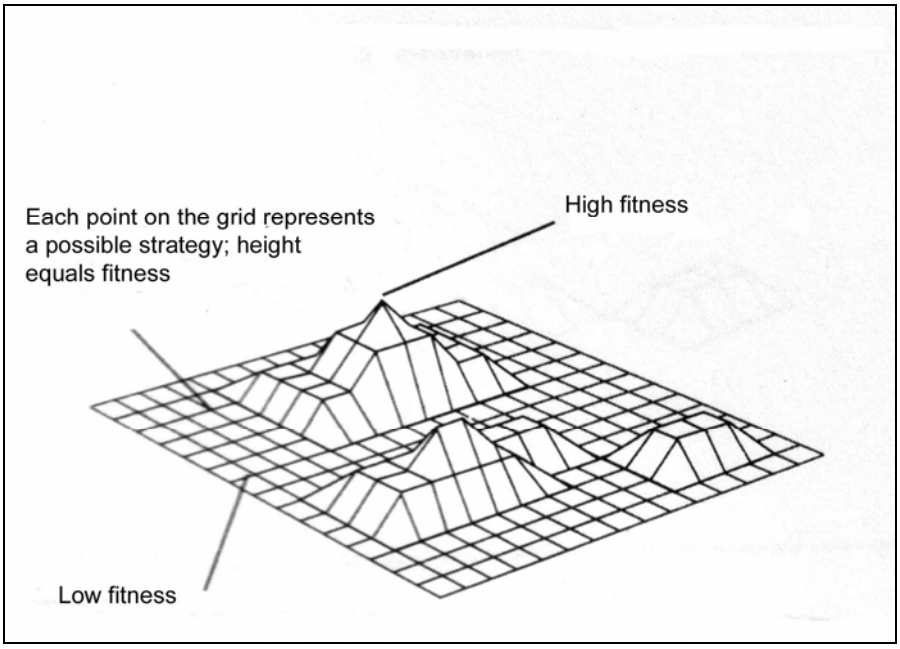
Co-evolution can take two forms: co-operative, mutualistic relationships where each helps the other to develop and advance more quickly than they could alone; or competitive, predator/prey relationships where one species develops more effective attack, or defensive, mechanisms to overcome or elude competitive species. In addition, the outcome, as mentioned above, must also be vital to the overall system. How fast the co-evolution occurs is influenced by the nature of the fitness landscape. In a slowly changing isolated landscape, co-evolution happens slowly, but in a landscape with many new entrants and sudden quick changes co-evolution can happen very quickly.

Farrell (1998) gives as an example of co-evolution, launching and establishing a new product. He explains that the fax machine, after being dormant for many years, grew in popularity because it co-evolved with the growth of Federal Express. Further, the Java programming language co-evolved with the growth of the Internet and the growth of corporate computer networking.

2.3.2.6 Fitness landscapes

The environment in complexity terms can be seen as a fitness landscape. A fitness landscape is a mathematically calculated three-dimensional graph of an environment with numerous peaks and valleys. These peaks and valleys reflect the range of possible actions available to the system, known as the 'possibility space' (Kelly and Allison, 1999). Figure 2.2 below illustrates a graphical representation of a fitness landscape.

Figure 2.2: Fitness landscape



Source:Beinhocker, 1999: 98.

Oliver and Roos (2000: 33) explain that a fitness landscape is a metaphor used to "map the terrain on which [the] struggle between conflicting constraints occurs ... In their struggle to survive species adapt by changing ... changes that are 'successful' give the species temporary advantage over their competitors, and will tend to be retained." Metaphorically, the species moves up a fitness peak when an adaptation makes it more suited to the environment or down the peak if it is less suited or fitted to the environment. Moving about the fitness landscape is known as an 'adaptive walk', a process that is necessary to increase competitiveness, but that is dangerous because energy is expended on a peak that might not be viable or optimal.

The number, size, shape and position of peaks and valleys that make up the shape of a landscape are determined by the competitive actions of all the agents interacting on the fitness landscape (Stacey, 1996c). In order to achieve the best fit to the landscape an agent has to avoid rationality and adopt a messy approach, trying various alternatives to avoid being stuck on a sub-optimal peak. Taking chances, trying lots of alternatives and metaphorically going up some peaks a little way and stumbling down into some valleys increases the probability of the agent finding the 'best' strategy, that is, finding the highest peak.

However, fitness landscapes continuously change by deforming due to the actions of other actors on the landscape. The 'best' position on a fitness peak cannot be maintained because other actors are continually deforming the landscape, causing the peaks to change, either increasing or decreasing in height and shape. Therefore, true fitness can only be maintained by continuously searching for new peaks or changing to new niches on the landscape (Battram, 1996). Unfortunately, the agent cannot know which is the highest peak until he has climbed it, which implies the pointlessness of trying to strategically plan where to move to on the landscape (Stacey, 1996c). Furthermore, it takes the continuous change and rearrangement of peaks and troughs to enable a firm to continuously adapt and maintain a good fit to the landscape, because, when the landscape is stable, no agent can be at an optimal position (Berreby, 1996). A further danger, according to Stacey (1996c) is that agents that get stuck on sub-optimal local fitness peaks look stable and successful, but are in fact at risk of being destroyed by competitors who have been more creative in finding better fitness peaks.

The tendency of a system is to slide into the valleys, as it takes effort to remain at a peak where survival opportunities are better. The valleys are effectively basin attractors - all systems tend towards the common bottom of the attractor (Kelly and Allison, 1999). One of the keys to success in a "landscape (that is environment) that's very rapidly changing ... (is) to find out and decide what you should be doing," that is, to identify and climb the tallest peak on the fitness landscape, and if it does not turn out to be the best peak, then to go back down and search for a better peak (Kelly, in Gibson, 1996: 266). An organisation's success therefore depends on its ability to manage its location on, and progress through, a fitness landscape. Any errors in manoeuvring in a fitness landscape can result in business failure (Frederick, 1998).

Examples of failures to manage the fitness landscape are the buggy whip manufacturers and Apple computers both of whom failed to adapt correctly to their changing fitness landscapes, or, in more traditional terms, to their changing external environment. They were not sufficiently vigilant, flexible or creative to cope with the changing landscape and slid off the peaks that symbolise success into the valleys that symbolise mediocrity or failure. They should have voluntarily left their high peaks before the landscape deformed under them, going on adaptive walks to seek higher peaks (better suited) or adjacent peaks (new areas with less competition) to avoid being outpaced by competitors. This 'letting go' Gibson (1996) sees as analogous to killing off a product when it is at its peak, or most profitable, because it is not right for the future. Other actions that agents can take to improve their fitness to the landscape are innovation and development of new technologies (Kauffman, in Oliver and Roos, 1999) or changing their form (Levinthal, 1997).

2.3.3 Application of complexity theory to business

2.3.3.1 Introduction

The work of Lissack (1997), together with that of the Santa Fe Centre for Management Strategy, has shown that using complexity theory can help to better understand management actions. In fact, Lissack (1999) maintains that complexity science is not only the best tool for understanding organisations; it may well be the only tool available at present. In this section, the principles and characteristics of complexity theory will be discussed as they have been applied to business organisations and to management, in order to show their relevance to the study of business problems.

2.3.3.2 Complex adaptive systems

Baskin (1998a: 6) maintains that computer technology and globalisation have made organisations so inter-dependant that they now "behave like natural ecological systems" and that, therefore, the best way to understand the apparent chaos in turbulent markets is by "applying the principles of natural ecological formation." He explains that markets, like natural ecologies, are complex adaptive systems. They are both made up of individuals who are grouped together, in the case of markets into companies, which make decisions to adapt to their environment. The individuals (people in companies) are themselves complex adaptive systems, linked to each other by information, which causes complex actions to emerge. As a result, the actions of the company cannot be predicted from the actions of any one individual making up that company. In fact, since humans are part of business

organisations, such complex adaptive systems become even more complex and less predictable (Stacey, 1996a). This is because, in an organisation, there are so many interactions between people within and outside the organisation, that the causal links between actions and outcomes are lost and so trying to predict causal links is impossible. In addition, any small change in these interrelationships can develop exponentially and produce unforeseen outcomes as will be explained in the section on chaos theory (Stacey, 1996a).

The increasing move away from the "mechanical model of business - centrally controlled, predictable, stable", towards the new 'organic' model that includes actions that are "distributed, dynamic, adaptive, organized to respond to the unexpected opportunities and threats in its changing environment" supports the belief that organisations are complex adaptive systems (Complexity and Business, 2000: 2).

Various authors show that businesses and organisations are complex adaptive systems. For example, Peters (1999) explains that, in a free market economy, the global characteristics of the system can be known, without knowing exactly how the system will behave on a specific day. In other words, complexity creates order at the global level, but uncertainty at the micro or detailed level. In addition, Whiting (2001) maintains that supply chains are complex systems and Venables and Bilge (1998:1) have shown that retailing logistics is a complex adaptive system by developing a complex adaptive modelling simulation of activities such as "customer behaviour in stores, patterns of customer demand commodity movements, and supply-chain strategies." They see this approach as providing increased understanding of the supermarket business and believe the insights it provides into consumer demand to be more worthwhile than traditional sales forecasting. Van der Erve (1998: 47) believes that organisations that lack instability encourage behaviour that is "too focussed, too obsessed, and too monotonous." They therefore lack the ability to respond to changes in the environment. As complex adaptive systems, organisations need systems, processes and structures that are inherently unstable to be able to cope with, and take advantage of, environmental change.

2.3.3.3 Self organisation

Organisations typically treat individuals as separate particles, keeping them apart. Traditional management theory therefore implies that, for the organisation to operate, coordination must be imposed on the system structure to achieve collective action (Briggs and Peat, 1999). According to Baskin (1998b), all organisations are inherently self-organizing learning systems. As the organisation develops, it operates as a loosely

organised complex adaptive system, but as it grows, it eventually requires a more formal structure and direction. This can come from control or self-control. He maintains that only self-control from an organic approach will be truly successful in the longer term. Briggs and Peat (1999) agree, showing that leaders or leadership systems are not effective in resolving complex social problems - in fact, they complicate them further. They also suggest that allowing self-organisation to take place produces better solutions to which all members of the system are committed.

According to van der Erve (1998), self-organisation begins with autonomy of the individual, or individual organisational unit, because the individual is less restrained and its actions reinforce the actions of other individuals, leading to increased complexity. This increased complexity enables an organisation to self-organise. Therefore, self-organisation is dependent on autonomy and inter-dependence. More autonomy and less inter-dependence leads to chaos, while less autonomy and more inter-dependence leads to avoidance of change, or stability. This indicates that self-organisation can help a system to move towards, or away from, the edge of chaos as required.

Self-organisation is a process that allows an organisation to find, through experimentation, the type of operation to which it is best adapted (Weick, in Thietart and Forgues, 1995). Self-organising behaviour emerges from the organisation when it is at the 'edge of chaos', and it is this self-emergent behaviour that enables firms to adapt effectively. Brown and Eisenhardt (1998) maintain that successful firms are successful because their flexibility through self-organisation enables them to continuously adapt to change in their environments.

Conner (1998) maintains that a company in an unstable market needs to self-organise from within to create the drive and urgency required in today's markets. For self-organisation to take place 'self referencing' must also occur. When an organisation develops radical new strategies or processes, these new strategies and processes evolve from the company's history, culture and accumulated knowledge. Like the branch of a tree, the new strategy maintains some properties of the original strategy. This 'self referencing' enables a firm to adapt to unfamiliar environmental demands without losing its identity and collapsing into the chaotic state. A company's change is, in this way, limited or bounded by its history and past identity, preventing it from moving into the chaos state. In other words, it operates within the bounded instability of a strange attractor.

Koch (2000) warns that just because organisations can self-organise does not mean that they will self-organise themselves in the best possible direction. Self-organised changes are largely uncontrollable by management. Therefore, it is sometimes necessary to intervene, but usually it is better to stand aside and let the system self-organise. As the system gets bigger, it is also often better to let it self-organise because it may be too complex to control and manage. But the self-organisation must be monitored to ensure that it does not self-organise in a negative direction. This view is supported by Cilliers (1999) who maintains that self-organisation does not negate control, but that control should be distributed throughout the organisation. Furthermore, when the context of the system requires it, centralised control and decision-making may be appropriate.

Some examples of self-organisation in a business context are given below.

- Business networks develop from the large-scale structure and order that self-organises from smaller scale interactions (Wilkinson and Young, 1998).
- Self-organising systems adapt to their surroundings, and markets can adapt to pressure from distant markets by growing and becoming more specialised (Koch, 2000).
- Self-organisation is a more effective method to achieve whole system change than the traditional methods of, for example, unfreeze, change, refreeze (White, 1999).
- Self-organisation is reflected in self-directed teams in business organisations (Gault and Jaccaci, 1996).
- Self-organising neural networks can be used to develop marketing communications messages or specific marketing tactics for specific prospects (Forrest and Mizerski, 1996).

2.3.3.4 Emergence

Complex systems' behaviour emerges from local behaviour, specifically the interaction between immediate neighbours, rather than from orders from the top (Andrew, 2002). Baskin (1999) maintains that in business emergence means the trying of many small tactics, and those that seem to work can be reinforced, while those that do not can be discontinued and something else tried. In other words, the overall strategy emerges from identifying, through trial and error, tactics that work, rather than through a grand long-term plan or vision. This is confirmed by Wilkinson and Young (1998) who see structure and performance as emergent properties of networks, which are developed by the interacting patterns of action of the entire role players in the network as proposed by Holland (1997, in Wilkinson and Young, 1998). This interaction creates a "new order of things" after a chaotic disruption, according

to Millier (1999: 103). He terms this ‘convergence’, which sounds like the emergence of order from chaos.

Emergence in business can be encouraged by having interconnected systems, by being decentralised to allow random interactions between people, by circulating information throughout the system, and by communicating with close colleagues and neighbours (Andrew, 2002). However, since emergence is unpredictable and cannot be planned, Koch (2000) stresses the importance of watching the environment in order to see emergence as it starts happening and then to encourage it, maybe to nudge it in Nilson's (1995) terms.

Emergence can happen at all levels in economic and business systems. For example, Arthur (1999) has applied complexity theory to economies at the macro level showing that economic agents such as banks or consumers interact, reacting to the possible outcomes of other agents' strategies. This results in the economy continually evolving. At an industry level, Tetenbaum (1998) explains that systems such as the Silicon Valley community or global marketplaces or the Internet evolve without anyone being in charge. They develop from the interactions of all the system members following a few simple rules.

At the level of a market, Tasaka (1998) maintains that ecosystems of products emerge to meet customers' needs. For example, the Windows operating system has co-evolved with many other programmes forming an ecosystem of products that meet customers computing needs. Furthermore, complexity theory has shown how an efficient market, in the form of a supermarket, "emerges from the decentralised, self-interested behaviour of individual agents with limited rationality and knowledge" (Mitchell, 1993: 13). A genetic algorithm computer programme has shown how independent artificial agents, each trying to maximise their profit and using random strategies, evolve and combine to generate the most efficient market possible without any overall control.

At the individual firm level, Sharma and Hakansson (1996, in Wilkinson and Young, 1998) explain how strategic alliances self-organise and the resulting relationship emerges in a non-controlled or directed way, rather than in a planned, purposeful way. This results in unanticipated, and maybe in unanticipatable, opportunities arising. At a lower, more tactical level, Kurtyka (2000a) maintains that the various elements of the human, organisational, and technical systems involved in a customer relationship management (CRM) system interact to create emergent behaviours that are typical of a complex adaptive system. Review of the CRM campaign leads to revisions that are recorded in the database for use in developing the next campaign. When customers respond to campaigns in new or unexpected ways, and the

firm develops different marketing approaches, it can be seen that the firm has adapted to the environmental through emergence.

2.3.3.5 Co-evolution

Complexity theory explains how organisations co-evolve with their environments, with the values and actions of both interacting to determine the system state, which is unpredictable at any point in time. As the two systems co-evolve, the environment influences the organisation, and vice versa (Frederick, 1998). This is clearly different from the traditional management approach that sees firms adapting to their environments (Mitleton-Kelly, 2001a). According to Stacey (1991), control in a non-linear dynamical system should be neither proactive nor reactive. It should be creative, as environmental changes are partly due to the co-evolutionary actions of the organisation. Therefore, the organisation should interact with other organisations to affect the environment and thereby create its own future.

This process of co-evolution happens with companies co-evolving with their suppliers, customers and competitors (Kauffman, in Whiting, 2001) and amongst goods and services that, through mutualism, symbiosis and competition, exist in niches created for them by other products and services (Kauffman, 1995). In order for such firms to co-evolve successfully, they must continuously co-evolve and therefore, must continuously change to keep up with the competition, and to lead change if they want to be market leaders (Kelly and Allison, 1999). It is interesting to note that Tasaka (1998) discourages the use of market segmentation because of the inability to separate products that make up an ecosystem. It is the co-evolution between the products and markets that create strong and rapid development, so actions should be taken that accelerate co-evolution of the whole system, and not just segments of it.

Co-evolution is very important in business. Modis (1998) believes it provides win-win results, with both host and parasite benefiting from the competition that happens during chaos and from the symbiosis and co-operation that happens during periods of order. Leibold (2001) maintains that supplier and customer together co-create value to their mutual benefit through partnership marketing, a form of co-evolution. Furthermore, since one change in one component of a system can send adaptive ripples throughout the system, a company that does not understand and participate in the relationships of the system ecology will be sidelined, and may find itself without a market (Baskin, 1998a).

Some examples of co-evolution in businesses include the following.

- Every time Intel develops a new computer chip, the entire industry restructures, developing new computers and developing new, more powerful, software to operate on the new, faster computers. IBM tried to dominate the market with the PS/2 computer, instead of adapting to it - Intel's 386 chips took the market and the PS/2 died. (Baskin, 1998a).
- Kauffman (1995) describes how the invention of the motor car destroyed the market for the horse and cart, but created whole new markets that co-evolved with the development of the motor car, namely, petrol stations, service workshops, motels, etc. This shows how technological inventions can create co-evolutionary systems.
- Using genetic algorithms to simulate the activities of marketers in complex, dynamic situations, Marks et al. (1998) investigated the behaviour of brand managers in an oligopolistic retail market. They showed that the genetic algorithm agents performed at least as well as the real brand managers, leading to their belief that brand managers could learn to improve their performance from the patterns and strategies that co-evolved in the simulation.

2.3.3.6 Fitness landscapes

A fitness landscape is the market space, made up of all the choices available to customers together with the marketing messages and offerings (schema) provided by all the competitors in the market Kurtyka (2000a). Little differentiation in the market is reflected as a smooth landscape, while perceived differences in offerings is seen as a rugged landscape. Koch (2000) explains how the concept of 'fitness landscapes' applies to business. The landscape in which the business operates changes as the environment changes - what was a fitness peak, e.g. a profitable niche, might change, becoming unprofitable. At the same time new fitness peaks might emerge, e.g. new niches with great potential. Therefore, managers must continuously scan the landscape to identify potential new fitness peaks or business opportunities or niches. According to Phelan (1997b), in business and strategy terms, the height of a fitness peak represents the level of profit available to firms. This height depends on the actions of all the firms in the landscape and the level of munificence of the environment itself. The best, or fittest, or most adaptive firms climb the highest peaks in the landscape and achieve the highest profit, or success.

As an example of the application of the fitness landscape concept, Beinhocker (1999: 106) explains how an evolutionary search process involving a portfolio of strategies should be used to enable the firm to explore the fitness landscape, using "constant experimentation,

parallel search, and mix of adaptive walks and long jumps." Such an approach enables the firm to defend current business, develop new business from core competencies, and develop future businesses that do not exist yet. Issues that could be considered include "speed of distribution, product reliability, ... innovation, customer loyalty, average time from product conception to launch..." (Kelly and Allison, 1999: 31). This search process enables the firm to explore many fitness peaks, adopting those that it succeeds in, and rejecting those where it is less successful. If a firm can identify where it lies on its fitness landscape, it can identify needed changes to its offering in order to improve its position (fitness) in the consumer's set of perceptions about the market. Unfortunately, since all other marketers will also be adjusting their offerings to improve their fitness to the landscape, it can be seen that this is a very dynamic situation and not easy to achieve (Kurtyka, 2000a). Further complicating the process is the fact that fitness landscapes are a function of the interactions between all the local adaptations and the firms' original forms at founding and their starting position in the landscape (Levinthal, 1997). Therefore, it is not possible to find an optimum fitness landscape for a global environment, but each unit or agent can attempt to achieve local optimisation. Such an attempt is always a trade off between optimising by following a known successful strategy, and using up energy in the less efficient search for new approaches or strategies. This latter approach is more suited to a deforming landscape as the historically successful strategy is unlikely to continue to be successful as the landscape changes (Battram, 1996).

Although it appears to be advantageous to be on a fitness peak, this can also be dangerous (Kelly and Allison, 1999). A company that is stuck on one fitness peak can become set in its ways, thereby being unable to adapt to the changes in the environment. In other words, their historical success prevents them from evolving to adapt to change. It is also important to note that the highest peak may not be the best position in a rapidly changing environment. It may take too much effort and the giving up of entrenched positions to move to another fitness peak. In other words, making the change may be beyond the company's ability and resources, leading to slow stagnation into obsolescence at the peak. Its performance and profit will probably decline as it moves into a loss-making situation or even to bankruptcy. If the company chooses to migrate to another peak, it has to accept reduced returns while it invests in the requirements for the new market and in the marketing costs of new competitive actions (Phelan, 1997b). Success on the new peak is of course not assured and more rapid death might occur by the company's becoming uncompetitive through inefficiencies and incompetence in the new product or market, or by being unable to catch up to competitors who had less dramatic changes to make (Kelly and Allison, 1999). Those organisations that

choose the wrong peak or are not able to climb the best peak quickly enough eventually lose the technological race and become extinct (Kauffman, in Oliver and Roos, 2000).

Some examples of a business market considered in fitness landscape terms follow.

- A new product category, different market or the use of a totally different distribution chain could be alternative fitness peaks to be considered (Kelly and Allison, 1999).
- The messy but rapid changes exhibited by Internet start-up companies are examples of the better long-term bet of searching amongst the lower peaks. This allows the flexibility to evolve and adapt quickly (Kelly and Allison, 1999)
- Improvement and development of technology is allied to climbing a fitness peak, with uncertainty as to which technology (which peak) will eventually prove to be the best. Initially many options are considered and experimented with, until one becomes dominant over time (Kauffman, in Oliver and Roos, 2000).

2.3.3.7 Loose coupling

In non-human complex adaptive systems, such as those of ants or bees, individuality is suppressed to the extent that the individual's role in the system is 'hard wired' or 'tight coupled'. In human systems, however, language enables man to play different and diverse roles and therefore 'loose coupling' or even choice as to what to couple with, is possible (Merry, 1998b).

According to Stacey (1996c), groups or systems are tightly coupled when there are direct inter-relationships and cause and effect is clear. Tight coupling results in efficiency, as in a production line, but a failure in any part of the system can have major impacts elsewhere in the system. Therefore, tight coupling is effective if the system can be kept under tight control. Keen (2000) believes that being too tightly coupled, or locked-in, to their history can prevent a firm from adapting to changing circumstances. Furthermore, Zohar (1997) maintains that if the elements of a system are too tightly linked they are likely to be alienated from other components and the system as a whole. The implication is that too much control results in the elements of the system making little contribution to the overall system. Since business environments are changing, companies that do not have staff who contribute to adaptation will perish. Companies 'locked in' to old style management practices will not be able to take advantage of the opportunities for more efficient and effective management being generated by the new information technology (Keen, 2000). In addition, tight coupling tends to create conformity, which discourages innovation, creativity and risk taking: activities needed in turbulent and changing environments (Stacey, 1995).

Loose coupling influences the success of relationships by having connections that are not uniform and that vary in terms of density, diversity and quality. The implication is that successful relationships require loose extended networks of connections (Mitleton-Kelly, 2001a). Stacey (1995) agrees, but also maintains that an optimal number of random ties are more important than the strength or weakness of the ties.

Of course, the more ties there are the more likely they are to be weak ties. Therefore, many weak ties can be seen to be beneficial to the creation of variety, creativity and innovation in organisations. Such loose coupling creates buffers or slack between components in a system, allowing the system to continue operating even when there are problems or delays in other parts of the system (Stacey, 1996c). Loose coupling is less efficient but is safer, especially in a turbulent, rapidly changing and unpredictable environment. Further, loose coupling creates links with other groups enabling new ideas and innovations to be brought in to a strongly tied group, thus avoiding conformity. In this way, loose coupling makes creativity possible and allows innovative forms, structures and technologies to emerge. Therefore, a truly effective organisation would be a combination of tight- and loose-coupling.

However, most authors recommend loose coupling for complex, turbulent and changing environments. Slater and Narver (1995), for example, believe loose coupling enables effective organisations to avoid having to react to every event because there is a 'buffer' between the organisation and the environment. This enables them to be flexible, and so able to quickly adjust to focus on emergent opportunities or threats. Levinthal (1997) maintains that loose coupling is preferable because the efficiencies of established policies are emphasised at the same time as future opportunities are explored and exploited. A further benefit of loose coupling amongst the components of a system, according to Stacey (1996c), is that it is necessary for remaining successfully at the edge-of-chaos. Redundancy, slack resources, messiness and inefficiency are needed for the system to be resilient enough to cope with the pressures of change at the edge-of-chaos. This loose coupling and redundancy facilitate multi-tasking and quick creativity, thereby keeping the system on the edge-of-chaos and balanced on the highest peak of a fitness landscape. This view is supported by Van der Erve (1998) who sees loose coupling as the degree of autonomy and inter-dependence that keeps the firm balanced at the edge of chaos. Finally, McKelvey (2001) maintains that it is the Chief Executive Officer's duty to loosen couplings in order to reduce bureaucracy, increase novelty and initiative and ensure that those who need to connect do in fact do so.

2.3.3.8 Conclusion

This section has applied the principles of complexity theory to organisations and firms, clearly showing that they can be seen as complex adaptive systems. They exhibit the key complexity characteristics of self-organisation, emergence, co-evolution and loose coupling. The environment of business has been explained as a fitness landscape and this view also supports the contention that complexity theory is relevant to business, management and marketing. In the next section chaos theory, considered by most as a branch of complexity theory, will first be explained and then discussed in terms of its application to business.

2.4 Chaos theory

2.4.1 Introduction

According to Fortin (1995: 1), Poincare was the father of chaos theory as he " realized at the turn of the last century that if a system consisted of a few parts that interacted strongly, it could exhibit behaviour that would be unpredictable." Lorenz, while using computers to try to model and forecast weather patterns in 1972, found that short-term predictions were possible, but not long term predictions. Minute changes extrapolated to create unanticipated results. He had founded the modern science of chaos (Gleick, 1987; Koch, 2000). Gerd Binnig, Nobel Prize winner in physics, sees chaos science as one of the "three greatest scientific revolutions of the twentieth century" (Diamond, 1993: 2). Chaos science helps to understand most things in daily life, including whirlpools, weather, treasury bill rates, heartbeats and product sales. It also explains why long term predictions in non-linear systems do not work.

In this section chaos and chaos theory will be defined, their characteristics explained and evidence of how they are applicable in business will be presented.

2.4.2 Explanation/discussion

2.4.2.1 Introduction

Jensen (in Gleick, 1987: 306) defined chaos as "The irregular, unpredictable behaviour of deterministic, non-linear dynamical systems." Hubbard (in Gleick, 1996: 306), feeling the word chaos implies too much randomness, defined it as "simple processes in nature ... [that] produce magnificent edifices of complexity without randomness." A more useful definition is provided by Hibbert and Wilkinson (1994: 218) who define chaos as

> "... a pattern of behaviour over time that is generated by a deterministic equation but which is extremely sensitive to the starting conditions such that no matter how close two starting conditions are they will diverge exponentially over time. ... A consequence of this behaviour is the impossibility of long-term prediction ..."

Chaos theory itself is a combination of various techniques and approaches that try to identify, describe and forecast the behaviour of systems exhibiting chaos (Goldberg and Markoczy, 1998), and has led to an understanding that:

- apparently simple systems can be quite complicated,
- apparently complicated systems can be quite simple, and
- a system can be perfectly deterministic and yet impossible to predict.

These findings are because most systems are not linear. Many apparently small and insignificant variables cause the system to operate in a non-linear fashion, creating patterns or events that seem random but in fact are causally determined. The process is deterministic because it is intrinsic to the dynamics of the system and not from extraneous, random or accidental interference. The patterns are generated by fixed rules that do not involve any element of chance (Herbig, 1990; Fortin, 1995).

Previous phenomena that were thought to be random might be predictable within limits if they are subject to non-linear rules and therefore are deterministic. Traditionally these variables either were ignored or were assumed to be random and cancelling each other out. However, in the real world, the variables cannot be ignored and they do not cancel each other out (Diamond: 1993). In fact, organisations should embrace chaos to succeed in a changing, turbulent environment (Frederick, 1998).

Such chaotic behaviour appears to be ubiquitous in both the human and natural environments. Researchers have found examples of chaos in the natural sciences, economics and finance, geography, medicine, and many other fields (Hibbert and Wilkinson, 1994). Some success has been achieved in identifying chaos in weather patterns, deer populations, stock market data and prices, business cycles, monetary aggregates and employment rates (Hibbert and Wilkinson, 1994; Sengupta and Zheng, 1995). Since chaos is seen in such a variety of systems, it is reasonable to believe that it exists in marketing systems such as consumer goods markets, sales call patterns and in-store discounting.

The three main characteristics of chaos are, according to Herbig (1990):

- sensitive dependence on initial conditions
- patterns within seemingly randomness, and
- self similarity

These will be discussed in detail in the sections that follow.

2.4.2.2 The science of chaos theory

Chaos science studies and describes the area in a system between regular, predictable behaviour and random, unpredictable behaviour - the area where behaviour moves from stable to disorderly through phase changes or bifurcations. Examples of phase changes are the transitions of the steady drip of a tap to a steady flow of water, the transition of water to ice, and the change of a song from an ‘unkown’ to a 'smash hit'. Feigenbaum and others (in Hibbert and Wilkinson, 1994) have shown that chaos has been detected in almost all the natural and social sciences. Data sets may comprise chaotic, random and non-chaotic elements. Traditional linear statistical techniques are able to identify the non-chaotic elements, but treat the chaotic and random elements as the same. In order to detect chaos, Hibbert and Wilkinson (1994) describe four techniques.

- Return maps separate random and chaotic data series, revealing the hidden pattern in the chaotic series, but none in the random series.
- The correlation dimension measures the randomness in a return map, with points being clustered if chaos is present, but scattered if it is random.
- The Lyapunov exponent measures the dynamic properties of a system, indicating whether there is chaos, stable equilibrium or periodic oscillation, and it also measures the speed of divergence of two paths from an initial starting position.
- Finally, prediction error indicates the accuracy of predictions on the premise that short-term predictions can be made if the data is chaotic, but not if the data series is random.

The unpredictable long-term behaviour of non-linear dynamic systems is governed by a deterministic equation which is intrinsic to the dynamics of the system, generated by fixed rules which in themselves do not involve any element of chance (Herbig, 1990). This is known as the logistic difference equation, which can generate chaos as follows:

$$Xt+1 = rXt(1-Xt)$$

"The value of the variable of interest (x) in the next time period (xt+1) is determined by the value in the current time period (xt) and a constant r. ... No matter how close two initial states are, their trajectories will ultimately become far apart." The amount of non-linearity in a system is determined by the value of the constant r. At a value of 3, bifurcations occur, resulting in period doubling (4, 8, 16, etc.). At an r value of 3.57 chaos sets in, producing a periodic trajectories within certain boundaries (Hibbert and Wilkinson, 1994). Feigenbaum (in Diamond, 1993) found that the rate at which chaos is produced from order is uniform and universal to all systems that exhibit chaos. Such systems occur when there are three or more variables affecting the system, especially if they are of differing periodicity levels (Thietart and Forgues, 1995).

According to Herbig (1990: 68), the stability function of the logistic equation, together with the key parameters of the equation, enable a researcher to identify if the function is operating in stability or if the "conditions are conducive to chaos." Consequently, the logistic equation is critical to the study of chaos (Herbig, 1990).

Stacey (1992: 63) shows that when a system moves from stable equilibrium to explosive instability (or chaos) it moves through a "phase of bounded instability in which it displays highly complex behaviour." This is known as the edge of chaos where behaviour reflects both order and disorder, and patterns that are unpredictable but familiar. It is this transition from order to chaos that the logistic equation identifies. Most authors discuss this transition in terms of a continuum from stable to random or chaotic. The following table indicates some of the terminology applied to the continuum by some authors.

Table 2.1: Continuum of system states

Author	**Simple/stable <----------> Complex/turbulent**		
Nilson (1995)	Stable system	Chaos system, complexity, or edge-of-chaos	Uncontrollable system
Glass (1996)	Stable equilibrium	Bounded instability	Explosive instability
Conner (1998)	Non-comparative realm	Future shock realm	Chaos realm
Peters (1999)	Simple system	Complex system	Random or chaotic system

Nilson (1995) explains that traditional scientific models see the ideal system as stable, predictable and with no change. The system operates like a machine, and although it may be complicated, it is predictable, and elements either are in, or quickly return to equilibrium after, change. As examples, Glass (1996) suggests the motorcar or soap powder markets where market share does not vary much. Traditional command and control management attempt to keep the system in this state. However, staying in this state is dangerous because companies fall behind and become unable to compete with others in their market. In this research study, this state is reflected as a simple and stable system or environment.

At the other end of the continuum is the uncontrollable system – it may be uncomplicated but it is unpredictable and unknowable (Nilson, 1995). There is no order or pattern, with events being truly random and disruptions exceeding the system's ability to adapt. This is commonly known as explosive instability, or 'chaos' in the popular terminology. Such a system is unmanageable and can only be reacted to. Such an extreme is rarely found in business. In this study, this state is reflected in the complex and turbulent environment.

Very few systems are ever found at either extreme of the continuum. In reality, most systems fall somewhere in the middle of the continuum and are what the various authors refer to as bounded instability, chaos, complex or edge-of-chaos systems. These systems are unpredictable within certain boundaries, developing highly complex and unpredictable behaviour within the boundaries, but due to inbuilt controls, they do not exceed these boundaries. Such systems are a mixture of order and disorder and although they are unpredictable, the basic pattern of the system's behaviour can be identified.
This state of unpredictability is important in coping with unpredictability and turbulence in the environment (Conner, 1998), as it is the state that most closely resembles a business environment. The dynamics of the system generate changing demand and lead to a company, a market or a society developing and growing. Since a business environment can be seen as a chaos or complex system, it must be accepted that there is no equilibrium in a business environment. Furthermore, prediction can only be an approximation (Nilson, 1995), and therefore, the firm must maintain awareness and be fast acting enough to take advantage of the instabilities in the system (Glass, 1996). To maintain this edge-of-chaos state, the leader must encourage change in the firm (Conner, 1998); the structure should be decentralised, but with enough loose connections for effective information communication and for searches for solutions (Peters, 1999).

In the sections that follow, the characteristics of complex, or edge-of-chaos, systems are discussed in detail.

2.4.2.3 Non-linear dynamics

Traditionally, relationships are considered in linear terms. This is because they can be calculated, their equations solved and plotted on graphs far more easily than can non-linear relationships. Most scientists, and businessmen, simplify their research by concentrating on the linear relationships. However, according to Black and Farias (1998), markets rarely move towards equilibrium and non-linear relationships are far more common in the real world, as is shown by the continuous development of new products and the opening up of new markets.

This tendency is especially true when considering the complexities inherent in social systems, such as human behaviour or an organisation or a market. In fact, Radzicki (1990) maintains that all social systems consist of non-linear relationships. Linear relationships can explain small, simple systems over the short term, but as systems become more complex over a longer period, a linear approach cannot be relied upon. This lack of reliability is brought about by a number of factors.

- The iteration of positive feedback, whereby slight variances are continuously magnified, and feedback on themselves so that the outcome is unpredictable (Wheatley, 1993).
- A change in a non-linear system's inputs will not lead to a consistent and directly proportional change in the outputs of the system (Goldspink, 1998). For example, a statement that ‘a 10% increase in advertising spending always results in an increase of 3% in market share’ is not possible because of the infinite intervening variables, such as competitors' reactions, changes in the economy, unexpected governmental actions, and changes in the weather (Glass, 1996).
- In most human systems all the possible small initial conditions and all the possible changes are infinite and so it becomes impossible to know or predict the future with any accuracy. According to Parker and Stacey (1994) the future in non-linear dynamical systems is not only difficult to predict, it is essentially unknowable.

Therefore, in complex, turbulent systems at the edge-of-chaos, it is essential to use a non-linear approach as complex dynamics are completely overlooked by traditional methods of analysis that focus on equilibrium conditions and linear approximations (Hibbert & Wilkinson, 1994).

In addition, non-linear reasoning can help to control a system by keeping it within the boundaries inherent in the system, through feedback mechanisms. Positive amplifying

feedback can be used to encourage small, insignificant issues to develop into major outcomes. Therefore, managers look for opportunities to nudge the system into moving in the desired direction. Hence, control is by positive, rather than negative, feedback (Glass, 1996), stabilising the system within certain parameters, and thereby preventing it spiralling out of control, or slumping into dormant stability (Nilson, 1995).

2.4.2.4 Feedback loops

Feedback loops are a basic characteristic of a chaos system. Feedback loops can produce stability, explosive instability, or complexity (edge-of-chaos), depending on the type of feedback that the system experiences. Stability occurs when negative feedback damps changes in variables, pushing the system back to its original state (Thietart and Forgues, 1995). Negative feedback loops produce regular, predictable behaviour (Stacey, 1995; Glass, 1996). On the other hand according to McGlone and Ramsey (1998), systems exhibit chaos, or explosive instability, when they have feedback that amplifies many small changes. Therefore, small changes are reinforced and amplified into large changes when the feedback is positive. As the system moves away from equilibrium, positive feedback will cause the system to move further away from the equilibrium point at an escalating rate (Oliver and Roos, 2000). Such exponential increases can result in explosive instability, or chaos, and probably in the collapse of the system.

The third state caused by feedback is complexity or bounded instability. Both positive and negative feedback act as countervailing forces on the system variables, reinforcing changes and pushing the system towards instability and at the same time damping changes and so increasing stability. This combined feedback can lead to stable equilibrium or periodic stability, or to chaos (Thietart and Forgues, 1995). This is so because, when the system is at the edge-of-chaos, behaviour is unpredictable in the long-term. The unpredictability is due to a bifurcation point being reached and the system then changes its form in some way, often in an unanticipated and unintended direction (Capra, 1996). The unexpected direction can be positive or negative because virtuous or vicious spirals can develop from amplifying feedback of apparently unimportant, small events that could be either favourable or unfavourable. Although the system's behaviour is unpredictable in the long term, it has a qualitative structure that makes short-term prediction possible (Stacey, 1995).

Positive self-amplifying feedback loops in a system at the edge-of-chaos lead to spontaneous bifurcations that represent locations of development and innovation, resulting in a qualitatively different system (Capra, 1996). This explains how new technology opens up new opportunities and niches for new products. For example, as a new product such as the laser printer succeeded and become more popular it gave rise to graphics programmes and desktop publishing. The more the technologies fed back into each other, the more they became locked-in (Battram, 1996). Thus, it can be seen that positive feedback is the principle underlying increasing returns to scale, which specifies that the firm that gets a small advantage early on can enjoy exponential growth until the advantage is so great that the advantage becomes 'locked in', and becomes an industry standard, as has happened with VHS video recorders and Microsoft Windows.

2.4.2.5 Sensitive dependence on initial conditions

Scientists used to believe that small changes to systems had small outcomes, and big changes had big outcomes. Sensitive dependence on initial conditions overturns this belief. Lorentz, in his attempts to model weather patterns by computer discovered that changing the sixth decimal point of an input to the model, after relatively few iterations, totally changed the outcome (Diamond, 1993). In a stable system, small changes do have small effects, but in a chaotic system, smaller changes or errors grow exponentially with each iteration, until no prediction accuracy is possible. This basic characteristic of chaos systems is not changed regardless of how much or how accurate the data is, nor how large or fast the computer is (Diamond, 1993). The relationship between accuracy in specification of initial conditions and accuracy of prediction is not linear. Therefore, it is impossible to obtain sufficient accurate information to develop a model for prediction, which explains why long term forecasting in complex systems is not worthwhile (Mix, 1993). Infinitely precise data would be required to produce accurate long-term predictions, and obviously, such accurate data is rarely available.

Herbig (1990) believes sensitive dependence on initial conditions is the main indicator of chaos. Insignificant factors in non-linear systems, that in linear systems would probably be ignored, can have very significant effects on the end result of the system. Small errors in defining the initial conditions can increase exponentially, leading to crisis points that further magnify the changes. This process explains why long term prediction in chaos systems is not possible. Hibbert and Wilkinson (1994: 229) explain that, although "the next point in a time series can be calculated, errors in the calculation of subsequent points compound."

Small changes can be followed by huge fluctuations, making the past a very unreliable predictor of the future. This exponential growth produces major, unexpected outcomes because of the amplifying affect of positive feedback on the small initial fluctuations in the system (McGlone and Ramsey, 1998). However, it should be noted that small changes do not always grow exponentially all the time, but only when there are enough connections in the system that cohere and then they lead to big changes (Lewin, 1999).

This concept of sensitive dependence on initial conditions appears to be a ubiquitous concept. Briggs and Peat (1999) show that it applies in all types of systems, including social systems, and Prigogine, Chen and Wen (in Phillips and Kim, 1996:259) maintain that "...sensitivity to initial conditions - is obviously satisfied in most human activities." Even in the murky world of espionage it appears to apply, according to Lyall (1993: 262), who says "...an espionage scandal. Its root cause - perhaps a single error by a single spy - is so minute as to be unforeseeable. Yet within days, perhaps even hours, it can be inflated into a major crisis..."

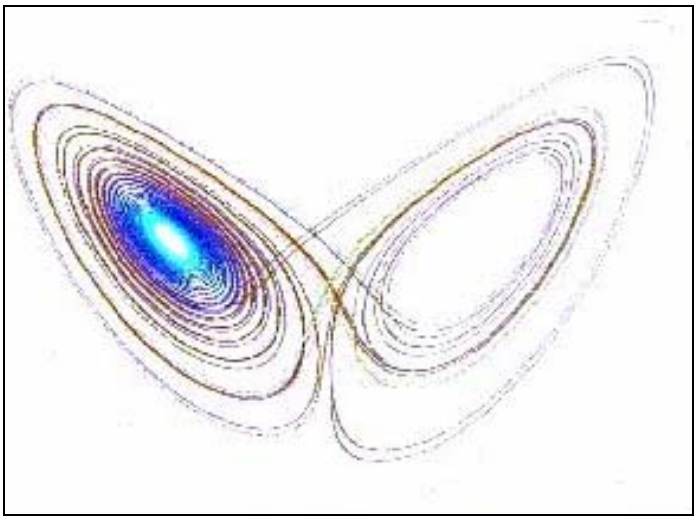
Using small nudges to guide an event, rather than dramatic actions to control it, is more likely to be successful in a chaotic environment (Handy, in Gibson, 1996). Varela (in Wheatley, 1996: 23) concurs, saying that "... you cannot direct a living system, you can only disturb it", concluding that a "...very slight twitch in a connective system will create convulsions elsewhere." Such nudges or twitches can be effective if they are applied before the system has deviated too far. However, nudging a chaos system can be dangerous because of the unpredictable exponential growth that can happen because of sensitive dependence on initial conditions. Small regular nudges, not necessarily in the same direction, but aimed at inching the system towards or away from stability, avoid cumulative destabilisation or true chaos (Balancing broomsticks, 1994). Unfortunately sensitive dependence on initial conditions means that causality can only be identified in retrospect, because which small actions will lead to the eventual major outcome cannot be predicted (Cilliers, 1999).

2.4.2.6 Patterns/Strange attractors

Open systems are dissipative in nature. This means that they have to expend energy to remain at higher levels of order. Such dissipative, or non-linear dynamical, systems have an underlying order or structure (Thietart and Forgues, 1995). Within the apparent randomness of a chaos system, patterns can be found by geometrically mapping the data. Although seeming to be truly random in that no points are repeated, a distinctive pattern does appear, showing that within the randomness there is order of a kind. These patterns are known as

attractors, with a chaos attractor being known as a strange attractor (Herbig, 1990). An example of a strange attractor is given in Figure 2.3 below. The strange attractor is an organising force and as such, chaos systems contain the bases for new stabilities.

Figure 2.3: Strange attractor – unpredictable but self-similar within boundaries

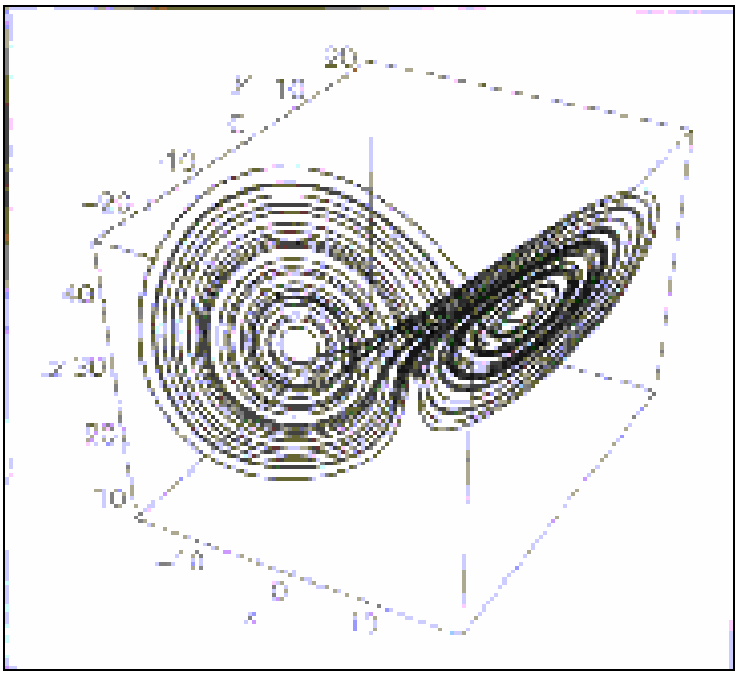


Source: Briggs, 1992: 143.

Dynamic systems exhibit four classes of behaviour - fixed point, periodic, chaotic and strange. This fourth class happens in the change from periodic to chaotic behaviour and according to Langton (in Lewin, 1992), is where maximum information processing occurs, which is why maximum creativity and innovation happen at this stage, also known as the 'edge of chaos'. Langton identified this change from the order of periodic behaviour to the randomness of chaotic behaviour as being the same as phase transitions in physical systems. Therefore, the edge of chaos, the transition between order and chaos, is the point at which very small inputs can provide big changes, which provides the ability to control the system at this point, as previously discussed.

The strange attractor, named by Ruelle and Takens (in Wheatley, 1993), is a basin of attraction to which a system is drawn. The strange attractor is a pattern plotted in three-dimensional phase-space and shows the history of a complex adaptive system's movements through time and space. This three-dimensional path, its lack of intersections and its unpredictability within boundaries are illustrated in Figure 2.4 below.

Figure 2.4: Three-dimensional trajectory of a Lorentz strange attractor



Source: Kaplan and Glass, 1995: 249.

According to Gleick (1987), the paths the system takes are never exactly the same: they never intersect themselves (or they would return to a stable loop – a periodic attractor), nor can they be precisely predicted. The strange attractor describes the path the system takes to explore its fitness landscape, continually seeking routes to higher peaks on the landscape. A unique feature of the strange attractor is that it always stays within certain boundaries, and therefore behaviour is broadly predictable within these boundaries but never identical. Nilson (1995) refers to this as non-repetitive repetitiveness. Exactly where the system will go next cannot be predicted, but it can be predicted that it will not go outside certain limits. For example, it cannot be known exactly when it will snow in the Drakensberg, but it can be predicted that it will not snow between December and February. Therefore, the strange attractor shows that the apparent chaos of a system has a deep seated, underlying order. The system is continually attracted to a stable state, but also continually changes in an unpredictable way. In other words, the strange attractor allows change while maintaining order. This bounded stability allows the complex adaptive system to continually adapt, coming close to the edge of chaos where creativity, innovation and success occur, but pulling it back from plunging over the edge into the disorder, randomness, and chaos that signify failure (Frederick, 1998). Thus, the strange attractor is also the source of order and stability. A system can leave its strange attractor, voluntarily or involuntarily, in two ways - by being

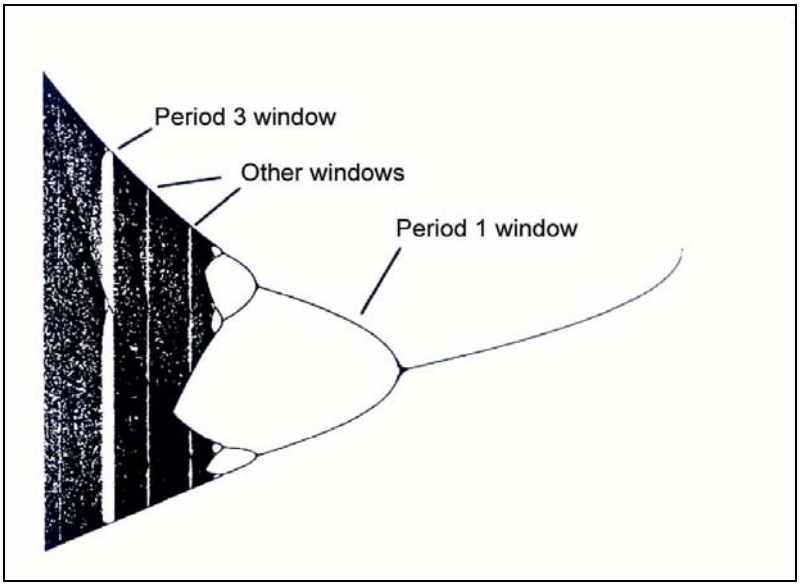
shocked into leaving its attractor through a discontinuity or by a gradual transition away from the attractor (Priesmeyer and Baik, 1989).

Examples of strange attractors in business are the entrepreneurial activities of firms entering and developing new markets and thereby acting as attractors, encouraging other firms to enter the market (Black and Farias, 1998). McMaster (in Battram, 1996) suggests that values, principles, goals, theories and emotions can guide and direct the actions in a firm, replacing the traditional individual leader.

2.4.2.7 Bifurcations

According to Mitleton-Kelly (2001b), components of a complex adaptive system are continually fluctuating, and when positive feedback causes a fluctuation to become powerful enough the system may break from its original boundaries, moving into a far-from-equilibrium position. This breaking of the boundary is also known as a bifurcation or phase transition or period doubling, and is the most common path to chaos. At each transition point, or bifurcation, the system is destabilised and switches to a new attractor (Radzicki, 1990). In other words, complexity does not just increase with randomness, it increases up to a bifurcation or phase transition point, and then decreases to the stability of the new attractor (Langton, 1990). The resultant new state cannot be predicted – it could be a collapse into explosive instability or a leap to a higher level of order. A graphic illustration of period doubling is given in Figure 2.5 below.

Figure 2.5: Example of bifurcations or period doubling



Source: Devaney, 1992: 93.

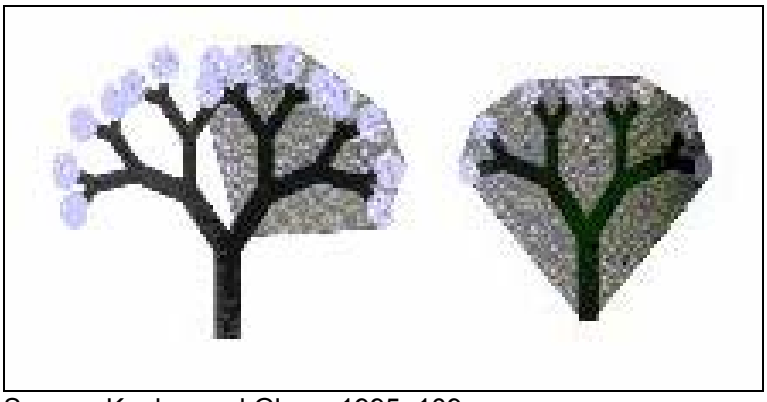
The process of bifurcation involves increasingly complex behaviour. From period one, stability, the system becomes unstable because of increasing inputs, but then settles into equilibrium in period two, whereby the system oscillates between two periodic attractor points. Further increases in inputs create more instability, with the system eventually restabilising with a period four cycle. In this cycle, the system oscillates between four attractor points creating the typical butterfly pattern of a strange attractor. As the period doubling continues, the system develops into higher levels of complex cycles and attractors, and eventually, with increasingly high levels of inputs, enters a state of random chaos, with the performance of the system being totally unpredictable (Priesmeyer and Baik, 1989).

Another way of understanding bifurcations is given by Oliver and Roos (2000). They explain that systems develop gradually until they reach a critical mass - a 'tipping point' or 'breakpoint' - when, through positive feedback, the system has a burst of development and growth. They base their understanding of this phenomenon on the work of Per Bak and Kan Chen in self-organised criticality. The critical tipping point occurs when the system is poised between two attractors and the build up of 'pressure' or some minor event can lead the system into a new burst of activity. This tipping point can be seen as similar to a bifurcation or phase transition where the system changes to a substantially different state. It can also be seen that sensitive dependence to initial conditions can play a role as the starting state of the system can influence the 'weakest point' that determines how the system will develop after the tipping point is reached.

2.4.2.8 Self similarity/Fractal structures

Self-similarity in complex systems implies that similar characteristics apply at different scales in the system, that is in their sub-systems or nested parts of the system (Mitleton-Kelly, 2001a). It implies patterns inside patterns (Gleick, 1987). For example, the shape of a leaf mimics the shape of the branch of a tree, which mimics the shape of the branching trunk, which mimics the shape of the whole tree (Kelly and Allison, 1999). The fractal nature of a tree is illustrated in Figure 2.6 below.

Figure 2.6: Self-similarity – a tree and its branches



Source: Kaplan and Glass, 1995: 109.

Fractal geometry describes and analyses the complexity of the irregular shapes in nature, such as trees, river deltas or snowflakes (Capra, 1996). Since fractal patterns are repeated at descending levels the shape of the item is the same at any scale of observation – the same pattern is observed. This self-similarity at different hierarchical levels is reflected in a cauliflower, which is shown in Figure 2.7 below.

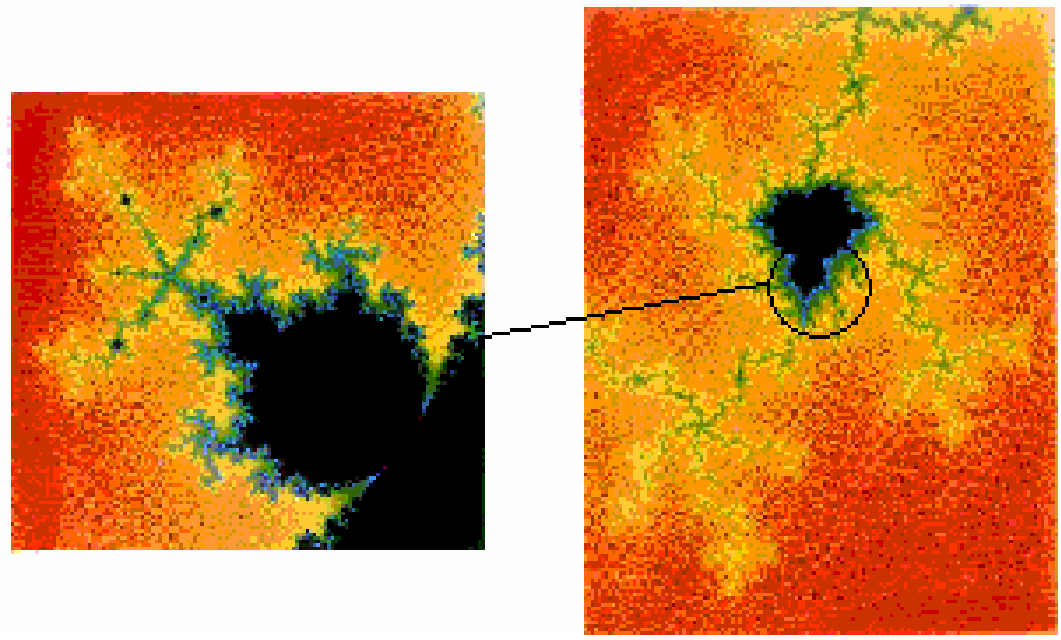
Figure 2.7: Self-similarity in a cauliflower – each stalk a replication of the whole

Source: Briggs, 1992: 70.

The details are random but the dimension is constant, and can be described with a very few pieces of data. A fractal has an infinitely long surface in the smallest space, and therefore is an efficient means of conveying data. DNA, for example, carries all the information for growth hidden in a few simple rules (Herbig, 1990).

Strange attractors reflect a fractal shape when their underlying structures are magnified. Because of the self-similarity present in fractal shapes it possible to predict the shape or pattern of an item by knowing its shape or pattern at a different scale. So, although the exact location or pattern cannot be predicted, the qualitative features of a system with a strange attractor can be predicted (Capra, 1996). The Mandelbrot set in Figure 2.8 below is a computer illustration generated by the repetitive iteration of a chaos equation. These pictures show the same shape or structure at two different levels of magnification.

Figure 2.8: Mandelbrot set showing self- similarity at different magnifications.



Source: Devaney, 1992: Plates 15 and 16

Briggs and Peat (1999) and Wheatley (1993) maintain that fractals are ubiquitous, showing that they exist not only in nature, but also in art and showing that time has a fractal nature. The hierarchical organisation structure in a business can also be seen as having a fractal nature, with each divisional, departmental and team structure being self-similar. Finally, it is important to note that, since fractals are continually repeated at ever-smaller levels of magnification, they cannot be measured. This inability to clearly measure implies incomplete information and therefore unpredictability. As a result, emphasis is placed on assessing the quality of the system as a whole rather than trying to measure individual parts of the system quantitatively (Wheatley, 1993).

2.4.3 Application of chaos theory to business

2.4.3.1 Introduction

Conner (1998: 14) maintains that the turbulence that businesses face can be understood in terms of "... a contest between adaptation resources (capacity) and adaptation requirements (demand)." This implies an adaptive balance between resources and requirements, which he maintains is important for companies to succeed in a turbulent environment. Under these circumstances such companies must try to stay in the 'future shock' or edge of chaos or complexity zone because, although this zone is unpredictable, if adaptation capacity is increased the elasticity and agility of the firm will increase.

Balancing at the edge-of-chaos does seem to be relevant to businesses, as Phelan (1997b) suggests that the business environment is a system balanced at the edge of chaos, and Koch (2000) sees economies as having both order and fluidity and therefore implies a balance at the edge-of-chaos. Further evidence that chaos theory can be applied to business is provided by Stewart (1993) who explains that systems, including economic systems, are at their most effective at the transition between order and chaos. A system that is too simple cannot compete because more sophisticated competitors will outwit it because its stability makes it predictable, but a system that is random and chaotic will also not survive. Therefore, the edge of chaos, also known as the zone of adaptive creativity, is the most effective state for businesses to maintain (Lewin, 1999).

This zone is where innovation, adaptability, and creativity happen and so managers must understand how to operate in this zone, and how to develop structures that enable people to be creative. This state is also preferred because, as mentioned by Stacey (1995), a system is easiest to change when it is at the edge-of-chaos since small actions can escalate to major outcomes due to the principle of sensitive dependence on initial conditions.

2.4.3.2 Non-linear dynamics

Benhabib and Day's (1981) seminal article was one of the first to apply chaos theory to economics and to a marketing issue. Their research showed that rational or logical decisions in a stable environment could lead to erratic, or turbulent, behaviour when the decision-making depends on experience. They showed that erratically fluctuating behaviour was not necessarily due to externally caused random shocks, but due to chaos that is inherent in, and emerges from, a deterministic structure in a stable environment. They showed over

twenty years ago that chaos can be present in a marketing system, and that such chaos is fundamental to such complex systems, and is not abnormal. Confirming the presence of chaos, Forrest and Mizerski (1996) have shown that chaos existed in sales data, and McElwee (1998b) has identified processes in organisations that show that organisations are non-linear dynamical systems. Van der Erve (1998), using a deductive approach based on the work into the chaotic function of the heart, concluded that organisations need non-linear systems, processes, and structures that are inherently unstable to be able to cope with, and take advantage of, environmental change and turbulence. Hamel (2000:13) concurs, saying, "In a non-linear world, only non-linear ideas will create wealth." He stresses the need for radical, novel innovation to cope with hyper-competition, rather than the traditional incremental, continuous improvement approach, which he maintains is an industrial age concept and of limited use in the new economy.

Diamond (1993), Benkenstein and Bloch (1994), and Koberstein (2000) all maintain that markets are non-linear increasingly turbulent. Koberstein (2000) stresses the break down of the understanding of cause and effect of marketing investments, causing companies to have less control over their marketing activities, while Benkenstein and Bloch (1994) maintain that strategy making is a non-linear process.

Regarding specific marketing activities, Mittal, Ross and Baldasare (1998) have shown that the relationship between product and service attributes and customer satisfaction is non-linear and that the consequences are complex; and Lange and McDade (2000) maintain that non-linear dynamics is helpful in understanding the complex market dynamics of the adoption of innovations.

In the field of advertising, Luhta and Virtanen (1996) have shown that the relationship between advertising and stock of goodwill (measured in terms of number of customers or market share) can produce chaotic behaviour, and that mistakes in advertising can result in chaotic behaviour of customer goodwill. Bischi, Gardini and Kopel (2000) quote various studies applying non-linear dynamics to advertising (Simon, 1982; Mahajan and Muller, 1986; Park and Hahn, 1991; Feinberg, 1992), concluding that chaos based advertising policies are preferable.

Finally, Holmstrom and Hameri (1999) have shown, from empirical data, that supply chains are non-linear dynamical systems that reflect chaos.

2.4.3.3.Feedback loops

Considerable work has been published showing the applicability of feedback loops to business and marketing in particular. McGlone and Ramsey (1998) suggest that negative feedback is best known to marketers, in terms of the control procedures used to adhere to budgets, but positive feedback also occurs to change the system, to push it away from the status quo or the expected. Therefore, positive feedback is a destabilising mechanism used to encourage change, while negative feedback is a stabilising mechanism. Stacey (1992) confirms that feedback loops exist in business, explaining that the profit feedback loop is not proportional or linear, that is, profit in one period is not linearly related to profit in other periods. This is because the law of diminishing returns influences the decisions managers take. For example, the more money that is allocated to advertising, the smaller will be the response that each additional Rand achieves.

Care must be taken to balance the positive and negative feedback as excessive amplifying feedback could promote change to the level where practical implementation is ineffective. Balancing the feedback carefully can keep a business system hovering at the edge of chaos (Kelly and Allison, 1999). However, interpreting feedback loops is a critical and difficult skill for marketers because information is always incomplete. Inability to understand and interpret feedback loops can result in a marketer incorrectly damping a system and missing out on new opportunities, or overemphasising change activities and pushing the company into chaos (McGlone and Ramsey, 1998). However, as with all chaos and turbulent environments, the results of feedback loops are unpredictable and cannot be planned (Millier, 1999), and can result in either virtuous or vicious cycles (Nilson, 1995). This unpredictability is because interactions between people create non-linear feedback loops that are based on human perceptions that often lead to over- or under-reaction (Stacey, 1995). An example of this is provided by Rasmusen and Mosekilde (1988, in Herbig and Golden, 1991) -customer defection due to delivery delays is a feedback loop and as delays increase, customer defections increase, leading to chaotic oscillations that can result in complexity and turbulence that may be impossible to stabilise.

Despite the potential problems, all authors agree on the importance of positive feedback in business. Tasaka (1998) maintains that it is better to encourage self-organisation and emergence than to rely on artificial control as, from this process, cyclic loops emerge and create positive feedback that allows structures and order to emerge autonomously. Millier (1999) believes that product development happens best when a feedback loop is set up, with the customer using the product and providing feedback to the firm, which then adapts or

changes the product to better suit the customer's needs. Another example of the importance of understanding feedback loops is provided by Saisse and Wilding (1997). The process of mass customisation has made a greater variety of products at reasonable prices available to customers. Because of the ability to change and up-date models quickly, customers come to expect more frequent changes and greater variety at lower prices. These expectations and their satisfaction create a feedback loop that leads to a more unpredictable and dynamic market, where small changes in customer demands, that could previously be ignored, now must be seen as competitive opportunities."

Stacey (1992) maintains that managers create and shape customer's needs by creating customer perceptions through advertising and by the products presented to customers. A feedback loop is created when customers respond to the offering, which influences subsequent offerings, and so on. It is an amplifying feedback loop. Similar loops are created by customers realising a need when they see products in use by other customers. Arthur (1993) refers to this process as increasing returns. Glass (1996: 102) provides an instructive example of how amplifying positive feedback can produce an unintended vicious cycle:

> "You launch an advertising campaign to gain some market share. A competitor takes fright and re-examines their relations with their advertising agency. They realise that, having been with the agency for ten years, they are no longer a 'glamour' account for the creative department and so are getting poor service from junior staff and an unsatisfactory campaign quality. They move their account to a new agency. Anxious to make its mark, the new agency puts its best people on the account. They come up with a great campaign and you get slaughtered in the market.
>
> All you were trying to do was grab a few points of market share to satisfy your newly appointed boss, who wanted to make his mark. But you end up pushing your main competitor into a more aggressive mode, which results in them taking from you the extra market share you had hoped to steal from them."

This vicious spiral for you, and virtuous spiral for them, can lead to their attracting better staff, becoming more productive, producing more at a lower cost, increasing their bargaining power, making more profit, and consequently being able to afford more advertising, lower prices, and generally to strengthen their market position. They are on a self-reinforcing virtuous spiral, which is very difficult to compete against (Glass, 1996). This example shows clearly the importance of understanding how feedback loops operate in business.

2.4.3.4 Sensitive dependence on initial conditions

Understanding sensitive dependence on initial conditions can be important for businesses. By giving the system a small 'nudge', a chain of change can be triggered. Traditionally a small 'nudge' would be ignored in business. However, the right kind of 'nudge' at the correct

time (the initial condition) could lead, through feedback, to major changes (Nilson, 1995). Ball and Asbury (1989) found that successful South African companies are better able to spot environmental clues to future opportunities. As a result, they are able to influence environmental changes in ways that are favourable to themselves, but unfavourable for their competitors. This means that if a small change suddenly develops into something significant, they are able to adapt quickly, whereas competitors are taken by surprise and unable to adapt. According to Hamel (2000), being a 'first mover' is essential because sensitive dependence on initial conditions and positive feedback create a 'flywheel affect' that reinforces early success, providing a significant advantage over the long-term (Koch, 2000). In order to be a first mover, a manager must be able to recognise the patterns that indicate which small changes to 'nudge' (Morrison and Quella, 1999). In addition to recognising the initial small changes, Hamel (2000) suggests three ways that the increasing returns of sensitive dependence on initial conditions can be harnessed.

- Network effects - as a company's network of stakeholders grows it becomes more difficult for late entrants to catch up
- Positive feedback effects - rapid feedback and improvements enable a firm to continuously improve its products and services faster than its competitors can - it creates a virtuous cycle.
- Learning effects - in knowledge intensive industries, starting early and accumulating knowledge faster than competitors can enable a firm to stay ahead of its competitors.

Although which small changes will evolve and develop cannot be predicted and managed, it is possible to intervene in the system. Wilkinson and Young (1998) suggest identifying key triggers or leverage points to initiate small changes that will push the system to a new attractor. However, it is very difficult to predict in advance which triggers will work, and to what extent they will work, and who should be the 'leader' or 'manager' in instigating the small changes.

Since chaos and complexity theory specify that complex adaptive systems self-organise from the bottom up, the solution is probably to encourage all agents in the system to initiate small, nudging changes. Management should then monitor these, and use negative, or damping feedback to reduce the effect of those that appear to be unfavourable to the firm. Such control is important because a small mistake can cause disastrous effects and create a vicious cycle (Tasaka, 1998).

Clearly, the ability to identify the points at which to nudge the system is critical. Some researchers have devoted their attentions to 'tipping points' or 'break points'. Tedesco (2001b) has developed an agent-based simulation, which uses typical market research data, such as focus groups and tracking data, to formulate and test marketing strategies. This simulation identifies tipping points, which are states where changes happen suddenly and unexpectedly, and spread rapidly throughout the society, or system: for example, the spread of word-of-mouth communication among consumers about brands. The simulation groups agents into market segments, which are then analysed in terms of the relationships between the agents and the brands in the market. The simulation identifies when a tipping point is reached, thereby providing a stronger understanding of consumer behaviour, and of the diffusion of a new brand through the market.

Gladwell (2000) has developed a theory for explaining how social events develop, evolve and very quickly reach a tipping point that pushes them into the exponential growth of an epidemic. He proposes three laws that explain this tipping point.

- The law of the few: there are a few, selected people who encourage the spread of an idea. They are knowledgeable about the idea or new product, know and talk about the product to many people, and have the persuasive ability to encourage people to try the new product. In other words, the messenger is important.
- The stickiness factor: some small, often unsuspected, aspect of the idea or product is so intriguing or eye catching that it will initiate adoption. Such stickiness factors are often seemingly small or trivial. This means that how the message is presented is important.
- The power of context: the environment in which the idea or message is conveyed can influence how well the message is accepted. People are sensitive to small differences in their environment and little things can be important - certain times, places and conditions. Therefore, the context in which the message is conveyed is important.

These three laws are all based on the concept of sensitive dependence on initial conditions. They all depend on small initial factors, namely, a few people, a minor change in how the message is packaged, or a small change in the environment. These small initial conditions can tip, growing exponentially into a major change. A practical application of this approach is provided by Schroer (2001) who describes the use of the tactic of 'buzz marketing'. Chrysler encourages staff members to constantly talk about Chrysler vehicles - within and outside the company. Their products are both exciting and complex, so their product messages create a self-reinforcing positive virtuous cycle, which then multiplies and spirals out to customers and potential customers. Nilson (1995) provides an example of the same principle applied to a vicious cycle. A perfect product is used incorrectly by a consumer and leads to product

failure. The consumer is an opinion leader and tells many friends about the product's failure to perform - one of these friends is a radio announcer who mentions the event on air. Thus, an isolated, unanticipated event is multiplied into a totally unpredictable and disastrous situation for the company.

One of the difficulties of managing these virtuous and vicious cycles is the unpredictability of the outcome. The same strategy can evolve totally differently in two firms because of small initial management errors or implementation differences because of the sensitive dependence on initial conditions (Kopel, 1996). Microsoft copes with this problem by trying many small innovations, monitoring the results, and then reinforcing those that seem promising. This approach clearly follows the principle of sensitive dependence on initial conditions (Pitta, 1998). The small initial conditions, or small exogenous shocks, may be spread throughout an organisation, so relying on a top-down, head office approach would be slow and cumbersome. To respond quickly, individuals must be empowered to think and act autonomously (Manning, 2001a).

2.4.3.5 Patterns/Attractors

According to McGlone and Ramsey (1998), one of the key lessons of chaos theory for businesses is that actions that are repeated, because they were successful in the past, will not necessarily lead to the same results in the future. This is because a strange attractor never follows exactly the same path. Needs change, expectations, change, and performance changes, and so what was successful in the past may well lead to failure in the future. Therefore, reacting to environmental change should always be creative and innovative, and not just 'more of the same'. However, the resultant marketing activities, although different, are usually similar. The results, therefore, are never identical, but vary, to a lesser or greater degree, within certain limits. The strange attractor illustrates such variance within boundaries. Nilson (1995) refers to this as non-repetitive repetitiveness, which explains why experience and the building of a knowledge data bank in a company are so important. With experience over time, patterns can be identified which help in rapid response to unpredictable changes. This is confirmed by Bischi, Gardini and Kopel (2000) and Manning (2001b) who both see the patterns of attractors as techniques that help executives to understand and make sense of the effects of the complex and turbulent environment on their marketing activities and can guide them in their actions in response to environmental changes. For example, Bates (1999b) and Frederick (1998) both see corporate vision and values as attractors that align the activities of the company, acting as a boundary for the activities that are preferred. However, if the vision and values are too broad

they can lead to misdirection, and if too narrow they are merely goals or missions that can limit the company's activities, especially in a changing environment.

Based on Kauffman's NK models, Wilkinson and Young (1998) define three types of attractors. Fixed attractors consist of fixed elements that settle down in equilibrium. Chaotic attractors consist of variable elements that have no set or repeatable pattern. Edge of chaos, or strange, attractors are a mix of the two with chaotic attractors separated by fixed attractors. These strange attractors are a key characteristic of organisations. The fixed elements that keep the system within its boundaries are the longer term or exploitative business relationships that maintain the overall structure of the organisation, while the variable elements that enable creativity, change, adaptation and evolution are the shorter term or exploratory relationships.

A fixed, longer-term attractor could be the individual relationship between two participants where balance is achieved through trust and mutual co-operation. The chaotic, or shorter-term, attractor might be the arm's length relationship that forms when there are immediate and short-term benefits for the two participants. The strange attractor could be the overall structure of the network as a whole, which might settle down to a set of relationships in equilibrium, due to the countervailing forces of the longer and shorter term relationships. So, in a turbulent environment a mix of relationships is necessary to keep an organisation operating at the edge of chaos. If there are only long-term relationships, the organisation will revert to stasis and death; only short-term relationships and the firm will spiral into chaos, with actions being so random as to be unmanageable and the core nature of the firm continually changing.

Glass (1996: 103) provides an instructive example of the importance of understanding the patterns provided by a chaos perspective. A stable equilibrium mindset sees market growth as regular over longer time periods but a chaos viewpoint sees it as "... lurching from one state of semi-stability to the next." These semi-stable plateaux can be seen as attractor points. The market settles at these points for a time, and if marketers view them as a long-term trend, the market may be entered too late and an opportunity may be missed. For example, a shift in consumer taste for small cars can cause a temporary surge in sales, which, once the change over to smaller cars has happened, can settle down to a steady rate of sale. The company that views this surge as a continuing trend might over-estimate the market, resulting in excess capacity and being over-stocked.

Numerous other authors have shown the applicability of attractors in business and marketing.

- Ketelhohn (1994) believes that learning from action and learning from analysis form two interacting spirals that act as strange attractors. Because this is not understood, many management decisions are uncertain and adequate linear guidelines for decision-making are lacking.
- Based on the research of Benhabib and Day (1981), Herbig and Golden (1991) show that, in certain circumstances, consumption behaviour, such as which products are bought, does not settle into a stable pattern, but into a broad pattern that can enable predictions within certain boundaries, that is a strange attractor.
- Based on the work of Rasmusen and Mosekilde (1988), Herbig and Golden (1991) show that increasing customer defections due to increasing delivery delays form a feedback loop that can push the system to the edge of chaos and into a strange attractor. If defections increase further, the system will be pushed into full chaos, making the system unpredictable and uncontrollable.
- Rasmussen and Mosekilde's (1988) simulation of inventory, production and selling activities, based on inventory levels and order backlogs, showed that marketing systems could produce a strange attractor.
- Sorger (1992, in Feichtinger, Hommes and Milik, 1994) showed, via a simple advertising model, that the interaction of two competitors' advertising could result in chaos. Feichtinger, Hommes and Milik (1994), through an even simpler advertising model, showed that a single simple feedback rule could create unexpected and erratic patterns, and even chaos. They found that a 'persistent' or stable firm stabilises a situation by using a continuous and defensive advertising strategy. However, if the persistent firm adopted an aggressive advertising strategy, then irregular and sometimes chaotic patterns resulted. In a less stable, turbulent situation defensive advertising can lead to chaotic behaviour.
- Kurtyka (2000a) explains that hidden patterns of behaviour and relationships can be found in consumer data in the Customer Relationship Management databases. These patterns are attractors in the retailer's state space (product, customer and behaviour combinations).
- Black and Farias (1998) believe that the actions of firms entering and developing new markets act as attractors that encourage other firms to enter the new market.

2.4.3.6 Bifurcations

Conner (1998: 84) describes the area just before and just after a system goes out of control as a "bifurcation zone." In this zone, "something that was whole and consistent splits and goes in two different and unpredictable directions." The loss of predictability is due to the increasing uncertainty of the destination of the system over time (Bischi, Gardini and Kopel, 2000). This bifurcation zone, although dangerous, is also the area in which innovation and new developments take place. It is a 'window of opportunity' that change agents can use to lead an organisation to a higher level of coherence, and so is very important for businesses. Authors from Rosser and Rosser (1996), studying an economy in transition from command socialism to market capitalism, to Herbig and Golden (1991) analysing a companies sales history, have confirmed that period doubling and bifurcation occur in business applications.

According to Fitzgerald (1996), fluctuations in a system build up until they become strong enough to shake the system free from equilibrium. At this point the structure of the attractor changes from a steady state to a periodic cycle, and then to a cyclic chaotic state, and finally to erratic behaviour with no apparent periodicity (Bischi, Gardini and Kopel, 2000). Priesmeyer and Baik (1989) suggest that organisations break from their attractors and move to the next limit cycle because of changes in their environments. They either return to their old attractors (due to damping feedback) or they stabilise at a new, more complex limit cycle, indicating innovative development. Period four (edge-of-chaos) companies oscillate among four points, for example, four quarters, coming very close to uncontrolled chaos. The authors believe this period four state is caused either by environmental conditions, or by the way the company deals with the periodic cycles.

Bifurcation points in business could be the launch of a new product (Millier, 1999), brand switching, fad behaviour (Herbig and Golden, 1991), product changes at the start and end of a product life cycle (Modis, 1998), business process reengineering activities (Mitleton-Kelly, 2001b) or starting a new division in a company (Kelly and Allison, 1999).

For the process to be effective and lead to success, the more bifurcations the better. This is because the likelihood of the firm finding the correct route for success is increased if there are many alternatives (Modis, 1998; Millier, 1999). Therefore, destabilisation and encouraging chaos to cause bifurcations is good for success in turbulent markets. However, care must be taken because, as has been shown, the results can be unpredictable and sometimes the opposite of what was wanted. Langton (1990), for example, has shown the

importance of information at a phase transition, or bifurcation. Before the transition, in stability, information is not distributed, while after the transition, in chaos, information is distributed too well, becoming overwhelming and swamping the system in information. Therefore, for a firm to cope well in a turbulent environment it must communicate effectively amongst its members.

2.4.3.7 Self similarity/Fractal structures

According to Kelly and Allison (1999) systems that have similar structures in their sub-systems (or nested parts of the system) are known as fractal, or self-similar. Baskin (1998b) applies this concept to organisations maintaining that employees network in their departments, that departments are nested within product divisions, that divisions are nested in market groups, market groups are nested in sectors, and sectors, in the company. In other words, he views the organisation as a nested, fractal network. Mitleton-Kelly (2001a) agrees that characteristics are the same at different levels (individual, department, division, corporate) within a firm, and Grulke and Silber (2000) see fractals as a perfect analogy for modern business.

Stacey (1991) stresses that patterns of performance, choice, and decision-making by different agents at different levels in the system are similar but not identical. Koch (2000) agrees that no single business situation is exactly the same, but there are a limited number of consistent patterns that repeat themselves, and thus current situations can often be recognised as resembling previous situations. Therefore, experience in recognition of patterns in the market is more important than detailed analysis. Trying to measure ever-finer levels of a system, which is typical of what is traditionally done in management control, is pointless as everything about a system can never be known.

However, since a few simple instructions create a fractal shape, some predictability is possible. Understanding the concept of fractals therefore leads to the importance of studying "the quality of the system - its complexity and distinguishing shape, and how it differs from other fractals" (Wheatley, 1993: 129). Simple rules, such as visions, values and beliefs, create a strange attractor, ensuring that individuals continue to independently operate within the limitations imposed by the values (the attractor). No regimented control is required as employees' actions will be shaped by the attractor and they will not go outside its basin of attraction. However, this is difficult for management as where the system or business will go cannot be predicted and so traditional management feel the need to take control. Managing

from a chaos viewpoint means trusting the strange attractor and standing back once the rules (vision, beliefs, etc) have been firmly established.

Having cultures, visions, values and beliefs shared throughout all the divisions, departments and individuals in a firm enables crises or opportunities to be quickly handled without having to laboriously build a new team culture or wait for a new culture to emerge, as everyone will know how to react (Kelly and Allison, 1999). For example, when entering a new market, although it will be different, similar patterns, trends and issues will be present. Therefore, decision-making based on experience and intuition is often superior to rational decision-making based on analysis.

An interesting, but untested, example of a fractal structure in business is the sigmoid, or S-curve that applies to most growth patterns, including business and the economy. Modis (1998) believes this to be an example of a fractal pattern. At all levels, short-term sales growth through to long-term economic cycles, the S-curve applies. This nested, or self-similar, pattern could apply sequentially to products, product groups, companies, basic technologies, industries, or the economy.

Finally, Morgan (1997) explains how an organisation structure that has a fractal quality can be created. When a business unit reaches, say, 200 employees, the only way it is allowed to grow further is by spinning off another business unit. As a result the firm keeps generating business units that are similar to their parent units, and each unit at a lower level is a replication of the units at a higher scale, which is the definition of a fractal structure.

2.4.3.8 Conclusion

This section has shown that every one of the key characteristics of chaos theory can be, and have been, applied to businesses, management and marketing. Therefore, it can be concluded that chaos theory is a suitable model to use to investigate the selection of marketing tactics by companies operating in a complex and turbulent environment, which has been shown to be an environment at, or near, the edge-of-chaos. It is reasonable, therefore, to assume that successful companies in such an environment would adopt tactics that are consistent with the principles of chaos theory.

2.5 IMPLICATIONS FOR BUSINESS

2.5.1 Introduction

In this section the implications of the fact that organisations are complex adaptive systems will be discussed. These implications include the need for a new mindset in business and specific implications for strategic management and marketing, especially issues relating to longer-term planning. In addition, the doubts that some authors have regarding the application of chaos and complexity theories to business will be critically discussed.

2.5.2 A new mind set

Tedesco (2000) sees complexity as a way of thinking, a shift in scientific approach, significantly different from the 'scientific management' of Frederick Taylor that was the predominant mindset of the industrial age (Macready and Meyer, 1999). Although chaos and complexity theories do provide methods and techniques that help to manage in a turbulent environment, they also provide companies with a new mindset, a "way of thinking about their businesses and the fitness landscape in which they compete" (Kelly and Allison, 1999: 8).

Such a new mindset was indirectly proposed nearly twenty years ago by Drucker (1985) who saw the source of innovation as being the unexpected, unanticipated changes in market structures, in perceptions, moods and meanings of the market, and the development of new knowledge. Since Drucker said this, most of the attempts to change have involved 're-engineering.' Baskin (1998a: 5) maintains that this merely replaced "old inefficient mechanical systems with new, highly efficient ones," and that mechanistic systems discourage innovation and adaptation. He maintains that managers need to de-engineer organisations and replace mechanistic systems with organic ones to release the employees' creative abilities. This opinion is supported by Farrell (1998: 16) who believes that the traditional mind-set of managers was to find the "single right answer." However, rapid change happens weekly, rather than yearly, and is so dynamic that outcomes are utterly unpredictable. There is no 'most likely outcome' as events are influenced by small, seemingly random, and unimportant happenings. Fitzgerald and van Eijnatten (1998: 261) contribute to the argument, maintaining that the 'equilibrium' mindset that involves control-driven management is a "dangerous, flawed and incomplete model of organisational reality." This model assumes that the natural state of business is homeostasis or near-to-equilibrium, and that it is management's job to maintain stability. They explain that the activities designed

to achieve stability in fact generate the far-from-equilibrium conditions they are trying to avoid. Kelly (in Gibson, 1996) agrees - organisations are today so complex that they are ungovernable and unmanageable by a mechanical mindset. Therefore, the traditional mindset was found wanting.

Fradette and Michaud (1998:18) maintain that a new mindset is needed because companies face a totally new "business landscape where our traditional assumptions and practices are no longer valid." This requires "...new ways to think about these discontinuities, new ways to organise our enterprises to exploit them, and new ways to turn them to extraordinary advantage." These new ways of thinking are essential because companies that have performed well should be learnt from - not in terms of what they have done, but in terms of why and how they have been doing it. In other words what they do is relatively unimportant, because the situations will have changed, so what was done in the past is not relevant. However, the reasoning behind the successful actions and how they arrived at the activities and implemented them could be applied to a new, changed situation. The 'process' is thus more important than the 'content' when examining behaviour in a turbulent or 'chaotic' environment (Nilson, 1995: 21)

This new mindset should include emphasis on global competitiveness, strategic and organisational flexibility, and urgency of execution. Such a mindset results in a greater ability to handle change (Ulrich and Wiersema, 1989), faster delivery, and new products and upgrades that add value throughout the supply chain (Macready and Meyer, 1999), and greater focus on interrelationships and the dynamic processes of change, rather than on simple linear cause and effect (Senge, in Slater and Narver, 1995). Wilkinson and Young (1998) believe that such a change in management philosophy leads managers to participate in, and respond to, the unpredictable environment rather than try to control and direct it. This change involves decentralising control to managers and staff in the organisation, thereby allowing the strategy to emerge through self-organisation. This new mindset is summarised by Gibson (1996: 22) whose suggestion for trying to cope with chaos and uncertainty is to "...go with the flow, and try to steer things a little," and by Wilkinson and Young (1998) who recommend that the manager stands aside for staff at the coal face, allowing them to take action.

2.5.3 Organisations as Complex Adaptive Systems

Senge (in Gibson, 1996: 128) sees business organisations as so big and complex in their internal and external systems that nobody can control them. He refers to the "... thousands of variables, the hundreds of thousands of people, the dynamics of the incredibly complex process." which indicate a complex adaptive system. Stacey (1996a: 188) agrees that organisations are complex adaptive systems, because they create order spontaneously through emergence. There is no "blue print, grand design or plan. There is neither mission statement, nor vision, nor even a charismatic leader in sight." How the organisation develops cannot be predicted from individual behaviour as it follows a self-organising process that evolves from co-operation and competition between agents or individuals in the system. So foresight, prediction and control are not possible. The Santa Fe Centre for Emergent Strategies shows the comparability between an organisation and a complex adaptive system:

> "A COMPLEX ADAPTIVE HUMAN SYSTEM (a business) is composed of interacting 'agents' (employees, managers, board members, customers, suppliers, competitors, regulators, etc.) following strategies (blueprints, values, ethics, laws, economics, organization/political, friendship, profit maximizing), exchanging influence (goods, ideas, money, trust) with their local and global environments (from the cubicle to the global market), and altering the very environment they are responding to by virtue of their 'simple' actions" (Complexity and Business, 2000: 1).

There appears to be total agreement that a business organisation is, and does not just behave like, a complex adaptive system. Other authors who support this belief include Pumpin (1991), Gault and Jaccaci (1996), Van der Erve (1998), Koch (2000), and Eoyang (2001). A practical commitment to this belief was exhibited by Hock (1996). He created the Visa organisation based on complex adaptive principles. He sees business organisations as self-organising, adaptive, non-linear complex systems that show the characteristics of both order and chaos: in business terms a combination of cooperation and competition.

2.5.4 Strategic planning

There is almost total agreement amongst chaos and complexity authors that traditional strategy making ineffective in turbulent environments. For example, Edgar and Nisbet (1995) and Roos (1999) agree that traditional strategy making is not innovative, creative or original. Conner (1998) maintains that strategic success formulae become rapidly obsolete in volatile

markets, and Fradette and Michaud (1998) explain that strategies are made irrelevant by competitors rewriting the rules of the game. Slater and Narver (1995: 79) see the rational model of strategy formulation as unrealistic during turbulent conditions, and they quote Mintzburg as saying "...formalized planning makes no sense in a dynamic environment."

This ineffectiveness of traditional strategic planning is partly due to the inability to predict in turbulent environments near the edge-of-chaos (New Marketing Imperatives Roundtable, 1994; Kurtyka, 2000a). This is because the system in which a company is enmeshed is continually being subjected to discontinuities, is continually changing, and therefore managers have to continually obtain new information to understand the environment. Any plan is therefore obsolete before it has been fully implemented, and staff who would be expected to cope with the environmental shocks would be restricted by a detailed, prescriptive plan (Glass, 1996).

Wall and Wall (1995) maintain that strategic planning is evolving to meet the changing external and market conditions. Strategy is being done in different ways, such as involving more people in the process, delegating it to those closest to the customers, using cross-functional teams to develop strategies, and generally making strategy everyone's responsibility. Strategy has become a trial-and-error process, evolving through the discovery of what works. As a result planning cycles are shorter, and because such quick responses are required, tactics often dictate strategy.

The new evolution of strategy often involves customers and suppliers, so strategy making becomes a constant give-and-take. They maintain that, in the 1990s, bottom up planning became the norm. Stacey (1992) suggests that strategy making should be a spontaneous self-organising process, with groups of managers informally discussing strategic issues. Sengupta, Unadkat and Jain (2000) suggest a reactive learning system that monitors environmental deviations instantly, communicates the problem or opportunity, and empowers individuals for prompt and effective decision making, instead of strategic planning.

Eisenhardt and Sull (2001:111) are more prescriptive in their suggestions. They recommend that strategy in turbulent environments must be flexible but disciplined, which requires a set of strategic rules. These they suggest are:

- how-to rules, that specify how a process should be executed,
- boundary rules which specify which opportunities to pursue and which to avoid,
- priority rules, which enable opportunities to be ranked,

- timing rules which synchronise the pace of the company with that of the environmental change,
- exit rules, which guide decisions on when to withdraw from a product or market.

Such rules help managers to cope with opportunities and threats coming rapidly at them from turbulent environments without having to continually refer to superiors or to have to indulge in slow strategic planning exercises.

Wheatley (1993) is even more radical. She maintains that open, self-organising systems are antipoetic. That is, they change in a way that is consistent with their past and their environment. They then have a clear sense of identity – values, traditions, competencies, culture, and core beliefs. Therefore, any change is based on a reference to these antipoetic principles and so adapting to environmental change does not need to be randomly reactive or uncertain. This is known as self-reference. The system knows what to do to change in a turbulent environment. With such a structure in an organisation the more freedom there is in the system the more order will exist in its handling of turbulence in the environment. As a result autonomy at a local level is to be encouraged, as individuals will be directed by the self-reference system, rather than by orders or strategic plans from above.

As a counterpoint to Wheatley's view, Phelan (1995) suggests that strategic planning still has value because within a turbulent environment, relatively long periods of stability often exist. He maintains that when instability arises from unexpected changes the firm should then abandon strategic planning and adopts organisational learning to cope with and adapt to the rapid change. The question, though, is whether it is possible for a company to switch between the two methods at will.

2.5.5 Marketing

"Lightning-fast change makes many of the marketing principles we've learnt obsolete" (Binedell, 2001: 15). As a result, traditional marketing wisdom is shifting, and the new rules are emphasising creativity, adaptation, knowledge and understanding: understanding of the environment, of consumer behaviour and of the dynamics of the interaction of these. Traditionally marketers want to know the effect of price changes or advertising on sales, whereas what they really need to know is "how do all of the elements in the marketplace interact in the complex, self-organizing, adaptive system that is each individual consumer's mind" (Tedesco, 2000: 4). Since marketing systems have been shown to exhibit the traits

typical of chaotic systems (Herbig and Golden, 1991) a complexity approach to the above problems would be of considerable benefit to marketers.

Such an approach could include rules and properties from complexity science that would help marketers to better understand consumer decision-making (Tedesco, 2000), and chaos models that would help to analyse and understand the adoption of a new product; and that would help identify brand switching points or fad behaviour by analysing and identifying the factors (attractors) that influence and drive the behaviour in the system (Gordon and Greenspan, 1988). In other words, chaos analysis can help to identify the marketing parameters that determine the dynamics of the marketing system, which is important because these are parameters that are under the control of the marketing decision-maker (Bischi, Gardini and Kopel, 2000).

A further marketing area that is being influenced by chaos and complexity theory is research. Since consumers, markets and all the factors that inter-relate with them have been shown to be complex adaptive systems market research cannot be accurate and predictions of sales over the longer term are, in most cases, not possible. This is because sales are influenced by many unpredicted and unpredictable factors. Diamond (1993) maintains that projections other than over a very short period - possibly only a few months - should be treated with caution as, for short term predictions, adding more data can increase accuracy, but as the prediction period increases, the number of small changes will also increase and interact with each other exponentially, increasing the likelihood of a wildly inaccurate estimate. One solution, according to Fortin (1995), is to use models that integrate chaos patterns in order to better understand the phenomenon under review. For example, complexity theory based modelling tools such as neural networks, genetic algorithms and artificial life simulations are being used to investigate the complexity in consumer decision-making systems. A second solution, because of quantitative market research's lack of dependability, is that efforts should be aimed at understanding phenomena, rather than trying to, for example, count how many bought a product. In other words, qualitative research is recommended in complex, turbulent environments.

2.5.6 Caveats regarding chaos and complexity

Although the evidence of the applicability of chaos and complexity theories to business presented so far appears to be irrefutable, there are many authors, including those already quoted, who have issued warnings about the indiscriminate or inappropriate application of these theories. Some even question whether they should be used at all. Phelan (1999), for

example, questions whether the models developed in physics and biology should be applied to management, and whether seeing similar patterns in, say, biological data and management data is enough to say that complexity applies to management. Although he appears to believe that complexity theory does apply in management, he argues for more expertise and mathematical modelling in management. More serious though, is Wytenburg's (2000) scepticism. He questions whether business organisations are complex adaptive systems at all, or merely organisations that display complex adaptive type behaviour in addition to other types of behaviour, including linear behaviour.

However, Wytenburg does admit that knowledge emerges at the 'edges', which is where complex adaptive system dynamics operate. He, therefore, agrees that, in a turbulent environment, it is better to operate at the 'edge' where more opportunities arise, and thereby implies that businesses are, in fact, complex adaptive systems.

The most criticism appears to have been against chaos theory. Herbig and Golden (1991), Johnson and Burton (1995) and the author of Chaos under a Cloud (1996) all question the ability to discover chaos in real life, as opposed to simulations. This is because, in real life, very large numbers of iterations, vast amounts of data and long time periods are required to identify chaos. Further, measurement error, noise, the lack of exactness in the data and chaos created in the system by a learning feedback loop all make obtaining proof of the existence in business very difficult, and according to some, impossible. This appears to have been true in studies into financial markets, but Chaos under a Cloud (1996) admits that the use of chaos theory has increased understanding of the non-linearity of financial markets and led to the use of more appropriate tools such as neural networks and genetic algorithms. It may be that chaos theory was not the correct tool (Scott, 1996), and it must be noted that chaos theory does stress the unpredictability of the long-term in edge-of-chaos systems (Ormerod, 1997). Furthermore, researchers such as Priesmeyer and Baik (1989) and Wilkinson and Young (1994) have shown that chaos theory can be practically applied without having to exhaustively define the variables and equations; and McElwee (1998a) has shown that sensitive dependence to initial conditions could clearly be seen in the relationships and behaviours when his workshop participant groups were destabilised.

Complexity theory appears to have had more success when applied to organisations, but even it has its detractors. Their criticisms, and arguments against their criticisms are given below.

- Lissack (1999), quoting Kellert (1995) and Barton (1994), warns against trying too literally to apply the metaphor of complexity to management, as the benefits of the metaphor can

be lost. The implication is that complexity theory has no other benefits for organisations. He does admit that using complexity theory as a metaphor has led to a new way of thinking about social organisations, which has enabled management scientists to examine problems from different viewpoints.

- Petzinger (1999a) does not believe complexity theory is of much value for helping to design management structures or activities, but he does believe it is very valuable for interpretation of a managerial environment.
- Johnson and Burton (1994) criticise the application of complexity theory because they maintain that organisations, as self-organising systems, do not operate according to simple rules. This argument is questionable as the various publications contributed to by Eisenhardt appear to clearly show that businesses can operate according to a set of simple rules. The presence of simple rules in organisational behaviour is supported by the work of McElwee (1998a), whose workshops found complex behaviours resulting from the interactions of a few simple rules.
- Kurtyka (2000b) and McElroy (2000) believe that business operations, including marketing tactics, are not emergent and thus are not complex adaptive systems. They are preconceived and planned and therefore, mechanical. Kurtyka (2000b) admits that complexity science provides new ways of describing marketing activities: that is, he sees it as a metaphor, but it does not lead to actionable tactics. Opposing this view, Lewin (1999) maintains that complexity theory is not useful merely as a simple metaphor. He implies that business *is* a complex adaptive system so it is important to identify what actions will influence the complexity in businesses. Even if Kurtyka (2000b) and McElroy's (2000) views are correct, they are not relevant, as the actions of a system, albeit a mechanical system, which is nested in a complex system, would still be subject to the characteristics of the greater system. In other words, the nested system can be expected to be influenced by the characteristics of the greater system. This is the perspective that has been adopted for this research study.
- Cilliers (1999) maintains that complexity theory cannot provide the one best way of running a business. It cannot provide specific actions or predictions because any accurate model of the system would have to be as big and as complex as the system itself, and this obviously is not feasible. This argument is accepted, but is not relevant, as this is one of the definitions of an adaptive system. Furthermore, complexity theory does not purport to predict exactly or be deterministic in terms of actions.
- McKelvey (1999) maintains that complexity science, because it is a social science system, is likely to suffer from dubious reliability. However, he admits that reliability of complexity science in business systems will be easier to achieve than in physical systems because it is becoming model-centred and so reliability can be controlled. Furthermore, reliability is

less important than validity in understanding a system. Because most complexity science tools tend to be qualitative and include in-depth involvement in, and understanding of, the system, and because complexity research does not try to extrapolate beyond the research object, the validity of complexity science can be accepted as satisfactory.

From the above discussion, it can be accepted that there may be some problems in applying chaos and complexity theory to business and that it should be applied with care. Johnson and Burton's (1994) worry about the metaphor becoming the explanation is accepted, but it should be noted that these new theories are not seen as replacing the Newtonian and Taylorist theories, but supplementing them. As Johnson and Burton (1994) admit, even metaphors can help to produce new insights and paradigms different from the more traditional approaches.

2.5.7 Conclusion

This section set out to show the implications of chaos and complexity theory for business, management and marketing. It has satisfactorily shown that organisations are complex adaptive systems, despite the criticism of some authors: these criticisms have mostly been refuted. Seeing organisations as complex adaptive systems requires managers to adopt a new mindset that leads to a different approach to strategy making and to marketing. As a summary of the implications, Gregersen and Sailer (in Fortin, 1995: 3) provide six implications of chaos and complexity theory for social science research.

- Longitudinal studies are better for identifying the chaotic nature of a system – this implies that traditional cross-sectional research of markets will give an inadequate understanding of the phenomena being researched.
- Standard statistic techniques will provide poor results when used to analyse chaotic systems. This implication is significant since most marketing studies assume linearity, but most variables are chaotic.
- Simulation techniques are better for studying chaotic systems. Simulation has, for some time, been a useful tool in management science, and with the increasing acceptance of complexity theory, is becoming more so.
- Statistical techniques should be used for understanding rather than predicting. Since chaos and complexity theories both reject long-term prediction, understanding the dynamics of businesses and markets becomes more important to enable businesses to cope with turbulent futures.

- Qualitative techniques should be used when studying chaotic systems. This is consistent with the need for understanding and the uncertainty and unpredictability of complex adaptive systems. It enables understanding of behaviour within the boundaries of a strange attractor.
- Understanding is the only scientific goal that can be achieved when studying chaotic systems. This is consistent with the five previous implications and has been shown to be the most important goal of management and marketing research and is, in fact, the goal of this research study.

How the features of chaos and complexity theory can be, and have been, applied to the various functions of business will be discussed in the next section.

2.6 APPLICATIONS IN BUSINESS FUNCTIONS

2.6.1 Introduction

In Sections 1.3.2 and 1.4.2 examples and applications of how business and management issues in general relate to each of the characteristics of chaos and complexity theories have been discussed. In this section each of the main business functions will be investigated with regard to how chaos and complexity theory relates to these functions, and with regard to what research based on these theories has been conducted.

Business as a battlefield, or the sports field, is a metaphor. Businesses as complex adaptive systems are not a metaphor - businesses are complex adaptive systems, according to Lewin and Regine (1999). Oosthuizen (1997: 69) maintains that many authors in the past have implied this, so "the modern-day hype about chaos ... may not be so new." In fact, Wroe Alderson (1958, in Enis and Cox, 1981), for example, mentioned the importance of adapting to the changing dynamics of the market environment more than forty year's ago. He highlighted the impermanence of differential advantage due to the actions of competitors and stressed the importance of innovation for maintaining a competitive advantage in dynamic markets. He also rejected the homogeneity of markets assumed by classical economists and saw heterogeneity as a characteristic of both demand and supply. He clearly saw markets as inherently complex. However, it should be noted that these authors did not apply today's detailed understanding of chaos or complexity to the 'turbulence problem'. They identified a turbulent or chaotic environment, but then tried to cope with it using the tools of stability, such as strategic or long term planning. Today many companies are using

complexity science in business applications, such as tractor and drug manufacturing, management training, strategic decision-making, and customer service. For example, Citibank uses complexity algorithms to anticipate when to schedule additional customer service representatives to man their telephones so as to reduce waiting time for customers phoning their 800 number (Brownlee, 1996).

To learn from these companies, it is therefore necessary to examine in more detail how chaos and complexity theories are being applied in the different functional areas and disciplines of business. All the major functional areas of business will be discussed in this section, with the exception of marketing, which will be covered separately later.

2.6.2 General management

According to Handy (1978), as organisations become bigger, they increase in complexity. At the same time as they get bigger they become less capable of handling complexity. This is due to the increasing uncertainty as they relate to more external organisations. The culture required to cope with bigness is suited to routine processes and stable unchanging environments. Therefore, there is a paradox of increasing bigness requiring more certainty but facing increasing uncertainty and change, which leads eventually to explosive instability and self-destruction. In addition, most managers have been brought up in, and trained for, an environment of certainty, whereas they now have to cope with increased complexity and uncertainty. As a result, the traditional dictatorial and control-oriented management style, when applied in an uncertain environment, can lead to destabilisation of group relationships and behaviours, and so also canresult in unanticipated behaviours and possible explosive instability (McElwee, 1998a). Often ‘vision’ is adopted as a way of aligning an organisation in an uncertain environment. However, this sometimes fails because vision implies predictability, but chaos theory has shown that complex adaptive systems are not predictable. Furthermore, vision as a form of alignment does not work because alignment implies control; but control precludes the looseness, flexibility, and diversity required in a complex adaptive system (Michaels, 1999). Wilkinson and Young (1998) agree, believing that attempting to impose managerial will on the firm is one of the reasons for management and strategy failures in modern firms.

According to Slater and Narver (1995) what is needed in the above situation is a complex style of leadership - a transformational or facilitative leader. Fitzgerald and van Eijnatten (1998) maintain that, since the future cannot be known in advance, the control in a complex environment has to do with 'influencing', rather than 'determining' future events.

Therefore, managers need to be coaches, who "facilitate and enable" staff, or leaders who "determine the direction of the organisation and ... create the environment in which everyone else can operate" (Hammer, in Gibson, 1996: 100). This means that the bureaucratic manager whose main function is control does not have a role to play as the bottom levels in the organisation are left to steer (control) the organisation in the direction or towards the destination specified by management (Gibson, 1996).

This bottom-up approach is also suggested by Senge (1990) and McGlone and Ramsey (1998), both of whom feel that control should be local, through self-management, rather than global, by management. This implies a significant change in the management role, as managers have to accept that they do not have all the answers. What managers should do is disturb the organizational equilibrium to challenge established ideas, to reject them if they are no longer relevant and to facilitate the creative learning process that generates new ideas (Welsh, in Louis Allen Associates Inc., 1996).

These suggested management approaches and roles in a turbulent environment are summarised by Stacey (1991), into three actions.

- Encouraging and making time for discussion and reflection to happen through informal work groups and open-ended discussions.
- Using different forms of power, namely, from ‘authority’, to ‘loose influence’, to ‘pressure’, and back again.
- Creating the environment that enables people to learn.

From the above discussion it is clear that the role of management in a complex and turbulent environment should be significantly different from the management role in a simple and stable environment.

2.6.3 Organisation design

In stable environments with low uncertainty, mechanistic, hierarchical, large and well-administered structures appear to be successful (Hubler, in Young and Kiel, 1994; Devanna and Tichy, in Prendergast and Berthon, (2000)). However, as far back as 1985, Naisbitt (1985) was reporting on the flattening of organisational hierarchies and the resulting techniques for managing these new organisational structures - networks, multidisciplinary teams and small groups. Command and control structures were being replaced by self-management and by computers, which give top management access to information that

previously had to be obtained via middle management. In other words, companies were "moving away from monolithic, vertical, homogenized institutions" (Kelly, in Gibson, 1996: 255).

New decentralised, organic structures became necessary for complex businesses to maintain global stability and to be able to change over time to adapt at the detail level (Peters, 1999). These organic structures were suitable because they are able to absorb a high degree of uncertainty since people can work across boundaries and quickly create new teams (Prendergast and Berthon, 2000). The characteristics of organic structures include flat organisations, few hierarchy levels, much open communication through loose connections, fluid and ambiguous job responsibilities and the degree of complexity and change inside the organisation should be equal to the degree of complexity and change in the environment (Burns and Stalker, in Slater and Narver, 1995; Wilkinson and Young, 1998; Peters, 1999; Lewin and Regine, 1999). Authors such as Naisbitt (1985), Sanyal (1993), Kelly (in Gibson, 1996), Gibson (1996) and Peters (1999) suggest that the network is the structure most suited to a complex and turbulent environment because a network structure meets all the above requirements. In addition, it has permeable boundaries, has no centre or head, no one is in charge, and there is no linear causality. As a result, there is a sense of uncertainty and of not being in control (Gibson, 1996), which is near to the truth because a network is based on collaboration, interdependence and relationships (Sanyal, 1993). Other structural types that seem to possess the required characteristics are federations (Bennis, in Gibson, 1996) and lean organisations (Jenner, 1998).

Although a firm may adopt an appropriate and effective structure, care must be taken to nurture and maintain it. If this is not done, over time the firm begins to petrify, adopting 'good business practices', with hierarchy and power taking dominance. Negative feedback loops start to control activities, creativity is subordinated to ritualised beliefs, people become less important, the firm becomes closed to change, information is restricted, and eventually the firms may succumb to competitors with more flexibility (Woodward and Arthur, in Briggs and Peat, 1999).

2.6.4 Production/Operations

The production discipline is an area where chaos and complexity theories have been applied with considerable success. An example provided by Glass (1996: 103) explains why these theories have become so popular in the production field.

> "What appears to be a regular increase in the market may lead management to build a new factory to cater for the anticipated continuing growth in demand. However, since growth is not a regular trend, but goes in fits and starts, levelling out at attractor points, the company can quite likely end up with excess capacity, because they have not understood growth from a chaos viewpoint. On the other hand bringing a new factory on line increases capacity, maybe at lower prices because of new technology or economies of scale. This product availability and/or decreased prices can cause a semi-static market to take off and grow rapidly. Unless the company has understood the detailed nature of growth in the short term, they may very soon run out of capacity again."

This example shows that, by viewing market growth as an attractor point, production mistakes can be avoided.

Another example of how chaos and complexity theories can assist production is given by St. John, Young and Miller (1999: 109). They found that turbulence caused by the environment is often experienced by manufacturing second hand through its relationship with marketing. This is because changes in the form of production priorities and demand patterns are introduced to manufacturing by marketing. They found that conflicts between the two functions most often arise due to schedule conflicts and forecast accuracy, which, as has been shown, is not possible in a complex or chaotic environment. As the environment becomes more complex, they propose that "more organic, informal methods for managing manufacturing's interaction with marketing" would be preferred over "centralized control, formal policies, computerized planning and scheduling, and even formal strategic plans."

A third problem area for production is the growths of mass customisation, which can lead to feedback loops in demand that create an unpredictable and dynamic market with turbulence and chaos present (Saisse and Wilding, 1997). Although mass customisation can initiate market turbulence when introduced in a stable market, it is an effective technique for small, fragmented and highly turbulent markets (Christy, 1992). Saisse and Wilding (1997) showed that developing manufacturing flexibility is the best method for coping with unpredictable disturbances and with the resulting chaos that can affect the supply chain.
Because building stocks as a buffer against uncertainty is not possible for mass customised products, they suggest that manufacturing planners have to work with short term planning horizons, and constantly take short term decisions to manage the uncertainty and the production flexibility, which is contrary to the traditional desire of production planners for ever longer planning horizons.

Dooley, Johnson and Bush (1995) argue that the success of process operations in the future will be dependent on integrating complexity into thinking about the social or organisational aspects of the production system. They refer specifically to methods for analysing and

improving dynamical systems, communication methods that help to sense and interpret the environment and change models involving self-organisation. Success in improving quality, they maintain, will be dependent on experimentation with, and development of, complexity based approaches.

Computerised methods based on chaos or complexity theories have been applied to production or process problems in a wide variety of industries. Some of these are mentioned below.

- Morley, the inventor of the floppy disk, developed chaos-based computer software that is being applied in Japanese electronics companies, steel-plant operations, scheduling the loading and unloading and harbour docking operations, and simulating Japan's bullet train operation (Green, 1995)
- Morley also developed a 'chaos computer' that enabled General Motors' paint shop to save one million dollars in a year (Green, 1995), and manufacturing problems are being more effectively solved than when they were using the traditional linear methods (Tetenbaum, 1998)
- Concepts from chaos theory, especially positive and negative feedback, were used in the project management of the installation of a very large Wide Area Network of a large engineering and construction firm (Bardyn and Fitzgerald, 1997)
- Haslett (2000) has produced empirical evidence to show that a kanban system in a factory performed better as it became less stable and predictable and moved towards the edge of chaos
- Complexity theory has been used as a consulting tool at Disney, an organisation that operates continually at the edge of chaos (Boje, 2000)
- Deere and Company is using complexity theory to schedule its production lines, achieving better inventory control and meeting customers' delivery requirements better (Tetenbaum, 1998; Whiting, 2001).

Not only are chaos and complexity theories being applied in production operations, they are being applied successfully, as is indicated by the cost savings, improved performances and better customer service reported above. The success of chaos and complexity theories in this field is reinforced by Youssef (1994), who maintains that non-linear approaches to manufacturing such as design for manufacturability or concurrent manufacturing, are leading to quicker development, shorter manufacturing lead times, shorter time-to-market, and as a result, better market shares and financial performance.

2.6.5 Economics, Finance and Accounting

In this section, the application of chaos and complexity theories to more macro-economic issues will first be discussed, then the application to finance and investment, and then finally to accounting and auditing.

2.6.5.1 Economics

Arthur (1993: 8) describes modern economics as "organic, evolutionary" and likely to "come to be seen as history-dependent, organic and continually evolving - in a word, complex." Herbig (1990: 68) agrees that an economy is a complex adaptive system. Three of the main characteristics of economic data are also characteristics of chaos. These are "its random like appearance, seemingly a periodic cyclical character, and sudden large discontinuous changes." So it is probable that deterministic chaos could exist in economic data. His study shows that fluctuations in economic data are probably due to non-linear influences. Tedesco (1998) agrees, explaining that economic modelling has changed from using a mechanistic approach to using an organic process, which is more suited to non-linear data.

Arthur's (1999) study of economies has shown that positive feedback, or increasing returns, produces an economy that is not predictable and is not in equilibrium as proposed by classical economics. Increasing returns are based on organic growth, positive feedback, and slight effects that produce larger, unpredictable, and asymmetric outcomes - clearly typical characteristics of a complex adaptive system. As a result, Arthur concludes that the extremes of trying to force (command) a desired outcome and using a *laissez faire* approach (Adam Smith's invisible hand) should be avoided. Either option could stabilise the system to a low death at equilibrium or destabilise it into the unpredictable chaos of explosive instability. He suggests that, instead, the system should be gently nudged towards the preferred outcome allowing the system to evolve and emerge towards the favoured position.

This complexity approach to economics is not new. Peters (1999) describes the similarity between the Austrian school of economics and complexity theory. In both cases the process in a system is considered as decentralised, feedback is common, each part of the system contributes to the whole, innovation takes place more because of luck rather than anticipatory planning, and the system adapts to changes in the environment. Practical applications of this complexity approach to economics are provided first, by Ormerod (1997) who applied the principles of non-linear dynamics to twenty years of macro-economic forecasting records to show that long term macro-economic forecasting is impossible and

that even short-term forecasting can not be done with any accuracy, and second by White (1997) who applied the principles of complex adaptive systems to Mexico's economy, a developing economy similar to South Africa's, maintaining that this approach helps economies to grow faster.

2.6.5.2 Finance and investment

According to Chaos under a cloud (1996), the financial and investment markets have attempted, without much success, to apply chaos theory to predicting the movement of the markets. Difficulties were experienced due to the large amounts of historical data required and the fact that the variables that influence the markets seem to change over time, which means that the same deterministic equation cannot be used for the period being investigated. Therefore, it was felt that the presence of chaos in financial markets could not be identified. However, the attention to chaos in financial markets has led analysts to adopt various non-linear tools like neural networks and genetic algorithms and to consider complexity theory as well, all of which are probably more suited to the financial markets. Despite the early disappointments with chaos theory, two more recent papers have reported more positively on the use of non-linear tools. Accone (1998) reports that fractal analysis, a branch of chaos theory, has been applied by Dr Wessel Matthews to stock market analysis of the Johannesburg Stock Exchange and Brown and Darley (2002) report on the application of agent-based simulations in fast-paced, turbulent stock markets, predicting that this will become an essential technique for understanding trading risks, opportunities and strategies.

2.6.5.3 Accounting and auditing

Siesfeld (1997: 2) maintains that current management accounting systems are not capable of coping with rapidly changing, time condensed, and complex business systems - what he refers to as "the connected economy." Farrell (1998) similarly criticises traditional month end, categorised accounting reports, which do not allow managers to interpret daily transaction data, which would allow the company to meet and adapt to changes in the competitive landscape more quickly. The typical aggregated sales data ignores abnormalities in demand, although such abnormalities are often indications of future change and can identify opportunities if interpreted correctly. Both of the above authors recommend more detailed, local information, provided much faster in order to evaluate the dimensions of a situation more quickly and more carefully. In addition, adaptive control as recommended by complexity theory, requires those closest to the information (that is lower in the

organisation) to react more quickly, which makes command-and-control and monthly management reports obsolete.

Considering more specific issues in the discipline, Hill (1996) maintains that operational cash flow and assets and liabilities are non-linear and that small disturbances in cash flow can have major adverse financial results. He concludes that since chaos theory appears to apply to these accounting issues, it probably also applies to budgeting, financial planning and investment appraisal using the discounted cash flow technique.
In addition, Overman (1996) shows that chaos theory has been applied as both a metaphor and a method in the fields of administration and finance; and Whitehead (1997: 5) reports that the auditing profession's environment is becoming increasingly complex, with company boundaries becoming "increasingly porous" and issues such as intellectual capital and learning and innovating becoming increasingly important. As a result she maintains that auditors are going to have to adopt complexity oriented actions, namely increasing knowledge and establishing alliances to leverage their skills, in order to cope with these changes.

2.6.6 Other functions

2.6.6.1 Human resources

Cooksey and Gates (2000) maintain that human resource management can be significantly improved by applying non-linear dynamics and chaos theory, creating more observable and effective outcomes. Stamps (1997) supports the application of complexity theory in the field of human resources by saying that there is evidence of workers self-organising. He gives an example of a pipefitting team being designed with four basic rules that enabled the workers to freely create their own work processes.

Merry (1998a) has applied chaos theory to training and development, maintaining that training should not be a one-way, linear, causal process. Using chaos and complexity thinking, training becomes an interactive, iterative learning process with each stage building on the previous learning, and developing in an organic way. Experiential learning, he maintains, operates in this way. Furthermore, he sees these theories informing organisational development as well. He sees organisations developing through self-organisation, by bifurcation in transitional stages, into more complex structures, while the role

of the manager is not to push change, but to remove obstacles to it and thus allow the self-organisation to happen.

Other areas of human resources that chaos and complexity theories have been applied to include:

- group decision-making (Goldstein, 1998) and delegation of decision-making (Stamps, 1997), which he says, often leads to positive results for the firm
- Coleman (1999) implies the application of complexity theory in human resource management by explaining that attractors describe motivated behaviour, pulling actions towards opportunities
- Priesmeyer and Baik (1989) believe that analysis of chaos patterns can help to analyse and identify limit cycles based on absenteeism and staff turnover rates, and Goldstein (1998) mentions a study done on staff turnover rates
- Goldstein (1998) reports on studies being conducted in the fields of work group dynamics and conformity and groupthink.

2.6.6.2 Purchasing

Hakansson and Gadde (1992, in Ford, 1997) explain that relationships between a purchasing firm and its suppliers are extremely complex. This is so because of the large number of individuals involved in the relationships and because each relationship between two individuals is interconnected with other specific relationships. The complexity of the relationship is also influenced by the complexity of production technology, logistics and administration of the purchasing firm. These interrelationships mean that solving a problem in one relationship can cause a problem to arise in another relationship because of their interconnectedness. In addition, the relationship with one supplier can influence the relationships with other suppliers; for example, using one supplier's quotation to press a second supplier to reduce their prices. There are an infinite number of ways of co-ordinating these complex, inter-connected networks and there is also generally an absence of simple solutions. So it appears that these networks are complex adaptive systems.

De Beer (2001) sees the supply chain in which the purchasing function operates as an open and dynamical social system and maintains that the complexity of such systems is a challenge for procurement professionals. The implication is that such systems require a non-linear approach in order to design and control them. This perception is confirmed by Whiting (2001) who reports that Proctor and Gamble use complexity theory techniques to guide the purchase and flow of raw materials in the supply chain for detergents and shampoos.

Results have included cutting shipping costs, reducing customers' inventory, and improving availability on the retailers' shelves. They ultimately expect to reduce supply chain costs and time by half by reducing inventory, transportation costs and the number of purchasing staff. These improvements will be achieved by automating purchase decisions by using 'programmed purchasing agents', and all decisions in the supply chain will be integrated rather than taken independently. In other words, their supply chain is being treated as a complex adaptive system, allowing the chain to make the decisions rather than imposing decisions from above by Procter and Gamble.

2.6.6.3 Conclusions

This section has shown that chaos and complexity theories can be applied at all the main functional levels in a business. Many researchers in many disciplines are finding relevance in these theories and are using them to better understand the dynamics of their disciplines. In some cases significant measurable results have been achieved. There is, therefore, no doubt that business organisations can benefit from the use of chaos and complexity theory tools and thinking. Since the applicability of chaos and complexity theory has been shown in all major management functions, it is reasonable to assume that the theories will also prove to be of relevance in the marketing discipline. In the next section this relevance will be investigated.

2.7 APPLICATIONS IN MARKETING

2.7.1 Introduction

McGlone and Ramsey (1998: 248) maintain that "many marketing constructs ... are so complex that they are better explained by chaos theory" and Nilson (1995) stresses the importance of understanding how to win in a turbulent environment, as this provides a competitive advantage. These two thoughts explain why understanding how marketing can be influenced by a complex and turbulent environment is important to companies. Therefore, in this section the relevance of complexity and chaos theory to marketing and how these theories have been applied in marketing will be investigated. First, the more general issues such as markets, customer behaviour, planning, and marketing information will be covered. Then the marketing mix will be reviewed in detail.

2.7.2 Presence of chaos and complexity in marketing

Herbig (1990) and Hibbert and Wilkinson (1994) have both found that marketing systems contain characteristics that are common to chaos systems. These include non-linearity, sensitivity to initial conditions, a periodic cycles or patterns, feedback loops, sudden discontinuities, unpredictability, and the logistic equation, which plays a role in many marketing models, such as the various new product diffusion models. As long ago as 1988, Rasmussen and Mosekilde (1988) demonstrated, via a simulation model, how the allocation of marketing resources between production and selling activities, on the basis of inventory and order backlogs, can oscillate between stability and chaos, thus showing the applicability of chaos theory to marketing. Their simulation showed, for example, that there are regions where the behaviour of the system will be chaotic when the bifurcation parameter of customer defections exceeds a specific value, resulting in a strange attractor. In other words, at a specific level of customer defections the interactions between inventory production and selling activities will become chaotic and unpredictable, thereby making management and control of the resource allocation system very difficult. Herbig (1990) felt that this model was so sophisticated that it indicated that chaotic oscillations probably do exist in real world applications.

An attempt to understand sales data using 'rescaled range analysis' (a technique used to understand the water level of the Nile river) showed that ‘real world’ sales data did exhibit chaos characteristics (Forrest and Mizerski, 1996). Using mathematical models, Hibbert and Wilkinson (1994: 219) explain that the "apparently disorderly patterns of behaviour over time observed in such phenomena as sales, inventories, brand shares, and prices" can partly be explained in terms of deterministic feedback mechanisms. They maintain that "external shocks, random noise or inherent stochastic processes" are not sufficient to explain the unpredictable patterns of behaviour often found in marketing phenomena. There appears, therefore, to be sufficient evidence to conclude that marketing does reflect chaos characteristics. They further believe that chaos theory can provide knowledge on how to cope with these disruptions. Although understanding the rules that govern these patterns may not permit long-term prediction, short-term prediction, and so control, may be possible.

Despite chaos being identified as useful to marketing, Phillips and Kim (1996) report that chaos has not been observed in empirical marketing data sets, and that it may not be possible to find such chaos for a number of reasons.

- Aggregation of data can obscure or hide the appearance of chaotic fluctuations
- Tactical changes by a firm or its competitors can produce fluctuations that only look like chaos
- The business mindset of simplifying and aggregating is contrary to that needed to search for chaos
- Marketing data sets are biased because important cases are eliminated, for example, products failed too early.

However, they stress that knowledge that a marketing situation may be driven by chaos is important, and that the qualitative and strategic lessons from chaos may be more important than actually finding chaos in a marketing data set. This is consistent with the shift in the literature from the marketing application of chaos theory to the application of complexity theory. For example, marketing is increasingly being viewed from a biological perspective. Prendergast and Berthon (2000: 223) see marketing as an ‘ecotone’, which is the "zone of transition between two ecosystems."
They therefore see marketing as a 'zone of transition' between the external environment of customers and competitors, and the firm itself, as well as between different functions within the firm. Ecotones are predominantly influenced by environmental factors, and therefore it can be concluded from their proposition, that marketing activities in such 'zones of transition' will be significantly influenced by the external environment and that they will be continually changing.

Despite the hesitations about chaos theory, many authors believe both chaos and complexity theory have direct applicability to marketing. Michaels (1999), for example, maintains that complexity theory has significant applications in marketing, referring to the work of Brian Arthur on positive returns as represented by his analysis of the VHS - Beta fight in the video recorder market. Priesmeyer (1992) contends that chaos theory influences virtually every marketing activity and changes marketing theory in very practical ways. It influences pricing, helps to identify opportunities, changes promotional tactics, influences distribution, and affects competitive and other marketing strategies. Finally, Samli (1993) maintains that as the environment becomes more turbulent companies' marketing activities change accordingly.

2.7.3 Markets and Customers

Nearly fifty years ago Wroe Alderson (1958, in Enis and Cox, 1981) saw markets as dynamic, heterogeneous and complex, with marketing bringing order to the market through continuous innovation of products that are meaningful to the consumer. This perception of markets is supported by Guckenheimer, Oster and Ipaktchi (in Hibbert and Wilkinson, 1994) who have shown that the more complex or multidimensional a system (increasing competitive products or growth of complementary products), the less severe the non-linearity needs to be for the onset of chaos. Consequently, the more complex the market the greater the potential for chaos. This explains why simple markets tend to be more stable, and complex markets more turbulent. Taking this argument a step further, Farrell (1998) states that markets are more than the sum of their parts and therefore their behaviour cannot be predicted by adding up all the behaviours of each individual 'agent' in the market. Markets, therefore, should be seen as living systems and thought about organically, as opposed to the traditional approach of treating them as machines operating under simple laws.

According to Farrell (1998) discovering the non-linear patterns and how they influence a business are critical to applying complexity theory to marketing. This idea of a market as emerging from a group of individual customers, and resulting in a system that is more than the sum of the individual customers is supported by Koch (2000) and Baskin (1998a). Baskin agrees that the behaviour of the market is different from, and infinitely more complex than, the behaviour of any individual member, because it evolves from the interactions between the individual members. The 'relationships' between the different members of a market are of key importance. In a natural ecology different species are reliant on each other for food, reproduction, health and safety. The success of the ecology is dependent on the different species 'coevolving' with each other. Similarly, individual parties in a market have to co-evolve with each other - a company is dependent on consumers, suppliers, other support entities like banks, and even competitors. Therefore merely trying to understand an individual consumer's behaviour is not enough. The behaviour of the whole system must be understood. Similarly, Bates (1999a) sees a market, with different segments and different sales and potential sales, as a form of fitness landscape.

According to Glass (1996) market growth is an unstable and unpredictable process. Customers are not added regularly, but grow by the addition of whole new segments of consumers with new tastes and needs. These additions make markets grow in fits and starts. As a new segment is identified and marketed to, sales take off as the new segment

adopts the product. As saturation starts to set in, the sales start to level off. A company slow to enter a new market segment can miss out altogether or alternatively, if they do not anticipate the plateauing, they can end up investing too much in a declining market, resulting in profit declines.

Farrell (1998) stresses the importance of networks, or connections, among people in the system who use the product, to create pathways for promoting the product. An understanding of such mutually beneficial relationships in markets, developed through co evolution has led companies, for example, to involve customers in their product development activities. This has changed the focus from the product to the customers' needs (Baskin, 1998a). Similarly, Sawhney and Prandelli (2000) propose that inter-relationships of individuals and firms jointly create intellectual property.

They maintain that such an approach encourages innovation in a complex environment by keeping the innovator balanced at the edge of chaos. This implies that a successful innovator in a complex environment will lay considerable emphasis on developing various close and long-term relationships, such as partnerships and strategic alliances. Clearly, the above discussion shows the importance of inter-relationships in complex and turbulent markets.

A final issue of significance in a consideration of a market is the concept of increasing returns, or 'lock-in'. According to Arthur (in Battram, 1996) resource based industries are subject to diminishing returns, but knowledge based industries are subject to increasing returns. These are industries that require large initial investments in development and manufacture, but incremental production is relatively cheap. They include industries such as computers, telecommunications, software and pharmaceuticals. However, Farrell (1998: 150) believes that increasing returns is not only applicable to high-tech markets or knowledge industries, but also applies in industries where "ego is bound into the product."

Branded products are 'locked in' through emotional increasing returns, "dominating the conversation and locking out any meaningful competitors." If this is so, then 'lock in' could also be achieved through the building of relationships between supplier and customer, and so the theory of increasing returns could well apply in more resource based markets as well. This is significant because Chakravarthy (1997) maintains that increasing returns generate instability in a market as opposed to the equilibrium generated by decreasing returns. If this argument is correct, it means that all markets could be subject to increasing returns and consequently are all subject to the rules of complexity and chaos theories.

2.7.4 Customer behaviour

Consumer behaviour is a "... decision system of great intricacies and elaborate amalgamations" (Tedesco, 1998: 1). He sees consumer behaviour not in the traditional linear, deterministic way, but as "...the changing interactions that comprise the natural structure of a system," that is, as complex, self-organizing, adaptive behaviour. Consumer behaviour as a non-linear process is supported by Benhabib and Day (1981, in Herbig and Golden, 1991) who identified chaos behaviour in consumption. They showed that rational choice behaviour in a stable environment can result in chaotic behaviour that does not settle into a stable attractor, but there may be sufficient underlying order to identify broad purchasing patterns such as the type of products the consumer is likely to buy. Similarly, Oliva, Oliver, and MacMillan (1992, in Fortin, 1995) believe customers' responses to increases in service could be non-linear, and that thresholds between satisfaction and dissatisfaction may not occur at the same point. A result of chaos being present in consumer behaviour is that customer' needs, wants and desires could be changed, and in fact the turbulence may change the customers themselves (Samli, 1993). It is possible that such changes can be anticipated by "identify[ing] points of chaos (brand switching, fad behaviour) by analysing changes which affect the drivers (key parameters) of the system" (Herbig, 1990: 70).

Benhabib and Day (in Herbig, 1990) and Fortin (1995) see consumer satisfaction and consumption as a cyclic process of a dynamic system. In other words, performance is a function of performance in a previous period, for example, where past consumer behaviour affects future behaviour, or where advertising budget allocation is a function of past financial performance. They found this relationship to be particularly true of wealthier consumers, who have more of a choice than poorer consumers, and that, in such cases consumption showed chaotic behaviour.

Successful product development seems to be influenced by non-linear processes. Farrell (1998) explains that a critical mass of interconnections between buyers and sellers is needed to create a bifurcation in the product's progress. When sufficient interconnections are reached the consumer behaviour can leap to a new level creating even further growth. Chaotic consumer behaviour can also be influenced by uncertainty inherent in a sales situation. Levitt (1983) maintains that the more complex the system being sold and the more related procedures, service components, etc. there are, the greater the customer's anxieties and expectations. This uncertainty in consumer behaviour is aggravated by short product

cycles that lead to customers who hesitate to purchase, continually expecting new improved products and lower prices. Thus unstable and unpredictable demand patterns are created (Benkenstein and Bloch, 1994). Levitt (1983) suggests that relationship building and the strengthening of dependencies and bonds between firm and customer can reduce this uncertainty, thereby creating long lasting partnerships.

2.7.5 Planning and control

Since social and business systems are beginning to be seen as complex and organic, breaking problems down into smaller parts simplifies the problem but loses the connection to a larger whole (Jones, 2000). He, therefore, believes that traditional planning, forecasting and controlling techniques are incapable of handling the vagueness and uncertainty inherent in real-life situations. Nilson (1995) concurs, maintaining that there are few, if any, factors that marketers can control, because few marketers have a monopoly over supply, they cannot heavily influence demand and even marketing expenditure and marketing resource allocations are influenced by outside factors, such as competitors. Although longer term planning and control are difficult in a chaos environment, understanding the non-linear nature of the market and its environment can help to improve the nature and quality of planning and control.

Three major changes to planning approaches are required.

- First, if information is received, disseminated and used very quickly, it is more accurate as it has not been massaged or contaminated by others - therefore faster feedback loops are required.
- Second, although long term planning is pointless in a turbulent environment, with faster feedback loops the planning horizon can be shorter, which will reduce the risk of mistakes. In such a situation longer term planning is not missed. This view is supported by Skae (1989) who rejected the hypothesis that firms operating in a more turbulent environment would have a longer planning horizon.
- Third, planning should deal with how to do things, rather than what to do. This enables the system to react quickly to changes, rather than having to spend time replanning because what was planned is no longer applicable.
- Fourth, planning should include alternative possible outcomes, but within system boundaries. This is similar to scenario planning, which is proposed by Jones (2000), who also suggests the use of other techniques from the 'new sciences' such as fuzzy logic, artificial intelligence, neural networks and chaos theory to form a 'hybrid forecasting

method'. As with scenario planning, the alternative possible outcomes approach creates preparedness for the unexpected.

Nilson (1995) maintains that this approach to planning does not require less attention to detail but more. Continuous real-time data, understanding of customers' needs and wants, understanding competitors, an understanding of the company's core capabilities and competitive advantage, and a sufficiently open plan enable the firm to cope with unexpected changes in the environment. Using and gaining experience in this type of chaos oriented planning reduces the reliance on prediction, control and stability, and increases the sensitivity to emergence and change (Briggs and Peat, 1999). Informal controls such as self-control, social, or small group control, and cultural control, which are used more in uncertain environments, would be supportive of this type of planning (Jaworski, 1988).

Microsoft's planning is an example of this type of complexity planning. Pitta (1998) explains that Microsoft cannot test all the variables in all their potential marketing options, so instead of planning, they use improvisation (as recommended by Brown and Eisenhardt, 1998). They invest in many, seemingly random, opportunities, letting the market determine which will succeed. This enables Microsoft to enter new markets early and to benefit from the resultant high profits. IT company Intel and clothing retailer Gap Inc also use the same approach. Another example is provided by Marks, Midgley and Cooper (1998), who investigated, via simulation, the behaviour of brand managers in an oligopolistic retail market. They showed that the genetic algorithm agents performed at least as well as real brand managers. Furthermore, they believe that brand managers could learn to improve their performance from the patterns and strategies that coevolved in the simulation.

2.7.6 Marketing research

In a non-linear, complex and turbulent market, researching, forecasting and predicting are very difficult if not impossible. Therefore, Diamond (1993) believes that market research should concentrate on why consumers buy, and what factors instigate purchase. Because of the poor predictive validity of traditional analytical tools, Anderson (1994) believes a more 'artistic' approach could be worthwhile. Such an 'artistic' approach could be provided by complexity theory, which calls for more subjectivity, creativity and personal involvement.

Such a complexity approach is suggested by Priesmeyer (1992). Forecasting the future in a turbulent market is not possible because the future state of the system is determined by its current state and the future forces that will act on it, and because there are so many

interacting variables and forces it is not possible to predict them all. Therefore, he maintains that a marketer should envision a future based on the system's current state (say, a product's market position) and an understanding of the pattern of forces that seem to have been influencing the system. Marketing activities are then undertaken to nudge the system towards that envisioned future. He stresses that this is not just goal setting - it is visualising the future based on patterns in the rates of change that have not been seen before, patterns only provided by chaos theory. Progress towards the envisioned future is incremental, with each specific increment being encouraged by various marketing tactics.

In this way short term forecasting is possible as the immediate variables are fairly well known and can be influenced, but longer term forecasting is not possible because the future variables are not known as they will be influenced and changed by future actions. Alternative methods to marketing research include scenario planning, which is a reliable method based on the present, that enables managers to think about uncertain futures, not through plans or forecasts, but through the flexibility that the various alternative choices can provide. In other words, scenario planning can help forecast Nilson's possible alternative futures (Rosenhead, 1998). A second method is SimCity, an agent based simulation. This simulation is used to better understand supermarket shoppers and also to redesign stores, reduce inventories and shorten stock turns. A similar simulation has been developed for the insurance industry. These are methods, based on complexity theory, which enable marketers to better understand their customers and markets than through traditional market research (Casti, 1999). If traditional marketing research has to be done in rapidly changing environments, Peters (1987) says it has to be done much faster and with less data.

In addition to advanced computer and simulation approaches, he recommends a deep, personal involvement of marketers with customers. He refers to it as listening in the field by everyone, undistorted by analysis and interpretation, with action taken quickly on what is heard. This clearly emphasises the importance of the qualitative methodology for market research in complex and turbulent markets.

2.7.7 Marketing mix

2.7.7.1 Introduction

The concept of the 'marketing mix', according to Borden (in Enis and Cox, 1981: 408), was first used by him about fifty years ago. He based the concept on the writing of Culliton, who saw the marketer as

> "an 'artist' - a 'mixer of ingredients', who sometimes follows a recipe as he goes along, sometimes adapts a recipe to the ingredients immediately available, and sometimes experiments with or invents ingredients no one else has tried."

This picture of the marketer appears far more in tune with the complexity approach than does the picture of the marketer as the rational and logical planner, or the military leader - it caters for adapting and changing to meet the needs of a changing environment. Borden included in his marketing mix, all the major marketing activities, that is product planning, pricing, branding, channels of distribution, personal selling, advertising, promotions, packaging, display, servicing, physical handling, and fact finding and analysis. He also introduced the concept of forces that govern or influence the marketing mix. These included consumers' buying behaviour (which included demographics and socio-cultural issues), the trade's behaviour, competitors' position and behaviour (which included some aspects of the economic environment), and government behaviour (which included legal or regulatory issues). Therefore, it can be seen that Borden understood the effect that the business environment has on marketing activities. As he said, the " firm is but one small organism in a large universe of complex forces." It is interesting to note that as far back as 1964 Borden used a biological metaphor for the firm rather than a mechanical one.

Thirty years later, Hibbert and Wilkinson (1994: 219) also saw marketing activities or institutions in organic, rather than mechanical, terms. They saw marketing activities and institutions as "disequilibrium mechanisms designed to buffer or reduce the effects of complex dynamics", but as has previously been shown, marketing activities can also be used to instigate or influence a shift towards the edge-of-chaos end of the chaos continuum. A market such as information technology would clearly be experiencing such complex dynamics and chaos, and therefore understanding how chaos and complexity theory applies to marketing and how marketing can influence the complexity and turbulence of environments and markets is clearly important for this study.

The section ahead will, therefore, examine the application of chaos and complexity theory to each of the four standard components of the traditional marketing mix, namely product, price, place (or distribution) and promotion.

2.7.7.2 Product

Phillips and Kim (1996) propose thirteen possible reasons why chaos has not been found definitively in marketing data, specifically relating to new product development and diffusion. These reasons mainly revolve around measurement and collections of aggregations at the wrong levels, unavailability of sufficient quantity and quality of data to identify chaos, proactive marketing actions that hide chaos or prevent it from being identified, or it is mistaken for errors or irregularities. Their implication is that it is probably present in product development and diffusion but it is very difficult to identify. Authors such as Priesmeyer and Baik (1989), Hibbert and Wilkinson (1994) and Kopel (1996) seem to agree with Phillips and Kim's (1996) implied conclusion.

Priesmeyer (1992) suggests that the product life cycle, which is a plot of the trajectories of two variables (sales and profit) over time, represents the forces in a non-linear system. Since the product life cycle has a common or generic shape, it can be assumed that there are forces that cause the variables to follow a common pattern. Furthermore, the shape indicates that there is an attractor that limits the behaviour within certain boundaries during the life of the product. In order to prevent the product from following its pre-ordained and deterministically defined path to decline, it can be encouraged to break from the attractor and create a new trajectory (that is, a new product life cycle) by means of innovative or dramatic marketing tactics.

This representation of the product life cycle as a chaos system is consistent with Millier's (1999) view that the launch phase of a new product is the start of a chaotic phase. The product develops in many directions based on technical development and customer use. It is bifurcating, and the more bifurcations (or proliferations as he terms it), the more likely the firm is to find the correct route (product design or application) for success. In this chaotic phase the chaos can come from inside or outside (environment) the company, and can be either constructive or destructive. He stresses that, in the innovation phase of new product development, chaos is necessary.

This is consistent with most authors' opinions of the importance of the edge-of-chaos for creativity and innovation. For example, Schumpeter (1934, in Schroeder, 1990) maintained

that innovation is a key to breaking existing market relationships by destroying old consumption patterns and allowing new ones to emerge. He sees innovation as a destabilising force. He concludes that constructive chaos is necessary, but not sufficient for success. Destructive chaos or the absence of chaos, on the other hand is likely to lead to failure. His research showed that, of thirty companies, all the successful ones experienced chaos, while all those that did not experience chaos were unsuccessful. Millier (1999) further explains that success comes when external chaos from the environment is responded to by an increase in internal chaos. This is consistent with the belief that 'only chaos can cope with chaos', that is to cope with a chaotic environment a company needs to instigate chaos in its domain if chaos does not arise by itself. He also highlights the importance of provoking chaos rather than merely reacting to it. This instigation or provoking of chaos is similar to Priesmeyer's (1992) innovative or dramatic marketing tactics, which include finding new uses for the product, new target markets, new ways of distributing or promoting the product, or associating it with emerging environmental issues.

The above conclusions are supported by Kopel (1996) who, using a non-linear model of the research and development process, has shown that periodic and chaotic behaviour is possible. This finding he supported with a theoretical argument based on real data that shows that 'boom and bust' behaviour is typical of business systems, and thus periodic and chaotic behaviour is very feasible. It therefore makes sense to view product development as a chaos process and the suggestions of many authors who take a complexity-based approach imply that there is a preferred approach to new product development.

One such suggestion is that the process must be very swift. Speeding up the product development cycle has significant benefits, according to Patterson (1993). For example, since learning takes place each time a product is launched, more learning will take place if the development cycle is shorter than the competitors', there are less likely to be costly, mid-stream design changes, the company gains a reputation as a market leader, and what is learnt in the process is not lost, as can be the case if the development cycle drags on over a long time period. Quick development is also suggested by van de Vliet (1994) and Hamel (2000).

Brown and Eisenhardt (1998: 13) do not only suggest speed, but also suggest the use of 'time pacing' in product management, which involves "launching a new product every six months, rather than whenever a competitive response is needed; ...refreshing a brand every three years, rather than waiting for market signals that indicate the brand is dated." Farrell (1998: 72) does not believe it is necessary to be a 'first mover', but that it is necessary to be

early into a market so as to "grab as much territory as you can." Being early, which implies being quick, allows the brand or product to establish a position in the market, and also allows the customers to develop a relationship with the product by helping to adapt and improve it. He believes that perfecting the product in the lab first is a sure way to failure in the marketplace.

A second suggestion is the importance of involving customers in the development process. Leibold (2001) sees what he terms as partnership marketing as a method of co-evolution, whereby the supplier and customer together co-create value to their mutual benefit - a form of symbiosis. This is supported by Hamel (2000) who believes that successful and radical innovation requires that customers must be co-developers of the product.

Product range also appears to be susceptible to understanding via a complexity approach. Skae's (1989) research confirmed that firms operating in a more turbulent environment would have a greater capacity to add products and product lines to their range than those operating in a more stable environment could. However, care should be taken with range extensions as Schiller, Burns and Miller (1996) imply that product proliferation introduces complexity into the marketplace, causing costly errors in invoicing and other operations, and alienating customers. These two findings can be understood through Skae's (1989) inability to confirm that firms operating in a more turbulent environment would have a larger and more complex range of products than those operating in a more stable environment, and the insistence by Hamel (2000) that losing, or unsuccessful, products should be killed off quickly.
The implication is that although the product range should grow, it should not be unbridled, but limited by a continual monitoring of products, and the culling of the less successful from the range, thereby keeping the complexity of the range within manageable proportions. This can be seen as balancing the range at the edge-of-chaos, and not allowing excessive growth to push it over the edge into chaos.

This discussion has shown that product development is probably a complex process, subject to chaos principles. Furthermore, it has highlighted the importance of chaos or destabilisation, innovation, quick development, careful range management, and customer involvement in the process as key factors in marketing success in a complex and turbulent environment.

2.7.7.3 Price

Relatively little work appears to have been published in the field of pricing. However, Priesmeyer (1992) maintains that supply and demand when viewed from a non-linear perspective, do not operate as traditionally believed. He quotes a study that shows that under certain conditions Coca Cola sales increase when prices are increased and decrease when prices are reduced. Another study, in the novelty ice cream market, showed that a new entrant into the market resulted in sales increasing at the same time as prices were increased. The key issue is that the supply and demand equilibrium point acts as an attractor, with equilibrium oscillating within certain boundaries. Within the boundaries of this attractor, there are equilibrium points at which high demand and high prices occur and also points at which low prices and low demand occur. Therefore, he maintains that understanding a product's attractor is helpful as it affects price changes and can give guidance as to when prices should be changed. This belief in the relevance of chaos theory to pricing is supported by Mix (1993) who believes that price dynamics reflect the presence of chaos, and by Granovetter and Soong (in Hibbert and Wilkinson, 1994) who argue that price changes can affect the dynamics of a market, implying the introduction of chaos by means of price changes. Priesmeyer and Baik (1989) agree that some marketing actions can push an organisation into chaos, sometimes unintentionally. For example, a price increase to counter a profit decline in a previous period may be a sufficient nudge to break the system free of its attractor, making future performance unpredictable.
However, Priesmeyer's (1992) finding of the relevance of the level of chaos should be kept in mind. He found, in a study of petrol retailers, that demand was not significantly influenced by price cuts when low order chaos (less turbulent) was present, whereas demand was influenced by price cuts when high order chaos (more turbulent) was present. This implies that destabilising tactics are more effective the more turbulent or chaotic the environment is.

Anticipation and quick reactions appear to be important in turbulent markets. Smith et al. (1999) believe that firms in turbulent environments can benefit if they are able to anticipate and react fast enough to competitive price changes, but that in low turbulence markets the ease of access to information about prices has led to a shift in power from seller to buyer, resulting in an inability to increase prices. Samli (1993) supports speed in pricing, saying that proactive pricing in turbulent times is essential.

Another related pricing issue is the increasing importance of pricing due to increasing availability of information. As mentioned above, availability of pricing information in stable markets limits a marketer's ability to set prices. This tendency is supported by Sviokla (1999)

who sees prices becoming more specific to individual consumers. Freely available price information and digital technologies enable customers to search for products at the price they require, and via digital auctions, customers are self-organising to determine prices. So the supplier is not necessarily the price setter. In fact, Oda et al. (2000), using cellular automata, showed that prices could affect consumer behaviour, to the extent that the diffusion curve for new products could be stable or unstable depending on the nature of the purchasers. From the above it can be seen that standard pricing policies and fixed prices are not suitable for turbulent markets.

Since pricing is so critical to all aspects of marketing performance, extreme care must be taken in setting pricing policies. The excessive number of special deals offered by consumer marketers has increased complexity to the extent that prices change weekly, and as such consumers are encouraged to buy on price rather than on product superiority (Schiller, Burns and Miller, 1996). Samli (1993) stresses the importance of the marketer being sensitive to price elasticity, as taking destabilising pricing actions, such as cutting prices, in an inelastic market situation will probably not lead to increased sales revenue and in most cases, can be detrimental to the success of the strategy. In addition, Smith et al. (1999) found that, in highly turbulent markets, product performance increases were not always accompanied by matching price increases, while in low turbulence markets stable or increasing prices were accompanied by unchanging product performance.

This implies that, in a turbulent market, spending on product improvements might not be profitable, while in a stable market, prices may be increased without a matching performance increase. Clearly, different pricing policies are required according to the turbulence of the environment. Using a complexity theory approach, namely cellular automata, Oda et al. (2000) researched the affect of price and neighbours' buying behaviour on consumer behaviour. They maintain that their results can shed light on the diffusion of new products, with the diffusion curve being stable or unstable depending on the nature of the purchasers.

From the above discussion it can be concluded that proactive price tactics are important in a complex and turbulent environment. Prices can be used to influence a market, but pricing needs to be quick and specific to the customer. Standardised, fixed prices are no longer adequate.

2.7.7.4 Place

Holmstrom and Hameri (1999: 998) showed clearly, from empirical data, that supply chains are dynamical systems that reflect "deterministic chaos, namely high sensitivity to initial conditions and islands of stability." The presence of chaos in a supply chain is supported by Rasmusen and Mosekilde (1988, in Herbig and Golden, 1991), who showed that destabilising, chaos behaviour can result from the alternating allocation of resources between sales (to recruit customers when there is excess stock) and production (to build stocks when their are backlogs of orders), and by Levy (1994) who has shown how small disruptions accumulated to make a supply chain highly turbulent, unexpectedly increasing the supply chain's costs. He found that despite the impossibility of prediction, patterns were discerned that enabled management to understand the supply chain as a complex dynamic system. Furthermore, Wilding (1998: 602) provided evidence that deterministic chaos can be generated in warehouse supply chains, showing "sensitive dependence to initial conditions, 'islands of stability', ... characteristic patterns, the reductionist view was invalidated, and finally, the chaos undermined computer accuracy." He also showed that there were complex interactions between deterministic chaos, demand amplification, and parallel interactions that increased uncertainty, and thus costs, in the supply chain.

There were, in fact, some 'stabilising' actions that could increase other sources of uncertainty. Similarly, Stacey (1996c) shows, through the beer game, how feedback loops in a complex system can throw the system into chaos.
Very small differences at the retail level feed back up the supply chain resulting in demand that cannot be met. Inventories are run down and back orders grow. Manufacturers then over-compensate with large quantities being delivered, and the end result is all members of the supply chain having excessive stocks of beer that they cannot sell. This cyclical behaviour is exactly what is observed in real-life businesses according to Stacy (1996c).

The above findings imply that introducing any change to a supply chain system should be done with care, considering all components and relationships in the system - very often trade-offs are involved. For example, product proliferation and excessive promotional deals can lead to chaotic situations in distribution. Schiller, Burns and Miller (1996: 99 - 102) report on how Procter and Gamble's marketing complexity led to error-prone operations, and how "... one-time-only deals cause wholesalers and retailers to stock up while the price is low, [causing] factories [to have to] constantly cope with artificial surges in demand." Clearly, their product and promotional deal proliferation was introducing unproductive chaos into their marketing system. The net result of these findings is that the conventional belief that supply

chain success demands stability is challenged. Priesmeyer (1992) explains this in complexity terms. Distribution channels behave non-linearly, with performance that is either constant, periodically oscillating, or chaotic. Using phase plane diagrams generated by a logistic equation simulation he shows how a channel's inventory system can vary from consistency to chaos, depending on the type of channel information used to determine order quantities and timing of manufacturing to replenish inventories. Using sales to the next level in the channel as the input information causes inventory levels to fluctuate significantly, especially at the manufacturer level. This inventory fluctuation results in inventory levels alternating between heavily overstocked, with resultant additional carrying costs throughout the channel, to under stocked, or out of stock, resulting in lost sales, overtime production, and faster transport costs, and thus reduced profitability.

The solution to chaos in the supply chain appears not to be increased planning and control (Johnston and Betts, 2000), as planning is only superior in a predictable environment. Three approaches appear to be important.

- Use of correct supply chain information – when end user or consumer demand information (generated at the point-of-sale) is used to drive manufacturing, and thus replenishment of inventory throughout the channel, much more consistent inventory levels result. Such damping of fluctuations leads to reduction of safety stocks and minimisation of stock outs, resulting in overall improvement of channel profitability (Priesmeyer, 1992). Wilding (1998) agrees that the best way to remove chaos from the system is to focus on the customer by communicating demand information as far up the supply channel as possible.
- Accept the uncertainty and adopt short term, or reactive, managerial actions within the prediction horizon. This approach reduces operating costs and increases the value of the system (Levy, 1994; Wilding, 1998). Johnston and Betts (2000: 292) support this reactive approach, showing through research with a multi-agent simulation, that a reactive inventory replenishment strategy is superior with increasing unpredictability. They also stress that reactive approaches are "simpler, able to take advantage of opportunities as they arise, and ... are likely to be more robust in a changing and complex world."
- A third way is by treating the supply chain as a complex adaptive system, using a few simple rules to manage the system. According to Whiting (2001) Southwest Airlines is using complexity methodologies to model its freight operations, simulating their cargo operation on a few simple rules. One of the results was a reduction in the transfer of cargo by 70%, saving millions of dollars, by not transferring packages to the most direct flights - a decision that was counter-intuitive.

The above discussion shows that the traditional approach of increased planning and control and the introduction of buffer stocks is not necessarily the most effective approach in a complex and turbulent environment. Adopting a complexity mindset of quick reaction, simple rules to direct the system and using consumption information throughout the chain can result in reduced channel inventory, reduced costs and improved customer service.

2.7.7.5 Promotion

Although Forrest and Mizerski (1996) report that there has been little application of chaos theory to marketing communications, they report on a significant study using self-organizing neural networks which can be used to interpret and understand marketing communication patterns of virtually any degree of complexity. The networks do this by learning, recognising and remembering patterns, which enable these networks to evaluate and develop better communications messages, and avoid incorrect messages. They can also be used to create connections between individuals in a database, and work is being done to develop their use for creating communication tactics based on media usage data, product purchase data, etc., in order to develop an automated interactive marketing system that could communicate directly with the consumer via, for example, the Internet.

Since business conditions are never the same as in the past, Samli (1993) recommends that planned promotional activities should always be seen as 'contingency plans'. The success or otherwise of the promotional activities should be continuously monitored and changed as external events change. This can mean redirecting promotional expenditure to different products, markets, or to different promotional techniques. Expecting to have to change prepares the firm to act proactively. In this way small changes or ‘nudges’ can be used to direct the promotional activities. Paladini (1999) explains how tiny improvements can be the difference between success, and mediocrity or failure in business. Using a direct mail campaign as an example, he mentions concentrating on reducing the production costs by using a slightly cheaper paper, by emphasising conversion rate rather than generating more leads, and by concentrating on customers in the data base who are currently still buying, rather than those who are not. So, as with sensitive dependence on initial conditions, relatively small, apparently unimportant steps, can lead to large, significant outcomes - in this example, significant improvements in return on investment in the direct mail campaign. However, care must be taken and results continuously monitored to catch vicious feedback cycles before harm is done. Stacey (1995) gives an example of a magazine that gave free trials to boost sales. However, as trials increased, subscriptions declined so the

management increased advertising rates. As a result, advertising volumes declined and this together with the decline in subscriptions put the magazine out of business.

Priesmayer (1992) suggests that studying the attractor patterns can identify the differences or similarities of markets in order to determine the different tactics required for each market. His study of the non-linear dynamics of sales patterns at two petrol retailers located close to each other in Texas showed that one reflected low order chaos (a tightly bounded attractor) while the second reflected high order chaos (a widely varying attractor). The retailer with low order chaos had constrained demand that was not influenced significantly by promotional activities, whereas the high order chaos retailer had more opportunities for influencing demand through promotional tactics. In fact, minor promotional changes or improvements to premises could result in major increases in sales and profitability. In a second study (in the novelty ice cream market), he showed that a new entrant into the market changed it from a stable market with traditional supply and demand dynamics, to a market with high order chaos. The high order chaos brought opportunities that enabled promotional activities to have significant and permanent effects on demand and market share. In Priesmeyer's (1992: 76) words, "The tight market share structure had been broken, the limit cycle escaped its attractor, and the future share of all products ... was unpredictable." This shows that knowing the attractor prevalent in a market enables the marketer to identify the appropriate marketing tactics. More aggressive promotional tactics in a turbulent market allow the alert marketer to take advantage of the turbulence to influence the trajectory of the attractor in order to increase market share, sales or profitability.

A number of authors have published work in three of the main areas of marketing communications.

a) Advertising

Although not providing any evidence, Mix (1993) believes that advertising dynamics might reflect the presence of chaos and Fortin (1995) believes that chaos theory would be helpful in areas where performance is a function of performance in a previous time period, such as in the allocation of advertising budgets, which is often a function of financial performance in the previous year.

More concrete evidence was provided by Sorger (1992, in Feichtinger, Hommes and Milik, 1994) who showed, via a simple advertising model, that the interaction of two competitors' advertising could result in chaos. Feichtinger, Hommes and Milik (1994) developed an even simpler advertising capital model, which showed that a single

simple feedback rule could create unexpected and erratic patterns, and even chaos. They found that a 'persistent firm' (meaning stable, conservative, and relatively unchanging) stabilises a situation (number of customers or market share) by following a continuous and defensive advertising strategy. However, if such a persistent firm adopted an aggressive advertising strategy, then irregular and sometimes chaotic patterns resulted. In a less stable situation (rapidly decaying market share or 'turbulence') defensive advertising can lead to chaotic behaviour. Their study thus suggests that a firm in a more stable market would benefit from a continuous, conservative and defensive advertising strategy, typically image or institutional advertising, while a firm in a more turbulent market would benefit from a more aggressive, pulsed advertising campaign, typically product, pioneering or competitive advertising.

b) Selling

Gordon and Greenspan (1988, in Herbig and Golden, 1991) showed how chaos could be found in the selling function. Their model showed that increasing selling success, and therefore increasing market penetration, could lead to chaotic behaviour, with sales appearing purely random. In such a situation guessing what sales would be would be as effective as sales forecasting. Priesmeyer (1992) also applies chaos thinking to selling. He explained that extra selling effort might close the sale, but that too much extra effort might antagonise the customer and lose the sale. Consequently the ideal amount of effort is a balancing act, similar to balancing at the edge-of-chaos. Positive feedback in the form of encouragement or reward can cause a sales person to break free of the limits of an attractor and lead to exceptional performance, while negative feedback (discipline) can bring them back to perform within acceptable limits that is within the required attractor. A sales person whose performance is totally unpredictable, that is it is chaotic, maybe should be fired, whereas sales persons whose performance is in a stable attractor may need steady feedback to keep them there if their performance is acceptable, or they might need a shock or an incentive to lift them out of a rut and encourage them to strive for higher achievements.

Siebel and Malone (1996) apply complexity theory more generally, maintaining that products are becoming so much more complex that a sales person cannot know the company's whole product range. In fact salespeople now need to be able to 'design' the product on the spot with the customer. This can only happen if sales people are adequately trained and constantly provided with updated information on products and

their capabilities. Clearly, adequately trained and motivated sales people are critical to success in a complex and turbulent environment.

c) Word-of-mouth

Farrell (1998: 25) has studied word-of-mouth advertising, or as he calls it, microbursts of interaction, intensively using a complex market simulation. The interaction spreads ideas, or “memes,” about products. Initial fans, supporters or evangelists spread the word to followers who adopt the product. In chaos markets these 'initial conditions', spread by the evangelists, can lead to spiralling waves of purchasing. As these memes are taken on by more followers, demand accumulates to create a market. This view is supported by Dye (2000: 139) who refers to word-of-mouth as buzz, which is driven by customer hype due to people wanting to share their experiences with others. These relatively small conversations "can snowball, resulting in runaway success" - clearly an example of sensitive dependence on initial conditions. He calls this process "explosive self-generating demand."

According to Farrell (1998: 33) word-of-mouth acts as “the medium through which agents connect, self-organise, and build.” Complexity theory therefore shows how consumer decisions are taken in an inter-related, non-linear, way - how one product, not necessarily different from others, succeeds whereas others fail. This process starts with a single event and then becomes increasingly complex through "an aggregation of interactions ... through networks forming, patterns emerging, or chain reactions taking place." These interactions explain how information or ideas are spread, "like a bee colony sharing information,” from one person to another. These ideas, or memes, are spread like a contagious infection (Farrell, 1998: 24). This view of word-of-mouth advertising shows a definite relationship to the sensitive dependence on initial conditions of chaos theory and to the networking, emergence and self-organisation of complexity theory.

The above discussion has shown the relevance of chaos and complexity theories to the different activities used in marketing communication, such as advertising, selling and word-of-mouth. In addition, Farrell (1998) stresses the importance of the integration of the activities. He maintains that media advertising together with word-of-mouth act together in a non-linear way to influence a product's popularity. Although each additional advertising impression may be the same, when the total mixture achieves a certain volume it stimulates the consumer or the market into a new state (a phase transition, breakpoint or tipping point), which can lead to a new wave of buying. Since resources are usually limited, merely spending more advertising money on the problem is usually not a solution. Creating a mix of

direct and indirect communication messages can build an environment that multiplies the dynamics, enabling the market itself to build purchasing momentum to the critical mass. Sales success is thus achieved by a mix of traditional marketing activities and activities by forces outside the company.

2.7.8 Conclusion to marketing applications

This section has clearly shown that chaos and complexity theory can be beneficially applied to marketing, providing increased understanding of market and consumer dynamics and acting as a guide to the choice of marketing tactics. This is so despite the scepticism of some authors and their belief that marketing tactics are operational issues that are decided by managers and therefore cannot be investigated from a complexity viewpoint. Chapter four will investigate the relationship between chaos and complexity theory and marketing strategies and tactics in more detail.

2.8 CONCLUSION

This chapter set out to provide an understanding of chaos and complexity theories. This was done by, first, providing a discussion of the main characteristics of each theory and then providing examples of how each characteristic has been applied in business and marketing. Then, second, the implications for business and marketing were discussed and the scepticisms of some authors about the applicability of these theories to business and marketing were presented, and in most cases, were refuted.

Finally, the various functions of management and marketing, including the marketing mix, were examined in terms of chaos and complexity theory, providing examples of how these theories have been used in examining and understanding these functions.

The chapter has not only explained chaos and complexity theories, but has provided strong evidence to support the contention that economies, markets and individual firms are complex adaptive systems and that, therefore, the principles and characteristics of chaos and complexity theories apply to them. It has also highlighted non-linear methods for understanding business and marketing dynamics and how this understanding can lead to the use of more effective management and marketing techniques and tactics.

However, Kelly and Allison (1999: 81) maintain that a "set of prescriptions," even those based on complexity science, cannot be accepted as "complete and unchanging." They

stress the need to use complexity science as a way of learning and thinking about the business and its environment, rather than as a means of fixing a business problem. Therefore, despite the importance of complexity oriented techniques and tactics, this chapter has also stressed the importance of the changing mindset, namely using complexity theory to guide the thinking about, and interpretation of, business and marketing issues.

Although most marketing authors have some suggestions for coping with turbulence and complexity, most lay emphasis on trying to reduce the turbulence. Samli (1993), for example, devoted his book to methods for reducing turbulence (the title 'Counter turbulence Marketing' is a giveaway), ignoring the benefits that firms can gain by taking advantage of the turbulence. This chapter has shown that an understanding of chaos and complexity theories leads to an acceptance of complexity and turbulence and to seeing both reduction and instigation of complexity and turbulence as valid strategies, dependent on the nature of the environment and the objectives of the organisation.

The next chapter will address the external environment in more detail, as this is where the management and marketing activities are applied, and because the external environment is one of the variables that comprise the propositions of this study.

CHAPTER 3 – EXTERNAL ENVIRONMENT OF BUSINESS

3.1 INTRODUCTION

Since this study is aimed at identifying the influence of the external environment on marketing tactics in turbulent complex environments, it is necessary to understand what is meant by 'the external environment'. This chapter will concentrate on defining the external environment and its components. It will further define the dynamics of change in the environment and the status of the external environment in South Africa.

According to Stanton, Etzel and Walker (1994) the macro external environmental forces include demography, economic conditions, competition, social and cultural forces, political and legal forces and technology, all of which can have a major affect on a company's marketing activities. Change in any one can cause a change in others, that is, they are interrelated. This "multiplicity of interacting factors influences the complexity of the environment" (Skae and Staude, 1990: 38). The environmental factors are also dynamic and change at an accelerating rate. Although largely uncontrollable by management, they can be influenced to a certain extent (Skae and Staude, 1990). Lewontine (in Wheatley, 1996: 20) agrees with this, maintaining that "...the environment is an organized set of relationships between individuals ... constantly affecting one another, constantly being changed by the process of being in relationship with one another by our choices." This implies that the environment is not an entity independent of the individuals and organisations operating in it. They are 'co-creative' with the environment.

These environmental factors and the relationships between them are continually changing. Conner (1998) lists many types of unanticipated disruptions being experienced by the world today, such as dangers, opportunities, innovations and demands. He maintains that there is more change, moving faster with more implications than ever before (Conner, 1998). Schumpeter (in Loewen, 1997: 28) sees such continuous change as typical of the capitalist system. Loewen (1997) maintains that this tendency is speeding up and goes on to quote Toffler, Popcorn and Naisbitt as saying that the change in the current environment is equivalent to the change during the Industrial Revolution. Both Achrol (1991) and Hamel and Prahalad (1994) agree with this, implying that the future is not an extrapolation of the past and that industries and peoples' lives will be transformed in unexpected ways.

Hamel and Prahalad (1994) believe that those who drive this revolution will be very profitable, but those who are driven will only achieve moderate profits. Furthermore, Kelly and Allison (1999) maintain, "Most of the business applications of complexity science are directed towards the external environment, such as the economy, global market behaviour and forecasting technological development." Thus, it appears that there could be major benefits to understanding the changing environment from a chaos and complexity viewpoint. In the next section, therefore, the dynamics of environmental change will be discussed before the nature of the environment is examined in detail.

3.2 ENVIRONMENTAL CHANGE

3.2.1 Introduction

Since there appears to be strong evidence that the environment has been changing and continues to change dramatically, it is necessary to obtain an understanding of this change and to identify its dimensions. Thurow (in Gibson, 1996: 236) maintains that the business environment is going through "...a period of punctuated equilibrium, where the environment suddenly changes and the previously dominant species dies out and is replaced by another." It is not known yet what this new dominant species in the business environment of post-communism, knowledge work and instant global communications is, so the business environment can be seen as one of uncertainty.

Authors such as Kotter (1996) and Glass (1996) agree that environments will continue to become even more complex and uncertain in the future. Burgess (1998) concurs that this turbulence, complexity and competitive intensity will increase in South Africa, but believes that South African managers do not adequately understand the role and impact that environmental trends can have on their companies. Manning (1989: 1) stresses the importance of such understanding, maintaining that "the future is a matter of choice, not chance. You are where you are today because of decisions you took - or didn't take - sometime in the past. The shape of tomorrow depends entirely on how you act right now." This implies that the individual company can influence its future environment. Therefore, environmental change should not be seen as something to submit to, but something in which the businessperson should participate. This is supported by authors such as Brittain and Freeman and Tushman and Anderson (in Morris and Lewis, 1995), who suggest that rapid environmental changes create opportunities for firms that are structured and positioned to

take advantage of changes. In such environments the rewards for innovation are greater, but so too are the penalties of failure.

Dess and Beard's model of the environment (in Robbins, 1990: 218) can help to understand the dynamics of environmental change. Their model is based on three characteristics, namely, growth capacity (which allows for mistakes to be made), volatility (stable or dynamic) and complexity (degree of heterogeneity, as simple or complex). They believe companies that operate in scarce, dynamic and complex environments face great uncertainty because they have little room for error as well many elements that have to be monitored. Huber (in Achrol, 1991) developed a similar model also comprised of three key characteristics:

1. more and increasing diversity (similar to complexity)
2. more and increasing knowledge (may be a component of complexity)
3. more and increasing turbulence

Many different terms are used in the description of environmental change. For example, Wilson (1999: 20) sees environmental change as a combination of "radical and frequent change with a significant level of perceived uncertainty", but accepts that this is similar to terms such as turbulence, high-velocity, munificence, complexity and dynamism. Clearly, terminology can be confusing and therefore, in the next sections the various components of environmental change and the words used to describe them will be discussed.

3.2.2 Equilibrium

The Little Oxford Dictionary (1986: 184) defines equilibrium as "a state of balance." Such balance or equilibrium is lacking in most business environments, which according to Van der Walt et al. (1996), change faster than most companies can cope with. Although most people, and companies, seek equilibrium, it is not attainable because of the increasing number of variables in varying states of agitation that affect the environment (Conner, 1998). This is because information is imperfect (Black and Farias, 1998), because the rapid rates of change cause new disruptions to start before previous disruptions have stabilised (Roberts, 2000) and because equilibrium is caused by decreasing returns to scale but knowledge based industries are subject to increasing returns (Black and Farias, 1998; Roberts, 2000; Chakravarthy, 1997).

Nilson (1995) maintains that equilibrium is neither possible, nor desirable, in the medium to long term, as without change there would be no progress and thus no improvement in standard of living. Glass (1996) agrees in that managing as if in a stable environment that

assumes equilibrium does not work. This is because the assumptions of closed systems on which equilibrium is based, namely, an ability to understand the system, plans remaining relevant over time and known cause and affect relationships, are no longer valid.

According to D'Aveni (1999) rather than trying to maintain equilibrium, successful companies maintain their leadership positions by continuously building new competencies in addition to their old ones. In an environment that is truly in disequilibrium leaders continually replace their old competencies with new ones. They make their products or markets obsolete or replace them before competitors do it for them.

3.2.3 Dynamism

Brooks and Weatherston (1997) imply that dynamism is an inherent condition of an environment, that is, it is continually changing, but the extent of this change varies for different organisations or environments. They quote methods of assessing dynamism on a continuum from static to dynamic, based on Miles (1980) and Richardson and Richardson (1992). Discontinuous change can be seen as an extreme form of dynamism. These are unpredictable shock events such as global accidents, terrorism, product tampering and pressure group activity. Thus, the extremes of dynamism are shocks or surprises that cannot be predicted.

Thirty years ago Toffler (1971: 29) believed that "... social processes are speeding up - strikingly, even spectacularly." He explained that this acceleration means that, not only do people have to cope with faster change, they also have to cope with more situations which are totally different to their past experiences. Thus, one of the measures of dynamic change is the degree to which an event or situation is novel or familiar.

Authors such as Fradette and Michaud (1998) and Kelly and Allison (1999) have shown that the dynamism in companies' environments today is growing exponentially, and companies are facing more and more sudden and unexpected shifts in markets. These sudden and unexpected shifts are similar to self-organised criticality, whereby a system organises until it reaches a critical state where a very small action can cause it to collapse, or 'bifurcate' in chaos terms (Oliver and Roos, 2000). This is also known as a phase transition (Battram, 1998). Unless the company's reaction to such dynamism is appropriate, it will generate ineffective behaviour that can lead to further surprises. This Stacey (1995) terms vicious cycles.

Conner (1998) suggests that this increasing dynamism is due in part to an increasing volume of significant disruptions in peoples' lives and to increasing momentum, with people being given less time to react to these disruptions. Tasaka (1998) maintains that the Internet revolution is another reason for the increasing dynamism.

To cope with this increasing dynamism, a company must be prepared to throw out its old success formulae and develop new ones to meet the changes. Increasing turbulence means these changes become more important (Conner, 1998) and the company must be able to adapt (Pumpin, 1991). Nilson (1995) stresses the importance of understanding dynamism in both dynamic and stable markets. This is because in stable markets, knowledge about change is rare and can thus become a stronger competitive advantage and second, because it is often easier to create turbulence in stable markets.

3.2.4 Uncertainty

According to Robbins (1990) dynamic environments are more uncertain and he sees it as management's task to reduce this uncertainty. The most common approach to reducing uncertainty appears to be by increasing knowledge by means of environmental scanning (Cheney and Harrison, 1996; Boyd and Fulk, 1996). However, Boyd and Fulk's research showed that environmental scanning was influenced by management's perceptions of the state of the environment and that scanning activities declined when the environment was perceived to be complex. Thus, attempting to reduce uncertainty through increasing knowledge by scanning the environment appears to be self-defeating.

Of more significance is the finding of Peters (1999) that reducing uncertainty by rigid planning also reduces innovation and adaptability. When a structured system is hit by changes it is unable to adjust and may become extinct. Kelly (1993) refers to this as 'a fatal rigidity', because an inability to change is the mark of a decaying system. This is supported by Achrol, Reve and Stern (1983) who propose that those who are able to cope with environmental uncertainty develop power over other members. If uncertainty continues for any length of time, relationships loosen, differentiation increases, multiple channels are introduced and there is a general generally reduction of dependency on others. This enables firms who are able to cope to take advantage of market opportunities. As a result, Merry (1995) believes that uncertainty creates new kinds of organisations and communities. Novel forms of organisation, different organisational cultures and new ways of leadership are developed to cope with a world of accelerating change, complexity and uncertainty.

To achieve this, an unpredictable and uncertain environment requires "a high level of genetic diversity" in order to create a wide diversity of outcomes to prepare responses for unexpected environmental conditions Chattell (1995: 160). According to Achrol (1991) to cope with the diversity, the successful organisation will fully understand its markets and be able to quickly react to market signals with a customized response: This stresses the importance of the marketing function in coping with an uncertain environment.

3.2.5 Complexity

Complexity is defined as the measure of heterogeneity or diversity in the environment, that is, the degree to which environmental factors are many and different. These factors include customers, suppliers, competitors and socio-political and technological environments (Chae and Hill, 1997; Chakravarthy, 1997; Teopaco, 1993; Lane and Maxfield, 1996). It is important, however, to distinguish between detail complexity, which involves the presence of many factors and dynamic complexity, which “arises when cause and affect are distant in time and space and when the consequences over time of interventions are not obvious” (Senge, 1990:15). Brooks and Weatherston (1997) measure complexity on a continuum from simple to complex, with the key criterion being the number of external variables impacting on the organisation." Further measures on the continuum are whether organisational interactions are routine or non-routine and whether they are interconnected or remote. Black and Farias (1997) adopt a different approach to defining complexity. They maintain that complexity has five dimensions to it, namely, firm density (number of companies in the market), information density (amount of information in the market), clarity of information (embedded in information flow of the system), path dependency (degree to which understanding and use of the information is dependent on previous use of similar information) and response time (rate of information dispersal between receiving and using it). They believe that complexity increases as the first four elements increase and the latter decreases. As the complexity increases the ability to understand and use the information to plan and predict becomes more difficult.

Earlier theorists, especially Galbraith (1973), Perroe (1967), Thompson (1967) and Woodward (1965), viewed the complexity of the administrative component as derived mainly from technological components (in Scott and Meyer, 1994). During this period, it was believed that technology would force standardisation and limited choice on consumers, resulting in a reduction of complexity. However, there has been a shift from a focus on technology as the primary determinant of complexity to emphasise the role played by the environment. In fact, two decades before, Toffler (1971) predicted a move towards an

increasing multiplicity of options that would increase the complexity of the consumer decision-making process. During this period the complexity of society has also increased with the growth of various sub-cultures and lifestyles.

This increase in complexity appears to be inevitable. According to Farrell (1998), all systems increase in complexity over time, whether they are products, services, pricing policies or promotional activities. He mentions the growing complexity of motorcars, the product options of Coca-Cola and their complex promotional programmes and the complexity of the pricing system of Bell Telephones in the United States to support this. Although Black and Farias (1997) emphasise different elements of complexity (firm density and the nature and use of information) their theory also seems to posit a continuing increase, rather than fluctuations, in complexity.

As the content of the business environment increases more rapidly though networked relationships the complexity of these relationships usually leads to more change and not the stability the manager had hoped for – change begets more change (Conner, 1998). Thus, when a firm's environment (what Lane and Maxfield (1996) call the agent/artefact space) changes structure rapidly, horizons of the future become complex. Because of the interactions between many agents, all responding to novel situations with very different perceptions the future is unpredictable. As the system becomes more complex, making sense of it means that interpretation is essential. In response people develop ever more complex sets of rules to cope with their environment, a belief system that Gell-Mann calls a "schema" (in Farrell, 1998).

According to Black and Farias (1997), as the complexity increases, the ability to understand and use the information for planning and predicting becomes more difficult. This agrees with Lane and Maxfield's (1996) view and is supported by Merry (1995) who believes that adaptation to the uncertain chaotic environment becomes more and more problematic in a complex world whose components are tightly intermeshed and interdependent.
This increasing complexity is reflected in projects today being more sophisticated and involved with a higher degree of specialisation with new jobs being created, especially in the computer and telecommunications fields (Vaga, 1994; Robbins, 1998). Bessen (1993) maintains that the marketing environment has increased dramatically in terms of complexity, specifically with regard to the increasing number of market segments and the number of products, including the variety of weights, colours and sizes.

Coping with such increasing complexity appears to take three forms. First an organisation responds by becoming more differentiated and increasing the number of departments and specialists (Robbins, 1990). Such an environment tends to low formalisation of externally orientated activities (for instance. marketing), while maintaining higher formalisation in internal functions, but overall tends towards decentralisation. A second approach, posited by Weits and Anderson (in Teopaco, 1993) is to match the level of environmental complexity with the appropriate level of organisational differentiation or complexity. The message is that internal complexity must match external complexity. This notion is reflected in Ashby's concept of requisite variety, which is demonstrated in Kauffman's simulations of evolving ecologies (1992, in Wilkinson and Young, 1998). A third approach is to create a desired environment by Leibold (2001). This is supported by Wilkinson and Young (1998) who explain how large-scale structure and order results from the smaller scale interacting processes taking place in a bottom-up, self-organising way.

3.2.6 Turbulence

Turbulence is defined in the literature in two different ways.
Authors such as Brooks and Weatherston (1997), Chakravarthy (1997), Malhotra (1998) and Smith et al. (1999) define environmental turbulence as a function of the complexity in the environment it faces and the dynamism and uncertainty in that environment. These definitions are based on Emery and Trist's (1965) causal texture of organisational environments. Such definitions incorporate the two key factors related to environmental change. However, they have the disadvantage of tending to obscure and reduce the importance of the two factors.

The second type of definition of turbulence concentrates only on the dynamism in the environment, involving rapid, unexpected change in the organisation's environmental sub-dimensions such as the technology, customers, competitors, government regulations and new product launches (Cronje et al., 1997; Conner, 1998; Vorhies, 1998). Cronje et al. (1997) stress that a stable environment does not change much, but when it does, the change is predictable. In a turbulent environment, on the other hand, there are many unexpected changes. Bridgewater (1995) mentions the speed with which the Iron Curtain was raised in 1989 and the resultant changes in Eastern Europe as an example of such discontinuous and unpredictable change in an environment. Tearle (1992) similarly mentions the reunification of Germany, the release of Nelson Mandela and the splintering of the Soviet Union as examples of turbulence that has been experienced in the international environment.

For this study, the second type of definition has been adopted so as not to lose sight of the importance of both complexity and turbulence/dynamism, which could happen if turbulence is seen to incorporate complexity. It is also important to separate the two factors, as turbulence (in the sense of dynamism and change) is seen as the natural state of the world, including business environments (Benton and Lloyd, 1992; Mintzberg, 1994b). This is reinforced by Schumpeter's comment that turbulence is the natural result of capitalism and that capitalism's 'creative destruction' leads to economic progress (in Theobald, 1994).

In addition to turbulence being the natural state of a capitalistic environment, it is also caused by the state of, and interaction between, environmental factors. For example, Samli (1993) maintains that turbulence is caused by a combination of environmental factors such as business cycles, sudden economic disturbances (for instance, oil crises), mergers leading to oligopolies, growth in importance of information over production, the concentration of economic and political power in the hands of a few, changing consumer lifestyles and behaviour and the downsizing trend in business. This is supported by Nilson (1995) who maintains that turbulence is sometimes caused by an industry's strategic assets being undermined, for example a legal monopoly or dominance due to high entry costs. An example of this could be Government breaking up a legal monopoly as has happened in the South African rail transport industry where the road freight industry was given a boost by the removal of the railway's monopoly on long distance transport, or the deregulation of the domestic airline industry.

In addition, these changes in the combination and integration of environmental factors are more rapid than ever before because of advances in technology (McKenna, 1991). The confluence of the computer, telecommunications and media industries, has led to unprecedented levels of technical and market uncertainty (Iansiti, 1995). Such growth in turbulence increases the importance of three key managerial activities. First, according to Chakravarthy (1997: 69), "orderly conduct among … competitors [is] more difficult" and thus normal strategic management models are inadequate. Second, according to Haleblian and Finkelstein (1993), the need for information increases as the environment grows more turbulent and decision-making becomes more difficult. Third, the need for innovation throughout the organisation grows as turbulence increases. This is so since, as the cycle of development speeds up, it becomes less possible to predict customer, product and service requirements (Pine, Victor and Boynton, 1993; Achrol, 1991). Thus, decision windows are shorter, risk of obsolescence is greater and long-term control becomes impossible. As a result managers have to learn new ways to operate in turbulent environments (Davis, Morris

and Allen, 1991). Successful companies, therefore, do not see turbulence as a threat, but as an opportunity to encourage innovation and creativity (Theobald, 1994).

According to Malhotra (1993) organisational theorists such as Crozier (1964), Thompson (1967), Terreberry (1968) and Duncan (1972) in the past, have emphasised the importance of coping with environmental uncertainty as essential for organisational survival. How to cope with these increased levels of turbulence requires managers to have a deep understanding of, and relationship with, the system in which they operate, resulting in their having to learn new ways to operate and compete (Davis, Morris and Allen, 1991). Success does not come from large, vertically oriented firms, but from leaner, specialised firms with large networks of close-knit alliances and partnerships (Achrol, 1991). Instead of emphasising their current competencies such firms continually develop new competencies (Chakravarthy, 1997) with emphasis on clearly defined and communicated value to the evermore-cynical customer (Brookes and Little, 1998). As a result, adopting a customer orientation has become a critical management approach to avoid reduced market position, lower profits or business failure (Davis, Morris and Allen, 1991). This approach is supported by Morris and Lewis (1995) and by Vorhies (1998) who emphasise the importance of marketing in coping with a turbulent environment. For example, mass customisation, according to Feitzinger and Lee (1997), postpones the task of differentiating a product for a specific customer until the last minute. The company is thus able to meet rapidly changing customer needs, while at the same time reducing the amount of stock required which in a turbulent environment can become rapidly obsolete. This approach adapts to the environment rather than trying to stabilise it through buffering mechanisms. Achrol (1991) supports this approach by explaining that such buffering mechanisms create organisational inertia, which prevents companies from responding timeously to environmental change. Marketing approaches that are replacing traditional approaches include network organisations made up of specialised firms linked together in co-operative arrangements and relationship marketing that emphasises customer retention rather than customer creation.

3.3 THE BUSINESS ENVIRONMENT

In this section the business environment will be defined and the changes that are being experienced in this defined environment will then be discussed. How the environment influences business will be discussed and the business environment will be shown to be a complex adaptive system. Finally, the various components of the external business environment will be explained.

3.3.1 Definition

Brooks and Weatherston (1997:4) define the environment as "...the totality of external environmental forces which may influence any aspect of environmental activity" and the business environment as "...all influencers which are external to the organisation."

Worthington and Britton (1997: 6) differentiate between the "immediate or operational" environment that has a more immediate affect on the day-to-day operations and the "general or contextual" environment that has a more general affect. This dual nature of the environment is supported by Robbins (1990) who splits the environment into two sectors, namely:

1 general environment - economic, political, social, legal, ecological and cultural factors
2 specific environments - customers, suppliers, competitors, regulatory agencies, trade unions and pressure groups.

Similarly, Skae and Staude (1990) separate the overall environment into the remote environment (political, social, economic and technological factors) and the task environment, competitors, customers and suppliers).

Achrol, Reve and Stern (1983: 57) separated the environment into three dimensions, the primary task environment (immediate suppliers and customers), the secondary task environment (suppliers of immediate suppliers, customers of immediate customers, competitors and regulators and other influencers) and the macro environment (social, economic, political and technological forces). Of importance is the fact that they maintained that the secondary task environment and the macro environment are, unlike the primary task environment, not amenable to individual influence.

An alternative approach to defining the environment was adopted by Dess and Beard (in White, 1998), who, using population ecology theory, defined the environment of organisations in terms of three dimensions. They saw the environment in organic, complexity terms, producing three dimensions: - munificence (capacity), complexity (homogeneity/heterogeneity and concentration/dispersion) and dynamism (stability/instability and turbulence). These are very similar to Achrol and Stern's dimensions of heterogeneity, variability and munificence (in White, 1998). Although important from a complexity viewpoint, this definition does not address the actual components of the environment, which are commonly used in marketing management.

Therefore, for the current research, the environment is taken to mean a two-dimension construct, with the 'external environment' comprising of a combination of the secondary task environment and the macro environment. This definition is supported by Pitt, Berthon and Morris (1997: 5), who define the external environment as "everything outside the company, including competitive conditions, market structure, customer requirements, technological developments, regulatory restrictions, economic conditions and so forth." This definition is seen as useful because all of these factors have an influence on a company's marketing activities and thus it is this view of the environment that is used in this study.

3.3.2 Business environment changes

Harvey-Jones (in Barham, 1989) maintains that management is about change and maintaining a high rate of change. Barker (1993) believes that the leverage that is gained by discovering and managing changes is profound. This change is more extensive and farther reaching in its implications than anything since the 'modern' industrial system took shape between 1890 and 1920 (Kanter, in Barham, 1989). This view is supported by authors such as Emery and Trist (1965), Barham (1989), Pitt, Berthon and Morris (1997) and who see the environmental contexts in which organisations exist as changing at an increasing rate, becoming more hostile and unpredictable and moving towards increasing complexity and turbulence.

The causes of these fundamental changes appear to be threefold:

- Political changes such as growth of the European Union, changes in Eastern Europe, globalisation and differing population growth rates between industrial and Third Worlds and the resultant changes in labour forces and patterns of world trade (Kanter, in Barham, 1989; Pumpin, 1991).
- Technological changes, specifically advances in computer hardware and software, telecommunications and the convergence of the two (Kanter, in Barham, 1989; Anderson and Hoyer, 1991; Hammer and Champy, 1993; Johns and Lee-Ross, 1995; Roberts, 2000).
- Changes in markets, with mass markets giving way to individualistic, customised markets. Niche markets are thus now the norm, but with high levels of competition coming from often unrelated and thus unexpected, economic sectors, resulting in a blurring of traditional industry boundaries (Barham, 1989; Hammer and Champy, 1993; Williams, 1994; Geroski, 1999).

In summary, the major changes in the business environment, according to authors such as Manning (1991) and Hooley and Beracs (1997), are:

- the accelerating pace of economic change
- the explosion of innovation and new knowledge
- the intensification of competitive pressures
- the new organisational structures
- the liberalisation of international trade
- the increasing visibility of company actions, especially environmentally
- the interdependence of global economics
- the increasing deregulation and privatisation
- the increasingly diverse workforce

Environmental changes that have impacted significantly on marketing include:

- Increasingly demanding customers with customers unwilling to pay premiums unless the product offers significant extra value (Manning, 1991; Hammer and Champy, 1993).
- Shorter product life cycles that require innovation and technological agility and global marketing blitzes to ensure a return on investment before interest in the new product wanes. These shorter life cycles require companies to continuously develop and launch new products (Manning, 1991; Sunter, 1997: 3).
- A proliferation of innovative new products that swamp customers, making consumer choice more complex (Manning, 1991; Cross and Smith, 1995).
- Mass markets breaking up into small, hard-to-reach groups, resulting in a fragmentation of the media with virtually any medium carrying advertising messages focussing on micro target markets (Hammer and Champy, 1993; Williams, 1994; Lynch, 1995; Cross and Smith, 1995).
- Shifts in consumer tastes and consumer buying patterns. For example, the distinction between leisure and shopping is becoming increasingly blurred (Barham, 1989; Williams, 1994; Geroski, 1999).
- Increased channel turbulence. Scanner and retailer information systems have given retailers more control than manufacturers, which has resulted in the growth of private label house brands (Williams, 1994; Roberts, 2000).

The net result of all this change is, as stated by Lynch (1995: 46), that the environment is "chaotic, fragmented and unpredictable and complex and turbulent." The key dimensions of this entire change amount to a paradigm shift as is illustrated in Table 3.1 below:

Table 3.1 - Environmental paradigm shift

Old environment	New environment
Continuity	Discontinuity
High growth	Low/no growth
Mass markets	Fragmenting markets
Loyal customers	Volatile customers
Mass media	Fragmenting media
Weak retailers	Strong retailers
Innovation important	Innovation vital
Technology important	Technology critical

Source: Lynch, 1995: 46

In summary, therefore, many industries can be seen as "perpetual transition industries" (Sunter. 1997:3), operating in an unsettled environment (Pumpin, 1991). Hammer and Champy (1993: 21) agree, saying that change has "... become both pervasive and persistent. It is normality." They maintain that coming late to market can mean failure in that market. Even worse, companies only notice the changes that they expect to happen and which are thus included in their scenario planning exercises. The dangerous changes are those that occur beyond the companies' experience and thus their expectations. They are 'blind sided' and thus are surprised by a new competitor, a new product from a non-traditional competitor, or a change in consumer behaviour or taste. Furthermore, according to Barham (1989), companies are facing so many developments in the outside world that they often do not know what kind of changes to make. In short they are bewildered by change.

3.3.3 Influence of environment

Most authors see the external environment as influencing a business or a market. Anderson and Hoyer (1991: 35) propose "environmental change has always been the driving force behind changes in managerial philosophy and in turn, changes in the managerial process." This implies that the environment can cause a managerial approach to become obsolete and require the development of new approaches. According to Nilson (1995: 51), the external environment can influence a market in two ways, "first, by inducing changes to total demand; second, by altering the relative strength of a brand/company." He uses an example of the tobacco industry to show how Government-imposed regulations can reduce the size of the market, while competitive activities, such as the price cuts of Philip Morris/Marlboro in 1993, changed the market shares in the US cigarette market. Authors such as Brittain and Freeman and Tushman and Anderson (in Morris and Lewis, 1995) maintain that rapid

environmental changes create opportunities and that firms can take advantage of these changes if they are structured and positioned correctly.

Generally, environmental changes appear to have a destabilising affect on a market or company, especially in the case of stable, mature markets (Day, 1997). Industries that have enjoyed protection through patent protection, import barriers, close personal relationships and local regulations are most affected when these protective mechanisms are removed in their environment. Deregulation, entrance of a more advanced global competitor, a major change in the industry's technology, or new competitors with new and different skills can totally disrupt a market. Many of the above are typical of South Africa, which was a particularly protected market. Although environmental factors usually have a destabilising affect on markets, according to Nilson (1995), they can also have a stabilising affect. For example, resale price maintenance legislation, such as exists in the South African petroleum market, can help to stabilise the market. Generally, however, destabilisation appears preferable according to Mavondo (1999). He found that the macro environment leads to homogeneity in an industry and that the business environment can lead to homogeneity in competitors, thus it is possible for strategies to become ‘me-too’ copies of each other. Destabilisation actions can be one way of achieving heterogeneity and thus some degree of differentiation.

As has been shown above, environmental change can influence the business, industry, or market by stabilising or destabilising the environment. In addition, environmental change can influence the firm and its markets in other ways, for example:

- the growth in technology leads to the lowering of many entry and mobility barriers, encouraging new competitors into previously relatively stable industries. This creates turbulence in those industries (Chakravarthy (1997).
- White (1998: 283) maintains that "environmental forces affect the degree of uncertainty experienced by channel members" creating turbulence in the supply chain.
- the macro environment influences the "focal dyad and its socio-economic relations" affecting how the firm relates to its customers (Achrol, Reve and Stern, 1983: 60).

Despite the above, it should be noted that there is uncertainty as to the ability to deterministically link environmental changes to specific marketing actions. For example, four decades ago, Dill (1958) called for understanding of ways in which environmental factors constrain the structure of organisations and the behaviour of organisational participants. He believed it was not possible to identify the relevant environmental variables and to predict their impact on behaviour and thus it was not possible to generalise this knowledge to serve

as prescriptions for behaviour in other situations where groups are subject to different environments. This is supported more recently by Winsor (1995: 184) who maintains that environmental marketing factors randomly affect outcomes because of the increasing environmental complexity. Thus, the relationship between strategic action and marketing outcomes is tenuous due to the increasingly chaotic nature of environments.

Despite the belief that a deterministic relationship between the environment and marketing actions cannot be measured, many authors highlight the interrelationship between the organisation and its environment, according to Polonsky, Suchard and Scott (1999). In light of this, marketers can change or influence the environment to a greater extent than previously thought possible. Wood and Jones (1995, in Polonsky, Suchard and Scott, 1999: 42) believe a firm should co-exist with its external environment, which appears very similar to the complexity theory concept of co-evolution.

This approach is best conveyed by relationship marketing which "recognizes the importance of other forces which were previously considered external to the firm. This type of perspective identifies that there is a two-way interaction or relationship between the firm and these external environmental forces." This is supported by Brooks and Weatherston (1997) who stress the two-way interrelationship of the environment and the organisation, with organisations influencing and shaping their environments. This is done by influencing their industries or collaborating with each other in an attempt to stabilise their environments.

This two-way view of the environment–firm relationship is explained by Anderson, Hakansson and Johanson (1994, in Ford, 1997) who maintain that a clear boundary between the firm and its environment should not be assumed. The presence of a relationship implies that the firm has gained some control over some part of its environment, but at the same time giving up some of its internal control. They state that the boundaries between firms and their environments are permeable, and, as a result, the environment is not completely determined by external forces but can also be influenced by the firm. This, they claim, happens through the network of relationships that make up the primary task environment - the firm's immediate suppliers and customers. Thus the traditional belief that the macro environment cannot be influenced, is rejected, and it is accepted that the individual firm can, to a greater or lesser extent, influence some aspects of its external environment.

3.3.4 Environment as a complex system

Authors such as Black and Farias (1997) and Peters (1999) see marketplaces and marketing environments as complex adaptive systems, basing their analysis on the Austrian school of economics, which sees markets in terms of disequilibrium rather than the more traditional equilibrium. Using the Sante Fe approach, Tedesco (1998: 2) sees an environment (economy or market) as "...determined by the interaction of many dispersed, possibly heterogeneous, variables acting in parallel". This is clearly a complex dynamical system. At a lower level in an environment Prendergast and Berthon (2000: 226) view an organisation as "a set of interdependent parts that, together, constitute a whole, which, in turn, is interdependent on some larger environment." They also quote authors such as Nicosea, Alderson and Weitz and Anderson, who see marketing as a complex ecological system. These conceptualisations clearly indicate that the marketing environment should be viewed as a complex adaptive system.

More specifically, some authors indicate the presence of complexity constructs in business environments, as follows:

- Co-determination or co-evolution takes place between firms and their environments (Levins and Lewontin, in Achrol, 1991; Wood and Jones, in Polonsky, Suchard and Scott, 1999)
- Self-organisation and emergence takes place through a loose coupling of participants in the environment (Tasaka, 1998; Peters, 1999; Tedesco Analytics, 2001).
- Environmental changes usually start small and develop slowly and unpredictably, which is indicative of sensitive dependence on initial conditions (Hofer and Schendel, 1978; Tedesco Analytics, 2001)
- Smit and Cronje (2002) and Black and Farias (1997) maintain that the environment is a system, and Black and Farias (1997) and Tedesco Analytics (2001) also add that an environment exhibits non-linearity.

Black and Farias (1997) explain how seeing marketplaces as complex systems increase understanding of how complex environments develop and change. They maintain that the actions taken by firms in low complexity markets to reduce uncertainty (or as they term it, equivocality) create an information explosion that causes a return to uncertainty, but now in a more complex marketplace. Thus, attempts to reduce uncertainty lead to non-linearity, a periodicity and unpredictability. They maintain that "the driving forces behind market growth are the entrepreneurial decisions and activities and the diffusion of knowledge revealed and created." This knowledge increases when firms leave or enter a market, or make changes in

the market. They create ‘ripples’ that affect the whole market and member firms are continuously trying to improve their strategic 'fit' to the continuously shifting market. It can be seen that the marketplace is in a continuous state of flux or disequilibrium and the more agents (participants) there are in a marketplace, the more information there will be and therefore the more ripples there will be, leading to further disequilibrium and more complexity.

If marketplaces and business environments are, in fact, complex adaptive systems, then a complexity or chaos perspective should be used to understand the dynamics and behaviour in environments and markets (Tedesco, 1998; Tedesco Analytics, 2001). In fact, Prendergast and Berthon (2000) suggest that a highly complex environment requires a more complex marketing function structure and not just understanding through a complexity perspective, but using complexity and chaos science to inform the development of marketing activities.

3.3.5 Composition of external environment

3.3.5.1 Introduction

In this section the composition of the external environment will be defined and explained, including how the environment’s components influence the firm and its activities.

The composition of the external environment is usually illustrated by acronyms such as PEST (political, economic, social, technological) or SLEPT (socio-cultural, legal, economic, political, technological). Brooks and Weatherston (1997) and Pearce and Robinson (1994) separate the external environment into three categories: the remote environment (contextual environment, including PEST), the industry environment (competitors) and the operating environment (task environment, including suppliers and customers). If an attempt is made to identify the turbulence and complexity in an industry, this latter operating environment is clearly important and can play a significant role in industry dynamism. Therefore, Brooks and Weatherston (1997) introduced the more comprehensive LE PEST C (legal, ecological, political, economic, socio-cultural, technological and competition), which encompasses most of the areas of concern in the external environment. This composition will be used in this thesis when referring to the external environment.

3.3.5.2 Legal

Worthington and Britton (1997: 146) explain the legal environment as a means of "regulating and controlling" which evolves over time. It is implied that laws and regulations do not change rapidly and drastically over a short time period, which of course was not true of South Africa in the 1990's as will be discussed in Section 3.5.2. Of significance is the law's constraining affect on business: a firm cannot do whatever it wants in the marketplace - its activities have to be within the law. Most authors discuss the legal environment as part of the political environment as it is the political institutions that promulgate the laws. Therefore, further legal issues will be touched on and discussed in Section 3.3.5.4 on the political environment.

3.3.5.3 Ecological/Physical

The physical environment encompasses the sources of the firm's raw materials, as well as the environment in which it operates and in which it disposes of waste. Important issues for the firm include resource scarcity, cost of energy, pollution and environmentalism. These can have short term cost implications and longer-term survival implications, as well as the social pressures placed on firms by society. Because of the growth in consciousness about the physical or ecological environment, this is a variable that is causing major changes in the business domain (Cronje et al., 1997).

The physical environment can have a two-fold influence on markets (Nilson 1995). Because of mankinds increasing dependence on electricity, telecommunications and the distribution of food and water, physical disruptions, such as earthquakes or floods, can have a significant impact on markets. Second, climate changes can influence the sales of many products, for instance, heating systems or air conditioners.

Serious ecological issues, such as the greenhouse affect, are becoming increasingly important to business. Many of these problems are caused by economic activity and the growth of business activity is often at the expense of the environment (Brooks and Weatherston, 1997). Environmental issues are becoming of greater concern for businesses because of Governments' increasing regulatory actions, such as the regulation of pollution emissions through taxes, permits, grants and other regulations. Individual, single-issue actions by environmental pressure groups are also relevant and are having a serious affect on individual organisations. The gravity of these problems, together with the official and

unofficial pressures, are likely to lead to radical changes in organisations to enable the global economy to become ecologically sustainable (Brooks and Weatherston, 1997).

3.3.5.4 Political

Government affects the business environment by promulgating and enforcing legislation (Cronje et al., 1997). Through legislation it controls the environment, especially the economic environment. Although a free market system provides freedom of action for businesses, the Government may intervene, for example, to limit monopolistic actions by businesses. It does this through the annual budget, taxes, import controls, promotion of exports, price controls, health regulations and many other controls. At a national level, Government is responsible for the nature of the economic environment through both monetary and fiscal policy. In addition, the Government also influences the environment when it acts as a producer, but even more so as a major purchaser of almost all consumer and producer products. It purchases in such large volumes that it can influence the economic and technological environments.

Brooks and Weatherston (1997) emphasise that political change occurs at the global, national and local levels and that, particularly at the global level, the interactions flow down to different levels and can have a significant affect on individual organisations at the local level. For example, political shifts enlarged the boundaries for competition. Such political shifts have included the move toward a united Europe in 1992, the return of Hong Kong to China in 1997, and the return of the former Soviet bloc nations to independent states with free market economies seeking ties with the West.

Innovators from outside the old industries invaded with new approaches, causing the environment to become turbulent as new struggles for dominance ensued (Kanter, Stein and Jick, 1992).
In addition to global politics, organisations often have to be flexible in responding to local political forces that might conflict with their own goals. Often political threats are neutralised by political action such as lobbying by individual companies.

According to Worthington and Britton, (1997: 38 - 39) changes in the political environment are affected by five factors inherent in the political environment.

- The political system is dynamic but has limited components of change and continuity, that is, values on which political activities are based remain the same, therefore dramatic changes are unusual.
- Built-in uncertainties such as elections create both opportunities and risk.
- Political influences flow across borders, so international activities can have a significant influence on firms.
- Political influences vary according to type of organisation. Multinationals are more influenced by international politics, while local firms are more influenced by local politics.
- Businesses can influence politics individually and collectively by lobbying.

It is important that companies do not see only the controlling, limiting side of political actions. Government induced changes can be positive or negative, stabilising or destabilising (Nilson, 1995). For example, a company selling products or services to help consumers stop smoking can benefit from a Government's anti-smoking campaign. Moreover, the internationalisation of business is leading to considerable change and increasing complexity of markets. This internationalisation, according to Nilson (1995), not only increases complexity but also increases the speed of change. This is because the information flow has become quicker and more comprehensive, as companies use computers and telecommunications to manage their international activities. Therefore, according to Garten, (1997) multinational companies can no longer leave foreign policy to politicians and bureaucrats. They must develop capabilities that will allow them to anticipate and respond to the disruptions in emerging, and in many established, markets, so as to take advantage of opportunities that present themselves.

3.3.5.5 Economic

According to Worthington and Britton (1997:84 - 94), economic factors that influence business include:

- Government activities to control inflation, promote, or restrict, growth, reduce unemployment, improve the balance of payments and control public borrowing. These activities are controlled by fiscal policy, monetary policy and direct controls.
- Increased or decreased demand for imports/exports.
- External shocks, for example, the onset of recession in a major trading partner, a rise in cost of a key resource (for example, the oil price rise in 1973 or a financial collapse such as the Asian crisis of 1998).

Brooks and Weatherston (1997) maintain that economic factors, such as Government goals of high growth, strong balance of payments, low inflation and low unemployment, can influence organisations. Although these fiscal and monetary policies are intended to control the variability in the economy, major shocks and unexpected discontinuities, as mentioned above, can occur.

Furthermore, economic structures are not static but change continuously, with shifts towards the tertiary sector, increasing openness that has stimulated international trade and an increasing integration of international economies. As an example, Schilperoot (1998) points out that, during South Africa's isolation by sanctions, local brands were created by copying global brands and logos. With the re-entering into the global marketplace, he believes South African companies have to behave more ethically and play by the same rules as the global companies.

It is interesting to note that Cronje et al. (1997) believe the economic environment is primarily influenced by the technological, political and social environments and in turn influences these environments. Furthermore, the main influence of relevance to marketing is the economic growth rate, which affects consumers' incomes and consequently spending on consumer products.

3.3.5.6 Socio-cultural

The socio-cultural aspect of the environment is made up of three issues; namely national culture, demographic structure and other social issues. These are discussed below.

- National culture encompasses the values, attitudes and beliefs that are shared by the majority of members of the society. As opposed to Levitt's convergence theory that proposes the reduction of culture differences (1983, in Brooks and Weatherston, 1997) cultural differences between countries are now being seen as significant. Although culture is dynamic and continually changing, fundamental change is rather slow, but significant, over a decade. For instance, concern for the natural environment is becoming part of some national cultures. Hofstede (1983, in Brooks and Weatherston, 1997) highlights national differences such as individualism versus collectivism, which might influence marketing practices. He argues that some countries such as Scandinavia, Great Britain, Singapore and Hong Kong, are more accepting of uncertainty than countries like Germany, Japan and France, which are high in uncertainty avoidance and thus plan and organise in detail to avoid uncertainty. Clearly, therefore, a change in national culture would necessitate changes in business and marketing practices.

- The demographic structure, namely the quality and quantity of people in an economy, can significantly influence a firm's performance. Important factors are the size of the population, age structure, birth and death rates, life expectancy, migration patterns, wage levels, education and training, welfare services, motivation levels and gender issues (Worthington and Britton, 1997; Brooks and Weatherston, 1997). Although dynamic, these changes are usually relatively slow, but they do however affect consumption and therefore marketing. More specifically, changes in the size and age structure of the population are important for predicting both the demand for products and the availability of personnel required for production. Although the total population of most Western countries is stable, their composition is changing.

  Most countries are experiencing an increase in the proportion of elderly people and a decline in the birth rate resulting in a decline in demand for the products and services of companies providing for the very young, while there is an increase in demand for products and services for the elderly. Other important aspects of the demographic environment include the changing geographical distribution of the population (between different regions of the country and between urban and rural areas) and the changing composition of households (especially the growing number of single person households).
- Other social issues that change are highlighted by authors such as Palmer and Hartley (1996), Brooks and Weatherston (1997) and Cronje et al. (1997). Some examples of these include:
  - family structures are changing with more single parent families, fewer children and grown children returning to live with parents. This has implications for consumption behaviour, a
  - attitudes to health have changed, from representing values held by a small fanatical minority to those that now represent mainstream cultural values,
  - the role of women is changing. In the early 1980's 60% of American women believed their place was in the home, today this figure stands at 22%. The increased acceptability for young mothers to continue working has given rise to a large child and home care service sector,
  - the consumerist movement, as a result of a better-educated public, has placed pressure on businesses that has affected product quality, advertising and trade practices in general. Society is also forcing companies to become more socially responsible and take note of consumerism and emphasising social goals in addition to profitability as the reason for the firm’s existence.

According to Nilson (1995) more general social forces have an overall influence on markets, but more specific social forces, such as attitudes to health, are less clearly understood, especially as related to a specific target market.

The socio-cultural environment is the environmental component most influenced by other variables. Thus, through the socio-cultural environment, all the other variables have an indirect influence on the business and strategy of a firm. Since a business is itself a social institution, it is at the centre of social change, influencing and being influenced by, social changes. It is interesting to note that Merry (1995) maintains that chaos and complexity sciences can be very helpful in understanding and finding ways of coping with the uncertainty and change in the socio-cultural environment.

3.3.5.7 Technology

Technology is defined by Gillespie and Mileti (1977, in Brooks and Weatherston, 1997: 128) as “the types and patterns of activity, equipment and material and knowledge or experience to perform tasks.” Understanding the technological environment is important because the technological environment has a significant impact on other environmental variables. For example, the number of new inventions influences the economic growth rate and inventions such as television and the birth control pill brought about a revolution in people’s social lives. Technological innovations also increase the unpredictability of the business environment. For example, the contraceptive pill meant smaller families, more women at work and therefore more money to spend. Thus, a technological innovation had unintended consequences for the socio-cultural and economic environments, as well as on the demographic environment.

Since Brooks and Weatherston (1997:128) stress that “the technological environment is currently witnessing a ‘new wave’ of information-based change,” more focus is placed in this thesis on the computerisation and telecommunications aspects of technology. This is justified by McKenna (1991: 65) who says the technological environment has changed recently at such a pace that it is "virtually meaningless to make distinctions between technology and non-technology businesses and industries." This is supported by Brooks and Weatherston (1997) who maintain that major leaps in technological developments include information based technologies, advanced manufacturing technology, supply chain management and electronic data interchange.

Modis (1998) explains that these changes happened because the information technology hardware industry was in the final phase of its growth cycle in the mid-1990s. This is the period of relatively low growth that leads to replacement or substitution – in this case by knowledge technology, networks, knowledge bases and software – and to a chaotic environment. The current maturity of the mainframe and personal computer markets resulting in changes and substitution by laptops, palm tops and interactive Television is symptomatic of further chaos or turbulence in the environment.

The adoption of these computer and telecommunications technologies has resulted in an increase in the speed and amount of information that can be stored and transmitted, as well as qualitative changes from the "creation of new patterns of information organisation" (Glazer, 1991: 2). As a result technological innovations are speeding up the rate of change, increasing competition and increasing complexity in the marketplace by increasing the complexity of products and production systems (Cronje et al. 1997). More specifically, Worthington and Britton (1997) maintain that technological change has a big impact on businesses through the introduction of new products, changes in methods of production, quality of resources, new distribution methods and new ways of storing and disseminating information. These changes have included computerisation of production, storage and distribution, speeding up of communication, including the Internet, development of new materials and the use of biotechnology. Palmer and Hartley (1996), furthermore, stress how technological advancements are important for marketing, for example:

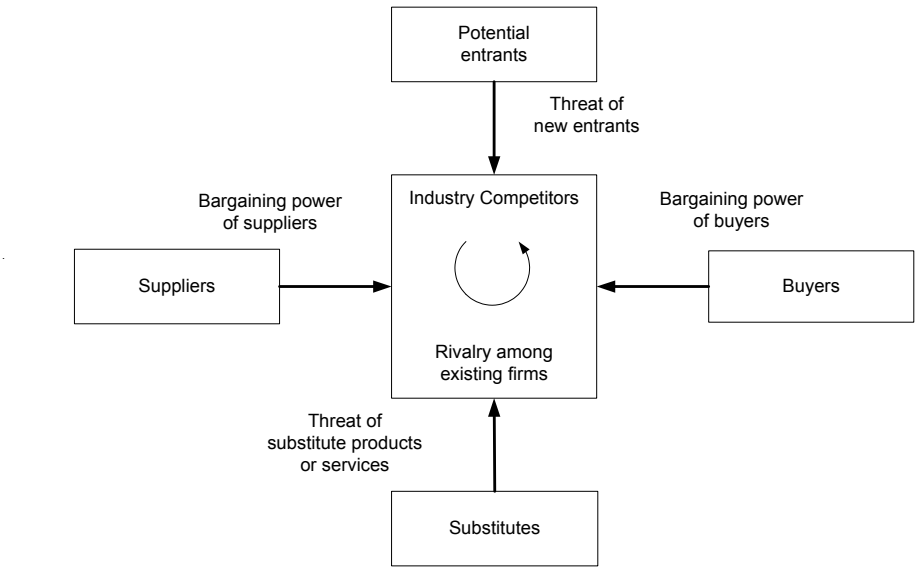
- technological development allows new goods and services to be offered to customers,
- new technology can allow existing products to be made more cheaply thereby lowering their prices and widening their markets,
- technological development allows for new methods of distributing goods and services,
- technology creates new opportunities for companies to communicate with their target customers.

Finally, it is important to note that technological change is quite easy to identify, but of greater interest and difficulty is the identification of the impact of the technological changes on product usages and general habits which makes the management of the technological environment particularly difficult (Nilson, 1995). This is despite the fact that managers appear to have more control over the forces in the technological environment.

3.3.5.8 Competition

Porter's five forces model of competition (in Boyd, Walker and Larreche, 1998) is very helpful in understanding the dynamics of the competitive environment. The model is given in Figure 3.1 below:

Figure 3.1: Porter's five forces model of competition



Source: Boyd, Walker and Larreche, 1998: 95

An industry with few competitors, hardly any threat of new entrants or substitutes and with many, small, weak suppliers and buyers (customers) would tend to be in a monopolistic situation, leading to stability and no inclination to change. On the other hand, an industry with many competitors, strong suppliers providing strategic, difficult to acquire materials and equipment, a few large customers (or consumer markets that are active in consumerism) and a strong, real threat of new entrants (say from overseas) and substitute products, would be in a state of considerable turbulence and complexity. From the point of view of industry insiders, their industry would definitely appear to be, at least, at the edge of chaos and for many would be seen as in a chaotic state - unpredictable, uncontrollable and changing and evolving so rapidly as to be difficult or almost impossible to cope with. For many firms it would appear to be an unattractive market and many would choose to exit the industry.

Further factors that can influence the intensity of complexity and turbulence in the competitive environment are entry and exit barriers and scale economies (Boyd, Walker and Larreche, 1998). An industry with high barriers to entry, established scale economies and low exit barriers would tend to be more stable with relatively low levels of competitive intensity.
On the other hand, an industry with low entry barriers, low scale economies and high exit barriers would inevitably become more complex and turbulent over time, eventually becoming chaotic. Incumbents would fight each other resulting in liquidations and business failures, but at the same time, new, hopeful entrants would continue entering the market, because of the low entry barriers and the scale economies. To succeed in such a market a company would have to change more frequently and more dramatically than its competitors, to keep ahead of the price-cutting followers in the market.

Porter's model is the traditional approach to competition. However, the level of competition in businesses has not only increased, the rules of competition have changed. This has happened due to "deregulation, the breakdown of industry boundaries, globalisation and non-stop technological shifts" (Fradette and Michaud, 1998). Because of the discontinuous nature of these changes it is not possible to predict which rules will change next. Competition no longer comes from known, traditional rivals. The authors mention that more books and music CDs are sold through the Internet than through traditional outlets. Banks are selling insurance, insurers are operating health care networks and motor companies are in the financing business. This perception of a changing competitive environment is supported by Manning (1991) who sees the competitive battle becoming tougher and faster and, in the process, changing the nature of competition. Companies are developing new and faster ways of competing. This is not necessarily bad news. D'Aveni (1999: 130) believes that, as rivalry in the competitive environment increases, profit potential can increase if the company focuses on "defining a new basis of competition for customers". In other words redefining the rules of competition and forcing competitors to become followers.

From the above it appears that success in a changing competitive environment requires an innovative approach: redefining competition, competitors and the ways to compete. This is important because competitors affect both the way a company operates and the attitudes and beliefs of customers (Nilson, 1995). The relationships between competitors and customers also affect the activities of a company and its specific relationship to its customers. For example, customers in one geographic market might react differently to a company's actions in that market than customers in another geographic market, because of the actions of different competitors in each of the markets. In addition, this new competitive

environment is made even more complex and turbulent by globalisation, which is the most powerful business and industrial policy wave of the late 1980's and 1990's and has established a new global economic order for the new millennium. Globalisation "exposes companies to the real world of unprotected business competition in which only the smart, shrewd, competent and bold survive (Joubert, 1998: 84).

3.3.5.9 Summary

This section has defined and explained the components of the external environment in which businesses operate. It is clear from this discussion that the external environment has been changing significantly in the recent past, in terms of turbulence and complexity, and that success requires the ability to cope effectively with rapid and unpredictable change in the various components of the environment. It is also clear that merely trying to predict changes through such methods scenario planning is insufficient. It is necessary to adopt an approach that enables the firm to 'create' its own environment by adopting technologies from other industries, redefining the rules of competition, influencing the political and legal environments through lobbying or moulding the socio-cultural environment through new products and promotional activities. Furthermore, viewing the external environment from a chaos and complexity viewpoint appears to give a better understanding of the dynamics of the environment and makes it easier to influence and to cope with.

3.4 ORGANISATION - ENVIRONMENT RELATIONSHIP

In order to identify how to cope with complex and turbulent environments a firm needs to understand the relationship between the environmental dynamism and the activities undertaken by the firm. In this section the relationship between the environment and the business will be discussed with specific focus on the relationship between the environment and marketing.

3.4.1 The business and the environment

Worthington and Britton (1997) believe the interrelatedness of the environments with the firm can lead to a turbulent environment creating management uncertainty and possibly decline in performance or the demise of the firm. The implication is that uncertainty is something to be avoided. They stress the almost infinite nature of the complexity of the environment and maintain that management must concentrate on the most urgent changes, although their

suggestions for identifying which are the most urgent changes are not clear. This volatility leads to uncertainty for managers, with the implication being that managers should try to reduce the uncertainty if they wish to be successful. However, other authors disagree with this attitude. Brooks and Weatherston (1997) maintain that the uncertainty resulting from dynamism and complexity is not necessarily a bad thing. Stability can lead to complacency that results in inflexible organisations being unable to cope when faced with a significant change. They quote Burrgeois (1985) who believed that reducing environmental uncertainty through long-term actions might result in poor performance in the long term.

Despite this difference there is agreement that volatility and dynamism differ according to the type of organisation. Differing levels of volatility are seen in some areas such as technology, some markets, or some industries. This mix of complexity and volatility results in each organisation having a unique environment that affects it. Thus, general strategies or approaches might not be relevant.

This is supported by Ansoff (in Clutterbuck and Crainer, 1990: 158) who maintains that a company's strategy should depend on the characteristics of its environment and not on any "universal prescriptions (like 'stick to your knitting' or 'return to basics'." It is further supported by April (1997) who stresses the need for flexibility and capacity for change in leaders.

Of more importance than the ability to control the turbulence in the environment is the ability to match the activities of the firm to the nature of the environment. Lawrence and Lorsch (in Robbins, 1990: 217) found that successful firms tend to have a good match between their internal and external environments, while unsuccessful firms did not. This meant that successful firms in diverse or turbulent environments had differentiated internal environments: more task segregation, managers having different attitudes and frames of reference, each department having differing points of view. This implies more complexity, rapid change and greater complications. To cope with this, successful firms in diverse environments had high levels of integration: collaboration between departmental units and techniques such as rules, formal plans and committees. In successful firms in standardised and stable industries there was little differentiation with these firms having similar structures. The unsuccessful firms had the reverse relationship between internal and external environments. This finding is supported by both Miller and Friesen (in Davis, Morris and Allen, 1991) and Morris and Lewis (1995) who found a relationship between entrepreneurial, as opposed to conservative, firms and environmental dynamism, hostility and heterogeneity. They also found a significant relationship in successful firms, between environmental turbulence and heterogeneity, and proactive and innovative behaviour.

Thus, it appears that a situational approach is related to business success, with successful firms in complex and turbulent environments adopting entrepreneurial, innovative, proactive and risk-taking strategies, with successful firms in more simple and stable environments adopting a more conservative, reactive and risk-avoidance approach.

3.4.2 Marketing and the environment

In order for marketing to be affective the marketer must understand the total environment - the marketplace, competition, customers, trends, etc. This, according to Nilson (1995), is especially true in a turbulent world. The type of relationship that exists between the environment and the marketing function in general will be covered in the next section. Following this, the relationship between the environment and customers will be discussed and the marketing mix relationship will be investigated in more detail.

3.4.2.1 The relationship

Some authors deny a link between the environment and marketing activities. Vorhies (1998) found that the marketing capability of a firm was not related to the level of environmental turbulence, and Oosthuizen's (1997) overall result was that South African companies' marketing activities do not appear to be influenced by perceived environmental uncertainty. There is doubt about the effectiveness of marketing activities relative to the environment.

However, the consensus amongst most authors appears to be that the macro environment has a critical impact on marketing relationships and variables (White, 1998). This was found by McKee, Varadarajan and Pride (1989, in Mavondo, 1999), who maintain that environmental turbulence has a significant impact on marketing variables. Mavondo's (1999) own findings confirmed this, showing that that the macro environment has a significant influence, not only on marketing effectiveness, but also on financial performance. This makes intuitive sense, but is also supported by Morris and Lewis (1995) who maintain that marketing, as a boundary spanning function in the firm, is the logical function to address turbulence in the external environment. They see it achieving this by effecting and managing change and by being opportunity-driven and flexible. Davis, Morris and Allen (1991) showed how this was related to environmental turbulence. They found that as uncertainty in the environment increases, firms increase their marketing activities. In other words, under placid conditions smaller, incremental improvements are made to better serve customers.

As turbulence intensifies the firms increase anticipation and quick response and when turbulence is great they increase innovativeness, risk-taking and proactiveness into all marketing activities. To further support the presence of a relationship between the environment and marketing activities, some authors have shown a relationship with specific marketing mix activities. White (1998) quotes many studies to show that, the external environment has a significant impact on channel relationships and processes (Dwyer and Welsh, 1985; Dwyer and Oh, 1987; Achrol and Stern, 1988; Klein et al. 1990). Oosthuizen (1997) found that companies operating in uncertain environments tended to place more emphasis on pricing and price levels, whereas those in stable environments placed emphasis on relationships with non-marketing functions. Pitt, Berthon and Morris (1997) showed that increasing environmental complexity causes firms to put more emphasis on product and market specialisation, while Davis, Morris and Allen (1991) found that as uncertainty in the environment increased, firms increased the collection of customer information.

A general finding appears to be that environmental turbulence seems to force firms into behaving in a more marketing oriented fashion (Davis, Morris and Allen, 1991; Morris and Schurink, 1993). Environmental complexity and turbulence also seems to cause firms to put more emphasis on niche marketing, relationship marketing, customisation, reliance on speed as strategy, and reducing the use of mass marketing, resulting in the disappearance of mass markets (McKenna, 1991; Pitt, Berthon and Morris, 1997.)

Morris and Lewis (1995) give some explanation of how marketing, entrepreneurship and environmental turbulence are interconnected. Environmental turbulence requires increased entrepreneurial and marketing innovation and change. The new product and process innovations introduced by entrepreneurial and marketing actions then change the way business is done and increase the rate of environmental change, in areas such as technology, social behaviour or competitive intensity. Thus, the relationship between marketing, entrepreneurship and turbulence appear to be a self-reinforcing spiral. However, although the above discussion appears to support a strong causal relationship between the nature of the external environment and the marketing activities adopted, this should be viewed with caution. White (1998), although supporting a relationship between the environment and marketing, stresses that pure environmental determinism is not possible and neither is pure environmental management. The reality is probably somewhere between these two extremes.

3.4.2.2 Customers

In the complex and turbulent environments of today, customer loyalty is no longer a certainty. What a customer is satisfied with today will probably not be what they want tomorrow. Fradette and Michaud (1998) maintain that the sale of many products on the Internet is making comparison-shopping the norm, leading to customers demanding products and services suited to their individual needs. Customers are continuously seeking cheaper and better products and services and are prepared to switch loyalties to get them. This finding is supported by Manning (1998: 24) who maintains that customers in South Africa are "... pickier, more promiscuous and increasingly price-conscious" and by Billington (1999: 1) who maintains that today's customers "...roam the world - virtually if not literally - with ever - expanding and ever-changing needs. They have no loyalty to any supplier." Quoting McKenna, he says that customers innovate and adapt faster than companies and so companies must change and innovate at even faster speeds just to keep up with the changing environment. Sheth and Sisodia (1995a) believe that three approaches improve marketing's ability to cope with these rapid changes in the customer environment. These are partnering, relationship marketing and marketing alliances.

3.4.2.3 Marketing mix

The traditional marketing oriented approaches of sales driven marketing, or customer and market research driven marketing, lead to incremental changes to products in existing markets, resulting in a lack of innovation and getting stuck in a rut (Laczniak and Lusch, (1997). They suggest that a future oriented marketing style is required: a style that predicts and takes account of, changes in the external environment and leads customers to products that satisfy the needs of which customers have not yet fully become aware. This is supported by Hamel and Prahalad (1994) who maintain that when breaking out from the boundaries of existing competition, no firm will be first to the market of the future if it waits for indications of a need from existing customers. In turbulent times this poses serious challenges for those advocating the more traditional market-led approaches to strategy. This clearly indicates that a successful company must understand the relationship between environmental changes and their marketing activities.

Many authors have shown direct relationships between the external environment and specific marketing mix tactics. For example, Pitt, Berthon and Morris (1997) see pricing as significantly influenced by the environment. They maintain that changing legislation has opened up markets, forcing companies to compete without price fixing. These increasingly

dynamic, hostile and complex environments require more opportunistic, or as they term it, ‘entrepreneurial’ pricing. Morris and Schurink (1993) also see a relationship between the environment and pricing policy, maintaining that environmental turbulence requires more delicate, sophisticated and complex pricing and that it leads to faster and more frequent pricing changes.

They see three environmental forces affecting pricing behaviour.

- The rapid rates of change being experienced in the environment reduce control and predictability, which mean that the assumptions regarding what determine the price (for instance, costs, competition or demand) are dubious. As a result, prices set may not match the requirements of the marketplace and may result in strategies that are uncompetitive and unable to benefit from opportunities.
- Marketplaces are becoming more heterogeneous with mass markets disappearing and becoming increasingly fragmented and segmented. This trend implies a need for more flexible, diverse and complex pricing approaches.
- Increasingly intense competitive environments require prices that reflect more flexibility, quick response and aggressiveness.

Product also seems to be influenced by the nature of the environment. The New Marketing Imperatives Roundtable (1994) found that product lifecycles have shortened drastically and product complexity has increased. Similarly, Chattell (1995: 58) maintains that 'fashionisation' is a feature of virtually all markets: a situation whereby product life cycles are shortened unpredictably by volatile and brief customer values. As a result products become quickly and unpredictably obsolete. This means companies must be able to develop new, replacement products that are personalised to the individual very quickly, rather than designed to suit the average consumer.

Although drawing less attention in the literature, the place and promotions components also appear to be influenced by the external environment (Nilson, 1995). In the field of promotion, The New Marketing Imperatives Roundtable (1994) maintains that the fragmentation of mass markets has resulted in mass advertising being unable to reach the target markets, leading to major shifts in promotional tactics. Regarding the place component, White (1998) quotes many studies that have shown that the external environment has a significant impact on channel relationships and processes (Dwyer and Welsh, 1985; Dwyer and Oh, 1987; Achrol and Stern, 1988; Klein et al. (1990).

A detailed analysis of the marketing mix and its relationship to the external environment will be presented in Chapter 4. This section has merely highlighted that a relationship between the external environment and the marketing mix does exist.

3.5 THE SOUTH AFRICAN ENVIRONMENT

3.5.1 Introduction

Since this thesis is based on the assumption that the South African external business environment is both complex and turbulent, it is necessary to assess whether this is in fact so. Looking at the external environment in total, Van der Walt et al. (1996) maintain that the lifestyles, values and expectations of South African society have changed perceptibly in the past twenty years. Burgess (1998) maintains that the Indian Ocean Rim area is changing rapidly, with the competitive environment of this region increasing in remain turbulence. Since South Africa falls within this region it is undoubtedly affected by this surrounding turbulence. Joubert (1998) is in agreement, illustrating the turbulent nature of the South African environment by highlighting the depreciating forces and the countermeasures, which influenced the significant decline in the value of the Rand from 1994. He shows the importance of the mix of political, legal, economic and socio-cultural factors on the changes being experienced by the South African environment. Other authors such as Weeks (1990), Nasser and Vivier (1993), Morris and Schurink (1993) and Morris et al. (1996) have also shown South Africa as having a turbulent external environment, specifically with regard to levels of change in the economy, technology and market intelligence. As a result they have concluded that South Africa was a suitable context for examining the impact of environmental turbulence.

The following sections will consider, in detail, each of the seven components (LE PEST C) of the external environment in South Africa.

3.5.2 Legal

The South African legal environment is based on the free-market system involving free enterprise, private ownership, freedom of vocation and a respect for the market mechanism (Van der Walt et al. 1996). The Government controls the legal environment via the annual budget, taxation and various controls, regulations and incentives. It also influences the legal environment via various investment policies, its role as a producer and its attempt to privatise certain Government assets and activities.

South Africa has many laws covering issues such as competition, fair trade practices, environmental protection, product safety, truth in advertising, packaging and labelling and pricing. Regulations are constantly changing: what was allowed last year may now be prohibited and what was prohibited may now be allowed. For example, the withdrawal of sanctions against South Africa, together with the demise of the Soviet Bloc, resulted in ex-Soviet countries rapidly passing laws to both regulate and promote an open-market economy. Thus, export markets that were previously closed to South African companies are now being opened up. Laws have been passed to define and prevent unfair competition. Such laws are enforced by the Harmful Business Practices Act No. 71 of 1988. Unfair business practices have been defined and are enforced by various Government departments in South Africa. For example, the Trade Metrology Act No. 77 of 1973 and the Advertising Standards Authority help to protect the consumer from unethical business practices. Furthermore, the marketing industry has been affected by the loss of revenue caused by the requirement of printing health warnings on cigarette packets and the banning of sponsorships by tobacco companies (Lamb et al., 2000). With the change in Government in 1994, there has been a significant increase in the rewriting of legislation to suit the new democratic South Africa. New laws and their enforcement will continue to be promulgated. Terblanche (1998) agrees saying that the South African legal environment is changing with the removal of apartheid era laws and the increasing of legal protection for consumers and employees, for example the new Constitution of the Republic of South African Act, No 108 of 1996, the Occupational Health and Safety Act No 85 of 1993 and the new Labour Relations Act No 66 of 1995. As an example of how this could affect businesses, the Basic Conditions of Employment Act No 75 of 1997, could cost South African Airways R90 million to implement (Lamb et al., 2000).

The greatest change in the new millennium is the transformation of the justice system, in the areas of, gender equality, sexual offences, human rights, discrimination and access to information (South African Yearbook 2001/02, 2002). Numerous other new laws such as Competition Act No 89 of 1998, the Labour Relations Act No. 55 of 1995, the Basic Conditions of Employment Act No. 75 of 1997 and the Employment Equity Act No. 55 of 1998 have also changed the legal environment for business (SA 2000: South Africa at a Glance, 1999).

The legal landscape has changed and is continuing to change, dramatically. Despite the changes that have happened and still are happening, Ginsburg (1998) believes that South Africa is still heavily over-regulated.

3.5.3 Physical

According to the South African Yearbook (1997), the Department of Environmental Affairs and Tourism is the central co-ordinating body for natural or physical environmental issues. The National Environment Management Act 1998 provides for planning and co-ordination of physical, environmental and ecological issues. The challenge is to increase the quality of human life without depleting the natural resources of the country (South African Yearbook 2001/02, 2002). In the future, companies can expect strong controls from Government and pressure groups. Concern for the natural environment has given birth to the so-called green movement. Today, according to Kotler and Armstrong (1999), enlightened companies go beyond what Government regulations dictate. They are responding to consumer demands with ecologically safer products, recyclable or biodegradable packaging, better pollution controls and more energy-efficient operations. In addition companies are assisting with the promotion of, and education in, the environment. Examples of this are the Gold Fields mining group who fund the development and running of the Environmental Centre at West Coast National Park; South African Breweries who sponsor an annual environmental journalism award; Pick 'n Pay who won the Keith Kirsten Greening Award for the most innovative tree planting project; and Eskom who runs a major programme to reduce the danger to birds from their electricity pylons (South African Yearbook, 1997). More and more, companies are recognising the link between a healthy economy and a healthy ecology.

Despite the efforts towards improving the physical environment, South Africa faces serious ecological threats. South Africa's natural resources are unlikely to be able to support the predicted population growth unless significant steps are taken to conserve water, prevent water pollution and reduce soil erosion (Koch, Cooper and Coetzee, in du Plessis, Rousseau and Blem, 1994). If water use continues at the current rate, the supply of water will be exhausted by 2025 (Cronje, du Toit and Motlatla, 2000). Rapid industrialisation, population growth and urbanisation pose a serious threat to the physical environment, with air, water and marine pollution and land erosion being particular problems (South African Yearbook 2001/02, 2002). As a result, more pressure is being placed on businesses in terms of pollution control, waste management, recycling and environmental impact assessments, and South African managers see environmentalism and concern for the environment as a growing trend (Lamb et al., 2000).

3.5.4 Political

It is in the political arena that the South African environment has changed most notably in the last decade. Ball and Asbury (1989: 242) predicted a "fundamental change in the political framework [that] would constitute a discontinuity." Their scenario, although radical for the time, was relatively mild compared to the changes that have actually taken place since their research was published. One of these unexpected developments was change from pariah state to the most politically correct nation in the world (Burgess, 1998).

The changes involved a new Constitution, a change in governing party after 46 years of same-party rule, new parliamentary structures and an increased democratisation of Government (SA 2000: South Africa at a Glance, 1999). Forsdick (1995) maintains that this new political dispensation has resulted in a change of rules that have direct and indirect impacts on the organisation. The political transformation is not complete, which implies further possible changes resulting in associated impacts on the economy and on organisations. The role of the individual within the organisation is also changing, leading to increased power, responsibility and the need for participation. In the South African sense, this response is aligned with the changing political issues (affirmative action, cultural diversity, increasing expectations and the conflicting socialist and capitalist values of labour and management).

The co-evolution and interrelationships of the political factors indicate that the South African political dimension will continue to be a driver of complexity in the short to medium term. This emphasises the turbulent nature of the South African political environment, which Binedell (in Cargill, 1994) likened to a change from "waltzing to break dance and one doesn't learn the latter in one easy lesson." Cargill (1994) suggests that the political power shifts in the South African political environment will introduce new markets and new forms of business.

One specific Governmental action which could have a further significant impact on the environment in South Africa is privatisation: the selling off of Government businesses and assets, which in a free enterprise system are not normally in the Government domain. However, according to Van der Walt et al. (1996), this has been happening at a slow rate. It appears that Government is now attempting to address this issue more aggressively, with restructuring taking place in the transport, telecommunications, energy and defence sectors (South African Yearbook 2001/02, 2002). By 1999 the Government had divested itself of R7

billion in assets in Transnet, South African Airways, Eskom and Safcol. Continuation of this restructuring will result in major changes to the business environment.

3.5.5 Economic

The South African economy has been subject to negative influences over a long period of time. This is indicated by the statistics in Table 3.2 below:

Table 3.2: Average growth rates (%)

	1980-84	1985-89	1990-92	1999-2000
Gross domestic product	3.0	1.5	-1.0	3.3
Private consumption expenditure	5.1	1.7	0.0	2.5
Real disposable income	3.4	1.2	0.4	
Per capita real disposable income	1.0	-1.2	-2.0	
Inflation	13.5	15.7	14.5	6.9
Prime overdraft rate	16.4	16.7	20,0	21,0

Source: du Plessis, Rousseau and Blem, 1994: 19 and 200)

These figures show that organisations have been operating in an economic environment that has been declining over a long period of time. This indicates an environment that was, to a degree, predictable: performance would continue to decline or at least no significant improvements could be expected. Further statistics from du Plessis, Rousseau and Blem (1994) that support this predictability are given in Table 3.3 below:

Table 3.3 Savings and tax ratios

	1980	1985	1990	1992
Savings ration (%)	10.8	6.3	1.2	2.6
Direct personal tax as % of total personal income	6.3	11.3	13.2	13.9

Source: du Plessis, Rousseau and Blem, 1994: 199 and 201

The final column in Table 3.2 indicates a change from a predictable trend, resulting in uncertainty as to what the future trend will be (SA 2000: South Africa at a Glance, 1999). This uncertainty is also indicated by the 30% devaluation of the Rand and an increase to 26% in the prime interest rate in 1998 following the Asian economic collapse. This was at a time when economists were predicting interest rates to decline to 15% (Cronje, du Toit and Motlatla, 2000).

One of the most dominant features of the South African economy has been the uneven distribution of personal income. However, with the attempt to close the 'wage gap' over the past twenty years, together with improved educational and occupational opportunities for Blacks since 1990, the income distribution is becoming less uneven. Average household incomes have increased by 54% from 1990 to 1995 for Whites, by 64.3% for Coloureds, by 77.1% for Indians and by 80.1% for Blacks. This factor, together with the fact that in 1993 South Africa emerged from the longest recession since World War II, led to a considerable spending boom and a growth in the economy significantly higher than the 1980s (Census in Brief, 1996). This indicates that in the early 1990's the economy improved from the long-term downward trend.

Further results of these significant changes happening in income distribution are quoted by du Plessis, Rousseau and Blem (1994: 156):

- Over 25% of the richest 20% of South African households were Black in 1994, compared to only 9% in 1975.
- In 1975 there were no Whites in the poorest 20% of the population. In 1994 five percent of the white population fell into this category.
- Although average real household income fell by 11% between 1975 and 1991, the wealthiest 20% of Black household incomes rose by 40% during the same period.

Despite the increase in average household incomes, the South African population became increasingly impoverished during the years of political change in the early 1990s according to Van der Walt et al. (1996). This, they maintain, was due to the population growth rate of 2.6% exceeding the economic growth rate. It was further aggravated by the influx of foreign immigrants from neighbouring states. The unpredictability of the economy was shown by their incorrect forecast that "inflationary pressures in South Africa are expected to remain high for the next ten years", whereas the actual inflation rate has dropped significantly since their prediction (Van der Walt et al., 1996: 58). Despite certain economic improvements, income distribution in South Africa is still very skewed. This is indicated by Table 3.4 below, which shows the proportion of total expenditure made by South African households for major categories of goods and services according to race group.

Table 3.4 Consumer spending by race group (% of total expenditure)

Expenditure	1998	1996	Black	Coloured	Indian	White
Food, drink & tobacco	36	29	44	37	32	18.1
Housing & h/hold equip	19.3	19	13	19	20	22
Transport & communication	17.4	11	7.4	10	12	12.4
Clothing & shoes	6.9	6	10	6	6	4
Medical & dental	6.3	6	6	8	8	7
Education, entertainment & sport	6.8	4	2.6	3.1	3.4	3.4

Source: Combined from Langschmidt, 1996: H20 and Cronje, du Toit and Motlatla, 2000: 9.

Food, housing and transportation consume the largest portion of household income. However, the table shows that consumption patterns by different race groups vary considerably. For instance, Whites spend less proportionately on food than the other race groups, while Black consumers spend less proportionately on housing and household equipment than the other race groups.

3.5.6 Socio-cultural

The structure of the South African population is one of extremes and is complex in its composition. According to Cronje, du Toit and Motlatla (2000), South Africa is showing significant changes in its socio-cultural make up. An example of this is that the growth rate of the total population is declining and will continue to do so, with the White population growth rate reaching almost zero by 2011. Traditional African cultures are breaking down, according to Morris (1992). Blacks today see themselves, first as South Africans and only second as part of an ethnic group. Urbanised Blacks see themselves first, in terms of their town or city and second as part of an ethnic grouping. It is only amongst older, or rural, people that African traditions still are predominant. With the assuming of power by the African National Congress (ANC) in 1994, this trend has escalated and the socio-cultural environment is becoming more and more Western and urbanised. The Urban Foundation (in du Plessis, Rousseau and Blem, 1994: 153) predicted that the number of Black people living in metropolitan and urban areas would increase by 99% between 1991 and 2010, while the rural black population will increase by 20%. While this rapid urbanisation is taking place, the population growth rate is declining, from 2.3% between 1980 and 1985, to 1.9% between 1985 and 1991. Further affecting these figures, however, is the unpredictable impact of Aids, which some experts believe will halt population growth (du Plessis, Rousseau and Blem, 1994).

Despite the urbanisation and Westernisation that is taking place amongst Black consumers, there is still a vast cultural difference between Black and White consumers (Morris, 1992). These differences exist because of issues such as historical cultural beliefs and the different lifestyles of the different people. Thus, the socio-cultural environment is an amalgam of tribes, languages, urban/rural, religious beliefs, lifestyles and degree of Westernisation, resulting in a population diversity that is extremely complex.

In addition, other demographic issues that increase the socio-cultural diversity are the more than half a million people living legally in South Africa - more than 2 percent of the population - who are not native South African (Census in Brief, 1996). In addition to these legal residents, rough estimates put the number of illegal immigrants from neighbouring states in the millions (Ministry of Welfare and Population Development, 1997).

Using basic segmentation methods, Morris (1992) showed the complexity of the South African market at the start of the 1990s:

Whites - traditional Afrikaners, new-young Afrikaners, English speakers and immigrants – British, Portuguese, German, etc.
Asians – Moslems, Hindus, other - six sub-cultural language groups
Coloureds – Malays, Griquas
Blacks - nine ethnic units - Zulu, Xhosa, Tswana, North Sotho, South Sotho, Shangaan, Swazi, Venda, Ndebele.

In addition, according to du Plessis, Rosseau and Blem (1994) South Africa has eleven 'official languages', which further increases complexity. In addition to the official languages many other European and Indian languages are spoken. To complicate matters further, many people speak more than one language; many have not been educated in their home language and many marry someone of another language group. However, English and Zulu/Xhosa tend to be *lingua franca* of South Africa, which does assist to simplify communication.

Since the time of Morris' (1992) study, these segmentation classifications have been changing rapidly as education levels increase and more Black people move into upper income jobs and into upper income suburbs. Positions of power in business and Government are assumed by Black people and the traditional township lifestyle has changed to a more suburban lifestyle. In the relatively short period of the last decade the socio-cultural environment of South Africa has changed substantially.

Other socio-cultural changes that indicate the complexity and turbulence of the South African environment are provided below.

- The role of women in South African society is changing significantly. According to Van der Walt et al. (1996) the number of women in the labour force has increased by 4.3% per annum, whereas the number of men increased by only 2.2%. The number of economically active women has increased from 19% in 1960 to 36.7% in 2000 (Cronje, du Toit and Motlatla 2000: 85). Terblanche (1998: 33) agrees that the female labour force in South Africa is growing much faster than its male counterparts. By 2005 the work force is expected to comprise 40% women. In 2000, women purchased 44% of new cars (Lamb et al., 2000). As a result gender roles are changing, with some men taking on household tasks such as shopping. For both genders, time is a scarce commodity. This has led to, and is continuing to lead to, demands for weekend shopping, preference for shopping centres where one-stop shopping can be done, day-care facilities for children and equal opportunities for women in management.
- The workforce is becoming more white-collar. More jobs are now being found in the tertiary sector (31% in personal services) and less in the primary (13% in agriculture) and secondary (15% in manufacturing) sectors. These trends are expected to continue (Ministry of Welfare and Population Development, 1997).
- Increasing crime indicates that South Africa's socio-cultural environment has moved towards the chaotic end of the stability-chaos continuum. Crime Statistics quoted by Peron (1999: 99) include:
    - Over a 23 year period the number of murders increased by 284%, rape by 352%, robbery by 323%, car theft by 385% and burglary by 372%,
    - According to the South African Institute of Race Relations, South Africa had the third highest rate of violent crime in the world, after Columbia and Swaziland,
    - South Africa's murder rate is eight times that of the United States,
    - The South African rape rate is the highest in the world,
    - Reported cases of robbery and violent theft are the highest in the world.

  This is supported by SA 2000: South Africa at a Glance (1999), which claims that crime is the number one concern of all South Africans and will continue to be so for some years to come.
- Ecological issues also becoming more important to South African consumers. Terblanche (1998) reports that consumers are becoming increasingly aware of conservation and green issues and that they are starting to take the ethics and social responsibility of manufacturers and retailers into account when making purchasing decisions.

In addition to these socio-cultural changes, there are also many important demographic changes taking place. The South African population increased from 22.8 million in 1970, to 29.2 million in 1980 and to 37.2 million in 1990 (Langschmidt, 1996). According to Census in Brief (1996), the population stood at 40.5 million in 1996. The most important demographic issues in South Africa are:

- The current population is youthful, with 11.5% of the population aged four years and under (Ministry of Welfare and Population Development, 1997). More than half the population is under the age of 24 (SA 2000: South Africa at a Glance, 1999). Despite this, the 1998 Human Development Report (in Naidoo, 1999) shows that the South African population is in fact getting older in proportion terms. This is happening for three reasons. First, there is a long-term slowdown in the birth rate (from 37.2 per 1000 in 1970/75 to 31.2 per 1000 in the 1985/90 period). There are fewer young people to pull the population's average age down. Second, life expectancy is increasing (62.8 years in 1991 compared to 58.8 years in 1980), so there are more old people to pull the average age up. Third, the AIDS epidemic is resulting in a declining population, especially in the age group 15 to 40 years. For the first time, the number of deaths in KwaZulu-Natal exceeded births, resulting in a negative population growth rate. Five Hospitals expect to admit 2,8 million fatally ill HIV patients by 2005 (Lamb et al., 2000). In ten years time, life expectancy is expected to drop to 48 years. The decrease in birth rate has been caused by smaller family sizes resulting from South Africans' desire to improve their personal living standards, the increasing desire of women to work outside the home, closing of the wage gap between White and Black South Africans and improved birth control. It is forecast that the number of people aged 60 and over will increase from 6.2% in 1995 to 7.4% in 2010 and to 9.1% in 2020. The shift of the bulk of the population up into older age categories will strongly affect marketers' targeting strategies (Census in Brief, 1996).
- The traditional large South African family is a thing of the past. In the 1980's the desired number of children was 3.3, but this has dropped below 2 for younger and urban people (Ministry of Welfare and Population Development, 1997). As these younger people move towards child rearing ages and urbanisation increases, the number of children per family decreases. This is also affected by the increasing use of contraception, the fact that people are marrying later due to increasing educational opportunities and women's desire to have a career outside the home. Finally, the number of non-family households is increasing. In 1996, a third of the households in South Africa consisted of people living alone or with only one other person (Census in Brief, 1996).
- The South African population is becoming better educated. From 1955 to 2000 the number of black matriculants increased by 40 000% and the proportion of Black university students increased from 7% in 1967 to 40% in 2000 (Cronje, du Toit and

Motlatla, 2000). Adult literacy increased from 74% in 1980 to 82% in 1991 and the population's average number of years of schooling has increased from 5.43 in 1980 to 6.86 in 1991 (Langschmidt, 1996). This important trend is further highlighted in Table 3.5 below:

Table 3.5: Increasing education of the SA population

	% of 16+ with no education		% of 16+ with matric	
	1985	**1995**	**1985**	**1995**
Black	22	16	7	13
Coloured	16	7	10	20
Indian	7	4	26	37
White	0	0	66	68

Source: Langschmidt, 1996: G14.

Despite the increase in absolute numbers passing the matriculation examination, as implied above, the proportion passing the examination has declined consistently from 58% in 1994, to 53% in 1995, to 55% in 1996, to 47% in 1997 (Peron, 1999). Further problems experienced in the education sector include reduction in teacher numbers, poor management of textbooks and facilities and the uncertain implementation of the outcomes based Curriculum 2005 policy (SA 2000: South Africa at a Glance, 1999). In addition, South Africa is experiencing a 'brain drain' as is indicated by a Wits School of Medicine survey that showed that over the past 35 years, 45% of doctors who graduated from the school had emigrated (Peron, 1995). These problems indicate a high level of turbulence in the educational industry.

The status of the socio-cultural and demographic environment is summarised by Terblanche (1998) who reports that South Africa's population experiences significantly different growth rates in terms of ethnic and age groupings. As a result the population is predominantly and increasingly Black and youthful. There is also a high level of urbanisation: the Bureau of Market Research estimated urbanisation of 82.4%, which has resulted in about 8 million people living in informal housing; backyard shacks, outbuildings and squatter units. Although overall real personal disposable income declined between 1990 and 1994 by 5.8%, it grew for all population groups except Whites. Clearly, therefore, the South African demographic and socio-cultural environment is undergoing some major shifts that will significantly influence marketing activities in the years to come.

More than a decade ago Ball and Asbury (1989) identified significant changes happening in the social environment. From the above discussion it can be seen that change is accelerating, with issues that ten to twenty years ago were of fringe importance, now moving to centre stage for businesses.

3.5.7 Technology

An indication of the importance of technology in South Africa is given by the fact that R2 600 million (0.75% of GDP) was spent on research and development in 1994. This included basic, applied and experimental research, with more than half being conducted by businesses (South African Yearbook, 1997).

South Africa has a history of technological development in the field of power generation development: coal fired power stations (Eskom), nuclear power (Koeberg), petrol from coal (Sasol) and gas (Mossgas). However, since the political transformations, much of these developmental activities have been reduced (SA 2000: South Africa at a Glance, 1999). The emphasis in technological development in post-apartheid South Africa has been diverted to a number of major social and economic themes, namely, competitiveness, quality of life, environmental sustainability and information technology for improving society and the economy (South African Yearbook 2001/02, 2002). Examples of such improvements include Eskom electrifying 1.44 million houses between 1994 and 2000 and Telkom introducing high-tech touch screens to speed up the process of paying telephone bills (Lamb et al., 2000)

Van der Walt et al. (1996) maintain that there has been a significant increase in spending on research and development, which is supported by the fact that in the five years to 2001 Government expenditure on science and technology increased by 27.6% and research grants allocated to the higher education sector have trebled (South African Yearbook 2001/02, 2002). This, together with the reduction by 60% of the time period between invention and the commercial application of new inventions (Cronje, du Toit and Motlatla, 2000) is an indication of the technological shifts in South Africa. As an example of these shifts the authors mention how laser technology has speeded up production in the diamond, jewellery, motorcar components and medical components industries. Further examples of South Africa's technological development is the fact that Durban Metro Council purchased the first electric powered Ford Bantam vehicle, designed and built by Eskom (Metrobeat - The Pulse of Durban, 1999) and the fact that South Africa has become a leader in "scalpel safaris", with overseas patients coming to South Africa for plastic and reconstructive surgery because of the world class and low cost, medical skills and facilities (Hamann, 2002: 131).

South Africa is also progressing in electronic communications – for example, the Wooltru group (Makro, Shield, Dion, CNA and 75 suppliers together sent one million transactions a week via the Internet in 2000 (Lamb et al., 2000).

As products and technology become more complex, the public needs to know that they are safe. Government departments such as the Department of Agriculture and the Department of Health investigate and ban potentially unsafe products. There are complex regulations for testing new drugs before they can be released onto the market. The South African Bureau of Standards (SABS) sets safety standards for consumer products and companies that fail to meet them may not use the SABS mark. Such regulations result in much higher research costs and in longer times between new product ideas and their introductions onto the market. These standards and regulations ensure that the quality of South African technological development remains at a high level, competitive with other industrialised nations.

3.5.8 Competition

Globalisation, according to Joubert (1998: 84) "is the most powerful business and industrial policy wave of the late 1980's and 1990's and it has established a new global economic order for the new millennium." This globalisation has exposed South African companies to unprotected business competition in which only the smarter and more competent will survive. Developing countries such as South Africa provide global corporations with huge opportunities, so the South African business environment is facing and will continue to face, increasing competition from these global corporations. As a result there are more aggressive competitors chasing fewer customers. According to Manning (1998: 24), "this is the age of hostile competition." Increasing competition has been encouraged by the promulgation of the Competition Act No 89 of 1998 and the Competition Second Amendment Act No 39 of 2000, which outlaw restrictive business practices, including mergers and acquisitions leading to monopolistic situations (South African Yearbook 2001/02, 2002). These new acts, together with various activities to encourage foreign investment, has increased foreign participation in the South African market, thereby increasing its complexity and turbulence.

In addition, competition from new sources has increased. Terblanche (1998) records that convenience stores at petrol stations grew by 25% per year during the mid 1990's, 'spaza' or home shops have proliferated to the extent where an area like Daveyton is estimated to have 5000 spaza shops. Spaza shops now account for 25% of retail sales in South Africa (Lamb et al., 2000). The franchise industry grew by 36% between 1995 and 1996 and this before

the entry of major international franchisors such as McDonald's into the South African market. Clearly the nature of competition is changing significantly, especially at the retail level.

Although the level of competition has increased, South Africa's competitiveness in the global market has been and continues to be, poor (Cronje, du Toit and Motlatla, 2000). The following table shows South Africa's position on five of the factors used in the world competitiveness survey:

Table 3.6: S. A. global competitiveness – position out of 46 economies per year

	1994	1995	1996	1997	1998
Domestic economy	42	42	44	42	40
Internationalisation	35	38	39	46	45
Government	38	35	37	34	31
Finance	26	27	31	36	31
Infrastructure	37	30	32	33	35
Management	35	38	40	37	38
Science and technology	28	31	34	40	39
People	46	46	46	46	46

Source: Cronje, du Toit and Motlatla, 2000: 486

From the above discussion it can be seen that the South African competitive environment has increased in complexity because of increased global competition and because of competition from new sources. Furthermore, it has increased in turbulence because of the speeding up of competitive activities internationally and the rapidity with which global competitors has entered the South African market. The South African economy and its participating firms, do not seem to have the level of competitive strength to cope with this increased complexity and turbulence. Therefore local firms may be at risk of losing market share to the new competitors.

3.6 CONCLUSION

This chapter has provided a comprehensive discussion of the external environment of South African businesses.

First, it showed that disequilibrium is a natural and acceptable state for the business environment, with dynamism and uncertainty being states to use and not avoid. The

dynamics of the environment were defined in terms of two bi-polar continuums: complexity and turbulence.

Second, how the environment has changed and is continuing to change and how these changes are affecting businesses were presented. The environment was shown to behave like a complex adaptive system. Each component of the external environment was defined and discussed in terms of its interrelationship with the other environmental components and with the businesses operating within the environment.

Third, the relationship between the external environment and the business, the business' marketing activities and the business' customers was explained.

Finally, the state of the South African external environment, in terms of each component, was discussed, showing that this environment has been increasing in both complexity and turbulence, making it a suitable location for the study of the effect of environmental complexity and turbulence on a company's choice of marketing activities and tactics.

The relevance of chaos and complexity theory to business and marketing was shown in Chapter 2, while the current chapter has justified the external business environment as a complex adaptive system and justified the South African market as a complex and turbulent environment suitable for research. The application of marketing, as informed by chaos and complexity theory, to a complex and turbulent environment needs to be investigated and will be covered in the next chapter.

CHAPTER 4 - COPING WITH ENVIRONMENTAL CHANGE

4.1 INTRODUCTION

The South African business environment has been shown in Chapter 3 to be increasing in complexity and turbulence. It is likely, therefore, that marketers are facing increasing difficulty in coping with such environmental complexity and turbulence. The question arises, what marketing tactics should marketers use to cope successfully with this increasing complexity and turbulence? Chapter 2 has shown how the lessons from chaos and complexity theories have been adopted in fields such as biology, medicine, economics and business. In the field of business, managers, academics and consultants are starting to apply these theories to management, finance, production, human resources, organisation design, strategy and even marketing. Since the complexity and turbulence being experienced can be seen to be the result of a complex, dynamic system moving towards the edge of chaos, it makes sense to apply the principles of chaos and complexity to identify the marketing tactics to adopt in markets that are close to the edge of chaos.

The current chapter has a number of objectives. First, it sets out to define what is meant by 'success' in a business-marketing context, since the overall objective of the study includes an attempt to distinguish between marketing tactics that influence the level of success in complex and turbulent markets. Second, it identifies the more traditional, or linear/mechanistic, approaches to handling turbulence and change in business environments and examines why these approaches are inadequate in more complex and turbulent environments. Third, it investigates the business, management and marketing approaches that emerge when the business, the market and the environment are viewed as complex adaptive systems, and determines the tactics suggested when the principles of chaos and complexity theories are employed.

4.2 BUSINESS SUCCESS

In order to identify how well companies cope with environmental change, it is necessary not only to assess their coping activities, but also to differentiate between those that are less successful and those that are more successful. Unsuccessful companies tend to not stay in business. This section will review some ideas on what constitutes business success.

Business success can be attributed to many different factors or a combination of these factors. As detailed in Chapter 1, this study is predicated on the proposition that success, in marketing terms, is largely influenced by the marketing tactics that a company adopts, and that the marketing tactics adopted are influenced by the nature of the external environment in which the company operates. The literature indicates that the marketing tactics adopted may be influenced by how a company perceives its external environment.

Ball and Asbury (1989: 7), in their research into what factors differentiate successful companies, found that one of the factors was "welcoming change and encouraging innovation," which is consistent with the chaos approach of continually looking for more attractive peaks on the environmental landscape, or keeping the organisation close to the edge of chaos in order to be creative in adapting to, or leading, change. They stress that successful companies are more adept at spotting clues to innovative opportunities in the environment that might be overlooked by less successful companies. This shows that awareness of the environment and the willingness to change as the environment changes is critical to success. However, this change must be innovative and different, as is indicated by Hamel (2000: 69) who says that success needs "...a business model so unlike what has come before that traditional competitors are left scrambling." Such a model is based upon avoidance, not attack.

The importance of the environment is supported by Wilkinson and Young (1998) who use the argument of a 'good restaurant in a bad neighbourhood' to imply that the action of and interactions in, the environment can lead to success or failure of a business, despite the actual actions of the individual business.

In other words, the business can increase its probability of success by ensuring that its actions are consistent and co-operative with its environment. This is further supported by Doyle (1998) who maintains that companies succeed, especially over the longer term, by adapting their strategies to suit the changing environment. Furthermore, he implies that success is also dependent on how the company implements its marketing activities. He maintains that success is related to speed in meeting customers' needs and the decisiveness in allocating marketing resources to meet these needs. To maintain success over the long term, a structure based on a network of relationships is required to enable the company to continuously change its strategies. This is supported by Hooley (in Golden, Johnson and Smith, 1995: 3) who states, "the choices and selections... with regard to marketing variables are key factors to the success of the organization."

The assumption that the environment has an effect on the marketing factors and that together they will influence success, is supported in the literature. How companies traditionally handle the environment, especially change in the environment, will be discussed in the next section.

4.3 TRADITIONAL METHODS OF COPING WITH CHANGE

4.3.1 Introduction

The traditional organisation's pyramidal structure was developed to suit a high growth environment because it is scalable: new workers could simply be added to the bottom of the hierarchy. At this lower level, work involved small, repeatable tasks which could be mechanised or automated and were ideally suited to a control and planning approach. However, the environment has changed. Not even business cycles are constant or predictable. Therefore, this bureaucratic approach is out of touch with the modern environment and results in "inflexibility, unresponsiveness, the absence of focus, an obsession with activity rather than result, bureaucratic paralysis, lack of innovation, high overhead" (Hammer and Champy, 1993: 16).

Traditionally, environmental change is seen as "massive, gut-wrenching corporate makeovers ... It's the big move, the big bet, the big success ... or the stunning failure" (Brown and Eisenhardt, 1998: 20). This is known scientifically as 'punctuated equilibrium'. It should be noted, however, that punctuated equilibrium is only one type of environmental change. It can be seen that, from the traditional viewpoint, environmental change is either something dramatic that requires huge and dramatic responses, or something that is predictable and can therefore be controlled. In reality, change in business environments is often very different to this and consequently traditional approaches may not be suitable.

A further problem of the traditional approach is illustrated by Briggs and Peat (1999: 90), who explain how science, in order to understand nature, "...objectifies and divides reality into manageable chunks for study." This simplification has made science possible, but at the same time has meant that only those things that are " quantifiable, numerical and measurable" are dealt with. This has led to fragmentation and oversimplification and the ignoring of "...nature's qualities and unquantifiable values." This simplification and abstraction makes prediction appear to be feasible, even though the true complexity of the

system makes it near impossible. To understand complex organisms or organisations, the interconnections with and dynamics of, the system and its environment must be understood and this cannot be achieved by traditional science. Since much of traditional management science follows the approach outlined above, it can be concluded that the traditional approaches used in management science are also inadequate to truly understand the dynamics of organisational systems.

The following sections will assess how management, in various functions of the business, handles environmental change of the nature spelt out above using the traditional scientific approach. This will show the weakness of this approach and explain why management systems, informed by chaos and complexity theories, are important.

4.3.2 Planning

The traditional method of handling change and turbulence in the environment appears to be to increase the level of formality in predicting and planning for the change. Chae and Hill (1997) reviewed numerous studies of marketing planning and came to the following conclusions about planning in complex and turbulent environments.

- An increasingly competitive global marketplace leads to formal marketing planning.
- Formal planning systems are found in complex environments.
- Environmental complexity was associated with more extensive planning, longer planning horizons and more frequent plan reviews.
- Most authors associated environmental uncertainty with the use of formal planning systems.

These findings indicate that companies tried to manage their environments by reducing the uncertainty and complexity in the hope of creating stability and equilibrium. It should be noted that all these authors were writing between ten and thirty years ago, when environments, were less turbulent relative to today and prior to the understandings developed from complexity and chaos theory. It is therefore not surprising that Chae and Hill's (1997) research rejected the hypotheses that firms with complex and uncertain environments would have more formal global strategic marketing planning systems. Their major finding was that planning was an internal process, driven by CEO involvement and organisational climate, rather than external factors.

Subsequent research using a chaos and complexity approach seems to show that formal planning in a complex and turbulent environment can be sub-optimal. Brown and Eisenhardt (1998: 28) maintain that “too much structure leads to mundane products, predictable strategy and missed market opportunities". Product development is regimented and slow, producing few truly innovative products. Due to the uncertainty of the future planning is ineffective, because managers attempt to "plan more than they know" and then do not update plans as the environment changes. Companies in slow moving industries, those that have been successful with strategic planning in the past and those for whom 'planning' is almost a religion, are at most risk. These firms often have "tightly configured plans" locked into elaborate schedules, which they then concentrate on, neglecting the future as it unfolds (Brown and Eisenhardt, 1998:129). Kelly and Allison (1999: 5) support this view, maintaining that "the best business plan is only a best guess," because the 'Information Age' has made what was 'known' obsolete and therefore it is impossible to predict, with any degree of accuracy, how technologies, markets or customers will react or perform.

Part of the reason for the failure of planning is because conventional business planning tools, including spreadsheets and regression analysis, are not suited to the dynamics of the complex and turbulent environments. According to Farrell (1998: 85), these are merely "linear approximations of non-linear events” and fail as analytical tools when non-linear change occurs. An example of the incorrect application of many planning tools is provided by Costa (1995), who believes that environmental scanning is the main way of gathering external data for strategic planning. Costas’ study showed that most writers on environmental scanning believe that successful scanning requires a formalised step-by-step (linear) process which should be 'inside-out', that is, focussing on pre-specified areas of interest to the company and participants should be carefully selected. However, the weakness of environmental scanning, from a complexity viewpoint, is this formalisation of the process, as it assumes that the planning can predict what information is required, an impossibility in a turbulent environment operating at the edge of chaos. Environmental scanning could be of significant benefit in a turbulent, chaotic market if it were less structured and involved everyone in the organisation scanning the environment and feeding back data. Rather than trying to summarise the information collected into main findings, the manager should look for abnormalities or anomalies that might be the precursors to the system, or environment, changing. In other words, it can be used to pick up the 'initial conditions' on which the system may be sensitively dependent.

It should be noted, however, that a chaos and complexity approach does not reject planning totally, but only the formal approach that is based on linear prediction. Not planning for the

future, or simply reacting to it, in intensely competitive markets is almost as dangerous as excessively formal planning.

Brown and Eisenhardt (1998: 141) maintain that not planning results in a lack of thought about the future and no experimentation. Emphasis is placed on internal efficiencies, resulting in the missing of opportunities. Usually these companies end up reacting to and falling behind, competitors. Thus, it can be concluded that the conventional wisdom relating to planning in a turbulent environment is questionable and that approaches more suited to a non-linear environment are required.

4.3.3 Strategy

4.3.3.1 Historical approaches to strategy

Going back as far as 1973, Mintzburg (in White, 1998) maintained that in order to cope with complex and difficult situations, strategy makers sought to avoid uncertainty by concentrating on short-term problems rather than long term issues. Subsequently though, longer term and more formal planning appeared to be the preferred approach, as is shown by Lindsay and Rue (in Shrader, Mulford and Blackburn, 1989: 48) who found that in 1980 "environmental complexity and instability caused corporations to adopt more formality in their planning procedures." Their study supported this, showing that, ten to twenty years ago, planning was an accepted tool for handling complexity and turbulence. However, their hypothesis that “uncertainty is positively related to strategic planning” could only be partially supported in retail and service industries, and was rejected in manufacturing industries and for small businesses (Shrader, Mulford and Blackburn,1989: 57). Of more interest though, was the fact that their hypothesis that 'uncertainty is positively related to operational planning' was supported for manufacturing and service industries and partially supported for retail industries. However, there was doubt as to planning’s efficacy, as their hypothesis that strategic planning is not related to performance was supported for manufacturing industries. Operational planning, however, was found to be related to performance.

Although more formal strategic planning was promoted as the means of coping with turbulent environments, there was uncertainty as to its effectiveness. To understand this better, two strategic approaches will be discussed in the next section.

4.3.3.2 Popular approaches to strategy

A common approach to environmental change events is that of Boyd et al. (1998). They maintain that the impact of the event should be assessed using an opportunity/threat matrix to detect the probability of occurrence and the level of impact on the firm. An example is given in the table below:

Table 4.1: Example of opportunity/threat matrix

		Probability of occurrence by year 2010	
		High	Low
Level of impact on the firm	High		
	Low		

Source: Boyd, Walker and Larreche, 1998: 74.

Based on this matrix a firm should decide on the type of strategy to follow in responding to the event, in other words, a reactive or proactive response. They mention six strategies that can be used in either reactive or proactive modes.

- Opposition strategy - trying to influence, change, or stop the environmental event. This is unpopular as generally environmental factors are seen as beyond the control of the firm.
- Adaptation strategy - this involves changing corporate factors, such as the product or packaging, to cope with the change. This is perceived as dangerous because it can result in the environment dictating the future of the company.
- Offensive strategy - taking advantage of the destabilisation caused by the event to change corporate activities, thereby creating a new competitive advantage.
- Redeployment strategy - moving out of an industry that has become unattractive due to environmental changes. This may not be feasible when almost all markets are experiencing extreme environmental change.
- Contingency strategies - this involves predicting possible future environmental changes and developing alternative actions for implementation if, and when, the event occurs. This requires large resources and the possibility exists that the event that actually happens was not predicted.
- Passive strategy - this involves doing nothing but gathering information and planning an appropriate response for possible implementation at a later date if a response is still required. The assumption is that a response may not be required (Boyd, Walker and Larreche, 1998: 74).

Looking at these strategies from a complexity perspective it can be seen that four of them are unsuitable for a truly complex and turbulent environment. The unsuitable strategies are listed below.

- Opposition strategy. Instead of working with the changes, this strategy tries to delay or oppose the environment, an approach not likely to be successful in a rapidly changing market.
- Redeployment strategy. Since most markets are experiencing some degree of turbulence and are becoming more complex, this might be the equivalent of 'jumping from the frying pan into the fire.' Since prediction of environmental discontinuity is very difficult, inappropriate redeployments are likely.
- Contingency strategy. This relies on predicting possible changes in the turbulent environment and designing responses to all possible events, an approach that is beyond the capability of most companies in terms of both ability and availability of resources.
- Passive strategy. In a fast changing market this approach is likely to result in the company being out-manoeuvred and left behind by more fleet-footed competitors.

The remaining two strategies, although not ideal, could be adopted in a turbulent environment:

- Adaptation strategy. This approach sees the environment of business in the same way that ecology is the environment of animals - it must be adapted to by changing the company's strategies and tactics. The fact that the environment and not management, sets the pace of change is seen as normal and acceptable. However, it should not be the only response strategy, but should be used in conjunction with the next strategy.
- Offensive strategy. This approach is consistent with the view of a business as operating at the edge of chaos. Destabilising, discontinuous environmental changes are seen as opportunities to keep the company at the 'cutting edge' of the market, thereby increasing innovation and building a competitive advantage over more conservative firms.

It should be noted that the traditional literature does not mention a strategy that involves actually attempting to generate environmental changes in order to throw the market into a confusion from which the company can benefit, because of prior knowledge of the change.

The Miles and Snow typology proposes market strategies based on the "...rate of product-market development (new product development, penetration of new markets)" (Boyd, Walker and Larreche, 1998: 215). These strategies are explained below.

Prospector, which is a company that:

- operates within a broad product-market domain that undergoes periodic redefinition,
- values being a 'first mover' in new product-market areas, even if not all these efforts prove to be profitable,
- responds rapidly to early signals concerning areas of opportunity and these responses often lead to new rounds of competitive actions,
- competes primarily by stimulating and meeting new market opportunities, but may not maintain strength over time in all markets it enters.

Defender, which is a company that:

- attempts to locate and maintain a secure position in relatively stable product or service areas,
- offers relatively limited range of products or services compared with competitors,
- tries to protect its domain by offering lower prices, higher quality, or better service than competitors,
- usually is not at the forefront of technological/new-product development in its industry; and tends to ignore industry changes not directly related to its area of operation.

Analyser, which is an intermediate type of company that:

- makes fewer and slower product-market changes than Prospectors, but is less committed to stability and efficiency than Defenders,
- attempts to maintain a stable, limited line of products and services, but carefully follows a selected set of promising new developments in its industry,
- seldom a first mover, but often a second or third entrant in product-markets related to its existing market base, often with a lower cost or higher quality product or service offering.

Reactor, which is a company that:

- lacks any well-defined competitive strategy,
- does not have as consistent a product-market orientation as its competitors,
- is not as willing to assume the risks of new product or market development as its competitors,
- is not as aggressive in marketing established products as some competitors.

These different strategies appear to coincide with the stability-chaos continuum as is shown in Table 4.2 below:

Table 4.2: Comparison of chaos continuum and Miles and Snow strategies

Continuum	**Stable----------Edge of chaos----------Chaotic**
Strategy	Reactor--------Defender---------Analyser----------Prospector----------???
Nature of market	Mature/stable/well defined domain; mature technology and customer segments. ----------technology and customer segments not well established Broad/dynamic domains;

Adapted from Boyd, Walker and Larreche, 1998: 218.

The Reactor and Analyzer strategies appear to be less successful for the following reasons:

- although many companies follow reactor strategies, this approach leaves them completely at the mercy of the environment and of competitors who respond more positively to environmental changes. They tend to be followers,
- since Analyzers have to both defend existing product-markets and develop new products and markets, this strategy is resource heavy and requires broad competencies. Since few businesses have such multiple strengths relative to competitors, analysers tend to be less innovative than prospectors and do not defend their core businesses as well as defenders,

The Defender and Prospector strategies appear to be the most effective: Defender in stable markets and Prospector in more turbulent markets. However, even the Prospector strategy does not appear to be extreme enough for operating in today's highly complex and turbulent markets. A further category appears necessary to explain companies truly operating at the edge of chaos. Some authors have invented names for what appears to be this fifth category: Conner's (1998) ‘nimble organization’, Fradette and Michaud's (1998) ‘kinetic organization’ and Hock's (1996) ‘chaordic organization’. This fifth category will be discussed in more detail later in this chapter. Some of the problems and limitations of traditional strategy making will be discussed in the next section.

4.3.3.3 Problems associated with traditional approaches to strategy

a) Strategic rigidity

The traditional strategic and long term planning process leads to rigidity and a lack of flexibility, with the company being locked into a specific, planned future, unable to take advantage of changes. Such companies cannot react or adapt to changes and get overtaken by more flexible competitors (Brown and Eisenhardt, 1998; Nilson, 1995).

b) Strategy based on stability

Much of the strategic management literature is based on a stable environment in which a company can achieve continuous, uninterrupted success. The strategic frameworks of Porter, Hamel and Prahalad and D'Aveni are all based on an assumption of stability (Volberda, 1997; Chakravarthy, 1997). In turbulent environments it can be very risky to rely on the conventional approaches to strategy that attempt to maintain or achieve equilibrium, as success in turbulent markets is often a function of circumstances and luck.

c) Information obsolescence

Strategic planning has failed because it is slow, time consuming, requires large volumes of information and is often based on information that is obsolete by the time of implementation. This is due to the Taylorist approach of separating thinking from doing, resulting in planning becoming a staff function with line manager often divorced from planning (Nilson, 1995; Loewen, 1997; Frederickson, in White, 1998).

d) Inability to control

Strategic planning is based on the assumption that a firm can, to a certain extent, control its environment (Cravens, 1991). However, in a rapidly and frequently changing environment it is almost impossible to implement the continuous, major changes required of a strategic control system without pushing the firm over the edge of chaos into a totally uncontrollable situation (Goold and Quinn, 1990). White (1998) supports this by maintaining that there is doubt about management's ability to control their staff in the strategic planning process. This implies that even when a rational, planned approach is used, strategies will tend to emerge from lower level interactions.

e) Limitations of planning techniques

Many authors believe that the traditional techniques and approaches used in strategic planning are of little use in turbulent environments. These techniques and their limitations are listed below.

- Segmentation analysis, industry structure analysis and value chain analysis do not help in new markets in rapidly changing industries (Hamel and Prahalad, 1994).
- Porter's two main generic strategies, cost leadership or differentiation, are no longer applicable, as today companies are striving to achieve both of these goals (Manning, 1989).
- The traditional 'economy of scale' approach to strategy is outdated. What is important in the current environment is customisation, speed and flexibility (Manning 1989).

- Portfolio models are of limited value because there is "little continuity with historic performance and, thus, fewer bases for prediction" (Wilson, 1999: 22). Wilson maintains that volatile environments require more flexible and innovative approaches that provide fresh perceptions of the environment.
- Most models of the environment are too simplistic, taking a 'snapshot picture' of events which precludes managers from seeing and truly understanding the complexity of the environment (Burgess 1998).
- Lane and Maxfield (1996) believe that scenario planning on how a complex situation will develop is dangerous, because of the unpredictability and instability of the future.
- The traditional approach of developing a strategy for a specific market is inadequate. Koch (2000) emphasises that many strategies are needed to cope with emerging market changes and strategies must be flexible to enable companies to change direction when necessary, or to drop a strategy that no longer shows promise.

4.3.3.4 Conclusion

From the above it can be concluded that the traditional approach to strategic planning is not entirely adequate for companies operating in complex and turbulent environments. Such strategic planning methods could result in the company adopting and becoming trapped with inappropriate, or obsolete, strategies.

4.3.4 Management

The traditional approach of management is that of command and control, with management dictating what the lower levels should do and protecting against environmental uncertainty through strict bureaucratic controls. This is shown by Drucker's statement that "the only things that evolve by themselves in an organization are disorder, friction and malperformance" (Clutterbuck and Crainer, 1990: 75). According to Fradette and Michaud (1998) and Ketelhohn (1994) the traditional manager predicts market trends, develops applicable strategies and controls activities to ensure the strategies are implemented correctly by the non-thinking operatives. Baskin (1998a: 2) sees this as management treating people as "replaceable parts in a corporate machine" and that employees do not need to know anything about the business other than the basic procedures for their own job. Although such bureaucratic, mechanistic organisational structures may be suitable for stable

environments (Morris and Lewis, 1995), they are not effective in environments that are volatile and turbulent, with the resultant changes in markets, customer demand, technology, competition, complexity of products and a flood of information. These authors maintain that under such circumstances, no person heading an organisation can possibly direct the entire corporation.

Traditionally, managers try to handle this volatile uncertainty by instituting bureaucratic controls and by maintaining the status quo (Pumpin, 1991). They either resist change or are unable to implement intended changes, preferring to do things in the same manner. Managers of these organisations maintain equilibrium by trying to predict and direct events, relying on prediction as the main way of preparing for the future. Since turbulent environments are at the edge of chaos, prediction becomes "a matter of guesswork and long odds" which is a dangerous way of trying to handle unpredictability (Conner, 1998: 41).

Cyert and March (in Clutterbuck and Crainer, 1990: 60) maintain that some organisations avoid dealing with uncertainty by trying to "buy stability with long term contracts, or they simply focus on the predictable short term and defer decisions where they are not confident of the prevailing environment." In more conceptual terms, Farrell, (1998) sees this as managers developing 'schemata', or rules, that help them make sense of the world. "As the environment, or system, becomes more complex, as happens when a firm grows, the schema has to be renewed and adapted" (Farrell, 1998: 61). Without such dynamic adaptation, what the firm offers will fall behind what the market requires and ultimately the company will fail in a turbulent environment. This dynamic adaptation requires a continuous adjusting of its strategic position according to the changing environment. To do this it must be able to adapt quickly, have the ability to learn and to have an open mind (Pumpin, 1991), none of which is possible if top management holds management and strategic thinking tightly. It can, however, be achieved by delegated authority, simple, informal decision making procedures, flat organisational structures and a minimum of bureaucratic regulations (Pumpin, 1991).

The traditional bureaucratic, command-and-control type of management may be suitable in stable environments, but it is inadequate in complex and turbulent environments and may even threaten the long-term future of the firm.

4.3.5 Marketing

Marketing is arguably the business function that has the most direct contact with the external environment. Thus, success or failure of marketing in coping with a changing environment can have a considerable effect on the success of the firm. It is, therefore, necessary to assess how marketing copes with complex and turbulent environments from the more traditional or mechanistic management approach. In this section the setting of marketing strategies, the role of market research and information and the marketing mix will be discussed.

4.3.5.1 Marketing strategies

Most of the traditional marketing strategy textbook authors (such as Kotler, 1997; Jobber, 1995; Boyd, Walker and Larreche, 1998), discuss the development of marketing strategies in terms of two frameworks, the product life cycle and marketing warfare.

a) Product Life Cycle

The product life cycle, which specifies the marketing strategies and tactics to be followed depending on the stage of the product life cycle. This implies two things:

- there is a predetermined ideal marketing approach for each stage in the life cycle, regardless of the state of the environment,
- the stage of the life cycle determines the state of market turbulence. The introductory stage is relatively stable as there is little competition. The growth stage becomes more turbulent with increasing competition, product changes and changing consumer needs. The maturity stage varies from turbulent, due to the fierce battle for market share between many competitors, to stable, because consumers' needs are well established, there is relatively little change in the products and the distribution channels are established and also experience relatively little change. The shakeout stage (where it is mentioned) is inevitably seen as turbulent, while the decline stage generally is seen as turbulent but can be stable if competition has lessened.

This shows that the product life cycle can help to understand the dynamics of the market and competitive environments, but can be misleading if the other environmental factors are not considered concurrently. A market that appears stable when considered in terms of the product life cycle may in fact be very turbulent when considered in terms of technology, socio-cultural, or demographic factors.

b) Marketing Warfare Strategies

These approaches use strategies such as Fortress or Position Defence, Flanker, Confrontation or Encirclement. These strategies all adopt a win or lose position, with all competitors seen as enemies to be defeated. This is not necessarily in the consumers' or the company's best interests, as healthy competition increases innovation and improves levels of quality and service. This strategic approach also focuses only on the competitive environment, not taking adequate account of developments in the other environmental variables. Thus, these strategic approaches might provide short-term victories, but are unlikely to enable companies to develop and maintain defendable, competitive positions over the long term. Furthermore, this is inconsistent with the current approaches of collaboration and networking in an effort to provide the customer with the best possible product/service offering. Using Baskin's (1998a) ecology metaphor, all members of a business ecology should co-operate, co-exist and co-evolve in order to best cope with their changing environment. Although members in an ecology compete, they also co-exist. In other words, the predators do not try to annihilate each other in order to have a monopoly over the food supply. They know inherently that this would lead to an imbalance in the ecology and that all members would suffer as a result, which is what happens when one company becomes too strong, or becomes a monopoly in a marketplace.

From the foregoing discussion, it can be seen that the traditional approaches to marketing strategies and their resultant tactics, are inadequate and insufficient to guide marketers in industries and markets where the environmental variables are in varying states of change and turbulence. This criticism of the traditional approach to marketing strategy is supported by other authors who believe that sequential strategic marketing planning does not suit a changing environment because it is too slow and unresponsive for a fast changing marketplace, nor can it keep up with customers' requirements or with aggressive competitors (Nilson, 1993; McKenna, 1991). Pine (in Heilbrunn, 1995) sees traditional marketing strategies as dying and needing replacement by mass customisation, which rapidly and flexibly adapts to market needs as they develop.

A further marketing strategy that appears to be of importance in a complex and turbulent environment is being a ‘first mover’ as opposed to being a ‘follower’. Being a first mover enables a company to achieve a strategic advantage in new attractor points on the market landscape. Being a follower can result in having to struggle to catch up to competitors, or

being left with a low profit segment of the market (Glass, 1996; Kerin, Varadarajan and Peterson, 1992). However, it is important to note that Kerin, Varadarajan and Peterson*'s* (1992) research has shown that being a first mover, by itself, does not provide significant advantages. What it does provide is the opportunity to obtain positional advantages. Strong marketing and manufacturing skills are required to take advantage of the first mover position. Even if these are present, followers can overtake first movers by avoiding a 'me-too' strategy, or by reducing the first mover's impact by avoiding the first mover's position and developing a more desirable position. In other words, being a first mover can be an advantage if the firm is able to take quick advantage of their position, before competitors undermine it. Being a first mover and trying to build a long-term competitive position might be an inconsistent and dangerous strategy.

From the above discussion, it can be concluded that success in a turbulent environment requires a strategic approach that is different to that recommended by traditional strategic marketing theory. The simplistic approaches recommended by the traditional strategies can be dangerous. It is necessary for marketers to consider the overall environmental position when designing their strategies.

4.3.5.2 Marketing information and research

Many authors question marketing research, as the main method for gathering information about customers and customer behaviour. Baskin (1998a: 107), for example, maintains "customers aren't machines that can be studied objectively, as you cannot tell when customers are telling the truth or merely trying to please the focus group leader." Nevertheless, companies operate on the assumption that their market research is 100% accurate. Loewen (1997) believes that traditional market research is unlikely to identify consumers' needs and wants.

Other authors maintain that the linear approach used by traditional quantitative research is too simplistic to understand the complexities of consumer behaviour (McGlone and Ramsey, 1998: 248; Tedesco, 1998). The traditional marketing mix models used in market research assume a linear, or a predetermined simple non-linear, relationship between the mix variables and the outcome as measured by sales or market share. These models also attempt to remove the joint impact of marketing actions and often omit or ignore some variables in order to simplify the statistical requirements. This approach became necessary because of the difficulty of the computational methods and the difficulty in conceptualising the complex and non-linear interactions of the marketing mix variables. This approach has

the weakness of lacking "completeness and intuitive sensibilities" (Tedesco, 1998: 2). These compromises result in an understating of the individual impact of the mix variables on sales (Totten and Block, 1994, in Tedesco, 1998).

It appears, from the above, that collecting information on and understanding consumers, markets and consumer behaviour requires a non-traditional marketing research methodology. For example, Loewen (1997) believes that spending time with customers, watching them and talking to them in a product use situation is much more effective.

4.3.5.3 Marketing mix

Although van Waterschoot and Van den Bulte (1992) question the '4 P' classification of the marketing mix, they admit that it is still very widely used, especially pedagogically. For this reason the basic classification of product, price, place and promotion was used as the structure for this research. However, they do criticise it specifically in terms of the promotions element and more especially the sales promotion element, which they reject as a 'catch-all' category. For this reason the marketing tactics in this study were investigated using Nilson's (1995) categories of totally new products, price change, product innovation (new product development), sales promotion, product enhancement (old product development), PR and other forms of non-advertising communication, advertising and distribution. In addition to this classification being more specific in terms of individual tactics, it is also better structured to differentiate between stabilising and destabilising tactics. However, because of the ubiquity of the '4 P' classification in the literature it has been retained for the structure of this section.

a) Product

The progress of a product or service in a market is often interpreted by means of the product life cycle, which predicts that a product in a particular market will go through four or five stages. The table below indicates some of the market conditions and the marketing tactics that typify the five stages.

Table 4.3: Stages in product life cycle

Stage characteristics	Introduction	Growth	Shakeout	Maturity	Decline
Market growth rate	Moderate	High	Levelling off	Insignificant	Negative
Technical Change in product design	High	Moderate	Limited	Limited	Limited
Segments	Few	Few to many	Few to many	Few to many	Few
Competitors	Small	Large	Decreasing	Limited	Few
Profitability	Negative	Large	Low	Large for high market shares	Low
Firm's normative responses					
Strategic marketing objectives	Stimulate primary demand	Build share	Build share	Hold share	Harvest
Product	Quality improvement	Continuous quality Improvement	Rationalize	Concentrate on features	No change
Product line	Narrow	Broad	Rationalize	Hold length of line	Reduce length of line
Price	Skimming versus penetration	Reduce	Reduce	Hold or reduce selectively	Reduce
Channels	Selective	Intensive	Intensive	Intensive	Selective
Communications	High	High	High	High to declining	Reduce

Source: Boyd, Walker and Larreche, 1998: 85.

The assumption in this model of a standard, predictable progress through a market is dubious at best and totally wrong at worst. Although it implies that complexity and turbulence occurs in all the different stages, it also implies that certain characteristics of the different stages would reflect stability. In a truly complex, turbulent environment this would not be true and consequently most of the characteristics of the traditional life cycle stages as specified in the table could be incorrect or inapplicable. As a result the suggested normative tactical responses might be inappropriate. As a result, the product life cycle for a market in a complex and turbulent market could look significantly different and would thus demand different marketing tactics.

Numerous authors seem to support this view. Shaw and Wong (1996) studied the United Kingdom machine tool market, which they found to be a mature and thus probably stable, market despite a degree of change being experienced. They found that successful companies tended to place more emphasis on new product development and adapting products to suit their customers than did the less successful companies. There appeared to be no difference in pricing, distribution or promotion strategies, although the successful companies seemed to spend more effort on promoting their products. Thus, in a stable market the traditional market approach of developing quality products with premium pricing and good promotions seems adequate.

Boyd, Walker and Larreche (1998) show that by managing according to the traditional product life cycle, a company is effectively managing itself towards intense price competition, reduced profitability and stagnation. This conclusion was reached by studying the profit impact of marketing strategies (PIMS) research that shows that product innovation is much higher in the more dynamic growth stage of the product life cycle (new products account for 10.2% of total market volume) than in later stages of the cycle (5.4% in growth maturity, 3.5 to 3.7% in stable maturity and 2.8 % in the decline stage). Research and development costs as a percentage of sales also decline as the product progresses through the product life cycle and the nature of innovation also changes: product innovation (to launch new products) in the dynamic growth stages and more process innovation (to reduce costs) in the more stable stages.

Thus, as a market moves towards maturity and stability, product differentiation declines and competition increases, as does price sensitivity. As a result market attractiveness decreases and profitability declines. This is consistent with thinking of markets as complex adaptive systems: as the system moves towards the stable end of the stability/chaotic continuum, innovation declines, competitive advantage is lost as product offerings become similar and the ability to cope with change becomes limited by static and defensive thinking. Managing according to the product life cycle in a turbulent market can lead to rapid stagnation and eventual death of the product.

This conclusion is supported by Priesmeyer (1992) who criticises the traditional product planning tools of product life cycles and product positioning matrices as being too static and producing information about current positions that is interesting but does not provide guidance in terms of the changing trajectory of the product performance. These methods can suggest actions that will have no impact or that could be incorrect and possibly dangerous for the product. Mohr (2001) maintains that managing via the product life cycle is

inappropriate in 'high tech' markets because many such products do not reach maturity because of intense competition and the extreme speed of product change. In such situations, high tech firms have continuously to bring in innovations that make their own products obsolete, which is not a clear strategy in the traditional product life cycle approach, despite the fact that customised new product development and rapid product introductions are becoming the key factors in competitiveness (Cespedes, 1995). For greater success, Cespedes maintains that marketers must intensify and increase the level of interaction with products, markets and accounts.

A further aspect of traditional product/service management is criticised by McGlone and Ramsey (1998). They maintain that the traditional way of handling change in the customer satisfaction field is to monitor performance against expectations and then use negative feedback to bring performance back to expectations. Unfortunately this creates reactive mindsets and staff who cling to standard methods of operating. In these circumstances proaction that can adapt to changing needs in changing environments is impossible and creativity and innovation is discouraged.

The above discussion has indicated that traditional product management methods are inadequate for complex and turbulent markets and may in fact be extremely dangerous for the survival of the product and in some cases for the entire company. There is a clear indication that new and different techniques, approaches and attitudes to product management are required in today's turbulent environment.

b) Pricing

Relatively little research appears to have been done in the field of pricing vis-à-vis stable or turbulent markets. Traditionally, managers have assumed that the main function of pricing is to cover costs and provide a reasonable rate of return. A further assumption was that all firms charge about the same and that regulatory bodies limited the use of price as a weapon. Managers rely on "overly simplistic rules of thumb and ... on cost-based formulas" (Pitt, Berthon and Morris, 1997: 2), which, it can be assumed, are suitable in simple and stable environments. Morris and Schurink (1993) found that managers traditionally handle price in uncertain environmental conditions conservatively by adopting risk avoidance or minimisation strategies. These strategies are reflected in the emphasis of cost based pricing or formulae approaches and by unsophisticated, inflexible and uncreative attitudes to pricing. There does not seem to be any difference in traditional pricing methods between stable and turbulent environments. It is probable, therefore, that these traditionally conservative pricing approaches in complex and turbulent environments do not contribute significantly to

marketing success. This is supported by Morris and Schurink (1993) who believe that traditional cost-based pricing formulae are unable to produce the flexible, complex and quick pricing responses required in a turbulent environment.

c) Place

Narus and Anderson (1996) maintain that the traditional approach of handling uncertainty in distribution management involves using increased safety stock, providing a broader range of products or services, or improving distribution capabilities. However, they believe companies are still not able to meet a consumer's unpredictable needs consistently with these approaches. This is supported by Johnston and Betts (1996) who, in discussing inventory replenishment, showed via a simulation that planning provides a good, and maybe even an optimum, solution in a stable environment. However, if the past is not repeating itself, relying on planning that is based on the past can be dangerous. In changing, turbulent environments, they found that reacting to changes as they happen is a superior approach.

Some authors believe that the place component is becoming less important because of how the new economy, based on knowledge workers, is disintermediating "traditional agents, wholesalers, brokers [and] retailers" (Tapscott 2000: 20). This is supported by Wilding (1998) who maintains that success can no longer be achieved by concentrating on improving the firm's distribution activities alone. Success now comes from the interrelationship of the performance of the company and its suppliers and customers. This increasing importance of the relationships within the distribution channel, or supply chain, is stressed by Holmstrom and Hameri (1999) who maintain that traditional linear optimisation of supply chains is not adequate for such dynamic systems. Furthermore, poor communication in the supply chain leads to uncertainty and sub-optimisation further up the supply chain. Such poor communication is often caused by breaking the link between end-product demand and the manufacturing process, as happens when each channel member operates in transactional, rather than relationship, mode and tries to manage the flow of information to their own advantage. Whiting (2001) infers that supply chains are so complex that it is not possible for managers or buyers to take optimal decisions, as they are knowledgeable about only a very small proportion of the variables in the chain. Therefore their decisions could have unpredictable effects up and down the supply chain. The traditional, transaction approach of a firm managing its place function independently is inadequate in a complex, rapidly changing environment.

d) Promotion

Almost forty years ago Marshall McLuhan saw advertising as a linear, mechanistic process, as is implied in his saying "the advertising industry is a crude attempt to extend the principles of automation to every aspect of society" (McLuhan 1964: 242). This is consistent with the linear view of advertising that has predominated in the latter half of the twentieth century. Bovee et al. (1995) confirm that advertising has traditionally followed a linear path with more emphasis on stabilisation, as is indicated by some typical advertising functions: differentiate products from competitors, communicate product information, urge product use, expand product distribution, increase brand preference and loyalty and reduce overall sales costs. This linear path is also implied in the hierarchy of effects model typically used in advertising, namely:

> Awareness ---> Comprehension ---> Acceptance ---> Preference ---> Ownership ---> Satisfaction
> (Bovee et al., 1995: 180).

Nilson (1995) sees advertising and selling as traditional promotional tools, which he also maintains are the most stabilising of promotional elements. The implication is that the traditional role of promotions is a stabilising one. He further asserts that marketers do not usually consider using advertising to create turbulence, as it is contrary to the more traditional thinking of building long term brand loyalty and improving the image of the organisation. In other words, it is traditionally used as a stabilising factor.

This deterministic view of advertising is consistent with Keynesian economics, which maintained that the role of advertising is to enable big companies to manage market demand by creating predictable consumer spending (Capra, 1982). However, the flaws in the Keynesian approach have led to it becoming inappropriate. Advertising is no longer seen to have such an influential, controlling and predictable role, which is consistent with seeing markets as complex adaptive systems. Markets are now known to be too complex for one factor, such as advertising, to produce predictable effects.

Concurrent with these changes in the perception of advertising, the traditional approach to promoting in mass markets by using mass media techniques has also changed because the mass markets have fragmented. Marketers are now "developing focused marketing programs designed to build closer relationships with customers in more narrowly defined micro-markets" (Kotler and Armstrong, 1999: 437). New technologies have enabled marketers to develop more information about specific customers in smaller customer segments and to develop messages tailored to the specific customer segment, even to the

extent of one-to-one messages. This fragmenting of markets and growth of new technology has also led to a swing from advertising dominating the promotional mix, to sales promotion being more important, since sales promotion can be more tightly focused on individual segments.

The above discussion has shown that the traditional, textbook concept of promotions is not consistent with the needs of a complex and turbulent environment and its tactical role should, therefore, be reviewed. Nilson (1995) maintains that sales promotions are probably the most ubiquitous form of promotion, being used mostly to achieve a short-term sales increase. As such, they are often used to destabilise the relationship between competitors and their customers, thereby winning customers away from competitors.

4.3.5.4 Managing change

Change, volatility and turbulence are generally seen as negative and to be avoided. Conner (1998: 16) maintains that most people are so desperate for tranquillity and stability that they delude themselves into believing that the "... department, company, industry will once again behave in a predictable manner", but according to Wheatley (1996), change cannot be managed, it can only be fostered. Despite this there is still a belief that change can be managed. Achrol, Reve and Stern (1983: 62), for example, propose two ways of managing environmental uncertainty: First, by acting upon the external source of uncertainty so as to achieve some control by, for example, establishing a monitoring and prediction system, or second, by buffering the firm against the effects of the environmental uncertainty by, for example, diversifying the product assortment to reduce external dependencies.

A second approach, suggested by Hammond, Keeney and Raiffa (1998: 115), is typical of the traditional approach to handling future uncertainties in a business. They suggest first listing all the key uncertainties and then considering each one, assessing its consequences and reducing the list to those that matter the most. Second, they suggest that secondary and primary information should be collected in order to measure the probability of these outcomes actually occurring.

In a relatively stable, or less turbulent, environment, managing change using these traditional methods may work, but in a turbulent environment near to chaos it is very difficult for the following reasons.

- It is not possible to know all the uncertainties and the direction and source of changes. Because of sensitive dependence on initial conditions, it is not possible to predict the outcomes so as to be able to plan for them.
- Since it is not possible to identify all the uncertainties, nor all the outcomes, it is not possible to know what information to collect.
- It is also likely that the number of uncertainties and possible outcomes are so great, that by the time the information is collected (assuming it could be collected) the uncertainties would have become history and the decision window closed.
- Managers cannot wait for the future to manifest itself, as more agile competitors will leave them behind. Once behind, it is almost impossible to catch up in fast changing industries.
- Competition is usually aggressive in turbulent industries and mistakes are quickly exploited, setting the erring firm back and making recovery difficult.
- Managers, while managing change, have to continue their day-to-day management activities and meet their short-term sales and financial targets (Brown and Eisenhardt, 1998; and Hammond, Keeney and Raiffa, 1998).

A further problem in handling change via the traditional methods is expounded by Kelly and Allison (1999). They maintain that when managers face continuous pressure from a rapidly changing environment they are encouraged to 'take action.' Invariably this means doing more of what has worked in the past, but which may be inappropriate for the new environment, or they try the latest management fad: Total Quality Management, benchmarking or re-engineering. The problem with these approaches is that they cause the knowledge, experience and connections of experienced staff to be lost and the whole process is slowed down while staff reconnect or relearn. Management become impatient and so decide to try something else and so another vicious cycle is started.

In a turbulent and chaotic environment the traditional rationalistic and programmed approach to handling uncertainty is shown to be inadequate. Kelly and Allison (1999:196) suggest "overarching integrated maturity models" for managing change. They suggest that the common wisdom that people dislike and resist change is wrong, that the "tension between chaos and stability is natural" and that some change is liked and some disliked. Many change models do not meet the requirements of complexity. For example, Lewin's 'Unfreeze, Change, Refreeze' model of the change process is in conflict with the continual change in environments and with the fluidity that is required to navigate a fitness landscape (Stacey, 1996c). Clearly, better approaches to handling or coping with change (rather than trying to 'manage' it) are required in the complex and turbulent environments of today.

4.4 CHAOS/COMPLEXITY METHODS

4.4.1 Introduction

In this section the handling of complex and turbulent environments by means of methods suggested by chaos and complexity theories, as opposed to the more traditional methods, will be reviewed. Whether the environment is stable, predictable within boundaries, or chaotic, understanding it from a chaos and complexity viewpoint is invaluable to business and helps management and marketing more effectively to understand their business systems, customer behaviour and how to respond to change (Nilson, 1995; Farrell, 1998; Van der Erve, 1998). Applegate (1994, in Brady, Saren and Tzokas, 1999) supports this, maintaining that marketing should not try to reduce complexity, routinise innovation or to avoid change, but should rather embrace them. In complex markets the rules according to which an industry operates are continuously evolving, so passive marketing that attempts to understand the 'rules of the game' and develop a strategy based on those rules is not effective. What is required is an aggressive approach that redefines "the law of the market to a rule ... which is advantageous to one's own company" (Tasaka, 1998: 5).

A generalised approach to coping with a complex and turbulent environment is based on the proposal by many researchers that the best way of controlling chaos is with chaos. This is supported by research conducted in the field of biology by Driver and Humphries, Miller and Budescu, and Rapaport (in Evans, 1998). These researches found that random behaviour (also called protean behaviour) is innate to animals, including human beings and is believed to give a competitive edge in coping with predators: acting unpredictably throws the predator, or competitor, off their stride. This ability is also believed to be a key element of creativity, providing "the capacity for rapid, unpredictable generation of highly variable alternatives" (Evans, 1998: 32). They also maintain that these behaviours are "at once random and adaptive, chaotic and yet the result of selection." This implies that the human animal has an innate ability to act at the edge of chaos. Thus, it could be that human beings, if not too strictly controlled, have a natural ability to create the chaos that is required to cope with an extremely complex and turbulent environment. In other words, bottom-up, emergent responses to environmental change might be the most effective method of coping.

Based on the above concepts, Brown and Eisenhardt (1998) recommend what they term a 'leading' strategy for managing change in rapidly and unpredictably changing industries.

While reacting to change when necessary and anticipating change when possible, they believe change to which others must react should be created when the circumstances are right. This is achieved through activities like the launch of new products, setting new industry standards and increasing the speed of product life cycles. By changing the rules in the industry, companies create their own business environments. They do this, not by planning, but by allowing a strategic direction to emerge from the constant change in their activities. Similar approaches are recommended by Quinn (1978), Mintzberg (1994a) and Stacey (1993), namely, approaches that are "...more adaptable and responsive to environmental flux" (in Brooks and Weatherston, 1997: 316). These approaches imply small incremental changes to the strategy, allowing strategies to 'emerge' from the relationship with the environment and developing more flexibility in the firm and in ways of working.

This chaos/complexity approach as proposed by Brown and Eisenhardt (1998), Brooks and Weatherston (1997) and Evans (1998) is characterised by the fact that it is:

- unpredictable and surprising: rapidly creating many alternative moves, seeing which work and then continuing those, thereby unsettling competitors,
- uncontrolled: it is not command-oriented from top management but emerges from the relationships between individuals and their environments. Strategy is made at the business unit level,
- inefficient in the short term, due to the generation of numerous unsuccessful alternatives - but this is necessary for discovering the long-term successful growth opportunities which rarely are identified through formal strategic planning,
- proactive: taking the lead and being a first mover wherever possible - continually being first and forcing others to react and follow,
- continuous: many small incremental changes causing the strategy to evolve - continuous change becomes natural to the firm,
- diverse: making many alternative moves of varying size and type.

Based on these generalised principles, specific coping actions and mechanisms for management and marketing will be discussed.

4.4.2 The market

Markets are changing significantly due to factors such as globalisation and the growth of communications, including the Internet. Distance in markets has become irrelevant because of the ease of communicating via the Internet. Time is less significant because of the

immediacy that can be achieved via these modern communications (Tapscott, 2000). These market changes include the blurring of boundaries between firms and the development of virtual organisations within value chains (Hooley and Beracs, 1997). In addition, the network of suppliers, distributors and customers are a more important entity for achieving value throughout the chain.

From a chaos/complexity viewpoint, markets can be seen as “continuously deforming landscapes”, terrains of many different peaks and valleys that are endlessly changing and reforming (Brown and Eisenhardt, 1998: 18). In such a continuously shifting market it is critical for a successful company to be early in entering a market to benefit from a 'peak' before it shifts to a ‘valley’: a strange attractor in chaos theory terms, that will attract many late entering competitors, thereby increasing competition and lowering profitability.

In order to continuously reinvent its business landscape a company must develop new products, services and markets, which force competitors to change or perish. Such innovation can be achieved as follows:

- workers are encouraged to look for profitable opportunities in their day-to-day operations and in their contacts with customers. They are provided with information and are allowed the freedom to take risks without the certainty of success,
- workers are helped to search for opportunities by keeping them abreast of industry trends and by ensuring they have access to senior management when necessary,
- co-operation with outsiders, such as suppliers, is encouraged in order to find possible areas of new development (Fradette and Michael, 1998).

Black and Farias (1997) have developed an interesting analysis of markets based on the Austrian school of economics approach. They see markets as either equivocal (ambiguous) or uncertain. Equivocal markets are typical of new markets, with little competition, lack of information and low in complexity. As participants in this market succeed, grow and become profitable, others enter it, thereby increasing the competition. The amount and clarity of information increases and path dependencies are revealed. The market becomes increasingly complex as a result and profits decline because of the increasing competition. Firms in the market have two possible responses.

First, they can choose to stay in the market and improve efficiencies and/or modify product features (honing). In this way they increase knowledge of, and ability in, the existing complex market, learning how to better fit their product offering to the market's needs.

Second, they can choose to leave this complex market and seek a new, equivocal market. This allows them to remain in a low complexity market, but one that is new and, therefore, ambiguous in terms of information and knowledge. They develop this new market, revealing to themselves and potential competitors, what is required to succeed, or fit this market. By continuously focussing on shaping and creating new markets they are staying ahead of competitors in the complex market.

These two responses require different skills. Staying in the old market requires honing, information processing and efficiency skills. Moving to the new market requires developing, enterprising and shaping skills, as well as the ability to cope with the ambiguous or unknown. These are typically known as entrepreneurial skills. More specifically, the authors propose the following match for successful firms, between markets and preferred orientations:

Low complexity market ----------> High enterprising/shaping orientation
Moderate complexity market----> High honing orientation
High complexity market ---------> High in both honing and enterprising/shaping orientation

The authors imply that increasing complexity is inevitable, as is shown in the current globalisation of markets. To cope with the very high levels of complexity being experienced, firms need both equivocal and uncertainty reduction skills, and efficiency and entrepreneurial skills. Although this interpretation of markets appears to be the opposite of the propositions of the current research, this anomaly can be explained. Black and Farias' (1997) approach is essentially one of stabilisation. Destabilisation does not seem to have a role to play in their model. Their honing orientation for moderate and high complexity markets is basically the same as adopting stabilising tactics to become the most efficient competitor in the market. If this is not possible, or too difficult, the company then exits that market and enters another less complex market. Thus, this is equivalent to moving to another, currently stable, peak on the fitness landscape, rather than trying to adjust the current market by destabilisation activities. This is a valid strategy, but, as they imply, requires very strong entrepreneurial skills to be able to continuously develop new abilities and competencies.

Farrell (1998: 73) suggests the opposite, namely a destabilising approach. He maintains that to "inject complexity into the system that you alone can manage best" can enable a company to destabilise a market with one or more dominant products. This action displaces established stimulus-response patterns from the minds of customers and replaces them with new patterns, leading to brand switching. He stresses however, that care must be taken not

to inject too much complexity as this could tip the system into chaos. Clearly, just enough complexity is required to keep the system, or market, hovering on the edge of chaos.

This discussion has shown that, whether intending to follow a stabilising or destabilising approach, using a chaos/complexity viewpoint can provide a clearer understanding of the market landscape. Furthermore, it shows that a stabilising efficiency approach is preferred for a simple/stable environment, while a destabilising, entrepreneurial and developmental approach is preferred for a complex/turbulent environment.

4.4.3 Structure

It is generally accepted that, for companies to be successful in a complex, turbulent environment, a more open, organic and flexible organisation structure is required (Ball and Asbury, 1989; Volberda, 1997; Kelly and Allison, 1999). This flexibility is required to keep close to the edge of change and to respond as the rules of the game change. Bureaucratic structures are too slow and conservative to cope in such environments. Various authors recommend a situational approach to structure. Miles, et al. (in Morgan, 1997: 55) maintain that "highly successful companies that strive to keep at the edge of change" tend to have flexible, organic structures. Companies that are successful and innovative, but not at the leading edge, tend to have more control integrated with their flexibility. Niche marketers who emphasise low cost and high quality tend to have tight control and more bureaucracy. Robbins (1990: 219) suggests that "the more scarce, dynamic and complex an environment, the more organic the organizational structure should be. The more abundant, stable and simple the environment, the more mechanistic structure will be preferred." Volberda (1997) is more prescriptive, proposing a typology of organisational structures based on the degree of environmental turbulence, as well as a mix of managerial controllability and flexibility. His structures are as follows:

Rigid -------> Planned -------> Flexible -------> Chaotic

In stable environments where firms are trying to reduce turbulence, the planned structure is ideal. The organisation is less flexible and many tasks are routinised or standardised. If unanticipated changes happen when the company has become too routine, inertia can set in and the organisation becomes fragile and vulnerable. In extremely turbulent environments the flexibility option is ideal. This involves what Volberda (1997: 173) terms "a trajectory of revitalisation" to move the firm from the rigidity side of the continuum, that is, from the planning option towards the flexibility option. This approach is dominant over the

environment to maintain organisational distinctiveness, but is also flexible enough to adapt to threats and disruptions. However, if there is strategic neglect, the firm can slide into "...unfocused actions with disconstructive results." This is the chaotic format.

This typology clearly matches the complexity continuum well, as is illustrated below:

Environment: Stagnation ----→ Stability ----→ Edge of chaos/complexity ---→ Chaos
Organisation: Rigid ----------→ Planned ---→ Flexible ----------→ Chaotic

It has been shown that the flexible organisation structure is the most effective for an organisation in a complex and turbulent environment and will be most effective for a firm trying to maintain a position at the edge of chaos. In order to remain successful, the firm must manage their transformation from a planned form to a flexible form, and then back towards the planned form if they move too far towards the chaotic form. It is a continuous balancing act to match the changing levels of turbulence in the environment.

The traditional, neat, orderly, evenly spaced rectangles of most organisation charts are not helpful in complex markets that are rapidly changing (Brown and Eisenhardt, 1998). Flexible, organic structures tend to organise around small, self-managing, entrepreneurial teams (Cooper, 1994; Snow, 1997; Brown and Eisenhardt, 1998). According to Fradette and Michaud (1998: 91), in such organisations, which they refer to as 'kinetic', all workers get involved, interact with customers and operate with real time information in order to cope with the unexpected. The main structural format is the network that learns more rapidly and co-evolves faster, enabling the members of the networks to cope with the continuous change through the fast and fluid connections and interconnections between the members (Drew and Coulsen-Thomas, 1996; Snow, 1997; Kelly and Allison, 1999; Cilliers, 1999). Ball and Asbury (1989) maintain that, to provide the lightning responses needed in the turbulent South African environment, companies must delegate responsibility to the lowest level of decision making. This is consistent with the view of the organisation as emergent and self-managing. Such self-management is facilitated by a company's 'corporate DNA', which Baskin (1998a: 91) defines as a "flexible, universally available database of company procedures and structures." This corporate DNA is built from past history and current learning and is the equivalent of organic DNA. Baskin believes that people act in ways to fulfil a company's identity due to the corporate DNA.

Organisations structured as organic entities have all the information in their corporate DNA to co-evolve in their market ecologies in a self-organising manner. This enables staff to act

autonomously and quickly in a turbulent environment, improving service to customers, learning new things and encouraging innovation, without the automotive rejection of new ways of doing things. Corporate DNA, or corporate culture, enables flexible and quick decision making, which, according to Nilson (1995), requires a flat organisational hierarchy, with few layers between decision-making and implementation levels. Thus, the 1990's fashion of re-engineering and delayering was consistent with the needs of a turbulent, changing environment.

Conner (1998: 39) believes that such 'nimble organizations' cope best with a turbulent environment because they are in an unending state of growth and renewal and efforts are continually made to increase the ability of staff to absorb further change. This enables the company to "consistently succeed in unpredictable, contested environments by implementing important changes more efficiently and effectively than its competitors."

To maintain such an organisational structure in a turbulent environment, the firm requires "'kinetic workers' who pull the bosses and everyone else along with them as they constantly evolve the business " (Fradette and Michaud, 1998: 91). Also required are employee empowerment and decision-making pushed lower down the hierarchy (Phillips and Kim, 1996). Furthermore, double loop learning – not merely reacting to events but also analysing why they occur – is also needed (Glass, 1996). In order for such staff to react quickly, Nilson (1995) maintains that systems and routines must be in place to ensure staff knows 'how' to react. ' What' they do, on the other hand, must not be planned, but must be improvised. Such an approach requires an organisational structure that is relatively stable in terms of the top management. This is so because experience and knowledge of the marketplace are essential for flexibility, as is the immediacy of the response when unanticipated change occurs. In terms of the organisational hierarchy, Nilson recommends constant evolution that follows or pre-empts changes in the marketplace rather than dramatic restructuring. This is supported by Volberda (1997) who suggests continuous management and adjustment of the structure as the environment changes.

It should be noted that this is contrary to the re-engineering approach of Hammer and Champy (1993), which promotes radical and dramatic organisational change. What these authors do not appear to appreciate, however, is how small effects can escalate into major and dramatic outcomes. In other words, they do not make allowance for the sensitivity to initial conditions so vital in chaos theory. This disagreement with Hammer and Champy is implied by Morgan (1997: 55) who sees business organisations as similar to those in the natural world, in that "successful organizations evolve appropriate structures and processes

for dealing with the challenges of their external environment." Such organisations are often referred to as 'learning organisations.' According to Slater and Narver (1995: 71) learning organisations are most relevant in turbulent and fragmenting markets, as they are better able to anticipate and act on opportunities. They provide "...rapid awareness of and response to, competitive and market change." This is consistent with Gupta and Govindarajan's belief that "... high environmental uncertainty requires high frequency and informality in communication patterns" (Slater and Narver, 1995: 69). This type of structure is also supported by Pine, Victor and Boynton (1993: 109), who suggest mass customisation, which requires a "dynamic network of relatively autonomous operating units."

From the above discussion, it can be seen that organisational structures for companies operating in complex and turbulent environments, when viewed from a chaos and complexity viewpoint, should be open, adaptive, flexible, flat and entrepreneurial. Workers are interrelated with other workers, customers and suppliers in networks, with the autonomy to take decisions that affect their performance. This increases concern for the customer throughout the company (Hooley and Beracs, 1997). Such structures should continually co-evolve with the environment in order to keep the company balanced at the edge of chaos so as to maximise innovation.

4.4.4 Strategy

Much has been written about how chaos and complexity theories can influence strategy making. It appears to be one of the areas where the greatest amount of research has been done and where chaos and complexity theories have been applied the most. Furthermore, strategy is the base upon which marketing tactics are built and it is, therefore, important to obtain a picture of how strategy and strategy making changes when viewed through the chaos and complexity lens.

The company mission or vision is often given as the starting point of strategy making. Manning (1991: 71) maintains, "in times of turbulence, uncertainty and unpredictability, a clear, long term view is vital." A clear vision is vital for delegating responsibility and for enabling employees to take decisions. Without it the self-organising, bottom up development suggested by complexity theory is almost impossible. This is supported by Baskin (1998a: 63) who says "success in a market ecology demands ... an identity." This is a specific way of succeeding in an environment by creating a competitive advantage. "It defines the essence of the organisation - how it relates to its market ... and how it must shape every corporate system." For example, 3M's identity revolves around innovation, with every system aligned

to produce innovation. As a result 30 % of their revenue comes from products less than four years old.

Baskin (1998a) quotes Wheatley and Kellner-Rogers (1996) saying that identity is an essential component of a self-organising entity. The process of invention is based on an identity. Baskin (1998a) goes on to maintain that an identity should include the contribution the company makes to its markets and what employees must do to help make that contribution.

Baskin's 'identity' is very similar to the concept of 'core ideology', proposed by Collins and Porras (1996: 54). They see core ideology as a set of fixed statements that hardly ever change: "This is who we are; this is what we stand for; this is what we're about." However, this permanence is anathema to complexity theory. Hamel and Prahalad's strategic intent and Collins and Porras' tangible image are, according to Chakravarthy (1997), only useful if they are seen as temporary.

If they are too permanent, they can trap a firm in an unsuitable or changing market. This is contrary to most beliefs about mission statements. A "less structured guiding philosophy, which … is a broad vision of the opportunities that the firm seeks to participate in" is more suitable (Chakravarthy, 1997: 80).
There is a fairly consistent belief that radical or destabilising strategies are necessary in complex and turbulent environments. For example, Manning (1998) believes that the turbulent environment in South Africa requires a radical approach to marketing strategy: not minor changes or adjustments to current strategies, but strategies that are totally different in idea and execution, are required. They should be a surprise to the competitors. They must be disruptive and must be done fast. This is clearly in line with the destabilising approach. However, this is a rather simplistic approach, as is implied by Loewen (1997), who maintains that some degree of chaos is necessary in a business, but that too much chaos reduces employees' confidence. D'Aveni (1999) takes this approach further by maintaining that success is dependent on matching the correct strategic paradigm to the nature of the environment. In an environment in equilibrium, a dominant company will use barriers to entry to minimise rivalry and competition thereby maintaining stability.

Challengers will attempt to disrupt the industry, to break down the barriers by making them obsolete. In a market that is in fluctuating equilibrium, the dominant player will continuously build on their core competencies to build dominance in new markets, but the challenger will use disruption to shift the competencies to turn the leader's competencies into weaknesses.

In an environment of punctuated equilibrium the dominant company builds standards to create stability between punctuations and responds to revolutions when necessary, while the challenger is contrary - disrupting when the leader is trying to stabilise and stabilising when the leader tries to disrupt. In an environment that is in total disequilibrium, the dominant player will use its superior resources to continually disrupt in order to beat the challenger at his own game, while a challenger will attempt to wear the leader down by "attacking more intensely, more swiftly and unpredictably" and by being more creative and unconventional (D'Aveni, 1999: 134). In other words, in a truly turbulent market, the most disruptive and unconventional company will tend to be more successful.

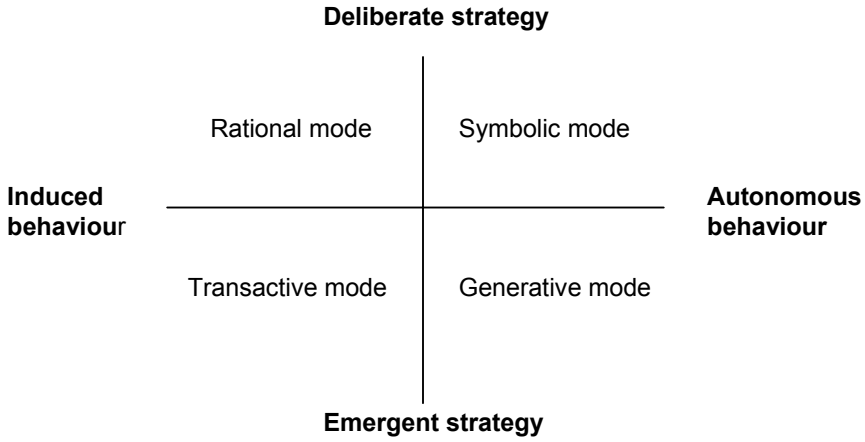
This more situational approach of D'Aveni (1999) is felt to be more relevant to a comparison of companies in simple/stable environments versus those in complex/turbulent environments. Furthermore, a chaos/complexity approach to strategy making differs from the traditional top-down, management dominated, strategy making. Most authors in the complexity field propose a bottom up approach. For example, according to Hart (in Slater and Narver, 1995: 70) "... in complex and heterogeneous environments, an iterative participative approach is necessary ... and ... strategy should be developed through a process of bottom-up." This is supported by Chakravarthy (1997) who believes that strategy making is more democratic when it follows a guiding philosophy and this bottom-up entrepreneurship generates new innovations. The resultant flat structures force units to innovate and to connect this entrepreneurship to management's vision. The flat structure increases communication that reduces uncertainty about fit between the guiding philosophy and the innovations.

This communication is seen by many authors as critical to successful strategy making in turbulent environments. Dialogue (Barnett, 1996), strategic conversation (Manning, 2001a) and continuous open discussion (Chattel, 1995) are approaches suggested for encouraging strategy to emerge from the divergent perspectives throughout an organisation. Encouraging discussion, sharing information and increasing feedback speeds up the organisation's awareness of the need for change and its ability to adapt, as does exposing the members of the organisation to the environment of customers, competitors and suppliers. This broad-based discussion requires involvement of staff at all levels (Senge, 1990) and not just a select few (Chattell, 1995). This approach changes strategy making from futile, long range complex planning exercises that try to predict the unknowable future, to "… an 'emergent phenomenon' based on strategic thinking … and … insight into the nature of complexity" (Mintzberg, in Senge, 1990: 11). The mechanistic model of strategic planning has thus been replaced, according to Barnett (1996), with Maturana and Varela's biological model of emerging forms, which has more relevance to the way business actually works.

Even the more formal and rationalist of strategy authors agree with a more organic approach. Ansoff (in Clutterbuck and Crainer, 1990: 151) says "Rather than quantify, I seek patterns in complexity which can help managers to do their work in the overwhelmingly complex and turbulent world of today and tomorrow." Authors such as Chaffee (in White, 1998), Glass (1996) and Chattel (1995) emphasise that such organic, fluid and emergent strategies are more likely to lead to success in turbulent and uncertain markets. In fact, Hamel and Prahalad (1994: 51) are even more extreme, suggesting that a company should "shape the emergence of that future industry structure." This is consistent with the approach predicated by complexity and chaos theory, namely, that firms must develop their own environments rather than being reactive or proactive to them.

In the last twenty years, more emphasis has been placed on adaptive or emergent strategy making and numerous models have been developed explaining this strategy making process. For example, Hart (in White, 1998: 277) created a strategy making classification based on "top management 'internationality' and organisational actor 'autonomy'." Figure 4.1 shows this model.

Figure 4.1: Hart's strategy creation style framework



Source: White, 1998: 277.

The generative mode is consistent with a complexity theory approach, with its 'autonomous behaviour' and 'emergent strategy'. White (1998) proposes that the generative mode is most suitable for uncertain and turbulent environments. It encourages creativity, experimentation and risk taking and it takes less time to implement. Thus fast, flexible strategy making, which

is necessary in a dynamic environment, is possible. In his research, White found that the transactive and rational modes were popular in unthreatening environments, but that managers preferred symbolic and generative modes in turbulent environments. He also found that channel members were more satisfied when the symbolic/generative mode was used, than when the transactive/rational mode was used. This is not surprising since the former modes place more emphasis on involving channel partners in strategy making. He also found that the symbolic/generative modes required less control over employees. This is significant for industries that are near the edge of chaos, as managerial control in these circumstances is not possible.

Another model similar to Hart's generative mode is the 'Crescive model' developed by Biurgeois and Brodwin (in White, 1998: 286). This model proposes that "strategy emerges in an 'almost-implemented form' from within the organization," rather than being passed down by top management. The authors maintain that management's role is judge and premise setter rather than creator of the strategy. White (1998: 287) also mentions other models that are very similar to the Crescive and Generative models, such as Chaffee's Interpretive model, Ansoff's Ad hoc model and Nonaka's Inductive model. The authors mentioned see strategy as driven by individual actors in the organisation rather than by management.

The following practical self-organising, emergent approaches are suggested as alternatives to traditional strategic planning:

- scenarios, in place of probable futures,
- outsider perspectives, rather than official futures,
- boundary blurring in place of traditional core competencies,
- uncertainty of small events on the periphery rather than confidence about major trends at the centre,
- self-organising systems in place of mechanical systems,
- on-going dialogue in place of a fixed plan (Bartlett 1996: 351).

Teare and Bowen (1997) suggests environmental scanning for a turbulent environment, but done in an informal manner, using experience, intuition and personal information gathering. This is in contrast to the traditional approach that recommends formal environmental scanning.

A fundamental problem of strategy making in a fast changing environment is to achieve 'adaptive innovation' at the edge of chaos, while still achieving consistent and reliable

execution of the strategy, that is, producing and delivering on time. Brown and Eisenhardt (1998) maintain that this is achieved by 'improvisation', a dissipative equilibrium between the two attractors of too much structure and too much chaos. Improvisation enables a company to alternate effectively between creative innovation and effective implementation. Improvisation requires two properties: intense communication and a few simple, easy to understand rules that allow just the right amount of structure. This improvisational approach is suited to their 'competing on the edge' approach that requires lots of experimentation and different competitive moves, some successful and some less successful. This approach requires operating at the edge of chaos, with sufficient structure (priorities, deadlines and responsibilities) that change can be organised, but not so rigid that it cannot occur. This is supported by Loewen (1997: 40) who maintains that some degree of chaos is necessary in a business because an effective strategy process "... not only encourages chaos, but also pulls it into some order…" Since too much chaos can be discouraging, some form of structured thinking is necessary. A new strategic framework for coping with turbulence suggests that a firm must produce chaos, through repeat innovation (Chakravarthy 1997). Merely being a first mover is not enough, as competitors can get a 'free ride'. Because of the difficulty in defending a strategy in a turbulent environment, the firm may be overtaken. In a knowledge-based industry (such as information technology) competencies are often not imitated but side-stepped, so it is essential to innovate continuously to the extent of making one's own products obsolete and replacing them before a competitor does. This is typical of the strategy of Microsoft who continuously changes and upgrades their products.

Based on the above concept of organic, self-organising and emergent strategy making, a number of further issues are important for firms operating in turbulent environments.

- Generic strategies of cost leadership or product differentiation are inadequate in rapidly and often unpredictably, changing markets. Hooley and Beracs (1997) stress the importance of being able to learn and adapt faster than competitors and thus 'the learning organisation' approach is most relevant. Similarly, Benkenstein and Bloch (1994) suggest that hi-tech companies should adopt a concentrated or focused strategy rather than differentiation, because this enables them to specialise, build technical know-how and continue research and development, which is difficult to maintain in a rapidly changing market.
- Flexibility is stressed by almost all authors as critical to the strategies of companies in turbulent and uncertain markets. Brown and Eisenhardt's (1998) improvisation and experimentation are structured forms of flexibility. Manning (1991) maintains that flexibility is required throughout the value chain in order to keep up with the new and

better offerings that customers are being exposed to every day. Chakravarthy (1997: 69) stresses "flexible commitments - a paradoxical blend of early commitment (vital for competitive success) and timely exits (crucial to minimise management risks)."

- Since, as Glass (1996: 104) believes, markets lurch from attractor point to attractor point, pausing at plateaux in-between, managers who adopt a wait-and-see strategy or are slow to act are courting disaster. Ulrich and Wiersema (1989) see such waiting for complete information as strategically reactive, allowing competitors, who understand the surges of growth to new plateaux to take advantage of the lack of competition in these growth phases. Once a company has fallen behind, it is very difficult to catch up and compete at the new plateau. Fast change and fast responses are therefore essential for success (Chattell, 1995) and the companies that achieve this are adaptable and innovative. This responsiveness is achieved through continuous open discussion and dialogue that continuously prepares the organisation for change. Barnett (1996) supports this by stating that, as breakthroughs come from unstable conditions, more mistakes must be made more quickly and they must be learnt from quicker than the competition.
- An example of this responsiveness is provided by Glass (1996) who mentions Honda's quick change of strategic direction in the U.S. from emphasis on big motorbikes to small motorbikes when they realised that there was an opportunity, and lack of competition, in this unexploited segment of the market. Various authors stress that, in a rapidly changing environment, nimbleness (the ability to adapt quickly) and learning faster than competitors are the only real sources of sustainable competitive advantage (Hooley and Beracs, (1997: 157) and Kelly (in Gibson, 1996: 263).
- Brown and Eisenhardt (1998: 11) stress the importance of time in strategy making. They suggest that organisations should balance at "the edge of time," and not to concentrate too heavily on the past or the firm will become stuck in outdated approaches. They should also not concentrate too much on the future, as they will lose current business by over planning. What they call ‘time pacing' is important in unpredictably changing industries. This means that change is triggered by time, rather than by events such as competitors' activities. Basing change on time is a method for reacting faster, anticipating better and possibly leading the pace of change by setting a rate of change for the business. An example of this is "creating a new product every nine months ... entering a new business every year" (Brown and Eisenhardt, 1998: 167). This enables the company to develop a continuous flow of competitive advantages. Microsoft's continuous introduction of new products that make their own products obsolete is a good example of this. Nilson (1995) also stresses the importance of time by explaining that the later a decision is taken, the more information is available about the market and the less chance there is of change happening between the taking of the decision and its implementation.

Thus, the implication is that, while the firm must 'time pace' its strategic actions, it must also minimise the time between decision taking and implementation. As has been indicated previously, this can be facilitated by flexibility, quick adaptation, balancing strategies at the 'edge of chaos' and bottom up strategy making.

- Strategic alliances, both within and between industries, is a feature of Miles and Snow 'prospector' type companies, which they maintain are more successful in turbulent industries (Joshi, Kashlak and Sherman, 1998). This is supported by Chakravarthy (1997) who believes that to build competitive advantage, a firm must leverage its competencies by sharing and exploiting them with others, building multiple competencies and diversifying into new competencies. This also implies that the firm must be prepared to let go of old competencies that are no longer relevant, in order to assimilate the new competencies.

From the above discussion it can be seen that strategy making in a complex, turbulent environment is different when approached from the viewpoint of complexity and chaos theory. A firm's strategy should involve a vision or identity, bottom-up emergence of the strategy involving all the staff, balancing between structure and rapid change through flexibility and rapid adaptability, 'time pacing' change rather than reacting to environmental change and, through all of this, intense and rich communication throughout the supply chain.

4.4.5 Management

According to Burns and Stalker in their 1961 book, The Management of Innovation (in Baskin, 1998a: 2), mechanistic management systems are more suitable for stable market conditions, but not for conditions of turbulence and change. This attitude became dominant in the 1990s, with Chattell (1995: 143) maintaining that management is not "running a tight ship", Halal (1996) stressing that the traditional view of mechanistic organisations designed like machines is obsolete in today's more complex world and Farrell (1998) saying that complexity cannot be managed - that it is not possible to impose top-down order on a bottom-up, self-organising system. Baskin (1998a:153) explains that a mechanical control and command style of management where "managers think, workers do," can only be successful while the manager is a visionary leader. If he leaves, the company usually becomes misaligned with its markets and cannot cope with change in its environment.

Thus, an alternative management theory became necessary for the more turbulent and complex environment prevalent at the end of the twentieth century. Burns and Stalker (in Baskin, 1998a) suggest that organic systems are superior in conditions of change and Halal

(1996: 2) points out that management theory has over the years moved progressively towards an organic structure. Baskin (1998a) agrees, maintaining that, in today's turbulent environment, corporations should run their businesses as if they were ‘living things’ by continually learning from, and adapting to, their environment.

Organic structures are more like a colony of bees, a tree or a market, and as such cannot be controlled like a machine. Only such "living systems operating on self-organizing principles" can cope in the turbulence being experienced (Halal, 1996: 2). Halal quotes Kelly who says "[systems] will become autonomous, adaptable and creative but, consequently, out of [managements’] control".

Such ‘organic management’ is very different to traditional ‘mechanistic management’. For example, Fradette and Michaud (1998: 116) propose five major actions of managers to create "self-adapting, self-renewing companies that are organised for instant action,” actions that are unlike the traditional actions of planning, organising and controlling. These actions are listed below.

- Set strategic purpose: this is a broad vision that guides workers as to the domain in which the company should be operating.
- Set strategic boundaries: these are set to ensure that actions contribute to competitive advantage and financial success
- Enable and encourage workers to challenge strategic boundaries: this is important to avoid stagnation by correcting or eliminating a boundary that no longer has a purpose.
- Champion market and customer events: encourage worker involvement in events by participating in the exchange of their ideas, as well as championing his own ideas.
- Make decisions in real time: in order to achieve the required flexibility and rapid response, managers must have confidence in their colleagues and employees to take quick decisions.

From the above it can be seen that organic management involves leaders who "are designers, teachers and stewards," rather than "bosses who call the shots" (Senge, 1990: 9). They create the conditions in which individuals, teams and the system are encouraged to respond spontaneously to the changing environment (Fitzgerald and Eijnatten, 1998), thereby enabling "people to 'self-organise' and attack opportunities as they appear" and so keep pace with the rapid changes (Baskin, 1998a: 2). In order to create the correct conditions for a firm to flourish in a turbulent environment (Baskin 1998:153) maintains that the ‘organic’ manager does not see his job as controlling, but as creating an environment in which workers can push the company to co-evolve with its markets.

The manager's main tasks are:

- to create awareness of the turbulent market and of what must be done to co-evolve,
- to increase flow of information to learn about and better satisfy customers' needs,
- to create trust to enable workers to cooperate better. Despite the difficulty of trusting staff to do as good a job as the manager, it is essential in the rapidly changing and more complex markets of today.

Similarly, Farrell (1998: 56) sees the manager's role as making sense of the complex system, identifying emerging forces and patterns and tilting the dynamics of the system so that it develops in a direction that is in the manager's favour. This means that the manager must "gather the right data, recognise patterns, see where systems are ready to break and build in the ability to create a wide range of futures." This is consistent with Pine, Victor and Boynton*'s* (1993: 109) view that managers are co-ordinators who "perfect the links that make up the dynamic network."

A key requirement of organic management is the ability to balance the firm at the edge of chaos by a "continuous redefinition of processes, products and services, structures, systems, skills and sometimes cultures", in order to develop "wealth-generating dynamic stability" (Chattell, 1995: 143). In order to do this successfully, management needs to stress that the future is not known and that it is the staffs' responsibility to discover the answers to the future through individual learning. Thus, the manager becomes a "facilitator of organisational learning ... fostering a spirit of continuous experimentation," rather then an instruction of the staff (Chattell, 1995: 150).

A successful manager in this environment is one who welcomes and helps the staff to cope with the turbulence and change. Conner (1998: 16) believes such managers are "brutally honest about the escalation of change they foresee ... [and] help their people understand that success at the new endeavours will not bring stability, only a more desired version of additional changes." In fact, Conner (1998: 199) sees a time of crisis as a "zone of chaos" in which a bifurcation can occur, leading to the opportunities of renewal, but also with the risk of decay and death. Such crises, Joubert (1998) stresses, are important to keep the minds of employees focused to avoid the complacency that can cause opportunities to be missed. Thus, an important step is to "create dissatisfaction with the status quo" in order to encourage change and "the starting point is to shake up their world" (Manning 1989: 182)." In other words, introducing some chaos is necessary to encourage change.

Chaos type activities are also necessary for control in a chaos environment. Fitzgerald and Eijnatten (1998: 269) suggest that the most effective method of controlling in a turbulent environment in flux is to “let go.” This involves allowing the system to self-control, usually through self-managing teams, to loosely control the work processes and to rely on subtle feedback from the environment. The main management task is stewardship, which involves the creation of conditions in which individuals, teams and the system are encouraged to spontaneously respond to the changing environment. This is so because people close to the action are more sensitive to the environmental forces because of their proximity in comparison with managers. This is supported by Phillips and Kim (1996) who suggest that local control and autonomy may contribute to reducing instability caused by chaos. In order to increase ‘local control’ and better cope with the rapidly changing environment, many companies are delegating decision-making to lower levels in the organisation, especially to sales levels. In addition the reduction of hierarchies is making the organisation more responsive and faster and "… in today's market the race goes to the swift" (New Marketing Imperatives, 1994: 36).

For such local control and decentralised decision making, all information should be available to staff who require it. This also has the advantage of using every employee as a collector of information that is then available wherever it can be useful, because of the openness of what Baskin (1998a) calls the corporate nervous system. This information should cover "what's happening within the organisation, what's happening within the company's markets and what's happening in the wider world in which it operates” (Baskin, 1998a: 2). If anybody identifies a market shift, that information is available throughout the organisation. This ‘corporate nervous system’ is a network that makes internal news available to all who need it. Market feedback is collected directly from till points through barcode scanning about customers' purchasing patterns, by managers or staff immersing themselves in the consumer market, or by Internet relationships. In a turbulent, rapidly changing market, a clear picture of what is going on is essential.

Openness and truthfulness are essential for co-evolving in such a way as to meet the increasing demands of customers effectively (Baskin, 1998a: 107). This accumulation of information can be seen as a learning process and, since it appears that the learning organisation is a requirement for coping with a rapidly changing environment, it could be advantageous to institute approaches that encourage learning. According to Stewart (1996: 125) corporate learning is a social process and takes place in 'communities of practice'. These are informal groupings of people bound by a common problem. They occur informally, during drinks after work, around the water cooler, in the tearoom, etc. Therefore,

to encourage learning and cross-fertilisation to occur, companies should encourage informal gatherings: encourage the use of an Intranet, let staff use the boardroom or fund a get together on the expense account. But they should remain informal, decentralised and unmanaged to ensure that they are not seen as centrally controlled, management functions. This idea of facilitation by management is supported by Graham and Pizzo (1996: 339), who see management as a social function aimed "to make knowledge productive."

This new organic management style is essential. According to Halal (1996:45), the world is going through a major restructuring which results in a demand for "accountability for performance in order to survive and creative entrepreneurship to adapt to chaotic change." As a result he recommends that organisations should be managed as "internal markets." In this approach, units of an organisation "feel their way along like the cells of a super organism possessing a life of its own, producing a constant stream of adaptive change ... it creates spontaneous order out of chaos." This local form of intelligence is essential to cope with the increasingly complex and turbulent environment, as it "guides average people to meet complexity where it begins - at the grass roots" (Halal, 1996: 45). This type of organisation is suited to a turbulent environment, demands accountability for performance and encourages client focus, innovation and adaptive change.

Even a mechanistic management tool like business process re-engineering can be seen to promote a more organic management style. The emphasis on core processes, as opposed to functions, recommended by business process re-engineering, enables the company, "to take a holistic, flexible and innovation-oriented view…[with]… fluid, cross-functional teams which constantly evolve and reshape to handle environmental uncertainty" (Lynch, 1995: 47). It can, therefore, be seen that business process re-engineering could be a meaningful tool to assist firms to cope better with a chaotic, complex and turbulent environment. It should be stressed that, although business process re-engineering downplays the importance of the marketing function in favour of the marketing philosophy, the marketing tactics of product development, selling, promotions, pricing and distribution still have to take place. They might not happen in a centralised or functional department, but they must still happen, possibly decentralised into customer, product or process oriented departments. The next section will discuss how chaos and complexity theory can guide marketing in a complex and turbulent environment.

In summary, it can be concluded that management in a complex and turbulent environment should be organic, with the manager concentrating on creating an internal environment conducive to co-evolution. Decision-making should be decentralised, learning and

experimentation should be facilitated and change encouraged. Management must provide the information to support this approach and must encourage informal information gathering.

4.4.6 Marketing

4.4.6.1 Effective marketing

In order to identify the types of marketing activities that are effective in a complex and turbulent market it is first necessary to identify what is meant by effectiveness. Effectiveness is not the same as it was twenty or thirty years ago. For example, Cespedes (1995: 3) stresses that success in marketing requires coping with changes in many areas, such as in the "nature of the product offering ... market fragmentation ... supply chain management ... product life cycle issues," and that these changes have altered the "bases of competition and marketing excellence." Therefore, it is necessary to pinpoint where marketing should focus its activities in order to claim to be successful and effective.

First, effective marketing today implies speed in recognising opportunities, developing new products, as well as reducing the time between “when a customer asks for, or orders, a product or service and when they receive it" (Morris, 1996a: 36). This importance of marketing speed is also emphasised by Seybold (2000: 38), who believes that a company has to "move faster, build momentum quickly” and by Manning (1991: 78), who is adamant that speed in all areas of the business is critical to competitive advantage. Nilson (1995: 14) too, says marketing must be fast, as excessive analysis can result in a product being brought to market too late, when the world and the customers’ needs have already changed.

To be able to take such quick marketing decisions requires a sound knowledge base especially regarding the history of consumers' behaviour (Nilson, 1995). However, Manning (1991: 78) maintains that decisions and actions have to be taken without total clarity of information, because, as is proposed by chaos and complexity theory, in a complex system, pure and complete knowledge is never available. To cope with this problem, Nilson (1995: 63) suggests that the emphasis should be on planning "…'how to do it' and keeping the options open regarding 'what to do' as late as possible." This ensures that information for decision-making is relevant and applicable when taking the decision regarding 'what to do' (Nilson, 1995: 63).

One of the key types of information needed for marketing effectiveness is customer knowledge. As Burgess (1998) says, in a rapidly changing environment, "there is no

substitute for understanding customers." Such knowledge enables the firm to offer the customer a better deal, with emphasis being on the key factors which the consumer uses in making a purchase decision, and then over-satisfying on those factors so as to out-perform competitors. In fact, Samli (1993: 154) stresses unique tactics aimed at individuals, such as designing customised offerings for individuals, selective insertions in magazines to communicate with individuals, promotions based on an individual's past behaviour and delivered solely to that individual and prices set based on knowledge of an individual's price sensitivity and their ability to pay. Therefore, he believes that the concept of one-to-one marketing is the solution to marketing in a complex and turbulent environment.

This intense, one-to-one knowledge can enable a company to "… find ways to get customers to literally stick to you" (Seybold, 2000: 38). This 'stickiness', originally proposed by Gladwell (2000), is the same as 'lock-in' and can be achieved by creating high switching costs or ensuring that customers do not want to defect, through getting customers to make some commitment to the product or company. In other words, customers must invest something, such as time or effort, into the relationship, which then makes them more likely to remain with the company and its products.

Relationships or partnerships are, thus, key elements of marketing effectiveness in complex and turbulent markets. A decade ago, Webster (1992: 14) reported on the fact that there was a shift from a transaction to a relationship focus and that this was leading to customers becoming partners. As a result, the boundaries between a firm and its environment were blurring. A firm's partners could be suppliers, customers and even competitors, all at the same time. To maintain these relationships companies have to make long-term commitments in the areas of quality, service and innovation.

According to Nilson (1995: 14), for marketing to be effective it must be proactive not reactive. It must create events and not merely rely on market research, since competitors can too easily copy the reactive following of customer requests. In other words, marketing innovation, or more specifically, the exploitation of innovations, is essential. This is supported by Richardson (1996: 1) who maintains, "traditional marketing is an inadequate response to the marketing opportunities emerging in a modern economy and is inappropriate for the complex social, economic, cultural and political climate of the late twentieth century and beyond."

Mavondo (1999: 245) found a positive relationship between product innovation and marketing effectiveness. He suggests that the source of effectiveness may lie with the

macro-environment rather than in the traditional marketing domain. It makes sense, therefore, that merely doing more marketing may not lead to increased effectiveness. As an example, Sheth and Sisodia (1995b) suggest greater use of information technology innovations to improve both efficiency and effectiveness of marketing.

The resultant increased productivity would improve not only customer contacts and interfaces, but would also improve new product and service development and how they are delivered to customers. Despite the above beliefs, it would be wrong to ignore innovations in the marketing field as activities that can contribute to marketing effectiveness. Both Cespedes (1995) and Vorhies (1998) stress that activities such as the product offering, product differentiation, product innovation, new product development and product life cycle issues are factors that lead to marketing excellence and enable one firm to outperform other firms.

Nilson (1995) maintains that, as the environment, the product, the customers, etc. become more complex, it becomes more important for a firm to focus its scarce resources on those few key activities that will give the best result. He maintains that there are, broadly speaking, two approaches to using marketing tactics in chaotic environments: stabilising or destabilising approaches. These are discussed in more detail in the next section.

4.4.6.2 Handling chaos in marketing

A market is a system and "all aspects or dimensions of that system have, or can have, a dynamic effect" (Nilson, 1995: 47). In other words, changing one aspect of marketing will likely cause something else to happen. McGlone and Ramsey (1998) agree that some marketing activities have a stabilising effect on the company - customer relationship by encouraging the system to behave within boundaries, while other marketing activities can have a destabilising effect by causing unanticipated consequences that break the system boundaries. This is typical of a ‘chaos system’, but, according to Nilson (1995: 173), "a system that is totally out of control is really just that: uncontrollable." Thus, a dynamic chaos market system is preferred. In other words, a system operating at the edge of chaos is preferred because stabilising and destabilising activities can be used to balance the system between uncontrollability and stagnation.

Nilson (1995) ranks the various marketing tactics in terms of stabilising/destabilising as follows:

Most turbulent/destabilising

Totally new products

Price change

Product innovation (new product development)

Sales promotion

Product enhancement (old product development)

PR and other forms of non-advertising communication

Advertising

Personal selling

Own distribution system

Most stabilising

In applying marketing tactics, there is consistency in the belief that companies should not wait for and then react to, changes in the environment, but should anticipate environmental change and proactively promote this change by acting as an 'agent of change' (Davis, Morris and Allen, 1991; Samli, 1993; Gow, 1998). This is supported by Morris (1996b:13) who believes that innovation is the key task of marketing in a changing marketing environment. He refers to Bonoma's 'marketing subversives' and Hamel and Prahalad's 'expeditionary marketing' and sees marketers as "inducing continual change." This implies that marketers should not only react to environmental changes, but also should lead customers rather than follow them. This is consistent with the chaos approach of leading a market by introducing change and chaos. In fact, Kotter (1996: 122) goes so far as to suggest that, to avoid the stagnation of complacency, a crisis should be created in the company by "allowing a financial loss to occur or an error to blow up." This can be seen as a way of destabilising a system to force it to engage positively with its changing environment.

According to Nilson (1995), such real, supplier-led, proactive change mostly comes either from new product development, or changes in the supply chain. Although new product development inevitably leads to turbulence, carefully managed change in the supply chain and in existing products, can lead to stability over time. He maintains that most of the turbulence experienced by companies in the late 1980s/early 1990s was self-induced. That is, most of the emphasis in marketing was on the destabilising actions, such as price promotions (spending on promotions increased relative to advertising) and new product development (food and beverage products launched in the USA increased from 3000 to 10 000 over a decade) and less on the stabilising actions, such as marketing communication. However, the apparent growth in importance of supply chain management and relationship

marketing in the 1990s may be an indication of a swing away from destabilisation and a swing back to more stabilising marketing tactics.

Despite the above conclusion, it still appears as if proaction and destabilising type activities are necessary in turbulent environments. For example, Cross and Smith (1995: 17) maintain that to succeed in a rapidly changing market landscape, marketers need to be able to easily and rapidly adapt their marketing approach for each market, while Thomas (in D'Aveni, 1999: 129) found that companies following a "strategy of controlling and muting competition produced better returns in the more stable ... environment" and that the successful and less successful companies in stable environments had similar levels of performance. However, when turbulence increased, companies following a stabilising strategy produced worse results and the gap between successful and less successful company performance increased. This implies that destabilising tactics used in more turbulent markets should lead to greater success than when stabilising tactics are used in such markets.

In the next two sub-sections stabilising and destabilising tactics will be discussed in more detail.

a) Stabilising

Hibbert and Wilkinson (1994) maintain that marketers' responses to a chaotic situation are predominantly stabilising activities. To understand this, it is necessary to define stabilising, but to define 'stabilising' the concept of 'stable' or 'stability' needs first to be defined. Stable is defined as "firmly fixed or placed, not easily displaced or over-balanced; maintaining or able to maintain equilibrium ...; not likely to give way or shift ... firmly established, not liable to destruction or essential change; fundamentally constant in composition or nature ... continuing without essential or permanent change" (The New Shorter Oxford English Dictionary, Vol. 2, 1993: 3018). Stabilising is defined as to "make (more) stable, give stability to" (The New Shorter Oxford English Dictionary, Vol. 2, 1993: 3017). Similarly, Webster's Third New International dictionary (Vol. 3, 1986: 2218) defines stable as "not subject to sudden change; subject to relatively limited fluctuation," and defines the concept of stabilising as "to make or hold steady; prevent fluctuation of; to limit fluctuations of (as business activity)". From a chaos and complexity perspective, stabilising is seen by Nilson (1995) as reducing the rate of change by encouraging negative feedback which brings the system back towards its equilibrium point, or to within its attractor boundaries. It is what Hibbert and Wilkinson (1994) refer to as 'damping change'.

In practice, stabilising activities can be conducted in a number of different ways:

- **Rationalising** marketing activities and product ranges can reduce complexity without reducing perceived value, since, many companies increase complexity without adding value (Sheth and Sisodia 1995a).
- **Isolating** the firm from the market turbulence. Hibbert and Wilkinson (1994: 229) suggest that, as competition increases, firms may increase market segmentation and product differentiation, thereby isolating their brand from competition and threats to its perceived attractiveness and ensuring a more stable market domain.
- **Buffering** the firm from unpredictable fluctuations by using 'disequilibrium mechanisms' such as inventory holding intermediaries, for example retailers and financial intermediaries, such as banks.
- **Achieving 'lock in'.** According to Nilson (1995: 79), by controlling the link between supplier and customer the supplier reduces the customers' ability to change suppliers, thus making the market more stable. Furthermore, distribution is often one of the largest costs in a business. Thus, it has potential for large savings and often for significant scale effects. Such savings can be shared between supplier and customer, thereby strengthening the link between them and increasing stability.
- **Creating Barriers to entry** - a large company can use advertising to minimise volatility, because the high costs of advertising can act as a barrier to entry, reducing competitive complexity and turbulence and by building brand loyalty, which is itself a stabilising factor (Nilson, 1995).
- **Relationship building** with an emphasis on personal selling can act as a stabilising factor in a smaller company that cannot afford the high costs of media advertising. Through sound salesperson-buyer relationships, the customers can be encouraged to remain loyal to the supplier, thereby increasing stability (Nilson, 1995).
- **Alliances** and the pooling of resources with other companies can enable "small and vulnerable companies [to] buffer themselves" when faced by a 'seismic shift' shakeout (Day, 1997: 102).
- **Building long-term relationships** with major suppliers reduces uncertainty in the vertical manufacturing chain, thereby increasing stability (Chae and Hill, 1997).
- **Collaborative customisation**, which requires raw materials or component parts being stocked instead of finished products, makes the firm less vulnerable to

demand fluctuations. Finished products are made only in response to the actual demand of specific customers. This also reduces costs by reducing the inventory stocking costs by the value added from manufacturing (Gilmore and Pine, 1997).

- **Reducing the importance** of a volatile or chaotic medium or activity. Nilson (1995) maintains that dominating and spending significant amounts in a specific medium increases the importance of that medium. By increasing the importance of that medium, the importance of another marketing mix dimension that is becoming more volatile and chaotic is downplayed, thereby defusing the volatility of the overall market.

The advantage of stabilising activities is shown by Thomas (1996, in D'Aveni, 1999) who maintains that performance in differing environments is affected by different approaches to rivalry. In stable environments, controlling and muting competition, i.e. stabilising, leads to better performance, while in turbulent environments it produces worse performance. Stabilising activities are advantageous in stable environments, but dangerous in turbulent environments. This is explained by McGlone and Ramsey (1998: 249) who maintain that, because of the fractal nature of complex systems, measurements become continuously smaller and never reach a conclusion. As a result "this obsession with minute details of a small component of a system clouds the overall picture." Thus, attempting to stabilise a complex and also turbulent system could lead to a degree of myopia and a misunderstanding of the dynamics of the system leading to incorrect tactical actions.

b) Destabilising

Glaser (1994: 3) believes that "strategic advantage can be obtained by changing the rules [of the game] or by deliberately creating turbulence." He dismisses the rule-based approach on the grounds that it makes strategic behaviour uniform and predictable. The implication is that creating turbulence or destabilising the system is the best way of developing a strategic advantage. To understand the role of destabilisation in a turbulent market it is necessary to first define it.

Destabilising is defined by The New Shorter Oxford English Dictionary (Vol. 2, 1993: 648) as to "deprive of stability, make unstable," while Webster's Third New International Dictionary (Vol. 1, 1986: 614) defines it as "to cause or allow to flow or fluctuate." In a more marketing oriented sense, Nilson (1995: 6) says that destabilising means the disrupting of a 'stable' environment, or reinforcing or increasing change in a particular direction. It also implies an increasing rate of

change, setting off events to change the marketing system (Nilson, 1995: 87), or unsettling the established market, often through guerrilla tactics. Another way of defining destabilisation is to see it as encouraging positive feedback, also known as 'the nudge' or 'butterfly effect,' thereby moving the system away from the status quo. Thus, destabilisation can be either small, seemingly insignificant actions that influence the environment, or large dramatic actions that cause dramatic shifts in the environment.

Most authors, such as Farrell (1998), Day (1997) and Kumar, Scheer and Kotler (2000), see destabilisation as radical, large, dramatic changes to the environment or to the market system. Pioneering companies achieve success by making radical innovations that come, not from researching customers' needs, but from visionary discontinuous leaps, resulting either from breakthrough technology or breakthrough marketing. These discontinuous leaps are usually based on "radical innovation on two dimensions - a discontinuous leap in the value proposition and the implementation of a unique business system" (Kumar, Scheer and Kotler, 2000: 130). Excellence in both is required for the innovation to be successful and in so doing pioneering companies change the 'rules of the game.'

The authors call such firms market drivers for three reasons: first, because they trigger 'industry breakpoints', which in chaos terms can be seen as bifurcations; second, they come not from traditional market research, but from a 'visionary' in the firm and third, because, rather than learning from customers, they often have to teach customers how to use and benefit from the new innovation. Such visionaries usually see opportunities to fulfil latent, unmet needs that others miss. They are often inexperienced in the industry and are not limited by the received wisdom in the industry. As such, these radical innovations often destabilise the industry by:

- Applying segmentation bases that are different to what the industry is accustomed
- Establishing new approaches to the setting of price points, thus often having lower prices for more value
- Instead of selling, the sales force differs by concentrating on educating customers, which creates a very different image of their activities in the marketplace
- Redesigning distribution channels is nearly always necessary to implement the unique business system. Innovative channels and channel management practices are introduced, including disintermediation, subcontracting, not using industry systems and increasing use of telecommunications technology

- Little money is spent on traditional advertising - the "buzz network", or word-of-mouth and encouraging reporters to write articles in magazines about the new innovation are used, building excitement amongst innovators and early adopters.

An example of this is the case of Gillette, which periodically disrupts its market by "...redefining the rules of competition", thereby forcing competitors to "play catch-up against a powerful new enhancement of the value proposition." They did this in 1998 by investing one billion dollars in development and advertising. In between such disruptions they perfect their offering. In other words, they establish "a pattern of stability punctuated by disruptions (D'Aveni, 1999:127)."

However, destabilising does not have to consist of large, radical moves. Smaller, continuous destabilisation is suggested by Bannister (in Palmer, 1997: 4), who refers to an 'interrupter' strategy which involves tactics that take the market by surprise through "quick forays - they are marketing's equivalent of hit-and-run tactics." This interrupter strategy can be seen as a form of destabilising tactic that throws the competition onto the defensive. This is supported by Glass (1996), who says, because of the danger of conceding an advantage to a competitor through self-reinforcing virtuous spirals, competitors should never be allowed to get away with small temporary advantages, which through amplifying feedback could rapidly become major competitive advantages. A 'chaos aware' company should always be watching for potential small advantages and using them, rather than leaving them for the competitors.

Regardless of the magnitude of the destabilising action, destabilising can result in either permanent or oscillating change to the system. A combination of temporary changes, such as price cuts, may permanently change a company's market share. Simon (in Farrell, 1998: 44) terms this 'hysteresis' and describes it as follows:

> "First, a favourable external situation must emerge, which a company must spot early and interpret correctly ... then the company must take an unusual, innovative action to surprise its competitors and prevent or delay their reaction."

These destabilising actions provide a shock to the system that permanently alters the market position: in chaos terms a change in phase state. Hibbert and Wilkinson (1994) agree that permanent change is possible, but only if truly innovative and dramatic destabilising changes are made. Then, it may be possible for one firm to significantly restructure, reinvent or recreate the market. This is often known as

'changing the rules of the game', which Kumar, Scheer and Kotler (2000) agree can come about because of radical innovations.

Many authors see destabilisation as a process leading to oscillating changes. That is, changes that keep nudging the system towards chaos, in opposition to stabilising forces pulling it back towards equilibrium, thereby attempting to keep the system balanced at the edge of chaos. Thus, destabilisation does not necessarily result in permanent changes. Hibbert and Wilkinson (1994: 229) imply that, under certain conditions, destabilising can be a valid response to chaos. Where there is a "more rigid, homogeneous type of response to stimuli ... the resulting complex dynamics and chaos create incentives to change behaviour strategies and/or leave the market." Thus, in a stable, uniform market facing chaos, firms might best respond by making significant changes, or destabilising actions, in order to change the system to a more heterogeneous one which will eventually revert to stability. This implies that the marketer must take continuous action to keep the system balanced at the edge of chaos.

There are two ways of coping with a turbulent environment through destabilisation. The first is to disturb the system by increasing the rate of change by, for example, continuously launching new products, or developing new ways of doing business or communicating with customers. This upsets conventions, thereby destabilising a market in order to benefit the brand. Ansoff (in Dru, 1996: 72) said "growing levels of turbulence signals a time not to react but to anticipate," upsetting the market by doing things differently. Such disruption, he says, prevents customers from becoming blasé and losing interest in the brand. It causes them to think about the brand and update their relationship to it. It does this by creating disorder and creating change, keeping the brand ahead of its competitors. The second method of coping with a turbulent environment through destabilisation is to try to encourage the unstable system to move in the required direction by, for example, "launching a specific type of product or pushing the price level down by X per cent (Nilson, 1995: 88)." A similar approach is that of Addison (2000), who maintains that more information causes uncertainty in the consumer who is then driven to find out more to reduce the uncertainty. This is the reverse of the traditional role of marketing information, which is seen as being to reduce uncertainty and create trust in the consumer's mind. Thus, providing product information can be seen as a form of destabilisation. Addison suggests that providing more information can destabilise the relationship between a consumer and their

current supplier or product, setting them off on a new search which the marketer can take advantage of.

It is interesting to note that the introduction of new communications technology, specifically e-commerce, is destabilising and will continue to destabilise nearly every environment (Moeller, 1999).

For destabilisation to work and for companies to be able to take advantage of the opportunities it presents, there are a number of actions that have to be taken.

- “An appreciation of what makes people 'tick', plus an ability to capitalise very quickly on a topical situation" is needed (Bannister, in Palmer, 1997: 4). In other words, a good understanding of customers and flexible and quick reactions are needed.
- This destabilising approach carries a high risk, as the outcome cannot be predicted with any degree of certainty. It is necessary, therefore, to have effective feedback loops in place in order to monitor the change in 'real time' so as to be able to take corrective actions, continuously 'nudging' the system in the direction required (Nilson, 1995).
- In addition to destabilising actions, firms must perfect their product and marketing offering between disruptions. In other words, they establish “a pattern of stability punctuated by disruptions” (D'Aveni, 1999:127).
- The destabilising activity must be unusual and innovative to surprise competitors (Farrell, 1998).

When destabilisation is well done, it has certain advantages.

- According to Day (1997: 101), those who "force the shakeout on their own terms" are able to compete in a new environment on their own terms.
- Glaser (1994:3) maintains that a “strategic advantage can be obtained by … deliberately causing turbulence” and implies that this is advantageous because the resulting strategic behaviour is not uniform or predictable.
- According to Hibbert and Wilkinson (1994: 230) innovative and dramatic destabilisation change the rules of the game, thereby enabling the firm to “restructure, or reinvent, or recreate the market” to their advantage.
- Hibbert and Wilkinson (1994) imply that destabilisation discourages tight coupling, which often leads to unpredictable instabilities in other parts of the system. Conscious destabilisation enables the firm to face known and anticipated instabilities, rather than the unknown and unexpected.

- Millier (1999) found that all the successful companies in his research experienced chaos, while all those that did not experience chaos were unsuccessful.
- D'Aveni (1999), quoting a study by Thomas (1996), proposes that companies in hyper competitive, or turbulent markets, can profit significantly by increasing the rivalry in the market (equivalent to destabilising) rather than trying to dampen it. He maintains that companies that understand this can strengthen their supremacy by introducing competence-destroying disruptions that harm the competitors, or by introducing competence-enhancing disruptions that strengthen their own positions.
- Addison (2000) suggests that providing more market information can destabilise the relationship between a customer and their current supplier, setting them off on a new search that the marketer can take advantage of.
- Dru (1996) maintains that disruption keeps customers interested in the brand so that they update their relationship to it, thereby keeping the brand ahead of competitors.

Despite these many advantages, there are disadvantages to instigating chaos or disruption through destabilising actions.

- According to Nilson (1995), the destabilising approach carries a high risk because the outcome cannot be predicted with any degree of certainty.
- Hibbert and Wilkinson (1994: 230) believe that destabilising actions could be a dangerous response to chaos. They found that many of the key parameters that drive the system dynamics, such as "market size, degree of competitive interaction and responsiveness of competitors" are outside the control of individual competitors; actions by one competitor are unlikely to change the market system significantly and may, in fact, not work at all.
- Unless the firm has a detailed understanding of the market dynamics and the key parameters, any destabilising action could “move the system from one region of chaos to another or from simple to oscillating regimes or even to chaos” (Hibbert and Wilkinson 1994: 230).

Finally, it should be noted that destabilising activities could act as control mechanisms in a turbulent market. Fitzgerald and van Eijnatten (1998: 269) believe that a manager should act "as a 'provocateur', prompting, perturbing and propelling the organisation to the edge of far-from-equilibrium." Nonaka and Yamanouchi see the "creation of chaos as the greatest source of variation in the organisation,” and

Polley suggests the "intentional generation of chaos" (in Fitzgerald and Eijnatten, 1998: 209). All these authors see destabilising as a process for 'controlling' or coping with chaos. Glass (1996: 105) suggests that double-loop learning, working to reach new attractor points and creating self-reinforcing virtuous spirals are ways that firms can use destabilisation to control chaos.

4.4.6.3 Marketing strategy and planning

Since marketing mix tactics are based on marketing strategies (Kilter and Armstrong, 1999) and marketing plans, it is necessary to understand how marketing strategy is influenced by environmental factors by viewing it through the lens of chaos and complexity theory.

Nilson (1995: 54) looks at marketing strategies from a chaos theory perspective, believing that the nature of a company's competitive position will influence its use of stabilising or destabilising marketing strategies. Brand leaders should achieve a pace of change a little faster than the change in the external environment. Typically, this will involve using the stabilising dimensions of advertising and product enhancements and tightly managing the more volatile variables like price. Not to change, or to change too slowly, can encourage competitors to challenge the leader's position. It should also be remembered that the results of even stabilising activities couldn't be guaranteed in a dynamic market system, as it is by definition unpredictable. If a brand leader is challenged, it should react quickly by countering the competitor's moves, or it should increase its offering through the use of stabilising factors. Thus, Nilson (1995) suggests leaders should only use stabilising factors.

Challengers should take advantage of a dynamic market by destabilising the market leader, or should exploit the dynamic changes better than the market leader. The challenger will tend to use more destabilising factors, such as price promotions and new product development. The use of the 'nudge' factor (sensitive dependence on initial conditions) is also likely to be higher because the multiplier effect works faster during times of rapid change. Thus, Nilson (1995) suggests that challengers should use destabilising tactics.

Mohr (2001: 47) seems to disagree that leaders should use predominantly stabilising tactics. She maintains that companies in changing environments must not allow their core competencies to become core rigidities, creating lock-in to old or obsolete technologies or products and hindering new product development. This could happen if a firm concentrates on stabilising tactics that tend to keep the firm and its environment in equilibrium. To avoid this she suggests 'creative destruction', which involves continuously innovating in order to

make the firm's own products obsolete and to replace them with the firm's own developments. Continuous leadership in a market is not possible without this creative destruction. This can be seen to be continuous destabilisation.

This destabilising approach is supported by Wilson (1999: 33) who indicates that, in volatile technology-intensive markets, "reactive, follower strategies" might be superior. This is because of an organisation's inability to implement truly proactive marketing strategies due to their slowness in perceiving competitive actions, responding to customer initiatives and abandoning outdated strategies. True strategic change seems only to happen when it is forced on the organisation by environmental threats. Thus, success in a turbulent market may be linked to reactive, but innovative and thus destabilising, strategies.

This is supported by Golden, Johnson and Smith (1995: 17), who found that the Miles and Snow reactor type of companies (no effective marketing strategy) in post-Perestroika Russia (a very turbulent environment) had a high level of strategic marketing awareness and perceived marketing to be more important than did the other types of companies. They conclude that the reactor type of strategy might be a valid strategy in turbulent transitional economies.
Strategies that attempt to predict the future and then adapt to that future appear to be inappropriate for complex and turbulent environments.

Tasaka (1998) maintains that the future in complex systems cannot be predicted because of their sensitivity to small fluctuations and because the basic rules governing the system can continually change. "Self reference can cause the predicted future of an ecosystem of products to terminate" so the best way to predict the future is to invent it (Tasaka, 1998: 6)." This is corroborated by D'Aveni (1999: 128), who implies that being 'adaptive' is not sufficient as this means adjusting to the environment others have created. He maintains that the firm with "strategic supremacy" can achieve significant advantages, not by niche marketing, but by redefining the "definition of value and how it is delivered."

Manning (1991: 74) agrees with the above but for different reasons. He believes that, although the future cannot be predicted, "if you look hard enough there are clear signals of what does lie ahead." Using these signs, a firm can stay one step ahead of its customers, not reacting to customers needs but 'pre-acting' to shape these needs. This is essential; as customers do not always know what products they want. Although this seems to be the reverse of traditional marketing wisdom, it is supported by other authors such as Wilson (1999) and Mohr (2001), who believe customers are often not aware of their needs or of

alternative ways they can be satisfied. It is, therefore, the marketer's responsibility to "escape the tyranny of the served market" and "get out in front of customers", leading them to new needs they are not aware of (Manning, 1991: 74).

With reaction and reinventing, or redefining, the environment as probable effective strategies for complex and turbulent markets, the value of long-term planning as a means of developing strategies is dubious. Farrell (1998) believes that long term planning is not applicable because of the speed at which complex systems change. It is better, he says, to use a series of short-term tactical moves to create the desired future. The key issue is to adapt or grow tactically based on bottom-up information from customers, not top-down planning. This does not contradict Mohr's (2001) attitude to the customer, as it is possible to obtain information on needs about which the customer is not aware. Nilson (1995) also believes that long-term planning is of dubious value. In today's volatile markets, planning should be done on a quarterly basis with a rolling twelve month plan. Furthermore, the plan should concentrate on "understanding the customers, ... focus[ing] on how to implement and ... preparing for the unknown by looking at alternatives" (Nilson, 1995: 168). Built into the plan should be fast, continuous feedback through both formal and informal feedback loops. He also stresses that traditional budgets are less important than real time feedback of costs, expenses and sales and profits, which is possible with modern computer systems.

This short term planning focus is supportive of the concept of strategy as sensible, continuous and conscious experimentation (Chattell, 1995; Wilson, 1999). These authors believe strategy is ensuring the company is always ready and prepared for unexpected changes. This is achieved by availability of expertise and knowledge, continuous innovation, flat, flexible structure with good communication, delegation of strategy development, openness to learning and change and closeness to customers and suppliers. Such an approach is partially supported by the research of Davis, Morris and Allen (1991) into a suitable structure for risk taking and the search for opportunities in turbulent markets.

Other key aspects of marketing strategies for turbulent environments are given below.

- Knowledge of and experience in, the market – how it develops and reacts to marketing tactics and the causes of success and failure. In complex systems this takes time to accumulate (Nilson, 1995).
- Marketing orientation is essential, as a firm is an 'open system' relying on environmental interaction for success, in contrast to an organisation that "defends itself against the environment" (Kumar, Subramanian and Yauger, 1998: 17).

- The use of 'lead users' to generate breakthrough ideas. Lead users are customers who are at the cutting edge of their own industry, ahead of the average user in terms of needs and solutions to those needs. Breakthrough ideas often come from customers and not from manufacturers or suppliers. The lead user approach is predicated on development of partnerships, building of trust and longer-term relationships (Mohr, 2001: 47).
- Being first with any new development because of the effect of sensitive dependence on initial conditions. This first mover advantage can sometimes provide sufficient of an initial small advantage to result in a significant advantage over the longer term (Koch, 2000). However, Nilson (1995) stresses that superior implementation and execution is still required. Markets will not accept dubious quality products that are later rectified and perfected in the market.

These new approaches to strategy do not undermine the importance of marketing. Hooley and Beracs (1997: 157) found that the best performing companies exceeded the rest in all aspects of marketing: using superior service to build relationships, investing in strong brands and using public relations/direct marketing. One important difference was that the poorer performing companies believed more strongly in the importance of keeping prices down. Burgess (1998) maintains that many authors suggest that analysis is not possible in turbulent times. He maintains that the opposite is true and that this can be achieved by automating analysis and using artificial intelligence systems to provide analyses in real time. Thus, it can be seen that, within the strategy framework discussed above, sound marketing can still be performed.

4.4.6.4 Marketing information and research

Effective marketing strategies and tactics are dependent on sound information about the environment and market. Usually, this is provided by historical sales and marketing statistics, marketing research and marketing intelligence, which are then used to forecast and predict the future environment. According to Menon and Varadarajan (in Vorhies, 1998) managers in a turbulent environment have an even greater need for market information. In a chaos or bounded instability environment, companies need the type of information that will help them cope with the future. Detailed, comprehensive financial historical data is not of much help according to Glass (1996: 105). This is so because businesses are fractal, in that no single business situation is exactly the same and thus the past does not help with prediction (Koch, 2000). In addition, Priesmeyer (1992) maintains that forecasting the future in a turbulent market is not possible because the future state of the system is determined by

its current state and the future forces that will act on it. In a market situation there are so many interacting variables and forces that it is not possible to predict them all.

Since long term planning in a chaotic system is almost irrelevant, continuous monitoring and modifying becomes more important. In order to monitor what is happening in the marketplace feedback loops are essential. Formal feedback loops include sales statistics and reports, customer complaint records, surveys of attitudes and other market research reports. Informal feedback loops are also important and include talking to customers and reading about and observing what is happening in the marketplace. Feedback loops must work quickly to enable managers to react swiftly as the information from formal and informal feedback loops produces patterns that can explain how the system might behave in the future. Glass (1996: 105) agrees, maintaining that what is required is reporting feedback on "current operations - are we efficiently making, delivering, serving, or whatever our core activity is? [and] strategic direction - are we developing our people, customers and suppliers so that when half-expected or unexpected threats or opportunities arise, we are aware and able to react to them?" This requires approaches such as 'lead and lag indicators' and 'balanced scorecards' and not just past financial performance.

Such continuous monitoring and feedback enables discontinuities to be anticipated. Where dynamics are not clear, which is the case in complex and turbulent markets, it is possible to get hints from similar markets that are further along in terms of the change, or from similar markets in other countries or regions (Day, 1997). Other authors believe research and information on understanding why customers buy or do not buy (Nielson Marketing Research, 1992; Diamond, 1993) and understanding the profitability and competitiveness of brand strategies (Marks et al., in Tedesco, 2000) are more important than prediction in turbulent environments. Scenario planning is seen by some authors (Day, 1997; Barnett, 1996; Modis, 1998) as a good way of identifying and anticipating future directions the system could take, rather than trying to predict a specific direction. This is consistent with the belief that identifying and understanding the patterns of forces in the environmental information that have been influencing the system in the past can help in predicting how the system will develop in the future (Priesmeyer, 1992; Nilson, 1995). According to Koch (2000), since businesses are fractal, a limited number of patterns of actions tend to repeat themselves. Therefore, experience in pattern recognition in the industry is more important than detailed analysis. Nilson (1995) and Day (1997) also stress the importance of business and industry experience for accurate interpretation of the patterns in a turbulent and changing environment. Koch (2000) maintains that decision-making based on experience and intuition

is often superior to rational decision-making based on analysis. It should be noted, though, that he implies that both analysis and experience should be used to support each other.

Based on such pattern analysis, Priesmeyer (1992) maintains that a marketer should envision a future based on the system's current state (for example, a product's market position) and an understanding of the pattern of forces that seem to have been influencing the system. Marketing activities are then undertaken to nudge the system towards that envisioned future. He stresses that this is not just goal setting. It is visualising the future based on patterns in the rates of change that have not been seen before, patterns only provided by chaos theory.

Progress towards the envisioned future is incremental, with each specific increment being encouraged by various marketing tactics. This explains why short-term forecasting is possible (the immediate variables are fairly well-known and influenceable), while longer-term forecasting is not (the future variables are not known as they will be influenced and changed by future actions). This approach is consistent with that of McGlone and Ramsey (1998), who suggest that instead of trying to predict what will happen if something is done, the boundaries of possible outcomes should be predicted. In other words, only certain outcomes are envisioned. This approach is valid because chaos and complexity theories show that causal connections are lost due to the unpredictability of complex systems, so predicting a future state is not possible, but envisioning possible states within boundaries is possible because of the strange attractor concept. Actions can thus be initiated to ensure that the system remains within the boundaries, but not statically so.

More advanced complexity based approaches, such as neural networks and artificial life simulations, are suggested by Tedesco (1998; 2000). Neural networks do not require the assumption of independence among the independent variables, do not require the shape of the distribution and the relationships to be known and can cater for hidden conditional probabilities. The "characteristics of a neural net include self-organization, fault tolerance, adaptive learning and most importantly, the ability to deal effectively with the contradictions, errors and inexactitudes of real world knowledge" (Tedesco, 1992: 3). Models using neural network pattern analysis are being used for forecasting and to identify the relative importance of causal variables in sales forecasting. They are being successfully used in research into purchase intent, pricing models, shopping patterns, media habits and brand awareness (Tedesco, 1992). Furthermore, Tedesco shows the vast superiority of neural networks over statistical methods in forecasting and prediction based on marketing and economic data. Tedesco (2001a) explains that neural nets are correct nine times out of ten when forecasting

one month ahead, whereas a multiple regression analysis based on the same data was correct only once out of five times. The neural network model's strength is its ability to determine the non-linear relationships in the data and through a sensitivity analysis, to identify the relative importance of the independent or causal variables.

Complexity based neural networks seem to be a technique suited to the world of complexity and uncertainty - the world of marketing at the edge of chaos - and are a marketing research technique that would be of assistance in developing marketing strategies. One of the reasons why neural networks are so successful and why they are so suited to complex and turbulent environments, is because they have a "...facility that ponders all information that is collected in the marketplace" (Tedesco, 1992: 3). In other words, neural networks do not simplify or deconstruct or focus only on apparently important issues, and therefore do not ignore seemingly insignificant initial conditions, which is one of the cornerstones of a chaos environment.

Daft and Huber (1987, in Sinkula, 1994: 41) maintain that "the highest levels of information processing occur when the organization is (1) in a rapidly changing environment, (2) in an emerging (i.e., young) industry, or (3) undergoing rapid technological development." They also propose that "under conditions of high environmental change, increasing the supply of market information will result in increased information distribution, interpretation, storage and organizational learning."

This section has shown that market information is still critically important to marketing, but it is information of a different type: information to understand behaviour and to identify patterns, rather than information to predict or forecast the future of the market and industry. Furthermore, the importance of information being disseminated to, and collected from, knowledgeable and experienced people throughout the organisation has been stressed.

4.4.6.5 Dealing with customers

There are two ways that a company can handle their customers in a turbulent and complex environment.

- Serve a single customer: Provide the sales relationships, products and services to match the infinitely diverse and changing demands of individual customers, one by one.
- Act in zero time: Meet customer's demands and exploit market opportunities instantly by means of simultaneous enterprise-wide collaborations and action (Fradette and Michaud 1998).

These two goals summarise the key issues that must be emphasised in managing the marketing tactics necessary to satisfy customer needs in a turbulent environment.

The first key issue has to do with providing unique products, for individual customers, through the type of relationship that the customer wants (Fradette and Michaud, 1998). Unique products are those that are designed to meet a customer's specific needs: products that are personalised through involving the customer in the design and through enabling the customer to choose from many permutations. To achieve this the firm needs customer contact staff who know the 'whole picture' of a customer, or multidisciplinary teams who can focus on a specific customer requirement. This is similar to Pine, Peppers and Rogers' (1995: 103) "one-to-one relationship." This close, personal, learning relationship enables the company to continuously understand the customer's needs better than their competitors and to maintain a competitive advantage and keep the customer's business almost forever. The time the customer invests in this relationship increases their switching costs, while the time and cost that has to be invested by the supplier makes it feasible to build these learning relationships with the best, biggest, or most valuable customers. Another benefit of this personalisation and customisation of the relationship is that they make customer's demands unpredictable for competitors, but controllable by the company. They also provide new, unusual products that are then available for sale to other customers. This keeps the company at the leading edge of customer requirements, or at the edge of chaos, which they can cope with, but competitors cannot (Fradette and Michaud, 1998). In addition, once such a product or service has been provided, it becomes part of the company's knowledge base, available for use by all other workers and for all other customers, and is thus a form of corporate learning. This approach also allows changes to happen more slowly, with staff gradually building their skill and knowledge levels. The process is evolutionary. In effect the company's approaches and processes emerge from hundreds of simultaneous customer interactions. This is consistent with the view of organisations as self-organising, emergent systems. In this way it is possible for the company's strategies and their marketing tactics to emerge from the continuous activities of their employees, rather than being passed down by top management. This is not inconsistent with the need for quick or instantaneous responses, because this accumulated knowledge is available throughout the company and is instantly available to facilitate quick responses when needed. This approach is supported by Cross and Smith (1995) who believe marketers need to bond with their customers through continuous in-depth knowledge of their likes. This requires marketing to be based on an information core, and on some method of communicating directly with each individual marketer, for example, direct database marketing.

The second of the key issues is the ability "...to spur the enterprise into instant action" (Fradette and Michaud, 1998: 20). This requires broader skills than the usual, specific, discipline-oriented skills. Organisational, communication and innovative skills are required of all employees. Each worker must have the skills and knowledge, through information technology to communicate, liaise and operate with all other workers. This enables the firm to be poised for mobilization and instant innovation. Other methods that can be implemented to achieve this are using technology to create rapid placing and supplying of orders (Fradette and Michaud, 1998) and incorporating customers and vendors into the design and development processes to speed up new product development (New Marketing Imperatives Roundtable, 1994). Conner (1998: 60) agrees on the necessity for a responsive process that can "provide what the customer wants now [and can] react quickly to unanticipated needs." Allowing individual workers to react enables a company to satisfy unique customer requirements that have not and could not have been planned for. This quick action, or reaction, enables a firm to destabilise by creating discontinuities, or a chaotic environment, for their competitors, but not for themselves (Fradette and Michaud, 1998). This approach has the advantage of effectively creating a future market environment for the company that its competitors cannot predict, but have to cope with. In other words the competitors will continuously be 'playing catch up'.

To achieve the rapid, personalised and customised products and services required in a complex and turbulent environment it appears as if close relationships are required. According to Cova (1996), consumers are unpredictable and from a post-modern perspective can only be retained by building strong relationships with them. Furthermore, post-modern consumers want to be involved in constructing their own world and therefore participating in the customisation of products is important to post-modern consumers. Manning (1989) stresses the importance of ‘hands-on research’ as opposed to traditional, formal market research: executives talking face-to-face with customers, retailers and wholesalers, which implies close relationships with all the stakeholders.

It should be emphasised that ‘relationships’ do not necessarily imply long-term relationships, but should be the type of relationship that the customer wants. Customers define the type of relationship they want with the company, for example, a close, integrated and personal relationship versus an arms-length, transaction-oriented relationship, both of which and any mix between, the companies should be able to accommodate. This involves the following.

- Allowing customers to choose which type of channel, or mix of channels, they wish to use.
- Making all the resources and knowledge of the company accessible to a customer.
- Making the database record of all customers' preferences accessible to all staff.

- Allow staff ready access to resources to satisfy customer demands immediately.
- Building a network of suppliers who can provide just-in-time, made-to-order goods (Fradette and Michaud, 1998: 184).

Wilkinson and Young (1998) believe that there are both advantages and disadvantages to long-term relationships. Co-operative longer-term relationships benefit companies by better adapting products and services, leading to lower costs in delivery, stockholding and communications that result in lock-in, which makes it difficult for competitors to attract customers away. However, such lock-in has disadvantages that must be guarded against. Firms can become myopic, limiting their consideration of better alternatives, leading to increased costs and reduced efficiencies and partners can be taken for granted and neglected, which opens the partnership to destabilisation by competitors. A balance is required to maintain existing relationships while at the same time searching for new relationships. The authors suggest that this should be done by having a portfolio of relationships, i.e. longer-term relationships to exploit the benefits of the relationship and shorter-term relationships to explore the environment for new opportunities. In other words, they maintain that short term relationships can be beneficial, especially in a very turbulent environment, where the company needs to keep itself open to new, developing opportunities outside their traditional relationships, especially in the area of technology. This is supported by Low (1996) who points out that, despite the emphasis on the importance of long term relationships, short-term opportunistic relationships are often appropriate and to be encouraged.

This is especially true in situations of rapid technological change, or turbulence. Wilkinson and Young (1998) concur, maintaining that firms operating in dynamic or turbulent environments, such as the telecommunications and computing industries, are likely to explore the environment for new relationships to better cope with technological or deregulation developments, in addition to maintaining their exploitation activities via longer-term relationships.

From the above it can be concluded that determining appropriate techniques for handling customers is critical in complex and turbulent environments.

4.4.7 Marketing mix

Marketing tactics are made up of the marketing mix – product, price, place and promotion. Morris (1996a) maintains that in traditional marketing, product, price and place are established and considered as essentially fixed, with only promotion being considered variable. In a turbulent market though, he maintains all of the marketing mix variables should be considered as continuously variable. This is supported by Tedesco (1998) who confirms that, from a complexity perspective, the marketing mix variables interact to drive product sales. Therefore, it is necessary to consider all of the marketing mix tactics when investigating how they are influenced by the nature of the environment. Tedesco (1998) maintains that, since a consumer decision can be understood as a complex dynamical system, more accurate marketing mix resource allocation is possible when complexity techniques are used. In the pages ahead each mix element will be discussed from a chaos/complexity viewpoint.

4.4.7.1 Product

Product is usually the first of the four Ps to be determined when designing the marketing mix and as such, according to Morris (1996a), is the most important component in the marketing mix. One of the most common ways of managing the product component is through the product life cycle. Priesmeyer (1992) suggests that the product life cycle, which is a plot of the trajectories of two variables (sales and profit) over time, represents the forces in a non-linear system. Since the product life cycle has a common or generic shape, it can be assumed that there are forces that cause the variables to follow a common pattern. Furthermore, it indicates that there is an attractor that limits the behaviour within certain boundaries during the life of the product. In order to prevent the product from following its pre-ordained and deterministically defined path to decline, it can be encouraged to break from the attractor and create a new trajectory (that is, a new product life cycle) by means of innovative or dramatic marketing tactics. These could be the more common 'finding new uses for the product', but also new target markets, new ways of distributing or promoting the product, or associating it with emerging environmental issues. Therefore, viewing the product life cycle as a representation of a chaos system enables a marketing manager to gain new insight into managing a product during its life.

As has been implied above, new product development is one of the most important chaos/complexity oriented tactics that a marketing manager can apply. Applying the product

life cycle concept, Modis (1998) maintains that product mutations grow at the start and at the end of the product life cycle and the more there are, the better the chance that some will survive and become established. In other words, the more bifurcations there are in the flow of products the greater the chance of success. Therefore, destabilisation and chaos should be encouraged in order to cause bifurcations as a product development strategy. This is supported by Nilson (1995), who maintains that introducing a totally new product is one way of introducing chaos into a market, i.e. destabilising an existing market.

However, for such an approach to be successful the company must be prepared to take a longer-term view, but must also be prepared to act innovatively in the short term to take advantage of unanticipated and unpredictable opportunities that might arise. In other words, "short lead times, fast feedback loops and good understanding of customers" is necessary (Nilson, 1995: 88). Chae and Hill (1997: 18) also emphasise the short term approach to product planning to "raise the efficacy of new product launches," namely short term programming of the specific steps to launch a new product, which is also proposed by Nilson (1995), who rejects the approach that many products should be brought to market and perfected there. Rather, superior execution of marketing activities must be aimed for, including detailed planning of implementation.

Thomke and Reinertsen (1998) also propose the short-term approach, but emphasise flexibility in product development because of the shifting product development environment. The shift is being caused by increasing product complexity and by the increasing rate of change in most markets. These changes are being driven by the increasing speed of technological development, and also technological obsolescence, and unstable and rapidly changing customer needs. This has led to the lack of forecasting effectiveness and the resulting need to eliminate long-term forecasts. Since obtaining information for forecasting in these circumstances is nearly impossible, they suggest that development flexibility is a viable alternative. This involves development systems that can handle the risk of design changes, that can make late design changes to better meet customers needs and that can avoid design changes entirely because design specifications and commitments can be made very late in the process. This developmental flexibility is supported by Golden, Johnson and Smith's (1995) study of Russian firms that showed the importance of a relationship between adaptability and new product development and Morris's (1996b: 13) suggestion that, in a turbulent market, "... a continual stream of new lines, additions to lines, product and service improvements/revisions, new applications and repositioning efforts" are required. Numerous trials, test markets and experiments are required.

This concept of short-term adaptability and flexibility becomes even more important when the effect of information intensity is considered. Information intensive firms, such as high technology firms, have shorter product life cycles, and such firms, which usually operate in complex and turbulent markets, have less time to launch and establish new products successfully (Glazer, 1991). Thus, flexibility and quick adaptation is essential. This need for quick, flexible product development and marketing, challenges Nilson's (1995: 112) rejection of the 'shotgun' approach of "...launch[ing] a number of ideas and throw[ing] them on the market in the hope that something might succeed." His 'rifle' approach that "...concentrates [limited] resources, … shows respect for the customers' time and operations and forces discipline into the organisation" is impractical in a fast moving, highly competitive market, with a short product life cycle. For a successful and quick product launch of a technological innovation the firm must be prepared to refine the product after launch. In other words, "you may not know if you have a marketable product until post-launch" (Lynn et al., 1999: 324). Taking this idea a step further, Samli (1993: 72) suggests that, although the future cannot be predicted, it is still necessary to develop and launch products which "may not be satisfying existing needs but will satisfy needs of the future." This implies launching products that can "create the future environment for the firm."

While the above stresses many quick, flexible product development activities, products of dubious quality and which may fail in the market cannot be afforded (Nilson, 1995). Benkenstein and Bloch (1994) agree, maintaining that a high quality strategy is best for companies marketing complex, high technology systems, as it can prevent, or slow down, entry of competitors to the market, it can encourage early adoption of the product and it can justify higher prices, thereby reducing the pay back period through shortened product life cycles. Related to a high quality strategy is the need to deliver unique benefits and product value beyond the users' expectations (Cooper, 1994; Williams, 1994). Cooper (1994) found product superiority to be the one dominant success factor. This superiority included unique attributes, value for money, superiority in meeting customers' needs, excellent relative product quality, superior price/performance characteristics, benefits easily perceived as useful by the customer and visible benefits obvious to the customer.

In addition to the above product planning issues, decisions relating to the product range are also important. There appears to be some conflict regarding whether ranges should increase or decrease. Morris (1996b: 13) proposes that, in a turbulent market, "... a continual stream of new lines, additions to lines, product and service improvements/revisions, new applications and repositioning efforts" are required. Millier (1999) supports this approach, stressing the importance of encouraging chaos and destabilisation during new product

development in order for proliferations, or bifurcations, to take place. This increases the likelihood of the product being developed correctly and in line with the consumer's needs. The chaos enables the product to develop as the customer uses it, with the 'perfect' product emerging from the inter-relationships between product and customer use. This implies that in turbulent markets an increase in the range can be expected.

Nilson (1995) warns against unnecessary range extension as this, he says, can destabilise a brand's position by encouraging consumer disloyalty and reducing benefits of scale in distribution. He also stresses the importance of making pack design changes gradually. In a turbulent market, familiarity and recognition are important. If changes are too dramatic, the company will lose identity and thus loyalty. Therefore, gradual pack changes are necessary to maintain stability (Nilson, 1995). Benkenstein and Bloch (1994: 3) recommend that high tech marketers concentrate on a limited range in order "to capture potential technological synergy" so as to capture and maintain market leadership. An example of this is provided by Schiller, Burns and Miller (1996: 98). In order to cope with the chaos caused by their product and promotional complexity, Procter and Gamble instituted a simplification programme, reducing the number of product variants and reducing their deals and coupon promotions, which has had the effect of reducing costs and increasing sales.

It should be noted, however, that the supporters of reduced ranges are all assuming a stabilising stance in turbulent markets. From this it can be concluded that increasing the range would be a destabilising type activity and would be recommended where destabilising tactics are preferred. It should also be noted that the growth of flexible manufacturing has enabled companies to achieve mass marketing and customisation. This means that the specific local needs of customers can be met through enlarged ranges without losing economies of scale and rapidly changing market needs can be satisfied more profitably (Nilson, 1995).
Despite the above, Benkenstein and Bloch (1994) also recommend a customising, as opposed to a standardised, strategy so as to tailor the product to win specific target customers over the long-term. Thus, customising involves extending the range, but without the disadvantages highlighted previously.

Manning (1991: 41) justifies the importance of range enlargement through customisation, by explaining that customers are "being actively hooked into the value-creating process as early as possible." This enables the consumer to 'create' their own product by combining various elements, rather than accepting the product as presented by the supplier. This is important because the customers' choices reflect what they really want and the product then becomes

'their product', creating ownership and tying them to that supplier. The development of such customisation has meant, "innovating close to the customer," which implies:

- a sensitivity to the customer's needs (Kashani, 1995),
- an increasing importance of the service component of products (Roberts, 2000),
- increasing information intensity which leads to more customer participation in product design and creation (Glazer, 1991),
- increased permeability of the firm's boundaries, thereby integrating customers into their product development system.

This integration enables the firm to understand its customers so well that it can satisfy their needs before their competitors are even aware of these needs (Baskin, 1998a).

Such customisation, according to Gilmore and Pine (1997), can involve revisions to the product itself, the packaging (shipping containers, labels, instructions, storage features), marketing materials (brochures, flyers, client references, videotapes), placement (delivery frequencies and procedures, point of purchase displays), terms and conditions (payment and discount terms, warranties, ordering policies, service), product names (co-branding, club membership, frequent customer privileges) and stated use (advertised purpose and operation, benefits to a specific user.)

While range increase appears important in complex and turbulent markets, range reduction, or culling of products from the range, is equally important, because 'parasites' (slow sellers with limited market appeal) drain resources from the marketing system (Nilson, 1995). The previously mentioned Procter and Gamble simplification programme is an example of how culling can have the effect of reducing costs and increasing sales. In addition, since product life cycles are getting shorter, it is necessary to develop new products quickly and continuously. Morris (1996a: 36) quotes Akio Morito of Sony: "our fundamental task is to make our own products obsolete." Culling, or cannibalising the company's own business, in order to keep ahead of competitors is important. Grulke and Silber (2000: 201) stress "The worst time to act is when you no longer have a choice and your options are limited", implying the importance of proaction - changing your own environment by culling existing products and developing new products, thereby disrupting the environment for the competitors. Kumar, Scheer and Kotler (2000) support this, maintaining that 'market drivers' are prepared to cannibalise, or make obsolete, their core business, because if they do not do it, with some control, somebody else will do it, outside of their control. A further justification for culling is provided by Mohr (2001), who maintains that because many 'high tech' products do not reach maturity because of the short product life cycle, high tech firms have to continuously bring in innovations that make their own products obsolete.

In addition to range enlargement and range reduction, range improvement or enhancements (also known as old product development) are also important. Roberts (2000), in stressing the growth of the service component of products, implies that existing products are improved, or enhanced, by adding a service component. Nilson (1995: 102) also discusses product enhancement or old product development (OPD). Products that are "at the core of a range and company, solid and with a large sales volume" (Nilson terms them 'builders') should be maintained and supported by investing in their development and "enhancing their tangible as well as intangible aspects." Therefore, stabilising activities are more relevant for these products. Regarding 'wobblers' (a product that could either improve into a 'builder' or degenerate into a 'loser'), he maintains that such products should be assessed to see if they could be improved. If so, feedback loops should be created to monitor them and actions taken to enhance them.

Using chaos principles, this can be done by means of:

- nudging the product in the direction required (sensitive dependence on initial conditions)
- speeding up change by changing the marketing system (moving closer to the edge of chaos)
- introducing some innovation to give it a competitive advantage (increasing bifurcations)

Nilson (1995: 108) believes such old product development is important because launching new products is becoming even more uncertain and difficult, as "... research results and personal experience 'grow old' more rapidly than in the past." Even though new product development is important, it must not be done at the expense of OPD. In many markets OPD is more profitable and less risky, as trial is immediate and repeat purchases are more likely when based on an existing product or brand.

Regardless of the type of product development being implemented, speed of execution appears critical in complex and turbulent markets. Iansiti (1995: 55) maintains that, because the computer industry is uncertain and turbulent, the capability to respond rapidly to evolving technical and market changes through product development, is of critical importance. Samli (1993) concurs that a turbulent environment requires the firm to innovate constantly and stresses that the speed of new product development must be faster than the changes in the environment, as changes in this market often happen in time scales shorter than the typical product development time scale.

In a turbulent environment change happens so quickly and unexpectedly that it is possible that, by the time an imitator has copied a strategy, that original strategy has been changed and made obsolete by its originator. In other words, innovation, as opposed to imitation, is essential in a turbulent environment (Phelan, 1997a). Lynn et al. (1999), Morris (1996a) and Glaser (1991) all agree on the need for quick development, the latter two stressing that this is due to reduced product life cycles. To cope in this situation, Geroski (1999) emphasises being a 'first mover' into a new market or rapidly changing markets. However, if being a first mover is not feasible or desirable, then in order to be a successful second mover the firm must be willing to change and must actively plan for this. A wait and see attitude is rarely successful. Success comes from moving fast when the time is right.

To be able to act quickly requires two things:

- knowledge about and understanding of, the customer and the competitive situation by the development staff. This implies in-depth involvement by development staff in marketing activities (Nilson, 1995).
- well-developed, internal co-operation amongst departments and external collaboration with other companies using multi-functional development teams staffed by company people and outsiders (Langerak, Peelen and Commandeur, 1997; Samli, 1993).

While speed of development is important, the development must also be innovative because this has a positive influence on marketing success in turbulent environments that cause continuous changes in customer needs (Mavondo, 1999; Morgan, 1997). To satisfy such changing needs, constant innovation is required (Samli, 1993). However, concentrating on current needs is not enough. Samli (1993) and Slater and Narver (1995) emphasise the need to concentrate on latent needs that may be satisfied only in the future. This means having to work with lead customers and being prepared to create the future through experimentation. Although most authors stress the importance of innovation, Phelan (1997b), using a simulation research process, found that there was little difference between innovators and imitators in turbulent and ambiguous environments. This apparent anomaly may be because, in real life, imitator-friendly conditions present more often in stable environments. In turbulent environments, on the other hand, change happens so quickly and unexpectedly that it is possible that, by the time an imitator has copied a strategy, the original strategy has been changed and made obsolete by its originator. In other words, imitability and turbulence can be expected to negatively co-vary, with imitators succeeding when imitability is high because turbulence is low and with adaptors succeeding when imitability is low because turbulence is high. Thus, it is likely that innovation is a key success criterion in turbulent environments.

Although many of the product management activities are destabilising, an important stabilising factor is the brand. In a market facing rapid change and turbulence, a strong brand name can be very important because, as the time available to communicate with the customer decreases, the brand is able to rapidly communicate the values for which it stands. In an environment of extreme advertising clutter and high time pressures on buyers, the ability to convey an image quickly and consistently is critical (Nilson, 1995). Thus, the product domain can be stabilised through brand building and emphasis on intangible benefits.

As a conclusion to this section, it is worth considering Biemans' interpretation of product development from a chaos perspective, as it accurately summarises the preceding discussion (Ford, 1997: 537). He maintains that the increasing complexity of products and markets and the increasing dynamism and turbulence of these markets makes new product development an expensive and high-risk activity. To overcome these problems his research has shown that success comes from cooperation with users, competitors, research institutes, suppliers, etc. For this to work the activities of these parties must be coordinated through activities such as having a product champion, periodic job rotation, joint customer visits, project teams, regular joint review meetings and joint development contracts. Cooperation and coordination requires "good and timely communication." Although the innovation process is accepted as characterised by chaos (surprises and unexpected changes), Biemans believes the three C's of cooperation, coordination and communication, can control this chaos to a certain extent without eliminating the chaos totally and thereby inhibiting the innovativeness. In order to apply this control, creativity in management practices is required, not traditional procedures, schedules or measures, but the application of experimentation and trial and error. This clearly implies that management must maintain the new product development at the edge of chaos, not controlling it so tightly that it falls back into stability and thus no innovation, nor allowing it so much free rein that it spirals into a chaotic process that never produces anything practical.

4.4.7.2 Price

Pricing is a marketing tactic that can be used both as a stabilising and a destabilising tactic. Status quo pricing strategies, for example, attempt to maintain the market pricing system, that is, supply and demand, at equilibrium, while dramatic price changes can disturb the system and change the nature of market demand. Priesmeyer (1992) maintains that supply and demand, when viewed from a non-linear perspective, do not always operate as

traditionally believed. He quotes a study that shows that, under certain conditions, Coca Cola sales increase when prices are increased and decrease when prices are reduced. The key issue is that the supply and demand equilibrium point acts as an attractor, with equilibrium oscillating within certain boundaries. Within the boundaries of this attractor, there are equilibrium points at which high demand and high prices occur and also points at which low prices and low demand occur. Thus, he maintains that understanding a product's attractor is helpful as it affects price changes and can give guidance as to when prices should be changed and by how much.

Applying the chaos theory principles is also proposed by Nilson (1995: 41), who says that the 'nudge' effect, or sensitive dependence on initial conditions, can be used by a marketer to encourage a market to "change not in a random way but in a desired direction." He gives the example of a company cutting a price to increase sales. Competitors follow suit and a price war results. If this receives a positive response from the market (a positive feedback loop) it may result in a total restructuring of the market, a result that was not anticipated. However, a company understanding the non-linear nature of these relationships should be prepared for the unexpected and would be able to take advantage of the restructuring better than its competitors, thereby building a new competitive advantage. This shows that managers who understand the non-linear nature of pricing can use it as an effective marketing tactic to create their own environment.

Pricing as a tactical tool is also important because, through complex and sophisticated pricing structures, firms can customise prices to suit individual segments, and often, individual customers. This customisation develops relationships and better caters to the needs of different clients (Pitt, Berthon and Morris, 1997). The authors also found that firms in turbulent environments will be more successful if they adopt pricing strategies that are novel innovative.

The above discussion implies that using pricing, as a destabilising tactic is beneficial in a turbulent environment. Morris and Schurink's (1993) findings on the South African environment confirmed that pricing tended to be more market-based, than cost-based, there was a willingness to initiate price changes and firms did use some aggressive pricing tactics. They also found that these pricing approaches were more prevalent in environments that were experiencing rapid change, market heterogeneity and competitive intensity, i.e. complex and turbulent environments. This situation, they believe, requires those managers responsible for pricing to become more externally focussed and to develop more offensive and opportunistic pricing systems. This tactic is important because they believed that pricing

would become more complex and those firms that could cope with this increasing complexity would be more successful.

The use of aggressive pricing strategies, especially in a promotional sense, is likely to destabilise the marketing system. This is particularly true if the business environment is price focussed. Nilson (1995:122) maintains that "...the greater the amount of product sold on price promotions in a market, the more disloyal will the customers be and the more unstable will the market system be." Therefore, in a price-oriented market, aggressive price promotions can win short-term sales benefits. However, if a company wants to introduce an 'everyday-low-price' policy in such a market, it will probably lose sales unless it quickly introduces stabilising dimensions in the market. As a corollary to this, Pitt, Berthon and Morris (1997: 6) maintain that increasing competitor hostility leads to more price-orientated competition. This, they say, is more than mere price cutting and includes greater creativity in the use of price variables, such as "charging price differentials to different market segments, varying price based on time of consumption, various time payment schemes and creative discount structures."

Other short-term tactics, such as rebates, coupons, cents-off deals and price promotions create pricing strategies that are more innovative, flexible and proactive. This approach means that price can be "an adaptive means for addressing and capitalising on increasingly complex change in the external environment," and shows that they see aggressive pricing in a more positive light than Nilson (1995), who agrees that it is important, but seems to hold back from enthusiastic recommendation of it.

It should be noted that not all authors are in favour of aggressive pricing tactics. Grundy (1995) maintains that tactical pricing and specifically price-cutting, leads to major losses, price wars and ultimately no gain in market share. However, his paper refers to the British supermarket industry that probably would not be classified as extremely complex and turbulent. Tactical pricing may have failed in this industry because it was inappropriate for a basically stable environment, which is consistent with the propositions of this research. Furthermore, he implies that tactical pricing fails when it is done in isolation and when the entire network of relationships in the supply chain is not considered. Tactical pricing, from a chaos viewpoint, must always be part of the overall tactics of an adaptive system, which would include the network of relationships the company has with its supply chain. Thus, although Grundy's (1995) lessons cannot be ignored, it is probable that they are of less relevance in a complex and turbulent environment.

Price setting also appears to differ in complex and turbulent markets. For example, Pitt, Berthon and Morris (1997) found more complex price setting, and Roberts (2000) found that the increase in one-to-one transactions has led to increasing use of differentiated pricing, with specific prices being set for individual customers. Kumar, Scheer and Kotler (2000) also found that prices were set differently to traditional pricing policies - either much lower, or much higher, but in both cases with a superior value proposition, or set in a different way, for example, everyday-low-prices, as opposed to a discount based approach. Mohr (2001) sees even more significant differences in price setting in high tech markets. She maintains that because many high tech products do not reach maturity (because of short product life cycles and companies making their own products obsolete) it is not possible to price according to economies of scale and production cost reductions. Thus, many innovative firms price very low, or even free and rely on generating profits from upgrades, add-ons, service, installations and complementary products. Clearly, pricing in such a turbulent environment is an uncertain and risky activity, therefore, understanding a product's attractor and pricing according to the boundaries of the attractor is important (Priesmeyer, 1992).

Other aspects of pricing in a turbulent environment that might be important to a marketing manager are listed below.

- Pricing tactics should be flexible and adaptive to be able to cope with and capitalise on, environmental changes (Pitt, Berthon and Morris, 1997).
- Price premiums are more likely in high technology and thus turbulent, markets than in low technology markets, because suppliers in high technology markets tend to have monopoly power due to industry standards as well as the improbability of contract termination. In other words, they have been able to achieve 'lock in.' Furthermore, customers in high technology markets can often only understand product quality after the purchase and after they have used the product. In low technology markets, quality can be assessed based on previous use or available information, so the price/value relationship can be assessed prior to purchase (Smith et al., 1999). This is supported by Benkenstein and Bloch (1994), who believe premium prices can be obtained by creating entry barriers through brand and firm loyalty.
- Firms in high technology markets are less susceptible to having their prices negotiated downwards. This is due to the lack of adequate information with "respect to cost valuation", resulting in the buyer not being able to gauge the true costs, which limits his ability to negotiate. In low technology markets such information is readily available and so buyers are able to negotiate prices downwards (Smith et al., 1999).
- Many of the above authors imply that price leadership is more likely to lead to success in turbulent markets, for example, price cutting (Nilson, 1995), "innovative, flexible and

proactive" pricing strategies (Pitt, Berthon and Morris, 1997: 6) and setting prices differently to traditional price policies (Kumar, Scheer and Kotler, 2000). Furthermore, Morris and Schurink (1993: 70) suggest that success in the turbulent South African environment is linked to a "willingness to initiate price changes before others in the industry."

A final reason for the importance of pricing as a market tactic, especially as a destabilising one, is that it is, according to Pitt, Berthon and Morris (1997: 2) "one of the more visible decision variables." Prices send clear signals to the market about product value and company objectives and frequent price changes indicate to the market that this is an innovative firm. Thus, pricing tactics can also act as a communication device to the market, instigating word-of-mouth advertising, which will be discussed in more detain in a later section.

4.4.7.3 Place

The place, or distribution, component of the marketing mix is traditionally one of the most conservatively handled marketing tactics, with minimal change taking place. This is confirmed by Nilson (1995), who maintains that distribution and availability are two of the main stabilising dimensions of the marketing mix. This is so because by controlling the link between supplier and customer the supplier reduces the customer's ability to change suppliers, thereby making the market more stable. This also applies similarly to backward integration by retailers and to forward integration by manufacturers, which reduce the uncertainty of whether the retailer will stock the manufacturer's product or not. This stabilises the environment. A further factor is the fact that distribution is often one of the largest costs in a business. It has potential for large savings and often for significant scale effects. The opportunity of these savings can be shared between supplier and customer, strengthening the link between them and increasing stability. Furthermore, if a product is easily available to customers then the relationship stabilises. If a firm has total control of physical distribution the customer has less choice, being forced to operate within the stable distribution channel.

Priesmeyer (1992) sees a distribution channel as a non-linear system that has performance that can be stable, periodically oscillating, or chaotic. Each channel member can maintain, increase, or dampen the oscillations by their actions and the more members there are in the channel, the more complex the system becomes. Coping with this complexity can be done better if the channel members are able to identify and understand the attractor pattern of the

system. Managing the whole system (i.e. the supply chain) according to the attractor pattern can enable efficiencies for all the channel members to be achieved. Forrester (in Stacey, 1996c) confirms this, showing how chaos can be caused in a distribution supply chain. If each element of the chain tries to optimise its performance, there is a likelihood that minor ordering differences or disturbances can be amplified up the chain, resulting in large, unpredictable disturbances at, for example, the manufacturer level. To illustrate this, a 10% increase in retail orders can result in a 40% increase at factory level, which can then oscillate unpredictably between over- and under-stocking. Forrester stresses that the solution is to treat the whole supply chain as a single system, aiming for optimisation of the system rather than the individual elements. This is supported by Wilding (1998) who found that some stabilising actions could in fact increase other sources of uncertainty. He concludes that introducing any change to a supply chain system should be done with care. All components and relationships in the system should be considered as, very often, trade-offs are involved.

Numerous authors have considered how the supply chain in a complex and turbulent environment should be managed. Achrol, Reve and Stern (1983) maintain that the transactions between two organisations should be studied. This is, however, a reductionist approach, not adequately allowing for the interrelationships of all the other parties involved in the channel. Findings based on a dyad are not necessarily representative of the whole network of relationships. Nilson (1995), on the other hand, believes that lasting change can be achieved only by a revolution in the supply chain. This is supported by Kumar, Scheer and Kotler (2000), who believe that, in order to implement a new radical innovation effectively, a new business system is nearly always required. This usually requires significant redesign of distribution channels and procedures. These changes are necessary to either improve the quality and speed of the delivery of the value proposition, or to reduce the costs so as to be able to offer lower prices and usually it involves both. An example of this is provided by Nilson (1995), who explains that, if a company cannot obtain access to a channel due to the dominance of a market leader, it might innovate and start its own channel, e.g. use direct mail or the Internet, which thus results in distribution being used as a destabilising factor.

Because uncertainty and chaos can be generated in a supply chain, Wilding (1998) believes the following steps should be taken, regardless of whether the firm sees distribution as a stabilising or destabilising tactic.

- If long-term plans are made they should be reviewed regularly.
- Short-term forecasts and prediction of patterns should be made.

- The supply chain should be treated as a complete system, to avoid small optimising changes causing massive disruptions in other parts of the system.
- Chaos can be removed from the system by focussing on the customer, communicating demand information as far up the supply chain as possible.
- When re-engineering the system, always run simulations to identify possible non-linear chaotic effects.

This supports the suggestion of treating the supply chain as a non-linear system and managing it according to chaos/complexity principles. Some of the practical measures used when following such an approach are discussed below.

- Partnerships and strategic alliances are becoming more important in the managing of supply chains. Mohr (2001) sees a blurring of distinctions between different members of the supply chain with the roles of members overlapping and co-location taking place, whereby a supplier's staff operate from a customer's premises, or vice versa. This improves knowledge of customer needs, reduces stock holdings and speeds up the delivery cycle. Glazer (1991) supports this, maintaining that because of the changing information environment, there has been a dramatic shift away from rivalry towards partnerships and extended co-operation. It should be noted though that Day (1983, in Hibbert and Wilkinson, 1994) warns that, despite the stabilising effects of partnerships, tight coupling of partners may lead to unanticipated instabilities elsewhere in the system.
- There is a reduction of the use of marketing intermediaries to meet changing market conditions. Roberts (2000: 10) maintains that there has been a growth in disintermediation, with manufacturers dealing directly with end users. As a result of this intermediaries are taking on different roles, such as adding value by saving search costs, communicating trust and providing turnkey solutions. An example of this was Dell Computers, who used a new distribution method (mail order) to by-pass the stabilising distribution system in the computer market (Nilson, 1995). This trend to direct distribution also seems to benefit market performance. Hooley and Beracs (1997) found that, of the top performing companies investigated, 84% had built direct-to-customer distribution systems and 51% had used direct marketing. Of the rest of the companies investigated, only 62% had used direct to customer distribution and only 30% had used direct marketing.
- Buffer inventories are often used to stabilise the uncertainties in the demand in the supply chain. Phillips and Kim (1996) suggest that this is done to reduce the chaos-inspired instabilities caused by the rapid feedback and tight coupling brought about by the use of information technology (electronic data interchange). Day (1983, in Hibbert and

Wilkinson, 1994) sees retail stores that act as inventory holding intermediaries and ordering mechanisms that result in backlogs and delays, as such disequilibrium mechanisms. They allow the system to operate in a chaotic environment as they absorb or dampen unpredictable fluctuations.

- Where inventories are used and how they are replenished is important. Johnston and Betts (1996) investigated planning for the future versus reacting in the context of trading and inventory replenishment, using a multi-agent simulation model. Although not closely resembling the real world, the model studied the essential features of the real world sufficiently to be able to generalise about the problem. The study showed that planning is superior in predictable environments, but it becomes rapidly inferior as the environment becomes more hostile and unpredictable. At the same time reacting becomes a more effective policy as the environment becomes more unpredictable. However, risk increases as the environment becomes more unpredictable. For a planning approach the risk rapidly becomes unacceptably high, but for the reacting approach, although risk increases, it is a more attractive policy than planning. Reacting appears to be preferable in a niche with an uncertain future and that is close to the breakdown of order. This implies that reacting is a valid strategy for operating at the edge of chaos.

  Although they did not find any chaotic interactions in the simulation, they believe the presence of chaos is likely considering the non-linear nature of the model. A key aspect of reducing the risk of chaos in replenishment systems is to use information from as far down the chain as possible. Priesmeyer (1992) suggests basing activities on retail sales to the consumer and not on sales to the retailer, while Wilding (1998) suggests focussing on the customer, by communicating demand information as far back up the supply chain as possible. In addition, Wilding also challenges the conventional belief that supply chain success demands stability. Accepting the uncertainty and using short-term management strategies within the 'prediction horizon' can improve the costs and value of the system.
- Narus and Anderson's (1996: 112) concept of "adaptive channels" provides a good overall summary of the above discussion on the place component. This has been brought about by the increasing dynamics of business and increasing competition, especially from global competitors who use unconventional methods because of their exclusion from the traditional channels. The 'adaptive channels' method involves co-operative arrangements, strategic alliances and partnerships between channel members and other suppliers, using shared information systems and integrated logistics systems. The network of capabilities in the channel enables it to be more flexible and responsive by having all the skills and inventories to satisfy the standard and emergency needs of customers. Instead of trying to cope with the chaos of unanticipated emergency demands by increasing inventory levels, the system copes with it by sharing the inventory

load and by very quickly responding through integrated computer systems and same day express delivery suppliers. In other words, the chaos is coped with through the larger system, rather than each agent in the system trying to cope with its own locally generated problem.

4.4.7.4 Promotion

According to Nilson (1995) there are three promotional, or as he terms it communications, aspects that are important from a chaos viewpoint.

- In addition to conveying a message, communications can be used to stabilise the marketing system.
- Communications media is one of the fastest changing sectors of marketing, namely electronic highways, satellite communications, cable television.
- The effectiveness of communications is changing in the same direction as the general business environment and so new messages must be in harmony with the changing value systems.

Although communications are mostly stabilising elements, they can be destabilising. As communications become faster and consumers change in terms of education, sophistication and different cultures, uncertainty increases, so awareness of and monitoring for, uncontrolled behaviour in the system becomes essential. However, it should be noted that, in terms of chaos theory, communications is unlikely to be able to achieve major, predictable disruptions in the marketplace, e.g. changing consumer attitudes and behaviours. It can, however, encourage, or 'nudge', an already changing attitude or behaviour. Thus, a marketer can, through communications, speed up a change that has already started (Nilson, 1995).

Priesmeyer (1992) has shown how awareness of a market in chaos terms can help a marketer to adopt the most appropriate marketing tactics. In a study of the novelty ice cream market, he showed that a new entrant into the market changed it from a stable market with traditional supply and demand dynamics, to a market with high-order chaos. Instead of reducing the market share of the existing participants, it attracted new customers and resulted in increasing sales while prices were increased. The high-order chaos brought opportunities that enabled promotional activities to have significant and permanent effects on demand and market share. "The tight market share structure had been broken, the limit cycle escaped its attractor and the future share of all products ... was unpredictable" (Priesmeyer, 1992: 76).

This shows that knowing the attractor prevalent in a market enables the marketer to identify the appropriate marketing tactics. More aggressive promotional tactics in a turbulent market allow the alert marketer to take advantage of the turbulence to influence, or nudge, the trajectory of the attractor in order to increase market share, sales or profitability.

The main traditional types of promotions are media advertising, public relations, sales promotions and personal selling. These will be discussed in an attempt to understand their role from a chaos/complexity point of view.

a) Media advertising

De Vasconcellos (1991) found that in mature (and thus stable) industrial markets, advertising was of relatively little importance, but that with large quantities of customers and low risk of product malfunction, advertising might become more important. However, Feichtinger, Hommes and Milik (1994) imply that such an understanding is too simplistic. They found that a 'persistent firm' (meaning roughly, stable, conservative and relatively unchanging) stabilises a situation (number of customers or market share) by following a continuous and defensive advertising strategy. However, if such a persistent firm adopted an aggressive advertising strategy, then irregular and sometimes chaotic patterns resulted. In a less stable situation (rapidly decaying market share or turbulence) defensive advertising can lead to chaotic behaviour. Their study suggests that a firm in a more stable market would benefit from a continuous, conservative and defensive advertising strategy, typically image or institutional advertising, while a firm in a more turbulent market would benefit from a more aggressive, pulsed advertising campaign, typically product advertising (pioneering or competitive advertising). This indicates that advertising can be both stabilising and destabilising in its effects.

Considering the stabilising function of advertising, through an analysis of the Vidale-Wolfe model of sales response to advertising, Herbig (1990: 72) found that if sales response and the loss of sales due to forgetting are fairly constant, then "by judicious selection of [the percentage of cumulative sales allocated to advertising], fairly predictable stability ... can be achieved." In his analysis of the Horsky-Simon model that combines advertising effectiveness and diffusion of new products, he found that emphasis on publicity and advertising would be stabilising. To an extent, this is supported by Nilson (1995) who maintains that, where distribution is not a stabilising factor, a large company could use advertising to minimise volatility. This works because the high costs of advertising can act as a barrier to entry, reducing

competitive complexity and turbulence and by building brand loyalty, which is itself a stabilising factor. Furthermore, by dominating and spending significant amounts in a specific medium it increases the importance of that medium. By increasing the importance of that medium it can downplay the importance of other marketing mix dimensions that are becoming more volatile and chaotic, thereby defusing the volatility of the overall market. However, this is not relevant to small firms because of the high costs of media advertising.

Some authors also believe that advertising can be destabilising. According to Nilson (1995: 92) there are three ways in which this can be achieved.

- The first method is to hijack another company's brand reputation to establish one's own brand. This is often done through some form of comparative advertising, whereby the challenger encourages the consumer or customer to view the new or 'inferior' brand as equivalent to the brand leader. This also has the advantage for the challenger of moving the perceptions of the consumer away from brand building intangibles (stabilising dimensions) to product features, which potentially can create more volatility. For this approach to be successful, the challenger must have the organisation and infrastructure to be able to take advantage of the chaos created in the market. The launch of Pepsi Cola into the South African market in the early 1990s created a potentially chaotic situation. Unfortunately for Pepsi, they did not have the distribution infrastructure to take advantage of the destabilised market and thus were not successful in their challenge to Coca Cola's dominance.

- The second approach is to launch a totally new and shocking, or amazing, advertising campaign. Examples of such campaigns are the United Colours of Benetton campaign or the Nando's campaigns. The controversy generated can result in unexpected customer behaviour, or no change in behaviour at all. As with all chaos-oriented actions, the company must be prepared to react immediately to the result that it does get. Dru (1996) agrees with this, believing that advertising can be a tool for disruption, or destabilisation, by taking both a creative and a strategic leap from the present into the future. Herbig (1990), through his analysis of the Vidale-Wolfe model of sales response to advertising, maintains that chaos and thus unpredictability of results could result from overspending on advertising.

- The third approach is more conservative but requires excellent creative abilities. It is intended to shift the perceptions of the market, that is, change the rules of the

game. This involves an unexpected campaign, but one built on "logic and perceived opportunities in the marketplace." An example was Volkswagen's advertisements in the United States which changed the way the consumers thought about motor cars - from 'chrome and oversized engines to utility and practicality" (Nilson, 1995: 93).

b) Personal selling

In a smaller company that cannot afford the high costs of media advertising, emphasis on personal selling and relationship building can act as a stabilising factor. Through sound salesperson-buyer relationships, the customers can be encouraged to remain loyal to the supplier (Nilson, 1995). This is supported by Pitt (1995: 19), who believes that a company that can establish a learning relationship with its customers should be able to retain its customers. This is because the company learns more about the customers' needs, while the customer would have so much time and effort invested in the company that it would not be worthwhile switching to a competitor. Personal selling, because of its personal dialogue, can create such "a dominating position in the minds of the customers," and because of this it is a stabilising influence on a market. However, it should be stressed that the relationship should be tied directly to the company, and not be with the individual sales representative. Furthermore, the sales force can play a key role as a feedback loop between customer and company. Fast communication is required between the sales force and the marketing management (Nilson, 1995). Flexibility and the ability to act at a quicker pace are possible using the networks of relationships with suppliers, distributors and customers. Since the company is not tied only to operating from its own asset base, more innovative and unique solutions can be obtained (Morris, 1996b). According to Cespedes (1996) such diversity in the network of relationships means that sales staff is even more important in meeting customer needs and have to be decentralised and empowered to take decisions. Strong marketing knowledge is needed by the sales force, especially in mature and stable, markets to achieve this (De Vasconcellos, 1991). This appears to highlight the importance of personal selling in stable and simple environments.

c) Public relations (PR)

Much of what has been said about personal selling may also be true of public relations, as PR also emphasises relationship building and could thus be stabilising. Herbig (1990) implies that PR is a more stabilising element and Nilson (1995) agrees that it can be a very effective method of disseminating information and building loyalty

to a company. However, in chaos terms, through a relatively small and inexpensive PR activity, a 'nudge', significant outcomes can result because of the multiplier effect. However, like all activities based on sensitive dependence on initial conditions, the result is unpredictable. Although the instigator of the action hopes for a positive response, they have no control over the dissemination of the information, nor over the way the message is presented.

d) Sales promotion

According to Nilson (1995), sales promotion activities, when linked to price promotions, create instability in a market and thus are destabilising. This can only be true within the limitations imposed by a chaotic system. The more unusual the promotion the greater the likelihood of the outcome being different to what was expected, that is, if the market is in a chaotic state an unpredictable outcome might be expected. However, when the sales promotion follows a theme (such as competitions, cross promotions, etc) it can stabilise the system. A message "that generates interest and action and purveys positive value dimensions is ... an effective contributor to brand equity" (Nilson, 1996: 126). Promotions that build relationships have the same stabilising effects as advertising. Direct mail, or direct marketing via the building of a relationship with customers through personalised communications with the help of a database, can also be very stabilising. It is more difficult for competitors to disrupt this communications method, in addition to which it provides a very fast feedback loop. The rapid changes in the technological environment, such as computerisation, scanning and smart cards, enable sales promotions to contribute to stabilising the marketing system, for example, by developing loyalty programmes and improving the information flow about buyers and buyer behaviour. The above is confirmed by Priesmeyer's (1992) study of the non-linear dynamics of sales patterns at two petrol retailers, located close to each other, that showed that the characteristics of the two markets were significantly different.

One reflected low order chaos (a tightly bounded attractor) while the second reflected high order chaos (a widely varying attractor). The retailer with low order chaos had constrained demand that was not influenced significantly by price cuts or promotional activities, whereas the high order chaos retailer had more opportunities for influencing demand through promotional tactics. In fact, minor promotional changes or improvements to premises could result in major increases in sales and profitability. The author suggests that market differences or similarities can be identified by comparing the attractor patterns, thereby identifying the relevant tactics for each market, namely stabilising sales promotion in the low order chaos market and

destabilising sales promotions in the high order chaos market. This shows that aggressive sales promotional tactics in a turbulent market enable a marketer to influence the trajectory of the attractor to increase sales, market share or profit. This is also indirectly supported by Williams (1994) who reported that sales promotion as a percentage of the marketing budget increased from about 10% in the relatively stable 1980s, to as much as 65% in the more turbulent early 1990s. The implication is that, in a rapidly changing marketing environment, sales promotion is a more effective marketing tool than advertising and should be used to cope with the increasingly turbulent market.

A final promotional method that needs to be mentioned is word-of-mouth. Herbig (1990) found a relationship between word-of-mouth advertising and chaos, resulting in word-of-mouth being seen as destabilising. It appears that word-of-mouth advertising could be so important in a turbulent environment that it warrants more in-depth investigation and will be discussed separately in the next sub-section.

In conclusion, it can be seen that some promotions or communications can have a destabilising influence, but that all can have a stabilising influence. Nilson (1995: 133) maintains that "advertising and personal selling have the strongest [stabilising] effects." This is so because they act directly on the marketing system and because the consistency of execution in a good thematic campaign creates extra stability. In a world of thousands of media messages bombarding the consumer daily, the familiarity of a consistent theme is important. Consequently, stability in a constantly moving environment can be a positive characteristic for the consumer. In addition, stability and consistency in a stabilising factor itself can reinforce its stabilising effects. This does not mean that the communications programme should not change. On the contrary, it must be continuously upgraded and rejuvenated, but within a consistent theme and building on the previous campaign. If this is not done, destabilising results might occur when they are not required or not applicable.

A fifth promotional technique that appears to be very important when promotional activities are viewed from a chaos and complexity perspective is word-of-mouth. However, it rarely receives more that a passing mention in marketing textbooks, but is starting to receive more attention in the marketing literature. Therefore, it will be discussed below as a fifth promotional technique.

e) Word-of-mouth

Word-of-mouth advertising involves activities that are likely to encourage consumers to talk about a product or a company, to their friends and neighbours, setting in motion a chain of communication that could branch out through a whole community. It involves using reference groups and opinion leaders to spread information and knowledge about the product or company. Heckman (1999: 2) defines word-of-mouth advertising as "…when people convey genuine enthusiasm for a product or service to others." In South Africa "... word-of-mouth among black consumers can make or break a product" (Morris, 1992: 38). Promotional activities that encourage talking about the company or product, i.e. positive word-of-mouth, should be used. Each activity, small and relatively unimportant in itself, could escalate through word-of-mouth to create strong and positive brand images and beliefs. It can be seen that the principles of sensitive dependence on initial conditions or the butterfly or nudge effect are at work here. In explaining word-of-mouth, Nilson (1995) stresses that it has a very strong non-linear effect and is impossible to control. However, since the principle of sensitive dependence on initial conditions is at work, a small investment in encouraging customers to talk about a product or service can produce a significant effect. This is because the spread of word-of-mouth messages is similar to the way an epidemic is spread by a virus (Gladwell, 2000).

Understanding and encouraging word-of-mouth is important because, as Peters (1987) says, 10% of the world influence the other 90%. He stresses that innovation relies on word-of-mouth to spread subjective evaluations and that change agents achieve success by using it to communicate with opinion leaders. Doyle (1998) takes this a step further, maintaining that satisfied current customers will generate word-of-mouth that will guarantee the acquisition of new customers. Rice (2001: 65) reports on how word-of-mouth is becoming more important, quoting various research studies that indicate the significance of word-of-mouth. He claims that "80% of brand decisions are influenced by someone other than the marketer of the brand", "65% of people seek advice from friends or family" and "word-of-mouth and referrals are the primary sales and marketing tools for 61% of small companies in the USA." Misner (1994) maintains that word-of-mouth is important for relationship building and that networking and rewarding referrals encourages word-of-mouth. The growing importance of word-of-mouth is further supported by Dye (2000: 146) who sees 'buzz' (as he calls word-of-mouth) as a phenomenon that "will dominate the shaping of markets" due to increasing globalisation, developments in mobile telephones, the continuation of consumers' associations with brands and rising disposable income.

Word-of-mouth does not, however, appear to be applicable in all business environments. Smith et al. (1999) found that high technology, and therefore turbulent, firms are more likely to use word-of-mouth as information sources. Mohr (2001: 285) agrees, seeing high technology companies using "influence the influencer" promotional strategies, such as giving products free, or at much reduced prices, to industry experts and opinion leaders in order to encourage word-of-mouth. This approach is more effective than advertising because high technology products are not able to build brand image over years or decades because they have short product life cycles. Therefore, the quick spread of word-of-mouth, leading to more formal publicity and thus to brand familiarity, is important. This is supported by Stephens and Goch (2001), who suggest its use in new product introductions or marketing of sophisticated products into niche markets and further by Kumar, Scheer and Kotler (2000: 134), who maintain that market drivers use word-of-mouth advertising and the activities of opinion leaders, such as reporters in trade publications and the popular press, to create what they call the "buzz network." Because of superior value for money offered, customers often talk about the product or service to other potential customers. This creates status or ‘cachet’ for the brand and reduces the need for traditional media advertising, thus reducing promotional costs, which in turn contributes to the firm being able to offer lower prices.

The building of brand awareness and image through word-of-mouth is especially possible if the company participates in an on-line environment. Rice (2001) maintains that there are many new electronic media that facilitate word-of-mouth, specifically the Internet and its bulletin boards, complaint sites and discussion groups. Word-of-mouth travels much quicker on the Internet and Mohr (2001) suggests the use of viral marketing to encourage the spread of word-of-mouth. This involves creating an experience that is so compelling that people will want to pass it on to, or tell, friends, acquaintances or colleagues. Jurvetson (2000: 27) supports this, maintaining, "good news - and bad - replicates on-line with a speed only before seen in the biological world" and thus refers to this as viral marketing. The message is spread voluntarily and independently by Internet users to their friends and colleagues. Thus the customers do the selling. He maintains that each customer should be seen as a distribution partner and rewarded for spreading the word-of-mouth message, for example, by being paid a sales commission. With such an incentive, customers would innovate and develop new distribution networks, which he calls "self-organizing viral distribution networks." This shows that word-of-mouth is also applicable in

marketing to consumers. Horovitz (2002: 3) maintains that the young 'generation Y' market cannot be reached through traditional promotions and suggests that word-of-mouth or buzz type promotions is being used by successful marketers in this rapidly changing segment. He says, "they're pecking away, sometimes one teen at a time. Or one cool crowd at a time. Or one hip happening at a time." As an example, he explains how Red Bull builds markets "on the sly," relying on word-of-mouth campaigns.

Dye (2000: 140) explains how companies targeting this market use "trend spotters" or "cool hunters" or the Internet to enable them to identify and track buzz, so that they can react quickly to a new trend. In a fast growing market, but one with a very short life cycle, it is necessary to benefit quickly from the trend. This is especially true for late market entrants who want to benefit from the trend without having to invest in new product development. In addition, Dye (2000) maintains that only some products are suitable for buzz or word-of-mouth advertising - they must be unique in some way and they must be highly visible - less visible or taboo products can be made visible through techniques such as Internet chat rooms or popularising terminology. It appears that word-of-mouth is applicable in both the business and consumer markets, but is more effective in high technology or fashionable, fast moving type markets.

For word-of-mouth to be effective, certain structural characteristics as specified by authors such as Gladwell, Rosen and Lewis are necessary (Rice, 2001). Gladwell's (2000) theory explains how social events develop and evolve, and quickly reach a 'tipping point' that pushes them into the exponential spread of an epidemic. He proposes three laws that explain this 'tipping point'.

- The Law of the Few, which maintains that there are a few, select people who, because of their nature, act as catalysts, encouraging the spread of an idea, usually through word-of-mouth. This stresses that the messenger is important in the spread of word-of-mouth. He called these select people mavens, connectors and salesmen. Also known as 'network hubs', these will be discussed in more detail in the next paragraph.
- The Stickiness Factor, which maintains that some small, often unsuspected, aspect of the idea, message, or product will be so intriguing, attractive, memorable, or eye catching that it will spur people to action. For example, telling a friend or colleague about the product, service or company. Misner (1994) refers to these factors as memory hooks. Such stickiness factors are often seemingly

small or trivial and often are not to do with the content of the message itself but how the message is packaged. The stickiness factor says how the message is presented is important.

- The Power of Context says that the environment in which the idea or message is conveyed can influence how well the message is accepted. In other words, the message and the context in which it is conveyed must match. People are highly sensitive to small differences in their environment and, significantly, it is little things in the environment that are important - certain times, places and conditions. This sensitivity is only possible in relatively small groups, that is, 150 or less. The context in which the message is conveyed is important.

These three laws can all be seen to be based on the concept of sensitive dependence on initial conditions. They all depend on small initial factors, namely, a few people, a minor change in how the message is packaged, or a small change in the environment. These small initial conditions can 'tip', growing exponentially into a major change. If these are understood in terms of a word-of-mouth advertising message, a company can enhance the spread of the message in an epidemic-like way.

Gladwell's (2000) Law of the Few identifies three personality types that comprise 'network hubs' and that encourage and facilitate the spread of word-of-mouth communication.

- Mavens - these are people who develop a large knowledge about products or ideas, usually specific categories of products and who enjoy sharing their knowledge with others. Dye (2000) refers to these as 'vanguard customers,' who may not be opinion leaders - they may be a counter-culture, which cannot be identified by researching what customers think of a product. What is needed is an understanding of how customers interact with each other and whom they value as a source of information for that particular product.
- Connectors - these are very sociable people who have many, relatively weak, relationships ('acquaintanceships') with many people in many different contexts and communities. They spread information between the different communities or groupings by talking about a new product to many people.
- Salesmen - these people are natural persuaders who have the ability to explain new innovations to their friends and colleagues and to encourage them to adopt the new idea or to try the new product.

Someone who has strengths in two or more of these personality types would be especially effective in the spread of word-of-mouth messages.

Gladwell's (2000) findings are corroborated by the work of Stephens and Goch (2001). They maintain that Gladwell's three personality types exist in South Africa and make up about one third of the Living Standards Measure groups 6 to 8. Their research also shows that these 'network hubs' interact with three to five times as many people as and recommend products nine times more frequently than, the rest of the population. This is supported by Morris (1992) who stresses the importance of word-of-mouth among black consumers. This confirms the importance of word-of-mouth in the South African context.

Ings (1999), in discussing the work of Marsden, explains that marketers apply cultural ideas or 'memes', to predict the success of new brands, products or services. He maintains that such 'memes' become popular if they are 'catchy', thereby encouraging their spread through the market like a contagious disease. If they are 'catchy' enough, consumers will want to talk about them and tell their friends and colleagues. This clearly is very similar to Gladwell's (2000) stickiness factor. Williams (2000) agrees with this, believing that the concept of memes can be helpful in understanding and encouraging the propagation of advertising messages, slogans and sayings. For a meme to survive and be replicated it needs to be learnable and infectious. It appears as if the concepts of memes could have something to contribute to the understanding of word-of-mouth communication and that word-of-mouth might have memetics (the study of memes) as its underlying theory.

From the above it is clear that word-of-mouth is an important promotional tactic. However, according to Heckman (1999) it does not happen by itself – influential individuals must be identified, their support won and information provided to enable them to spread the word. Peters (1987) maintains that word-of-mouth can be organised just as systematically as any other aspect of promotions. The company should decide who should get the message and who should deliver it.

There are many actions that can be adopted to encourage word-of-mouth.

- Get the product into the hands of the 'vanguard' customers, or mavens.
- Use opinion leaders or celebrity endorsements.
- Giving products away free, or at reduced prices, to the industry experts, mavens and opinion leaders.

- Nurture early adopters and incentivise sales to them.
- Provide product samples and demonstrations at meetings, schools, community centres.
- Offer factory tours to school children, clubs, potential customers, etc.
- Providing stories of how a product exceeded expectations or how the company went out of its way to solve a customer's problem.
- Pair satisfied customers with prospective customers at events.
- Use or create lists - for example publish a 'best of...' or 'top 10' list - these are often talked about and discussed
- Send newsletters to targeted non-users
- Consciously gather and distribute testimonials for use in newsletters

(Peters, 1987; Morris, 1992; Heckman, 1999; Dye, 2000).

Although word-of-mouth has been shown to be a very effective method of advertising, it is not without difficulties and problems. First, if it is used in a chaotic system it is possible that the result will not be as anticipated, but that a negative communication could result and according to Nilson (1995), negative effects spread twice as fast as positive ones. To avoid this, great care needs to be taken to be sensitive to the marketplace, and to what customers think and feel about the product. Second, Lane and Vescovini (1995) showed, via agent-based simulations, that obtaining too much information can reduce market share. This implies that excess word-of-mouth information could, in fact, be bad for further adoption and for sales. This would be true for products that have 'snob appeal.' Dye (2000) supports this maintaining that the 'vanguard' often rejects a product that is over-exposed and popularised and so using advertising too early can kill 'buzz' or the spread of word-of-mouth. Therefore, encouraging customers to communicate through, for example, active Internet messaging or viral marketing, should be used early in the process, without seeming like exploitative marketing. Media and advertising can be used later to encourage more word-of-mouth. Finally, Stephens and Goch (2001) highlight that too much influence, such as paying people to talk about the product, can reduce the person's credibility. This could have the negative effect of causing the word-of-mouth initiator to not want to talk about the product because they may not personally believe the message and could make the receiver sceptical of the validity of the message because of the lack of objectivity.

Despite these difficulties, word-of-mouth appears to be a very effective tactic for use in an environment that is at the edge of chaos, as it is grounded in one of the main characteristics of chaos theory, namely sensitive dependence on initial conditions.

4.5 CONCLUSION

This chapter had three objectives. The first was to define what is meant by success in a business-marketing context. It has been shown that success involves being able to cope with change, to welcome it and to see it as an opportunity, rather than as something to avoid. Furthermore, success involves what marketing tactics are adopted and this is influenced by the environment in which the company is operating.

The second objective was to assess the traditional methods of coping with environmental change. This chapter has shown that, in the current complex and turbulent environment, the traditional, mostly stabilising type activities are inadequate for coping with the uncertainties and volatilities of environmental change. The traditional models do not facilitate the rapid adaptations that are required.

Third, the methods predicated on chaos and complexity theories were investigated to identify if they could identify more effective methods of coping with environmental turbulence.

Overall, it has been shown that by adopting a chaos and complexity approach, it is possible to develop tactics that enable a firm to handle complex and turbulent environments better than companies that use the traditional approaches. In other words, success can be influenced by adopting tactics proposed by chaos and complexity theory.

From the findings in this chapter, a model of the marketing mix tactics that are proposed for use in a complex and turbulent environment was developed. This model was used as the basis for developing the interview guide for the depth interview component of the empirical study and to guide the observations and documentary analyses that were conducted. This model is presented in Chapter 7, where it is discussed relative to the findings of the empirical component of the research study, to identify whether the empirical findings support the model that emerged from the literature.

In the next chapter, Chapter 5, the methodology used to conduct the empirical study will be presented, explaining and justifying the specific research design that was used.

CHAPTER 5 - METHODOLOGY

5.1 INTRODUCTION

The purpose of the study was firstly, to explore the relationship between the level of turbulence and complexity in the environment and the marketing tactics selected by companies operating in these environments. Secondly, it attempted to identify if there was a relationship between the use of destabilizing marketing tactics and success in turbulent and complex environments and if there was also a relationship between the use of stabilizing marketing tactics and success in stable and simple environments.

Lincoln and Guba (in Rudestam and Newton, 1992) proposed ten design considerations for a naturalistic or qualitative research study. These are:

- determining a focus for the enquiry,
- determining fit of paradigm to focus,
- determining the fit of the enquiry paradigm to the substantive theory selected to guide the enquiry,
- determining where and from whom the data will be collected,
- determining successive phases of the enquiry,
- determining instrumentation,
- planning data collection and recording modes,
- planning data analysis procedures,
- planning the logistics,
- planning the trustworthiness.

Following the ten-point approach outlined above, this chapter describes the methodology used in conducting the empirical research. More specifically, it discusses and justifies the nature of the research design chosen, explains how the sample industries and companies were chosen, spells out the methods and instrumentation used for collecting the data and describes the analysis techniques used. Furthermore, it discusses the trustworthiness and rigour of the findings, showing why the findings can be accepted as a reasonably accurate representation of reality. Finally, the chapter sets the scene for the presentation of the analysis of the findings in Chapter 6.

5.2 RESEARCH DESIGN

In this section the type of research design chosen will be discussed and a justification provided for the use of the chosen methodology.

5.2.1 Research approach or paradigm

The research design chosen is of course based on the ontological paradigm or beliefs of the researcher. It is important, therefore, to initially take a position in this regard. Traditionally, researchers choose from among positivist or anti-positivist (Mouton, 1996, and Welman and Kruger, 2001), or positivist or interpretivist (Riley et al., 2000), or positivist or phenomenological (Saunders, Lewis and Thornhill, 1997) or positivist or phenomenological/interpretivist (Babbie and Mouton, 1998) approaches. However, the approach of Oka and Shaw (2000: 4) has been used in developing this thesis, namely "… that there is a real but imperfect link between paradigm and method." They maintain that by adopting one specific paradigm there is inevitably a trade-off between relevance and rigour, and therefore, "purist attitudes toward paradigms are not appropriate in qualitative research." Saunders, Lewis and Thornhill (1997: 73) support this by maintaining "It is perfectly possible to combine approaches (positivist and phenomenological) within the same piece of research." This dual approach is suitable for this research for the following reasons: a positivist approach is fitting because it has been possible to develop propositions based on the literature as to how companies operate in the reality of complex/turbulent or simple/stable environments. As a result a deductive approach has been used.

However, from the literature review it can be seen that little research has been done applying complexity and chaos theories to how marketers make tactical choices according to their environments. Therefore, it is also fitting that an interpretivist or phenomenological approach be adopted in order to develop an understanding of these tactical choices and their relationship to the environment and to market success. Therefore, an inductive approach has also been used. In summary, therefore, the approach adopted could be seen as a middle point on the continuum from positivist to interpretivist/phenomenological. From the above it can be seen that a post-positivist paradigm has been followed. This assumes an ontology where "… truth exists but can only be partially comprehended", an epistemology where "Objectivism is ideal but can only be approximated" and a methodology of "Modified quantification, field studies, some qualitative methods" (Quigley, 2000: 3).

In addition to the philosophical approach adopted for the research, it is also important to specify the time perspective and the research purpose category adopted. Since the study was conducted at a particular point in time and over a short time period and respondents were interviewed only once, it can be seen that a cross-sectional methodology (as opposed to a longitudinal methodology) was adopted (Saunders, Lewis and Thornhill, 1997). This methodology was suitable because the study attempted to assess companies' historical performance relative to the marketing strategies adopted during that period, rather than assessing changes over a period of time.

Various authors, for example, Saunders, Lewis and Thornhill (1997) and Tull and Hawkins (1993), categorise research according to the main purpose, namely whether it is exploratory, descriptive or explanatory (causal). According to Sekaran (2000: 123), "…exploratory studies are undertaken to better comprehend the nature of the problem, since very few studies might have been conducted … Exploratory studies are important for obtaining a good grasp of the phenomena of interest and for advancing knowledge through good theory building." This is clearly consistent with the purpose of this study, because there is a lack of understanding, as mentioned above, of the relationship between the environment and marketing tactics.

An approach that is exploratory and that is based to a large degree on the interpretivist/phenomenological paradigm lends itself to qualitative research. In the next section qualitative research will be discussed and a justification for its use in this study will be provided.

5.2.2. Qualitative research

Since a more interpretivist/phenomenological approach is being followed, it makes sense to use a qualitative methodology, as this is "… rooted in the phenomenological tradition" (Taylor and Bogdan, 1998: 6). Qualitative research can be defined as involving descriptive data that is made up of words rather than numbers (Rudestam and Newton, 1992). More formally, Gordon and Langmaid (1988: 2) define it as "… centrally concerned with understanding things rather than with measuring them". They further describe the characteristics of qualitative research as listed below.

- It involves small samples not necessarily representative of a larger population – this is consistent with the sample of four companies and 31 interviewees.
- A variety of different techniques are used to collect the data – field notes, interview transcripts and documents were used.

- Interpretation is carried out concomitant with the data collection – this was done to a limited extent.

Rudestam and Newton (1992: 32) further describe qualitative research according to "… three fundamental assumptions (Patton, 1980).

- A holistic view … qualitative methods seek to understand phenomena in their entirety in order to develop a complete understanding…
- An inductive approach. Qualitative research begins with specific observations and moves toward the development of general patterns that emerge from the cases under study…
- Naturalistic Inquiry. Qualitative research is intended to understand phenomena in their naturally occurring states. It is a discovery-oriented approach…"

Scientific research, according to the positivist paradigm, should be replicable. However, this is not possible in qualitative research, as the exact conditions prevailing at the time of the research cannot be recreated. Padgett (1998: 91) further stresses that replication is not desirable as "qualitative studies are less concerned with normative data than with the wide range of life experiences." With the focus on attempting to view the environment and the firms as complex adaptive systems, a holistic, naturalistic approach is more fitting for this study than a normative approach.

Finally, the methods used in qualitative research are extremely diverse, but typically include such methods as descriptive studies, survey studies, historical studies and case studies (Leedy, 1993). The method used in this study, namely case research, will be discussed in more detail later in this chapter.

5.2.3. Reasons for using a qualitative methodology

This study is based on the assumption that the business environment is a complex adaptive system, subject to some of the principles applicable to chaos systems. Gregersen and Sailer (1993) suggest that standard statistical techniques are inadequate for studying chaos systems. They also suggest that qualitative research should be used and that understanding is the only attainable scientific goal that can be achieved when studying chaos systems. This view is supported by Cupchik (2001), who believes that the precision that is achieved through quantitative simplification often leads to important aspects of the phenomenon being ignored. In addition, according to Halliday (1999: 2) "…the complexity of the human behaviour and motivation" implies that the hypothetico-deductive approach is not applicable in a qualitative study.

This view is further supported by the fact that so little research into marketing from a chaos and complexity perspective has been done, as is reflected by the literature review. According to Padgett (1998: 7) one of the main reasons for doing qualitative research is because "You want to explore a topic about which little is known." This is very true of the application of chaos and complexity theories to marketing. Although much has been written about the two disciplines individually, very little has been written about the intersection of the two. Therefore, research of an exploratory nature is required in order to develop some understanding of the nature of the problem. This claim is also supported by Lee (1999: 38), who maintains "… qualitative research may be the best choice when the identification of new theoretical propositions or managerial actions is deemed necessary, but the researcher is not fully knowledgeable about the details of the phenomena …." Furthermore, Halliday (1999: 8) maintains that "mainstream marketing research may well be objectively true and scientific, but nevertheless unenlightening and therefore totally inappropriate." She thus implies that enlightening research through qualitative methods is more appropriate in marketing.

Qualitative methods are inherently inductive; they seek to discover, not test, theories. This is because one of the strengths of qualitative research is validity, that is, that it provides answers closer to the truth (Greenhalgh and Taylor, 1997). Qualitative research, according to Manicas and Secord (1982, in Padgett, 1998), is based on an open systems approach, whereas quantitative research assumes a closed systems approach. The qualitative, open systems approach is consistent with the study of chaos and complexity, which also reflect 'open' systems. Qualitative research also attempts to view the complex world in a holistic manner, and for the above reasons it can be seen to be a technique more attuned to a study of complexity, rather than the simplifying, deconstructive, deductive approach of quantitative research. This view is supported by Cupchik (2001) who also sees qualitative research as holistic and "searching for patterns that lie within its bounds" – clearly a view that is consistent with a complexity approach. Furthermore, Quigley (2000: 2) maintains that qualitative methodologies are especially suited to environments characterized by "…turbulence and ill-structured, ill-defined problem contexts of human endeavour." Such environments can be seen to be typical of the turbulent, complex environments envisaged in this study.

Wilson (1999: 31) maintains "arguing causal relationships in management is always hazardous because of the impossibility of isolating individual influences from their contingent and complex context." As a result, a quantitative approach that researches specific variables is of dubious benefit. He believes that "case methods are essential to

understanding and explicating these complex, multifaceted processes" and since case approaches are qualitative, he is also supporting a qualitative methodology for research into understanding of management phenomena. In addition, Maxwell (1996: 20) suggests that qualitative research is capable of developing "causal explanations". This is because qualitative researchers tend to ask questions about "*how* x plays a role in causing y" rather than trying to measure the variance caused. Therefore, qualitative research has the benefit of being able to provide understanding of the phenomenon, as well as understanding of the causal relationships between two phenomena.

It was decided that, because of the nature of the problem and the environment in which the problem was located, a qualitative methodology would be most suitable. However, many authors stress the increasing popularity and importance of integrated research methods. For example, Padgett (1998) explains three types of combinations.

> QUAL -> QUANT where the qualitative study precedes the quantitative study
> QUANT -> QUAL where the quantitative study precedes the qualitative study and
> QUANT <-> QUAL where the two approaches are integrated.

In the current study, although primarily qualitative, aspects of the QUANT <-> QUAL form were used. It is what she terms a QUAL-quant approach – some quantitative data is included in the study to supplement the main, qualitative data. In the current study the 'quant' data is made up of rank orders of marketing tactic importance, and frequency of use of certain words.

5.2.4. Choice of method of inquiry – the case method

A case study is "a research strategy (that) comprises an all-encompassing method – with the logic of design incorporating specific approaches to data collection and data analysis" (Yin, 1994: 13). It relies on multiple sources of evidence and often makes use of propositions to guide data collection and analysis.

According to Yin (1994: 12), "a case study is an empirical inquiry that investigates a contemporary phenomenon within its real –life context." This is consistent with the objectives of this study, as the intention is to understand the choice of marketing tactics within the context of the business environment.

Keen and Packwood (1999) explain that, after setting the broad research question, two approaches can be used to design a case research methodology. The first involves setting precise questions that guide the data collection and analysis. This approach allows comparisons to be made. The second approach starts with very broad questions and then refines them inductively. Since fairly clear research questions had been developed from the literature review, the first option was seen to be relevant to this study.

Stake (in Denzin and Lincoln, 1994: 237) defines many different kinds of case studies. An "instrumental case study … is examined to provide insight into an issue or refinement of theory". Furthermore, a collective case study is a " study (of) a number of cases jointly in order to inquire into the phenomenon". This research study uses the case in this regard, rather than as the primary focus of the research.

St. John, Young and Miller (1999: 11) maintain that, in a cross industry study, "other industry effects (stage of life cycle, competitive intensity, among others) would have influence on uncertainty." Thus by limiting the number of industries in this research study the sources of variation due to unique industry characteristics are reduced. Reduction in variation was necessary to be able to focus the study on the key variables – environmental turbulence/stability and marketing tactics.

Yin (1994) explains that the type of questions to be asked, the degree of control by the investigator over events and the focus on contemporary events, can identify when case studies should be used. In considering the questions to be asked, he stresses that case studies can be exploratory, descriptive (less likely), or explanatory.

Exploratory research attempts to "investigate poorly understood phenomena" and as such case studies are effective" (Lee, 1999: 41). As has previously been discussed, this study is exploratory in nature.

Explanatory case studies answer questions of 'how' and 'why', which deal with "operational links" rather than "mere frequencies or incidence" (Yin, 1994: 6). This view is supported by Lee (1999: 41), who maintains that multiple case studies are suitable "if the study's purpose is explanatory (e.g., to clarify causal forces …". He maintains that causal inference is possible from case studies because of the "in-depth nature and emphasis on situationally embedded processes" (Lee, 1999: 54). In addition, Riley et al. (2000) support the use of multiple case studies as the resulting evidence is more powerful and increases external validity, thereby enabling some degree of generalisation to be possible. Yin (1994: 45) also

supports multiple cases as they result in the overall study being more robust. These characteristics are consistent with the goals of this study, which are to understand and explain the relationship between the choice of marketing tactics and the degree of turbulence in the external environment. Therefore, it was concluded that an explanatory multiple case study approach was a suitable research strategy to use. In terms of Yin's second identifying factor, it should be noted that little control of events in the companies or industries was possible during the study and so a case study strategy (as opposed to, say, an experiment) was applicable.

Finally, although the research focused on decisions in the companies over the past four to five years, the focus was essentially on contemporary, rather than, historical events. In other words, the researcher could observe relevant behaviours and interview people who were involved in the decisions over the past four to five years, but could not observe the events themselves, so participant observation was not possible. This final factor also confirms the applicability of the case study method for this study.

5.3. SAMPLING

According to Stake (in Denzin and Lincoln, 1994: 243) "… nothing is more important than making a proper selection of cases. It is a sampling problem. The case will be selected to represent some population of cases." Therefore, considerable effort was expended in the selection of the sample. In this section the type of sampling method chosen is discussed, and then the techniques used to select the industries, the companies and the interviewees is discussed, including a justification for the sample size.

The unit of analysis in this study is the firm, even though the interviewees were individuals. This is because the propositions relate to the decisions about marketing tactics taken by the firm and not by individuals within that firm.

5.3.1. Sampling in case research

Keen and Packwood (1999) maintain that purposive sampling is usually required in case research because it is necessary to select a sample that is typical of the phenomena being studied. Patton (1987: 52) maintains that purposive sampling provides "information-rich cases" from which much can be learnt about the problem being studied. Oka and Shaw (2000) also suggest purposive sampling.

In choosing the number of cases, Yin (1994: 45) suggests that "sampling logic" should not be followed, but that "replication logic" is important. A case should be selected so that it either produces the same results (literal replication) or contrasting results (theoretical replication) and the results should be "predicted explicitly at the outset of the investigation. According to Padgett (1998: 50), "…qualitative researchers often choose to focus on the 'outliers', the atypical cases that remind us of the richness of human diversity." Therefore, in this study, cases have been chosen, at the outset, to represent extremes of environmental turbulence/stability and market success. In other words, a 'theoretical replication' case approach has been used. This case approach is also known as "maximum variation sampling", a type of purposive sampling strategy. Maximal variation can be achieved by "selecting diverse characteristics" (Patton, 1987: 53). This case approach turns the weakness of purposive sampling (the significant differences between sampled cases) into a strength.

This strength is that any common patterns that are found are significant because they have "emerged out of heterogeneity." Flick (1998: 70) supports this, saying that this sampling method uses "…only a few methods … to disclose the range of variation and differentiation". This maximal variation has been achieved on two axes – complex/turbulent versus simple/stable and more success versus less success. Although not necessarily facilitating generalization, this sampling method does allow understanding of variation to be achieved and to find and understand patterns within that variation.

5.3.2. Selection of industries

In order to select suitable industries as the focus for the study, a preliminary research study was carried out. The methodology and the findings for this preliminary study are discussed below.

5.3.2.1 Introduction

Since it is assumed that the South African business environment is, by definition, an increasingly complex environment in a state of turbulence, it was first necessary to identify sectors of the environment that are more turbulent and more complex than others. This was necessary in order to identify two industries that are considerably different from each other in terms of complexity and turbulence since it was hypothesised that marketing tactics would differ according to the level of complexity and turbulence in an environment. The second

step was to select two companies from each industry – one performing well in the industry and one performing relatively poorly.

St. John, Young and Miller (1999: 11) maintain that, in a cross industry study, "other industry effects (stage of life cycle, competitive intensity, among others) would have influence on uncertainty." Therefore, by limiting the number of industries in this research study, the sources of variation due to unique industry characteristics are reduced and the variables being studied could be emphasised.

To classify industries in terms of complexity and turbulence, the first step was to identify a list of industries in the South African business environment. This was done by using the Johannesburg Stock Exchange listing from the Profile Stock Exchange Handbook (1999). Certain sectors of the Stock Exchange were omitted from the list because of their making very little use of marketing tactics, for example, the mining sector, unit trusts, investment trusts, property holdings and equity funds. The list ended up consisting of nineteen industry sectors, as is shown in the table below.

Table 5.1 – List of industries

Chemicals, oils and plastics	Banking	Financial services
Insurance	Beverages	Clothing and textiles
Furniture and appliances	Food	Hotels and leisure
Building, construction & engineering	Retail	Electronics and electrical
Information technology	Media	Telecommunications
Education and staffing	Healthcare	Packaging and printing
Transport		

Two methods were then used to identify the most complex and turbulent industries and the least complex and turbulent: these were a review of literature and a short opinion survey of knowledgeable industry experts.

5.3.2.2 Review of literature

a) High complexity and turbulence

Studies in the United States showed the following industries to be high in complexity and turbulence:

Information technology, computer gaming and computers (Nielson, 1995)

Health care, finance/banking/insurance, telecommunications (Baskin, 1998a)

High technology products (Macinnes and Heslop, 1990; Kashani, 1995; Smith et al., 1999)

Full service hotel and health maintenance (Teopaco, 1993)

Telecommunications/multi-media (Courtney, Kirkland and Viguerie, 1997)

Computer industry (Iansiti, 1995)

Financial services, health care, transportation, information, communication (Chakravarthy, 1997)

South African literature showed the following to be high in complexity and turbulence:

Pharmaceuticals, electronics and computers (Cronje et al., 1997)

Pharmaceuticals (Mbendi Information Services, 1997b)

Financial services (Mbendi Information Services, 1997a)

Telecommunications, health care, motorcar, oil & chemicals (Forsdick, 1995)

Financial services (van der Hoven, 1995)

Manufacturing in 1995, but expected to be trade in 2000 (Baxter, 1995)

Computers, fax, photocopy machines (Smit and Cronje, 1992)

b) Moderate complexity and turbulence

Industries of moderate complexity and turbulence, or which were low in one of these variables and high in the other, were found in the United States to be:

Mail order, fast food (Teopaco, 1993)

Telephone, pulp and paper, chemicals, raw materials and technological industries such as semi-conductors (Courtney, Kirkland and Viguerie, 1997)

In South Africa, such moderate industries included:

Health benefits (Morris, Hansen and Pitt, 1995)

Electronics, information technology, manufacturing (Forsdick, 1995)

Trade and business services in 1995, but expected to be manufacturing and Business services in 2000 (Baxter, 1995)

Clothing and motor manufacturing (Smit and Cronje, 1992)

c) Low complexity and turbulence

Literature on the United States market showed the following industries to be low in complexity and turbulence:

Retail, motor and wine industries (Nilson, 1995)

Automobile industry (Baskin, 1998a)

Chemicals/mineral based industries, pharmaceuticals (Kashani, 1995)

Credit card industry (Teopaco, 1993)
Airline (Courtney, Kirkland and Viguerie, 1997)

South African literature suggested the following industries to be low in complexity and turbulence:

Automobile parts, bakeries (Cronje et al., 1997)
Gold mining (Forsdick, 1995)
Mining, construction (Baxter, 1995)
Packaging materials, cafes, bakeries (Smit and Cronje, 1992)

From the above it can be summarised that the high complexity/turbulence industries are telecommunications, information technology/computers, financial services and health/pharmaceuticals, while the low complexity/turbulence industries are motor, bakeries and mining. Other industries that received only a limited mention in the literature, such as trade/retail for high complexity/turbulence and packaging for low complexity/turbulence had also to be considered when the opinions of experts were taken into consideration.

5.3.2.3 Opinions of industry experts

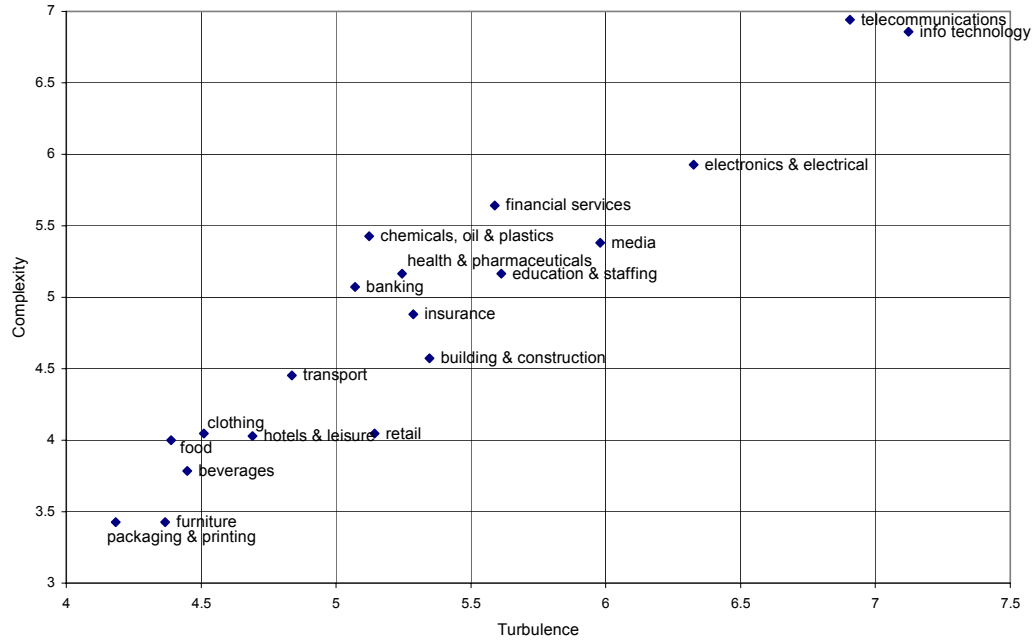
Since most managers in all industry appear to believe that their industry is very complex and turbulent, it was necessary to rely on the opinions of objective outsiders who would have an overview of all industries. For these reasons two types of experts were selected – investment analysts in stock broking firms and general management consultants, both of who require an overall knowledge of the business environment for success in their chosen professions. Questionnaires (see Appendix A) with covering letters (see Appendix B for industry analysts and Appendix C for management consultants) were developed from appropriate directories and mailed out. Five investment analysts and one management consultant returned six completed questionnaires. The mean scores from these questionnaires for complexity and turbulence (on a scale of 1 to 10) in the nineteen industries are given in the table below. Full statistics for all the industry variables are given in Appendix D.

Table 5.2 – Complexity and turbulence rating scores by industry

INDUSTRY	TURBULENCE	COMPLEXITY
Chemicals, oil, plastic	5.238	5.6286
Banking	5.229	5.7143
Financial service	5.714	5.8571
Insurance	5.381	5.0000
Beverages	4.476	3.8571
Clothing & textile	4.452	4.1143
Food	4.452	4.2286
Furniture & appliances	4.548	3.7714
Retail	5.262	4.2857
Hotel & leisure	4.800	4.4286
Building, construction & engineering	5.571	4.8571
Electronics & electrical	6.571	6.3429
Information technology	7.381	7.2000
Telecommunications	7.200	7.6071
Education and staffing	5.833	5.3714
Media	6.191	5.6286
Packaging and printing	4.143	3.3429
Healthcare	5.452	5.5429
Transport	5.071	4.8000

These scores were plotted on a scatter graph that is provided below.

Figure 5.1 : Complexity and turbulence by industry



This clearly shows that telecommunications and information technology are seen as the most complex and turbulent industries, significantly more complex and turbulent than the third placed industry, electronics and electrical. Packaging and printing was the least complex and turbulent. This was seen as considerably simpler and more stable than the group of food, clothing and textiles, beverages and furniture and appliances, which were seen as very similar in terms of their levels of complexity and turbulence.

5.3.2.4 Conclusion

There is no doubt that the telecommunications and information technology industries are the highest in complexity and turbulence based on the above analysis. They are so similar in their ratings that a decision as to which to include in the study was based on the ease with which co-operation could be obtained from companies. Personal contacts within the information technology industry and geographic location were the final deciding factors. In addition, regarding the information technology industry as the most turbulent and complex industry also made intuitive sense.

The low complexity/turbulence decision, however, was not so easy. Although the literature review showed the motor industry to be in this category, the experts classified it, as part of the transport industry, as moderately complex/turbulent. Both the literature review and the

experts rated bakeries, as part of the food industry, as low in turbulence/complexity, but bakeries by themselves did not qualify as an industry in the Stock Exchange terms. The third low complexity industry, according to the literature review, was mining which was not included in the study because of its lack of marketing activities. An alternative to these was the packaging industry, which was rated by the experts as significantly the least complex/turbulent and which was also mentioned in the literature review as a low complexity/turbulence industry. For this reason the decision was taken to include the packaging industry as the representative of low complexity and turbulence industries.

Robbins (1990) maintains that there have been many criticisms of perceptual measures of environmental uncertainty (such as those used in this study), specifically of the work of Lawrence and Lorsch. In this study, the subjectivity of perceptual measures has been minimised by using outside experts, who have knowledge across all industries, to assess the level of uncertainty in the various industries. Since it was believed that all managers would perceive their industry as uncertain and turbulent it was seen as essential to use outsiders to assess this factor. Furthermore, the use of two different means of measuring, namely industry experts and a literature review, is believed to be sufficient to reduce the subjectivity believed by critics to be inherent in perceptual measures.

5.3.3. Selection of companies

Within each industry it was necessary to select two companies to reflect more successful performance and less successful performance. This was necessary in order to identify if there appeared to be different marketing tactics related to success in each industry, as has been proposed. Ideally, success should be measured in terms of sales, profit, market share, growth in these measures and the number of successful new products introduced in the previous three years (Mavondo, 1999). However it was anticipated (correctly with hindsight) that companies would not be prepared to release much of this information and it was necessary, therefore, to use a more subjective measure of success. Shaw and Wong (1996) report that the judgemental approach of self-evaluation has been found to be as effective as other methods such as internal company information, or peer group or expert evaluation. Shrader, Mulford and Blackburn (1989: 51) measured uncertainty via management opinions using Likert scales. They found these measures to be reliable, quoting Dess and Robinson, who found these types of measures to be "consistent with other objective and subjective measures." Therefore, it was decided that the Delphi technique, using a panel of experts, would be suitable for this study. Roberts (2000: 3) reports that the Delphi forecasting technique is now being accepted as a valuable tool for research. "A panel knowledgeable in

the field is given a background briefing about the issue being considered. Members of the panel then make individual judgements together with their reasoning; these judgements are compiled and redistributed to the panel. The process is repeated until the panel converges toward a consensus about the likely future." The suitability of this technique is confirmed by Caldwell (2000: 2), who maintains that Delphi analysis is used for 'experts' rather than the general population and that it is useful for "getting things focused."

A panel of five experts from the packaging industry and four from the information technology industry was established. These experts were selected after discussions with numerous knowledgeable people in both industries. The panels were made up of consultants specialising in these industries, journalists from relevant trade magazines, major buyers of the industries' products and services and managers with wide experience in the industries. All the experts were personally telephoned, the nature of the study explained to them and their agreement to participate obtained. They were asked to name the five most successful and the five least successful companies in their industry, after 'successful' was defined for them. A list of the companies was then created and included in a questionnaire for each industry (See Appendix E for the IT industry – first round and Appendix F for the Packaging industry - first round). The questionnaire was pilot tested with an acquaintance who had experience in both investment analysis and the computer industry. He found it to be acceptable and no changes were felt to be necessary. The questionnaires were then e-mailed to the panel members who were asked to indicate the companies that they judged to be the most and least successful in their industry. From their responses a weighted ranking of companies was created and a second questionnaire with the companies in order from most successful to least successful was developed. This second questionnaire (see Appendix G for the IT industry – second round and Appendix H for the Packaging industry – second round) was e-mailed to the panel members, who were asked to reassess their judgements, taking into account the ranking resulting from the first round of judgements. These responses clearly identified two companies in each industry as most and least successful and they were chosen for the study. They were designated company ITA for the more successful information technology company, company ITB for the less successful information technology company, company PA for the more successful packaging company and PB for the less successful packaging company.

5.3.4. Number of interviewees or participants (sample size)

Padgett (1998: 52) maintains that "because the emphasis is on quality rather than quantity … qualitative researchers sample not to maximize numbers, but to become 'saturated' with information about a specific topic." As a result, the sample size is relatively unimportant – it needs to be as big as the researcher needs, taking into account time and resource constraints.

Taylor and Bogdan (1998: 93) maintain that, in a qualitative study, the sample size should not be decided in advance - "The size of the sample in an interviewing study is something that should be determined toward the end of the research and not at the beginning." Therefore, the number to be interviewed was decided once the research had begun, by discussing and agreeing who the participants would be with the Managing Director, or Marketing Director, on the first day in the company. Furthermore, where appropriate, other participants were recruited after one or two days of interviewing, where it was felt that more information was required, or where an alternative perspective was needed. The selection of participants is further discussed in the section on 'Entering the field.' The net result was a sample of 31 interviewees (see Appendix I for a list of job titles of those interviewed).

5.3.5 Confidentiality

It was anticipated that companies would only participate if they were guaranteed total confidentiality, as they would not wish their strategic and tactical marketing thinking being made publicly available. Therefore, it has been necessary to keep the company names anonymous, as well as the experts' rankings of the lists of companies used for selecting the sample companies, since it could be possible to identify the individual participating companies if this data was known.

5.4. DATA COLLECTION

In this section the procedures used for collecting the empirical data will be discussed. Yin (1994: 68) suggests that certain issues need to be planned for in the data collection protocol to ensure reliability.

- Gaining access to the key interviewees – appointments were made in advance, usually through the CEO or Marketing Director, or through a person nominated by this person.

- A clear schedule of data collection activities within specific periods of time should be developed. This was done, but was not made known to the participants as it was deemed not to be of relevance to them, as it would put unnecessary pressure on them.
- Unanticipated events, such as changes in interviewee availability, must be provided for. Where such problems were experienced, the appointment was rescheduled and continued at a time that better suited the interviewee.

5.4.1. Entering the field/appointments

Telephone calls were made to the chief executive officer or the senior marketing executive in each of the companies, the research was explained to them, their co-operation requested, and an appointment made. At the appointment, the nature of the study was fully explained and a list of people to be interviewed (see Appendix I) and documentation required was agreed. It is important to note that considerable effort was taken to obtain participants who met the criteria of Morse (in Flick, 1998: 70) for a "good informant". The participants:

- should have the necessary knowledge and experience – the most senior marketing and management staff available were selected. However, people lower in the hierarchy were also interviewed in some cases because, as Taylor and Bogdan (1998: 9) say, "the perspectives of powerful people are (not) more valid than those of the powerless,"
- should have the capability to reflect and articulate – most of the participants were in management or had many years of experience and were able, in most cases, to reflect on the questions asked and answered them competently,
- should have time to be asked – in all cases specific appointments were made and in most cases the interviews were conducted in a meeting room, away from the participants office or desk, thereby reducing interruptions,
- should be ready to participate in the study – all participants voluntarily submitted to interviewing, with the understanding that it was not compulsory.

These 'good informants' were contacted personally in most cases and individual appointments made. For the company based in Johannesburg, it was more feasible for the appointments to be arranged by their Marketing Assistant

Although Padgett (1998: 53) implies that the use of incentives to encourage participation is not uncommon, no individual incentives were offered as they were not necessary – the informants participated voluntarily. The organization, however, was offered a copy of the sections of the report that applied to their company.

5.4.2. Setting of the study

The two packaging companies and one of the information technology companies were located in Durban, South Africa, while the second information technology company was located in Johannesburg, South Africa. This difference in geographic location was not significant, as both the information technology companies operate on a national and regional (rest of Africa) basis. Although one of the information technology companies also operated on an international basis, this was not relevant because the companies/ strategic business units researched concentrated mainly on the South African and rest of Africa markets.

5.4.3. Methods used

Keen and Packwood (1999) suggest that the use of multiple methods and sources of evidence is common in case research. Therefore, a number of different data collection methods were used. Such multiple methods were also important to achieve rigour and trustworthiness via triangulation, which will be discussed in more detail in Section 5.6. Yin (1994) suggests six sources of evidence for case studies – documentation, interviews, archival records, direct observation, participant observation and physical artefacts. Of these, documentation and interviews were chosen for the collection of the data. They have the advantage of providing both an 'etic', or outsider and an 'emic', or insider, perspective (Hodder, in Denzin and Lincoln, 1994).

5.4.3.1 Interviews

For this study, interviews comprised the main data collection technique. The strengths of interviews are that they can be focused directly to the research topic and they can provide insight into causation (Yin, 1994). Weaknesses that could have been experienced during the study were response bias; inaccuracies due to poor recall or the respondent not knowing an answer and reflexivity, whereby the respondent answers what they think the interviewer wants to hear. These weaknesses were minimised as is discussed in the section on trustworthiness.

Of the three types of interview methodologies (structured, unstructured and semi-structured or guided) discussed by Oka and Shaw (2000), the last, or semi-structured or guided, interview technique was chosen as structured interviewing would not have allowed for the flexibility and adaptability required in qualitative research. Unstructured interviewing was not applicable as some questions and areas of research had already been developed from the

literature review. Furthermore, Flick (1998) maintains that semi-structured interviews are widely used in qualitative research.

Taylor and Bogdan (1998: 90) mention four justifications for using depth interviews (a type of unstructured or semi-structured interview) in a qualitative study.

- "The research interests are relatively clear and well defined". For this study, this is applicable, as is reflected in the research objectives and propositions in Chapter 1.
- "Settings of people are not otherwise accessible" – For this study, obtaining the opinions of managers and staff was the only way of identifying the companies' attitudes towards their environment and their tactics.
- "The researcher has time constraints" – time was limited from the researchers point of view (he has a full time job) and the interviewees were busy business people.
- "The researcher is interested in understanding a broad range of settings or people" – to identify accurately the company attitudes and opinions it was necessary to collect data from a diverse range of staff in four companies.

Data was also collected via what Merton et al. (in Yin, 1994) call a focussed interview. This is a relatively short interview of about one hour, which although still open ended and conversational, follows a set of questions. This set of questions was developed into an interview guide – see Appendix K. The interview guide was necessary for a "directive function with regard to excluding unproductive topics" and so that the interviewer would not "present him or herself as an incompetent interlocutor" (Flick, 1998:92). Such interview guidance was necessary because the interviews were what Flick (1998: 92) calls "expert interviews", in which it is necessary to ensure that the 'expert' does not "get lost in topics that are of no relevance and permits the expert to extemporize his or her issue and views on matters". This latter potential problem was also avoided because the interviewer did, in fact, have considerable knowledge of both marketing and the two industries, from previous work and consulting experience.

5.4.3.2 Documents

According to Burgess (cited in Oka and Shaw, 2000) documents as evidence can be categorised in three ways:

- primary versus secondary sources – in this study only primary sources were used, namely documents with a direct relationship with the companies being studied;

- public versus private documents. All the documents used in this study were public, in the sense that they were at least accessible to members of the companies;
- solicited and unsolicited documents – only unsolicited documents were used, namely documents that were naturally produced by the company and later researched for the study.

Documentation is important according to Hodder (in Denzin and Lincoln, 1994: 395), because "'What people say' is often very different from 'what people do'". Therefore, an analysis of documentation can act as a check on the interview findings. Documentation has the strengths of being stable, unobtrusive, exact and having broad coverage in terms of time and settings. However, two problems associated with documentation were experienced, namely, retrievability - some documents, such as a marketing plan, could not be found, and access - the marketing plan in another company was confidential and could not be seen.

The following are the types of documents that were studied:

Annual reports
Stock exchange prospectuses
Company brochures
Company web sites
Policy and procedure manuals
Minutes of meetings
Company newsletters
Magazine articles
Leaflets
Meeting agendas

5.4.4 Data collection instrument

Kutz (1998) sees research, from a complexity theory viewpoint, as any form of exploration or enquiry. He therefore believes that traditional hard-science questions, built on older questions, linearity and carefully structured rigour and which proceed in small steps, are inadequate for research into the rich and complex nature of reality. Furthermore, traditional soft-science questions are not much better. They modify language to bridge the gap between the hard and soft sciences, but they still emulate the hard sciences to acquire legitimacy. He suggests that the solution is to stop asking rational questions and to ask novel or process questions. Such questions come from any source, but are grounded in

reality. This approach concentrates on understanding how things work, and therefore is suitable for exploratory requirements. Furthermore, in using this approach in a complex environment, he implies that cause and effect should be ignored and concentration should be on characterising the phenomenon in depth as it is at present. In other words, rather than presetting research questions, research should be by observing the phenomena and allowing questions to emerge from the observation, that is, from a beginner's, or empty, mind.

Since the above approach is a common attitude toward research in the complexity field, it is necessary to explain why this approach was not religiously followed. The nature of the problem being studied was such that certain outcomes could be anticipated and therefore it made sense to direct the interviewing to address these possible outcomes, for example, a relationship between a turbulent environment and the use of destabilising marketing tactics. In other words, it was not necessary to treat the phenomenon as a 'total unknown.' Furthermore, the phenomenon being researched resided, to a large extent, in the past and therefore could not be observed, as suggested by Kutz (1998). It was therefore decided that a research protocol was necessary to guide the empirical research and this was developed as suggested by Yin (1994: 69), who sees a "set of substantive questions reflecting the actual inquiry" as being the "heart of the protocol." For this study a comprehensive questionnaire guide was thus developed and used to guide all the interviews, and was also used as a guide for the analysis of the interview data (See Appendix K). However, it should be stressed that the 'questionnaire' was used purely as a guide, because as Taylor and Bogdan (1998: 8) say, the interview should be "a normal conversation rather than a formal question-and-answer exchange."

5.5. DATA ANALYSIS

In this section the treatment of the raw data in terns of storing and sorting it prior to analysis, as well as the analysis techniques and procedures used will be discussed.

5.5.1. Storing/sorting of data

5.5.1.1 Field notes

As interviews were conducted, the answers provided by the participants were mentally summarised and a brief summary of the interviewee's answer to a particular question was recorded on a specially prepared interviewee response sheet. Once all the interviews were

completed these response sheets were further summarised into an Excel spreadsheet, which was then used for analysis and interpretation. A copy of the interviewee response sheet is provided in Appendix J.

5.5.1.2 Interview recordings

All interviews were audio recorded with the permission of the participants. These recordings were transcribed into typed documents, which were then converted manually into the format required by the NVivo computer package. The transcriptions were then saved into the NVivo computer package, ready for analysis,

5.5.1.3 Documents

Where possible documents were obtained in their original format (e.g. newsletters, prospectuses) and filed for later analysis. Internet documents (corporate websites) were printed out and filed for analysis. However, many documents could not be removed from the companies' premises due to their confidentiality – for example, meeting minutes. These were summarised on site by reducing them to their key meanings, listing the types of issues discussed and recording the typical words/language used. These were also then filed for later analysis.

5.5.1.4 Word usage

Based on the literature review, a list of words related to chaos, complexity, turbulence, stability and order was developed (see Appendix L). This list was fed into the NVivo computer package and the package then interrogated the interview transcripts to obtain a count of the frequency of use of these words by participants from each company. The word usage by company was then recorded in an MS Word table.

5.5.2 Analysis techniques/methods used

5.5.2.1 Timing of analysis

Most analysis was done after the data collection was completed. This is in line with Taylor and Bogdan's (1998: 142) opinion that "practical considerations may also force the researcher to postpone analysis. For example, people sometimes underestimate the amount of time it takes to have taped interviews transcribed." This particular problem was

experienced in this study. However, some analysis was done during the data collection phase of the study, as is recommend by other authors. For example, Coffee and Atkinson (cited in Oka and Shaw, 2000: 8) say "We should never collect data without substantial analysis going on simultaneously." In line with this approach, preliminary analyses were conducted on the field notes taken after each company was completed. It was not appropriate to analyse after each interview, as the interviews were conducted intensively over a short period of time (three to four days for each company). Some documents were analysed and summarised during the period at the company, as discussed in Section 5.5.1.3.

5.5.2.2 Qualitative analysis strategies used

The broad approach followed was that recommended for qualitative research by Coffee and Atkinson (in Lee, 1999: 97). This involves first "decomposing and reducing [the] data … [so that] a general, coherent and [above all] simplifying structure is imposed." Secondly, the data is reconstructed and expanded in order to provide "new and broadening perspectives." This was achieved by using the QSR NVivo software and will be discussed in more detail in the next section.

Most of the analyses were done using the content analysis approach. Lissack (1998: 3) explains that there are two approaches to analysing textual data – "(1) an inductive approach which seeks to identify theoretical constructs from textual data; and (2) a deductive, measurement-orientated approach which seeks to quantify textual data in terms of pre-existing, theoretical concepts." However, since Taylor and Bogdan (1998: 8) maintain that "Pure induction is impossible", in this study both approaches were used. Deduction was used to analyse the interview transcripts in terms of the propositions developed from the literature review and to quantify the use of complexity or chaos 'oriented' words. This was appropriate because, as maintained by Lissack (1998: 5), "Traditional content analysis software assumes that most users already have an idea of the type of information they want to retrieve and already have a grasp of the text's discourse." Induction was also used, in analysing the interview transcripts to inductively identify patterns of commonalities or differences in the data.

It could also be said that abductive reasoning was used. This starts from the particular (in this study, from the propositions developed from the literature review) and then progresses to explaining "the phenomenon by relating it to broader concepts" identified from personal experience, personal knowledge and knowledge from the discipline being researched and other disciplines (Peirce, in Coffee and Atkinson, 1996: 156). Abductive reasoning thus uses

the data to go beyond existing ideas and theories, using wider knowledge "to come up with new configurations of ideas." Such abductive reasoning is clearly appropriate to qualitative research and also seems appropriate to the handling of the research problem of this study. As a guide to abductive (or both the deductive and inductive) analysis of the interview transcripts, the table below was developed. As can be seen, the contents of the table include both the 'known particular' and the 'unknown that requires new ideas and knowledge.'

Table 5.3 – Guide for analysis of interview transcripts

CASES	LOOK FOR	MEANING ……..	NATURE OF CRITERIA
Packaging	Commonalities between PA & PB	Factors not influencing success in packaging	Destabilising factors
	Differences between PA & PB	Success factors for packaging	Stabilising factors
Information Technology	Commonalities between ITA & ITB	Factors not influencing success in IT	Stabilising factors
	Differences between PA & PB	Success factors for IT	Destabilising factors
A companies	Commonalities between PA & ITA	Success criteria regardless of environment	Not known
	Differences between PA & ITA	Success criteria influenced by environment	Not known
B companies	Commonalities between PB & ITB	Criteria effecting less success regardless of environment	Not known
	Differences between PB & ITB	Criteria effecting less success influenced by environment	Not known
ITA & PB	Commonalities between ITA & PB	Success criteria for IT & less success for packaging	Destabilising factors
ITB & PA	Commonalities between PA & ITB	Success criteria for packaging & less success for IT	Stabilising factors

According to Yin (1994: 106) "one of the most desirable strategies is to use a pattern-matching logic." This involves comparing an "empirically based pattern" (in this study, obtained from the four cases) with a "predicted one" (as identified from the literature review and presented in the propositions). Where the patterns match, a causal relationship can be

inferred and the propositions accepted. Where the patterns do not match, the propositions would have to be questioned. This is known as “a theoretical replication across cases” and helps to strengthen the internal validity of the case study. This pattern matching approach is reflected in the table above.

In addition to pattern matching, the analysis technique of explanation building was also used. This involves building an explanation about the case by analysing the case data, thereby providing an alternative perspective to the pattern matching, which improves internal validity. Since this procedure was used for four different cases (companies), it effectively forms a cross-case analysis, which contributes to improved external validity of the study (Yin, 1994: 110).

The analysis was further enhanced, as recommended by Yin (1994: 120), by “analysing embedded units” (documentation analysis and the ranking of marketing tactics) and by making “repeated observations” (each company ‘case’ involved interviews with a number of employees and managers).

5.5.2.3 Process of qualitative analysis

In conducting the content analyses, coding was carried out using the QSR NVivo Version 1.2.142 software package, resulting in “the assignment of pieces of text to particular categories and discerning patterns from the categorical mappings” (Lissack, 1998: 3). The actual procedures used were as follows:

a) Word analysis

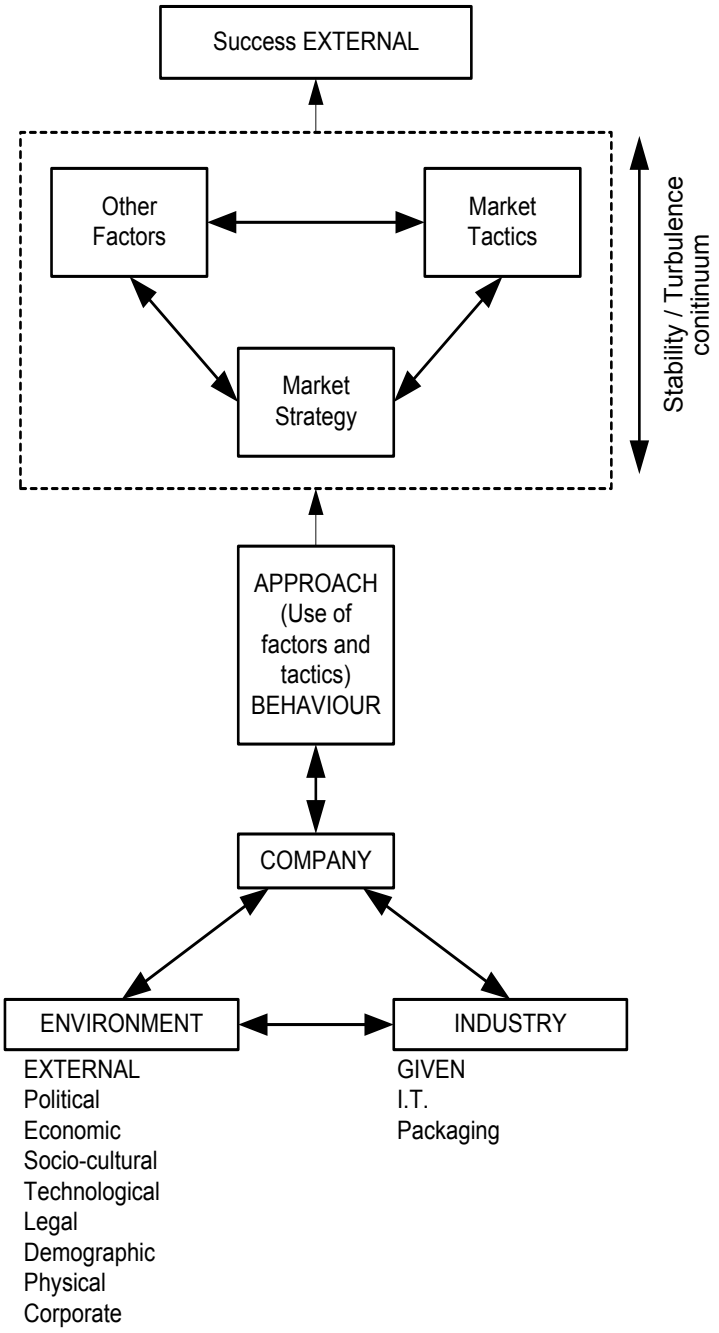
A Boolean search using UNION was done via the QSR NVivo software, by entering the complete set of words developed from the literature review with an ‘OR’ between words. Also, the option of returning the results as the word as well as its contextual paragraph was selected. This resulted in a large body of text, as, unfortunately, the words searched for could not be individually highlighted. The entire text was then manually scanned and the words highlighted and recorded manually, resulting in a table of words commonly used by each company. This table is presented in Appendix M and constitutes the findings used in Chapter 6.

b) Interview transcript analysis

To analyse the interview transcripts, a process consisting of a number of steps was used.

- Step 1 – The coding scheme was devised. A conceptual framework for the coding was first devised. This is shown in the figure below.

Figure 5.2 – Conceptual framework for guiding coding



- Step 2 – The research questions to be answered by the analysis were identified, namely, what is the overall approach of each company – stabilising or destabilising, and what are the differences and commonalities in approach between more successful and less successful companies and between those in turbulent/complex environments and stable/simple environments.
- Step 3 – The overall structures and themes in the analysis were conceptualised, namely management, marketing strategy, structure, innovation and marketing tactics (product, price, place and promotion).
- Step 4 – Start codes were decided on for the initial analysis. These were change, stability, marketing strategy, marketing tactics and other factors.
- Step 5 – A list of codes was developed from the conceptual framework, the research problem, the research questions, the conceptual themes, the start codes and the key variables. This list of codes is given in Appendix N.
- Step 6 – Operational definitions of the codes in the form of the criteria for each code were developed. These are shown in Appendix O, the Coding framework.
- Step 7 – Using QSR NVivo, the transcripts were deconstructed and reconstructed according to the coding scheme mentioned in Step 5. This resulted in a series of extracts from the interviews that were recorded under each code.
- Step 8 – Each code and its associated set of extracts was manually analysed, looking for patterns of similarities and differences in the themes or trends in the initial codes. This resulted in a 'memo' summarising each code (variable), with supporting extracts, for each company. These 'memos' comprised a write-up about the codes and their relationships.
- Step 9 – The 'memos' from step 8 were then pattern coded manually according to the main themes or variables of the study, namely complex/turbulent versus simple/stable environments and more success versus less success. This enabled the large amount of data in the 'memos' to be reduced to a smaller, manageable number of analytical units, to develop an integrated schema for understanding local incidents and interactions and to facilitate cross-case analysis by surfacing common themes. These 'pattern codes' constituted the themes, causes/explanations and relationships that are discussed as the findings in Chapter 6.

c) Analysis of field notes

The Excel spreadsheets on which the participants' responses were summarised formed the basis of analysis for this phase. By reading through the responses of all the participants for a particular company and for a particular question, a consolidated

or average response was subjectively identified for each issue/question for that company. These 'company responses' were then recorded in a table. This table is provided in Appendix P and constitutes the findings discussed in Chapter 6.

d) Analysis of documents

Initial analysis of documents was either done *in situ* at the companies' premises or once the fieldwork had been completed. This initial analysis involved reading through the documents and extracting and recording all information in the form of quotations, summaries, or words that were relevant to the study. These summaries/quotations/words were then coded according to the coding framework provided in Appendix O, recorded in a table and sorted according to company and code. The final step in this process was then to 'pattern code' this table according to the same themes, variables, explanations, or relationships discussed in Step 6 above. This outcome provided the findings that are discussed in Chapter 6.

5.5.2.4 Quantitative analysis

As was explained in section 5.2.1 above, a combined positivist and phenomenological approach was followed. The positivist approach using quantitative methods was seen as suitable because propositions based on the literature as to how companies operate in the reality of complex/turbulent or simple/stable environments were developed. Thus, quantitative analysis methods were used to analyse the ranking of marketing tactics done by the respondents.

a) Univariate analysis

Univariate analysis was done by averaging the respondents' rankings for each company to create a marketing tactic 'rating'. These 'ratings' were then ranked to identify the most important, second most important, etc., tactics in each company. These final rankings were then compared between companies and against the propositions to identify if the importance of tactics, as stated by the respondents, matched the importance suggested in the propositions.

b) Multivariate analysis

Multivariate analysis was necessary for a more in-depth analysis of the rankings in order to pinpoint differences in the marketing mixes between the four companies and to identify which tactics were most closely related to the different environmental levels, the different levels of success and the different companies. The technique

chosen was correspondence analysis and the analysis was done using the Statistical Package for the Social Sciences (SPSS) version 9.0. Correspondence analysis, according to Hair et al. (1992), is suitable for non-metric data and especially suitable for exploratory data analysis. It is a perceptual mapping technique that reflects the association between variables in a contingency table and as such is suitable for this study. The contingency table consists of columns and rows, with columns reflecting levels of turbulence and success and the rows reflecting marketing tactics. Proximity of the plots on the map is an indication of the level of association between the variables.

5.5.2.5 Conclusion

From the above discussion it can be seen that the protocol adopted was generally in line with a qualitative methodology, but not so unstructured as to detract from achieving the overall research objectives. The approach was sufficiently systematic and carefully implemented so as to maximise the trustworthiness and rigour of the study, which is discussed in depth in the next section.

5.6 RESEARCH QUALITY AND RIGOUR

5.6.1 Introduction

It is always necessary to judge the soundness of the research to identify if its "findings are authentic and its interpretations credible" (Padgett, 1998: 88). The study approached the methodology from both a post positivist and a constructivist viewpoint. It is post positivist in that it accepts that a "separate but parallel set of criteria" (Padgett, 1998: 89) is required to assess the rigour of a qualitative study. Furthermore, it is accepted that research should be "empirically grounded" and subject to the "minimization of bias." Therefore, validity and reliability are briefly discussed. However, the nature of the study is such that "generalizability" is not entirely possible and so a constructivist approach is also adopted. This approach, according to Padgett (1998: 89), sees the reliability and validity of quantitative research being replaced by Guba and Lincoln's concept of 'trustworthiness' which implies that the study "is carried out fairly and ethically and [its] findings represent as closely as possible the experiences of the respondents" (Steinmetz, 1991, in Padgett, 1998: 92). This approach to assessing the quality and rigour of a qualitative study is supported by many authors (for example, Trochim, 2001; Babbie and Mouton, 1998). As a result, a large

proportion of this section is devoted to assessing the trustworthiness (validity) and consistency (reliability) of the study.

5.6.2. Validity and reliability

Yin (1994) maintains that there are four tests relevant for assessing the quality of a case study. These are construct validity, internal validity, external validity and reliability.

- Construct validity entails assessing the quality of the operational measures of the concepts being studied. In order to increase construct validity "multiple measures of the same phenomenon" should be used, as this encourages "convergent lines of inquiry" (Yin, 1994: 90). In this study multiple sources of evidence were used in the data collection stage, namely, multiple interviewees, documentation and field notes. Furthermore, as far as possible, a "chain of evidence" has been established as is discussed later in the section under audit trail. This allows the readers to study the evidence themselves and to track the logic of the researchers interpretation.
- Internal validity considers the quality of true casual relationships as opposed to spurious relationships. To ensure internal validity, use was made of pattern matching and explanation-building techniques amongst the cases. This "theoretical replication across cases" strengthens internal validity, according to Yin (1994: 106).
- External validity assesses the "domain to which a study's findings can be generalized" (Yin, 1994: 110). To ensure generalizability, the research design involved replication logic using multiple case studies in the form of cross-case analysis. Furthermore, Riley et al. (2000) stress that multiple case studies increase external validity, thereby facilitating generalisation.
- Reliability implies that the study can be repeated with the same results. This was ensured by establishing a clear protocol for data collection, as suggested by Yin (1994), specifically the use of a detailed interview guide, by developing and keeping a data base of the empirical data and by using a formal, computerised analysis technique. In addition a "chain of evidence" has been kept as recommended by Yin (1994:90), so that readers may study the evidence or use the methodology and data to assess the logic of the analysis themselves. As a result, the methodology is capable of being audited and therefore replicated, which increases the reliability of the study. Copies of the above guides and empirical data are available on request from rogerm@dit.ac.za or rbmason@mweb.co.za.

Therefore the nature of the research design has increased validity and reliability, especially through the multiple-case study approach which produces more compelling results that are considered as "being more robust" (Yin, 1994: 45)

5.6.3. Threats to rigour

Lincoln and Guba (1985, in Padgett, 1998) claim that there are three main threats to trustworthiness – reactivity, researcher bias and respondent bias.

Reactivity refers to the potential influence the researcher's presence might bring to the study in terms of behaviours, attitudes and feelings. Reactivity in this study was minimized by means of the following:

- all interviews were held in the respondents' own offices or conference rooms to ensure that they were at ease and did not feel threatened. In other words, the setting was as natural as possible;
- respondents were deliberately kept ignorant of a full understanding of the propositions that were being investigated to ensure that they did not try to give responses that they thought were what the researcher wanted.

Researcher's bias involves "filtering(ing) one's observations and interpretations through a lens clouded by preconceptions and opinions" according to Padgett (1998: 92). She stresses various techniques that can be used to reduce researcher bias. Those listed below were used in this study.

- A semi-structured interview guide (see Appendix K) was used to ensure that questions did not vary to such an extent that they could have influenced the respondents or that leading questions were used.
- Careful choice of sympathetic respondents was avoided by having the contact person (CEO or marketing director), assist with the choice of who would be interviewed.
- All interviews were audiotape recorded in order to keep the communication impersonal and to minimize the researcher's having to slow the interview down for note taking. Furthermore, this precluded the researcher from only recording some and ignoring other, data.
- Weiss (1994, in Padgett, 1998: 92) maintains qualitative researchers should maintain an "emotional middle distance." This was achieved by having all interviews conducted by the same researcher, who had ten years of qualitative, consulting-type interviewing experience, in addition to academic research experience.

Respondent bias involves respondents either lying or withholding information, or giving answers that they think the researcher wants (Padgett, 1998). In order to avoid this the following steps were taken:

- respondents were deliberately kept ignorant of a full understanding of the propositions that were being investigated to ensure that they did not try to give responses that they thought were what the researcher wanted;
- respondents were assured of total confidentiality.

5.6.4. Strategies to enhance rigour and trustworthiness

Padgett (1998: 95) suggests six strategies for increasing rigour in a study. These strategies are summarized in Table 5.4 and their applicability, or otherwise, to this research study is discussed below.

Table 5.4: Strategies to increase rigour

STRATEGY	REACTIVITY	RESEARCHER BIAS	RESPONDENT BIAS
Prolonged engagement	+	-	+
Triangulation	+	+	+
Peer debriefing/ support	0	+	0
Member checking	+	+	+
Negative case analysis	0	+	0
Audit trail	0	+	0

Key: + = Positive effect in reducing threat
- = Negative effect in reducing threat
0 = No effect

From the table it can be seen that triangulation and member checking are the most powerful techniques, followed by prolonged engagement. Regarding reactivity and respondent bias, both these threats were addressed via triangulation and to a lesser extent, prolonged engagement. Researcher bias was addressed predominantly via triangulation, but peer debriefing/support and audit trail and to a lesser extent negative case analysis, also contributed to minimising researcher bias.

The six strategies are discussed in more detail below.

- **Prolonged engagement**

One of the key benefits of prolonged engagement is that it makes lying or withholding information difficult, due to repeat interviews. The nature of this study, however, makes such negative responses unlikely. All interviewees were encouraged by the CEO/Marketing Director to co-operate and the nature of the data collected was not threatening or embarrassing in any way. Nevertheless, a degree of prolonged engagement was achieved as the researcher spent a minimum of three days in each company (in most cases, spread over about two weeks) – this meant that the staff came to feel reasonably comfortable with the researcher and so reactivity and respondent bias would, to a limited extent, have been controlled.

- **Triangulation**

From the table above it can be seen that triangulation is effective in controlling all three sources of threat to rigour. This is supported by Keen and Packwood (1999) who maintain that case studies often use triangulation to improve the validity of a study. This is achieved by systematically combining different data and methods. For these reasons, it is one of the most widely practiced means of enhancing rigour in qualitative research. Padgett (1998, quoting Denzin, 1978) mentions four types of triangulation.

> Theory triangulation – the use of multiple theories to interpret the data. Although theory triangulation was not strictly used in this study, chaos theory, complexity theory and various marketing theories have been used to analyse the data, so to a limited extent it can be said that theory triangulation has assisted in ensuring rigour and enhancing trustworthiness of the results.
>
> Methodological triangulation – use of multiple methods in a single study, often a combination of qualitative and quantitative methods. Although this study is predominantly qualitative, some degree of quantitative analysis has been included, by assessing, for example, the frequency of use of certain terms and by asking respondents to rank order the importance of marketing tactics in their organizations. Bowen (1996: 10) maintains that methodological triangulation "…can enhance, illustrate and clarify research findings," thus improving the validity of a study.

Observer triangulation – use of more than one observer in a single study. This was not relevant in this study, as one observer collected all data.

Data triangulation – use of more than one data source. Different types of data were collected in the study and multiple data types can be seen to be the main source of triangulation in this study. In the depth interviews, data was collected in two ways – first, the interviews were audio recorded, transcribed by a professional transcription typist and then analysed, and second, the researcher took notes during the interview, thereby interpreting and highlighting what, during the interview, seemed to be the most important and relevant issues. This approach has the advantage of selecting and interpreting the interview as it is happening, but also enables the data to be dispassionately analysed, free of influence by factors such as the environment, the respondent, interruptions and the interviewer's mood at the time. Therefore, these two types of data were checked against each other. A third form of data collection involved a rank ordering by all respondents of their marketing tactics in terms of their importance to the company. This gives a third assessment of marketing tactics' importance that can be compared against the data collected through the other methods. Fourth, data was collected in the form of documents, namely, meeting minutes, brochures, manuals, websites and newsletters. A content analysis of these documents also enabled the data collected through the other methods to be crosschecked.

Denzin and Lincoln (1994: 215) mention a fifth method of triangulation – interdisciplinary triangulation. This method was applied in this research by the conceptualisation and investigation of the problem in terms of marketing theory and chaos/complexity theory, two widely differing disciplines. By applying another discipline "we may broaden our understanding of method and substance."

- **Peer debriefing and support**

This strategy involves the use of other researchers to get feedback, fresh ideas and to guard against bias. Since this study is done for qualification purposes, this method is less relevant. Nevertheless, the researcher did discuss the research with co-workers and co-researchers to test ideas and to generate new ideas and a research assistant was also closely involved with the coding and analysis. Furthermore, four papers were presented at conferences in order to test ideas and to obtain feedback from as wide a range of marketers as possible.

- **Member checking**

Member checking involves returning to the field and checking findings with respondents. This strategy was impractical as one of the case companies was geographically distant and, due to cost, time and hesitation on the company's part, it was not possible to revisit them. It was also felt that if one company could not be revisited, then revisiting only the other three companies might bias the results against the company not visited. Therefore it was decided not to make use of member checking.

- **Negative case analysis**

This strategy requires an attempt to find evidence to refute the theory or proposition being studied. Since the study is not attempting to accept or reject a hypothesis this approach can be seen as not relevant. However, the design of the study, with two industries at extremes of the turbulence/stability continuum and two companies in each industry defined as more and less successful, can be said to have a form of negative case analysis built into it.

- **Audit trail**

Providing copies of field notes, interview transcripts and journals to enable other researchers to confirm the findings is known as creating an audit trail. Since the interview transcripts run to about 300 pages and the coded documents to about 600 pages, it was felt that it would be impractical to include them in this report. However, summary copies of the field notes and the document summaries are included as Appendices M and O. In addition, the full transcripts are available on request by e-mail from rogerm@dit.ac.za or rbmason@mweb.co.za.

Trustworthiness can be assessed via four principles: credibility, transferability, dependability and confirmability. These four principles and how they relate to this study are discussed below in terms of the strategies for achieving rigour and trustworthiness discussed above.

- **Credibility** is the "compatibility between the constructed realities that exist in the minds of the respondents and those that are attributed to them" (Lincoln and Guba, in Babbie and Mouton, 1998: 277). Of the methods they suggest to achieve credibility, this study has used triangulation and to a lesser extent prolonged engagement.

- **Transferability** is “the extent to which the findings can be applied in other contexts” (Lincoln and Guba, in Babbie and Mouton, 1998: 277). Since qualitative research is not intended to be generalizable, it is the responsibility of a researcher who wishes to generalise these findings to assess their transferability. This has been made possible by the use of purposive sampling and by providing sufficiently detailed data (thick descriptions) to allow transferability to be assessed.

- **Dependability** implies that, if a similar study were conducted with similar participants, a similar finding would be made (equivalent of reliability). Since, according to Lincoln and Guba (in Babbie and Mouton, 1998), there can be no credibility without dependability, the fact that the credibility of this study has been justified above means that the findings must be dependable. In addition, an audit trail is available to conduct an ‘inquiry audit’ to attest to the dependability.

- **Conformability** is the “degree to which the findings are the product of the focus of the inquiry and not the biases of the researcher” (Lincoln and Guba, in Babbie and Mouton, 1998: 278). An audit trail is available for the quality of the findings, interpretations and conclusions to be assessed in terms of their source material. Tape recordings, transcripts, deconstructed and reconstructed summaries, documentation, field notes and data collection instruments are either presented in the Appendices, or are available via e-mail on request.

From the above discussion it can be concluded that this study meets the requirements of trustworthiness.

5.6.5. Conclusion to trustworthiness

From the above it can be seen that considerable effort has been taken to ensure rigour and trustworthiness in this study. The main technique used was triangulation, with the other strategies being less important. This was felt to be acceptable if Padgett’s (1998: 103) comments are considered, namely that “peer debriefing and auditing are considered potentially contaminating influences that interfere with the search for deep structures of meaning” and that “Prolonged engagement, peer debriefing, member checks and auditing all expose respondents to a loss of privacy”. Privacy and confidentiality was a major issue with all four companies and therefore it was felt that it was ethically correct not to follow any strategies that might have jeopardised their privacy and confidentiality.

5.7 CONCLUSION

The methodology chapter is the most important chapter of a thesis, as it is the core of the study, the basis of the empirical research and the standard against which the quality of the research is judged. The preceding pages have spelt out exactly how this study was conducted. First, the research design chosen was set out against the ontological paradigm adopted, located within the overall milieu of qualitative research and then the chosen method, case research, was explained and justified. Second, the sampling method used was specified and the preliminary research conducted to select the sample was explained. Third, the data collection, including the methods used and the data collection instruments, were outlined. Fourth, the protocol for data analysis, including the techniques, strategies and processes used, was explicated. Finally, the quality and rigour of the study was assessed, both in terms of validity and reliability and in terms of trustworthiness and consistency.

A careful study of this chapter will show that the ten design considerations of Lincoln and Guba (in Rudestam and Newton,1992) outlined in the introduction to this chapter have been adhered to, with each step being addressed by one or more of the chapter's sections. This adherence to the design considerations implies that this methodology chapter "describe[s] in sufficient detail the methods and procedures to permit a replication of the study" (Rudestam and Newton, 1992: 74), thereby meeting their required criteria of completeness for a high quality research study.

The findings that resulted from the implementation of this methodology will be presented and discussed in the next chapter.

CHAPTER 6 – ANALYSIS OF DATA

6.1 INTRODUCTION

This research study set out to understand how South African companies operating in a complex and turbulent environment or in a simple and stable environment differ in their use of marketing tactics. To meet this overall objective, a number of sub-objectives were identified. These were:

> Sub-objective 1: To develop a model of the marketing mix tactics that could be expected to be found in companies operating in complex and turbulent environments. This model was developed from a review of relevant literature. The applicability of the model was tested via the empirical research and is reported on in Chapter 7.
>
> Sub-objective 2: To identify any differences in the marketing mix tactics between companies operating in complex/turbulent industries and those operating in simple/stable industries. The analyses of results in this chapter are structured according to the environment, i.e. turbulent/complex or stable/simple in order to contrast the marketing mixes of the companies operating in each environment.
>
> Sub-objective 3: To investigate the relationship between the different types of marketing mix tactics mentioned above and marketing success in complex and turbulent industries. Throughout the analyses in this chapter the marketing mix of the more successful company in an environment is contrasted against the marketing mix of the less successful company in the same environment in order to identify if there is a relationship between the type of marketing mix and success in each of the environments.

In order to achieve these sub-objectives a number of propositions were developed from the literature in order to guide the data collection and the data analysis. The four propositions are:

Proposition 1: It is proposed that companies operating in an environment that is highly complex and turbulent will use a marketing mix made up of more destabilizing variables, such as:

new product development and real product innovation

sales promotion

price promotions (including price cutting)

Proposition 2: It is proposed that companies in simpler and more stable environments will use marketing mixes that are made up of more stabilising variables, such as

relationship selling and relationship building

corporate or image advertising

'status quo' price policies

Proposition 3: It is proposed that companies using a destabilising mix in a complex/turbulent environment will be more successful than those using a stabilising mix.

Proposition 4: It is proposed that companies using a stabilising mix in a simple/stable market will be more successful than those using a destabilising mix.

In order to assess these propositions, and to identify the accuracy and applicability of the model, the analysis phase of the research is presented as follows. First, the content analysis of the interview transcriptions, the analysis of the field notes taken during the interviews, and the analysis of the documentary evidence collected during the study is analysed and presented together. This is the purely qualitative analysis of the data. Second the results of the more quantitative analytic methods are presented – namely, the use of turbulence/chaos oriented versus stability oriented words in the interviews is discussed, and then the ranking of the importance of marketing tactics, as provided by the respondents, is analysed using univariate and multivariate statistical techniques. Finally, the conclusions from each analytic methodology are drawn together in order to provide an overall conclusion to the empirical component of the research. The model developed from the literature is presented in, and will be contrasted with the empirical findings in, Chapter 7. Conclusions regarding the sub-objectives and the propositions will be discussed in Chapter 8.

6.2 QUALITATIVE ANALYSIS

This section of the chapter will integrate and discuss the content analyses of the depth interviews conducted with the management and staff of the four respondent companies, the field notes taken during the interviews, and the analysis of the companies' documentary evidence. The depth interviews constituted the primary results of the study, and as such are the basis for the primary discussion in this chapter. The field notes taken during the interviews constitute an on-site analysis and summary of what was said in the interviews, without the screening factors of time or the difficulties in interpreting the audiotapes. Therefore, this analysis is an important check on, and confirmation of, the analysis of the interview transcriptions. Documentary evidence is particularly useful as a check on other evidence, and as such comprises a major component of the triangulation to ensure trustworthiness of the results of this study. The field notes and documentary evidence are presented as a back up, or corroboration of the primary evidence from the interview transcripts.

Each company's perception of their environment, their management activities, and their marketing tactics are compared against the profile expected as specified in the propositions. This is then followed by a comparison of the companies operating in the turbulent and complex environment and a comparison of the companies operating in the stable and simple environment. Finally, an overall conclusion relating the nature of the environment to the tactics used and the level of success is presented.

The section is structured according to the three broad *a priori* areas of data that were collected, namely, the environment, general management issues and marketing tactics. Within these areas, specific sub-issues are discussed in terms of the similarities and differences between the more successful and the less successful companies. In this way it is possible to identify those variables that are related to success in a turbulent/complex environment and those which are not.

6.2.1 Environmental issues

Although the two industries (information technology and packaging) were defined as complex/turbulent and simple/stable, respectively, through the survey of consultants and analysts, how the companies' staff perceive their environment could influence their marketing behaviour. Therefore, this section will discuss the perceptions of the respondents in terms of

the environment and markets in which they operate, and in terms of the degree of change being experienced and their attitudes to this change. This is important because it will enable comparisons to be made between the more successful and less successful companies relative to the environmental conditions. Furthermore, it is important because the propositions specify that the environment is influential in the choice of marketing tactics, and therefore it is necessary to identify how the companies perceive their environment and the change being experienced. The approach used is to look for similarities and differences between the more successful and the less successful companies in a particular environment, first in the turbulent/complex environment, and then in the stable/simple environment. A predominance of similarities implies that they perceive the environment in the same way, and it would be expected therefore that they would adopt similar management and marketing tactics. A preponderance of differences, on the other hand implies that they perceive the environment differently, and therefore would adopt different tactics.

6.2.1.1 Environmental and market change

Each of the issues will be discussed separately to clearly identify the conditions perceived by the more and less successful companies in their markets, and the degree of similarity or difference in these perceptions.

a) Companies in a turbulent and complex environment

The main similarity in this area was that both companies **perceive their environment** as changing and turbulent, as is indicated by the following extracts:

> ITA - “The way technology is evolving … the dynamics are different from day to day” (Node 1 of 4, passage 1 of 3).

> ITB - “It is continuously shifting. Very definitely” (Node 1 of 4, passage 2 of 5).

However, if their perceptions are looked at in more depth, significant differences appear. The less successful company (ITB) made relatively little mention of the environment in general, other than to refer to it as “diverse and constantly changing” (ITB01A2). Nor was much mentioned made of the specific components of the environment. This may indicate that they perceive their environment as being more stable and not sufficiently turbulent to warrant too much attention. Since the information technology environment is turbulent and complex (as defined by the survey of consultants/analysts and as discussed in Chapter 3),

this apparent 'blind spot' in the understanding of their environment might negatively influence their response to the environment, namely that they might adopt inappropriate marketing tactics.

The more successful company (ITA), on the other hand, shows a more detailed perception and understanding of their environment, as is shown by the following extracts:

> ITA - "…becoming increasingly complex due to convergence of e-commerce, supply chain management and customer relationship management" (ITA01A3).

> ITA - "…industry deregulation and revolution in telecommunication technology" (ITA01B2).

ITA also appear to have an understanding of the environment in terms of chaos and complexity theory, as is reflected in their use of complexity terms like "market space" (ITA01A5) instead of 'marketplace', and saying the "landscape is constantly changing" (ITA01B12).

This more detailed and more active perception of the environment leads to the belief that they are able to influence the environment, as is reflected in the following:

> ITA - "We try and change the playing fields" (Node 1 of 4, passage 2 of 3)

> ITA - "We try to shake the market up …we try to make new markets all the time" (Node 3 of 4, passage 2 of 19).

These two extracts clearly explain that ITA's attitude to the environment is not to passively wait for environmental changes and then react, but rather to encourage environmental change, especially in their market, such that they are able to take advantage of such change ahead of competitors. ITB, on the other hand, would be more passive and reactive, as they do not pay as much attention to their environment. This is supported by the attitudes towards the entrepreneurial **development of new markets** – ITA see this as very important as is reflected by their emphasising early market entry, new product introductions and entrepreneurial culture, and by the fact that they have won a major award for entrepreneurship (ITA01C). On the other hand, for ITB, entrepreneurial market development seems less important as emphasis is placed on a "steady stream of repeat business from existing customers" (ITB01C1).

The findings of this section indicate not only that both companies do view their environment as rapidly changing and turbulent, but also that the more successful company see themselves not as victims of such turbulence, but as its masters, encouraging such change to their own advantage. The less successful company would tend to be passive, battling to cope with changes after they have happened. As a result ITA appear to handle their turbulent environment better. Their approach to handling this rapid change is to "remain agile, constantly innovative and open to change" (ITA01D2). Although not appearing to attempt to disrupt the market, they do "focus on the industry's highest growth sectors" (ITA01D1) which implies a comfort with rapid, and even disruptive, change.

The analysis of the field notes confirmed the overall findings of this section. These different perceptions of the environment are as would be expected from more successful and less successful companies in such a turbulent and complex environment, namely that the more successful company would be more aware, active, and aggressive in terms of their environment, while the less successful company would be less aware, passive, and reactive.

b) Companies in a stable and simple environment

The way the two companies in this industry **perceive their environment** appears to be very similar, with differences being in the degree to which their perceptions are held rather than in the substance of the perceptions held.

There seems to be a degree of uncertainty in PA as to the degree of turbulence or stability in their environment. This is reflected in the different opinions held by people and differing interpretations of what stable and turbulent imply. It appears, however, as if the perceived turbulence is mostly related to the technological component of the environment, with other components being relatively stable. This is reflected in the following extracts from interviews with PA:

> PA - "Technology coming through from a machinery point of view is changing phenomenally fast" (Node 1 of 4, passage 2 of 2)

> PA - "It [technology] goes through with the economy … it is pretty stable" (Node 1 of 4, passage 1 of 2)

Nothing on the environment was found in PA's documentation, but they have won a number of entrepreneurial awards, which could indicate a more destabilising approach to their environment, and the importance of market development. If PA do follow a destabilising

approach then it can be assumed that they perceive their environment and market as changing, and so respond to the change with entrepreneurial actions.

In contrast, PB have, in the past, concentrated on a specific industry (referred to hereafter as their 'traditional market' to ensure that confidentiality is maintained), but in the past five years have attempted to diversify into other markets. Despite some indication of technological change, specifically computerisation, over the past few years, and anticipated change from the legal environment due to legislation limiting the thickness of plastic carrier bags, most of the change and turbulence PB have experienced has been due to change in their traditional market, as is shown in the following quote:

> PB - "[our traditional market is] extremely unstable at the moment" (Node 2 of 4, passage 4 of 11).

However, despite this perception of some degree of turbulence, all in all it does not appear as if this industry (packaging) experiences more that the usual change/turbulence experienced by the South African market. Their belief that this is true is illustrated by:

> PB - "The packaging industry has been changing very much due to the change within SA" (Node 1 of 4 passage 1 of 9).

The two companies differ slightly in the way they react to the change and turbulence, with PA attempting 'consolidation', which implies controlled change in order to bring the system, or company, back to an equilibrium position, from a state which may have been heading towards turbulence and chaos. PB on the other hand, appear to place emphasis more on improvements in their current markets than **developing new markets** and being entrepreneurial. Words and phrases common in the company leaflet include "replaced with modern machinery, recently installed sophisticated machinery, attending advanced courses, efficiency, revamped" (PB01C1). PB's approach to their market appears to be fairly conservative and predictable, as opposed to disruptive, since the products produced and markets served are clearly defined (PB01D1, 5) and they have fixed procedures for product development and release, as is indicated by the fact that "products are not released until quality control approves" (PB01D2), and there are "detailed procedures for tracing back to production process, batch, supplier, etc." (PB01D3). This company thus appears to merely try to improve efficiency in their current market rather than trying to control their own destiny by influencing or reacting to environmental changes.

PA's emphasis on the *status quo* and PB's unwillingness, or inability, to cope with a turbulent environment in a proactive manner are reflected in the following two extracts:

> PA - "… been able to build our capacity over this period as well as increase our profits and that was just by consolidation" (Node 3 of 4, passage 6 of 15).

> PB - "The move away from (our traditional market) was, I think, forced on us by the market shrinking" (Node 1 of 4, passage 9 of 9)

Thus, it appears as if both companies perceive their market as turbulent and changing in a limited area, but generally more stable in the other components of the environment. They see the turbulence as something to be either controlled in order to bring their companies (systems) back towards the *status quo* of equilibrium where they feel more competent to manage them, or to be avoided by moving into less turbulent markets.

PA's perception is not what would have been expected from a more successful company in a stable and simple environment, but PB's perceptions are consistent with the expectations for a less successful company. This finding was supported by the analysis of field notes, and is consistent with the preliminary study selecting this industry as a simple and stable environment.

6.2.1.2 Change and attitudes to change

In this section the changes being experienced by the companies in their markets, and how they perceive these changes, are discussed.

a) Companies in a turbulent and complex environment

There are significant differences in the ways the two companies **react to changes** in their environments. The following comment exemplifies that the more successful company (ITA) reacts quickly to changes in order to achieve an advantage over competitors:

> ITA - "Decisions around selecting technology, that time is very short, you select a network today and tomorrow you have to look at the next element, you don't have time to make that selection" (Node 2 of 4, passage 2 of 26).

This is supported by the documentary evidence, which shows that ITA aim to be the leader and keep "one step ahead of competitors" (ITA02A8) by "acceleration of roll-out of services"

(ITA02A3), “reducing time to market” (ITA02A4), and aiming for “extremely rapid growth” (ITA02A7).

The less successful company (ITB), on the other hand, appears to change rather slowly. In fact, it almost appears to resist change. This is illustrated by their slowness relative to the rest of the market, as is shown below:

> ITB - “… slower than our customers. They tend to suggest changes – we are not proactive generally” (Node 1 of 4, passage 2 of 4).

The documentary evidence corroborates this, with comments like “grow steadily through partnerships” (ITB02A1) and “improve business processes in a controlled manner” (ITB02A2).

ITB tend to be pushed into change by their customers and suppliers, whereas ITA encourage their customers to change, thereby changing the nature of the market and product environment for their customers as well. This is highlighted by the following extracts:

> ITA - “If we are not leading our customers in the right direction we are not doing our job” (Node 1 of 4, passage 12 of 19).

> ITA - “We generally change faster than the customers and even with suppliers we generally tend to bring them under pressure” (Node 1 of 4, passage 13 of 19).

This difference in ability to cope with change appears to be a function of a number of things. First, attitudes to change and whether it is welcomed or not is different, which is reflected by the following extracts:

> ITA – “… in any period of six months this company will change and that change is expected” (Node 2 of 4, passage 7 of 26).

> ITB - “We have actually explored a lot of avenues, but what we actually say is that we don’t have to rush this” (Node 2 of 4, passage 3 of 20)

These extracts indicate that ITA change frequently, have experience in handing change, and therefore probably have learnt to cope with change, while ITB do not hurry to change, probably tend to avoid change, and therefore are not experienced in coping with change.

Second, attitudes to planning and planning periods are different, as the following extracts show:

> ITA - “Very seldom do we plan a year ahead the things we are going to do, three months is nearer (Node 2 of 4, passage 18 of 26).
>
> ITB - “We are on a three year plan now and we used to work on a one year plan” (Node 2 of 4, passage 12 of 20).

By adopting a long term planning horizon, ITB try to maintain the status quo and avoid having to cope with change, while ITA’s short term planning horizon forces them to face and cope with changes on a regular basis.

Third, the systems that support change seem to be different as well:

> ITA - “Six months yes, budgets are yearly, and all other issues even get to a quarterly basis’ (Node 2 of 4, passage 16 of 26)
>
> ITB - “We are actually pretty slow from the inception of an idea to getting off the ground, I believe that we don’t have the processes dynamic enough to support quick running with something.” (Node 2 of 4, passage 5 of 20).

These extracts imply that ITA are geared to be able to plan and change over a short (three month) period, while ITB admit that they are not able to react to change quickly because of the time processes take in the company.

These differences in attitudes to change, and in planning and systems, result in ITA being more proactive and ITB being more reactive, as is reflected in the following extracts:

> ITA - “We don’t really get into markets because someone asks us to do something, we tend to be there already” (Node 4 of 4, passage 8 of 31).
>
> ITB - “We follow what those clones are doing because inevitably they set the trend and as soon as the market starts moving we have to be ready for that – it is a lower risk aspect … but we don’t cause change” (Node 3 of 4, passage 3 of 29).

Coinciding with this difference in being proactive is a difference in their attitudes to risk. This is reflected in the quotes below.

> ITA - “It is a culture that accepts trial and error” (Node 4 of 4, passage 9 of 31).

> ITB - “We believe that we need to … be cautious” (Node 3 of 4, passage 7 of 29).

The above extracts show that ITA have a culture, acceptance and encouragement of change, and that adapting and being flexible are seen as critical abilities. However, it should be noted that this does not preclude planning. Even their planning takes account of anticipated change and is designed to suit their culture of adaptation, as is shown by this final extract:

> ITA - “Everything is planned carefully … I think in marketing is where these changes happen most and you have to put up with them but those changes have to made very quickly” (Node 1 of 4, passage 9 of 19).

This finding is supported by the documentary evidence that shows that ITA attempt to keep up with the shortening cycles of change, and even change faster, by “reducing time to market”, and by ”constantly reviewing and adapting to market conditions and technological developments” (ITA02B2). Their reaction to such rapid change is to be aggressively proactive to build a “dominant market position” (ITA02C2). This proaction is reflected by its being “agile, constantly innovative, and open to change” (ITA023) and by “on-going reorganisation of the business” (ITA02C4). ITA personnel try to anticipate change as is reflected by the comment that they “see and predict the future and strategise accordingly” (ITA02D3). ITA are extremely flexible, agile, open to change, and adapt rapidly to environmental changes.

ITB, however, do not welcome or encourage change, but try to delay having to change until it is inevitable. Even then change is seen as something that must be planned carefully to avoid the risks inherent in it. This means that they are unable to take advantage of the opportunities created by the innovation and new developments in this industry. The documentary analysis also shows that ITB’s approach is far more conservative. They do not appear to be very proactive or aggressive as is shown by the phrase “consolidation before looking for growth” (ITB02C2).

The above discussion indicates that the two companies, although operating in the same environment, have very **different** attitudes and approaches to change. The more successful company welcomes and encourages it, whereas the less successful company tries to avoid it and delays taking action until it is forced to. The findings from the field notes analysis provided similar results. As is to be expected of a successful company in a turbulent market, ITA placed more emphasis on new market development than efficiency in current markets, and was prepared to aggressively disrupt the market in order to take the lead in, and control, it. ITB, on the other hand, placed more emphasis on stability and efficiency, and reliance on acquisitions for growth, rather than on developing new markets. Although ITB appear to plan quickly and radically, the emphasis seems to be on cautious efficiency rather than adaptive flexibility to change. These factors are all consistent with a less successful company in a turbulent market.

b) Companies in a stable and simple environment

The **attitudes** of the two companies towards change and how they **handle change** are very different. It appears from the following statements that PA are able to, and often do, change very quickly, whereas PB, although maintaining that they can change quickly, appear to change very slowly, if at all:

> PA - "I think we adapt very quickly – we can change very quickly." (Node 1 of 4, passage 4 of 6)

> PB - "I think if the company can get away with what they have got they will stick with it, but if it is technological they will wait and see if it is going to work properly before they change anything" (Node 1 of 4 passage 3 of 9)

The documentary evidence supports this with PA's mission statement saying they are "fast, efficient and professional" (PA02A2), and elsewhere, as "deceptively fast" (PA02A1). This emphasis on speed and "fast turnaround times" (PA02C3) emphasises their desire to be proactive and to keep ahead of the market. This is supported by the emphasis of "never be complacent" (PA02C2) in their mission statement. However, it is also clear that PA do not always adapt very quickly. In certain circumstances they are slower than the rest of the market as is shown in the following extract:

> PA - "It [changing] is thorough. I would not say it is very quick or very slow, I think it is just very thorough, and very well thought out" (Node 2 of 4, passage 5 of 24)

Based on the above, it can be concluded that PA do not, as a matter of principle, change rapidly, but when such change is required they are capable of changing, and willing to change, very quickly. On the other hand, PB, when they do change, appear to do so with reluctance. These differing approaches are indicated in the next extracts.

> PA - "It depends on what the changes are but they can be done very quickly" (Node 2 of 4, passage 9 of 24)

> PB - "The move away from (our traditional market) was I think forced upon us by the market shrinking … possibly we acted a bit too late" (Node 2 of 4, passage 13 of 24)

Regarding the length of the **cycles of change**, PA tend to take a longer term view regarding more strategic issues such as product development or increasing machine capacity, while in operational matters they tend to adopt a short term view. The following quotations reflect this.

> "PA - If you create a product you are normally looking at a cycle of three to four years." (Node 2 of 4, pass 17 of 24.

> PA - "We don't look beyond 12 months on an operational level" (Node 2 of 4, passage 16 of 24)

In terms of PB's consideration of the future and how it will be addressed, there appears to be no form of longer term or shorter term planning. Although this would be acceptable in a rapidly changing environment, in a stable market such as packaging, some form of longer term planning would be advantageous. Thus, other than the annual budget, no real consideration is given to future environmental changes.

The two companies appear to have **different** ways of dealing with their environments. Although it appears that PA adopt a contingency approach to reacting to their environment, they do as a generalisation appear to disrupt their environment to develop a competitive advantage. PB, on the other hand, are unlikely to instigate changes in their market, to be proactive, or to disrupt the market in any way. They appear to wait until there is no alternative but to change, by which time it may be too late for the change to have a significant and positive effect on the company.
The following extracts reflect the approaches to change as a corporate strategy.

> PA - "…I would say that it [disrupting the market] is one of the key strategies, key ways of operating" (Node 2 of 4, passage 4 of 24)

> PB - "Well this industry changes with the other industries that we deal with, so if they change then we follow suit" (Node 3 of 4, passage 1 of 25)

These extracts reflect the opposite of what would be expected according to Proposition 2, namely that PA would be expected to follow a stabilising strategy and PB to follow a destabilising strategy. Despite this apparent commitment to destabilisation by PA, there also appears to be quite a strong need to maintain stability in other areas of their operation, specifically in terms of competition. Therefore PA appear to encourage stability, in line with Proposition 2, except when it suits them to destabilise! This stabilising emphasises is shown by the following comment:

> PA - "I think in some ways we have kept the market stable…in some instances we have actually brought people into the company not to ruin the market, people who were going to start up in the same niche." (Node 3 of 4, passage 3 of 20)

This difference in handling change arises mainly from the fact that PA are a creative, innovative and adaptive organisation that takes a flexible and entrepreneurial approach to its business, while PB are reactive, and even then they appear to be the victim of change rather than being able to avoid the negative impacts. This is implied from the following extracts:

> PA - "…there are a lot of things we have done tests on that the market hasn't asked for yet" (Node 3 of 4, passage 11 of 20)

> PB - "The move away from (our traditional market) was I think forced upon us by the market shrinking … possibly we acted a bit too late … we lost certain of our business (and) have had to go into some other areas" (Node 3 of 4, passage 13 of 25)

The documentary evidence showing PA's emphasis on "maximum flexibility" (PA02D1) supports the above finding, but the evidence for PB is contradictory, namely that they are flexible and adaptive, for example, "flexible and can cope with urgent deliveries" (PB02D2).

The quality of the actions taken to cope with change also appears to differ significantly, with PA's changes being 'carefully thought out', but PB tending to act too quickly without sufficient thought. This is indicated by the following extracts:

> PA - “We first make sure…Don’t offer something that you are not confident in making. Be very sure that what you are offering will happen” (Node 4 of 4, passage 16 of 32
>
> PB - “I would say we had always jumped in and changed quickly, but possibly not with sufficient thought behind it, sometimes we have reacted too prematurely without sufficient planning … - a bit of a cowboy approach” (Node 3 of 4, passage 17 of 25).

PB’s poor handling of change appears to be due to an inappropriate management style, procrastination and a lack of an innovative or entrepreneurial culture in the company. This is implied by the following extracts:

> PB - “… we come from an era where nobody was – you know the style of management was where nobody was allowed to take decisions” (Node 4 of 4, passage 2 of 12)
>
> PB - “I think we hold back until information is available” (Node 4 of 4, passage 5 of 12)

In conclusion it can be seen that PA have a positive and proactive attitude to change, being prepared to instigate change in their industry in order to give themselves a competitive advantage. However, they are not prepared to do this at the expense of control of their own destiny. Although they may appear slow and deliberate in some ways, they have learnt to take decisions quickly and to implement very rapid change when necessary. This appears to be a very suitable method for an environment that is fundamentally stable, but that has pockets of turbulence and rapid change in it, and for a company that is prepared to institute significant changes to keep themselves ahead of the competition.

In other words, PA emphasise stability and stabilising actions most of the time, but they are prepared to destabilise the environment when it suits them, and are able to cope with the occasional instability that this causes. They also then appear to be proactive in rapidly restoring stability. This indicates that they are able to cope with turbulence from the environment, or turbulence instigated by themselves, by taking advantage of turbulence and then rapidly restabilising the situation. It can be concluded that PA operate partially as proposed in Propositions 2 and 4. This conclusion was supported by the analysis of the field notes, which showed that PA place equal importance on efficiency in current markets and on

new product development and were prepared to use innovation and disruption to cope with their environment.

PB seem to operate as if there is no environmental change, which may have been the situation in the past. However, in the South Africa of the 1990's, the packaging industry did experience environmental change, and it appears that they were unable to cope with this, partly because they did not perceive the significance of the change, partly because of the bureaucratic and authoritarian nature of the company culture, and partly because of the inappropriate management actions and styles. It can thus be concluded that, although the environment was essentially stable, it did experience some turbulence (as did all industries in South Africa) and PB did not adopt the strategic or tactical approaches necessary for this environment. The field notes analysis confirmed PB's emphasis on current markets, efficiency, and stability and thus supports the above conclusion that they do not handle change effectively.

These conclusions show that the findings are only partly what was predicted in the propositions. It was anticipated that PA, the more successful company, would tend to use more stabilising actions, while PB, the less successful company, would use more destabilising actions. These findings have in fact shown that PA, although using some stabilising activities, also are prepared to destabilise their market, while PB shy well clear of any destabilising activities.

6.2.2 Management issues

In this section a number of management issues relating to the running of the business, and which can be expected to vary with the turbulence of the environment, will be discussed. These issues are grouped under the sub-headings of general management, structure and staff, and strategy issues. As before, similarities and differences between the more successful and the less successful companies are sought, first in the turbulent/complex environment, and then in the stable/simple environment. The findings from the documentary and field notes analysis are also integrated as corroboration of the findings from the interview transcript analysis.

6.2.2.1 General management issues

As an introduction to the overall management of the marketing issues an attempt was made to understand the ways the companies managed their businesses. These general

management issues are discussed in this section.

a) Companies in a turbulent and complex environment

The most consistent **vision or philosophy** reflected by the more successful company (ITA) was that they are leaders and number one in their field. Almost equally frequent was a strong emphasis on aggressive achievement reflected by comments such as 'shareholder or results driven', 'make your target', 'they expect to see heavy profits', and 'numbers driven.' Other attitudes that were emphasised were their continuous desire to change and shake up the market, often through innovation, and a perception of themselves as global competitors. With such core philosophies, it would be expected that they would take a proactive approach to their marketing activities, initiating changes to destabilise the market and thereby enabling them to keep one step ahead of their competitors. This vision was confirmed by the documentary analysis that highlighted issues such as leadership, dominance, growth, innovation and entrepreneurship, which are reflected in the following extracts: "obsession with sales growth" (ITA03A18), "becoming dominant player" (ITA 03A2), and "Aim to foster innovation and entrepreneurial thinking" (ITA03A20). According to Propositions 1 and 3, this is what was expected of a successful company in a turbulent environment.

This aggressive, hard driving philosophy is in direct contrast to that of the less successful company (ITB). Their most prominent core philosophy was commitment to their staff, especially in terms of respect and providing opportunities and growth for them. The second most dominant aspect was the emphasis on the product and the solutions that they provide for clients. It is also clear that they view themselves as trend followers – they do not like the risk associated with being a market leader.

The documentary analysis agreed with this people orientation, showing that ITB stress innovation through people, as is shown by their mention of enthusiasm, participation, responsibility and passion (ITB03A1) – very people oriented beliefs. The field notes analysis also showed their strategic vision as being predominantly people oriented. This philosophy is consistent, according to Propositions 2 and 4, with what would be expected of a company viewing its environment as more stable, or one that wants to create stability, rather than encourage turbulence, in their environment. Therefore, it is consistent with the proposition for a less successful company in a turbulent environment.

The ITA **management style** is in many ways very open and democratic. Independent and entrepreneurial action is encouraged and emphasis is placed on empowerment, which is reflected in the following extract:

> ITA - "… to try and get the guys at the coalface to try and come up with innovations and new ways to do things" (Node 4 of 13, passage 2 of 29).

The same management style also appears to be used by ITB, namely open and democratic, as is reflected by the following comments:

> ITB - "… everyone can take routine decisions. That's your internal process – that is trust" (Node 5 of 13, passage 5 of 15)

> ITB - "… because I believe people want that freedom, they are mature, they are rich in knowledge. You can't go and hound them all the time." (Node 5 of 13, passage 6 of 15)

Both companies avoid 'policing' type management control, as is reflected by the following statements:

> ITA - "I am not the dictatorial 'you will' type boss and you are reporting to me – we go as a team …" (Node 4 of 13, passage 9 of 29).

> ITB - "We try not to control people – we try to encourage independence" (Node 6 of 13, passage 3 of 3).

Both companies rely predominantly on **self-control** by their staffs, which are synonymous with autonomy, as staff appeared to realise what was required of them in their jobs and controlled themselves. This is reflected in the following two quotes"

> ITA - "… we rely on self control, we don't go around checking up on them" (Node 4 of 13, passage 28 of 29).

> ITB – "You were responsible for a project and they actually allowed you to do it, nobody checked on you, you worked your own hours, and you had to get it done" (Node 5 of 13, passage 7 of 15).

One difference that did exist between the two companies was that ITA applied very tight control in the critical areas of budgets, targets and project implementation. This does not detract from the findings, because it refers primarily to financial control, which would be

expected for a company listed on the Stock Exchange. This emphasis on tight control is shown by the following extract"

> ITA - "… in certain ways not so autonomous, and when it comes to budgeting, absolutely [no autonomy]" (Node 4 of 13, passage 12 of 29)

ITB do not have these strict controls, but it appears that, as they grow bigger, they are feeling the need to instigate tighter controls, indicating that the self-control is not sufficient.

The documentary analysis concurs with the above findings, showing that both companies lay considerable stress on self-management and self-control. ITA emphasise "progress based on merit, employee involvement, participation, sharing of information" (ITA03D2), while ITB's management style is very participative (ITB03D1), with a flat organisational structure and self-management (ITB03B2). Both companies also seem to see control as important despite the emphasis on self-management. ITA are intolerant of failure, and apply very rigid financial control, as is reflected in "iron fisted control, intolerance of failure" (ITA03D4). ITB see planning as important because they do not like surprises (ITB03F1), which implies that they want to be 'in control.'

These findings are very close to what was expected, with the exception that the degree of self-management encouraged by ITB was not expected. It appears as if ITB are attempting to apply a similar management style to that of ITA, but with less success, probably because they have not been able to maintain the indirect control over key aspects of the business as ITA have. It may be that this management approach is typical of the information technology industry, and that ITB's inability to apply it thoroughly may be part of the reason for their being less successful.

Staff relationships in both companies were found to be very informal and positive. In ITA, "everybody is co-operative" and "work well together," while in ITB "everybody gets treated the same and we try and respect every individual". This seems to be supported by the emphasis on participation, involvement, and in ITB, the flat organisation structure (ITA03D2 and ITB03D1).

Internal communication in both companies is informal, being dominated by "corridor talk" and "discussions at lunch time" (ITA) and "discussions over coffee and cigarettes" (ITB). Both companies are totally open and transparent regarding company information, enabling

staff to be sufficiently informed about the company and its activities to be able to react without managerial direction when required. This openness and transparency is probably typical of the information technology industry, due to the inherent informality and the high skill and qualification levels. These findings are also generally supported by the documentary analysis that showed, for ITA, "employee involvement, sharing of information" (ITA03D2) and for ITB, the participative management style (ITB 03D1).

Both companies have few **policies and procedures**, relying on some basic principles and believing that staff should be independent, as they know what to do and should just get on with it. This informality and lack of 'rules' is typical of the flexibility needed for a successful company in a turbulent environment to be able to be sensitive to small and rapid environmental changes and to be able to take advantage of them. However, this approach is not consistent with a less successful company struggling to cope with a turbulent environment. It may be that this informality has been adopted, as it is the 'fashionable' style in the industry, and is thus typical of the industry, rather than being unique to a more successful company.

The **planning approaches** used by the two companies are very different as the following discussion shows. The overall strategic direction of ITA appears to be logical and rational, based on the goals set by top management, but the details of the plan appear to evolve from the environment. This is reflected in the following extracts:

> ITA - "The way it [planning] evolves is not cast in concrete" (Node 8 of 13, passage 3 of 14).
>
> ITA - "It [planning] might be reactive to market demands or reaction to customer demands or even competition to some extent or even suppliers" (Node 8 of 13, passage 5 of 14).

As a result, ITA's planning horizon does not appear to go beyond 12 months, and even within that short time period, the plan is kept very flexible – "it will be adapted quickly" (Node 8 of 13, passage 8 of 14) and "We can and we do change our minds" (Node 8 of 13, passage 9 of 14) are two statements that reflect this approach.

This finding is supported by the field notes analysis that found that strategies are both planned from the top down and also evolve dynamically, quickly and radically from elsewhere in the company.

Regarding ITB, they use a well thought out, long term (three years) planning approach, but with "… sporadic initiatives, somebody will say here is a good thing to try …" (Node 9 of 13, passage 6 of 12). However, even this requires "… a bit of homework … it is a planned approach" (Node 9 of 13, passage 6 of 12). Although there have been some quick moves based on 'gut feel', ITB management are generally very careful, as the following extract indicates:

> ITB - "… our planning is thought out … this last year our planning is actually sometimes very cautious" (Node 9 of 13, passage 3 of 12).

Of significance is the fact that their planning appeared not to be successful, as is shown by the following extract:

> ITB - "… it [the plan] was all airy fairy but no one knew how we were going to achieve this, there were no milestones in quantitative steps …" (Node 9 of 13, passage 2 of 12).

The field notes and the documentary analyses support this by identifying that formal, rational planning had recently been introduced into the company in order to develop long term plans, and because "they do not like surprises" (ITB03F1), but in reality only short term planning was being used.

In comparing the planning of the two companies, it certainly seems as if ITA's planning approach is to allow their strategies to evolve from the environment, under the guidance of their overall goals, which is what would be expected of a more successful company in a turbulent and complex environment. The more formal, planned approach of ITB is what would be expected of a less successful company in a turbulent and complex environment. The lack of resultant success could have been due to a planning approach inappropriate to their environment, or to their inability to plan and to implement the plan correctly, or a combination of the two.

Decision making in the two companies appears to be very similar, with decisions relating to general direction, high level objectives, strategic issues, and those impacting on corporate policy being centralised at top management. This is reflected by a quote from an ITA manager:

> ITA - “I think there is a macro strategy, again that is given to us from an executive” (Node 9 of 13, passage 2 of 13).

Below these higher levels, decisions are decentralised and staff have the freedom to make their own decisions. The following extract reflects the situation in ITA:

> ITA - “Make up your mind, that is what you need to do to get the business, then go for it, but just take the responsibility for it as well” (Node 11 of 13, passage 2 of 12).

In ITB the process is only a little different, as is shown by the following extract:

> ITB - “… if I have to make a decision on a sale and it has an impact on resources I can’t make that decision on my own” (Node 12 of 13, passage 2 of 8).

This extract shows that most decisions appear to be taken on a group basis, involving a number of people in the final decision. However, the group does not necessarily have to include top management, and it is the individual’s decision whether others need to be involved in the decision making process or not.

In both companies decisions are taken quickly, as is reflected in the following extracts:

> ITA - “… the industry we are in and the type of business we operate, decisions are made on the fly and decisions are made very quickly” (Node 11 of 13, passage 3 of 12).

> ITB - “Decisions are taken quickly, but by a body. What they would do is they would get together, they have two or three teams and they would basically caucus and make a decision” (Node 11 of 13, passage 1 of 2).

Decision making in both companies appears to be consistent with their democratic management styles, with staff being allowed and encouraged to take relevant decisions at their level of responsibility. Therefore, it can be seen that, in both cases, decision-making is more like what would be expected of a more successful company in a turbulent and complex market – quick and decentralised – with the only difference being that ITB make more use of joint decision-making.

The findings relating to general management issues have shown that the main **differences** lay in the areas of vision/philosophy and planning – in both cases their visions/philosophies and their planning approaches are consistent with what was anticipated in the propositions.

The general management issues that were **similar** were management style (with the exception of financial control), staff relationships, internal communications, policies and procedures, and decision-making. In all five of these management aspects the findings relating to ITA were consistent with what would be expected of a more successful company in a turbulent and complex environment, while the findings relating to ITB were not consistent with what would be expected of a less successful company in a turbulent and complex environment.

The fact that most of the management issues were similar could indicate that the relationship between the nature of the environment and the nature of management has no impact on success. However, other likely possibilities are that ITA have been more successful because they have implemented the applicable management approaches better than ITB have, or that ITB have applied a 'turbulent/complexity management' approach in an environment that they do not truly see as turbulent and complex, and that this contradiction could lead to weaknesses in other areas of their operation. These possibilities are evaluated further in the discussions below on other management issues, and in the discussion on marketing tactics.

b) Companies in a stable and simple environment

Both companies have clear and consistently agreed upon **visions or core identities**, which are, however, significantly different from each other.

PA see themselves as a specialist company, with everything they do being dynamic, innovative and unique. They see themselves as leaders in their market, initiating methods and techniques that other companies in their market follow. These innovative approaches are also applied to PA's dealings with people – staff, suppliers and customers – resulting in them also being leaders in terms of employee, supplier, and customer relationships. This finding was confirmed by the documentary evidence that is reflected in the quotes "Don't just do more of the same" (PA03A5) and "renowned for innovation" (PA03A7).

This innovative approach is consistent with a company proactively facing change and trying to keep ahead of their market, but is not consistent with what would be expected of a successful company in a stable environment. This anomaly may have three causes: first, PA do not view their immediate environment as stable, second, the specific niche that they

operate in is probably the most turbulent in the packaging industry, and third they have a belief that even if the environment is stable, they can get a competitive advantage by creating instability, with which the other traditional, conservative packaging companies are not capable of coping.

PB's main vision of themselves is as an old established family oriented business, placing a lot of emphasis on the history of the company. In line with this they see themselves as leaders in their particular niche, which they have dominated for decades. In terms of operational issues, their philosophy is based on high quality products, service and systems, and on making money – 'chasing turnover', 'growing the business' and 'becoming profitable.' The vision/identity reflected in the documentary evidence is, to an extent, contradictory. The company leaflet stresses words like "young, vibrant, modern, state of the art" (PB03A1), but other documents emphasise the history and ancestry of the company (PB03A2, 4). This implies that, although they are trying to cope with change, they might be restricted by the traditions and conservatism of the past.

The attitudes and philosophies of PB were what was expected of a more successful, not a less successful, company in a stable environment. This anomaly could be due, once again, to PB's immediate environment (especially their traditional market) having experienced considerable change in the past few years. Therefore, their more conservative approach did not enable them to adequately cope with this change, leading to a less successful result. A further factor which could have led to PB's under-performing despite following an approach expected to be suitable for the packaging industry, is the fact that during this period they experienced numerous management changes, including an attempted change from a dictatorial management style to a more democratic style.

The **management styles** of the two companies are very different. PA's style is very open and transparent, while PB was run on strict disciplinarian and authoritarian lines until 1998. It involved a bureaucratic and family oriented style. Everyone was required to be subservient to the Managing Director. The following extracts illustrate this;

> PA - "The company has always has always had a very open way about things, and you have meetings where they dish out the financials to everybody from cleaner up … it also means that the company trusts people, and if you have a view on something you can speak" (Node 4 of 13, passage 5 of 29).

> PB - “The guy in charge was very regimental … everybody had to do exactly what he wanted” (Node 4 of 13, passage 3 of 15).

PA’s view is that everyone can make a contribution and that motivation and commitment can be generated through involvement. As a result structures are loose and overlap, and people can get involved in and comment on any aspect of the business. Individuals are also given full responsibility for their areas in order to “breed decisiveness” (Node 4 of 13, passage 8 of 29). PB, on the other hand, discouraged participation and independent action. These differences are reflected in the following extracts:

> PA - “… it is really up to you, … the printer would make a decision on quality due to his experience, he is a printer and his job is to maintain the quality, so everyone has been given the responsibility, there is no, like, I have to go and ask this person” (Node 4 of 13, passage 8 of 29).

> PB - “He ran this place like an army concentration camp, that people weren’t allowed to think for themselves” (Node 5 of 13, passage 15 of 15).

It should be noted, however, that the current Managing Director of PB has been trying to change this style, introducing a more democratic and open management style, as is reflected in the following comments:

> PB - “I definitely encourage independent action, and it is a change from the past” (Node 4 of 13, passage 6 of 15).

> PB - “… bureaucratic and autocratic attitude … that has been removed and there is a lot more participation from management” (Node 5 of 13, passage 2 of 15).

However, this new management style does not appear to have taken hold in PB. It does not appear as if there is a total commitment to democratic management, and it appears as if some staff members are not comfortable with this new style, as the following quotations show:

> PB - “I would like to think there is an openness, that at any stage anyone is very welcome to ask… yes, within certain channels if it is business related” (Node 4 of 13, passage 14 of 15).

PB - "… when you have to go and speak to [the Managing Director] because nobody else will make that decision" (Node 5 of 13, passage 4 of 15).

The two differing management styles have also resulted in different outcomes. PA's encouragement of responsibility empowers staff and encourages independent action, which they believe makes their company more successful. PB, on the other hand, seem to be suffering from a degree of uncertainty and hesitancy regarding their new management style, which seems to have created a degree of internal instability. Their staff seem unable to cope with the increased participation they are being offered. These differences are epitomised by the following statements:

PA - "Speaking from my own position I do my own thing and no one controls what I do. I got things to do so I get on with it and I know how many hours I have spent here or there, and I think most people work like that, there is that element of trust and I think people work better like that rather than having someone breathing down their neck." (Node 4 of 13, passage 25 of 29).

PB - "… a lot more participation from management now, but it will take a while to change all those old ways" (Node 5 of 13, passage 2 of 15).

The differing management styles have also resulted in differing attitudes towards discipline and control. The freedom allowed by PA does not imply a lack of discipline or control. The vision and culture of the company institute self-control and also appear to make it clear what the decision should be. Furthermore, management are open for advice, especially since they have many young and inexperienced employees. In contrast, it does not appear as if the PB Managing Director is successfully encouraging openness and democracy. This is illustrated by the following quotes:

PA – "There is no policing, it is self policing' (Node 4 of 13, passage 19 of 29).

PB - "Not that there should be policemen but there should be checking, there is a line that you draw" (Node 5 of 13, passage 9 of 15).

The above findings are corroborated by the documentary evidence and the field notes analysis. The documentary evidence shows that the management styles in the two companies are significantly different. Openness of, and participation in, meetings is indicative of a participatory and democratic management style in PA. The full presentation of

sales and financial figures (PA03D1, 3, 5, 7) reflects transparency. Furthermore, decisions on staff issues were democratic, allowing staff to decide issues such as self-measurement (PA03D4) and provident fund (PA03D6). Management at PB is fairly formal, with little autonomy and self-control. The history of dictatorial management has ensured that staff continues to be 'managed', either through managers or through policy manuals and systems PB03D1). The field notes showed PA to encourage autonomy and independence, while PB had more centralised decision-making and control-oriented management.

From the above discussion it can be seen that the two companies have different management styles as was expected. Unexpectedly, however, PA have a relatively democratic management style, and the culture of the company enables this autonomy and responsibility to be managed and not to result in a totally *laissez faire* attitude. As with the two IT companies, financial matters are also fairly tightly controlled - "… with major decisions with financial obligations you would have to get other opinions" (Node 4 of 13, passage 9 of 29). Although there is more freedom and self management than was expected to be found in a successful company in a stable environment, this can be understood if it is realised that fairly strict control, albeit self control, is instituted via the clear vision and culture that imposes a fairly high degree of conformity to the overall corporate goals. Furthermore, this management style has been in place for the past ten years and so is familiar to the staff and may well contribute to a sense of stability in the company.

With regard to PB, it can be seen that there is considerable uncertainty and a lack of conviction about the democratic style of management. It appears as if the Managing Director is the only really autonomous influence in the company, and because the staff are not embracing democratic management, he has to still keep a large amount of central control. Although it was proposed that a less successful company in a stable environment would tend to use a democratic style of management, these findings are not necessarily in disagreement with this. Their original style of management was too extreme for the broad South African environment of increasing openness, transparency and democracy that started to prevail in the mid 1990s. However, the movement to a democratic style was probably also too extreme, leaving the staff feeling directionless in an unstable environment, and as such, conforming, to an extent, to the proposition that a democratic style of management is not fully suited to a stable environment.

The **staff relationships** with management and the company as a whole are very different in the two companies. PA have a high degree of openness and transparency. As they say, "if the person sweeping the floor wants to know about the budget for the month we tell them"

(Node 2 of 13, passage 1 of 7). All staff attend their quarterly meeting and the financial results are presented openly to the staff. There are also advancement opportunities, for example, the tea lady being promoted into a clerical post. Although PB have instituted a number of changes over the past two years; their fundamental approach to staff relations up until then had been one of a "bureaucratic and autocratic attitude" (Node 2 of 13, passage 1 of 14). This led to many negative feelings and attitudes, such as are indicated in the statements "their wings have been clipped" (Node 2 of 13, passage 1 of 14) and "there were really cutthroat relations between sales and production" (Node 2 of 13, passage 3 of 14).

The authoritarian attitude is indicated in the statement "head of department(s) are there to make sure that people under them do what they are told" (Node 2 of 13, passage 4 of 14). The atmosphere is more one of formality, with little openness, which is shown in the statement "Lots of people don't even know about the golf day" (Node 2 of 13, passage 6 of 14) and "Not all people attend meetings and then sometimes things mentioned there everybody is supposed to know about but haven't really been told" (Node 2 of 13, passage 6 of 14). Although not specifically mentioned in the documentary and field notes analyses, these findings on staff relationships seem to be supported by the previously mentioned emphasis on participation and democracy in PA and by the lack of autonomy and the dictatorial management style in PB

The more formal and bureaucratic approach was expected of the more successful company, and the open and transparent approach with staff was expected with the less successful company. In other words the findings are the reverse of what was expected. This may be because the more democratic and open approach to staff seems to have become the goal in South Africa – it is what staff expect because of the new openness in South Africa since 1994, and thus companies that apply 'old fashioned' attitudes to staff may anticipate less successful results.

Internal communications also differ significantly between the two companies. Although there is a fair amount of formal communication in PA ("a quarterly meeting which is fairly formal" – Node 1 of 12, passage 11 of 17), they also encourage lots of informal communication, especially via the canteen. In PB, on the other hand, communications are more formal. These differences are illustrated by the following extracts:

> PA - "… it is quite a loose situation. Generally you will go and have tea in the canteen and you will discuss a whole lot of stuff …" (Node 1 of 12, passage 4 of 17).

> PB - “We never used to have meetings every single day, it was every Friday, I have changed that” (Node 1 of 12, passage 4 of 19).

Both companies make use of informal communication, but the difference is that it seems to be encouraged more in PA than in PB, as is reflected in the following extracts:

> PA - “… there are no pigeonholes, they are definitely able to step into other peoples territories … if you don’t do it you don’t have the correct type of communication in the family” (Node 1 of 12, passage 1 of 17).

> PB - “Not really encouraged because of production downtime, but at teatime and lunchtime they all get together” (Node 1 of 12, passage 16 of 19).

The documentary analysis also shows internal communication differing significantly in the two companies. In PA it is more informal, open and transparent, as is reflected by the full presentation of financial figures to all staff (PA03E1, 2, 3, 4, 6, 7,9). In PB, internal communication is much more formal, as is indicated by the quote from the policy manual – “eliminate informal instructions, clear information communication” (PB03E1). This, too, was contrary to what was expected. The openness and participation in PA and the formality in PB, as reflected in the field note analysis, also seems to support the above findings.

As can be seen from the above, PA encourage open and inclusive communication, which contributes positively to their democratic culture. Although PB’s management is attempting to increase the openness and informality of communications, over the past few years the general feeling has been that “… people don’t know what is going on around them except where they are” (Node 1of 12, passage 7 of 19). The reverse of this finding was anticipated – open and inclusive communication was proposed for the less successful company, and restricted and formal communication was proposed for the more successful company.

These findings again are in contradiction to what was expected for companies in a stable and simple environment. The more successful company was expected to be more formal, while the less successful company was expected to rely more on informal communications.

The two companies are almost diametrically opposite when it comes to **policies and procedures**. Up until recently PA had no written policies and procedures, as is indicated by the following quote: “there are no rules. There is no formal procedure” (Node 3 of 13, passage 10 of 15). It is only since the introduction of the Equity Act that they have started

introducing human resource type policies and operating manuals covering specific operating tasks. Although this was not expected of a successful company in a stable environment, it is not surprising considering the innovativeness and creativity shown. PB, on the other hand, has a very formal policy and procedure system, with a comprehensive manual including detailed job descriptions. This, some feel, has curbed people from making decisions "as there is no system for bypassing the procedure so you hesitate to take a decision" (Node 3 of 13, passage 1 of 4). Despite this disadvantage, they feel that these procedures do contribute to improved quality.

From the data in the documentary analysis, although both companies show a fairly high degree of emphasis on efficiency and 'sticking to the rules', there is a difference in the application of policies and procedures in the two companies. Minutes of PA meetings reflect the importance of efficiency, policies and procedures – for example, "appeal for avoiding mistakes on GRNs to thereby reduce need for credit notes" (PA03C2) and need for "use of correct colour pens, tidiness, etc" (PA03C3). In terms of PB's policies and procedures, everything is formally included in the policy manual with detailed work instructions (PB03C2), lists of approved suppliers with full documentation (PB03C1), and detailed reporting on complaints, errors and non-conformance (PB03C7, 8). Clearly formality and structured policy are part of the PB company culture. PA's apparent formality and the presence of policies and procedures appear to be in conflict with what was found from the interview transcript analysis. However, it should be noted that the degree to which systems are formalised is much higher in PB than in PA, who seem to have kept their systems more informal and verbal. Therefore, it can be concluded that the documentary analysis does generally support the findings from the interview transcript analysis.

This finding is contrary to what was expected. The use of policies and procedures and more formal staff relations were expected to correlate with success in a stable environment – the opposite of what was found here. This is probably because, in PB, the bureaucratic and authoritarian approach was too harshly implemented and the policies and procedures lacked the flexibility to allow staff to use common sense and initiative when necessary. PA, on the other hand, are creative and entrepreneurial, characteristics that do not lend themselves to more formal systems.

Neither company does formal **planning** and in this sense they are similar. Strategies in PA are "extremely focussed" (Node 8 of 13, passage 3 of 21), but without a written plan. Although projects are carefully planned, the overall strategy is not. In PB planning is seen

primarily as budgeting and production planning. There appears to be no strategic planning of any kind, with strategies neither being planned, nor evolving from their interrelationship with the environment. This is indicated by the following extracts:

> PA - "… like in most entrepreneurial companies opportunities are seen along the way and to some extent it can be … impulsive … go in a certain direction and to make those decisions pretty much there and then" (Node 8 of 13, passage 4 of 21).

> PB - The move away from (our traditional market) was I think forced on us by the market shrinking" (Node 8 of 13, passage 4 of 10).

However, the informal planning and the way their strategies develop are very different. In PA, success is based on the fact that this "… off the cuff but not in a reckless way but decisive" (Node 8 of 13, passage 5 of 21) strategy making method is based on a clear vision and idea of who they are and where they want to go. Regarding PB, at best it can be said that their strategy is a mere reaction to environmental changes, an attempt to 'keep up.' These strategy-making approaches are reflected in the following extracts:

> PA - "… it is not a random decision. You must know where you are going, you must have done your homework" (Node 8 of 13, passage 11 of 21).

> PB - "We see something going that way and we follow it and if I can be harsh and say blunder along …" (Node 8 of 13, passage 7 of 10).

PA's planning is thus short term, continually monitoring the environment and maintaining the flexibility to adapt quickly to any anticipated changes. PB, on the other hand, are at the mercy of the environment – unable to have any say in their strategic direction. Even when PB have attempted proactive strategic steps they have not been successful. These differing approaches are shown by the following two quotations:

> PA - "It is a lot of reaction between machinery, suppliers, or customers themselves, trial and so on" (Node 8 of 13, passage 9 of 21).

> PB - "We had always jumped in and changed quickly, but possibly not with sufficient thought behind it, sometimes we may have reacted too prematurely without sufficient planning … a bit of a cowboy approach" (Node 8 of 13, passage 9 of 10).

The above discussion shows that PA are continually considering what is happening in the market and developing ways of reacting, even if they do not implement them. This indicates that PA's strategic planning is a continuously evolving process, growing, changing and developing based on changing environmental factors. This is very much the approach that would be expected of a successful company in a turbulent environment, rather than in a stable environment. Again it appears as if their approach is successful, even if they are in an environment that is stable relative to the information technology environment. This may be because their environment is sufficiently turbulent to warrant a less formal, destabilising-type approach, or because a degree of destabilisation may be inherently good, always leading to some success, regardless of the nature of the environment. The documentary analysis tends to support the finding regarding PA but also indicates that the informal approach of the past is changing as is reflected by the following extract: "… becoming more corporate … work being less fun. Need more information, more planning, more facts, less gut-feel" (PA03F1).

The planning approach adopted by PB is consistent with what would be expected of a less successful company in a stable environment, exacerbated by an inability to use a proactive flexible approach to adapt to, or change, the market. Clearly they are suited to, and used to, an unchanging market and have been unable to cope with the changes, no matter how small, that they have experienced. Unfortunately, the PB documentation made no significant mention of their planning for comparison against PA.

Strategic planning is thus one of the few business strategic issues that have performed as predicted in the research propositions. The differences, and the direction of the differences, were found to be as anticipated.

In both companies top management takes major decisions, but in PA lower level staff, who have been given the responsibility, are trusted by management to take decisions relevant to their operational area. In PB lower level staff seem unable to take decisions, mainly because of the history of dictatorial management in the company. These findings are exemplified by the following extracts:

> PA - "…a senior operator on a machine – if there was a problem he would make that decision … without going through management" (Node 9 of 13, passage 13 of 13).
>
> PB - " Nobody else will take a decision … I am not sure if it is top management who is saying you must come to them for a decision" (Node 9 of 13, passage 2 of 8).

Although both companies' decision making seems a bit slow, PA do not procrastinate or wait for perfect information whereas PB do sometimes do this, as is reflected in the two examples below:

> PA - "If there is insufficient information then we hop around and get it – you can't put off decision making too long" (Node 9 of 13, passage 11 of 13).

> PB - "I have had three meetings already … I want to make the right decision so therefore I want to know everything" (Node 9 of 13, passage 8 of 8)

Decision making in PA is fairly informal, whereas in PB it seems to be a little more formal, involving the formal management structure, as is shown in the following extracts:

> PA - "You will go and have tea in the canteen and you will discuss a whole lot of stuff and that is kind of how you make a lot of decisions" (Node 10 of 13, passage 4 of 6).

> PB - "I don't like to take snap decisions – I like to involve my managers" (Node 9 of 13, passage 6 of 8).

The approaches to **decision making** identified via the documentary evidence also differ in the two companies. PA are very democratic, with staff deciding on shift changes (PA03G1) and whether to rehire a disciplined worker or not (PA03G2). However, such democratic involvement may limit autonomous decision-making and may even slow it down. It is also doubtful whether this form of decision-making would be used for more urgent, marketing orientated decisions. In PB, decision-making seems to rest mostly with managers or 'experts'. This is reflected in the fact that the policy manual provides "detailed instructions for each activity … as well as who to go to if uncertain about something" (PB03G1). These findings were also corroborated by the analysis of the field notes, which showed PA to use autonomous decision-making, while PB used more centralised decision-making.

These findings are the reverse of what was anticipated, i.e. PA were expected to have had more centralised, slow and formal decision making, while PB were expected to use democratic, quick and informal decision-making.

The general management issues were almost all totally **different** between the two companies. The only **similarity** was that neither company used a formal approach to

strategic business planning. Of interest is the fact that, with the exception of strategic planning, all the issues were found to be the reverse of what was anticipated, i.e. PA behaved as a less successful company in a stable and simple market, while PB behaved as was expected of a more successful company in a stable and simple market. This conclusion can also be reached from the documentary analysis. This reverse of what was expected could be because the packaging industry in South Africa is sufficiently turbulent to warrant a chaos/complexity, destabilising type management, or because this type of management (democratic, participative, and open) is superior in any environment and thus could explain PA's superior performance.

6.2.2.2 Structural and staffing issues

In this section issues relating to how the organisation is structured; how staff operate; how staff and management interrelate; and the day-to-day operational issues relating to staff will be discussed in terms of the nature of the environment in which they operate.

a) Companies in a turbulent and complex environment

Internal communication is very open, is seen as very important and is proactively encouraged in both companies. This is shown in the following extracts:

> ITA – "… an empowerment strategy within the organisation to try and get the guys who are constantly at the coalface to try and come up with innovations … and not to be frightened of shouting from the coalface" (Node 1 of 12, passage 3 of 16).

> ITB - "… we have breakfast sessions for all the staff and … the financial forecasts and the sales targets and report all the costs, the salaries" (Node 8 of 13, passage 5 of 6).

Although both companies have formal communication methods (e-mail, weekly meetings), informal communication also plays a major role, as is shown in the following extracts:

> ITA – "… corridor talk … we do encourage a lot of communication, informally …" (Node 1 of 12, passage 11 of 16).

> ITB – "'good co-operation" (Node 2 of 13, passage 5 of 5) and a lot of informal discussions over coffee and cigarettes.

Communication between different levels in the hierarchy and between different business units is also encouraged in both companies, as is reflected in the following extracts:

> ITA - "… communications works very closely with everybody … we all work together as a lot of things could not happen if different sections did not work together' (Node 1 of 12, passage 9 of 16).

> ITB - "…[the company has] no hierarchy and no titles" (Node 5 of 13, passage 3 of 15).

From the above it can be seen that the open and informal communication style that is expected in a successful company in a turbulent environment is present in ITA as proposed. However, the same style is present in ITB in contradiction to what was expected. This indicates that the communication style is possibly more of a function of their overall management approach than of the environment in which they operate.

Regarding the **profile of staff** employed, there seems to be a significant difference between the two companies. ITA tend to employ young, self-confident, assertive, mature, team players as is illustrated by the following extract:

> ITA - "… young, individual, strong entrepreneurs, who have an idea where they want to go individually, they have their own goals … there is always change …" (Node 2 of 12, passage 6 of 8).

ITB, on the other hand, employ staff with "independence and … initiative" (Node 6 pf 13, passage 3 of 3), who "on a day-to-day basis …manage themselves" (Node 5 of 13, 10 of 15), and who "… manage their own time and their own delivery" (Node 6 of 12, passage 15 of 15). Despite this apparent independence, "there are no individuals running off and doing their own thing" (Node 12 of 13, 4 of 8), as they place a lot of emphasis on teamwork, as is reflected in the following extract:

> ITB - "Everything works in teams – very important" (Node 9 of 12, passage 2 of 6).

ITB's staff tend to be "more generalists than specialists" (Node 4 of 12, passage 10 of 18) and to be "able to multitask and had multiple responsibilities" (Node 6 of 12, passage 1 of 15). As to be expected, within this almost collegial environment there is a lot of

"collaboration and co-operation" (Node 2 of 12, passage 5 of 5) and "people are working hard and are happy" (Node 10 of 12, passage 6 of 6). Therefore, it can be seen that 'individualism' seems to be the underlying philosophy in ITA, whereas in ITB teamwork appears more important.

The documentary evidence supports the above findings, showing that the main difference in the profile of, and attitude towards, staff in the two companies seems to be aggression versus people orientation. Aggressive innovation and entrepreneurship is fostered amongst ITA personnel, but at the same time they are intolerant of failure. Much emphasis is placed on teamwork, recognition and social events. The profile of ITB staff appears to include enthusiasm, participation and responsibility (ITB05B1, 2, 3) with relatively little aggression. "Self management" (ITB05C2) and minimal management (flat organisation structure – ITB05C1) seem to reflect the attitude towards staff in the company. The field notes analysis also supports the interview findings.

These profiles are as was expected of more successful and less successful firms in a complex and turbulent environment.

Staff relationships in both companies are informal and co-operation is encouraged. In ITA, 'everybody is co-operative', and 'work well together', while in ITB, "… everybody gets treated the same and we try to respect every individual" (Node 2 of 3, passage 1 of 5) and there is "good co-operation" (Node 2 of 13, passage 5 of 5).

The structure in terms of **policies and procedures** is also very informal in both companies, as has previously been mentioned. ITA believe staff know what to do and just get on with it, while ITB believe that people know what to do because of their basic principles. The documentary analysis supports this finding, except that it also highlighted some strict policies and procedures related to financial control in ITA. However, this does not detract from the conclusion that in the rest of their organisation, policies and procedures are essentially informal.

The informality in relationships and lack of 'rules' is typical of the flexibility needed for a company in a turbulent environment to be able to be sensitive to small and rapid environmental changes and to be able to take advantage of them. This informality, together with loosely defined job roles, can be expected to result in overlapping of responsibilities and versatility, which enhances teamwork and swapping of jobs.

Knowledge and skills of staff are seen as very important, and both companies have lots of knowledge and skills, especially at senior levels, but for ITA, experience and skills may be lacking at lower levels in the organisational hierarchy. This is reflected in the following extracts:

> ITA - "At senior level there is a lot of experience, but there are people coming in that perhaps lack the experience but because of the skill shortage you have to take these people in and train them up" (Node 5 of 12, passage 17 of 34).

> ITB - "We have lots of experience. We don't have many people who are inexperienced" (Node 4 of 12, passage 6 of 18)

This continuous influx of new but inexperienced people may be an advantage for ITA as these newcomers are not limited by old or established knowledge and skills, and may bring more creative thinking, challenges to the *status quo*, and act as a source of new knowledge about the rapidly changing environment.

In ITB, experience is limited to the technical aspects, rather than the business aspects, as is indicated below:

> ITB - "In computers and the areas of expertise it was good and extensive … in terms of management and general business shocking" (Node 4 of 12, passage 8 of 18).

Both companies appear to be confident in being able to handle the crises and changes endemic to turbulent markets. The main difference is that ITA seem to revel in crises, while ITB handle information technology crises well but not business crises. This is reflected in the following extracts:

> ITA - "We work in a lot of crisis environments probably every week … whereas for [competitors] it is a crisis situation, for us it is normal operation" (Node 5 of 12, passage 8 of 34).

> ITB - "If it was a system crisis, yes [the crisis could be handled], because they are specialists, if it was a general business crisis, no [the crisis could not be handled]" (Node 4 of 12, passage 3 of 18).

The knowledge of customers' businesses and operations by sales representatives or account managers seems to be a little better in ITB than in ITA, as is shown by the following two extracts:

> ITA - "They are relatively knowledgeable. Where we have long-term relationships they know [the customer's business]. Where they are in and out, probably not [so knowledgeable]" (Node 5 of 12, passage 33 of 34).

> ITB - "…[customer knowledge is] a key requirement in getting business" (Node 4 of 12, passage 18 of 18).

This difference could be due to one or both of the following reasons – first, because ITB's selling activities are conducted by much higher level staff, director level in half the cases, and second, because ITB pay less attention to the turbulence of their environment, and thus act more like it was a stable environment with building of long term relationships with all their customers as a key strategy.

The documentary evidence supports the finding that both companies consider **knowledge and skills** as very important, place emphasis on it, and appear to be strong in this area, as is reflected by the following extracts:

> ITA - "Need to remain one step ahead of competitors via intellectual capital" (ITA05E4).

> ITB - "Has the skill and experience to provide an overall IT solution" (ITB05E9).

Although there do appear to be some differences in the knowledge and skills of the two companies, overall these factors appear to be sufficiently similar to conclude that they do not have any determining influence on the relative success levels of the two companies.

With regard to **management style** as it influences staff, both companies are very open and democratic, as has been mentioned previously. They rely on self-control, rather than control by managers or 'policing', as is reflected in the following extracts:

> ITA- "… we rely on self control, we don't go around checking up on them" (Node 4 of 13, passage 28 of 29).

> ITB - “we try not to control people – we try to encourage independence” (Node 6 of 13, Passage 3 of 3).

The documentary analysis found a similar management style, characterised by participation, autonomy, personal responsibility, and self-management. This was as expected for ITA, but ITB were expected to have a more bureaucratic management style.

Job roles appear to be different in the two companies. In ITA they appear to be fairly tightly defined, with job descriptions and little rotation among different departments. In ITB, which has a very flat, open organisation structure (directors and the rest of the staff), staff are more generalists and appear not to have tightly defined roles. This is reflected in the following extracts:

> ITA - “From an HR point of view it is very loose, but from a technology focus point of view it is very tight. If your job is to sell X you do not try to start messing around in Y” (Node 8 of 12, passage 1 of 5).

> ITB – “… able to multi-task and had multiple responsibilities” (Node 6 of 12, passage 1 of 15).

However, both companies make much use of teamwork, which leads to overlapping of roles and so this difference is probably not significant.

Teamwork is seen as critical in both companies, as is reflected in the following quotations:

> ITA - “… at the end of the day the only way we are going to get what we need is a collective effort” (Node 9 of 12, passage 11 of 18).

> ITB - “Critical, they work together in teams – there are project teams – all work together because one was dependent on the other. Both internally and externally” (Node 9 of 12, passage 5 of 6).

Although it was earlier stressed that ITA staff are more individualistic, this does not detract from the fact that they have to be ‘team players’, or from the importance of teams as perceived by ITA. Thus the importance and the role of teamwork are seen as similar in the two companies. The documentary analysis showed similar findings. Teamwork appears to play a considerable role in management in ITA with words like ‘participation’, ‘sharing’ and

'teamwork' being used frequently. There is some mention of the importance of teamwork in the ITB documentation (ITB05H1), which is supported by the emphasis on 'participation' (ITB05H1). Thus the two companies seem to be similar in this regard.

Job stability differs significantly between the two companies. In ITA, staff seems to be in a state of 'constant tension', for two reasons – first, because in the environment in which they operate "stability is not an option" (Node 11 of 12, passage 5 of 7) and second, because of the individualistic, achievement, and goal orientated culture of the company. In ITB, on the other hand, there is a degree of staff stability and most staff do not experience uncertainty of tenure in their jobs. These differences are reflected in the extracts below:

> ITA - "Account managers I don't think will ever feel settled because if they don't perform they are not going to be around and they know that" (Node 11 of 12, passage 7 of 7).

> ITB - "We don't get rid of people easily, we believe there is value in everyone, it is to find that talent and we will work on it as long as the employee is also prepared to work on it" (Node 10 of 12, passage 1 of 6).

However, it should be noted that there are some ITB staff members who are put under peer pressure, as the open management style makes it difficult to hide under-performance, as the following extract shows:

> ITB - "… they are also kept on their toes because everybody knows what their utilisation has been – every month all these statistics are there so anyone can see what they have achieved or not … this stops them from becoming complacent" (Node 10 of 12, passage 2 of 6).

This pressure, though, leads either to the individuals improving their performance or to leaving the company voluntarily – there is no threat of firing as there is in ITA. Therefore, staff in ITB feel secure in their jobs, whereas in ITA security is totally reliant on the individuals' performance, which is accepted because they are better paid than their competitors and because of the individualistic, self confident, and achievement oriented personalities of the people attracted.

The documentary evidence corroborates the above findings. Stability does not appear to be something that is sought in ITA. This is indicated by the following extract: "…intolerance of

failure, continually reinvent the company" (ITA05I1), but other factors such as merit progress, participation, teamwork, recognition, etc. seem to indicate that such emphasis on instability is used positively to encourage change and reduce complacency. In ITB, on the other hand, emphasis is on retaining staff (ITB05I3) and as a result they have very low staff turnover (ITB05I1, 2).

These findings appear to indicate that a difference exists between the two companies regarding job stability – ITA use the instability to 'keep people on their toes', while ITB reduce instability to increase the sense of security amongst staff. ITA's approach is clearly more in line with an aggressive, destabilising approach to a turbulent environment. ITB's approach on the other hand is consistent with a stabilising approach to a turbulent environment. This difference is what would be expected between more successful and less successful companies in a turbulent and complex market. Thus, job stability appears to reflect accurately what was predicted in the propositions.

From the above discussion it can be seen that internal communications, staff relations, policies and procedures, knowledge and skill, management style, and teamwork are all very **similar** in the two companies. Job roles, although different, are compensated for in ITA by considerable use of teamwork, and thus cannot be considered to be sufficiently different to be a determinant of success. The only major **differences** between the two companies in the structure and staffing arena were in the profile of staff employed and in the sense of job stability felt by employees. The findings relating to both these factors correlate well to the nature of the respective companies' visions and philosophies, namely aggressive and results orientated for the more successful company (ITA) and more people orientated for the less successful company (ITB). These findings also therefore seem to correlate well to the approaches proposed for a more successful and for a less successful company in a turbulent and complex environment.

b) Companies in a stable and simple environment

Internal communication is significantly different in the two companies as was discussed previously. Communication in PA is open and inclusive, contributing positively to the democratic and participative culture. PB's management is attempting to change from formal and restricted communications to openness and informality. However, over the past few years the general feeling has been that "… people don't know what is going on around them except where they are" (Node 1of 12, passage 7 of 19), and so their communication cannot be seen as open and transparent, nor making use of informality. The documentary evidence supported this finding, with PA's openness and transparency reflected in their full

presentation of financial figures to all staff (PA05A1, 2, 3, 4, 7, 8, 10). Informal communication amongst staff appears to be encouraged as is indicated by the use of the functions room and the 'pub' (PA05A6). In PB, internal communication is much more formal, as is indicated by the quote from the policy manual – "eliminate informal instructions, clear information communication" (PB03E1).

These findings were in contradiction to what was expected for companies in a stable and simple environment. The more successful company was expected to be more formal, while the less successful company was expected to rely more on informal communication.

The **profile of the staff** in the two companies was also very different. PA employ young independent people who are flexible and willing to learn, while PB generally employ people who are older, more conservative, and loyal. This is reflected by the following extracts:

> PA - "… we want guys who can learn easily and are not set in different ways, we want guys who can think for themselves, not those who expect to be spoon-fed … you bring youngsters in and they develop and you can mould them" (Node 2 of 12, passage 1 of 1).

> PB - "… the staff turnover here is almost negligible, there are people who have been here for absolutely years, so that also shows they have faith in the company … and are so loyal" (Node 1 of 12, passage 6 of 19).

PB's staff profile appears to have both negative and positive implications. For example, the negative aspect of this is that management are seen as not encouraging staff to use their initiative to the extent that staff can almost be seen as 'yes men'. This is reflected by the following extracts:

> PB - "People don't like not to conform" (Node 3 of 12, passage 1 of 4).

The positive side of this profile is that there is a lot of co-operation, with staff supporting and helping each other, for example when people are on leave, as is shown by the following extracts:

> PB - People are prepared "… to go to the guy in the next department and seek advice" (Node 4 of 12, passage 4 of 38).

With regard to PB's day-to-day activities "there is a lot of self managing by people because they have been here for a long time and know what they are doing" (Node 5 of 12, passage 10 of 15).

The analysis of documents corroborated these findings. PA employ peoples who are independent 'self-starters', and who are encouraged to be entrepreneurial (PA05B1, 3) and to act independently as is shown by the emphasis on "individual responsibility" (PA05B2) in the mission statement. However, although PA do seem to encourage self-management ("…targets against which to measure … needed in order to self measure" (PA05C1)), the freedom to act independently seems to be decreasing due to their "becoming more corporate" (PA05C1). In PB, there appears to be a degree of contradiction in the description of staff employed. One document stresses "loyalty and pride" (PB05B1) which implies older more established values, while another mentions "youth, vibrancy, modernity" (PB05B2). This possibly explains some of the other contradictions in the findings about PB.

PA's staff profile is more as was expected of a less successful company, while PB appear to have a mix of both expected and unexpected staff profiles. In the stable and simple environment, this 'older and more loyal staff' was expected of the more successful company, with the less successful company being expected to have the younger, more aggressive staff.

Staff relationships, as was discussed previously, were very different in the two companies. PA showed openness and transparency towards their staff, while PB's approach to staff relations is still largely bureaucratic and autocratic. The atmosphere is more one of formality, with little openness. The findings are the reverse of what was expected, namely that the more formal and bureaucratic approach was expected of the more successful company, and the open and transparent approach with staff was expected with the less successful company. As previously suggested, this may be because staff expect more openness, and therefore companies that apply authoritarian attitudes to staff can expect to be less successful, regardless of the environment.

The **policies and procedures** are very different as has been discussed previously. PA had virtually no written policies and procedures, which was not surprising considering the innovativeness and creativity in the company. PB, on the other hand, had a very formal policy and procedure system, with a comprehensive manual including detailed job descriptions. The documentary evidence confirms this, with considerable discussion of efficiency, policies and procedures in meeting minutes. In terms of PB's policies and

procedures, everything is formally included in the policy manual with detailed work instructions (PB05D2), lists of approved suppliers with full documentation (PB05D1), procedures for compliance with policy (PB05D3) and detailed procedures for reporting on complaints, errors and non-conformance (PB05D7, 8). Formality, structured policy and conformity are clearly part of the PB company culture. Although both companies have formal systems, PB seem to apply and enforce the use of the systems more strictly, while PA seem to be fairly casual in their use of the systems

Formal policies and procedures were expected of the more successful company in a stable environment – the reverse of these findings. This is probably because PA are creative and entrepreneurial, characteristics which do not lend themselves to more formal systems, whereas PB applied the bureaucratic and authoritarian approach too harshly and therefore staff were not allowed to use common sense and initiative when necessary, leading to staff dissatisfaction, and inferior performance.

There appears to be a slight difference in the level of **knowledge and skills** of the staff in the two companies. PA deliberately have people with a lot of experience and people with very little experience, but few with middling experience. Similarly, PB have lots of experience, with some staff members having been with the company over 30 years, but there are clearly weaknesses in certain specific areas. However, for PA, this is a deliberate policy to build the type of employees with the type of knowledge they want, while for PB, it seems to be a weakness. This is shown by the following extracts:

> PA - "… we have tried guys who come out of sweat shops and they just cannot cope, so now we take young guys who have the skills but not the experience … and help them learn" (Node 5 of 12, passage 16 of 29).

> PB - "I think it is fairly thin on the ground especially on the technical side" (Node 4 of 12, passage 15 of 38).

Neither company believes that their staff know fully how to cope in a crisis, but both believe they know whom to contact, as is reflected in the following extracts"

> PA - "I think again in general everybody knows that if they don't know there is always someone they can ask" (Node 5 of 12, passage 1 of 29).

> PB - “During normal working hours I would say so (that staff can handle crises), they know who to call, etc. – after hours they certainly know who to call, but I believe things could be more efficient with having a more responsible person there” (Node 4 of 12, passage 5 of 38).

Building individual responsibility and knowledge to cope with crises seems to be a goal in PA, but not in PB, as is indicated in the following quotes”

> PA - “I think that is where skill development comes in, where you are actually training people beforehand before they even reach the point” (Node 5 of 12, passage 3 of 29).

> PB - “… sometimes a chap will be called to another department and told to do a job when somebody is away, but he will not have been taken before and told to work with that guy in case you have to relieve him one day” (Node 4 of 12, passage 10 of 38).

Although fairly similar, there are some differences in the status of knowledge and skills in the two companies. The documentary analysis also showed similarities, but with minor differences. In PA, individual skill and knowledge is developed through technical and product presentations, e.g. presentation on speciality inks (PA05E1), involvement of staff in training requirements and Sector Education and Training Authority (SETA) involvement (PA05E4), and allowing people to learn from mistakes (PA05E3). This is reinforced by the fact that the mission statement includes a comment on “development of individual’s skills” (PA05E2). Training of PB staff to improve skills is important enough to have a major place in the company manual, including evaluation for further training (PB05E2) and interchange of staff (PB05E1). Although important, the degree of continuous training at PA was unexpected. However, considering the changes in technology and in the human resource/legal environment of education and training this can be understood.

Unlike what was anticipated of the more successful company in a stable and simple environment, PA employ and train new, inexperienced staff, benefiting from their ‘new minds’, whereas PB merely seek standard, industry oriented experience. This difference can probably be explained by PA’s more creative and entrepreneurial approach to their business.

The **management styles** of the two companies were found to be very different. PA’s style is very open and transparent, believing that everyone can make a contribution and that motivation and commitment can be generated through involvement. As a result structures

are loose and overlap, and people can get involved in and comment on any aspect of the business. Individuals are also given full responsibility for their areas in order to "breed decisiveness" (Node 4 of 13, passage 8 of 29). PB, on the other hand, discouraged participation and independent action, as the company was run on strict disciplinarian and authoritarian lines until 1998. It involved a bureaucratic and family oriented style. Everyone was required to be subservient to the Managing Director. As previously mentioned, the current Managing Director is attempting to change the style, but with limited success. This finding was corroborated by the documentary analysis.

Although the management styles are different, they were not as anticipated: PA's style was what was expected of a less successful company, and PB's style that of a more successful company, in a stable and simple environment. As previously indicated, this may be because a more open democratic style is more fitting for the open and transparent approach generally fashionable in South Africa over the past few years.

The **roles of staff** differ significantly between the two companies. In PA, the organisation structure is very loose, overlapping, and with no written job descriptions, whereas in PB the structure is very tight with formal job positions and job descriptions. This is reflected in the following extracts:

> PA - "No it is loose, it overlaps – extremely overlaps – you can get involved in anything. We help each other, there is no such thing that you work so hard to hold your position" (Node 8 of 12, passage 5 of 11).

> PB - "… in general I think it is a very tight ship, everybody knows their job and they have to do it, it very seldom overlaps" (Node7 of 12, passage 2 of 9)

Although neither company has a formal job rotation policy, there is multi-skilling that results in staff moving between different jobs, e.g. from production to sales. Thus, most key positions can be covered, with people being moved around when necessary. The following extract from PA reflects this:

> PA - "… most of the people know what the other is doing so that when they are on leave somebody covers for them" (Node 7 of 12, passage 8 of 9).

The roles of staff were also found to be different in the two companies by the documentary analysis. In PA, roles are fairly loose and staff are allowed to involve themselves in each

other's responsibilities. Staff are encouraged to take the initiative, which is indicated by a discussion on quality problems in which staff were told of the "need to support each other by pointing out errors" (PA05G1). The policy manual formally defines staff roles in PB, with detailed job descriptions for all posts. There is no overlapping of roles, although "interchange of staff" is allowed for training (PB05G1). This finding was the reverse of what was anticipated.

Neither company places much emphasis on formal **teamwork**, but, in PA, use is made of involving any relevant staff whenever necessary, as is reflected in the following extract:

> PA - "We don't really have formal teams that we set up to do things … I might, if I am looking for something new for someone, I might call a few guys in from various departments to look at it, but you don't have formal meetings as such, with specific teams" (Node 9 of 12, passage 10 of 12).

Although PA does not use the team concept, it is clear that the whole company is viewed as a team with everybody striving towards achieving a common 'team' goal. The formality of PB's structure seems to preclude the concept of team work, although some attempts have been made recently to encourage team building and *esprit de corps,* but with little apparent success.

The documentary evidence seemed to show a difference between the two companies, with teamwork, but not necessarily teams, appearing to be important to PA, as is shown by the involvement of all staff in decisions (PA05H2, 6), discussions of quality and sales problems, e.g. "debtors asked reps to chase accounts over 60 days" (PA05 H5), and the emphasis on supporting each other in identifying errors (PA05H1) and cleaning machines (PA05H7). In PB, however, not much teamwork is reflected in the documentation, although the mention of "loyalty and pride" in the mission statement (PB05H1) indicates that it might be desired.

Once again PA seem to behave more as expected of a less successful company in a stable and simple environment, with PB behaving as expected of a more successful company.

Both companies appear to provide a working environment that is **stable and secure**, as is illustrated by the following extracts:

> PA - “We try for stability, we try to make it as comfortable as possible” (Node 10 of 12, passage 3 of 11).
>
> PB - “… the staff turn around here is almost negative … people have a trust in the company and are so loyal” (Node 10 of 12, passage 1 of 4).

Although PA provide job security, there is a degree of uncertainty in that “there is discipline if a guy is stepping out of line” (Node 10 of 12, passage 8 of 11). This is seen as positive in order to avoid stagnation as is reflected in the next extract:

> PA - “I think we do that, sort of ‘keeping people on their toes’. I think it is done in a positive way – there is no complacency in stability” (Node 10 of 12, passage 5 of 11).

The documentary evidence supports this, showing that, in PA, there appears to be emphasis on letting people know their job security is dependent on performance. This is indicated by, for example, a mention of organisational restructuring (PA05I1), and comments such as “watching for people not pulling their weight, liabilities will have to go” (PA05I3), all of which seem to be aimed at ‘keeping people on their toes.’ PB, on the other hand, appear to have a sense of stability with little uncertainty regarding job security, as is reflected by the mission statement, which stresses a “stable, secure work environment” (PB05I1).

Once again, these findings are contrary to what was expected, with PA being expected to be safe and secure, while PB’s job security was expected to be more uncertain.

Differences between the two companies exist in most of the structural and staffing issues, especially internal communication, staff profile, staff relationships, policies and procedures, management style, and staff roles. **Similarity**, or only slight difference, exists in the issues of knowledge and skills, teamwork, and job security. Therefore, as a generalisation, it can be said that the two companies differ in terms of their structural and staffing issues, but that these differences were in a reverse direction to what was expected. PA performed similarly to a less successful company in a stable and simple market, while PB performed as expected of a more successful company in a stable and simple environment. This overall finding indicates that the environment does not necessarily determine the human resource or staffing issues and approaches in a stable and simple environment, and therefore, may not be influential in determining success. As mentioned previously, it appears as if there is a superior method for management (which includes these structural and staffing issues), which correlates with success, regardless of the external environment condition.

6.2.2.3 Business strategy issues

In this section some key business strategy issues relating to marketing will be discussed with regard to how they would be expected to evolve according to chaos and complexity theory.

a) Turbulent and complex environment

Both companies, as has previously been mentioned, considered their environment and market to be constantly changing and shifting. The more successful company (ITA), however, seemed to have more environmental awareness, referring to constant change in specific components of the environment, such as the market, technology, and the economy. The less successful company (ITB) did not comment on specific aspects of the environment.

The **strategic approaches** adopted by the two companies are significantly different. ITA are very aggressive, trying to shake the market up and developing new ways of doing business. ITB, on the other hand, are more conservative and reactive, possibly due to a restricted strategic vision. These differences are reflected in the following extracts:

> ITA - "We have … business analysts where we can go into an environment and see what ways we can interface with the customer…So we will be seen by the industry as being innovative and constantly changing" (Node 3 of 13, passage 19 of 19).

> ITB - "Strategic vision is probably one of our liabilities …we are very good at … operationally doing the same thing, but the brand new thing [innovating] about where you need to go, that is needed …" (Node 3 of 13, passage 4 of 16).

It is important to note that although ITA are constantly trying to change, shake up, or destabilise their market environment, they are at the same time trying to consolidate and stabilise their customer relationships. This is illustrated by the following extract:

> ITA - "… although you will find we are an aggressive and dynamic company, there's very much a friendship that develops with customers. We tend to do a lot of marketing and golfing events, etc.…I would say in terms of our success in the market we must be good" (Node 3 of 13, passage 18 of 19).

The documentary evidence supports this finding, with ITA showing aggressive new market development as is reflected in the following extracts:

ITA - “Continuous entry into new markets” (ITA04B4).

ITA - “… use competitive advantage to obtain dominant position in embryonic stages of market development” (ITA04C4).

ITA’s launching into new markets involves a scaleable business model which can be seen to be a practical application of the fractal concept of self-similarity in chaos theory, where different levels of a structure are almost the same, or self similar, also known as scaling. This enables the strategies, attitudes and beliefs to be rapidly replicated in new markets. ITB, although talking about aggressive plans for growth, place much more emphasis on existing markets as is reflected in the following extracts:

ITB - “Steady stream of repeat business from existing customers” (ITB04B2).

How the companies’ strategies develop also differs, with ITA’s strategy tending to emerge from the market, while ITB’s uses a more formal strategic planning approach conducted by management. This is illustrated by the following two extracts:

ITA - “… our market has changed and obviously our approach into that market, we constantly have to adapt” (Node 4 of 13, passage 4 of 13).

ITB - “Yes this business has been logically and rationally planned – very much so – deliberated over for some time, a good six months, we have gone through a lot of consultations, we have been introspective, we have looked at what we have to offer” (Node 4 of 13, passage 1 of 3).

The source of strategy is from a wide range of influencers for ITA, but predominantly from one main supplier for ITB, as is indicated by the following quotes:

ITA – “… it might be reactive to market demands or reaction to customer demands or even competition to some extent or even suppliers.” (Node 4 of 13, passage 12 of 13).

ITB - “---------- [a specific supplier] is a trend setter or a leading edge company, but we are very cautious with new technology, and we follow what ---------- is doing …

and as soon as the market starts moving we then – we have to be ready for that – it is a lower risk aspect … we have got to be ready to deliver, but we don't cause the change" (Node 5 of 13, passage 2 of 8).

Adaptation is seen as a key strategy for dealing with turbulent markets. The two companies also differ significantly in this regard, with ITA seeing the ability to adapt and change as a key approach to the way they operate. They prepare for change and therefore do not see it as only reacting to change. Although numerous ITB interviewees stressed that adapting was important, there is a strong belief in the company that efficiency and concentrating on current business is more important, and so they tend to wait for the market to move and then react. This is reflected in the following extracts:

ITA - "… we have to have the ability to evaluate and change, do things differently, think of ways to do it, create, go and grow – that is the main thing – just get on and do it" (Node 9 of 13, passage 10 of 31).

ITB - "We are actually pretty slow from the inception of an idea to getting off the ground, I believe that we don't have the processes dynamic enough to support quick running with something" (Node 9 of 13, passage 4 of 10).

This finding was corroborated by the documentary analysis, which showed that speed is critical in everything ITA do, as is reflected in the following quotes: "reduces time-to-market" (ITA04F2), "implement rapidly" (ITA04F3), "rapid implementation" (ITA04F5), and " need for flexibility and instant error resolution" (ITA04F6). Little mention, though, is made of adaptation or flexibility in ITB's documents, while mention is made of improving in a "controlled manner" (ITB04F1) – this implies slower reactions and planning. This was also supported by the field notes analysis.

ITA used quick adaptation to change as a strategic tool, as was anticipated of a more successful company in a turbulent and complex market, while ITB wait and then tries to 'play catch-up' with faster competitors, which is what was expected of a less successful company in a turbulent and complex market.

In contrasting **market development** against maintaining existing markets, both companies felt that maintaining and being efficient in current markets was critical – for ITA it was the foundation upon which they can grow. This is reflected in the following quotes:

ITA - "… being efficient in our existing markets is not negotiable" (Node 2 of 13, passage 7 of 23).

ITB - "… because we work on retainer revenue, for us keeping that going and making it more efficient – with our customers - it is a key objective" (Node 2 of 13, passage 9 of 9).

However, ITA also believed that developing new markets was equally critical to the company, but ITB have avoided it, concentrating on current market maintenance. This is reflected in the following extracts:

ITA - "there are two things we need to do … the one is to have to grow within your existing customer base … and we need to find new markets" (Node 2 of 13, passage 14 of 23).

ITB – "They spoke about developing new markets … but in reality they just stayed in the same line (Node 2 of 13, passage 8 of 9).

This finding was also supported by the documentary evidence, as was discussed in the section on strategic approaches above.

Information is important because, for a company to be able to cope adequately with environmental discontinuities and change, it must be able to learn about and understand its environment. The attitudes towards information about the environment and how it is collected differ significantly between the two companies. These differing attitudes are reflected in the following extracts:

ITA – "We need to know competitive information, we need to understand competitive trends, in terms of where technology is going, what are the emerging technologies, where are the technological drivers" (Node 6 of 13, passage 25 of 50).

ITB - "IT is about passion … I think you will reach over analysis – paralysis – one has to jump and believe me no matter how much research you do you don't know whether you have picked a winner" (Node 7 of 13, passage 5 of 25).

ITA make use of both informal and formal (BMI, Reuters, Data Monitor) sources of information, and collect both qualitative and quantitative data. The sources they use include the customers, suppliers, management and sales staff. Collection of environmental information is not seen as particularly important by ITB as they don't 'develop ahead of the market'. As a result information collection is incidental or serendipitous. It is informal and qualitatively gathered by all staff in their day-to-day jobs and private lives, and not formally collated. The following extracts illustrate their differing approaches to information gathering:

> ITA - "… from top management … constantly looking at new markets, collecting information, looking at new products, seeing what would work better for us …" (Node 6 of 13, passage 48 of 50) and
>
> ITA - "Our sales people collect information in an informal way. This information gets brought out in sales meetings and it gets discussed – story telling – success stories in the field, why people lost deals, who they lost it to …" (Node 6 of 13, passage 25 of 50).
>
> ITB - "we get it from our customers and from our partners and from people we know in the industry. It is a very incestuous industry" (Node 7 of 13, passage 11 of 25).

The documentary evidence and the field note analysis supported the above finding, namely that information is very important to ITA, but not so important to ITB. ITA see information as part of the value they provide customers. Furthermore, it is critical to enable ITA to strategise about the future. Information was only mentioned once in ITB's documents, so it does not seem to be too important.

As would be expected of a more successful company in a turbulent market, ITA appreciate the importance of environmental information, especially from a wide variety of sources, and like most successful companies they are dissatisfied, continually trying to improve their information collection. Regarding ITB, it can be seen that environmental information is not seen as of much importance, as would be expected of a less successful company in a turbulent market. It is also to be expected of a company that operates in a relatively small niche, and sees itself as a follower - changes in the market are usually fairly well established before this company adopts them.

Building strong **relationships with customers** to act as a continuing bond – a consistency – through environmental changes is considered an important strategy for a successful

company in a turbulent environment. Both companies, as the extracts below show, place a lot of emphasis on relationship building with their customers:

> ITA - "We know the business that we don't get, that we lose, is because we did not have that relationship" (Node 6 of 13, passage 18 of 44).

> ITB – "80% of our revenue comes from our customer base, so it is important that we have a relationship with them and keep that good" (Node 6 of 13, passage 4 of 20).

What is different between the two companies is that ITA use the relationship to adapt to market change and to grow in new markets, whereas ITB tend to use relationships to maintain existing business. This is reflected in the extracts below:

> ITA – "… the customer is a lot more powerful today, he's demanding, he's creative; in some aspects it leads to new markets. And if we don't take note of this we are going to become extinct (Node 6 of 13, passage 2 of 44).

> ITB - "… because we work on retainer revenue, for us keeping that going and making it more efficient, it [the relationship] is a key objective" (Node 2 of 13, passage 9 of 9).

Both companies also accept that strong long-term relationships cannot be built with every customer. The documentary evidence supported the fact that both companies see customer and supplier relationships as very important.

Although the reasons are slightly different, the building of relationships by both companies is sufficiently similar to conclude that this is probably a function of their type of business (systems development and implementation), and is not determined by the environment, nor is it a determinant of success. A more in-depth discussion of relationships is provided in the next section.

The above discussion shows that there are significant **differences** in the strategic approaches of the two companies. The only **similarity** is in the importance placed upon building relationships with customers. In the areas of how the market is perceived and market development, there are some similarities, but the differences (more in depth understanding of environmental turbulence and importance of developing new markets) seem to outweigh the similarities. The strategic approach, adaptation, and information collection are very different between the two companies. It is therefore concluded that the

strategy adopted does seem to differentiate between more successful and less successful companies in turbulent and complex markets, and may play a role in determining the level of success achieved.

b) Stable and simple environment

There are some differences in **market perceptions** between the two companies. As far as PA are concerned, the overall environment is perceived as fairly stable, but there are certain aspects that are seen as quite volatile, for example, technology and new product development. Although PB perceive their industry technology and their immediate, traditional market domain as having changed significantly, the rest of their market and the rest of the environment does not seem to be perceived as excessively turbulent.

The overall **attitudes to strategy** are similar. Although PA try to be different in their strategic approach – a maverick – and to continuously look for new ways of doing things, they do not want to be overly aggressive. Similarly PB try to avoid aggressiveness in the market, as is indicated by the following extract:

> PB - "… you have to go carefully in the market as well not to tramp on too many toes. I would not really do that – I like to think we have friendly opposition out there" (Node 3 of 13, passage 16 of 17).

As is implied above, PA adopt an innovative approach to strategy, whereas PB, although they do try to be creative and develop new methods in production to improve efficiency, appear to prefer to "keep things as they are" (Node 3 of 13, passage 4 of 17): that is, there is not too much development of new ways of doing things. This is reinforced by the following extract:

> PB - "No – the routine has been in for a long time … its more a routine of I know what I have to do, you know what you have to do, so get on with it" (Node 3 of 13, passage 8 of 17).

The source of strategies is similar in the two companies. In both companies top management mostly develops strategy. The following PA quote is an example of both companies' beliefs:

> PA - "I would say the strategy side of it is probably coming more from the management of the company" (Node 4 of 13, passage 1 of 8).

Both companies say they encourage all staff to be involved in strategy development as far as possible. In PB, the staff do not seem to participate and it seems as if strategy development is predominantly a top management activity. In PA, strategies are discussed with all staff and they are invited to submit their own ideas. This approach is reflected in the following extract:

> PA - "Suggestions can come from anybody right from the bottom of the line and if it is a creative, logical, achievable idea it can be implemented" (Node 4 of 13, passage 4 of 8).

From the above, it can be seen that generally their intended approaches to strategy appear to be similar, but PA seem to implement their strategic approach more effectively than PB do. The documentary evidence seems to provide more evidence on PA's being more innovative and therefore implies some difference in their approaches. PA's approach to strategy appears to be innovative and aims at doing things differently (PA04C4, 5, 6), while PB's approach tends to concentrate on the current situation, as is reflected by a document stressing, "company, product, and technology oriented" (PB04C1). The PB documents do not make any mention of an aggressive or innovative strategy relative to the market. The implication is therefore that PA are more forward looking, while PB seem to concentrate on their current situation. This finding was contrary to what was expected.

A significant difference in the use of **adaptation** as a strategy exists between the two companies. Maintaining efficiency in existing markets is seen as being probably most important in PA, but they do understand that adapting to changes in the market is very important. PB, on the other hand, appear not to be at all adaptive to environmental changes and appear to be reactive to changes, and slow in taking the required decisions. These differing attitudes are reflected in the following extracts:

> PA - "… we are constantly doing trials and the development side is going on. You know we have got good ideas but no one has asked for them yet. But everything is there and I think if a gap opened we would be ready to jump in with confidence" (Node 8 of 13, passage 9 of 32).

> PB - 'No, I don't think we make decisions before we have all the information" (Node 8 of 13, passage 6 of 12).

PA therefore appear to use a satisfactory mix of concentrating on maximising efficiency, but at the same time being flexible and ready for the changes that happen in their environment. Although more emphasis on efficiency would have been expected in a more successful company in a stable and simple environment, PA do not appear to neglect efficiency while being so totally adaptive to the environment that their behaviour would be considered unexpected. PB's lack of adaptability and their heavy emphasis on efficiency are, on the other hand, not what was expected of a less successful company in the stable and simple market. This finding is supported by the documentary analysis. Although PA documentation made little mention of flexibility and short term planning, other than for production, the emphasis, especially in the mission statement, on speed (PA04F1) implies a high level of adaptability. Flexibility was mentioned in the PB documentation, but this seems to be more to do with production and the ability to meet customer deadlines (PB04F3, 4). It does not seem to also apply to their relationships with the environment and the market. Thus, it confirms that PA are more adaptable and flexible than PB, the reverse of what was expected.

Differences also exist between the two companies in their approach to **developing new markets**. As is implied in the previous section PA appear to lay almost equal emphasis on developing new markets and maintaining current markets through efficiency improvements, while PB appear to prefer to improve efficiencies in current markets rather than to develop new markets. This is reflected in the following extracts:

> PA - "We are always trying to develop new ideas so that we are always one step ahead so that by the time the people have caught up with you in the marketplace we have come out with a new idea" (Node 2 of 13, passage 1 of 16).

> PB - "… if you are going to increase your efficiency within the factory you are going to make much more on your efficiency side than getting new work. When you are efficient you retain but you also gain" (Node 2 of 13, passage 8 of 16).

As indicated above, PA place equal importance on maintaining their position in current markets through efficiency improvements. Emphasis seems to swing from development to efficiency depending on the company's situation, as is shown in the following extracts:

> PA - "… at this time I would say efficiency has become quite a key issue and the reason for that is that we are running at capacity here … so it would be quite stupid to go and try to develop a new market … But when we get a new machine it is different. Then you concentrate on the market again" (Node 2 of 13, passage 13 of 16).

PB's emphasis on current markets appears to have been bred into the conservative culture of the company as is reflected in the following extract:

> PB - "… in the old days when I first joined the company we were told not to go to Lever Brothers because they could make or break any company, but we were always encouraged to go for (traditional market) work" (Node 2 of 13, passage 15 of 16).

However, PB have, over the past few years, increasingly emphasised developing new markets, but it should be noted that this was not a voluntary decision but was forced on them by the industry changes. This ambivalent attitude to new markets is shown by the following extract:

> PB - "I don't think we would have gone for these other markets if there had not been all the changes in (our traditional) market" (Node 2 of 13, passage 13 of 16).

The documentary analysis provided some support for the above finding. Both companies seem to place emphasis on both developing new markets and maintaining current markets. PA's emphasis on efficiencies was to be expected. However, it was not unexpected that PB, although considering new market development to be important, have not been very effective in developing new markets. This is so because in a stable and simple market, concentrating on maintaining existing markets may be more important. Their ambivalence may result in their not devoting enough attention to such maintenance activities, which could be part of the reason why they are a less successful company

Overall, these findings are contrary to what was expected in a stable and simple environment, although PA's equal emphasis on efficiency in current markets indicates that there is a degree of conformity with what was expected.

Both companies collect **information** informally, rather than formally. They also both stress that it is important. The following extract from PA is typical of the attitude voiced:

> PA - "… you have to have an idea of what is going on in order to be ahead of the game. You can react quicker. If you don't see it coming you are not going to be able to play" (Node 6 of 13, passage 11 of 45).

Both companies collect information from a wide variety of sources. PB's information is collected through social contacts, magazines, packaging expositions and the sales representatives, while PA's sources are shown in the following extracts:

> PA - "You get information from packaging conferences, feedback from suppliers" and "reps, magazines, suppliers" (Node 6 of 13, passages 12 and 14 of 45).

However, despite the apparent importance, market information does not seem to be well used in practice. The following extract gives the lie to what they say:

> PA - "… you know we get all the magazines, you don't always get around to reading them but you do flick through them and see what is interesting … but not really serious research" (Node 6 of 13, passage 8 of 45).

> PB - "No, I would say that we don't worry enough about [market information]" (Node 6 of 13, passage 8 of 25).

In contrast to the openness regarding information in PA (as discussed previously), very little openness and transparency has been present in PB in the past. Terms like 'mushroom management' and the following extract indicate this:

> PB - "Generally people don't know what is going on around them except where they are" (Node 7 of 13, passage 4 of 8).

It should be noted, however, that the Managing Director is attempting to change this attitude, with regular meetings, release of the financial statements to staff, and a more 'open door' policy.

The documentary evidence supports the view that both companies place relatively little importance on market information. No mention was made of specific market, competitive, or technological information in PA's documents and no mention at all was made of information in PB's documentation. This shows that there appears to be a lack of emphasis on marketing information in both companies.

A successful company in a stable market would have been expected to place less importance on environmental information, but to adopt a more formal approach to its collection. Therefore, in terms of the importance of information, PA have behaved as

expected, but not in terms of the collection approach. The fact that informal collection is used may be more a function of the relative youth and smallness of the company – they have not had the time or the marketing expertise to develop formal information systems. Higher importance and ineffectiveness in the use of information is what was expected of the less successful company in a stable environment. Thus, it appears as if PB do perform as expected in this regard, stressing the importance of information, but not collecting, distributing, or using it very well.

Both companies stress the importance of building **relationships with customers** as a strategic exercise. However, the natures of the relationships in the two companies are different. In PA relationships only appear to be built with the bigger more important customers, as is reflected in the following extract:

> PA - " the [bigger] customers … are more qualified to speak about the product and they are very involved … so with them there would be a blurring, but with my little customers they never ever come near so I would say it would only be with the bigger customers' (Node 6 of 13, passage 2 of 26).

Therefore, it can be said that although there are long-term relationships with some customers, this is not prevalent throughout PA's customer base. PB, on the other hand, are an old established company with long-term relationships with many of their customers. However, these relationships are typical of the types of relationships built by a professional sales force, and have not developed into full partnerships. This is reflected in the following extract:

> PB - "It is a long term relationship, you have to build up trust and then he understands if you have a problem on your side, you are late on the job … It is always a two way treatment …" (Node 6 of 13, passage 3 of 14).

The documentary evidence supports PA's commitment to "focussed, committed relationships with customers" (PA04D1), which implies longer-term partnerships. Unfortunately no mention was made of customer relationships in PB's documentation, so the above finding could not be corroborated. However, it can be noted that longer-term relationships were not expected of PA.

Regarding the above strategy issues, there are more **differences** between the two companies (perception of market, innovative strategies, staff involvement in strategy making,

adaptation, developing new markets, and customer relationships) than similarities (attitudes to strategic aggression, sources of strategies, and information). The fact that they are mostly different indicates that something other than the environment or the industry may be at work, and that success may be linked to how they handle these strategic issues. Generally speaking, PA's handling of these strategic issues was as expected of a less successful company in a stable and simple market, while PB's was similar to what was expected of a more successful company. However, enough of the findings were **similar** to expectations to indicate that there may be some relationship between the environment and success.

6.2.2.4 Relationships with customers and suppliers

Since relationships seem to develop differently according to the level of turbulence of an environment, this section looks at the types and nature of relationships between the sample companies and their customers and suppliers.

a) Turbulent and complex environment

Relationships, especially **long-term relationships,** are seen as very important by both companies as is reflected in the following extracts:

> ITA - " …we are talking long term relationships – 10 years –of service and trust …" (Node 1 of 7, passage 36 of 44).

> ITB - "… they ask us to build a system and we build a relationship …" (Node 1 of 7, passage 11 of 20).

Building relationships with customers is important because it enables the company to build and develop more business with that customer, as is implied in the following extract:

> ITB - "…a relationship with the customer at a very strategic level … it is very easy then to get to the next level with the customer" (Node 1 of 7, passage 7 of 44)

There is some doubt, however, as to how well ITB have built such relationships, as is shown by the following quotation:

> ITB - "Probably three years ago it was more the employer was king not the customer" (Node 1 of 7, passage 3 of 20).

The documentary evidence confirms that both companies place considerable importance on their relationships with their customers and suppliers. The main difference appears to be the extent or intensity with which they are applied. ITA place strong emphasis on building relationships with both customers and suppliers through partnerships, strategic alliances and joint ventures. These issues are reflected in the following extract:

> ITA - "… strategic partnerships with suppliers and clients – co-operative marketing, new product development" (ITA06A6)

They build relationships widely in their industry - "Mutually beneficial partnerships" (ITA06D10) are seen as very important with small/medium enterprises in disadvantaged communities, and relationships are built with many, rather than one, manufacturer, with technology providers, and in complementary businesses. In ITB, long-term relationships with customers (ITB 06A4) and strategic alliances with suppliers (ITB06A3) also seem very important, but they do not seem to pursue strong relationships as vigorously as ITA do. The field notes analysis also supported this finding.

Both companies set out to build and maintain long-term customer relationships, but both companies agree that it is really the customers **who determine the nature of the relationship**. This is shown in the following two extracts:

> ITA - "It is always the customer's decision, … we set out to really create long term relationships with our customers. Sometimes it might not work for them." (Node 1 of 7, passage 22 of 44).

> ITB - "If the customer does not want a relationship we respect them, so maybe it is the customer" (Node 6 of 13, passage 8 of 20).

Both companies talk about striving to develop the relationships into **'partnerships'**, where there is a deep relationship between the two parties. This is reflected by an extract from ITA:

> ITA - "… we spend time, at a strategy level, with some of our key suppliers, and then we are IT partners with a lot of our customers. We are not vendors, we are partners" (Node 2 of 7, passage 3 of 30).

Although ITB believe that their customers see them as partners rather than just suppliers, the closeness of these relationships or whether they are true partnerships is questionable, as is reflected in the following extract:

> ITB - "… no, this is the company and that is the customer" (Node 2 of 7, passage 1 of 20).

The documentary analysis corroborated these findings, showing that the degree of co-operation with suppliers is also significantly greater in ITA than ITB. ITA's emphasis on partnerships implies a high level of co-operation with suppliers, especially in new product development, marketing and technology development. However, co-operation with competitors does not seem to take place. Although there is some indication of co-operation between ITB and their suppliers ("strong partnerships and alliances" ITB06H3), it is rather infrequently mentioned. The field notes analysis seems to show a slightly stronger emphasis on partnerships in ITB than the other analyses do, but overall it does confirm their findings.

In both companies true partnerships seem to be built with only selected customers and suppliers. This is particularly true for ITA who use **'lead customers'** in their product development activities, but also applies to ITB to an extent. This is shown in the following two quotations:

> ITA - "…'friendly customers' – they are customers who we have strong relationships … they would be where we would take innovation to first because we have a relationship where we can go to them and play open cards and say 'guys, this is new, what do you think, and so forth, will you go on trial basis with this'" (Node 1 of 7, passage 29 of 44).

> ITB – "… it is more a partnership than vendor\supplier issue because IT is … believing and trusting each other so that you can turn concepts into realities. So yes it is a very close interaction" (Node 2 of 7, passage 1 of 20).

In both companies the **locus of the relationship** is with the company rather than the sales representative, and so they are not likely to experience the disruption of losing customers that defect with a sales representative who has resigned. The locus of the relationship being with the company can thus be seen as a stabilising influence. This 'locus of relationship' is confirmed by the following extracts:

> ITA – "[Locus is with the company because] … you find they deal with a lot of individuals in the company" (Node 2 of 7, passage 30 of 30).

> ITB - "I think they would stay with [the company] because of delivery capabilities" (Node 2 of 7, passage 20 of 20).

In the past there was little **overlapping or blurring of boundaries** with customers and suppliers, but this has changed recently and is shown by the following extract from ITB:

> ITB - Present - "… the best approach has been to become almost partners with our customers so that we can see into that customers business, we can see when there are opportunities that we need to get involved in …" (Node 4 of 7, passage 1 of 1).

This overlapping and blurring of boundaries between vendor and customer usually is the result of close co-operation, but in many cases it involves conflict and competition with their suppliers and to a lesser extent with customers. The positive aspects of this are reflected in the following extract from ITA:

> ITA - "A lot of collaboration, co-operating with others, fellow group companies, and in some instances, competition, which we look at if it is in the interests of getting a client. We can work together with a competitor in such a case" (Node 3 of 7, passage 1 of 5).

The negative aspect of the blurring of boundaries is shown in the following extract, also from ITA:

> ITA - "… when they [a supplier] want to grow … then they look at wanting to get into a service business as well and it is all a bit of a threat" (Node 4 of 7, passage 2 of 2).

The documentary evidence confirms that the traditional barriers between supplier, company and customer are blurring, as is indicated by the following extract:

> ITA - "Traditional boundaries, trade barriers and business methods are disappearing" (ITA06G2).

In ITB, long-term relationships do not seem to lead to blurring of the boundaries. There does seem to be a degree of overlapping, though, as is indicated by the following quotes: “part of team with customers” (ITB06D4) and “integral part of customer’s business” (ITB06D5).

ITA seem to have much more co-operation and stronger **strategic alliances** with their suppliers than ITB do, as can be seen from the following extracts:

> ITA - “We work hand in hand with our suppliers … the product manufacturers, they are involved 100% in our business, they are integral to our business, there are people dedicated to us, so they spend a fair amount of time with us here. It is a huge partnership” (Node 5 of 7, passage 7 of 21).
>
> ITB - “… they open doors for us, and if we tender we will often partner our hardware vendor to tender on a job” (Node 6 of 7, passage 10 of 10).

The following extracts emphasise the greater importance that ITA place on co-operation and strategic alliances with suppliers and even, in some cases, with competitors:

> ITA - “We do contribute to our suppliers’ strategies, we do sit on their innovation boards” (Node 5 of 7, passage 10 of 21).
>
> ITA - “Yes we do a lot of it and it is of vital importance, we have a lot of competitors in a consultancy capacity, so strategic alliances across the board are very important” (Node 5 of 7, passage 20 of 21).

All aspects of customer and supplier relationship building are of similar importance in the two companies. However, the extent of this relationship building does vary in some cases. ITA seem to be better at building longer-term relationships, partnerships and strategic alliances, and seems to succeed with a greater degree of boundary blurring than ITB. Thus, although the two companies are similar in this regard, ITA appear to be better and more effective in building relationships. It may be this superior execution that influences success, rather than the activities themselves.

The documentary analysis provided a similar conclusion. Although both companies see strong relationships with customers and suppliers as important, the much greater intensity and degree of blurring of boundaries between company and supplier or customer shown by ITA indicate that they behave as expected of a more successful company, while ITB’s more

reserved approach to relationships is what would be expected of a less successful company in a turbulent and complex environment.

b) Stable and simple environment

Both companies maintain that they build **long term relationships**, but in both cases these seem to be only with the larger customers, as is reflected in the following extracts:

> PA - "The little guys will phone and we are too expensive for them. I will phone them a couple of times after that but you are wasting your time – we are too exclusive for them" (Node 1 of 7, passage 8 of 21).

> PB – "The closeness with a customer is, I think, [sales] volume related" (Node 1 of 7, passage 1 of 40).

The **nature of the relationships** is similar, involving friendship and a sense of family – one difference is that PB define a long-term relationship as someone who has bought from them for many years, which is not necessarily relevant to PA, as they are a relatively young company. This similarity is illustrated by the following quotations:

> PA - "… there are a few who come in and are very relaxed as they know our commitment to them so we have now built a relationship, a good relationship with the customer and when they come in it is almost like family" (Node 1 of 7, passage 1 of 21).

> PB - "I have got clients who are my friends, we socialise on a regular basis, we visit each other at home, that is the sort of relationship we have developed over the years" (Node 1 of 7, passage 22 of 40).

Who determines the type of relationship is, in both companies, generally the same – it is the Managing Director and the sales representatives, but PA feel that the customer also influences the nature of the relationship, as is shown in the following extracts:

> PA - "… the customer determines what kind of a relationship it is" (Node 1 of 7, passage 10 of 21).

> PB - "No, we don't really spend much time with the customers, (the managing director) does that sort of thing" (Node 1 of 7, passage 3 of 40).

Although both companies do have close relationships with some customers, they do not seem to have developed to the level of **partnerships**. With the exception of a few of the bigger customers, in depth co-operation in research and in developing and customising new products does not seem to happen much – the relationships still seem to be mainly transactional. This is reflected in the following extracts:

> PA - "I haven't seen much interaction on that level (customising) to be honest" (Node 2 of 7, passage 11 of 26).

> PB - "… you have to build up trust and then [the customer] understands if you have a problem on your side, you are late on the job … explain what is happening and when we can expect to deliver, etc. That sort of thing you can only do if you have somebody's trust …" (Node 2 of 7, passage 3 of 14).

The documentary analyses partially confirmed the above findings, namely that close alliances and partnerships seem to be less important in both companies. Although PA consider long term relationships with customers as very important, as is stressed in their mission statement – "focussed, committed relationships" (PA06D1) - and although they do have alliances and partnerships with suppliers (PA06A1), as was shown by a presentation at a quarterly meeting by a supplier in appreciation for many years of business (PA06A4), co-operation and joint ventures tend to be more with sister companies (PA06A2). Regarding PB, although job descriptions of managers mention the building of relationships and trust (PB06A3, 4), the relationship is not one of partnership. Only suppliers on an approved list may be used (PB06A7), they are audited annually (PB06A8), and they "are judged on delivery efficiency, rejects, and price containment" (PB06A0), which is typical of a transactional, rather than a partnership, type relationship.

The relationships with larger customers seem to take the form of working with **lead customers** in product development in both companies, as is illustrated by the following extracts:

> PA - "But then you get a customer who … have manufacturing technologists, etc. and then it is a joint thing, and eventually you will sit down and discuss the product and come up with a decision together" (Node 6 of 13, passage 21 of 26).

> PB - "… we work with lead customers too … if they are looking for something, then we will bring in everybody, if we can't help we will get the guys who can" (Node 5 of 13, passage 28 of 40).

Where relationships are developed by PA, the **locus of the relationship** is with the company rather than with the individual sales representative, as is shown by "the purchase association is also with the company" (Node 2 of 7, passage 24 of 26) and "… in the end a lot of it is technology and that goes with the company" (Node 2 of 7, passage 26 of 26). In PB, however, the relationships seem in some cases to be located with the company, but in other cases to be quite strongly linked to the sales representative. They have in fact lost customers when a sales representative left the company.

Although there is a slight overlapping and **blurring of boundaries** in PA, both companies essentially appear to maintain clear boundaries, with little blurring or overlapping, between themselves and their suppliers and customers. This is reflected in the following extracts:

> PA - "… on the technical side we do like to let our suppliers get involved with the customers just to show we know our suppliers will stand by their products…So our suppliers could be involved by ourselves with our customers in some cases" (Node 3 of 7, passage 2 of 5).

> PB - "… but we don't go into other peoples business" (Node 1 of 7, passage 5 of 40).

The documentary evidence seems to confirm that there is no blurring of boundaries between company and customer in both companies, as is exemplified by the following quote: "are clearly defined supplier/customer responsibilities" (PB06 G2). However, there does seem to be more co-operation between PA and their suppliers than between PB and their suppliers. Supplier awards (PA06H1), the presentation in thanks for many years of business by a supplier company (PA06H4), and the encouragement of factory visits (PA06H3) are evidence of co-operation with PA's suppliers. PB also show some co-operation with suppliers, such as 'logging' into a supplier's system to see the status of orders (PB06H3). However, the boundaries are generally impermeable as implied above, and this impermeability reinforces the belief that the relationships seem to be more of an 'arms length', transactional nature. This finding was also supported by the field notes analysis.

Neither company participates significantly in **strategic alliances** or partnerships with suppliers, and especially not with competitors, as is illustrated by a quote from PB: "We try to

do it individually, we try not to get too involved with other companies" (Node 5 of 7, passage 1 of 20). The exceptions are franchise agreements that are held by PA with an overseas supplier, and by PB in a sub-section of the company. However, both companies maintain that there is a fair amount of co-operation with suppliers. Comments from PA that support this are "we all understand each other" and "you scratch my back and I'll scratch yours", as does the following extract from PB:

> PB - "… you treat them as a partner in your business, … we meet them, we tell them our concerns, how we are doing, we offer them help and we want to understand their business and they must understand ours…So we are partners, it works both ways." (Node 5 of 7, passage 2 of 20).

The overall conclusion of this section is that most of the customer and supplier relationship activities of the two companies are very **similar**. The main **difference** is in the locus of the relationship - in PA the relationship is more with the company, but in PB it is more with the sales representative. The only other apparent differences are relatively minor, including the definition of long term relationships by PB, PA feeling customers also influence the relationship, and a slight blurring of boundaries. As a generalisation, these findings appear to be partially what was expected of a more successful company, and partially what was expected of a less successful company, in a stable and simple environment. Therefore, each company seems to behave as a more successful company in some issues, and as a less successful company in others. As a result, it appears as if the nature of the relationship is not related significantly to success in this industry. Since both companies perform so similarly, it appears that the environment and the industry may prescribe the nature of the relationship, but that other factors may be more important in influencing success.

6.2.3 Marketing tactics

The main focus of this study is the effect of the selection of marketing tactics on success, and how the environment influences the choice of tactics. Therefore, this next section comprises the most important findings of the study. The four components of the product mix will be discussed.

6.2.3.1 Product

Product policies, involving development, range, customisation, culling, and source of ideas, are discussed in terms of their stabilising or destabilising roles in the respondent companies.

a) Turbulent and complex environment

The **source of new product ideas** seems to be different in the two companies. The more successful company (ITA) seems to drive innovation in their market as is indicated by the example in the following extract:

> ITA - "We see service as a whole new concept that we are creating a need for right now … we are creating a whole new market in that regard" (Node 5 of 15, passage 2 of 27).

However, they do not originate new product ideas themselves, but get them from suppliers and from the trends in the market. This is shown by the following extract:

> ITA - "… individuals within the group will be developing and picking up on new trends and then our suppliers will come and say this is what we are developing – this is what technologies are coming on" (Node 6 of 15, passage 6 of 12).

The less successful company (ITB), on the other hand, tends to get their new product ideas from interaction with the customers, as is shown in the following extracts:

> ITB - "The market the customers they are the ones that hear what is going on in the market and what the market is doing … and also our suppliers" (Node 6 of 15, passage 2 of 10).

This difference means that ITA are able to develop ahead of, or at least in time with, market, customer, and competitor changes, but ITB, because they only develop to customer demands, are in fact developing after the market changes, and thus are following competitors. This is reflected by the following extracts:

> ITA - "… what is it you can do that it is not easy to copy and as soon as somebody copies it we must do something new" (Node 5 of 15, passage 4 of 27).

> ITB - "So we don't particularly develop, we adopt and embrace … we don't develop ahead of the market" (Node 13 of 15, passage 10 of 10).

The documentary evidence tends to corroborate these findings, also reflecting differences between the two companies in their product tactics. ITA appear to be in the vanguard in

terms of new products and new ideas, being first-to-market, achieving early market entry and staying one step ahead of competitors (ITA08B425). In ITB, on the other hand, new product development appears to be driven more by customers as is reflected by the following statement: “Focus on solutions no products” (ITB08A1). Their product development is not ahead of the market as is shown by the fact that they “develop niche products” (ITB08B1).

Both companies seem to develop their **new product planning** carefully, but ITA plan over a much shorter time period than ITB, which means they are able to cope with rapid or discontinuous changes more competently. This is shown in the following extracts:

> ITA - “Short term (planning) with regard to product. We have an idea what the market will be like in 2002” (Node 12 of 15, passage 13 of 14).

> ITB – “We have like five year cycles (on product culling) – I don’t think it is a quick thing” (Node 9 of 15, passage 4 of 6).

This appears to be partially supported by the documentary analysis, which found that product planning was not mentioned in the ITA documents, but was hinted at in the ITB documents. In ITB, the implication is that it is longer term as “Research and development is used for specifically identified opportunities” (ITB08H1).

Both companies appear to be increasing their **range** of products and service. ITA, for example, stress that their range is much bigger than that of competitors, while ITB’s range is increasing in the implementation of packages, as is shown in the following extract:

> ITA - “… customers can get most things from us. I don’t know anyone else that could offer as much as we do” (Node 4 of 15, passage 3 of 9).

> ITB – “[range] increasing, in that we now do package implementation of software” (Node 4 of 15, passage 4 of 4).

Both companies seem to be growing their products more in the field of software and services rather than hardware, as is shown in the quotation from ITA below:

> ITA - “Decreased. Well that is just from a hardware perspective … It has increased because … the selling of hardware…has decreased, where we used to sell maybe six

different products we now sell two…but we have increased the number of service offerings or related services that we are able to offer" (Node 4 of 15, passage 8 of 9).

This increase is also to be expected from ITB, who are predominantly a software company, and it is confirmed by the following extract:

"Increasing, in that we now do packaging implementation of software, that is, packaged solutions" (Node 4 of 15, passage 4 of 4).

Very little data regarding product range was found in the analysis of document, but it did confirm that ITA's product range has been increasing as is reflected in the following extract:

ITA - "… continued development and rapid deployment of product/service offerings" (ITA08C3).

Culling old products from the range does not significantly influence the size of the range. ITA only cull products if they have something to replace them with, while ITB tend to keep old products, provided there is a market, as is reflected below:

ITB - "We support systems that are ancient because our customers have still got them" (Node 9 of 15, passage 2 of 6).

The documentary analysis does not provide any evidence on product range reduction, but both companies' preparedness to dispose of unsuccessful divisions (as reflected in the extracts below) indicates that they might be prepared to cull their ranges if necessary.

ITA - "Ruthless with acquisitions –eradicate problems quickly" (ITA08C7).

ITB – "[They] terminated and disposed of non-profitable divisions" (ITB08C1)

Both companies design the product or service offering to the customers' needs, with customers deeply involved in the process, as would be expected of a product that is being tailor made. Therefore, **customisation** is more important than developing standardised offerings, as is implied in the following extracts:

ITA - "… the product range is huge but I think a lot of our customers want to be customised" (Node 5 of 15, passage 12 of 27).

ITB - "We build solutions for customers … everything we do is different – nothing about standardisation" (Node 5 of 15, passage 6 of 12).

The documentary evidence also shows that both companies customise their products according to customer needs, as is reflected in the following extracts:

ITA - "Taylor offering to unique needs of customer" (ITA08D1).

ITB - "Customise packages and custom build applications" (ITB08 D1).

The **speed of development of new products** reflects a significant difference between the two companies. ITA develop very quickly as would be expected of a company that is very aware of its positioning in a turbulent market. ITB, on the other hand, is slower than their competitors, which is consistent with the fact that they follow the market leaders. This differing speed of development is indicated in the following two quotations:

ITA - "I would say that the lead times to develop the products and to come to the fore with new technology is extremely quick – yes quicker than other like companies" (Node 7 of 15, passage 3 of 6).

ITB - "No, we don't develop quicker, I would say we are slightly longer, we try to go for quality" (Node 7 of 15, passage 3 of 5).

The documentary analysis also showed that the speed of product development in the two companies differs. Everything ITA do appears to be done at speed – faster than the market and competitors, as is indicated by the following extracts:

ITA - "rapid deployment of product/service offerings which give competitive advantage" (ITA08E1) and "Implement rapidly, improving client's time-to-market" (ITA08E4)

In ITB, on the other hand, although believing they can “rapidly develop and deploy a solution” (ITB 08 E2), rapid development does not appear to be the norm as is indicated by the following extracts:

> ITB - “research and development in a controlled manner” (ITB08E1).

Both companies indicated a limited degree of **flexibility** in product design, with changes possible up to the last minute, but being for the customer’s account. This is reflected in the following extracts:

> ITA - “… we say, of course you can have what you like but you are going to pay more for it. These days we are not so flexible – we burned ourselves by being too flexible, so now it just depends on the circumstances and we try to accommodate” (Node 8 of 15, passage 2 of 12).

> ITB - “The design can change – we are flexible to a degree – to say about half way through. It is something we don’t like to do – it costs us money – put it that way. It can change later on but then it costs the customer …” (Node 8 of 15, passage 1 of 3).

Despite this apparent hesitancy on the part of ITA, it appears as if their new product development process is continuous and has flexibility built into it, as is implied in the following quote:

> ITA - “… from the time we start dealing with this product to where we are now there have already been maybe four or five innovations of that technology and upgrades to that technology” (Node 2 of 15, passage 21 of 26).

Both companies indicated that they do ‘old product development’ or **product enhancement**, but neither seems to place too much importance on it, as is exemplified by the following extracts:

> ITA - “So long as a product is selling it will be constantly upgraded and value added” (Node 10 of 15, passage 3 of 7), in order to “… make them perform, if they don’t work they become redundant” (Node 10 of 15, passage 7 of 7).

> ITB - “I know they were supposed to be doing some upgrades but they delayed that for a while” (Node 10 of 15, passage 2 of 2).

The documentary analysis provides a slightly different emphasis on enhancement in the two companies. Old product development appears to be less important in ITA. Although mentioned indirectly, it does not appear to have as high a priority as in ITB, where “Continuous enhancements” (ITB08G2) appear to be the main product strategy.

Branding was hardly mentioned in the transcripts, but from the documents, it seems to be used mainly to achieve consistency of corporate image as is implied by scrutiny of ITB’s document covers, and by the following ITA extract:

> ITA - “All subsidiaries implementing the same brand name, allowing a single face to be presented” (ITA08I1).

Based on the above discussion it can be seen that many of the product issues are **similar** for both companies, specifically the increasing range, culling products from the range, customising the product rather than developing standard products, limited flexibility in their product development process, and although doing it and agreeing that it is important, the less than enthusiastic approach to product enhancement.

Regarding the more successful company (ITA) it is to be expected that their range is increasing, and that product enhancement plays a lesser role than product innovation, but a more ruthless approach to reduction of old or obsolete products would have been expected. Customising the product was to be expected, especially considering the nature of software development, but more flexibility than they showed was expected. The maintaining of older products and lack of flexibility was expected of a less successful company in a turbulent and complex market. The nature of the industry probably influences the emphasis on customisation, but the increasing range and lesser emphasis on product enhancement was unexpected. This may be because the industry in general perceives itself as at the cutting edge of technology and every company probably feels the pressure to be seen to be developing new products.

The factors that were **different** between the two companies, namely the source of new ideas, the planning terms, developing ahead of the market, and the speed of development, differed in the direction anticipated. Overall, it is felt that product tactics are utilised more or less as anticipated and the anomalies tend to be because of industry-applied norms. The

field notes supported these overall findings on product management, namely that ITA's actions were typical of a more successful company in a turbulent market, while ITB's were typical of a less successful company in a turbulent market.

b) Stable and simple environment

Both companies develop new products, but the **source of new products** and new product ideas is different. Neither generates new product ideas themselves - PA get ideas from suppliers, while PB get them from customers, as is shown by the following extracts:

> PA - "So it probably comes more from the supply chain than the market" (Node 6 of 15, passage 12 of 19).

> PB - "Basically customers (drive new product development) – they come up with new ideas and we take them up" (Node 6 of 15, passage 7 of 17).

This is only partially confirmed by the documentary evidence, as no indication of the source of new product ideas was given in PA's documentation. PB, on the other hand, seem to get all their ideas from outside the company. This is shown by the idea for using a hologram for security and promotion that came from a supplier (PB08A1) and the idea of a new packet that came from an acquired company (PB08B2). This finding was consistent with what was expected of a less successful company in a stable and simple environment.

New product development is very important to PA. They are continually testing and experimenting with new products, in order to stay ahead of the competitors. PB, however, do little new product development, tending to follow the market. This is reflected in the following extracts:

> PA - "… you've got to start developing on a daily basis, get new ideas, and I think we are very much like that. We try to stay ahead of the game through new ideas" (Node 5 of 15, passage 3 of 15).

> PB - "I think generally there is very little innovation in this company in terms of product development" (Node 3 of 15, passage 23 of 25).

This was confirmed by the documentary analysis. PA are "renowned for innovation" (PA08B1) which is indicative of their new product development being ahead of the market. The hologram concept (PB08B1) and the idea of a new packet that came from an acquired

company (PB08B2) indicate that PB are not developing new ideas ahead of the market. This follower strategy was not expected of a less successful company in the stable and simple environment, nor was the leader strategy of PA.

Both companies have increasing **product ranges**, although there were comments justifying a decrease in range size for PB. Generally it is probably accurate to say that PB's range is increasing to some degree because of their diversification over the past few years. In PB's traditional market the range has definitely reduced. These beliefs are reflected in the following extracts:

> PA - "We are offering more options to the customer" (Node 4 of 15, passage 2 of 7).

> PB - "…I still make the same products…What we have done…is diversify. We have gone into a lot of the motor industry side, the dairy side…" (Node 5 of 15, passage 1 of 19).

Although range growth is similar in both companies, their attitudes to **reducing the range** are different. PA are prepared to cull under-performing products, while PB are loath to do so (which explains their product growth). This is indicated by the following quotations:

> PA - "So if there is something that has to be taken out we tend to develop something that can immediately take its place" (Node 4 of 15, passage 3 of 7).

> PB - "No, it is usually the customer that takes a product away" (Node 9 of 15, passage 2 of 6).

The two companies are also very different in terms of **product innovation**. PA do new and unique things, while PB tend to just follow customers, as is reflected in the following two quotes:

> PA - "… we are able to do things differently and have challenged the market and have done things that nobody else has done before" (Node 5 of 15, passage 8 of 15).

> PB - "We tend to get our ideas from customers. We do work with lead customers to develop new ideas. We also, if a customer has an idea and they want to do a new launch, we would get involved in that, we try whenever to get involved right in the beginning" (Node 6 of 15, passage 17 of 17).

Both companies essentially **customise** as they mostly develop products to specific customer specifications. This is reflected in the following extracts:

> PA - "We try to customise but unfortunately you have to fit in with some standardisation …" (Node 8 of 15, passage 12 of 12).

> PB - "Totally (that customers are involved in product customisation). We use standard packaging but we have some customers who want something different and you will design something special for them" (Node 6 of 15, passage 4 of 17).

Speed of development by PA is much faster than the rest of the market. PB are much the same as the rest of the industry, but their actual delivery (production) is a bit faster, due to their having to compete nationally from a decentralised (Durban) location. This is reflected in the following extracts:

> PA - "If we go back three or four years [development lead time] is way under, you go back a year it was two thirds or half the lead time of our competitors. It is one of the unique selling points of the company" (Node 7 of 15, passage 8 of 18).

> PB - "I think we are on a par with most [with development pace]" (Node 7 of 15, passage 7 of 13).

This finding was corroborated by the documentary evidence, which confirmed that the two companies differ in terms of speed of developing new products. PA's development of new products is very quick, as is indicated by the emphasis in their company brochure on "fast turnaround times" (PA08E1). Development at PB, on the other hand, does not seem to be very fast, as is reflected by the fact that "products are not released for sale until quality control has approved them" (PB01D2), and that they experience "late delivery problems" (PB08E1). This finding is the reverse of what was expected.

PA are very **flexible**, prepared to make changes at the last minute with little penalty for the customer. PB, on the other hand, are loath to make changes, and when they do there is a risk that the change will slow the process down. This means that although changes can be made, there will be an inevitable delay, indicating that PB are not really geared up to be truly flexible. These differences are shown in the following extracts:

> PA - “Right up to the end … and it does not necessarily fall back in the queue…We have what we call ‘filler jobs’ which can go on until you are ready to put other jobs back on” (Node 8 of 15, passage 7 of 12).
>
> PB - “[Changes] can be made right up to before printing [but] it would throw back the whole process … because the machine hasn’t got time to stand while the changes are made, but it doesn’t go right back to the end of the queue” (Node 8 of 15, passage 8 of 8).

The documentary analysis again confirms this finding. Both companies evince some degree of flexibility, but PA generally seem to be more flexible and adaptable than PB. The company brochure stresses “maximum flexibility” in relation to product development (PA08F1). This is reinforced by the fact that PA have “short runs – no minimum quantities” (PA992), which means their product offering can be very flexible. In PB, there appears to be production “flexibility to meet customers’ deadlines” (PB08F1) or to “cope with urgent deliveries” (PB08F2), but in the rest of the business there does not appear to be much flexibility and adaptability. This finding was the reverse of what was expected, although PB’s production flexibility brings them fairly close to what was anticipated for a less successful company in a stable and simple environment.

Both companies lay considerable emphasis on **product enhancement**, although PA tend to emphasise new product development more. This is reflected in the two quotes below:

> PA - “We have it that a customer like … will change a machine to use a new label – we have done it five times now. We have actually encouraged those changes, and each time it has been a development to try. You are just progressing up the level all the time” (Node 10 of 15, passage 5 of 5).
>
> PB - “In the so-called packaging field there have been big changes in say up to four colours on a package, embossing, silver foil, etc. They have really upgraded the packaging to catch the eye” (Node 10 of 15, passage 1 of 4).

Product enhancement seems to be marginally more important to PA than to PB according to the documentary analysis. In neither case does it seem to have overwhelming importance. Product enhancement at PA is implied by the mention of “continual improvement” in the mission statement (PA08G1), while at PB enhancement or changes to products can be done, but only at the request, and with the approval, of customers (PB08G1). Thus, it is unlikely to

be initiated by PB. The marginal importance at PA was contrary to what was expected, but the finding for PB was what was expected.

Planning for new products is also different. PA's new product development planning is generally seen as short term, while PB do little planning of product development activities, as is indicated in the following extracts:

> PA - "It's more short term – six months as opposed to two to three years – it will be perceived to be short term but with benefits in the long term" (Node 12 of 15, passage 15 of 21).

> PB - "The move away from (our traditional market) was, I think, forced upon us by the market shrinking … possibly we acted a bit too late" (Node 2 of 15, passage 13 of 24).

Although not discussed in the depth interviews, the documentary evidence shows that little difference exists in the use of **branding**. Both companies have put reasonable amounts of effort into branding, as is reflected by the prominent presence of PA's logo on all pages in the company brochure (PA08I1) and the PB company name being visible on all products (PB08I1). In a stable and simple environment, branding by the more successful company (PA) was expected to be more important, while what was found for PB was as expected.

The field notes analysis generally supported the above findings about the product. Product development at PA was mostly technology driven, with older and under-performing lines being kept. This is consistent with what was expected of a more successful company in a simple and stable market. PB involved customers in new product development, resulting in product customising, which is to be expected of the less successful company. However, the relative unimportance of new product development and innovation was not anticipated.

The findings of this section reflect significant differences between the two companies. The only issues that are **similar** are the increasing product ranges (but for different reasons), the fact that they both customise products (this is a characteristic of the packaging business), and the emphasis on product enhancement (but it is secondary to new product development for PA). Clearly, therefore, product is an area that **differs** considerably and that distinguishes between the more successful and the less successful companies in a stable and simple environment. However, what is really of interest is that PA's product tactics are almost entirely what was expected of a less successful company, while PB's product tactics

were almost entirely what was expected of a more successful company. This seems to indicate that 'turbulent' type product tactics lead to success regardless of the nature of the environment. Alternative reasons might, of course, be that the packaging industry is sufficiently turbulent to warrant the use of turbulent type tactics, or that PA's perceiving the market as turbulent leads them to adopt more turbulent oriented tactics. Thus, it appears that the evidence partially agrees with the propositions, but overall it can be said that the expectations for product were not adequately met.

6.2.3.2 Price

Pricing, and how the companies set and change prices, whether they use pricing aggressively as a tactic to achieve leadership or whether they adopt status quo pricing to maintain stability in their markets, is discussed in this section

a) Turbulent and complex environment

As a general rule neither company uses **aggressive pricing** as a regular strategy to disrupt markets, as is shown in the following extracts:

> ITA - "We don't use [price cutting or aggressive marketing], we walk away from that kind of business" (Node 6 of 9, passage 1 of 25).

> ITB - "We work out prices to win customers but we - in Natal which is probably different to other markets – you can't be too blatant or you will burn bridges" (Node 3 of 9, passage 15 of 16).

For ITA this appears to be so because they offer extra value added which makes price less important in their field, as is shown in the following extract:

> ITA - "I think pricing is not normally an issue because we have got a lot of value to add to a product. When you are selling a product and you have nothing else to add with it, price will be an issue" (Node 5 of 9, passage 7 of 31).

However there are certain situations in which both companies would use pricing aggressively, for example, to win specific business or customers. This is indicated in the following extracts:

ITA - “If it is an account we really want we would be prepared to cut prices – yes” (Node 6 of 9, passage 6 of 25).

ITB - “… when you put in a quotation you have to look it up and say, is this a long term relationship, is this a customer we would like to have, is this an industry we would like to be in, is this a brand we need – let’s cut our prices to get it” (Node 6 of 9, passage 17 of 18).

The fact that the use of pricing is not mentioned in the documents indicates its relative unimportance. The numerous mentions of value in the ITA documents (ITA04E4), and the emphasis by ITB on ”reduced overall IT cost” (ITB09A1) and “plan for no surprises in costs” (ITB09A2) indicate a static approach to pricing – thus neither company appears to use pricing aggressively. Regarding ITA, this was not as expected – a more aggressive and destabilising use of price was anticipated. The findings were, however, consistent with the expectations for a less successful company (ITB).

Although costing seems a little complex, both companies appear to have fairly simple and easy to understand **price-setting methods**, as is shown by the following quotations:

ITA - “Yes simple, basically, there is a product price, there is a market price list you know, and basically that is a measure of the discount you will get” (Node 5 of 9, passage 9 of 31).

ITB - “Very simple … it was basically time and people costs” (Node 5 of 9, passage 6 of 20).

In both companies the price setting methods used are fairly standardised, and so their base prices are much the same for all their customers. However, each customer ends up with a different price, because of different sizes of business and different service levels, as is reflected in the following extracts:

ITA - “There is a set price on product and services, there are norms and set standards. So in other words, that level of service demands that level of price” (Node 5 of 9, passage 20 of 31).

ITB - “It is all fixed [pricing], but every customer will get a different price. It is the method of the service that will determine the price” (Node 5 of 9, passage 9 of 20).

Surprisingly, ITB appear to be more **innovative in their pricing** tactics than ITA do, as is shown by the following quotations:

> ITA - “We price per project – it is very dynamic – you deliver a system and a customer has a certain requirement and they require certain hardware and software modules so it is very difficult to price up front” (Node 5 of 9, passage 10 of 31).

> ITB - “With project work generally the market does not accept time and material anymore so you have to go on risk with the quote…we go on a fixed amount if there is an element of risk … sharing with fifty/fifty from then onwards …they know they can believe you when it comes to actual costs. It is being transparent” (Node 5 of 9, passage 3 of 20).

As can be expected from a market leader with the above pricing policies, ITA are able to achieve a **price premium** over competitors for their product and service offerings. ITB, on the other hand, do not manage to get a premium price for their service, and often have to accept the price being negotiated downwards to get the business. These differences in their pricing abilities are shown in the following extracts:

> ITA - “We demand a price premium because we believe we have got the necessary – we want a high price because we provide a high product value” (Node 5 of 9, passage 1 of 31).

> ITB - “People know what it costs … I doubt we get a premium, customers negotiate as low a price as possible” (Node 5 of 9, passage 14 of 20).

Although ITA usually get a premium, it must be noted that there are situations in which they are prepared to negotiate and cut prices, as has been discussed above.

Neither company can be said to be a **price leader**, as their overseas supply partners indirectly set prices which they, and the rest of the market, have to follow, and furthermore, there seem to be common pricing rates which most of the market stick to, as is explained below:

ITA - “All of us ---- dealers would pass increases on immediately, the reason being that all customers have access to ------ ‘s retail price list so they know if there has been an increase. We don’t wait for anybody, we go ahead” (Node 6 of 9, passage 11 of 25).

ITB - “We would love to be able to do that [initiate prices] but we don’t. The ------ market does not really have a leader – it tends to be rate per person and again we follow there – it is almost standard throughout South Africa, and even internationally” (Node 6 of 9, passage 7 of 18).

Because neither company has full control of it’s pricing, being subject to indirect price control by their suppliers and by the market, they are not able to be proactively aggressive with their pricing tactics. Certain **differences** between the two companies do exist, for example, ITA appear to be marginally less aggressive than ITB but able to justify premium prices more easily, which is contrary to what was expected. Also what was unexpected was that ITB seem to be marginally more innovative in their pricing methods than ITA. This may be necessary because of the inability to command premiums or to be able to control their own pricing ‘fate’. The other aspects of pricing, namely the basic price setting methods, standardisation, and customers getting different prices were **similar** for the two companies. Overall these findings were confirmed by the field notes analysis. They showed that ITA perform more like a less successful company, while ITB also exhibited behaviour that is typical of a less successful company.

b) Stable and simple environment

The two companies differ in their perception of the **importance of pricing**. PA see pricing as less important because of the value and quality they provide, but PB see it as very important, as is shown in the following extracts:

PA - “… the customers maybe aren’t as price sensitive because of the service we are giving them” (Node 5 of 9, passage 4 of 34).

PB - “… the market is so price oriented” (Node 5 of 9, passage 4 of 30).

Neither company **uses pricing aggressively** to upset the market or to win customers, nor do they use price cutting as a policy weapon, as is shown in the following extracts:

> PA - “I don’t think … we would go and shake up the market in terms of pricing issues” (Node 5 of 9, passage 2 of 34).
>
> PB - “We don’t really want to get into the situation of price cutting” (Node 5 of 9, passage 3 of 30).

In fact, both companies try to stabilise the market through their pricing policies, as is shown in the following extracts:

> PA - “I think in some ways we have kept the market stable by making other people aware of pricing … someone comes and starts undercutting and destroys everything … So you have got to educate the people out there and you’ve got a fare share of the market” (Node 2 of 9, passage 3 of 20).
>
> PB - “No, we don’t disrupt the market with our prices, I am not going to take on something that other people don’t do” (Node 4 of 9, passage 11 of 25).

Thus, price changes tend to be in reaction to some other marketing activity and not a proactive pricing action in its own right, as is implied in the following extract from PA:

> PA - “… changing prices if that comes about through innovation, source reduction, through being smarter …” (Node 6 of 9, passage 20 of 24).

These findings were corroborated by the documentary analysis, which showed that neither company uses pricing as an aggressive tactic to disrupt the market. PA’s pricing appears to be fairly conservative – not aggressive or disruptive – and they tend to get business because of their quality, and not through price-cutting. This is indicated by the following extract:

> PA - “Superior service at a fair price with a fair profit” (PA09A1).

PB, on the other hand, appear to be prepared to use price cutting reactively to try to keep business or regain lost business. This is indicated by the fact that their mission statement says “top quality at competitive prices” (PB09A1), but numerous cases of having to re-look at, or reconsider, prices in order to win the business were discussed in sales meetings (PB09A3, 4, 7). Furthermore, they reduced prices for two customers in order to get large

volume business (PB09A6). PA, thus, do not use pricing tactically, while PB only use it in reaction to someone else's aggressive manoeuvre.

Price setting is perceived by both companies as simple, but the actual setting process appears to be quite complex in PB, as is shown in the following extracts:

> PA - "It is very simple, you have the cost and you have your overheads and there are some small internal things, but it is very simple to understand" (Node 5 of 9, passage 13 of 34).

> PB - "It is fairly complex – you know there is a lot of – everything has a different specification, everything has a different process, there are a number of colours, quantity, size, board. We don't have price lists as such." (Node 5 of 9, passage 17 of 30).

The finding for PB was confirmed by the documentary evidence which showed that a fairly complex pricing system seems to exist at PB, with the Chief Estimator handling quotes and estimates (PB09B2, 3), but the Chairman handling contracts and tenders (PB09B4, 5). The price setting approach appears to be fairly traditional, and not innovative or transparent. Unfortunately, no information was included in the PA documents on price setting, so a comparison between the two companies cannot be made.

Both companies appear to be fairly **flexible in determining prices**, but PA seem to be more fixed in their costing, while PB seem to be more innovative. This is reflected in the quotes below:

> PA - "… the process of costing is pretty fixed, it has got a computer costing structure, but the end that comes out of the computer printer does not dictate the price" (Node 5 of 9, passage 24 of 34).

> PB - "A client can give you all the specifications they have worked out and ask you for a quote and you can do that, but I also like to go that bit further, be a bit more creative and if there is another option which might save them money – say to them, lets look at option B before the proposal that they have requested" (Node 5 of 9, passage 28 of 30).

Both companies do seem to be able to get **premium prices**, but only in their specific market niches, as is shown in the following extracts:

> PA - “There are products that we do that are specific to ourselves. They obviously have a premium that goes with it” (Node 5 of 9, passage 10 of 34).

> PB - “No, we are with the rest of the market, we will get a premium over some guy who is not recognised as a --------- packaging manufacturer” (Node 5 of 9, passage 23 of 30).

The documentary analysis reflected some difference in their abilities to achieve premium prices for their products. PA appear to be able to get a premium price for their products/services, as is indicated by the following quote: “under priced by a competitor on a job, but retained the job through better quality” (PA09C1). The fact that PB’s mission statement stresses “competitive prices” (PB09C1) and that generally there “seemed to be low prices” (PB09C2) indicates that they are not able to get premium prices for their products. This is not too inconsistent with the interview transcripts that indicated that premium prices are only received for niche products.

Thus, it is not surprising to find that both companies end up having to **negotiate lower prices** with many customers, as, as is shown in the following extracts:

> PA - “… we will negotiate, we have contracts and we submit tenders so there is definitely negotiation” (Node 5 of 9, passage 25 of 34).

> PB - “… they will look at price first and say you are too expensive. There are customers that have been with us for many years and they will come and negotiate …” (Node 5 of 9, passage 2 of 30).

A slight difference between the two companies was found in terms of **price leadership**. PA tend towards being leaders, but only in their niche, while PB seem to be price followers, although both companies tend to change prices in line with resource and raw material price changes. These differences are reflected in the following extracts:

PA - “We are not really interested in what the market is doing, if raw materials come down we follow and vice versa” (Node 6 of 9, passage 10 of 24).

PB - “We don’t really change prices here, they go by the quote, with suppliers that we have a long relationship with, we will go and say, look there are a few suppliers who are cheaper, what can you do?” (Node 7 of 9, passage 10 of 16).

The documentary analysis provided similar evidence in terms of price leadership; with slight differences in the way PA‘s price leadership is viewed. There is a similarity in tactics, since neither company takes a strong price leadership position in their markets. With PA’s conservative and non-aggressive approach to pricing as indicated above, it is unlikely that PA could be considered a major price leader – pricing does not seem to be a tactic that plays an important part in their marketing strategy. PB are also not price leaders, as is indicated by their having to “redo prices on some products to avoid losing money” and the fact that they have lost business to a newcomer to the market (PB09D2). PB clearly are following the pricing trends set by competitors in their market.

Most of the pricing factors are **similar** between the two companies, which indicates that both companies may be merely following industry norms and conventions. The **differences** between the two companies involved the perceived importance of pricing (which was consistent with expectations) and price leadership, in which PB’s lack of price leadership was not anticipated. The findings for PA are fairly consistent with what was expected for a more successful company in a stable and simple market, but PB’s findings are the reverse of what was expected. The main reason for this was the fact that they try to maintain reasonably high price levels, but then have to react when more aggressive competitors undercut them. Overall, the field notes analysis confirmed these findings.

From this analysis it appears as if the nature of the environment is not a determinant of success in this industry.

6.2.3.3 Place

Distribution is a major stabilising tactic and in this section the importance of distribution in the companies’ marketing tactics is discussed, specifically, the use of channel intermediaries, inventories and physical distribution.

a) Turbulent and complex environment

In terms of **distribution channels**, both companies mostly deal directly with the users of their products, as is reflected by the following quotation from ITA:

> ITA - "… normal business operations in South Africa are directly [with] the customer" (Node 1 of 8, passage 15 of 16).

ITB do not make use of any intermediaries, but ITA do, to a limited extent, use intermediaries in selected markets as is shown below:

> ITA - "… do have some representatives, alliances for global markets" (Node 1 of 8, passage 6 of 16).

Both companies make use of **partnerships and strategic alliances**, but for ITB this is a recent innovation, whereas for ITA it is used considerably. This difference is reflected in the following extracts:

> ITA - "A lot of collaboration, co-operating with others, fellow group companies and in some instances competition, which we look at if it is in the interests of getting a client. We can work together with a competitor in such a case" (Node 7 of 8, passage 1 of 21).

> ITB - "Not so much that way, but rather seen as competitors at times, because there is a conflict of interest…we have also changed – we also wanted to keep everything to ourselves and we realised that you need partners and lets share a piece of the pie rather than not get any piece of the pie" (Node 7 of 8, passage 3 of 10).

Another significant difference between the two companies is ITA's greater preparedness to partner with competitors if it is in their interests, as is indicated by the following extract:

> ITA - "Yes, a lot with competitors – now with the nature of the game – you know a guy will have had a strategy done by Deloittes and we will go and institute it. We could have done the strategy, so they are competitors" (Node 7 of 8, passage 19 of 21).

The documentary analysis partially supports these findings, but also highlighted the fact that distribution issues in both companies appear to revolve around the difficulties in handling geographically dispersed business. ITA refer to deploying their services into all geographic

regions (ITA04B3) and they "leverage skills by using specialists from different regions/products" (ITA05E3) to handle any skills shortages. The geographic distribution of ITB's service is handled through the use of technology and is seen as important from the following extract:

> ITB - "Provides solutions in foreign countries and supports them remotely through satellite and VPN technology" (ITB10E1).

The above extract also reflects the fact that ITB do not rely on intermediate channels, but use technology to enable direct distribution. ITA, although also mainly distributing directly, increase their ability to distribute by using alliances, and partnerships (ITA06A2) and joint venture (ITA06A3).

Differences between the two companies exist in the area of **physical distribution**, because ITA deal, to a certain extent, in computer hardware, whereas ITB do not. ITA do not carry stock so physical distribution is generally less important. The reason for this is given in the extract below:

> ITA - "The problem we have is that technology changes all the time and if you do hold stock, within six months it is out of date" (Node 4 of 8, passage 7 of 7).

However, not carrying stock means that they have to manage the supply of materials very carefully. As a result logistics is considered important as mistakes can result in lost sales, as is shown in the following extract:

> ITA - "No, although it is important, we have a policy that we don't hold stock so we need to know logistically at any time where we are. So logistics is important" (Node 4 of 8, passage 6 of 7).

For ITB, physical distribution is not seen as important because they do not sell 'products'. However, they are aware of the importance of distribution of their services, as is shown in the following extract:

> ITB - "Distribution of services gives us complications, e.g. if we are doing a job in Port Elizabeth the work is there, then we have big problems because our product is our people … It has been probably our major reason why we haven't been able to grow successfully in other regions" (Node 1 of 8, passage 4 of 8).

The above extract also indicates that ITB do not seem to cope with this distribution challenge very well.

The nature of the two companies' business seems to influence their attitudes towards distribution. ITA's heavier emphasis on business outside South Africa and the fact that they sell hardware means that they place more emphasis on intermediaries and logistics than ITB, which predominantly sells software and systems. ITB's emphasis on customised software leads to problems in the physical distribution of their main resource, people. Taking this factor into account it appears as if 'place' does not account for much **difference** between the two companies. From the relatively low-key approach to distribution it appears, furthermore, as if both companies consider 'place' to be less important than the other components of the marketing mix.

The documentary analysis tends to support these conclusions, showing that the only observable difference between the two companies is that ITA use more alliances, partnerships, and joint venture in their distribution tactics, as would be expected of a more successful company in a turbulent and complex environment, and ITB seem to place marginally more importance on distribution than ITA does, which is the reverse of what was expected from a less successful company in a turbulent and complex environment..
These findings are generally what would have been expected for the more successful company in a turbulent and complex market (ITA), but are almost the opposite of what was anticipated for the less successful company (ITB). The field notes analysis also confirms this finding. The reason for this anomaly seems to be that ITB have not yet had to face distribution problems as it has been operating mainly in a niche market, both in terms of a specific industry, and in terms of a geographic region.

b) Stable and simple environment

Although both companies stress the **importance of distribution**, it appears to be important in the sense that it is a given - a necessary, basic foundation for their operations, rather than a tactical weapon to be manipulated. They both use direct distribution **channels**, selling directly to the packaging users. Generally speaking **intermediaries** are not used with the exception of a few commission sales agents and a transport company, as is shown in the following extracts:

PA - "We've got two agents, one in Cape Town and one in Natal. We don't really use distributors as such" (Node 2 of 8, passage 6 of 12) and "… we haven't got our own freight and transport – we use external, the reason being we leave it to the experts" (Node 1 of 8, passage 1 of 7).

PB - "Using outside transport, some outside commissioned sales people … we use agents in our -------- division (a small division not related to the core business of packaging)" (Node 2 of 8, passage 3 of 9).

Both companies emphasise the importance of **physical distribution** for the success of their operations, as is shown in the following extracts:

PA - "… you can have the best price but if you don't get an order there on time its bad, and you will have a customer who is extremely upset" (Node 1 of 8, passage 3 of 7).

PB - "If we don't get it there in the same time as the other guy can, we have a problem. We have even outsourced our local deliveries now" (Node 2 of 8, passage 2 of 9).

The documentary evidence partially supports the above findings. There was no mention of physical distribution in PA's documentation, but physical distribution at PB appears to be very important, being covered in the policy manual in terms of "storage, packing and delivery of products" (PB10E2). This is further reinforced by comments such as "efficient delivery on time" (PB10E3), "drivers are trained to handle and pack products safely" (PB10E5), and "overnight delivery service to Gauteng" (PB10E7).

Neither company seems to have much in the way of partnerships or strategic **alliances** to further their distribution objectives. They do, however, have some 'informal partnerships' and co-operation with some suppliers, which are illustrated in the following extracts:

PA - "Yes, fairly informal [partnerships]. You work with them … you scratch my back I scratch yours…. We don't have contracts on quantity we have on quality. We don't have supplier contracts for certain periods – we take it as it comes" (Node 7 of 8, passage 16 of 17).

> PB - "… we meet them, we tell them our concerns, how we are doing, we offer them help, and then we want to understand their business and they must understand ours" (Node 7 of 8, passage 2 of 20).

Both companies do carry small quantities of stock of both raw materials and finished goods, but the **stock levels** are kept to a minimum, as is shown in the following extracts:

> PA - "We don't hold stock for the majority of our customers – only for a few – but generally we produce and it is sent out" (Node 4 of 8, passage 2 of 20).

> PB - "We only keep for some customers and that is included in the cost to the client" (Node 4 of 8, passage 3 of 19).

This indicates that they both only keep stocks for selected or preferred or larger customers. Raw material stocks are also kept to a minimum by encouraging suppliers to keep back up stocks for them. This is demonstrated in the next two extracts:

> PA - "… we rely on our supplier to be able to supply fairly quickly, but we do keep a minimum of stock but it is a calculated risk. Most of the stock we hold at present is for specific jobs" (Node 4 of 8, passage 4 of 20).

> PB - "…all our suppliers out there have some stock on hand and it takes us a couple of days to get it" (Node 4 of 8, passage 12 of 19).

The documentary evidence also shows that stocks are relatively unimportant and to be kept to a minimum. Although PA do carry stocks, they seem to be relatively unimportant, as discussions in meetings tend to be in relation to "stock and reduction thereof" (PA10C1). This is reinforced by the following quote: "Reps asked to try to move stocks out to customers as the warehouse is running out of space" (PA10C3). At PB, it is policy to carry stocks, especially on behalf of customers who draw off product with blanket orders (PB10C2). However, PB do try to "minimise stock levels" (PB10C1) of raw materials.

Both companies, rather than producing as and when necessary or carrying large buffer stocks do **stock replenishment** on a planned basis. This planned approach is reflected in the following extracts:

PA - “Replenishing of stocks is done on a planned basis – we send out a weekly schedule for customers’ stock levels and it is all done on order” (Node 4 of 8, passage 11 of 20).

PB - “… planned through the customer. They normally work through the sales reps so we normally know when they have in stock and when they need supplies” (Node 4 of 8, passage 10 of 19).

The documentary analysis corroborated this, indicating that PA’s inventory replenishment appears to be on a planned basis, as was indicated by a discussion on a “new stock schedule system” (PA10D1), whereas PB’s stock replenishment appears to be more reactive, as it is determined “at the request of the customer” (PB10D1) or because they “must work to the customer’s forecast” (PB10D2).

The distribution activities of both companies were found to be very **similar**. For company PA, the importance of physical distribution, the lack of alliances, and the planned stock replenishment were expected. For company PB, all the distribution factors were as expected, with the exception of the lack of alliances and the planned stock replenishment. No significant **differences** between the two companies were found. As a generalisation, it appears as if both companies see distribution as a fundamental activity that has to be done well regardless of the environment, or any other tactical activities. As such, the successful company in the stable and simple environment (PA) places sufficient attention on distribution to ensure that its stabilising influence supports their other activities. On the other hand, the less successful company (PB), which was expected to downplay the importance of distribution, although seeing it also as fundamentally important, does not place so much importance and emphasis on it that the relevant proposition would be totally rejected. Thus, it can be said that the distribution function is handled partially as expected.

Overall the documentary analysis and the field notes analysis mostly support this finding.

6.2.3.4 Promotion

Promotion can be either a stabilising or a destabilising tactic, and this section considers the broad promotional categories, and the extent to which the companies use them to stabilise or destabilise their markets.

a) Turbulent and complex environment

Neither company makes much use of the traditional promotional mix. Those **promotional activities** that are used are either personal selling or of the public relations type, as is shown in the following extracts:

> ITA - "We actually rather use cheap kinds of advertising – we use public relations – we don't use advertising as such, we rely more on the news releases" (Node 9 of 11, passage 2 of 5).

> ITB - "Then we employed [a PR person] and she did quite a lot of PR type marketing – and suddenly people started taking note" (Node 4 of 11, passage 6 of 6).

Regarding ITB's **public relations** activities, they are now seen as "important but not well done" (Node 4 of 11, passage 5 of 6), as is shown in the following extract:

> ITB - "That [public relations] I believe is important. But we don't do much of it, we don't even tell people about our successes" (Node 4 of 11, passage 1 of 6).

The main public relations activities of both companies are events that bring them together with their customers such as sports days, cocktail parties, exhibitions or luncheon meetings. ITA focus on entertainment via events such as golf days that they sponsor, and other sporting events, while ITB seem to use whatever opportunities present themselves, in a rather unfocussed way. This is reflected in the following extract:

> ITA - "The [golf day] is very important to us, and entertainment – we do a lot of that – rugby suites, etc. – regular golf days, get-togethers …" (Node 4 of 11, passage 4 of 5).

> ITB - "…We have had one cocktail party " (Node 6 of 11, passage 8 of 11), "… we are a member of the Chamber of Commerce, we go to the monthly lunches, we take part in the golf days, we attend conferences, that's where we network" (Node 6 of 11, passage 9 of 11), "We have an exhibition stand at the ---------- conference …" (Node 6 of 11, passage 10 of 11).

In addition, ITA also make considerable use of publicity and news releases in the trade and financial press, as is shown in the following extracts:

ITA - “In the IT journals we run success stories and that sort of thing” (Node 9 of 11, passage 5 of 5).

ITA - “Investor relations are important – and PR to the point of keeping the name out there so every article in the paper would be geared to investors” (Node 4 of 11, passage 1 of 5).

Media advertising is not used at all by ITB, and only to a limited extent by ITA, with some corporate image advertising by the corporate head office and some advertising in support of their sponsorships, as is shown in the following extracts:

ITA - “[Head Office] might place an advert and they bill us a share – and I would say we get value out of that” (Node 9 of 11, passage 5 of 5).

ITA - “We advertise in the papers, yes and on the TV you will see the ------- we sponsor one of those tournaments” (Node 6 of 11, passage 8 of 19).

Sales promotions are not used by either company, as is shown in the following extracts:

ITA – “… buy one get one free we would only promote on behalf of a supplier – it would not originate with us” (Node 8 of 11, passage 12 of 25).

ITB - “… believe that now and again it wouldn’t do harm to put a fly in the ointment just to upset the competitors … but we have never done [sales promotions]” (Node 8 of 11, passage 15 of 18).

Personal selling, via sales representatives for ITA and senior executives for ITB, is a critical component of both companies’ promotional activities, as is shown in the following extracts:

ITA - “… we have got to be plugged in to each client at every level from the bottom to the top – the account manager …” (Node 3 of 11, passage 16 of 44).

ITB - “[a knowledgeable sales force] – absolutely, that is critical in our line” (Node 5 of 11, passage 11 of 18).

Generally ITA feel that their sales representatives are fairly knowledgeable, especially of their longer-term customers’ business. ITB, however, are entirely satisfied with the level of

their representatives' knowledge of their customers' business. This is indicated by the following two extracts:

> ITA - "I think it could be better, it is OK – look we don't structure ourselves in vertical teams, so we are not market – customer based. I'd like to say we have a fair knowledge, but I must say it could be better" (Node 5 of 11, passage 29 of 34).

> ITB - "With our current customer business they know it inside out" (Node 5 of 11, 16 of 18).

Although the ITA sales representatives are seen as knowledgeable about their longer term customers, ITA do not seem to be generally satisfied with the sales representatives' level of knowledge about the customers' business, as is shown in the following extract:

> ITA - "Probably with the exception perhaps of banking they are probably not [knowledgeable about customer's business] – they won't know how he works" (Node 5 of 11, passage 28 of 34).

The one promotional method that both companies feel is the most important is **'word of mouth'** advertising, which is very effective when considered from a chaos theory perspective. The concept of sensitive dependence on initial conditions (or Nilson's (1995) 'nudge' effect or Gladwell's (2000) 'tipping point') shows that small initial actions, such as positive comments from a satisfied customer, can spread exponentially through 'word of mouth' resulting in a promotional effect much greater than the initial comment. The following extract from ITB typifies this importance:

> ITB - "That's very important, most of our business comes from word of mouth" (Node 6 of 11, passage 5 of 11).

Neither company has formalised their promotional activities in order to encourage word of mouth. They are, however, aware of the fact that certain of their activities do generate it. ITA's awareness of this appears to be higher, and they do more to encourage customers to talk about their service and to recruit potential customers. The first of these activities is referrals, which are encouraged, as is shown in the following extract:

> ITA - "… we get lots of referrals and we focus a lot on delivering solutions that work, that meet our customers' objectives and in fact we make a lot of use of customer referral sites. So we will take up new customers and send them to our old customers …" (Node 6 of 11, passage 4 of 19).

The second activity is sports events during which existing and prospective customers are put together in an environment that encourages discussion about the company and its products, as is shown in the following extract:

> ITA - "… in the social events we would put a [positive] customer in a four ball with somebody we are trying to impress. If we invite people to the rugby, lets have someone from [a good customer] because they will be enthusiastic …" (Node 6 of 11, passage 14 of 19).

A third form of word of mouth encouragement is the use of clients as spokespersons in print or at special events, as is shown in the following extracts:

> ITA - "In our PR approach we try to use case studies a lot, which is a sort of print-aided, sort of word of mouth type of thing. We try to get our clients to speak at events that we run – we try to promote our clients" (Node 6 of 11, passage 11 of 19).

By promoting their clients and their success, ITA build a strong support base with people who are then prepared to talk positively about ITA, about their service, and about how good ITA are to work with, to other prospective clients.

A fourth activity that encourages word of mouth is ITA's customer forum, as is shown in the following extract:

> ITA - "We do have an event that we run – it is called '------- Forum' – and that is for any customer, and again in that kind of environment you want to be getting your strong customers and your good relationships talking to your prospective customers" (Node 6 of 11, passage 17 of 19).

The final activity is public relations, which maintains a continuous high profile in the financial press, which ensures that the market, including customers, prospects, competitors and investors, is always aware of ITA and discusses them in informal situations. This is reflected in the following extract:

ITA - “Investor relations are important – and PR to the point of keeping the name out there so every article in the paper would be geared to investors” (Node 4 of 11, passage 1 of 5).

From the above discussion it can be seen that ITA do deliberately try to generate word of mouth communications.

Some of ITB’s promotional activities also promote word of mouth. Although most people do not believe that they proactively promote word of mouth, ITB have undertaken many activities that may, in fact, promote it. Such activities are shown in the following extracts:

ITB - “We do have golf days – we will take people along to a golf day … we have had one cocktail party in the beginning with customers” (Node 6 of 11, passage 8 of 11).

ITB - “We try, we are a member of the Chamber of Commerce, we go to the monthly lunches, we take part in the golf days, we attend conferences, that’s where we network” (Node 6 of 11, passage 9 of 11).

These activities may generate word of mouth, but ITB do not take the extra step to ensure that word of mouth is encouraged. Only one activity is undertaken that really does encourage the power of word of mouth. This is shown in the following extract:

ITB - “So there is a focussed effort in that area. We use our good clients for references formally and informally. For quotes, we will say phone so and so, and we actually give their details out, and then we also ask them to phone our potential customers, and we take out potential customers to visit our clients and see how happy they are” (Node 6 of 11, passage 11 of 11).

ITA appear to be more **aggressive in the use** of their promotional tactics than ITB, as is shown in the following extracts:

ITA - “Where we have done well is quite simply because we have gone hard on publicity …” (Node 8 of 11, passage 20 of 25).

ITB - “No we do not use aggressive promotions” (Node 2 of 11, passage 27 of 29).

However, both companies use their promotional activities to stabilise their relationships with customers rather than to destabilise the market. ITA appear to have a greater awareness of this, as is reflected in the following extracts:

> ITA -"… once we have a relationship with the customer at a very strategic level we try to consolidate that …" (Node 3 of 11, passage 7 of 44)

> ITA - "… there's very much a friendship that develops with customers, we tend to do quite a bit of marketing and golfing events, etc." (Node 6 of 11, passage 19 of 19).

This seems to indicate a fundamental relationship between what could be a destabilising marketing tactic and stabilisation of the marketing relationship. However, it should be noted that, although they do not perceive it as such, these PR and 'entertainment' activities could have the effect of destabilising the relationships between prospective customers and their existing suppliers. Thus, although they do not see their promotional activities as destabilising, they could have the effect of shaking loose the connections between prospective customers and competitive suppliers. If this is so, it is clear that they do it very subtly, as is shown in the following extract:

> ITA - "… but we are very careful to not be ...- there is a fine line between being confident and arrogant. In some instances guerrilla tactics won't do, and we rather say, stay away guys and just chip away slowly" (Node 8 of 11, passage 18 of 25).

It is interesting to note that, although ITB appear receptive to the idea of using sales promotions to disrupt the market and competitors, this is not common across all staff, as is shown in the following extracts:

> ITB - "… believe that now and again it wouldn't do harm to put a fly in the ointment just to upset the competitors … but we have never done it [sales promotions]" (Node 8 of 11, passage 15 of 18).

There is very little change in the promotional activities of both companies, and therefore, it is not possible to comment on the **frequency or speed of change** of campaigns. Regarding ITA, the following extract describes this:

> ITA - "Pretty much the same [over the last two years] and not at a high level (Node 1 of 11, passage 26 of 26).

ITB do not do sufficient promotions to be able to comment on the frequency or speed with which activities are changed. Effectively they have only developed one promotional campaign, parts of which are still used, so it can be said that ITB do not change, and if they did it would probably be slow and infrequent.
This lack of variability in ITB's promotional activities is consistent with a stabilising approach – destabilising policies would tend to change activities before the market became used to them or before they could react to them. Keeping promotional activities the same enables customers to get used to them, to become comfortable with the company – in other words a stabilising approach.

Very little mention of promotion is made in the documentary evidence. However, it seems significant that ITA have won numerous awards for their advertising activities, including their website, and that consistent images, in terms of colour, logo, and slogan, are carried through in both ITA's and ITB's documents – clearly some effort has been put into the branding and public relations aspect of marketing both companies. Because of the paucity of information on promotion from the documents, no clear conclusion can be reached as to whether their promotional tactics are as expected or not.

From the above discussion it can be seen that the promotional tactics used by ITB are consistent with what could be expected of a less successful company in a turbulent and complex environment. Those few promotional tactics that they do use are all of a more stabilising nature. The only exception is the importance they place upon word of mouth advertising, but it should be noted that ITB do not consciously set out to encourage word of mouth or perceive it as a destabilising tactic.

ITA, contrary to what is expected of a more successful company in a turbulent and complex environment, also use their promotional tactics in a stabilising way. However, since they are fairly aggressive in their use, and are much more aware of the role that word of mouth advertising plays and how they are encouraged, it can be said that ITA also use their promotional tactics to destabilise the market. Such destabilising activities could be seen to make potential customers dissatisfied with their current suppliers and aware of ITA as an alternative supplier.

Thus, although there are many **similarities** in the way that the two companies apply their promotional tactics, there is sufficient **difference**, albeit subtle, to conclude that the use of promotional tactics was found to be as anticipated in the propositions.

b) Stable and simple environment

The two companies are very similar in terms of the use of **promotional tactics**. Both make little use of promotions, concentrating mostly on personal selling, public relations, and word of mouth in order to merely spread their name in the industry, as is shown in the following extract from PA:

> PA - "What has built our name over the years is service, quality and trust. It is rather commitment than any advertising" (Node 8 of 10, passage 6 of 6).

Promotions are not used at all to disrupt the market, although PA are quite prepared to shake the market up by doing other things differently or setting standards that are way ahead of the industry norm. Both companies' conservative use of promotions is described by the following extract:

> PA - "No, I don't think we believe in that [being aggressive in the market]. No, but slowly, slowly … I wouldn't say we are overly aggressive" (Node 7 of 10, passage 22 of 24).

The types of promotional activities that they do undertake are very standard, low key, and the minimum to be expected of such companies. They both see public relations activities as important and do make use of them to a limited extent, as is indicated in the following extracts:

> PA - "We do promotions at the race course once a year – more of a promotion – you will see us on T.V. because of all the signs etc. around … In a trade magazine we might put in something about our winning an award" (Node 4 of 10, passage 4 of 5).

> PB - "Yes, we have a newsletter, but not radio or TV, but the odd golf day, etc., more public relations" (Node 7 of 9, passage 1 of 9).

The documentary evidence indicates what appears to be some difference between the two companies in terms of their promotional activities. PA appear to place more importance on promotions than PB do, but even so, it is still relatively low key.

Much of their **public relations** activities revolve around entertainment and networking, but it does not seem to be planned with any specific objectives in mind, as is shown in the following extracts:

> PA - Well we had supplier of the year award, and we entertain customers with a race box" (Node 5 of 10, passage 7 of 10).

> PB - "Entertainment we do on an individual basis, not a planned structured programme, lunches etc. for customers coming to Durban – informal" (Node 3 of 9, passage 7 of 8).

Although seen as rather unimportant, both companies do use **media advertising** on a limited and *ad hoc* basis, as is reflected in the following extracts:

> PA - "Mostly through the areas where we get to the people, to the decision makers who count, so we will do it through, for example, advertise in Package Review and Food Review" (Node 8 of 10, passage 4 of 6).

> PB - "Apart from the telephone book and the Yellow Pages and the Internet trade pages, we have been in the International ------- magazine periodically, we are regularly in Packaging Review … I don't think we do enough, we need to be in one or two more trade journals on a regular basis" (Node 7 of 9, passage 6 of 9).

The documentary analyses show significant use of **public relations** as a promotional tactic by both companies. PA's promotional material strongly emphasises the speed of their services (PA02A1), and their numerous awards. Visits to the factory by customers also show an emphasis on public relations (PA06H3). PB's promotional materials tend toward the traditional and conservative – calendars, leaflets, document holders, and writing pads (PB11A1). PB's objective appears to be to remind customers of the company - in other words, to maintain the *status quo* through the use of rather low-key public relations type activities. No evidence of aggressive or disruptive promotional activities was found.

Neither company makes use of **sales promotional** activities, but both do use personal selling, and see it as very important. Both companies seem to have sales representatives who are sufficiently knowledgeable about their customers and the market, as is shown in the following extracts:

PA - “Very knowledgeable [about customers’ business] – the sales force has by and large been very stable” (Structure node 5 of 12, passage 28 of 29).

PB - “… we have new reps that are learning, others know a lot about customers, our senior chap in Johannesburg has a lot of experience …” (Structure node 4 of 12, passage 33 of 38).

The documentary evidence also shows **personal selling** to be important as is implied by PA sales representatives’ involvement in meetings, and their being requested to provide information (PA04E4). Regarding PB, the regular attendance at, and involvement in, the sales meetings by the Managing Director, and the issues discussed and debated with the sales representatives, as shown in the meeting minutes, is indicative of the importance now being placed on personal selling in ITB.

For both companies the promotional tool that seems to be the most important and used the most is **word of mouth**. It is used mainly to publicise the names and reputations of the companies, as is exemplified in the following extracts:

PA - “The name is established, but it is through word of mouth and awards. The establishment of the name has happened because of this – not deliberately” (Node 5 of 10, passage 1 of 10).

PB - “Between that [personal selling] and word of mouth, [word of mouth] is probably our most important” (Node 5 of 9, passage 11 of 13).

Although word of mouth is seen as so important, neither company seems to do anything proactively to encourage it, as is shown in the following extracts:

PA - “I don’t say we go out of our way to do it [word of mouth], I think it just comes naturally” (Node 5 of 10, passage 8 of 10).

PB - “… a lot of the business we pick up is word of mouth, so it must take place. I don’t really know where it comes from – I suppose one buyer to another” (Node 4 of 9, passage 11 of 12).

Although not deliberately encouraged, both companies are aware of numerous activities (mostly public relations type activities) that they believe cause word of mouth to happen, as is reflected in the following extracts:

> PA - “Well we had supplier of the year award, and we entertain customers with a race box…we really go for quality, we have a name on the product and we are proud of it, and if people want to talk about it, it is there” (Node 5 of 10, passage 7 of 10).

> PB - “We encourage [word of mouth] by delivery dates, efficiency, quality. And the golf day is important …” (Node 4 of 9, passage 5 of 12).

Since so little is done in the way of promotions, the **frequency and speed** with which the promotional activities are changed is not really relevant for these two companies. However, PA maintain that when the promotion tool is used “it is changed regularly, it is not staid or the same thing over and over” (Node 1 of 10, passage 24 of 24), which is consistent with PA’s overall approach to the business of innovation and novelty. Regarding PB, the impression from the above discussion is that their promotional activities are fairly standard, and do not, therefore, seem to change much over time.

The promotional activities of the two companies are very **similar**. Both companies rely on personal selling, public relations and word of mouth, while making little or no use of advertising and sales promotions. Their attitudes towards, and objectives of, promotions are also the same. What little **difference** there is, lies in the details of the activities undertaken, and can be considered insignificant in terms of the influence on success. Most of the findings were consistent with what was expected of a more successful company in a stable and simple environment. The exceptions were the importance placed on word of mouth (but not overly encouraged) by PA and the importance of sales representatives by PB. Since these two factors seem to be so important, it can be concluded that PA performed approximately as expected of a more successful company in a stable and simple market, with PB not performing as would be expected of a less successful company.

These findings were generally corroborated by the documentary analysis and the field notes analysis. For example, PA build strong relations and a strong name and image through the use of public relations and personal selling, thus stabilising their environment, as anticipated. PB tended to use the same tactics, rather than following the more destabilising tactics that were anticipated of the less successful company in a stable and simple environment.

6.2.4 Conclusion to qualitative analysis

To obtain an overview of the findings, each sub-heading was summarised in terms of the relevant environment level and level of success, and cross tabulated for each of the three methods used – interview transcript analysis, document analysis, and field notes analysis. These cross tabulations are provided in Tables 6.1, 6.2 and 6.3 below. In these tables the check marks indicate that the findings were generally consistent with the propositions, while the crosses indicate that the findings were generally the reverse of what was expected. A cross and a tick appearing together indicate that the findings are ambiguous, some indicating consistency with, and others indicating the opposite of, what was anticipated. A question mark indicates that insufficient evidence was obtained to draw a conclusion. By allocating a score of 1 for a check mark, half for a check mark with a cross, and nought for a cross or question mark, a rough score can be calculated, which enables the qualitative, subject assessment to be checked quantitatively.

The summary for the **interview transcript analysis** is provided in Table 6.1. The overall pattern indicates that the findings for the turbulent/complex environment are generally consistent with the proposals developed from the literature review, although the findings about price were the reverse of what was expected. There was also a degree of uncertainty about place for the less successful company and about promotions for the more successful company. However, overall it can be said that the findings are consistent with what was anticipated. The quantitative scores of 8 out of 10 and 6.5 out of 10 for the more and less successful companies respectively, confirm a fairly high degree of consistency with the expected propositions.

Regarding the stable and simple environment, the findings were mostly the reverse of what was anticipated from the literature review. However, there were enough of the findings (about 25 to 30%) that were as expected, to indicate that there may be some relationship between the nature of the tactics used and success in a stable and simple environment. Closer associations have perhaps been inhibited by PA's perception of their environment as turbulent, thus leading to the use of more destabilising tactics, and by PB adopting more formal management and marketing approaches to cope with the results of the dictatorial management style used in the near past. The quantitative scores of 3 out of 10 and 2.5 out of 10 for the more and less successful companies respectively, confirms a low degree of consistency with the expected propositions.

Table 6.1: Summary conclusions from interview transcript analysis

Factors	Turbulent/complex		Stable/simple t		Score
	More successful	Less Successful	More successful	Less successful	
Environmental & market change	√	√	√	X	3/4
Attitude to change	√	√	X	X	2/4
General management	√	X	X	X	1/4
Business strategy	√	√	√X	√X	2.5/4
Structure & staff	√	√	X	X	2/4
Relationships with customers/suppliers	√X	√X	√X	√X	2/4
Product	√	√	X	X	2/4
Price	X	X	X	X	0/4
Distribution	√	X	√X	√X	2/4
Promotion	√X	√	√X	√	3/4
Score	8/10	6.5/10	3/10	2.5/10	

Table 6.2 below provides a summary of the **document analysis**. From the pattern in this table it can be seen that, for the turbulent and complex environment, the findings are very consistent with what was suggested in the propositions, with one exception in each company. The quantitative scores of 8 out of 10 for both the more and less successful companies confirm this.

However, in the stable and simple environment the findings were mostly the opposite of what was predicted by the propositions. PA, the more successful company, was marginally closer to the predictions, with about three and a half factors conforming to the expectations, than PB, the less successful company, which had only two factors consistent with the propositions.

Table 6.2: Summary conclusions from documentary analysis

Factors	Turbulent/complex		Stable/simple		Score
	More successful	Less successful	More successful	Less successful	
Environmental & market change	√	√	X	√	3/4
Attitude to change	√	√	X	X	2/4
General management	√	√	X	X	2/4
Business strategy	√	√	√ X	X	3/4
Structure & staff	√	X	X	X	1/4
Relationships with customers/suppliers	√	√	√	X	3/4
Product	√	√	X	√	3/4
Price	X	√	√	X	2/4
Distribution	√	√	X	X	2/4
Promotion	?	?	√	X	1/4
Score	8/10	8/10	3.5/10	2/10	

Table 6.3 below gives the summary of the **field notes analysis**. Regarding the turbulent and complex environment, it appears from the subjective interpretation of the pattern in the table as if ITA and ITB do behave as more successful and less successful companies respectively, i.e. the findings are consistent with the propositions. Thus, these findings appear sound for the turbulent and complex environment, as is reflected by the quantitative scores of 7.5 and 6.5 for the more and less successful companies respectively. However, the findings for the stable and simple environment were not so clear-cut. PA's behaviour is a mix of the predictions for the two more successful companies in the two environments, while PB's behaviour is a mix of the behaviour of a more and a less successful company in the stable and simple environment. This is reflected in the quantitative scores of 5.5 and 4 respectively.

Table 6.3: Summary conclusions from analysis of field notes

Factors	Turbulent/complex		Stable/simple t		Score
	More successful	Less Successful	More successful	Less successful	
Environmental & market change	√	X	√	X	2/4
Attitude to change	√	X	X	X	1/4
General management	√	√X	X	X	1.5/4
Business strategy	√	√	√X	√X	3/4
Structure & staff	√	√X	√	X	2.5/4
Relationships with customers/suppliers	X	√	X	√	2/4
Product	√	√	√X	√X	3/4
Price	X	√	√	√	3/4
Distribution	√	√X	√	√X	3/4
Promotion	√X	√	√X	√X	2.5/4
Score	7.5/10	6.5/10	5.5/10	4/10	

In order to provide an even clearer view of the **summarised results**, the summaries for all three methodologies were plotted in one table, which is presented as Table 6.4. This overall pattern shows that the findings for the more successful company in the turbulent/complex environment were very consistent with the propositions. The less successful company was marginally less consistent. Regarding the simple and stable environment, both companies' patterns show a lack of consistency with the propositions.

Table 6.4 – Overall summary conclusions

Factors	Turbulent/complex						Stable/simple					
	More successful			Less Successful			More successful			Less successful		
Environmental & market change	√	√	√	√	√	X	√	X	√	X	√	X
Attitude to change	√	√	√	√	√	X	X	X	X	X	X	X
General management	√	√	√	X	√	√X	X	X	X	X	X	X
Business strategy	√	√	√	√	√	√	√X	√X	√X	√X	X	√X
Structure & staff	√	√	√	√	X	√X	X	X	√	X	X	X
Relationships with customers/suppliers	√X	√	X	√X	√	√	√X	√	X	√X	X	√
Product	√	√	√	√	√	√	X	X	√X	X	√	√X
Price	X	X	X	X	√	√	X	√	√	X	X	√
Distribution	√	√	√	X	√	√X	√X	X	√	√X	X	√X
Promotion	√	?	√X	√	?	√	√	√	√X	X	X	√X

Key: Blue = interview transcripts analysis

Green = documentary analysis

Red = field notes analysis

In an attempt to cross check this finding, a score of 2 for a check mark, a 1 for a check mark and a cross, and a score of 0 for a cross or question mark, was allocated to Table 6.4 to create a quantitatively scored table which is presented as Table 6.5 below.

Table 6.5: Summary conclusions with quantitative scores

Factors	Turbulent/complex environment						Stable/simple environment						Total	%
	More successful			Less Successful			More successful			Less successful				
Environmental & market change	2	2	2	2	2	1	2	0	2	0	2	0	17	70.8
Attitude to change	2	2	2	2	2	1	0	0	0	0	0	0	11	45.8
General management	2	2	2	0	2	1	0	0	0	0	0	0	9	37.5
Business strategy	2	2	2	2	2	2	1	1	1	1	0	1	17	70.8
Structure & staff	2	2	2	2	0	1	0	0	2	0	0	0	11	45.8
Relationships with customers/suppliers	1	2	0	1	2	2	1	2	0	1	0	2	14	58.3
Product	2	2	2	1	2	2	0	0	1	0	2	1	15	62.5
Price	0	0	0	0	2	2	0	2	2	0	0	2	10	41.7
Distribution	2	2	2	0	2	1	1	0	2	1	0	1	14	58.3
Promotion	2	0	1	2	0	2	2	2	1	0	0	1	13	54.2
TOTAL	17	16	15	12	16	15	7	7	11	3	4	8	131	54.6
PERCENTAGE	85	80	75	60	80	75	35	35	55	15	20	40	54.6	
GROSS SCORES	48			43			25			15				
GROSS PERCENT	80			71.7			41.7			25				

Key: Blue = Interview transcript analysis

Green = Document analysis

Red = Field notes analysis

Black = Totals

This summary confirms that the findings for the companies in the complex and turbulent environment were consistent with what was suggested by the propositions. The findings for the simple and stable environment, however, were not consistent, showing that the expectations for this environment were not as suggested by the propositions.

6.3 QUANTITATIVE ANALYSIS

In addition to the qualitative analyses discussed above, two more quantitatively orientated methods were used as part of the triangulation. These were an analysis of the words used by the respondents in the interviews and a ranking of the importance of the marketing tactics by the respondents, which was then analysed using correspondence analysis, an exploratory multivariate statistical technique.

6.3.1 Analysis of word usage

6.3.1.1 Introduction

Another method of interrogating the interview transcripts was the content analysis of words relating to chaos and complexity versus those relating to order and stability. As was described in Chapter 5, lists of these words were developed from the literature review. Using the NVivo software, extracts containing the target words were isolated, and then using the 'find' function in MS Word, the words were located and counted. Appendix M lists the target words and shows the frequency of use by each company.

6.3.1.2 Discussion of word usage

In this section the types of words (chaos/complexity or order/stability) and their frequency of use is discussed in terms of the two environments – turbulent/complex and stable/simple. Within each environment their use by the more successful company is compared against their use by the less successful company, and discussed in terms of what was anticipated from the propositions developed from the literature review.

a) Turbulent and complex environment

Comparing the companies in the turbulent and complex industry, the most frequently used chaos related word for ITA was 'change'; with 'dynamic' the second most used word. 'Change' was also the most frequently used chaos related word for ITB, which used 'dynamic' as frequently. This similarity indicates that both are aware of the turbulent nature of their environment. However, the main difference was in the frequency of use, as is shown in Table 6.6 below:

Table 6.6: Summary of word use frequency – turbulent environment

	ITA	ITB
Chaos/complexity related words	26	9
Order/stability related words	16	6

ITA used 'change' fifteen times compared to ITB's three, and 'dynamic' five times compared to ITB's three. Overall ITA used chaos related words 26 times compared to ITB's nine times. This seems to indicate a higher awareness of, and more attention being paid to, the turbulence in their environment, and therefore seems to confirm the relationship found via the qualitative analysis, namely, that the more successful company would be more aware of, and pay more attention to, the turbulent and complex environment.

The reverse relationship for order and stability related words were expected. This was not found, however, as ITA used order related words sixteen times compared to ITB's six times. The most frequently used word by ITA was 'control' (seven times), with the second most frequently used words being 'structure' and 'certain' (three times each). This seems to indicate that, even though they are more aware of the environmental turbulence, ITA are also very aware of the need to keep strict control of certain aspects of their business, especially the financial aspects.

The above discussion appears to show that greater awareness and attention to the turbulent environment, together with some degree of attention to discipline and control, are related to greater success in a turbulent and complex environment. This was more or less as anticipated from the literature review.

b) Stable and simple environment

The chaos related word most frequently used by PA was also 'change' (12 times), with 'dynamic' also the second most used word (nine times). 'Change' was also the most frequently used word by PB, but it was only used three times. The second most used terms were 'uncertainty' and 'unstable' (twice). The main difference, as with the turbulent environment, was the frequency of use of chaos related words in total. PA used chaos related words significantly more frequently than ITB did. This is shown in the Table 6.7 below:

Table 6.7: Summary of word use frequency – stable environment

	PA	PB
Chaos/complexity related words	44	8
Order/stability related words	33	9

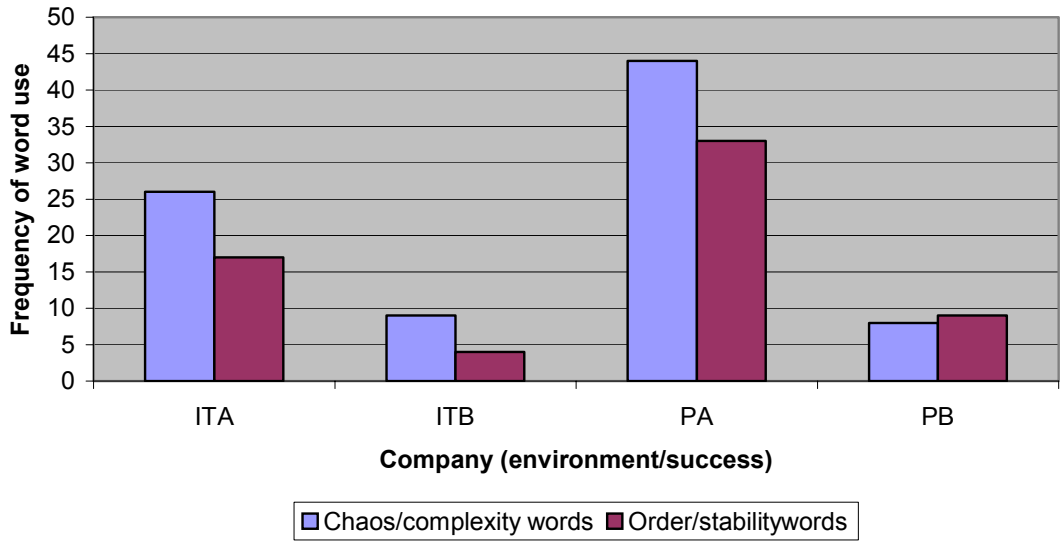
As with the turbulent and complex environment, this seems to indicate a greater awareness of, and attention to, the environment by PA than by PB: the opposite of what was expected.

The reverse relationship for order related words was also expected in the stable and simple environment. However, as with the turbulent and complex environment, this was not found. The order related word most frequently used by PA was 'planning/plan/planned' (fifteen times), with 'stable/stability' being the second most frequent (seven times). 'Certain' was the most frequently used term by PB (four times), with 'management' being the second most frequent (three times). Again, the overall frequency of use of these words was significant, with PA using order related words 33 times compared to PB who used them only nine times, as is shown in Table 6.7 above. The emphasis on order related words is to be expected as it was proposed that success in this environment would be related to activities aimed at stability or stabilising the environment. PA clearly pay considerable attention to planning as was expected, while PB pay relatively little attention to stability issues in their environment, and did not even mention planning.

The above discussion seems to indicate that success in the stable and simple environment is related to a strong awareness of the environment, even to the extent that it is considered turbulent, even though it is stable compared to other industries. Furthermore, a strong emphasis on stabilising activities like planning probably enables PA to maintain the *status quo*, namely their superior position in the industry, by proactively promoting stability.

Figure 6.1 below presents a visual representation of the overall pattern of word usage:

Figure 6.1: Word usage by company



This clearly shows that, of all four companies, PA use both chaos and order related words significantly more than the other three companies, and ITA use them significantly more than the two less successful companies (ITB and PB). This seems to indicate that success, regardless of environment, is related to a high awareness of, and attention to, the environment. The two more successful companies (ITA and PA), clearly talk more about, and use more terms relating to, the turbulence in their environments. This heightened awareness presumably enables them to anticipate trends and changes and therefore enables them to better adapt to changes in their environments. Since the more successful companies also use order related words considerably more frequently than the less successful companies do, it can be concluded that they also are able to maintain some degree of order and control within the turbulence that they perceive in their environments. In other words they are able to maintain a degree of control in the form of being vigilant and proactive in adapting to changes or causing the changes themselves, rather than having to react to and follow the changes forced on them by the environment.

6.3.1.3 Conclusion to word usage analysis

From the foregoing discussion of word use it can be concluded that awareness of, and attention to, the environment are important for success regardless of the turbulence or stability of the environment. This awareness of any change in the environment, even if in a

stable and simple environment, may enable a company to achieve the benefits of destabilisation. By instituting the change the company is prepared for the change, and so is able to position themselves ahead of competitors in the new, changed environment.

The discussion also highlights the importance of attention to order and stability, even in a turbulent environment. Clearly, success in a turbulent market does not mean a *laissez faire* approach, and control of the operation is important. However, what is not clear is whether the traditional bureaucratic form of control or control via the more participative, self-managing approach as proposed by complexity theory is to be preferred.

6.3.2 Analysis of ranking of marketing tactics

6.3.2.1 Introduction

As is discussed in Chapter 5 - Methodology, the use of a combination of qualitative and quantitative research and analysis methodologies can improve the trustworthiness of research findings. Therefore, this section discusses the quantitative analysis of the importance rankings of marketing tactics provided by the interviewees. Firstly, a bivariate analysis comparing the rankings of the marketing tactics for each company is provided and discussed. Then a multivariate analysis technique, namely correspondence analysis, is presented and the findings interpreted in terms of the expectations from the propositions developed from the literature review.

6.3.2.2 Bivariate analysis of rankings

Each respondent was asked to rank the nine marketing tactics from most important in their company down to least important. The rankings for each company were then summed and a company average ranking was created. For convenience sake this is referred to as a 'rating' in Table 6.8 below. Based on this 'rating', the tactics were then ranked. Note that the lower the rating, the more important the activity is perceived to be, i.e. 1 = most important through to 9 = least important.

Regarding the IT industry, it can be seen from the *rankings* that there is little difference in perception in the two companies about the importance placed on the various tactical activities. For example, both ranked 'Personal selling' (PS) as most important and 'Product innovation' (PI) as second most important. However, when the *ratings* are examined it can be seen that 'Personal selling' (PS) is perceived as being less important by ITA (2.3 vs. 1.0

for ITB), whereas ITA perceive 'Product innovation' (PI) (2.4 vs. 3.0 for ITB) and 'New product development' (NP) (2.5 vs. 5.8 for ITB) to be considerably more important than ITB do. It is also interesting to note that ITB perceive 'Product enhancement' (PE) (4.0 vs. 5.6 for ITA) and 'Price changing' (PC) (5.4 vs. 6.4 for ITA) to be more important than ITA do. Moreover, of ITA's three most important tactics, two are destabilising (PI and NP), whereas for ITB two are stabilising (PS and 'Public elations/other communications' (PR)). This is more or less what was expected from the propositions, namely, that the more successful company in a turbulent environment would emphasise destabilising tactics more, while the less successful company would emphasise stabilising tactics more.

Table 6.8: Average importance rating of marketing tactics

TACTICS	TURBULENT / COMPLEX (IT INDUSTRY)				SIMPLE / STABLE (PACKAGING INDUSTRY)			
	Company ITA		Company ITB		Company PA		Company PB	
	Rating	Ranking	Rating	Ranking	Rating	Ranking	Rating	Ranking
Develop new products	2.5	3	5.8	6	2.8	1	7.2	8
Price changing	6.4	6	5.4	5	6.1	6	4.6	4
Product innovation	2.4	2	3.0	2	2.9	2	4.6	4
Sales promotions	6.8	7	6.8	7	8.0	9	5.9	7
Product enhancement	5.6	5	4.0	4	3.6	4	5.1	6
PR/other communication	4.0	4	3.8	3	6.4	7	4.4	3
Media advertising	6.8	7	7.4	8	7.9	8	8.6	9
Personal selling	2.3	1	1.0	1	3.0	3	2.0	1
Distribution	8.4	9	7.8	9	4.4	5	2.4	2

In comparing the two companies in the simple/stable environment (the packaging industry), it can be seen from the *rankings* that the importance they place on the various marketing mix elements is very different. No element is ranked the same, nor do any of them have similar *ratings*. Of the three most important elements for PA, two are destabilising (NP and PI), whereas for PB, all three were stabilising (PS, Distribution (D) and PR). This finding was the reverse of what was expected from the propositions.

These findings are reasonably consistent with the model developed from the literature review and presented in Chapter 7, namely that the more successful IT company would place more emphasis on destabilising tactics (PI and NP), while the less successful company would emphasise stabilising tactics (PS and PR).

Regarding the packaging industry, both rankings and ratings reflect a difference between the two companies. However, these differences are not what were expected. PA tended to stress destabilising tactics ('NP' and 'PI'), while PB preferred stabilising tactics (PS, D and PR) - the opposite of what would be expected according to the proposed model.

6.3.2.3 Multivariate (correspondence) analysis

a) Explanation of the technique

Correspondence analysis is a graphical method aimed at showing, on the same graph, how the rows and columns of a contingency table are related to and between each other. One of the advantages of representation on the same graph is that the geometrical distances on the graph have the same interpretation, which facilitates simultaneous analysis of the rows and columns and the detection of relationships between them (Klerk, 1987).

Correspondence analysis attempts to find a low-dimensional approximation to the original data matrix, creating co-ordinates that determine the variables' positions on the graph (Pietersen and Nieuwoudt, 1995). Two artificial dimensions are created, against which the research variables can be plotted on the same graph. Points close to the origin of the graph are average points, meaning that they do not have characteristics that differentiate from other points, or variables, on the graph. Distances between points of different data sets are not meaningful. However, variables that are close together can be said to have scored similarly, while those that are far apart can be said to have scored differently. This enables the perceived relationship between the variables, in this study the sample companies, the perceptions of the environments and the perceptions of the importance of the marketing tactics, to be simultaneously compared. In addition, the further a variable is from the centre the more distinctive it is, thus highlighting the variable (for example, the marketing tactic) that is most important.

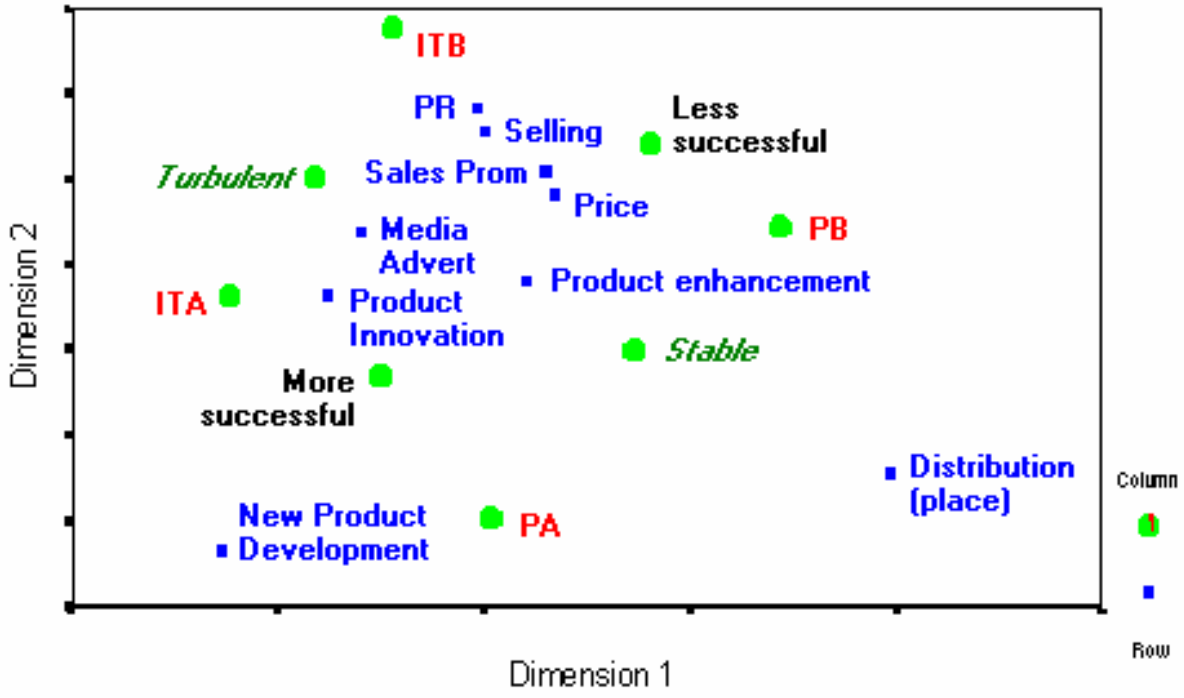
Although the mathematics of correspondence analysis is complex, as a technique it is easy to interpret, is very flexible in application and is convenient for the interpretation of categorical data (Bendixen, 1996). This ease-of-use is obtained in a trade off for accuracy. However, since this is a qualitative study, and since the correspondence analysis is used as evidence to support the qualitative findings, this trade off was felt to be acceptable.

b) Application in the study

The graph in Figure 6.2 was generated by running a correspondence analysis on the marketing tactics' importance rankings as provided by the respondents. Based on the

importance rankings of marketing tactics, it can be seen that the companies in the complex/turbulent environment (ITA and ITB) are located in the opposite quadrant to the companies in the simple/stable environment (PA and PB). The location of the two less successful companies (ITB and PB) is also located in the opposite quadrant to the more successful companies (ITA and PA). Furthermore, each individual company falls in a different quadrant, widely separated from each other.

Figure 6.2: Correspondence analysis – environment, success, company



These locations on the graph confirm the accuracy of the choice of the four companies for the sample as representative of the two research variables, namely level of turbulence and level of success. Each company corresponds to the level of turbulence/stability and to the level of success as expected – this is because the plots of turbulence and success determine the companies' plots. This also supports the choice of the four companies as representatives of the four quadrants in the environment/success matrix. It is also important to note that the four companies are sufficiently widely spaced in opposition to each other, indicating that they are considerably different to each other, thereby also confirming their suitability as representatives of the four quadrants in the turbulence/success matrix.

c) Environment

From the graph it can be seen that companies in the turbulent/complex environment tend to be more associated with 'Public relations' (PR), 'Personal selling' (PS), 'Media advertising'

(MA), and 'Product innovation' (PI). 'New product development (NP), 'Sales promotion' (SP), 'Price changing' (PC) and 'Product enhancement' (PE) do not correspond closely with either turbulent or stable environments, that is, they seem to have equal importance in both environments. 'Distribution' (D) is strongly associated with the stable/simple environment and strongly dissociated from the turbulent/complex environment, as would be expected. Thus a clear pattern differentiating between turbulence and stability according to destabilising or stabilising tactics has not emerged. This is to be expected as it was proposed that the two companies in each environment would use opposite tactics, and so the 'average' which is reflected in the correspondence map should fall mid way between turbulent and stable, as has happened with most of the tactics.

d) Success

The pattern for the relationship between success levels and tactics is more clear-cut. 'New product development' (NP) and 'Product innovation' (PI), both destabilising tactics, are more closely associated with the more successful companies, while 'Public relations' (PR), 'Personal selling' (PS), 'Sales promotion' (SP) and 'Price changing' (PC) are more associated with the less successful companies. 'Media advertising' (MA), 'Distribution' (D) and 'Product enhancement' (PE) fall in between, and thus can be seen as of average importance for all companies. Also of significance is the fact that 'New product development' (NP) is totally dissociated from the less successful companies. It thus appears that 'New product development' (NP) and 'Product innovation' (PI) are significant factors in success. This was not completely as expected from the propositions. It was only expected to be true of the more successful company in the complex/turbulent environment.

e) Intersection of success and turbulence, i.e. individual companies

In comparing the importance of tactics to each individual company, which involves the intersection of environment and success, the following is reflected in the graph:

- ITA are most closely related to 'Product innovation' (PI) and to a lesser extent, to 'Media advertising' (MA). However, if it is compared only to Dimension 1, then it can also be seen to be associated with 'New product development' (NP). Two of these tactics are destabilising, and thus it can be seen that these associations are more or less similar to what was expected from the propositions.
- ITB are most closely associated with 'Public relations' (PR) and with 'Personal selling' (PS). Considering only Dimension 1, ITB are also associated with 'Media advertising' (MA), and to a lesser extent, to 'Product innovation' (PI). These are mostly stabilising

tactics, and so it can be concluded that this relationship is as specified in the propositions.

- PA are not closely associated with any tactics, which is consistent with their maverick image. However, they are most closely associated with 'New product development' (NP), and if only Dimension 1 is considered, they are also associated fairly closely with 'Public relations' (PR) and 'Personal selling' (PS), which was anticipated. Their reasonably close relationship with 'New product development' (NP), however, tends to indicate the opposite of what was expected from the propositions.
- PB are fairly closely associated with 'Distribution' (D). This is contrary to what was expected from the propositions.

In summary, it can be seen that the findings for companies in the turbulent/complex environment are generally consistent with the propositions, but that those for the companies in the stable/simple environment are mostly the opposite of what was proposed.

f) Marketing tactics

A number of interesting findings regarding the interrelationships between the marketing tactics themselves have emerged from the correspondence analysis. First, as could be expected, 'New product development' (NP) and 'Distribution' (D) are furthest apart in proximity, which confirms their positioning on the continuum from most destabilising to most stabilising. Second, 'Public relations' (PR) and 'Personal selling' (PS) were positioned very close to each other on the map, and thus it can be concluded that they are perceived as very similar. This is understandable when it is considered that these are the companies' main promotional tools. Third, 'Sales promotion' (SP) and 'Price changing' (PC) were positioned very close together, again indicating a perception of similarity. This makes intuitive sense, since most respondents saw cutting prices as a form of sales promotion, and the respondents invariably thought of pricing actions when they referred to sales promotion. Furthermore, both of these marketing tactics are destabilising. Fourth, the product development continuum of

New product development (NP) <-> Product innovation (PI) <–> Product enhancement (PE)

is confirmed by the sequential positioning of these tactics on the map. From this analysis it could be possible to group 'Public relations' (PR) and 'Personal selling' (PS) into one tactic, and call it, say, 'Personal communication' (PC), and 'Sales promotion' (SP) and pricing could be classed together and called, say, 'Promotional pricing' (PP). However, it was not the objective to study the tactics themselves in depth, so this opportunity was not researched further.

g) Conclusion to multivariate analysis

Table 6.9 below summarises the findings of the correspondence analysis in terms of the association between the marketing tactics and the variables (environment, success, and intersection or companies). Ticks indicate a close association and crosses indicate no or very low association. Equal signs indicate that the tactic is associated to both extremes of the variable (i.e. to both more and less stable companies), which implies an average association and thus no real difference between the two ends of the variable's continuum. A tick and a cross indicate that there is some association (but not strong) and mostly only based on Dimension 1 in the analysis.

Table 6.9 – Summary conclusions from correspondence analysis

Variable	Turbulent	Stable	More success	Less success	ITA	ITB	PA	PB
New product develop	√X	**X**	√	**X**	√X	**X**	√	**X**
Price change	**=**	√X	**X**	√	**X**	**X**	√X	√X
Product innovation	√	**X**	√	**X**	√	√X	**X**	**X**
Sales promotion	**=**	**=**	**X**	√	**X**	**X**	√X	√X
Product enhancement	**=**	√	**=**	**=**	**X**	**X**	√X	√X
Public relations	√X	**X**	**X**	√	**X**	√	√X	**X**
Media advertising	√	**X**	√X	**=**	√	√	**X**	**X**
Personal selling	√X	**=**	**X**	√	**X**	√	√X	**X**
Distribution	**X**	√	**X**	**?**	**X**	**X**	**X**	√

Although the correspondence analysis has not shown very strong relationships between the turbulent, success, and company variables, and the marketing tactics, it does show sufficient evidence to conclude that the associations for both companies in the turbulent/complex environment seem to be consistent with the propositions related to this environment – that is, ITA are mostly associated with destabilising tactics and ITB are mostly associated with stabilising tactics. The companies in the stable/simple environment both appear to be associated with the opposite of the tactics proposed – both PA and PB seem to be associated with both stabilising and destabilising tactics. Thus, the correspondence analysis confirms the propositions for the turbulent/complex environment, but only partially confirms the propositions for the stable/simple environment.

6.3.2.4 Conclusion to quantitative analysis

The findings of both the bivariate and multivariate analyses were reasonably consistent with the proposed model for the turbulent/complex environment. Regarding the stable/simple environment, both methodologies showed the opposite of what was proposed, although the multivariate analysis also showed some consistency with the proposals. Overall the conclusion seems to be that the model matches the turbulent/complex environment quite well, but matches the stable/simple environment only partially to poorly.

6.4 CONCLUSION TO CHAPTER 6 – ANALYSIS OF DATA

In this chapter the findings from the empirical research have been presented. These include the findings from the interview transcript analysis, the field notes analysis, the documentary evidence analysis, the analysis of word usage, and the quantitative analysis. This last includes the bivariate analysis of the importance ranking of marketing tactics, and the correspondence analysis of the importance ranking of marketing tactics. The findings were discussed in terms of the two environment categories and the levels of success. In addition, the conclusions from these empirical findings were discussed relative to whether they were consistent with the propositions derived from the literature review, or not. Finally, the findings from the different methodologies are now compared in the tables below for each of the companies (intersections of environment and success), to arrive at an overall conclusion from the empirical research. Note that the ticks in the tables indicate that the findings were generally consistent with the propositions, while the crosses indicate that the findings were generally the reverse of what was expected. A cross and a tick appearing together indicate that the findings are ambiguous, some indicating consistency with the propositions, and others indicating the opposite of what was anticipated.

The overall conclusion for ITA, the more successful company in the turbulent/complex environment, is given in Table 6.10 below.

Table 6.10: Overall conclusion for company ITA

Factors	More successful in Turbulent/complex environment (ITA)			
	Interview transcripts	Field notes analysis	Documentary analysis	Summary
Environ & market change	√	√	√	√
Attitude to change	√	√	√	√
General management	√	√	√	√
Business strategy	√	√	√	√
Structure & staff	√	√	√	√
Relationships with customers/suppliers	√X	X	√	√X
Product	√	√	√	√
Price	X	X	X	X
Distribution	√	√	√	√
Promotion	√X	√X	?	√X

The above table shows that, with the exception of pricing and some components of customer/supplier relationships and promotions, the findings confirm, and are consistent with, the proposition that companies in turbulent and complex environments would be more successful if they used more destabilising tactics. The table also supports the assertion that the model developed from the literature review for a more successful company in a turbulent and complex environment is fairly accurate, and also seems to support the belief that the chaos and complexity theories are helpful in understanding this environment.

ITB, the less successful company in the turbulent and complex environment, did not produce results that were as clear-cut. These results are shown in Table 6.11 below.

Table 6.11: Overall conclusion for Company ITB

Factors	Less successful in turbulent/complex environment (ITB)			
	Interview transcripts	Field notes analysis	Documentary analysis	Summary
Environmental & market change	√	√X	√	√
Attitude to change	√	√	√	√
General management	X	√X	√	√X
Business strategy	√	√	√	√
Structure & staff	√	√X	X	√X
Relationships with customers/suppliers	√X	√	√	√
Product	√	√	√	√
Price	X	√	√	√
Distribution	X	√X	√	√X
Promotion	√	√	?	√

The summary in Table 6.11 above shows that, with the exception of some components of general management, structure and staffing, and distribution, the empirical research produced results consistent with the proposition that a less successful company in a turbulent and complex environment is likely to follow more stabilising tactics. This finding, together with the results for ITA on the previous page, seems to indicate that the model developed from the literature review is an accurate reflection of the behaviour necessary for success in a turbulent and complex environment.

An overall conclusion for PA, the more successful company in the stable and simple environment, is provided in Table 6.12 below.

Table 6.12: Overall conclusion for Company PA

Factors	More successful in stable/simple environment (PA)			
	Interview transcripts	Field notes analysis	Documentary analysis	Summary
Environmental & market change	√	√	X	√
Attitude to change	X	X	X	X
General management	X	X	X	X
Business strategy	√X	√X	√ X	√X
Structure & staff	X	√	X	X
Relationships with customers/suppliers	√X	X	√	√X
Product	X	√X	X	X
Price	√	√	√	√
Distribution	√X	√	X	√X
Promotion	√X	√X	√	√X

As can be seen from the large number of crosses, the findings for PA are not consistent with the proposal that a more successful company in a stable and simple market would use predominantly stabilising tactics. This clearly shows that PA use a mix of destabilising and stabilising tactics, with many of the activities being the reverse of what was anticipated, and therefore the findings only partially support the proposition. This finding indicates that either the model as developed is not very accurate for a stable and simple market, or that the packaging market, although the most stable and simple, is sufficiently turbulent and complex to encourage the use of some destabilising tactics.

Finally, the overall conclusions for PB, the less successful company in the stable and simple market are presented in Table 6.13 below.

Table 6.13: Overall conclusion for Company PB

Factors	Less successful in stable/simple environment (PB)			
	Interview transcripts	Field notes analysis	Documentary analysis	Summary
Environmental & market change	X	X	√	X
Attitude to change	X	X	X	X
General management	X	X	X	X
Business strategy	√X	√X	X	√X
Structure & staff	X	X	X	X
Relationships with customers/suppliers	√X	√	X	√X
Product	X	√X	√	√X
Price	X	√	X	X
Distribution	√X	√X	X	√X
Promotion	√	√X	X	√X

The overall findings for PB are similar to those for PA, namely that the model does not accurately reflect behaviour in the stable and simple environment. The large number of crosses indicates that PB tend to behave as a more successful company was expected to behave, namely, using more stabilising tactics and activities. A few components were consistent with the proposition, and so it can be said that there is a partial agreement with the proposition, but overall the model is not a good enough predictor of behaviour in the stable and simple environment.

It is interesting that the behaviour of both the more successful companies is consistent with the behaviour predicted for a more successful company in a turbulent and complex environment, while the behaviour of both the less successful companies is consistent with the behaviour predicted for a less successful company in turbulent and complex environment. This seems to indicate one of two things:

- the packaging industry, and therefore the whole South African environment, can be considered turbulent and complex, in which case the model could be said to apply well to such turbulent and complex environments,

- the behaviour proposed by the model is predictive of success regardless of the level of turbulence and complexity of the environment. In other words, more destabilising tactics are more likely to lead to market success than are stabilising tactics.

The overall findings presented above seem to be supported and confirmed by the more quantitative conclusions. The correspondence analysis, for example, shows that both the two more successful companies are associated with the more destabilising activities of 'New product development' (NP) and 'Product innovation' (PI), while the two less successful companies are partially associated with stabilising tactics like 'Public relations' (PR), 'Personal selling' (PS), and 'Distribution' (D).

The use of chaos/complexity and change-oriented words was greater in both the more successful companies than in the two less successful companies, as was the use of stability/order related words. This seems to indicate that a greater awareness of the environment, its turbulence and complexity, and the necessity to attempt to cope with such turbulence and complexity, could be a key factor in achieving success. This awareness is what is important regardless of the nature of the environment, but especially when the environment is turbulent and complex.

These conclusions will be interrogated in more detail and compared to the marketing mix model, developed from the literature review, in the next chapter, which will concentrate on a more in-depth interpretation of these findings. The trustworthiness of these findings, and whether they support or reject the propositions, will be discussed in Chapter 8.

CHAPTER 7 – INTERPRETATION OF FINDINGS

7.1 INTRODUCTION

In this chapter the intention is to compare the outputs of the literature review, covered in Chapters 2 to 4, to the empirical findings covered in chapter 6, in order to meet the overall aim of this research study. The overall aim was to understand how South African companies operating in a complex and turbulent environment differ in their use of marketing tactics from those who operate in a simpler and more stable environment. In order to achieve this overall aim, three research objectives were set. These were:

- to develop a model of the marketing mix tactics that could be expected to be found in companies operating in complex and turbulent environments,
- to identify any differences in the marketing mix tactics between companies operating in complex/turbulent industries and those operating in simple/stable industries,
- to investigate the relationship between the different types of marketing mix tactics mentioned above and marketing success in complex and turbulent industries,

To achieve the first objective, a model of the marketing tactics suggested by the literature review for success by a company operating in a complex and turbulent market was developed. The chapter will start with a presentation and discussion of this model.

To achieve the second objective, the marketing tactics identified from the empirical study will be compared. Differences will be identified by comparing the two companies from the same industry to the model developed for success in that industry. This means that ITA and ITB will be compared to the model developed for success in the complex and turbulent environment. PA and PB will be compared to the model developed for success in the simple and stable environment. These comparisons will clearly identify differences or similarities between the companies' marketing mixes.

Regarding the third objective, the above comparisons will also highlight the marketing tactics that are associated with the more successful company. Furthermore, differences between the two companies in the mix of their marketing tactics, as identified for Objective two, will be

evidence of a relationship between the identified marketing mix and marketing success in a complex and turbulent environment.

The comparison of the marketing mix model identified for the first objective to the empirically identified marketing mixes for the second and third objectives will also confirm whether chaos and complexity theory is a good basis for determining marketing tactics in a complex and turbulent environment.

7.2 THE CHAOS AND COMPLEXITY BASED MARKETING MIX MODEL

This section will present the model of the marketing mix tactics (Model 1) that was derived from the analysis of the literature review in Section 4.3.1 in chapter 4. The model specifies the mix of marketing tactics that the literature suggests are most suited to achieving success in a complex and turbulent environment. If this model is suited to a success in a complex and turbulent environment, it can logically be induced that the opposite would be required for a more successful company in a simple and stable environment. Therefore a model was also developed (Model 2), based on this induction and the relevant literature, for the marketing tactics that could be expected of a more successful company in a simple and stable environment.

It can, furthermore, be induced that a less successful company in a complex and turbulent environment would be less successful because it does not adhere to the tactics specified in the model for success in a complex and turbulent environment. This implies, therefore, that a less successful company in a complex and turbulent environment would adopt the tactics of a more successful company in a simple and stable environment. The same reasoning can be applied to a less successful company in a simple and stable environment. Therefore, it is not necessary to develop models for the less successful companies. This conclusion is illustrated in the following table.

Table 7.1: Application of models

	More successful	**Less successful**
Complex/turbulent environment	Model 1	Model 2
Simple/stable environment	Model 2	Model 1

These two models will be presented in the tables below. The first component of the model, the product component of the marketing mix, is reflected in Table 7.2 below.

Table 7.2: Product component of the chaos/complexity marketing mix models

	Model 1 More success in complex/turbulent environment	Model 2 More success in simple/stable environ.
NPD planning	Short-term planning and short programming of launch steps. Involve customers in process	Longer-term planning with launch programmed over longer period
Range change	Increasing ranges due to continuous new products, destabilising markets	Static or simplified product ranges.
Culling of products	Slow sellers/losing products must be culled to avoid a drain on company resources.	Maintain older, established products
Product innovation	Use to destabilise market. Lots of trials leading to stream of new products – create the future by concentrating on latent customer needs. Make own products obsolete to avoid rigid competencies.	Minimum innovation, experimentation. Concentration on patent customer needs.
OPD or product enhancement	Innovatively improve current products to offset uncertainty, cost and difficulty of launching new products	Enhance old products when pushed to by competitors/ customers.
Product customisation	Individual, local needs met through enlarged ranges of customised products. Unique, personalised products in many permutations. All aspects of product customised.	Tendency to standardised products, with little customisation.
Speed of product development	Must be very fast to bring product to market before competitors, and before needs change. Short lead times with fast feedback loops needed because of short PLC. Need to launch and establish new product quickly. Critical to respond quickly to market changes.	Slow, considered development or response to environmental changes.
Product design /flexibility	Flexible to handle environmental shifts and late design changes. Able to set design specs late in process.	Little flexibility. Design specs set early and changes discouraged.
Branding	Strong branding critical to quickly convey image, but also to maintain long-term communication stability in a rapidly changing, destabilised market.	Important for product recognition over longer term – maintain *status quo.*
Importance of product	Critical and often the basis of destabilisation. Other mix actions determined by product tactics.	Basis of mix, but not significantly more important.

The above product components of the models show that a complex and turbulent environment requires a quick, innovative, flexible marketer who develops products personalised to each consumer before the consumer is aware of the need.

The price component of the model is presented in Table 7.3 below.

Table 7.3: Price component of the chaos/complexity marketing mix models

	Model 1 **More success in complex/turbulent environment**	**Model 2** **More success in simple/stable environment**
Aggressive pricing	Aggressive price promotions especially in hostile competition and price focussed markets.	Less aggressive pricing, not used as a proactive strategy. Aiming at maintaining status quo.
Price leadership	Lead the market in initiating price changes, price-cutting and generally different pricing policies.	Price follower. Does not initiate price changes.
Innovation in pricing	Novel and unexpected pricing, including price differentials, payment schemes and discount structures.	Standard pricing methods, following the industry techniques.
Price setting	Complex and sophisticated methods to customise prices. Integrate with other tactics and the supply chain. Flexible to adapt to changes in the environment.	Follows simple standard pricing methods, without much variation. Pricing not obviously integrated with other tactics.
Price premium	Price premiums obtained via customer's inability to assess costs, quality and value as bases for negotiation.	Price premiums not obtained. Customers often negotiate prices down.
Importance of pricing	Important because of its visibility and its ability to communicate messages to the market and stimulate word-of-mouth.	Pricing important, but only to cover costs, achieve profit – not for strategic reasons.

Table 7.3 shows that proactive pricing policies are needed in a complex and turbulent market. Pricing is not merely to ensure profitability, but should also be used to destabilise the market and in support of the other marketing mix tactics.

The following table presents the place or distribution components of the chaos/complexity marketing mix model.

Table 7.4: Place component of the chaos/complexity marketing mix models

	Model 1 More success in complex/turbulent environment	Model 2 More success in simple/stable environment
Changes in the channel	Treat supply chain as a single system. If change needed, should be implemented	Change in the channel avoided. Attempt to maintain stability.
Use of intermediaries	Reduction of intermediaries. Deal more with end users.	Distribution done through traditional channel members/ intermediaries
Partnerships/alliances	Use of partnerships and strategic alliances, with blurring of boundaries and roles. Staff working on customer or supplier site. Shared info and systems.	More arms length relationships – not integrated partnerships.
Physical distribution	Quick delivery to reduce need for inventory – often same day delivery.	Delivery important but within traditional lead times.
Stock levels	Inventory load shared throughout the supply chain. Quick response and integrated computer systems	Carry own buffer stocks and maintain responsibility for stock levels to achieve supply rates.
Stock replenishment	Short-term management with reaction to trading demand based on end user demand info rather than immediate customer demand.	Based on long-term predictions to reduce uncertainty. Forecast stock levels based on immediate customer demand. Hold buffer inventory to cater for uncertainty.
Importance of place	Important but seen as a 'given'. The overall system copes with the environmental turbulence.	Seen as critical to success.

Table 7.4 indicates that the place component needs to be managed in a specific way in a complex and turbulent environment, namely by seeing it as part of the overall supply chain. Therefore, all place activities are integrated with customers and suppliers and as such the place component is seen as an infrastructural issue. Although place is important, it is not seen as a critical activity for the application of marketing tactics for the coping with environmental complexity and turbulence.

The final component of the chaos/complexity marketing mix model, promotion, is reflected in Table 7.5 below.

Table 7.5: Promotion component of the chaos/complexity marketing mix models

	Model 1 More success in complex/turbulent environment	Model 2 More success in simple/stable environment
Media advertising	Pulsed advertising campaign, pioneering, competitive or product oriented. Comparative advertising disrupts consumers' beliefs about competitors. Creative, amazing campaigns to create controversy, shift perceptions and change 'rules of the game.'	Continuous, conservative, defensive advertising – image or institutional adverts. Acts as barrier to entry and builds brand loyalty. Heavy spending reduces importance of rest of mix, reducing volatility.
Personal selling	Although obviously needed it is seen as relatively unimportant for destabilising in turbulent market	Strong customer-rep relationships stabilise by building loyalty. Good rep knowledge. Relationship to company and not only to rep needed.
Public relations	Although less important, small PR activities can nudge the system towards destabilisation	Important for providing info to build customer loyalty, strengthen relationships, and thus stabilise.
Sales promotions	If used with price promotions are effective and can destabilise. The more unusual the better. Minor promotions or changes can lead to significant impacts. More effective than advertising in turbulent markets.	Stabilising when following theme, thus building relationships – direct marketing used through use of personalised communications – difficult to disrupt and provide quick feedback – e.g. loyalty programmes
Word of mouth	Continuously encourage word-of-mouth. Use 'influence-the-influencer' promotions, e.g. give free or low priced products to opinion leaders. Spread info about new, amazing aspects of product, use multiplier channels like Internet, discussion groups.	Although always important, is not as effective in stable market, due to fewer network links, innate conservatism, and less dramatic issues to generate interest.
Aggressive use of promotions	Aggressive use enables trends to be nudged and advantage to be taken of turbulence	Promotions be more conservative and used to build and maintain relationships, i.e. not aggressive.
Speed of change of promotions	To be unusual and surprising, campaigns should be short-term, and changed frequently.	Promotions are longer-term, themed, and not changed too quickly – allow market to build relationship with the campaign
Importance of promotions	Promotions are important to manage the system via the nudge effect, but are less effective in trying to make major changes	Very important for maintaining stability through building relationships, loyalty and countering competitors disruptive actions

Table 7.5 above shows that promotions are important in both complex/turbulent and simple/stable environments, but for different reasons and different types of promotional activities are important in the different environments. In the complex turbulent environment, aggressive sales promotions (linked to price promotions) and word-of-mouth advertising are effective, while in simple/stable environments image advertising and personal selling are most effective. In both environments public relations and sales promotions can be effective, but applied in different ways.

In conclusion, this section has developed a model of the marketing mixes that would be anticipated in more successful and less successful companies in complex/turbulent and simple/stable environments, thereby meeting the requirements of objective one. It can be seen from the model in the four tables that marketing tactics should be applied differently in the two environments in order to increase the likelihood of marketing success. In order to test this model empirically, the findings from the empirical study, as reflected in Chapter 6 of this report, will be compared against the model in the next section.

7.3 COMPARISON OF QUALITATIVE FINDINGS TO THE MODEL

In order to assess the accuracy and applicability of this model it was necessary to compare it to the actual marketing mix activities applied by companies in complex/turbulent and simple/stable environments, especially in South Africa. Therefore, in this section the qualitative findings for each of the more successful and less successful companies in the two environments will be compared to the model relevant to their environment, namely Model 1 for the complex/turbulent companies and Model 2 for the simple/stable companies.

7.3.1 More successful company in complex/turbulent environment

The tables that follow reflect the comparisons of the empirical qualitative findings for the more successful company in the complex and turbulent environment (ITA) against Model 1 – the suggested tactics for success in a complex and turbulent environment. The comparisons were assessed for the closeness of matching and allocated a ‘yes’ for a close match, a ‘partial’ for a partial match and a ‘no’ for a poor or no match. In addition, a score of 2 was allocated to each ‘yes’, a 1 for each ’partial’ and a 0 for each ‘no’. These were then summed for each tactic for each company and converted to a percentage. These percentages were

used to draw conclusions as to the overall match of a company's marketing tactics to the relevant model.

It should be noted that ITA would be expected to have a high percentage match to Model 1, while ITB were expected to have a low percentage match, as they would be expected to perform contrary to ITA. Similarly, PA were expected to have a high percentage match to Model 2, but PB should have a low percentage match.

The first table reflects the findings related to the product component of the marketing mix.

Table 7.6: Comparison of ITA to Model 1 - Product

	More success in complex/turbulent environment		Match
	Model 1	**Company ITA**	
NPD planning	Short-term planning and short programming of launch steps. Involve customers in process	Plan carefully over short time period	Yes
Range change	Increasing ranges due to continuous new products, destabilising markets	Increasing, bigger than competitors, especially software.	Yes
Culling of products	Slow sellers/losing products must be culled to avoid a drain on company resources.	Only if have new product to replace the old product	Partial
Product innovation	Use to destabilise. Lots of trials and experiments leading to stream of new products – create future by concentrating on latent customer needs. Obsolete own products to avoid rigid competencies.	Develops ahead of market, with early market entry, drives innovation in its market.	Yes
OPD or product enhancement	Innovatively improve current products to offset uncertainty, cost and difficulty of launching new products	Constantly upgraded, but not important, but must be done	Partial
Product customisation	Individual, local needs met through enlarged ranges of customised products. Unique, personalised products in many permutations. All aspects of product customised.	Customise to customer's needs, with customer deeply involved in process.	Yes
Speed of product development	Very fast to bring product to market before competitors and before needs change. Short lead times and fast feedback loops needed because of short PLC. Need to launch and establish new product quickly. Critical to respond quickly to market changes.	Everything done quickly, faster than competitors	Yes
Product design /flexibility	Flexible to handle environmental shifts and late design changes. Able to set design specs late in process.	Fairly flexible via continual improving and developing. Customer pays for changes.	Partial
Branding	Strong branding critical to quickly convey image, but also to maintain long-term communication stability in a rapidly changing, destabilised market.	Not very strong – only for corporate image.	No
Importance of product	Critical. Often basis of destabilisation. Other mix actions determined by product tactics.	Important	Yes

It was expected that ITA's product tactics would match Model 1 very closely. A perfect match would be shown by ten 'yeses' in the last column, which summarise the comparisons. The comparisons in the table above indicate that ITA's approach to product tactics matches Model 1 very closely. This is further shown by the six 'yeses', three 'partials' and only one 'no' in the last column, giving a summed score of 75.0% - a close match.

The next table shows how ITA's approach to price tactics matches the tactics recommended in Model 1.

Table 7.7: Comparison of ITA to Model 1 - Price

	More success in complex/turbulent environment		Match
	Model 1	**Company ITA**	
Aggressive pricing	Aggressive price promotions especially in hostile competition and price focussed markets.	Not used, emphasise value for money. May use situationally to win a specific customer.	No
Price setting	Complex and sophisticated methods to customise prices. Integrate with other tactics and the supply chain. Flexible to adapt to changes in the environment.	Fairly standardised methods used – simple and easy to understand. Prices differ because all projects differ.	No
Innovation in pricing	Novel and unexpected pricing, including price differentials, payment schemes and discount structures.	Standardised methods so not innovative.	No
Price premium	Price premiums obtained via customer's inability to assess costs, quality and value as bases for negotiation.	Get a price premium because offer high product value.	Yes
Price leadership	Lead the market in initiating price changes, price-cutting and generally different pricing policies.	Not price leader – prices determined by principals and the market.	No
Importance of pricing	Important because of its visibility and its ability to communicate messages to the market and stimulate word-of-mouth.	Not seen as an important tactic to be used proactively to effect the market	No

The above table shows that ITA do not match the model with regard to their pricing tactics. Five 'no's' and only one 'yes' provide a summed score of 16.7% indicating a very weak match to the model. In other words, ITA perform like a less successful company in terms of their pricing tactics.

The next table will compare ITA's place tactics to those suggested by Model 1.

Table 7.8: Comparison of ITA to Model 1 - Place

	More success in complex/turbulent environment		Match
	Model 1	**Company ITA**	
Use of intermediaries	Reduction of intermediaries. Deal more with end users.	Mostly direct with users. Few intermediaries used, only in selected markets.	Yes
Partnerships/alliances	Use of partnerships and strategic alliances, with blurring of boundaries and roles. Staff working on customer or supplier site. Shared info and systems.	Partnership and strategic alliance collaboration used extensively, including with competitors.	Yes
Physical distribution	Quick delivery to reduce need for inventory – often same day delivery.	No buffer stocks - so quick delivery and just in time logistics are important.	Yes
Stock levels	Inventory load shared throughout the supply chain. Quick response and integrated computer systems	No stocks – order for specific job, so must manage supply carefully.	Partial
Stock replenishment	Short-term management with reaction to trading demand based on end user demand info rather than immediate customer demand.	Ordering based on need for specific job, so no long-term stock planning or replenishment	Partial
Importance of place	Important but seen as a 'given'. The overall system copes with the environmental turbulence.	Important for material supply, but not overall, as it is a 'service' business.	Partial

The above table shows that ITA match the model fairly closely with regard to their place tactics. Three 'yeses' and three 'partials' provide a summed score of 75%, indicating that ITA perform closely to what was expected of a successful company' place tactics.

The next table will compare ITA's promotional tactics to those suggested by Model 1.

Table 7.9: Comparison of ITA to Model 1 - Promotion

	More success in complex/turbulent environment		Match
	Model 1	**Company ITA**	
Public relations	Although less important, small PR activities can nudge the system towards destabilisation	Extensive use, including customer events and press publicity – formally planned.	No
Media advertising	Pulsed advertising campaign, pioneering or competitive, and mainly product oriented. Comparative advertising disrupts consumers' beliefs about competitive brands. Creative, shocking or amazing campaigns to create controversy, shift perceptions and change 'rules of the game.'	Limited use of corporate image advertising and some advertising in support of PR events.	No
Sales promotions	If used with price promotions they are effective and can destabilise. The more unusual the better. Minor promotions or changes can lead to significant impacts. More effective than advertising in turbulent markets.	Not used	No
Personal selling	Although obviously needed it is seen as relatively unimportant for destabilising in turbulent market	Critical to success, but not as knowledgeable as they should be.	No
Word of mouth	Continuously encourage word-of-mouth. Use 'influence-the-influencer' promotions, e.g. give free or low priced products to opinion leaders. Spread info about new, amazing aspects of product and use multiplier channels like Internet and discussion groups.	Very important. Aware of role promotions can take in promoting it and do try to generate it, but such promotion not formalised.	Yes
Aggressive use of promotions	Aggressive use enables trends to be nudged and advantage to be taken of turbulence	Aware of role promotion can play in destabilising market and used subtly, not aggressively.	Partial
Speed of change of promotions	To be unusual and surprising, campaigns should be short-term, and changed frequently.	Promotional activities not changed much, so seem slow to change.	No
Importance of promotions	Promotions are important to manage the system via the nudge effect, but are less effective in trying to make major changes	Not seen as very important in general.	Partial

The above table shows that ITA have a weak match to the model with regard to their promotional tactics. Five 'no's', two 'partials' and only one 'yes' provide a summed score of 25%, indicating a poor match to the model. Therefore, ITA perform like a less successful company in terms of their promotional tactics. In other words, they tend to use promotional tactics to stabilise their market rather than to create instability.

In concluding this section it can be seen that ITA partially match Model 1 with a total summed score of 50%. The product tactics match the model closely and the place tactics match quite closely. However, the price tactics do not match and the promotional tactics have only a weak match. Therefore, it can be concluded that Model 1 is partially descriptive of the marketing tactics of a successful company in a complex and turbulent environment.

7.3.2 Less successful company in complex/turbulent environment

The tables that follow reflect the comparisons of the empirical findings for the less successful company in the complex and turbulent environment (ITB) against Model 1.

The first table reflects the findings related to the product component of the marketing mix. It should be noted that it is expected that a less successful company in a complex and turbulent market would not match the tactical profile represented by Model 1.

Table 7.10: Comparison of ITB to Model 1 - Product

	More success in complex/turbulent environment		Match
	Model 1	**Company ITB**	
NPD planning	Short-term planning and short programming of launch. Involve customers in process	Plan carefully over longer time period	No
Range change	Increasing ranges due to continuous new products, destabilising markets	Increasing range, esp. in software packages.	Yes
Culling of products	Slow sellers/losing products must be culled to avoid a drain on company resources.	Tend to keep all products and not cull	No
Product innovation	Use to destabilise. Lots of trials and experiments leading to stream of new products – create future by concentrating on latent customer needs. Obsolete own products to avoid rigid competencies.	Less innovative, new developments driven by customers. Tend to follow the market, customers, and competitors.	No
OPD or product enhancement	Innovatively improve current products to offset uncertainty, cost and difficulty of launching new products	Continuous enhancements a main tactic.	Yes
Product customisation	Individual, local needs met through enlarged ranges of customised products. Unique, personalised products in many permutations. All aspects of product customised.	Customise to customers' needs, with customers deeply involved in process.	Yes
Speed of product development	Very fast to bring product to market before competitors, and before needs change. Short lead times with fast feedback loops needed because of short PLC. Need to launch and establish new product quickly. Critical to respond quickly to market changes.	Slower, following market – controlled development	No
Product design /flexibility	Flexible to handle environmental shifts and late design changes. Able to set design specs late in process.	Some flexibility, but discouraged – customer must pay for changes	Partial
Branding	Strong branding critical to quickly convey image, but also to maintain long-term communication stability in a rapidly changing, destabilised market.	Not very strong – only for corporate image.	No
Importance of product	Critical and often the basis of destabilisation. Other mix actions determined by product tactics.	Important	Yes

It was expected that ITB would not match Model 1 very closely. A perfect mismatch would be shown by ten 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that ITB's approach to product tactics partially matches Model 1, with a summed score of 45%. The five 'no's', one 'partial' and four 'yeses' indicates that the match is rather weak, which is fairly close to what was expected.

The next table shows how ITB's approach to price tactics matches the tactics identified in Model 1 for success in a complex/turbulent environment.

Table 7.11: Comparison of ITB to Model 1 - Price

	More success in complex/turbulent environment		Match
	Model 1	**Company ITB**	
Aggressive pricing	Aggressive price promotions especially in hostile competition and price focussed markets.	Not used. Would use situationally to win a specific customer.	No
Price setting	Complex and sophisticated methods to customise prices. Integrate with other tactics and the supply chain. Flexible to adapt to changes in the environment.	Standardised method used but prices differ because of different service levels – simple and easy to understand.	No
Innovation in pricing	Novel and unexpected pricing strategies, including price differentials, payment schemes and discount structures.	Does use innovative methods to cope with changed market requirements.	Yes
Price premium	Price premiums obtained due to customer's inability to assess costs, quality and value as bases for negotiation.	No price premium – often must accept negotiating price down to get business	No
Price leadership	Lead the market in initiating price changes, price-cutting and generally different pricing policies.	Not price leader – prices determined by market practices.	No
Importance of pricing	Important because of its visibility and its ability to communicate messages to the market and stimulate word-of-mouth advertising.	Not seen as an important tactic to be used proactively to effect the market	No

It was expected that ITB's pricing tactics would not match Model 1 very closely. A perfect mismatch would be shown by six 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that ITB's approach to price tactics does not match Model 1. The five 'no's', one 'yes' provide a summed score of only

16.7% indicating that the match is very weak, which is very close to what was expected for a less successful company in a complex and turbulent environment.

The next table shows how ITB's approach to place tactics matches the tactics identified in Model 1 for success in a complex/turbulent environment.

Table 7.12: Comparison of ITB to Model 1 - Place

	More success in complex/turbulent environment		Match
	Model 1	**Company ITB**	
Use of intermediaries	Reduction of intermediaries. Deal more with end users.	No use of intermediaries	Yes
Partnerships/alliances	Use of partnerships and strategic alliances, with blurring of boundaries and roles. Staff working on customer or supplier site. Shared info and systems.	Few partnerships/ alliances, although seen as becoming important.	No
Physical distribution	Quick delivery to reduce need for inventory – often same day delivery.	Physical distribution of people to jobs geographically is difficult and therefore important.	Partial
Stock levels	Inventory load shared throughout the supply chain. Quick response and integrated computer systems	No stock carried as deal in services	No
Stock replenishment	Short-term management with reaction to trading demand based on end user demand info rather than immediate customer demand.	No stock carried as deal in services	No
Importance of place	Important but seen as a 'given'. The overall system copes with the environmental turbulence.	Little importance placed on distribution	Partial

It was expected that ITB's place tactics would not match Model 1 very closely. A perfect mismatch would be shown by six 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that ITB's approach to place tactics do not match Model 1 very closely. The three 'no's', one 'yes' and two 'partials' give a summed score of 33.3%, indicating that the match is rather weak, which is very close to what was expected for a less successful company in a complex and turbulent environment.

The next table shows how ITB's approach to promotional tactics matches the tactics identified in Model 1 for success in a complex/turbulent environment.

Table 7.13: Comparison of ITB to Model 1 - Promotion

	More success in complex/turbulent environment		Match
	Model 1	**Company ITB**	
Public relations	Although less important, small PR activities can nudge the system towards destabilisation	Limited use of customer events, in unfocussed way	Yes
Media advertising	Pulsed advertising campaign, pioneering or competitive, and mainly product oriented. Comparative advertising disrupts consumers' beliefs about competitive brands. Creative, shocking or amazing campaigns to create controversy, shift perceptions and change 'rules of the game.'	Not used	No
Sales promotions	If used with price promotions are effective and can destabilise. The more unusual the better. Minor promotions or changes can lead to significant impacts. More effective than advertising in turbulent markets.	Not used	No
Personal selling	Although obviously needed it is seen as relatively unimportant for destabilising in turbulent market	Critical to success, with reps very knowledgeable	No
Word of mouth	Continuously encourage word-of-mouth. Use 'influence-the-influencer' promotions, e.g. give free or low priced products to opinion leaders. Spread info about new, amazing aspects of product; use multiplier channels like Internet, discussion groups.	Very important. Aware of role promotions can take in promoting it and do try to generate it, but such promotion not formalised.	Yes
Aggressive use of promotions	Aggressive use enables trends to be nudged and advantage to be taken of turbulence	Not aggressive, although think it might not be a bad idea.	No
Speed of change of promotions	To be unusual and surprising, campaigns should be short-term, and changed frequently.	Promotional activities not changed, so seem slow to change.	No
Importance of promotions	Promotions are important to manage the system via the nudge effect, but are less effective in trying to make major changes	Generally seen as less important – used to stabilise the market	No

It was expected that ITB's promotional tactics would not match Model 1 very closely. A perfect mismatch would be shown by eight 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that ITB's approach to promotional tactics do not match Model 1 very closely. The six 'no's' and two 'yeses' provide a summed score of 25%, indicating a weak match to what was expected for a less successful company in a complex and turbulent environment.

In concluding this section it can be seen that ITB's tactical mix does not match Model 1, which is what was anticipated. All four tactical components are weak matches to Model 1, with the price component being very weak. The total summed score for ITB is 31.7%, again indicating a weak match. Therefore, it can be concluded that a less successful company in a complex and turbulent environment uses marketing tactics contrary to the way suggested in Model 1, as was expected.

7.3.3 More successful company in simple/stable environment

The tables in this section reflect the comparisons of the empirical findings for the more successful company in the simple and stable environment (PA) against Model 2 – the suggested tactics for success in a simple and stable environment.

The first table reflects the findings related to the product component of the marketing mix.

Table 7.14: Comparison of PA to Model 2 – Product

	More success in simple/stable environment		Match
	Model 2	**Company PA**	
NPD planning	Longer-term planning with launch programmed over longer period	Short-term – six months.	No
Range change	Static or simplified product ranges.	Increasing through offering more options.	No
Culling of products	Maintain older, established products	Prepared to cull. Will then develop replacement.	No
Product innovation	Minimum innovation, experimentation. Concentration on patent customer needs.	Very innovative, doing things differently. Test/ experiment to stay ahead of competitors. Lead market.	No
OPD or product enhancement	Enhance existing products when pushed to by competitors or customers.	Continual improvement, but of marginal importance – NPD more important.	Partial
Product customisation	Tendency to standardised products, with little customisation.	Customise as develop products to customer specifications.	No
Speed of product development	Slow, considered development or response to environmental changes.	Faster than market in developing new products.	No
Product design /flexibility	Little flexibility. Design specs set early and changes discouraged.	Very flexible, change at last minute with no penalty for customer.	No
Branding	Important for product recognition over longer term – maintain status quo.	Corporate branding, but not emphasised much.	No
Importance of product	Basis of mix, but not significantly more important.	Of major importance – basis of its strategy.	Partial

It was expected that PA's product tactics would match Model 2 very closely. A perfect match would be shown by ten 'yeses' in the last column, which summarise the comparisons. The comparisons in the table above indicate that PA's approach to product tactics is an almost perfect mismatch, with a summed score of only 10%. This is shown by the eight 'no's' and two 'partials' in the last column.

The price component of the model is presented in Table 7.15 below.

Table 7.15: Comparison of PA to Model 2 - Price

	More success in simple/stable environment		Match
	Model 2	**Company PA**	
Aggressive pricing	Less aggressive pricing, not used as a proactive strategy. Aiming at maintaining status quo.	Conservative pricing – use to stabilise. Avoids price cutting.	Yes
Price leadership	Price follower. Does not initiate price changes.	Leader in its niche, but price changes prompted by supplier price changes.	No
Innovation in pricing	Standard pricing methods, following the industry techniques.	Standardised pricing methods, but does lead the market in setting the standards	Partial
Price setting	Follows standard, simple pricing methods, without much variation. Pricing not obviously integrated with other tactics.	Fairly simple with a cost based standardised approach not flexible.	Yes
Price premium	Price premiums not obtained. Customers often negotiate prices down.	Does get price premiums, in its niche. Prices not negotiated down.	No
Importance of pricing	Pricing important, but only to cover costs, achieve profit – not for strategic reasons.	Less important because of emphasis on value and quality.	Yes

The above table shows that PA match the model fairly closely with regard to their pricing tactics. Three 'yeses', a 'partial' and two 'no's' give a summed score of 58.3%, indicating that PA perform fairly closely to how a more successful company in a simple and stable environment would be expected to behave.

The following table presents the place, or distribution, components of the chaos/complexity marketing mix model.

Table 7.16: Comparison of PA to Model 2 - Place

	More success in simple/stable environment		Match
	Model 2	**Company PA**	
Use of intermediaries	Distribution done through traditional channel members/ intermediaries	Generally not used except for transport and minor commission agents.	No
Partnerships/alliances	More arms length relationships – not integrated partnerships.	Only a few informal partnerships and co-operation.	Yes
Physical distribution	Delivery important but within traditional lead times.	Important, but only to get product to customer.	Yes
Stock levels	Carry own buffer stocks and maintain responsibility for stock levels to achieve supply rates.	Keep stocks low. Mostly make to order. Suppliers keep stock.	No
Stock replenishment	Based on long-term predictions to reduce uncertainty. Forecast stock levels based on immediate customer demand. Hold buffer inventory to cater for uncertainty.	Planned according to customer stock levels and orders. Fairly short-term.	No
Importance of place	Seen as critical to success.	Important, but a basic necessity rather than a tactical weapon.	Partial

The above table shows that PA do not match the model very closely with regard to their place tactics. Two 'yeses', a 'partial' and three 'no's' provide a summed score of 41.7%, indicating that PA do not perform much as was expected of a successful company in a simple and stable environment, in terms of their place tactics.

The final component of the chaos/complexity marketing mix model, promotion, is reflected in Table 7.17 below.

Table 7.17: Comparison of PA to Model 2 - Promotion

	More success in simple/stable environment		Match
	Model 2	**Company PA**	
Media advertising	Continuous, conservative, defensive advertising – image or institutional adverts. Acts as barrier to entry and builds brand loyalty. Heavy spending reduces importance of rest of mix, reducing volatility.	Unimportant – limited and ad hoc in trade journals and directories.	No
Personal selling	Strong customer-rep relationships stabilise by keeping customer loyalty. Good rep knowledge and tying relationship to company and not only to rep needed.	Very important. Knowledgeable reps.	Yes
Public relations	Important for providing info to help build customer loyalty, strengthen relationships, and thus stabilise situation	Important – entertaining and networking customers, but unfocussed and unplanned.	Yes
Sales promotions	Can be stabilising when following theme, thus building relationships – direct marketing also used in this way through use of personalised communications – difficult to disrupt and provide quick feedback – e.g. smart cards, loyalty programmes	Not used	No
Word of mouth	Although always important, is not as effective in stable market, due to fewer network links, innate conservatism, and less dramatic issues to generate interest.	Very important, but not proactively sought. Is aware of PR activities that encourage it.	Partial
Aggressive use of promotions	Promotions should be more conservative and used to build and maintain relationships, i.e. not aggressive.	Conservative, low key, not disruptive, relationship building	Yes
Speed of change of promotions	Promotions should be longer-term, themed, and thus must not be changed too quickly – allow market to build relationship with the campaign	Changed regularly. Does not keep same promotions over long time period.	No
Importance of promotions	Very important for maintaining stability through building relationships, loyalty and countering competitors disruptive actions	Little importance. Only to spread company name in industry.	No

The above table shows that PA have a partial match to the model with regard to their promotional tactics. Four 'no's', three 'yeses' and one 'partial' providing a summed score of

43.8%, indicating that PA perform partly like a less successful company and partly like a more successful company in terms of their promotional tactics.

In concluding this section, it can be seen that PA's tactical mix does not match Model 2 very closely. Three tactical components are weak to fair matches, with the product component being an almost total mismatch. The total summed score of only 35.0% confirms this finding. Therefore, it can be concluded that the more successful company in the simple and stable environment uses marketing tactics partly in the way expected and partly in a way not expected.

7.3.4 Less successful company in simple/stable environment

The tables in this section reflect the comparisons of the empirical findings for the less successful company in the simple and stable environment (PB) against Model 2 – the suggested tactics for success in a simple and stable environment. It should be noted that it is expected that PB will not match the suggested tactics in Model 2.

The first table reflects the findings related to the product component of the marketing mix.

Table 7.18: Comparison of PB to Model 2 – Product

	More success in simple/stable environment		Match
	Model 2	**Company PB**	
NPD planning	Longer-term planning with launch programmed over longer period	Little planning done – react to pressures from the market and environment.	No
Range change	Static or simplified product ranges.	Decrease in traditional market, but overall increasing because of diversification.	Partial
Culling of products	Maintain older, established products	Products not culled – kept until customer deletes them.	Yes
Product innovation	Minimum innovation, experimentation. Concentration on patent customer needs.	Little NPD – follows customers.	Yes
OPD or product enhancement	Enhance existing products when pushed to by competitors or customers.	Marginal importance – improve products at request of customers.	Yes
Product customisation	Tendency to standardised products, with little customisation.	Some customisation, as products made to customer's specifications.	No
Speed of product development	Slow, considered development or response to environmental changes.	Development is slow, but production delivery is fast.	Yes
Product design /flexibility	Little flexibility. Design specs set early and changes discouraged.	Reluctant to make changes – fear of slowing process – therefore not flexible.	Yes
Branding	Important for product recognition over longer term – maintain status quo.	Corporate branding for image purposes only – not too important.	No
Importance of product	Basis of mix, but not significantly more important.	Core of its business but not emphasised significantly.	Yes

It was expected that PB would not match Model 2 very closely. A perfect mismatch would be shown by ten 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that PB's approach to product tactics in fact matches Model 2 closely. The six 'yeses', one 'partial' and only three 'no's' give a summed score of 65%, indicating a strong match, which is the opposite of what was expected.

The price component of the model is presented in Table 7.19 below.

Table 7.19: Comparison of PB to Model 2 – Price

	More success in simple/stable environment		Match
	Model 2	**Company PB**	
Aggressive pricing	Less aggressive pricing, not used as a proactive strategy. Aiming at maintaining status quo.	Status quo pricing and not proactively aggressive, but will price cut in reaction to competitors' actions.	Partial
Price leadership	Price follower. Does not initiate price changes.	Follows market and changes prices according to supplier price changes.	Yes
Innovation in pricing	Standard pricing methods, following the industry techniques.	Follows standard setting process – some innovation in trying different approaches when costing a job.	Partial
Price setting	Follows standard simple pricing methods, without much variation. Pricing not obviously integrated with other tactics.	Fairly complex – no standardised prices, but based on costs and processes.	No
Price premium	Price premiums not obtained. Customers often negotiate prices down.	Premiums obtained for niche products but often have to negotiate down to get a job.	Partial
Importance of pricing	Pricing important, but only to cover costs, achieve profit – not for strategic reasons.	Price seen as very important because it sees its market as very price oriented.	Partial

It was expected that PB's pricing tactics would not match Model 2 very closely. A perfect mismatch would be shown by six 'no's' in the last column, which summarises the comparisons. The comparisons in the table above indicate that PB's approach to price tactics partially matches Model 2's suggested tactics, as is indicated by the summed score of 50%. The four 'partials', one 'yes' and one 'no' indicate that the match is half of what was expected for a less successful company in a simple and stable environment.

The following table presents the place or distribution components of the chaos/complexity marketing mix model.

Table 7.20: Comparison of PB to Model 2 - Place

	More success in simple/stable environment		Match
	Model 2	**Company PB**	
Use of intermediaries	Distribution done through traditional channel members/ intermediaries	Not used. Only transport and minor commission agents.	No
Partnerships/alliances	More arms length relationships – not integrated partnerships.	Only a few informal partnerships and co-operation.	Yes
Physical distribution	Delivery important but within traditional lead times.	Important, to achieve competitive parity or superiority	Partial
Stock levels	Carry own buffer stocks and maintain responsibility for stock levels to achieve supply rates.	Keep low. Suppliers keep stock. Stocks kept for few customers.	Partial
Stock replenishment	Based on long-term predictions to reduce uncertainty. Forecast stock levels based on immediate customer demand. Hold buffer inventory to cater for uncertainty.	Planned only based on customer stock levels – rather reactive. Fairly short-term.	No
Importance of place	Seen as critical to success.	Important, but not a tactical weapon.	Partial

It was expected that PB's place tactics would not match Model 2 very closely. The comparisons in the table above indicate that PB's approach to place tactics do not match Model 2 very closely. The two 'no's', three 'partials' and only one 'yes' provide a summed score of 41.7%, indicating that the match is rather weak, which is very close to what was expected for a less successful company in a simple and stable environment.

The final component of the chaos/complexity marketing mix model, promotion, is reflected in Table 7.21 below.

Table 7.21: Comparison of PB to Model 2 - Promotion

	More success in simple/stable environment		Match
	Model 2	**Company PB**	
Media advertising	Continuous, conservative, defensive advertising – image or institutional adverts. Acts as barrier to entry and builds brand loyalty. Heavy spending reduces importance of rest of mix, reducing volatility.	Unimportant – limited and ad hoc in trade journals and directories.	No
Personal selling	Strong customer-rep relationships stabilise by keeping customer loyalty. Good rep knowledge and tying relationship to company and not only to rep needed.	Very important. Knowledgeable reps.	Yes
Public relations	Important for providing info to help build customer loyalty, strengthen relationships, and thus stabilise situation	Important – entertaining and networking customers, but unfocussed and unplanned.	Yes
Sales promotions	Can be stabilising when following theme, thus building relationships – direct marketing also used in this way through use of personalised communications – difficult to disrupt and provide quick feedback – e.g. smart cards, loyalty programmes	Not used.	No
Word of mouth	Although always important, is not as effective in stable market, due to fewer network links, innate conservatism, and less dramatic issues to generate interest.	Very important, but not proactively sought. Is aware of PR activities that encourage it.	Partial
Aggressive use of promotions	Promotions should be more conservative and used to build and maintain relationships, i.e. not aggressive.	Conservative, low key, not disruptive, relationship building	Yes
Speed of change of promotions	Promotions should be longer-term, themed, and thus must not be changed too quickly – allow market to build relationship with the campaign	Kept standard and not changed much over time.	Yes
Importance of promotions	Very important for maintaining stability through building relationships, loyalty and countering competitors disruptive actions	Little importance. Only to spread company name in industry.	No

It was expected that PB's promotional tactics would not match Model 2 very closely. The comparisons in the table above indicate that PB's approach to promotional tactics matches

Model 2 fairly closely. The four 'yeses', three 'no's' and a 'partial' give a summed score of 56.3%, indicating a weak to fair match to what was expected.

In concluding this section, it can be seen that PB's tactical mix matches Model 2 quite closely, which is the reverse of what was anticipated. All four tactical components match Model 2, ranging from weak to very strong matches, providing a total summed score of 55%. Therefore, it can be concluded that a less successful company in a simple and stable environment uses marketing tactics as suggested in Model 2, which is contrary to what was expected.

7.3.5 Conclusion

The comparisons discussed above indicate that Model 1 is a good representation of the marketing mix tactics used in the complex and turbulent environment, as is indicated by a relatively high matching score (50%) for ITA and a low matching score (31.7%) for ITB. This shows that there is a significant difference between the tactics of a more successful company and those of a less successful company in a complex and turbulent environment.

However, Model 2 does not accurately represent the marketing mix tactics used in the simple and stable environment. This is indicated by a low matching score (35.0%) for PA and a relatively high matching score (55%) for PB. Despite the fact that these findings indicate that companies in a simple and stable environment did not perform as expected, they did identify a difference in tactics between the more successful and the less successful companies.

Objective two has been partially achieved, by showing that some differences exist between the marketing mixes adopted in the two environments. However, PA, by showing a poor match to Model 2, can be said to have a close match to Model 1, and PB, by showing a good match to Model 2, can be said to have a poor match to Model 1. These mismatches imply that ITA and PA have similar marketing mixes, while ITB and PB also have similar mixes. This similarity means that the marketing mixes are associated more with more success and less success, than with the complexity or turbulence of the environment.

Because differences were found between the more successful and the less successful companies in both environments, it can be concluded that the tactical marketing mix is related to the level of success in these industries. Therefore, objective three can also be said to have been achieved.

From this interpretation it can be suggested that the use of chaos and complexity theory, and the model based on these theories, is worth considering for companies operating in complex and turbulent environments, but a doubt hangs over its use for companies operating in simpler and more stable environments.

7.4 COMPARISON OF QUANTITATIVE FINDINGS TO THE MODEL

To further assess the marketing mix model it was compared against the importance of the components of the marketing mix as rated by the respondents, and reported on in section 6.3.2 and Table 6.8. In order to obtain scores that could be compared, the marketing mix components, as rated in Table 6.8, were subjectively rated based on their textual description in the models. A scale of 1 to 9 as was used for the respondent ratings was applied, with the scale ranging from 1 equal to 'Very Important' to 9 equal to 'Very Unimportant'. These ratings are given in Table 7.22 below – the respondents' ratings are in the columns headed 'Resp Rating' and the model ratings are in the columns headed 'Model Rating'. Where the ratings of the respondents and from the model are similar the ratings are shown in bold to highlight a match.

Table 7.22: Comparison of importance of tactics – model versus respondents

	Complex/turbulent environment (IT)				Simple/stable environment (Pack)			
	Company ITA		Company ITB		Company PA		Company PB	
	Resp Rating	Model Rating	Resp Rating	Model Rating	Resp Rating	Model Rating	Resp Rating	Model Rating
Develop new products	**2.5**	**2**	**5.8**	**8**	2.8	8	7.2	2
Price changing	6.4	2	**5.4**	**8**	**6.1**	**8**	4.6	2
Product innovation	**2.4**	**2**	3.0	8	2.9	8	4.6	2
Sales promotions	6.8	4	**6.8**	**6**	**8.0**	**6**	**5.9**	**4**
Product enhancement	**5.6**	**6**	**4.0**	**4**	**3.6**	**4**	**5.1**	**6**
PR/other communication	4.0	8	**3.8**	**2**	6.4	2	4.4	8
Media advertising	**6.8**	**6**	7.4	4	7.9	4	**8.6**	**6**
Personal selling	2.3	8	**1.0**	**2**	**3.0**	**2**	2.0	8
Distribution	**8.4**	**8**	7.8	2	4.4	2	2.4	8
TOTAL	**45.2**	**46**	45	44	45.1	44	44.8	46

Studying Table 7.22, it can be seen that five of the activities for ITA, and six for ITB, are rated similarly. However, only four of the nine for PA, and three of the nine for PB, were rated similarly. This appears to be consistent with the findings from the comparison with the qualitative data above, namely that the model fits the complex and turbulent environment better than it fits the simple and stable environment. The similarity of the Total scores in the last row is a validation of the subjective rating of the model elements, showing that there was a spread of rating scores rather than too much emphasis on more importance or less importance.

A further method used to test the accuracy of the model was to compare it against the correspondence analysis findings given in Figure 6.2. First, the three tactics that were most closely associated with each company, according to the correspondence analysis technique, were identified. These are shown in Table 7.23. Then the three tactics that appear to be the most important for each company according to the marketing mix model were identified and also recorded in Table 7.23 below. Note that the sequence of presentation does not imply relative importance.

Table 7.23: Comparison of importance of tactics – model versus correspondence map

	Important tactics from model	Important tactics from correspondence map
Company ITA	Product innovation	Product innovation
	Price	Media advertising
	New product development	New product development
Company ITB	Public relations	Public relations
	Personal selling	Personal selling
	Distribution	Sales promotion
Company PA	Public relations	New product development
	Personal selling	Product innovation
	Distribution	Product enhancement
Company PB	New product development	Distribution
	Price	Price
	Product innovation	Product enhancement

This table also shows that the model reasonably accurately represents the companies in the complex and turbulent environment. In both companies two out of the three tactics matched. However, for the companies in the simple and stable environment the model was highly inaccurate, with only one tactic out of six coinciding. This reinforces the finding that the model is a good representation for companies operating in a complex and turbulent environment, but may be of dubious value to companies in simpler and more stable environments.

7.5 CONCLUSION

This chapter has presented the marketing mix model based on the principles inherent in chaos and complexity theories. It was developed from a combination of the chaos and complexity theory literature and the literature on marketing in complex and turbulent environments. Therefore, objective one of the study was achieved. The marketing mix model was then compared to the empirical findings of this research, including the findings from both the qualitative and quantitative methodologies.

As required of objective two, the study investigated the differences in the marketing mixes adopted by companies in the two different environments. The conclusion was that the model does not discriminate well between the complex/turbulent environment and the simple/stable

environment. This failure to discriminate means that either the model is not accurate, the environments are in fact the same or management perceptions of the environment, rather than the actual environment, influence the choice of tactics.

Despite the inability of the model to differentiate between the complex/turbulent environment and the simple/stable environment, it has clearly shown that different levels of success in both environments are associated with different marketing mixes. Consequently, objective three was achieved.

The overall interpretation of these comparisons is that the marketing mix model is a fairly accurate representation of the tactics needed for success in a complex and turbulent environment. However, it has been shown to be of questionable value to companies operating in simple and stable environments. This may be because the model is incorrect, because the environment chosen as a simple and stable environment is in fact complex and turbulent, or because management of PA and PB perceive their environment to be complex and turbulent and market accordingly. This research study has not collected the relevant information to solve this conundrum. This issue will be discussed further in the next chapter.

The final chapter, Chapter 8, will review the findings, and the implications of these findings, in relation to the objectives of the study, and will assess the propositions that were posited in Chapter 1. Conclusions will be drawn with regard to the benefits that this study can have for marketing theory, for industry in general and for specific companies, and finally, recommendations will be made for further research to expand upon the knowledge that this study has created.

CHAPTER 8 – CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

The overall conclusions to the research study will be presented in this chapter. These conclusions are based on a synthesis of the outcomes of the literature review presented in Chapters 2 to 4 and the findings from Chapter 6, as interpreted in Chapter 7. The conclusions are presented in terms of the theoretical constructs of marketing, which are of value to marketing academics, and in terms of the practical application of marketing tactics, which will be of value to practicing marketing managers. In addition, limitations of the study that were identified during the conducting of the research are discussed and recommendations for further research that have been revealed during the study are presented.

In brief, the research set out to understand how South African companies operating in a complex and turbulent environment differ in their use of marketing tactics from those in a more stable environment. In order to solve this research problem three objectives were set:

- to develop a model of the marketing mix tactics that could be expected to be found in companies operating in complex and turbulent environments,
- to identify any differences in the marketing mix tactics between companies operating in complex/turbulent industries and those operating in simple/stable industries,
- to investigate the relationship between the different types of marketing mix tactics mentioned above and marketing success in complex and turbulent industries.

To guide the research four propositions were postulated.

Proposition 1: It is proposed that companies operating in an environment that is highly complex and turbulent will use a marketing mix made up of more destabilising variables, such as:

new product development and real product innovation,

sales promotion,

price promotions (including price cutting).

Proposition 2: It is proposed that companies in simpler and more stable environments will use marketing mixes that are made up of more stabilising variables, such as:

relationship selling and relationship building,

corporate or image advertising,

'status quo' price policies.

Proposition 3: It is proposed that companies using a destabilising mix in a complex/turbulent environment will be more successful than those using a stabilising mix.

Proposition 4: It is proposed that companies using a stabilising mix in a simple/stable market will be more successful than those using a destabilising mix.

The structure of the presentation of the conclusions will be based on the research objectives and propositions. First, conclusions will be drawn as to the acceptance or rejection of the propositions, and second, conclusions regarding the extent to which the objectives of the study have been achieved will be presented.

8.2 CONCLUSIONS ABOUT THE PROPOSITIONS

In order to decide whether the propositions can be accepted, or whether they should be rejected, the main conclusions from the literature review and the summary from the relevant component of the chaos/complexity marketing mix model will be presented. Then the findings from the empirical research, as presented in Chapter 6, and the relevant comparison against the marketing mix model will be presented. By comparing the empirical findings to the literature review conclusions, a decision will be made as to whether the proposition can be accepted, partially accepted, or whether it should be rejected.

8.2.1 Proposition 1

It is proposed that companies operating in an environment that is highly complex and turbulent will use a marketing mix made up of more destabilising variables, such as:

new product development and real innovation,

sales promotion,

price promotions (including price cutting).

As shown in the chaos/complexity marketing mix Model 1 for the product component in Table 7.2, the destabilising action of new product development is essential in complex and turbulent markets, as was suggested by Nilson (1995). A number of destabilising aspects of new product development were shown by the literature review to be important in the new product development process in complex and turbulent environments.

- A continual flow of new products is needed (Morris, 1996b), because of the shorter product life cycles and the less time available to establish a new product in a complex and turbulent market (Glazer, 1991).
- Because of the uncertainty in complex and turbulent markets, innovative product development, rather than imitating, is essential (Phelan, 1997b). Iansiti (1995) stressed the applicability of this fact to the computer industry, the industry chosen to represent a complex and turbulent environment in this study. In addition innovation was found to have a positive influence on success in complex and turbulent environments (Mavondo, 1999; Morgan, 1997).
- Product ranges should increase to meet rapidly changing market needs (Nilson, 1995). Such increases can be achieved through customizing (Benkenstein and Bloch, 1994; Gilmore and Pine, 1997) or by integrating the customers into the innovation and product development process (Glazer, 1991; Kashani, 1995).

In order to confirm Proposition 1, it is necessary to find that ITA use predominantly destabilising product tactics. The empirical findings in Chapter 6, specifically in Section 6.2.3.1 (a) indicate that ITA place more emphasis on fast product innovation than product enhancement, product planning was short-term and quick, their product range was increasing and customisation of products was important. These findings were confirmed by both the transcription analysis and the field notes analysis, and are also confirmed by the summary presented in Table 7.6 in chapter 7.

Regarding sales promotions, the chaos/complexity marketing mix Model 1 for promotional tactics in Table 7.9 indicates that a successful company in a complex and turbulent market would be expected to use sales promotions aggressively, especially linked to price promotions, to destabilize the market. Nilson (1995) stresses that the more unusual the promotion the more unexpected and destabilising the outcome would be. Priesmeyer (1992) also found promotional activity, especially linked to price promotions, to be destabilising and very effective in influencing demand when the environment is turbulent.

The empirical findings in Chapter 6 – Section 6.2.3.4 (a) and the summary in Table 7.9 in chapter 7 indicate that ITA do not use sales promotions aggressively. However, they are aware of the destabilising nature of sales promotions, and many of their public relations activities are subtly used as promotional activities to destabilize the links between potential customers and competitors who are currently supplying these potential customers.

Aggressive pricing tactics, especially price cutting and the use of price as a promotional tool, are proposed by the chaos/complexity marketing mix Model 1 in Table 7.3 to be important in complex and turbulent environments. In the literature, Nilson (1995) suggests that aggressive pricing destabilizes the marketing system and Pitt, Berthon and Morris (1997) suggest that creativity in the use of pricing tactics is necessary in complex and turbulent markets. Complex methods of price setting, usually with customized pricing, tend to be used in complex and turbulent environments (Pitt, Berthon and Morris, 1997; Roberts, 2000; Kumar, Scheer and Kotler, 2000) and successful companies in such markets tend to be price leaders (Morris and Schurink, 1993; Nilson, 1995; Pitt, Berthon and Morris, 1997; Kumar, Scheer and Kotler, 2000). This approach to pricing enables more successful companies to obtain price premiums in complex and turbulent markets (Benkenstein and Bloch, 1994; Smith et al., 1999).

Although the empirical findings in Section 6.2.3.2 (a) in Chapter 6, and the summary in Table 7.7 in Chapter 7 show that ITA do not generally use pricing aggressively, they do price aggressively when trying to win specific business. ITA's prices do differ amongst customers, but their price setting method is generally standardized and relatively simple. Although not a price leader as pricing is, to an extent, determined by their principals, ITA do obtain price premiums for their products. In other words, their pricing tactics are situationally determined – generally maintaining a stabilizing approach, but prepared to destabilize by aggressive pricing when the situation demands it.

From the above discussion it can be seen that ITA's use of the marketing tactics generally involve a fairly high degree of destabilising actions. Although their use of sales promotion and pricing are not exactly as proposed by the chaos/complexity marketing mix Model 1, there are sufficient similarities to support Proposition 1. However, Proposition 1 can only be fully supported if it can be shown that ITA do not also place equal emphasis on the stabilising tactics as suggested for more success in a simple and stable environment, as specified in Proposition 2.

The empirical findings in Chapter 6 and the comparison against Model 1 in Table 7.9 show that, although personal selling is seen as important, it does not have the primacy and critical relationship-building role that it would have in companies in the simple and stable environment. ITA's use of personal selling and relationship building is therefore in line with the suggestions in Model 1. Media advertising is hardly used by ITA, and not at all in a destabilising way, and so this aspect of their marketing mix is not consistent with expectations. As has been shown above, ITA tend to use pricing in a more stabilising way, but they are prepared to use pricing aggressively to destabilise the market when necessary. Although ITA also use some stabilising tactics such as institutional advertising and generally follows status quo pricing policies, these stabilising tactics are less important and receive less emphasis in the overall marketing mix. Therefore, the acceptance of Proposition 1 can be confirmed, namely, that a more successful company in a complex and turbulent environment will use a marketing mix with considerable emphasis on destabilising marketing tactics.

8.2.2 Proposition 2

> *It is proposed that companies in simpler and more stable environments will use marketing mixes that are made up of more stabilising variables, such as:*
>
> *relationship selling and relationship building,*
>
> *image or corporate advertising,*
>
> *'status quo' price policies.*

The suggestions for success in a simple and stable environment, as presented in the chaos/complexity marketing mix Model 2 in Table 7.5 in Chapter 7, highlight the importance of building strong relationships through personal selling, public relations and sales promotion activities. More specifically the details from the literature review support the above summary. Nilson (1995) stresses the importance of personal selling and relationship building as a stabilising factor in a stable market. De Vasconcellos (1991) agrees but emphasis the importance of sound sales person knowledge to ensure that the relationship is built with the company and not just with the sales person.

The empirical results for more success in a simple and stable environment are reflected in Table 7.17 in Chapter 7. The comparison of PA against Model 2 shows that using personal selling to build strong relationships and customer loyalty is very important. PA also use public relations and sales promotional activities primarily to build and strengthen

relationships with customers. These results are consistent with the findings in section 6.2.3.4 (b) in Chapter 6. Personal selling, public relations and sales promotions are aimed predominantly at entertaining customers and encouraging networking, which are consistent with a relationship building approach.

The chaos/complexity marketing mix Model 2 indicates that image or institutional advertising acts as a barrier to entry and builds brand loyalty, and as such, is important as a stabilising activity in a simple and stable environment. Although some authors (Herbig, 1990; Nilson, 1995) have shown that media advertising can be destabilising, these same authors showed that media advertising, especially corporate and image advertising, is stabilising, building brand loyalty and reducing overall volatility. In addition, Feichtinger, Hommes and Milik (1994) found that conservative and defensive advertising, typically image and corporate advertising, was better for a firm in a simple and stable market.

The empirical findings in Section 6.2.3.4 (b) in Chapter 6 downplay the importance of media advertising, and the chaos/complexity marketing mix Model 2 in Table 7.17 in Chapter 7 also reflects this unimportance, with limited ad-hoc media advertising in trade journals being mainly used to publicise the company name.

Less aggressive, follower-type tactics, with simple and standardised price setting methods, and prices often being negotiated down by customers, are suggested by the chaos/complexity marketing mix Model 2 in Table 7.3 in Chapter 7. Grundy (1995) maintains that conservative, status quo pricing should be followed in simple and stable environments. This approach is also implied by Nilson (1995) who suggests that a conservative, every-day-low-price strategy requires stability in the market to be successful. In simple and stable environments, Pitt, Berthon and Morris (1997) imply that pricing can be standardised. Smith et al. (1999) show that price premiums are rarely obtained and Morris and Schurink (1993) found that this is pricing according to the market rather than being a price leader. Furthermore, Priesmeyer (1992) supports this conclusion by maintaining that, in stable market, firms should price within the boundaries of the product's attractor.

The empirical results in Section 6.2.3.2 (b) in Chapter 6 emphasise that PA follow a stabilising approach to pricing. They do not use price aggressively and try to educate the industry against price-cutting. Price setting methods are fairly simple and standardised. Although PA do get price premiums, they often also have to negotiate prices with customers. PA tend towards being a price leader, but only in their specific niche market, generally having to follow major suppliers' price increases.

The above summary of findings related to Proposition 2 shows that personal selling concentrating on relationship building, some use of institutional image advertising and status quo pricing are important to PA, thereby indicating support for Proposition 2. However, Proposition 2 can only be fully supported if it can be shown that PA do not also place equal emphasis on the destabilising tactics as suggested for more success in a complex and turbulent environment, as specified in Proposition 1.

The empirical findings in Chapter 6 and the comparison against Model 2 in Table 7.14 show that PA perform more like a more successful company in a complex and turbulent environment, placing considerable emphasis on product innovation, quick and flexible product development, an increasing product range, but less emphasis on product enhancement.

Table 7.17 in Chapter 7 shows that sales promotions are less important and are not used in an aggressive manner, as is suggested by Proposition 1. Table 7.15 in Chapter 7 shows that PA do not use pricing as an aggressive, destabilising tactic, but rather attempt to maintain pricing stability through conservative pricing, standardised price setting and following the supplier market in terms of price changes.

From the above summary it can be seen that PA place considerable emphasis on stabilising tactics, and tend to downplay the importance of the destabilising tactics. However, the importance of destabilising product tactics in PA's marketing mix prevents Proposition 2 from being fully accepted. It is, therefore, concluded that Proposition 2 can only be partially confirmed, namely that companies in simpler and more stable environments will use marketing mixes that are mostly made up of more stabilising variables.

8.2.3 Proposition 3

> *It is proposed that companies using a 'destabilising' mix in a complex/turbulent environment will be more successful than those using a 'stabilising' mix.*

Proposition 1 has shown that the more successful company (ITA) in the complex and turbulent market does tend to use a more destabilising marketing mix. To confirm Proposition 3, it also needs to be shown that the less successful company (ITB) uses a marketing mix that is not destabilising, and that it tends to emphasise the stabilising elements. This requires showing that new product development, sales promotion and

aggressive pricing are less important in ITB's marketing mix and that personal selling and relationship building, image advertising and status quo pricing are more important.

Regarding the destabilising tactics, the comparison against Model 1 in Table 7.10 in Chapter 7 shows that new product development is not particularly important, with slow, longer-term planning, flexibility being discouraged and product enhancement being important. Sales promotions, including price promotions, are not used as is reflected in Table 7.13 in Chapter 7. Table 7.11 in Chapter 7 confirms that aggressive pricing is rarely used, price setting is standardised and ITB are not price leaders.

Regarding the stabilising tactics, the comparison against Model 1 in Table 7.13 in Chapter 7 shows that personal selling is critical to ITB's marketing activities, with their sales people being very knowledgeable about customers and their needs. Table 7.13 also shows that media advertising is of no importance, neither as a stabilising nor as a destabilising tactic. As implied above, although ITB are prepared occasionally to price aggressively and are reasonably innovative in pricing, their pricing tactics tend to be more stabilising. Price changes are instigated by suppliers, standardised pricing methods are used and overall a status quo type policy is followed.

The above discussion shows that the destabilising tactics are either not used by, or are unimportant to, ITB. The stabilising tactics are generally of considerable importance to ITB, with the exception of media advertising, which is not used at all. As a result, it can be concluded that ITB use a predominantly stabilising marketing mix, which is consistent with what would be expected of a less successful company in a complex and turbulent environment. Consequently, Proposition 3 can be fully accepted, namely, that companies using a 'destabilising' mix in a complex/turbulent environment will be more successful than those using a 'stabilising' mix.

8.2.4 Proposition 4

It is proposed that companies using a 'stabilising' mix in a simple/stable market will be more successful than those using a 'destabilising' mix.

Proposition 2 has shown that the more successful company (PA) in the simple and stable market does tend to use a more stabilising marketing mix, although it also uses destabilising

product tactics. To confirm Proposition 4, it also needs to be shown that the less successful company (PB) uses a marketing mix that is not stabilising, and that it tends to emphasise the destabilising elements. This requires showing that new product development, sales promotion and aggressive pricing are more important in PB's marketing mix and that personal selling and relationship building, image advertising and status quo pricing are less important.

Regarding the stabilising elements of the marketing mix, the comparisons in Table 7.18 in Chapter 7 show that new product development is relatively unimportant to PB. There is little product innovation, development is slow and inflexible and there is not much increase in the range. Promotions are not used aggressively, with sales promotion not being used at all, as is shown by Table 7.21 in Chapter 7. Table 7.19 in Chapter 7 reflects a conservative, status quo pricing policy. Pricing is not used aggressively, prices are only cut in reaction to competitors' pricing actions and the firm is a price follower, often having to negotiate prices downwards to obtain a job.

Regarding the destabilising elements of the marketing mix, Table 7.21 in Chapter 7 shows that personal selling is PB's main promotional tactic, with entertaining and networking also important. Media advertising is unimportant, with some ad hoc corporate advertising being placed in trade journals. As discussed above and shown in Table 7.19 in Chapter 7 status quo pricing tactics are important to PB. There is a lack of pricing aggression and pricing is not used to destabilise the market.

The above discussion shows that the more successful company (PA) uses a mix of both stabilising and destabilising tactics. The less successful company (PB), which was expected to emphasise destabilising tactics, predominantly uses stabilising tactics. Consequently Proposition 4 cannot be accepted as PB do not behave as expected, and PA only partially behave as expected. Therefore, the proposition that companies using a 'stabilising' mix in a simple/stable market will be more successful than those using a 'destabilising' mix is rejected.

8.3 CONCLUSIONS ABOUT THE RESEARCH OBJECTIVES

8.3.1 Research objective 1

To develop a model of the marketing mix tactics that could be expected to be found in companies operating in complex and turbulent environments.

Chapter 7 presented a model of the marketing mix tactics that were proposed for a successful company in a complex and turbulent environment. This was named Model 1. The opposite of Model 1 was the model of the marketing tactics that were expected to be adopted by a more successful company in a simple and stable environment. This was named Model 2. The discussion above on Proposition 1 shows that the marketing tactics included in Model 1 are used by ITA, the more successful company in the complex and turbulent environment. Therefore, it appears that Model 1 is a reasonable representation of the marketing mix required for success in a complex and turbulent environment. This conclusion is confirmed by the discussion above on Proposition 3. This discussion shows that the less successful company, ITB, did not match the model closely, implying that less success is associated with the opposite of what Model 1 represents. It can, therefore, be concluded that Research objective 1 has been achieved.

8.3.2 Research objective 2

To identify any differences in the marketing mix tactics between companies operating in complex/turbulent industries and those operating in simple/stable industries.

The findings in Chapter 6 show that the marketing tactics adopted by ITA are more similar to the marketing tactics adopted by PA than they are to the tactics adopted by ITB, a company in the same industry as ITA. Furthermore, PA's marketing tactics, in many ways, are more similar to ITA, than they are to the company in their own industry, namely, PB. Although certain differences were found, of more significance seems to be the fact that a more destabilising marketing mix appears to be associated with more success, regardless of the industry, and that a more stabilising marketing mix appears to be associated with less success. In other words, it appears as if success is related to adopting destabilising tactics in both complex/turbulent and simple/stable environments. This implies that marketing success is not influenced by the nature of the external environment, but that it is influenced

by the nature of the marketing mix adopted. This conclusion is supported by the finding that the two more successful companies used change related words more in their interviews than the less successful companies did, which indicates a greater awareness of change, uncertainty and volatility. Therefore, it could be expected that they would adopt tactics that are more change oriented: that is, destabilising tactics.

However, the above argument can be undermined if it is assumed that the entire South African environment is so complex and turbulent that Model 1 could be applicable to all industries. Although the packaging industry was seen to be the most simple and stable in South Africa, it is possible that it is sufficiently complex and turbulent that destabilising marketing tactics are more effective than stabilising tactics. This argument may be true of the broader external environmental variables. However, the external variables that are more closely related to the industry, such as technology and competitors, do seem to be much more stable in the packaging industry than in the information technology industry. Since these variables could be expected to have a major influence on marketing tactic choice, it must be assumed that there is a difference in complexity and turbulence between the two industries. It is therefore unlikely that this second argument can be correct.

A third argument for the apparent similarity between the marketing mixes of the two industries could be that the management of PA and PB view their industry as complex and turbulent. With such an attitude, it would be likely that these managers would adopt marketing tactics that they believe are more suited to a complex and turbulent environment. If this argument is correct, it implies that there is an external environmentally determined optimal marketing mix for a complex and turbulent environment. However, the findings regarding the two packaging companies, the large difference in the use of change related words, the observed behaviour of the staff in the two companies and the overall atmosphere in the two companies lead to a conclusion that they do not both view their environment in the same way, namely, as complex and turbulent. Therefore, this third argument appears likely to be false.

Consequent to the above discussion, it can be concluded that the first argument is most likely to be correct, namely that success is related to the use of destabilising tactics, regardless of the external environment. As a result, Research objective 2 has been met by showing that there is not a significant difference between the marketing tactics adopted by a more successful company in a complex and turbulent environment and a more successful company in a simple and stable environment.

8.3.3 Research objective 3

To investigate the relationship between the different types of marketing mix tactics mentioned above and marketing success in complex and turbulent industries.

The chaos/complexity marketing mix model proposed a mix of marketing tactics that should be associated with greater success in a complex and turbulent environment. The acceptance in full of Proposition 3 indicates that the model, specifically Model 1, is a good representation of the marketing tactics required for success in a complex and turbulent environment. The mix of marketing tactics in Model 1 indicates that a preponderance of destabilising actions is required in a complex and turbulent environment. These include fast, flexible and innovative new product development, price leadership via aggressive and innovative pricing, and advertising and sales promotion activities aimed at surprising and amazing so as to disrupt the links between competitors and their customers. The place activities involve quick responses to inventory and delivery requirements, through integrating the firm's distribution activities with the rest of the supply chain.
In addition, Model 1 stresses that a more successful firm will also use some stabilising activities, such as continually improving existing products, maintaining strong partnerships and alliances in the supply chain and building relationships with customers through the sales force.

In summary, it can be seen that more success in a complex and turbulent environment requires a mix of mostly destabilising product and price activities, a more or less equal mix of promotional activities, and mostly stabilising place activities. Therefore, it can be confirmed that Research objective 3 has been met.

8.4 IMPLICATIONS FOR MARKETING THEORY

Most marketing theory has been developed over many years from other disciplines such as economics, psychology, sociology and systems theory. It is, therefore, reasonable to expect that further development of marketing thought would be based on a non-marketing discipline. Chaos and complexity theories are contributing to the development in thought in a wide variety of different disciplines, such as economics, biology, medicine, education, organisational behaviour, psychology, politics and manufacturing. Consequently, it could be

expected that chaos and complexity theories could contribute to development in marketing thought.

This research study has shown that chaos and complexity theories do have application in the marketing field, in that these theories as applied in this study, have provided increased knowledge and understanding of the marketing tactics that contribute to marketing success, of the marketing tactics that should be used in complex and turbulent environments and of some of the subtleties possible in the use of marketing tactics.

In terms of marketing tactics for marketing success, the research has confirmed the importance of innovation throughout the marketing mix and has stressed the importance of basing the development of the marketing mix on the need to stabilise or destabilise the market. It has also confirmed the importance of integrating the mix components, such as a new product launch being supported by aggressive pricing, competitive product advertising, unexpected sales promotions and encouragement of word-of-mouth.

Regarding the tactics for a complex and turbulent environment, although there is some doubt about the deterministic nature of the environment, the study does suggest that more destabilising, than stabilising, actions should be used. For marketing theory, this implies that the market should be treated as a complex adaptive system, with attention being placed on the stabilising or destabilising nature of the marketing tactics. Therefore, the implication is that the simplistic discussion of the four Ps in most marketing textbooks needs to be expanded to better explain how the marketing mix can be used to influence the market, and often, the environment. This implication highlights the ability of marketing not only to adapt to the external environment, but also to influence the external environment. This is contrary to many textbooks that refer to the external environment as uncontrollable. The study has also emphasised the importance of subtle application of many of the marketing tactics. For example, the concept of sensitive dependence on initial conditions shows that relatively minor actions can be important. In the traditional marketing approach, minor changes or actions tend to be ignored as unimportant. Chaos theory explains how these can have an exponential impact, becoming very significant. This principle has shown how small promotional actions, slight price cuts, minor product changes or an important customer initiating a word-of-mouth campaign can have a significant effect on marketing success. It is, therefore, important that marketing theory stresses the importance of all tactical issues, and not only the major or more obvious ones.

A final issue that this research has raised is the paucity of academic research on marketing tactics used in the complex and turbulent South African environment. This study, therefore, has highlighted the need for South African academics to more intensively address marketing theory specifically from a complexity and turbulence viewpoint, and preferably making use of chaos and complexity theory.

8.5 IMPLICATIONS FOR MARKETING PRACTICE

This research study has provided some guidance to marketers on how to relate to the external environment when it is complex and turbulent and it has also provided guidance as to the marketing mix tactics that should be adopted in such an environment. It has also indicated the types of tactics that increase the likelihood of marketing success, regardless of the nature of the environment. These implications are important because the increased complexity and turbulence in the current South African environment make marketing more challenging today than in the past. Although some work has been done in South Africa on business as a complex adaptive system, virtually nothing has been done looking at the micro level of how marketing activities relate to the market as a complex adaptive system. Therefore, the study provides marketing managers with a new perspective on their marketing activities

More specifically, the study suggests a definite mix of marketing tactics that should be adopted by South African marketing managers. This mix is explicated below.

8.5.1 Product

Considerable emphasis should be placed on the product component. Specifically, new product development should be innovative and fast. The development process should be planned over a short time period and the process should be flexible, allowing changes as close to delivery as possible. This speed and flexibility will enable the firm to make the environment volatile and unstable for competitors, but since the firm is planning for the change it will be able to take advantage of this volatility. Ideally, customers should be involved in the process to achieve maximum customisation to meet the customer's needs, ensuring customer loyalty despite the environmental volatility. The firm must continually increase its range to meet changing customer needs, but must also be prepared to cut products from the range to avoid unnecessary range duplication.

8.5.2 Price

To be successful, the firm must be a price leader, setting the pace in changing prices and pricing methods. Innovative pricing methods should be adopted to customise pricing to suit specific customers. The firm should be prepared to use pricing aggressively and tactically. This can involve price-cutting, innovative discounting systems or the use of price promotions. It is important that these tactics be integrated with the rest of the supply chain and with the rest of the marketing mix, to avoid the company merely starting a price war. Price cutting by itself can be easily matched by competitors, but an innovative new pricing system, integrated with the supply chain is difficult to react to or copy.

8.5.3 Place

The place component generally should not be treated as a short-term tactic to be used aggressively. It forms the foundation through which the rest of the marketing mix is implemented. Therefore, the overall system must be designed to cope with complexity and turbulence. The entire supply chain must be treated as a single system, and if change is required it must be implemented through the entire supply chain. The use of traditional arms-length intermediaries should be minimised and more use should be made of close partnerships and strategic alliances, with blurring of boundaries between the organisations being encouraged. The use of such partnerships and alliances increases system flexibility and increases the system's knowledge of the environment. Regarding inventory and physical distribution, the inventory load should be shared by the entire supply chain with stock replenishment being based on end-user demand rather then the demand from the immediate customer. Emphasis should be on quick response and short-term management of the system, rather than on building buffers to cope with the uncertainty. This quick response includes using the fastest delivery method possible.

8.5.4 Promotion

Provision should be made to use promotional activities to destabilise the market in order to maximise opportunities to win new customers and gain market share, but allowance should also be made to use promotions for stabilising the relationships with existing customers to maintain customer loyalty.

8.5.4.1 Destabilising actions

If the firm is financially strong enough, pioneering, product advertising should be used with a shocking or amazing campaign aimed at shifting perceptions about the firm or the product. If allowed, comparative advertising can be disruptive.

Creative and unusual sales promotion campaigns should be used, linked to price promotions. Even small, localised campaigns can be effective in promoting instability, for example, between a specific competitor and its customers. These promotional programmes should be aggressive, deliberately aimed at destabilising competitors' relationships. Furthermore, they must not be allowed to become expected or stale – they should be changed frequently to maintain the unexpected and surprising.

Although not included in the discussion of the propositions, the empirical findings emphasised the importance of word-of-mouth in complex and turbulent markets. Therefore, the firm should continuously take actions to encourage the spread of word-of-mouth. Such actions can include influence-the-influencer actions such as giving free or low priced products to opinion leaders, spreading information about amazing product facts through multiplier media such as the Internet, or matching satisfied customers with potential customers at entertainment events.

8.5.4.2 Stabilising actions

Although it is necessary to destabilise the market, it is also necessary to stabilise the relationships with customers so that the volatility does not result in the disruption of the firm's own relationships with loyal customers. Actions that can achieve this are strong sales force activities aimed at building and maintaining sound customer relationships. Certain types of sales promotions can be used to maintain customer loyalty. Direct marketing and personalised communications, with a stable theme can be used to maintain relationships and support loyal customers. Smart cards, loyalty programmes and, of course, excellent service would form part of a stabilising campaign.

The above discussion suggests that marketing managers can benefit from this study by using the chaos and complexity principles to guide their marketing mix development.

8.6 LIMITATIONS OF STUDY

The methodology used in this study was designed to provide data that is trustworthy and can be believed. Nevertheless, the very nature of research is such that as validity and reliability (or trustworthiness and consistency) are improved in some areas, they are weakened in others. It is, therefore, necessary to highlight possible limitations of the methodologies used.

Since this was an exploratory study and a small sample was used, it is subject to the limitations of small sample studies. The findings are not necessarily representative of all companies in the sampled industries, nor are they necessarily representative of similar types of environments. However, this is not sufficient of a problem to reject the findings as the objective of the study was to 'throw light' on the relationship between environmental turbulence, marketing tactics, and marketing success, and not to measure this relationship or generalise it to other industries or environments. The study has provided better understanding of these relationships, and there was never any intention to try to extrapolate these results to all companies or all markets. If extrapolation of the results to other industries is attempted it should be done with extreme caution.

A second possible weakness is in the field notes analysis, namely that the individual results were averaged. This, according to Vorhies (1998), can be a weakness as the summing of individual answers to represent an organisational answer can result in organisational variability being lost. It is felt that this was not a significant problem as the field notes were only one component of the study, intended as a check or confirmation of the main analysis, which was the interview transcript analysis. Furthermore, the opinions and attitudes of an organisation can only be the opinions and attitudes of the individuals within the organisation. Since care was taken to select senior members and those knowledgeable about the firms' marketing activities, it is believed the attitudes and opinions sampled reflect those that truly reflect the organisational opinions and attitudes.

One of the strengths of the study, the use of maximal variation sampling, is also to some extent a weakness. This is because the choice of only two industries makes it difficult to draw conclusions about other industries between the two chosen. In other words, the degree of variation between other industries might not be so significant, and therefore it might be inaccurate to try to apply these findings to other industries. Again however, this is seen as a relatively unimportant problem because the goal of the research was to gain understanding of the phenomena and not to extrapolate the findings to other industries.

Since only three methodological weaknesses were identified during the implementation of the study, and since these three weaknesses have been shown not to be significant to the study findings, it can be concluded that the trustworthiness and consistency of the study have not been compromised.

8.7 RECOMMENDATIONS FOR FURTHER RESEARCH

Although this research study has cast considerable new light on marketing tactics by viewing them from a chaos and complexity perspective, there is still much to be learnt about the use of marketing tactics in complex and turbulent environments and in simple and stable environments. It is believed that further research using the chaos and complexity theories will eventually provide a far greater understanding of the relationships between marketing mix elements, and how they should be used in different markets, industries and environments.

It is, furthermore, believed that some of the anomalies and difficulties identified in this research report can be resolved by further research using the chaos and complexity approach.

Resolution of these problems and expansion of knowledge of marketing tactics could be achieved through successful research in some of the following areas.

- Similar research, but in a wider range of companies and in different industries, could test whether the findings of this study can be generalised to the overall South African economy.
- A quantitative research study focussing on a specific industry could be very helpful in more clearly differentiating the marketing tactics of more successful from less successful companies.
- Research that quantitatively measures the level of complexity and turbulence of an environment could resolve the uncertainty as to whether all South African industries are in fact complex and turbulent.
- Research in a country that does not suffer from the extremes of complexity and turbulence that South Africa does may be able to better differentiate between the marketing tactics in complex/turbulent markets and simple/stable markets.

- How managers' perceptions of the level of complexity and turbulence influence their choice of marketing tactics should be researched. Such research could confirm whether this study's findings were influenced by such perceptions in the simple/stable environment or not.
- This study concentrated on the total marketing mix. More detailed research into individual tactics from a chaos and complexity perspective could throw considerable light on their role in stabilising or destabilising the market, and on their influence on marketing success.
- Detailed research is required in individual markets to clearly show their behaviour as complex adaptive systems, with specific emphasis on co-evolution and the extent to which individual companies' marketing strategies and tactics affect the external environment. In other words, research is required to investigate how the components of a marketing oriented complex adaptive system affect the overall system.
- Of major benefit would be a longitudinal study that follows the trajectory of a minor incident or issue as it develops according to the principle of sensitive dependence on initial conditions, into a major event that has a significant impact on a system. Such minor incidents could be product problems, price changes for key customers or product information spread initially through word-of-mouth.

It is accepted that most of the recommended research projects will be very difficult to conduct owing to measurement problems, confidentiality issues, uncertainty as to what specifically to observe and measure and the problem of confounding and intervening variables. Nevertheless, the likelihood that a chaos and complexity theory approach is able to unlock greater knowledge about marketing, marketing tactics and their influence on marketing success makes taking on these difficulties and challenges very important and worthwhile.

"I think that the next century will be the century of complexity."
Stephen Hawking (2000)
(Chui, 2000: 29A).

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APPENDIX A - INDUSTRY EXPERT QUESTIONNAIRE

ASSESSMENT BY INDUSTRY EXPERTS OF LEVEL OF COMPLEXITY AND TURBULENCE

SECTION A – TURBULENCE OF INDUSTRY ENVIRONMENT

*"**Turbulence** is a measure of change that occurs in the businesses environment. At one end of a continuum there is a static state, with everything that happens being familiar (has happened before), change is slow (slower than the firm's ability to respond), and a vision of the future is predictable (it recurs). At the other end of the continuum, things that happen in the environment are novel and discontinuous (they haven't happened before), change is extremely rapid (quicker than the firm's ability to react to it), and the future is unpredictable and full of surprises (there are only very weak signals or clues about what will happen in the environment in the future)."(Smart & Vertinsky, 1984: 200)*

Please answer each of the following questions for each of the industries listed in the table on page 3. Enter your answers in the table on page 3 by entering a rating number for each environmental component for each industry. Use the "Turbulence scale" below to select the rating number that you think is most applicable in each case:

Characteristics	**Stable** ←----------→ **Turbulent**			
Familiarity of events	Familiar	Similar, experienced before	Different, but related to experience	Totally different & novel
Rapidity of change	Slow, easy to follow ←----------→ Fast, hard to keep up			
Predictability of the future	Past repeats itself – is known	Can be forecast	Partially predictable – weak signals	Unpredictable Surprises
Turbulence Scale	**1 2 3**	**4 5**	**6 7**	**8 9 10**

Ansoff & Sullivan, 1993. 13

Is the political and legal environment in which the industry operates stable or highly turbulent, or somewhere in between? The politico-legal environment includes laws, actions of departments, and investments or purchasing of all levels of government, from central government to municipalities.
Is the economic environment in which the industry operates stable or turbulent, or somewhere in between? The economic environment includes growth rate, levels of employment, consumer income, inflation rate, interest rates and the general state of the economy.
Is the socio-cultural environment in which the industry operates stable or turbulent, or somewhere in between? The socio-cultural environment includes cultures, way of life, demographic changes in the population, consumers and households, urbanisation, and consumerism.
Is the technological environment in which the industry operates stable or turbulent, or somewhere in between? The technological environment includes technological development and innovations in machinery, products, processes, methods and even marketing or management practices.
Is the international environment in which the industry operates stable or turbulent, or somewhere in between? The international environment includes globalisation, involvement in SA markets by foreign companies, opportunities overseas for SA companies and dependence on overseas sources for raw materials, products, technology, etc.
Is the physical environment in which the industry operates stable or turbulent, or somewhere in between? The physical environment includes the physical resources such as raw materials, energy and foodstuffs, and their costs, as well as the field of environmentalism, including pollution, recycling and general responsibility for avoiding harm to the ecology.
Is the competitive environment in which the industry operates stable or turbulent, or somewhere in between? The competitive environment includes new entrants or departures from the industry, competition from substitute products, changing market shares and the number of competitors in the market.
(questions based on and adapted from Baxter, 1995)

SECTION B – COMPLEXITY OF INDUSTRY ENVIRONMENT

*"**Complexity** is a measure of the number and heterogeneity of components in the environment which impact on the business simultaneously, making understanding of cause and effect difficult. A management or marketing action can produce unexpected consequences, which can differ in different parts of a system (e.g. a business) and which can differ dramatically in the short versus the long term. In a complex environment relationships are more important than simple cause and effect chains. A simple environment, on the other hand, has few components, and their interactions are easy to understand and produce predictable results."*
(Based on Teopaca,1993:74;Coucourakis, 1994: 22; Forsdick, 1995: 37)

Please answer each of the following questions for each of the industries listed in the table on page 4. Enter your answers in the table on page 4 by entering a rating number for each environmental component for each industry. Use the "Complexity scale" below to select the rating number that you think is most applicable in each case:

Characteristics	**Simple ←----------→ Complex**									
Variables that impact on business simultaneously	Few			Many			Almost infinite			
Understanding of cause and effect relationships	Clear and easy to understand			Apparent but unmeas-ureable relationship			No clear cause and effect relationship			
Outcome of marketing / management actions	Easy to predict			Outcome is usually as expected			Outcomes uncertain/ surprises are common			
Complexity scale	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Based on Senge (1990), in Coucourakis, 1994: 22.

Is the political and legal environment in which the industry operates simple or highly complex, or somewhere in between? The politico-legal environment includes laws, actions of departments, and investments or purchasing of all levels of government, from central government to municipalities.
Is the economic environment in which the industry operates simple or complex, or somewhere in between? The economic environment includes growth rate, levels of employment, consumer income, inflation rate, interest rates and the general state of the economy.
Is the socio-cultural environment in which the industry operates simple or complex, or somewhere in between? The socio-cultural environment includes cultures, way of life, demographic changes in the population, consumers and households, urbanisation, and consumerism.
Is the technological environment in which the industry operates simple or complex, or somewhere in between? The technological environment includes technological development and innovations in machinery, products, processes, methods and even marketing or management practices.
Is the international environment in which the industry operates simple or complex, or somewhere in between? The international environment includes globalisation, involvement in SA markets by foreign companies, opportunities overseas for SA companies and dependence on overseas sources for raw materials, products, technology, etc.
Is the physical environment in which the industry operates simple or complex, or somewhere in between? The physical environment includes the physical resources such as raw materials, energy and foodstuffs, and their costs, as well as the field of environmentalism, including pollution, recycling and general responsibility for avoiding harm to the ecology.
Is the competitive environment in which the industry operates simple or complex, or somewhere in between? The competitive environment includes new entrants or departures from the industry, competition from substitute products, changing market shares and the number of competitors in the market.

RESPONSE SHEET

Your firm's name……Phone No.:…...……..……..

Your name…….……..…Job title:……
These details are only requested in case clarification of any of your responses is needed.

SECTION A - TURBULENCE OF INDUSTRY ENVIRONMENTS

Please enter your answers to questions 1 to 7 from page 1 in this table. Please ensure that you enter a rating number in each cell in the table. If you cannot rate some industries or do not know enough to rate one or more of the environmental factors, please enter DK (Don't Know) in the relevant cells.

	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7
ENVIRONMENT INDUSTRY	**Politico -legal**	**Econ -omy**	**Socio- culture**	**Tech- nology**	**Interna -tional**	**Phys- ical**	**Comp- etitors**
Chemical, oils & plastics							
Banking							
Financial services							
Insurance							
Beverages							
Clothing and textiles							
Food							
Furniture and appliances							
Retail							
Hotels and leisure							
Building, construction & engineering							
Electronics & electrical							
Information technology							
Telecommunications							
Education and staffing							
Media							
Packaging and printing							
Healthcare							
Transport							

SECTION B - COMPLEXITY OF INDUSTRY ENVIRONMENTS

Please enter your answers to questions 8 to 14 from page 2 in this table. Please ensure that you enter a rating number in each cell in the table. If you cannot rate some industries or do not know enough to rate one or more of the environmental factors, please enter DK in the relevant cells.

	Q 8	Q 9	Q 10	Q 11	Q 12	Q13	Q 14
ENVIRONMENT INDUSTRY	**Politico -legal**	**Econ- omy**	**Socio- culture**	**Tech- nology**	**Interna -tional**	**Phys- ical**	**Comp- etitors**
Chemical, oils & plastics							
Banking							
Financial services							
Insurance							
Beverages							
Clothing and textiles							
Food							
Furniture and appliances							
Retail							
Hotels and leisure							
Building, construction & engineering							
Electronics & electrical							
Information technology							
Telecommunications							
Education and staffing							
Media							
Packaging and printing							
Healthcare							
Transport							

Please fax both sides of this response sheet to:

Roger Mason
Department of Marketing
Technikon Natal

Fax No.: (031) 204 - 2608
Direct line: (031) 204 - 2465
Cell No.: 083 661 5938

Thank you very much for your co-operation and assistance.

Appendix B – Covering letter for questionnaire to investment analysts

P. O. Box 1973,
Hillcrest,
3650.
15 November 1999.

Dear,

I am conducting research into the nature of the South African market that companies are facing at present. This involves getting an assessment of the relative complexity and turbulence of the various industries in South Africa. As managers all perceive their own industries to be very complex and very turbulent, I have to rely on industry outsiders who can be objective, and who are knowledgeable about many industries, to make this assessment.

I would be very grateful if you could forward this request to the investment analyst/s in your organisation, or anyone else that you feel is knowledgeable about a number of industries, and ask them to complete the attached two-page questionnaire for me within the next two weeks. Completed questionnaires can be returned to me in the enclosed reply paid envelopes, or they can be faxed back to me (fax details are on the questionnaire). I have included three copies of the questionnaire in the hope that there will be a number of people in your firm who are able and willing to complete it.

This study forms part of the research for my PhD degree that I am doing through Rhodes University. Once I have analysed the completed questionnaires, I will send a summary of the analysis to all those who returned questionnaires. I hope that you will be able to co-operate, as the success and value of this project is dependent on getting a large response from as many industry experts as possible. I therefore thank you in advance and look forward to receiving your completed questionnaires soon.

Yours sincerely,

Roger Mason.

Appendix C – Covering letter for questionnaire to management consultants

P. O. Box 1973,
Hillcrest,
3650.
15 November 1999.

Dear Sir/Madam,

I am conducting research into the nature of the South African market that companies are facing at present. This involves getting an assessment of the relative complexity and turbulence of the various industries in South Africa. As managers all perceive their own industries to be very complex and very turbulent, I have to rely on industry outsiders who can be objective, and who are knowledgeable about many industries, to make this assessment.

I would be very grateful if you could complete the attached two-page questionnaire for me within the next week. Completed questionnaires can be e-mailed (rbmason@mweb.co.za) or faxed back to me (fax details are on the questionnaire).

This study forms part of the research for my PhD degree that I am doing through Rhodes University. Once I have analysed the completed questionnaires, I will send a summary of the analysis to all those who returned questionnaires. I hope that you will be able to co-operate, as the success and value of this project is dependent on getting a large response from as many industry experts as possible. I therefore thank you in advance and look forward to receiving your completed questionnaires soon.

Yours sincerely,

Roger Mason

Appendix D – Turbulence and complexity by industry – descriptive statistics

Industries	N	Minimum	Maximum	Mean	Std. Deviation
Turbchemical	6	3.43	7.14	5.2381	1.3752
Turbbanking	5	4.71	5.86	5.2286	.5210
Turbfinance	6	4.43	7.29	5.7143	.9731
Turbinsurance	6	4.43	7.57	5.3810	1.1236
Turbbeverage	6	1.86	6.14	4.4762	1.5770
Turbclothing	6	3.29	6.00	4.4524	1.0591
Turbfood	6	3.43	6.14	4.4524	1.1154
Turbfurniture	6	3.00	6.57	4.5476	1.4212
Turbretail	6	3.57	7.14	5.2619	1.3261
Turbhotel	5	3.71	6.14	4.8000	.9400
Turbbuilding	6	4.14	7.57	5.5714	1.5092
Turbelectronic	6	4.86	7.86	6.5714	1.0142
Turbinfotechnology	6	4.57	9.43	7.3810	1.7087
Turbtelecomms	5	5.14	9.29	7.2000	1.4867
Turbeducation	6	4.00	9.00	5.8333	1.8940
Turbmedia	6	4.71	7.86	6.1905	1.2278
Turbpackaging	6	2.71	5.57	4.1429	1.0420
Turbhealth&pharm	6	3.57	8.71	5.4524	1.9783
Turbtransport	6	3.43	7.57	5.0714	1.3873
Compchemical	5	4.14	7.43	5.6286	1.5472
Compbanking	4	5.00	7.29	5.7143	1.0562
Compfinance	5	5.00	6.86	5.8571	.6701
Compinsurance	5	3.57	5.71	5.0000	.8330
Compbeverage	5	2.29	6.00	3.8571	1.4498
Compclothing	5	3.14	5.86	4.1143	1.1535
Compfood	5	2.86	7.43	4.2286	1.8533
Compfurniture	5	2.71	5.29	3.7714	1.0182
Compretail	5	3.00	6.71	4.2857	1.4428
Comphotel	4	3.29	5.14	4.4286	.8165
Compbuilding	5	3.14	6.00	4.8571	1.1824
Compelectronic	5	5.00	7.86	6.3429	1.1935
Compinfotechnology	5	5.86	8.29	7.2000	1.1321
Comptelecomms	4	6.43	8.71	7.6071	.9785
Compeducation	5	4.00	7.43	5.3714	1.4378
Compmedia	5	3.57	8.29	5.6286	1.8143
Comppackaging	5	2.29	4.29	3.3429	.8182
Comphealth&pharm	5	4.14	7.43	5.5429	1.5098
Comptransport	5	3.57	6.29	4.8000	1.3194

Appendix E - IT company assessment questionnaire

* Please select the three companies from the table below that in your opinion are the most successful, and rate them with an M in the ranking column. Then select the three companies that you think are the least successful and rate them with an L in the rating column.
* Please consider "success" in terms of their performance over the past three to five years. More successful firms would be those that have achieved consistent growth in sales, profits and assets, that have increased market share, or that have adapted well to the changing IT market, while less successful firms have performed poorly on these factors. Although you may not know the actual figures for these performance measures, I'm sure you can make a subjective or qualitative assessment based on your overall knowledge of the IT industry.
* Should any of these companies, in your opinion, not have control over their marketing destiny (e.g. they are controlled by and dictated to by a holding company, or they exist to serve mostly one major client) please do not rate them, and advise me of this by crossing them off the list.
* If there are companies that you would like to include in your list of the three most or three least successful companies, but which are not listed below, please write their names in the spaces provided at the bottom of the table, and rate them with an M or L as applicable.

	IT Companies	RATING
1	Note: Company names suppressed to maintain confidentiality	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

From:……..

Please e-mail your selection to me at rbmason@mweb.co.za or fax this page back to me on 031 – 767 4905 (ask for fax). Alternately, you could just phone your selection to me on 031 – 767 4905 or 083 661 5938.

Many thanks for your assistance.

Appendix F - Packaging company assessment questionnaire

Please select the three companies from the table below that in your opinion are the most successful in KwaZulu-Natal, and rate them with an M in the ranking column. Then select the three companies that you think are the least successful and rate them with an L in the rating column. Please consider "success" in terms of their performance over the past five years. More successful firms would be those that have achieved consistent growth in sales, profits and assets, that have increased market share, or that have adapted well to the changing packaging market, while less successful firms have performed poorly on these factors. Although you may not know the actual figures for these performance measures, I'm sure you can make a subjective or qualitative assessment based on your overall knowledge of the packaging industry. If there are companies in KwaZulu-Natal that you would like to include in your list of the three most or three least successful companies, but which are not listed below, please write their names in the spaces provided at the bottom of the table, and rate them with an M or L as applicable.

	Packaging Companies	RATING
1	Note: Company names suppressed to maintain confidentiality	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

From:……..

Please fax this page back to me on 031 – 767 4905, or e-mail your selection to me at rbmason@mweb.co.za. Alternately, you could just phone your selection to me on 031 – 767 4905 or 083 661 5938.

Many thanks for your assistance.

Appendix G - IT company assessment – round 2 questionnaire

The table below lists the companies from most successful to least successful, on the basis of the accumulated ratings given by all the panel members. A score of, for example, +2 means that two people rated that company as most successful; a score of –1 means that one person rated that company as least successful; a score of 0 means that nobody rated the company at all, or a company was rated most and least successful by different panel members, with the scores cancelling each other out.

*Taking into account how the other panel members rated the companies, can you now please rate them again? However, this time please only mark the **two** companies that in your opinion are the most successful and the **two** companies that in your opinion are the least successful. Again mark the most successful companies with an M and the least successful companies with an L*

	IT Companies	SCORES		RATING
1	Note: Company names suppressed to maintain confidentiality	3 x M	+3	
2		2 x M , 1 x L	+1	
3		2 x M, 1 x L	+1	
4			0	
5			0	
6		1 x M, 1 x L	0	
7			0	
8			0	
9		1 x M , 1 x L	0	
10		1 x L	-1	
11		1 x L	-1	
12		1 x L	-1	
13		2 x L	-2	
14				
15				

From:……..
Please e-mail your selection to me at rbmason@mweb.co.za or fax this page back to me on 031 – 767 4905 (ask for fax). Alternately, you could just phone your selection to me on 031 – 767 4905 or 083 661 5938.

Many thanks for your assistance.

Appendix H - Packaging company assessment – round 2 questionnaire

The table below lists the companies from most successful to least successful, on the basis of the accumulated ratings given by all the panel members. A score of, for example, +2 means that two people rated that company as most successful; a score of –1 means that one person rated that company as least successful; a score of 0 means that nobody rated the company at all (with the exception of one company which was rated most successful by one person and least successful by another panel member, so the two ratings cancelled each other out). Please note that three companies (names suppressed for confidentiality) were added to the list by one of the panel members.

*Taking into account how the other panel members rated the companies, can you now please rate them again. However, this time please only mark the **two** companies that in your opinion are the most successful and the **two** companies that in your opinion are the least successful. Again mark the most successful companies with an M and the least successful companies with an L.*

	Packaging Companies	SCORE	RATING
1	Note: Company names suppressed to maintain confidentiality	+4	
2		+3	
3		+2	
4		+2	
5		+1	
6		+1	
7		+1	
8		0	
9		0	
10		0	
11		0	
12		0	
13		0	
14		-1	
15		-1	
16		-1	
17		-1	
18		-2	
19		-4	

From:……..

Please e-mail your selection to me at rbmason@mweb.co.za. or fax this page back to me on 031 – 767 4905 (ask for fax). Alternately, you could just phone your selection to me on 031 – 767 4905 or 083 661 5938.

Many thanks for your assistance.

Appendix I – Titles of interviewees

COMPANY ITA	COMPANY ITB
Marketing Director	Managing Director
Product Director	Executive Director and Account Manager
Regional Director	Account Manager
National Technology Director	Technical Services Manager
Service Manager	Marketing Manager
Sales Manager	
Corporate Communications Officer	
Project Co-ordinator	
COMPANY PA	**COMPANY PB**
Managing Director	Chairman and Managing Director
National Sales Manager	Production Manager
Factory Manager	Quality Assurance Manager
Purchasing Manager	Chief Estimator
Production Manager	Buyer
Commercial Manager	Verification Manager
Sales Representative	Divisional Manager
Sales Agent	Marketing and Public Relations Manager
	Sales Representative
	Sales Agent

Appendix J – Interviewee response sheet

MARKET	
Is your market stable or continuously shifting?	
To what extent do you develop new markets – entrepreneurial, co-op with outsiders?	
Is there a blurring of boundaries between you and suppliers/customers?	
Which is more important: increasing efficiency in current markets or developing new markets?	
To what extent do you shake up/disrupt the market versus maintaining stability?	
STRUCTURE	
How loose/tight is the structure? Defined jobs/roles?	
How autonomously can people act? How centralised is decision making?	
Do staff know <u>how</u> to respond to problems/crises (not what to do)?	
Are staff aware of and have access to all necessary policies/procedures.	
Which is more important: delegating & controlling staff, or encouraging independent action?	
STRATEGY	
What is the vision or guiding philosophy of the company?	
How do you define the identity or core ideology of your company?	
Is your strategy developed by managers or does it emerge from lower down?	
Is strategy planned logically and rationally?	
Are changes carefully planned over a period of time or are they radical and quick?	
Which is more important: optimising processes/ efficiency or adapting quickly to change?	
Do you take decisions quickly without perfect info, or do you hold back until info is available?	
Do you take decisions early in the process or wait until the last minute?	
MANAGEMENT	
Are activities controlled by managers or is there self-control?	
How much info about the company is given to employees?	
To what extent is informal discussion amongst employees encouraged?	
Is the emphasis on stability for employees or are there constant changes and shake ups?	
CHAOS TACTICS	
Which of the following are important to your company: long term relationships not being too aggressive in market maintaining inventories/stocks developing new products developing new ways of doing business changing prices/promotions, etc	
MARKETING STRATEGY	
Are you a leader or follower in your market?	
Does your company change faster or slower than your customers and suppliers?	
Over what time period do you plan for?	
How would you describe the experience available in your company?	

MARKETING INFO AND RESEARCH	
How important is market info to you?	
What type of market feedback do you use?	
Is your market info collection formal or informal?	
Is your research collection aimed at quantity (how many) or qualitative (understanding)?	
Do your staff get face-to-face with customers in doing research?	
CUSTOMERS	
Who decides the type of relationship you develop with your customers?	
How much are the customers involved in customising your product offering?	
PRODUCT	
What drives your NPD – management, users, suppliers?	
To what extent are customers involved in developing new products?	
How important are teams, job rotation, communication to your NPD?	
Re new ideas, do you move first or wait and see how the market develops?	
Would you be prepared to make your products obsolete/cut them from the range while they are still profitable?	
How important is brand building to your company?	
Are your development lead times longer or shorter than the rest of your industry?	
How late in the development process can design changes be made?	
Is there good or poor co-operation between departments and with suppliers?	
Do you develop ahead of customers' needs, i.e. use of lead customers?	
Do you place more emphasis on standardising or customising your products?	
Do your products offer something truly superior to competitors in some way? How?	
Has your product range been increasing or decreasing?	
Would you say you use long-term or short-term planning?	
How do you handle products in your range that are under performing?	
PRICING	
How important is pricing as part of your marketing tactics?	
To what extent do you use price-cutting or aggressive pricing to win business?	
Are your pricing structures simple or complex?	
Do you have fixed, standardised pricing or innovative, flexible pricing?	
Do you get premium prices for your products, or can your customers negotiate lower prices?	
Do you have different prices for each customer?	
Are you willing to lead the market and initiate price changes?	
PLACE	
How important is distribution (physical and intermediaries) as part of your marketing tactics?	
To what extent do you use intermediaries – distributors, agents, etc.?	
Do your customers see you as partners in their supply chain, or just suppliers?	

Do you have co-operative arrangements, alliances, partnerships with other players in your industry?	
Do you use stocks to buffer and stabilise yourselves against the unexpected in your business?	
Would you say inventory replenishment is planned or reactive?	
PROMOTION	
How important are the following as part of your marketing tactics: - advertising sales promotions public relations personal selling word-of-mouth	
Do you use promotions/adverts to build relationships, image etc.?	
Do you use aggressive promotions, i.e. comparative, shocking, amazing, etc.?	
Do you use promotions to build or upset relationships?	
How often/fast do you change your promotions/communications programmes?	
Would you say a knowledgeable sales force is more important than advertising	
Are relationships with customers tied to the company or to the sales rep?	
How knowledgeable are your reps of your customers' business?	
Do you do anything to encourage word-of-mouth? What?	
Do you see promotions as more important for maintaining stability/status quo in your market, or as a means to shake up and upset your market and competitors?	
TACTICAL EMPHASIS	
Please rank the following activities from most important in your marketing activities (rank 1) through to least important (rank 9): Developing totally new products/services Price changes Product innovation (new product develop) Sales promotions Product enhancement (old prod. develop) Public relations and other non-advertising communications Media advertising Personal selling Distribution	

Appendix K - Interview guide

MARKET
Market stable or continuously shifting ?
Development of new markets – entrepreneurial, co-op with outsiders?
Blurring of boundaries between company and suppliers/customers?
Increasing efficiency in current markets or developing new markets?
Shake up/disrupt the market or maintain stability?
STRUCTURE
Looseness/tightness of structure? Defined jobs/roles?
Autonomy/centralisation of decision-making?
Knowing how to respond to problems/crises (not what to do)?
Access to all necessary policies/procedures/systems
Managing, delegating and controlling staff, or encouraging independent action?
STRATEGY
Vision or guiding philosophy of the company?
Identity or core ideology of the company?
Strategy developed by managers or emerges from lower down?
Strategy planned logically and rationally or just happens?
Changes carefully planned over a period of time or radical and quick?
Optimising processes/efficiency or adapting quickly to change?
Decisions taken quickly without perfect info, or hold back until info is available?
Decisions taken early in the process or wait until the last minute?
MANAGEMENT
Control by managers or self control?
Info about the company is given to employees?
Informal discussion amongst employees encouraged?
Emphasis on stability for employees or changes/shake ups/keep on toes?
CHAOS TACTICS
Which of the following are important to your company:
- long term relationships
- not being too aggressive in market
- maintaining inventories/stocks
- developing new products
- develop new ways of doing business
- changing prices/promotions, etc

MARKETING STRATEGY
Leader or follower in market?
Change faster or slower than customers/suppliers?
Time period for planning?
Staff experience available in company?
MARKETING INFO AND RESEARCH
Importance of market info?
Type of market feedback used?
Market info collection formal or informal?
Research collection aimed at quantity (how many) or qualitative (understanding)?
Staff face-to-face with customers in doing research?
CUSTOMERS
Type of relationship with customers?
Customers involvement in customising product offering?
PRODUCT
Driver of NPD – management, users, suppliers
Customers involved in developing new products?
Use of teams, job rotation, communication in NPD?
New ideas - move first or wait and see how the market develops?
Obsolete/cut products from range while still profitable
Importance of brand building?

Development lead times longer or shorter than the rest of industry?
How late in the development process can design changes be made?
Co-operation between departments and with suppliers?
Develop ahead of customers' needs, i.e. use of lead customers?
Emphasis on standardising or customising products?
True superiority to competitors of product offering?
Range increasing or decreasing?
Long-term or short-term planning?
Products in range that are under performing?

PRICING

Importance of pricing as part of marketing tactics?
Use of price cutting or aggressive pricing to win business?
Pricing structures simple or complex?
Fixed, standardised pricing or innovative, flexible pricing?
Premium prices for your products, or negotiate lower prices?
Different prices for each customer?
Willingness to lead market and initiate price changes?

PLACE

Importance of distribution (physical and intermediaries) as part of marketing tactics?
Use of intermediaries – distributors, agents, etc.?
Partners with customers in their supply chain, or just suppliers?
Co-operative arrangements, alliances, partnerships with other players in industry?
Use of stocks to buffer/stabilise against the unexpected?
Inventory replenishment planned or reactive?

PROMOTION

Importance of following as part of marketing tactics:

- advertising
- sales promotions
- public relations
- personal selling
- word-of-mouth

Use of promotions/adverts to build relationships, image etc.?
Use of aggressive promotions, i.e. comparative, shocking, amazing, etc.?
Use of promotions to build or upset relationships?
Frequency/speed of changing promotions/communications programmes?
Knowledgeable sales force more important than advertising
Relationships with customers tied to company or to sales rep?
Knowledge by reps of your customers' business?
Encouragement of word-of-mouth?
Promotions: for stability/status quo, or means to shake up/upset market/competitor

TACTICAL EMPHASIS

Rank from most important in your marketing activities (1) to least important (9):

- Developing totally new products/services
- Price changes/cutting
- Product innovation (new product develop)
- Sales promotions
- Product enhancement (old prod. develop)
- Public relations and other non-advertising communications
- Media advertising
- Personal selling
- Distribution

Appendix L - List of words

CHAOS related words–
Chaos, chaotic, haphazard, erratic, madness, random, unpredictable, uncertainty, volatility, volatile, turbulence, turbulent, mess, disturb, disturbance, bifurcation, discontinuous, discontinuity, flux, instability, unstable, anarchy, fuzzy, dynamic, spontaneous, spontaneity, disorder, perturbation, perturb, dissipation, dissipate, "fall apart", destruction, disintegrate, disintegration

ORDER related words –
Order, harmony, harmonious, structure, rigid, rigidity, control, certainty, certain, planning, plans, equilibrium, stable, stability, coherence, stagnation, stagnate, forecast, forecasting, similarity, consistent, balance, optimum, optimal, cohesion, rationality, rational, static, bureaucracy, "scientific management", procedures, procedure, policy, policies

COMPLEXITY related words –
Complexity, complex, emerging, emergence, emerge, reproduce, replicate, self-organising, evolve, evolving, interdependence, interdependent, feedback, "spontaneous reorganisation", "living systems", diversity, diverse, influence, learning, unfolding, co-operation, flexible, flexibility, adaptable, adapt, lean, innovative, innovate, organism, organic, evolution, "complex system", ecology, DNA, grow

OTHER WORDS/PHRASES related to chaos/complexity/turbulence –
"agents of change", champion, "small changes", "small causes", multiplication, magnification, "multiplier effect", amplification, subtle

Appendix M – Frequency of word usage

CHAOS related words

	ITA	ITB	PA	PB
chaos				
chaotic				
haphazard				
erratic				
madness				
random			1	
unpredictable			2	
uncertainty	1		1	2
volatility				
volatile			3	
turbulence				
turbulent			3	
mess	2		1	
disturb				
disturbance				
bifurcation				
discontinuous				
discontinuity				
flux				
instability				
unstable				2
anarchy				
fuzzy				
dynamic	5	3	9	1
spontaneous				
spontaneity				
disorder				
perturbation				
perturb				
dissipation				
dissipate	1			
“fall apart”				
destruction				
disintegrate		1		
disintegration				
TOTAL CHAOS WORDS	**9**	**4**	**20**	**5**

ORDER related words

	ITA	ITB	PA	PB
order				
harmony				
harmonious				
structure	3			
rigid			1	
rigidity				
control	7		1	
certainty				
certain	3	1	3	4
planning/plan/planned		1	15	
equilibrium				
stable/stability			7	1
coherence				
stagnation				
stagnate				
forecast			1	
forecasting				
similarity				
consistent				
balance		1		
optimum				

optimal				
same		1		
organise		1		
cohesion				
rationality				
rational				
static		1		
bureaucracy	2			
management			4	3
procedures	1		1	1
procedure				
policy				
policies				
TOTAL ORDER WORDS	**17**	**4**	**33**	**9**

COMPLEXITY related words

	ITA	**ITB**	**PA**	**PB**
complexity				
complex	1			
emerging / emerge				
emergence				
reproduce				
replicate				
self-organising				
evolve				
evolving	1			
interdependence				
interdependent				
feedback				
“spontaneous reorganisation’				
systems	3	1	3	
diversity				
diverse				
influence				
learning				
unfolding				
co-operation				
Flexible/flexibility	1		4	
adaptable				
adapt				
lean				
innovative	1		1	
innovate				
organism				
organic		1		
evolution				
“complex system”				
ecology				
DNA				
Grow/growth			4	
TOTAL COMPLEXITY WORDS	**7**	**2**	**12**	**0**

OTHER WORDS/PHRASES

	ITA	**ITB**	**PA**	**PB**
change	10	3	12	3
champion				
“small changes”				
“small causes”				
multiplication				
magnification				
“multiplier effect”				
amplification				
subtle				
TOTAL OTHER WORDS	**10**	**3**	**12**	**3**

Appendix N – Coding scheme

NVivo revision 1.2.142 **Date:** 12/27/01 - 8:25:48 PM

NODE LISTING
Nodes in Set: Marketing strategy
Created: 12/23/01 - 1:49:06 PM
Number of Nodes: 13
1 (3) /Markets
2 (3 1) /Markets/Perception
3 (3 2) /Markets/New markets
4 (5) /Strategy
5 (5 1) /Strategy/Detailed
6 (5 2) /Strategy/Open
7 (5 3) /Strategy/Source
8 (8) /Customers
9 (8 1) /Customers/Relations
10 (8 1 1) /Customers/Relations/Public Relations
11 (8 2) /Customers/Partnerships
12 (17) /Information
13 (17 1) /Information/Feedback loops

NODE LISTING
Nodes in Set: Structure
Created: 12/23/01 - 1:52:13 PM
Number of Nodes: 12
1 (6 2) /Communication/Internal
2 (9 1) /Staff/Profile
3 (9 2) /Staff/Relations
4 (9 3) /Staff/Procedures~ policies
5 (9 4) /Staff/Knowledge and skills
6 (9 5) /Staff/Management style
7 (9 5 1) /Staff/Management style/Autonomous
8 (9 5 2) /Staff/Management style/Restrictive
9 (9 6) /Staff/Roles
10 (9 7) /Staff/Teamwork
11 (9 8) /Staff/Small groups
12 (9 9) /Staff/Stability

NODE LISTING
Nodes in Set: Overall approach GM issues
Created: 12/16/01 - 2:14:24 PM
Number of Nodes: 13
1 (7) /Core statements
2 (9 2) /Staff/Relations
3 (9 3) /Staff/Procedures~ policies
4 (9 5) /Staff/Management style
5 (9 5 1) /Staff/Management style/Autonomous
6 (9 5 2) /Staff/Management style/Restrictive
7 (17) /Information
8 (17 1) /Information/Feedback loops
9 (17 2) /Information/Transparency
10 (18) /~Strategy~ Planning
11 (19) /decisions
12 (19 1) /decisions/Centralized
13 (19 2) /decisions/Diffused

NODE LISTING
Nodes in Set: PRODUCT
Created: 12/23/01 - 1:55:25 PM
Number of Nodes: 15
1 Change pace
2 Cycles
3 Proactive
4 (4) /Range

5 (11 1) /New products/Innovation
6 (11 2) /New products/drive
7 (11 3) /New products/development pace
8 (11 4) /New products/Flexibility
9 (12) /Existing products
10 (12 1) /Existing products/Culling
11 (12 2) /Existing products/Enhancement
12 (13) /Pricing
13 (18) /~Strategy~ Planning
14 (21) /Adaptation
15 (22) /Cooperation~ partnerships

NODE LISTING

Nodes in Set: PRICE
Created: 12/23/01 - 1:59:02 PM
Number of Nodes: 6

1 Cycles
2 Proactive
3 (5) /Strategy
4 (5 3) /Strategy/Source
5 (13) /Pricing
6 (21) /Adaptation

NODE LISTING

Nodes in Set: PLACE
Created: 12/24/01 - 3:13:36 PM
Number of Nodes: 7

1 (2) /Distribution
2 (2 1) /Distribution/Intermediaries, middlemen
3 (2 2) /Distribution/Distribution method
4 (2 3) /Distribution/Inventories~ stock
5 (8 1) /Customers/Relations
6 (8 2) /Customers/Partnerships
7 (22) /Cooperation~ partnerships

NODE LISTING

Nodes in Set: PROMOTION
Created: 12/24/01 - 3:15:33 PM
Number of Nodes: 11

1 Cycles
2 Proactive
3 (8 1) /Customers/Relations
4 (8 1 1) /Customers/Relations/Public Relations
5 (9 4) /Staff/Knowledge and skills
6 (10 1) /Buying and selling/Word of mouth
7 (10 2) /Buying and selling/Personal
8 (14) /Promotions-sales
9 (16) /Advertising
10 (16 1) /Advertising/Product~price
11 (16 2) /Advertising/Corporate image

NODE LISTING

Nodes in Set: TACTICAL EMPHASIS
Created: 12/23/01 - 2:08:43 PM
Number of Nodes: 8

1 (2) /Distribution
2 (6 1) /Communication/External
3 (10 2) /Buying and selling/Personal
4 (11 1) /New products/Innovation
5 (12 2) /Existing products/Enhancement
6 (13) /Pricing
7 (14) /Promotions-sales
8 (16) /Advertising

Appendix O - Coding framework

Features of each set which apply to a more successful company in a complex, turbulent environment or a less successful company in a simple, stable environment, i.e. Companies ITA and PB. The opposite of these features would apply to the more successful company in a simple, stable environment and to the less successful company in a complex, turbulent environment, i.e. companies PA and ITB.

ENVIRONMENTAL ISSUES

1. Environment and market

Market change	Shifting, changing
Environment	Changing in all areas
Market development	Very important, entrepreneurial
Approach to market	Disrupt, shake up

2. Change/attitudes to change

Pace of change	Very quick, faster than customers/suppliers, change their market
Change cycles	Short cycles, shorter than environment cycles
Proactive	Aggressive, change first, ahead of market, risk takers
Adaptation	Anticipate change, flexible, short term planning

MANAGEMENT ISSUES

3. GM issues

Vision/identity	Leaders, innovation, freedom, responsibility, different, disruptive, change
Staff/relations	Self managing, aggressive, supportive, informality, transparent
Procedures/policies	Minimum of formality/manuals, known through learning and company culture
Management style	Autonomous, transparency, self management, loose structures, responsibility, independence, self control
Internal communications	Transparent, open, informal, little confidential
Planning	Little formal, short term, quick, adaptive, decentralised
Decisions	Democratic, quick, independent, autonomous, flexible

4. Marketing Strategy

Perception of market	Shifting
Development	Emphasis on developing new markets
Strategy	Innovation, aggression, disruptive, emergent, reactive, bottom up
Customers	Long term relationships, partnerships, blurring/integration with customers
Information	Informal, about market is important
Adaptation	Short term planning, flexible, quick reacting and changing

5. Structure/staffing issues

Internal communications	Open, helping, inclusive, democratic, informal interaction
Staff profile	Self confidence, team players, self starters, entrepreneurs, assertive, self control, independent
Staff relations	Self managing, aggressive, supportive, informality, transparency
Procedures/policies	Little formality/manuals, known through learning and company culture, unwritten
Knowledge/skills	Trained/qualified to respond, mix of experience and inexperience, continuous training, knowledgeable about customers
Management style	Autonomous, transparency, self management, loose structures, responsibility, independence, self control
Staff roles	Loosely defined, overlapping, not formalised, considerable job rotation, versatile
Teamwork	Overlap, family, help each other learn, informal, people get involved, co-operation
Stability	Instability and tension but positive, continuous change, no complacency

6. Customer/supplier relationships

Relationship type	Close, overlapping, partnership, blurring boundaries, stability, long term, trust
How established	Customer and rep and company
Lead customers	Are used
Partnerships	With key customers, very close, co-operation
Customising	Lots done, customer heavily involved
Relationship locus	With company not rep
Boundaries	Blurring, overlapping, transparent
Co-operation	Lots with suppliers, even competitors

MARKETING TACTICS

7. Tactical issues

Distribution	Least important
Selling	Less important
New product/ innovation	Very important to stay ahead
Product enhancement	Important, improve, cannibalise
Pricing	Very important, use pricing to compete
Sales promotion	Important
Advertising	Less important
Public relations	Less important
Word of mouth	Very important

8. Product

Source of NPD	Driven by market/customers
New ideas	Move ahead of market/customers, many trials
Range	Continually growing, many options, cut ruthlessly if need to
Product type	Customising, work closely with customers
Development speed	Very quick, faster than market
Development flexibility	Very flexible, change at last minute, adaptable
Enhancement	Less important, but still ahead of market
Planning	Tend to be short term and quick

9. Pricing

Use of pricing	Aggressive, cutting to disrupt, discounts
Price setting	Simple, but innovative and flexible, transparent, different prices per customer
Price premium	Usually get but prepared to negotiate
Leadership	Lead market in price setting/changing

10. Place

Intermediaries	Not much used
Partnerships/alliances	Much used
Use of stock	Not very important
Stock replenishment	Reactive
Physical distribution	Important, but is a given, no choice
Channels	Less important

11. Promotion

Use of promotions	More to shake up/disrupt market and competitors
Type of promotions	Aggressive, shocking, amazing
Frequency/speed	Change promotions often and quickly
Word of mouth	Important and encouraged
Rep knowledge	Knowledge of customers more important than advertising
Customer locus	Tied more to company than to rep

Appendix P - Summary field notes of depth interviews

QUESTION	Pack A	Pack B	IT A	IT B
MARKET				
Market stable or shifting	Mostly stable, but some aspects seen as shifting	Mainly see some aspects of market shifting	Shifting due to technology changes	Shifting
Develop new markets	Yes – innovate/explore with customers & group companies	Not much in past, is more now	Continually developing new markets	Some, mostly through acquisitions
Blurring of boundaries	Yes, with bigger, old customers. Overlapping with customers & suppliers	Little in past, some now with big customers & with suppliers	Yes, at customer, supplier & group	Some, with bigger "partners"
Efficiency in current markets or develop new markets	Equally important but now more efficiency because plant at capacity	Mostly emphasis on efficiency	Developing new markets, but efficiency also very important	Efficiency in current markets
Disrupt versus stabilise	Disrupt to change things & be different	Stabilise	Aggressively disrupt, move goal posts so can control new markets	Stabilise
STRUCTURE				
Loose-tight – roles defined	Loose, overlapping roles, informal job descriptions	Tight	Loose, but focussed on project/opportunities/ technology	Loose, flat
Decision making-autonomous/central	Autonomous if feel confident, MDs hands on /supportive	Centralised, but in some cases autonomy	Mostly autonomous, but within strategy/project parameters	Autonomous within parameters, but limited on big risky projects
Know how to respond to crisis	Mostly yes, know who to go to	Generally yes	Yes, within experienced teams	Yes, in technical sense, but not in business sense
Aware of/access to policies/procedures	Yes, for the few policies there are	Yes, detailed manual	Generally know corporate way of working	Yes, underlying principles, but not documented
Controlling versus independent action	Independence, encourage it	Control, but independence now encouraged	Independent	Independent action
STRATEGY				
Vision/philosophy known	4 principles known, fairness, honesty, leadership	Quality/service, history of company, happy staff	Leader/No. 1, global, innovative, bottom line achievement	Growth, quality/ professional, IT solutions, equity/development for staff
Identity/core ideology	Mostly people issues	No consistency, all have different view	Aggressive, enjoy, exciting, young, innovative, success	People, software solutions,
Strategy comes from manager or emerges	Management but encourage contributions from staff & customers	From management, but accept ideas from staff	Planned from top, but also opportunistic, evolving from lower with trial and error	Management with staff participation
Strategy planned logically / rationally	No, entrepreneurial, decisive, flexible, but not reckless	Generally feel is logical & rational planning	Generally rational, but follow market fashions, dynamic, trial and error	Not really
Planned over time/ radical / quick	Quick/decisive, based on homework/short term planning	Planned quickly, but with some degree of care	Quick/radical within window of opportunity	Generally radical and quick
Optimise efficiency versus adapt quickly	Adapt/react quickly, but don't sacrifice quality, efficient	Efficiency more important	Adapt quickly	Efficiency, with some adapting/reacting to change

Decide quick/ wait for perfect information	Fast, but base on info, won't risk reputation	Tend to wait, don't take quick decisions	Decide quickly but not rashly	Generally quick, but if high impact are cautious, wait for info
Decide early / wait until last minute	Early, but keep options open, flexible to change	Last minute	Late, but when early are flexible	Inconsistent answers, seems more early
MANAGEMENT				
Manager control or self control	Self control	Was management control, now more self control	Self control	Self control
Info about company that employees get	Full disclosure of everything they want – including financials	Was very little, now getting more	Lots at operational, less at strategy/acquisition level	Everything about company, including salaries
Informal discussion by staff encouraged	Yes, braais after quarterly meeting, canteen, shift change	Is fair amount but not throughout company	Encouraged, coffee, drinks, lunch, white board for smokers	Encouraged a lot, e.g. at pub
Staff feel secure or experience change & being shaken up	Generally stable, but are shaken up because of continuous change	Secure/stable, maybe even complacent	Constant uncertainty/ change, but accept as good communication & growing	Secure, stable, with some pressure due to industry/productivity
CHAOS TACTICS				
Importance of:				
Long term relationships	Yes, very important, especially for loyalty	Important	Important	Important
Being aggressive in market	No, avoid being too aggressive	Must be aggressive but not too much	Not important, are very aggressive	Important
Carrying stocks	Yes, for raw materials & some big customers, otherwise no	Only important for raw materials	Not important	Not important
Developing new products	Very important	Important	Important	Important, but follow suppliers
Develop new ways of doing business	Very important	Important, but tend to do it only when pushed into it	Important	Not too important
Changing prices/ promotions	No, only when costs change	Not important	Not important	Not important
MARKETNG STRATEGY				
Leader or follower in market	Leader	Leader only in their specific niche	Leader	Follower
Change fast/slower than customers / suppliers	Mostly faster	Same, sometimes slower	Faster, especially than customers	Generally slower
Planning time horizon	Generally 1 year, production much shorter, product longer	About 1 year	1 yr budget, but 3 to 6 months for activities	3 yr business plan, but in reality plan 6 – 12 months
Experience available in company	Mix of much experience & some inexperience – deliberate	Lots, but with some lacks in tech & production	Generally lots, but less at lower & global levels	Highly experienced, but with lack of business skills
MARKET INFO / RESEARCH				
Importance of market info	Important about customers, products, not competitors	Important	Important, especially on technology, market, global, but not done well	Important

Type of market feedback used	Customer / supplier contacts, magazines, BMI, reps	Magazines, shows, customers, industry association, reps,	Syndicated reports, reps, suppliers	Customers, suppliers, personal contacts
Info collection - formal / informal	Informal	Informal	Both formal (syndicated) & informal (reps/suppliers)	Informal
Info collection quantitative or qualitative	Qualitative	Qualitative	Both quant (syndicated) & qual (reps/suppliers)	Qualitative
Face-to-face with customers for research	Yes, visits to and from customers at all levels of staff	Some contact, mostly through customer audits	Yes, but informal & not well done	Yes, account & project managers
CUSTOMERS				
Who decide type of customer relationship	Generally company, adapting to what think customer wants	Company	Sales reps/account manager and customer	Account managers and customers
Customer involved in customising product	Totally	Heavily involved in customising	Yes, where they have the skills, feedback important	Totally
PRODUCT				
NPD drivers – users, management, suppliers	Generally technically driven by company	Mostly customers and management	Management, suppliers and customers	Mostly customers, but also suppliers/technology
Customer involvement in NPD	Closely involved by bigger customers who have packaging experts	Heavily	To some extent, depends on nature of project	Totally
Importance to NPD of teams, communication, job rotation	Communication /interaction important but no real teams, job rotation	Not much use	Yes, virtual teams put together, including customers	Very important, project teams with rotating membership
New ideas–move first or wait for market to move	Move first	Mixed response – half wait half move first	Aggressively first to commercialise	Wait
Obsolete products / cut from range	Yes, but only when have a replacement	Generally not, keep while customer wants it	Only cut, if replaced / upgraded, customer doesn't need	Yes, but sometimes keep for customer
Importance of brand building	Company seen as important brand	Mixed response, half see as important, half unimportant	Mostly company name as a brand. Also support supplier brands	Not important
Development lead time shorter than industry's	Much shorter, but still trying to shorten more	Same or shorter	Mostly quicker, but sometimes longer	Generally a bit longer, but better quality
How late design changes can be made	11th hour, not to back of queue, will meet customers deadlines	Very late, until printing starts	Late, to be flexible	Late, but customer pays for any changes
Good co-operation between departments/suppliers	Yes, very good	Was poor, but getting better	Good, but could be better – some selfishness	Good
Dev ahead of customer needs using lead customers	Yes, especially working with more dynamic customers	Generally not – follow customer needs	Develop ahead, generally with lead customers	No, except occasionally on technology
Standardise or customise products	Customise	Customised	Customising	Customising

True product superiority over competitors	Understanding customers, product / print quality, service	Quality / timeous delivery, historical experience in niche	Yes, due to technology, service, relationships	Costing lower, openness, adhere to quote. Quality of solution
Product range increasing / decreasing	Increasing	Increasing	Increasing	Increasing
Use long or short term planning	Short term	Short term	Short term	Directors say long term, all others say short term
How handle under-performing products	Generally keep if customer wants it and making a profit		Try to improve, then cut from range	Will cut if necessary
PRICING				
Importance of pricing as marketing tactic	Not too important, be competitive, but not price sensitive	Very important	Not too important	Fairly important
Price cutting/ aggression to win business	Not important	Do cut sometimes to win business – fill plant	Generally not, but do cut price to win specific strategic customer	Don't do it, but would for long term gain
Pricing structures simple or complex	Complex for customer but really quite simple	Simple	Generally simple, list less discount	Simple
Fixed/standard or innovative/flexible price setting	Flexible, but more standardised for small customers	Flexible	Flexible through discounts, but based on standard list	Fixed / standardised method, can be flexible per project
Get premium price or customers negotiate lower prices	Usually get premium prices	Don't get premium	Get premium, but will negotiate if necessary	Some premium for suppliers quality, but negotiate if necessary
Different prices for each customer	Yes, different	Yes	Yes, different discounts & different solutions	Rates the same, but different total price as all projects differ
Lead & initiate price changes	Are prepared to, but generally follow market / cost changes	Not really – many contracts	Yes, but follow suppliers, react to competitors cost cutting if necessary	No, follow the market
PLACE				
Importance of distribution	Vital to give good service. Pay more for good delivery	Important to meet delivery dates	Not important	Not important
Use intermediaries	Not really – 2 sales agents & transport companies	Commission sales agents & transport companies	Don't use much, mostly direct distribution	Not used
Customers see you as partner or supplier	Mostly partners, some small companies see just as suppliers	Partners	As partners	Partners
Co-op arrangements, alliances, partnerships	Licence with overseas company, alliances with group companies	Only with two suppliers	Alliances with suppliers, competitors, especially in Africa	Yes, with major suppliers
Use stocks to buffer/stabilise market demand	Minimum possible on raw materials. Also for big companies	Did for some customers, reducing now	No	No
Inventory replenishment planned	Raw materials planned – rest reactive, to order on week basis	Generally reactive, with raw mats planned	N/a	N/a
PROMOTION				
Importance for marketing:				

Advertising	No – only minimal ads in trade magazines, "payment" for editorial	No	Not important, except to establish company as brand name	Not too important
Sales promotion	No	No	Not important	Not important
Public relations	Yes, press coverage of awards, event entertaining, trade show	Fairly important	Important, events news releases, golf day, rugby suites, investor relations	Important
Personal selling	Yes	Important	Very important	Important
Word-of-mouth	Very important	Important	Important	Important
Use promotions /advertising to build relations	No	No	Yes to build company image	No
Use aggressive, shocking promotions	No, but do things that surprise industry	No	No, except do amaze/ impress customers	No
Use promotions to build or upset relationships	Events used to build customer relations	No	Not really, although occasionally use guerrilla tactics / target companies with bad press	No
Change promotions often / fast	No	No	Not abnormally often	Don't do so don't really change
Knowledgeable reps versus advertising	Knowledgeable reps more important	Yes	Knowledgeable reps most important	Knowledgeable reps more important
Customer relationship tied to rep or company	Mostly to company	Company	Company	Company, but account manager also important
Reps' knowledge of customer's business	Mostly are knowledgeable	Fairly knowledgeable	Good for key / strategic accounts	Very knowledgeable, learn quickly
Encouraging word-of-mouth?	Yes, by events and reputation for doing the unusual & doing right	Satisfy customers by meeting delivery dates, reputation	Put prospects with good customers together at events, use cases studies in PR, reference sites	Visits to reference sites, golf
Promote for stability or to upset market/ competitors	Stability, remind of company name			Mostly stabilise

TACTICAL EMPHASIS	*Ave rating*	*Ranking*	*Ave rating*	*Ranking*	*Ave rating*	*Ranking*	*Ave rating*	*Ranking*
Developing new products	2.7	1	7.2	8	2.7	3	5.8	6
Price changing	6.0	6	4.6	4	6.7	7	5.4	5
Product innovation	3.0	2	4.6	4	2.4	2	3.0	2
Sales promotions	7.9	8	5.9	7	6.9	8	6.8	7
Product enhancement	3.6	4	5.1	6	5.4	5	4.0	4
PR & other communications	6.4	7	4.4	3	3.9	4	3.8	3
Media advertising	7.9	8	8.6	9	6.6	6	7.4	8
Personal selling	3.3	3	2.0	1	2.1	1	1.0	1
Distribution	4.3	5	2.4	2	8.3	9	7.8	9