Rhodes University

Effective Management of an Information Technology Professional's Career.

THESIS

Submitted in the fulfilment of the requirements for the degree of

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by

Derek Tedder

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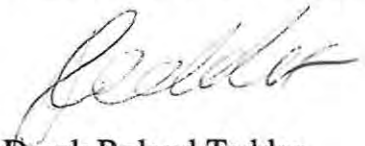
Declaration

I acknowledge that all references are accurately recorded and that unless otherwise stated, all work herein is my own.



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Abstract

The human resource is constantly cited as an organisations greatest asset. In a rapidly changing technological environment this is most applicable to the Information Technology (IT) function. Organisations are experiencing IT human resource problems such as low satisfaction, early plateauing, high turnover, burnout, limited advancement potential, nominal corporate commitment, supervisory aversion, poor organisational culture, and exceptional compensation. These problems are directly related to the IT professional's career. There is a lack of information and awareness surrounding IT careers to deal effectively with these problems.

The research aims to create increased awareness of IT careers and the inherent problems through the development of a career management model. The research aims to identify the factors that influence IT careers, provide career management with a means to measure compatibility of the factors, and suggest solutions to incompatibility. The solving of this problem will be of mutual benefit to both organisations and individuals as they seek to better manage IT careers.

After reviewing research literature relating to career anchors, IT job types, IT skills portfolios, and career dynamics a model for Effective IT Career Management (EITCM) has been constructed. The model represents the dynamic interactions between individual, organisational, and dependent factors. The model examines the compatibility of these interacting factors by measuring the levels of relevant career variables. The model suggests appropriate career management techniques to increase the compatibility of the interacting factors.

An empirical study was designed and launched online to provide data that would confirm the seven Critical Success Factors (CSF) relating to the proposed model. The responses from the members of the Computer Society of South Africa (CSSA) allowed the seven hypotheses derived from the CSFs to be tested.

The results of the empirical study were positive but required modification to five of the CSFs before they could be confirmed. The EITCM model was modified to reflect the improved CSFs. An awareness of career influencing factors combined with active career management is advantageous to both IT professionals and their organisations.

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Glossary of Terms and Abbreviations

Glossary of Terms

- ***Career:*** An occupation or profession followed as one's life work.
- ***Career Anchor/Career Orientation:*** A career anchor refers to a cluster of self-perceived needs, values, and talents that give shape to an employee's career decision.
- ***Career Dynamics:*** Matching individual and organisational needs.
- ***Career Movement:*** Any organisational or interorganisational transfers an individual may make in the course of their career.
- ***Career Path:*** An evolving sequence of work activities and positions that individuals experience over time as well as the associated attitudes, knowledge and skills they develop throughout their life (working life).
- ***Career Plateau:*** The point where the likelihood of additional hierarchical promotion is very low.
- ***Career Satisfaction:*** The fulfilling of an individual's career expectations and needs.
- ***Career Stage:*** Work attitudes and aspirations vary systematically as an individual progresses through a career and acquires a range of occupational and life experiences. Each stage is delineated into specific activities and psychological adjustments.
- ***Career Transition:*** A career movement and the changes experienced when an individual switches to a new related or unrelated functional area.
- ***Career Variables:*** Refers to the mix of an individuals career/job satisfaction, organisational commitment, state of plateauing, and turnover intentions associated with their career.
- ***Information Systems/Technology Professional:*** A well educated individual who has at sometime worked within the Information systems/Technology environment.
- ***Job Satisfaction:*** The fulfilling of an individual's job expectations and needs.

- ***Job Type:*** An individual's position within an organisation and the inherent characteristics associated with it such as responsibility, authority, salary, rewards, and duties.
- ***Professional Plateau:*** The point where employees find their job unchallenging and it provides few opportunities for professional development and future employability.
- ***Skills/Knowledge Portfolios:*** The set of skills and knowledge an individual possesses.
- ***Turnover Intention:*** An individual's intention to leave their job or organisation, acts a strong indicator of organisational commitment and actual turnover experienced by an organisation.

Abbreviations

- ***ACM:*** Association for Computing Machinery.
- ***AIT:*** The Association for Information Systems.
- ***AITP:*** The Association of Information Technology Professionals.
- ***EITCM:*** Effective Information Technology Career Management.
- ***CDF:*** Career Development Framework.
- ***CDP:*** Career Development Plans.
- ***CIO:*** Chief Information Officer.
- ***COI:*** Career Orientations Inventory.
- ***CSF:*** Critical Success Factor.
- ***CSSA:*** Computer Society of South Africa.
- ***HR:*** Human Resource.
- ***HRM:*** Human Resource Management.
- ***IS:*** Information Systems.
- ***IT:*** Information Technology.
- ***ITQW***: Information Technology Quality at Work.
- ***MIS:*** Management of Information Systems.
- ***PDP:*** Professional Development Portfolio.
- ***PDS:*** Professional Development Scheme.
- ***VP:*** Vice President.

Chapter 1 Introduction

1.1 The Problem and its Setting

Richens (1998:289) states that "the overall Human Resource (HR) challenge has always been to deliver the right people to the right place at the right time." The placing of employees in the right place at the right time should provide benefits for both the organization and the individual. To fully realize these potential benefits the careers of Information Technology (IT) professionals need to be observed and managed. According to El-Sabaa (2001:2) "A career is an evolving sequence of work activities and positions that individuals experience over time as well as the associated attitudes, knowledge and skills they develop throughout their life." To successfully manage the IT professional's career and the path it may take the individual (experiences over time and associated attitudes), organisational (work activities and positions), and dependent (knowledge and skills) factors affecting it must be taken into consideration (Las and Sein, 1995). This section examines the lack of awareness and information surrounding IT career management.

The problems surrounding IT careers can be monitored through career dynamics. The concept of career dynamics tests the compatibility of factors that influence careers (McLean, Tanner, and Smits, 1991:3). The matching of individual and organisational factors results in compatible career dynamics. This is represented through positive levels of career variables such as career and job satisfaction, professional and career plateauing, and turnover intentions. Knowledge of individual, organisational, dependent factors and career movements can provide individuals involved in career management with a means of adjusting career dynamics to make them more compatible.

The individual factors that influence an individual's career include clusters of self-perceived needs, values, and talents. These are represented by career anchors that give shape to an employee's career decision (Igbaria, Greenhaus, and Parasuraman, 1991:151). The career anchors of the IT professional have received attention from authors such as Agarwal (2000, 2001), Cheney (1988, 1980), Igbaria (1991, 1993,

1995, 1996), Jiang (1995, 2001), Lee, D (1995), Lee, P (1999), McLean (1991, 1994), Ridings (1998, 1999), Ramakrishna and Potosky (2002), Schein (1985, 1987), Trauth (1993). These authors provide a solid foundation of supporting literature for the eight career anchors originally identified by Schien (1985). Career anchors provide an ideal way to measure the influence of individual factors on the IT professional's career.

Organisational factors can be represented by IT job types and dependent factors by IT skills portfolios. The term "rapidly changing environment" is becoming synonymous with the IT profession. This rapidly changing environment requires that the individuals within it adapt their skills to match the requirements of IT job types. A study conducted by Todd, McKeen, and Gallupe (1995:1) from 1970 to 1990 established that the largest transition in job skill requirements has occurred for IT related jobs. Reich and Kaarst-Brown (1999:348) found that this rapid change is causing IT careers to be re-conceptualised away from job histories toward a set of experiences and skills accumulated through changing job types and non-traditional paths. The IT professional's career is reliant on the skills and knowledge they possess yet the skills required are never constant. This is emphasized in a study by Nakayama and Sutcliffe (2001:104) which found that IT professionals continuously learn new skill sets as their careers evolve through different job types. A successful career requires the maintenance and management of the IT professional's skills/knowledge portfolios. A variety of IT skills/knowledge categories exist such as technological, conceptual, social, and marketplace skills (Heckman, 1998). IT skills (dependent factors) need to be categorized in order to effectively monitor the influences on the IT professional's career. In the same way the numerous IT job types (organisational factors) need to be categorized in order to monitor the influences of job type characteristics on the IT professional's career.

Research examined in the literature review suggests IT careers are not receiving necessary attention. An example of this is the lack of career paths designated by the HR department for the IT function (Richens, 1998:290). Organizations instead choose to utilize a general linear career path throughout the entire organization. In a linear organization where an employee starts at entry point A and develops through multiple positions to finish at management point Z, the traditional career path makes

sense. However, when considering the IT professional whose next skill set is not known a year ahead of time, a new model must be devised for managing their career development (Richens, 1998). The traditional single career path, programmer→analyst→project manager→IT manager, is being replaced with a new reality in which there are multiple IT career paths (Leea, Kohb, Yena, and Tangc, 2002:52). Brousseau, Driver, Eneroth, and Larson (1996) and Lash and Sein (1995) identified numerous types of career movements. These career movements are combined into career path models. Models of multiple IT career paths that have been developed are not well supported by empirical studies and focus on movement in one organization (Lash and Sein, 1995). These diverse career paths need to be explored in order to manage the IT career effectively. This understanding can be used to initiate career management methods and tools that will rectify problems found in the IT professional's career.

The research intends to overcome the problem of inattention to IT careers through the development of a career management model that draws attention to individual factors (represented by career anchors), organisational factors (represented by job types), and dependent factors (represented by skills). The research also intends to provide career management with a means to measure the compatibly of the influencing factors and provide solutions to incompatibility of these factors. The solving of this problem will be of mutual benefit to both organisations and individuals as they seek to better manage IT careers.

1.2 The Statement of the Problem

The research aims to investigate how individual, organisational, and dependent factors affecting the South African IT professionals' career can be effectively managed, by the IT professional and or employer, in order to achieve compatible career dynamics characterised by positive levels of career variables.

1.2.1 The Statement of the Sub-problems

1) Identify and examine the dominant career anchors of South African IT professionals that represent individual factors in order to determine their influence on career dynamics.

2) Identify and categorise the job type characteristics representing organisational factors in order to determine their influence on career dynamics.

3) Identify and categorise the skills/knowledge portfolio representing dependent factors in order to determine their influence on career dynamics.

4) Determine career management methods that are available to South African IT professionals and or their organisations to rectify incompatible career dynamics.

5) Develop a model of effective IT career management (EITCM) using knowledge of the dynamic interactions between individual, organisational, and dependent factors, and provide a holistic view of career management that draws attention to IT careers and provides a tool for monitoring career influencing factors in order to produce compatible career dynamics.

1.3 Scope of the Research

1.3.1 Hypotheses

The hypotheses to be tested within the research are derived from the theoretical model for EITCM developed in the course of the research. These hypotheses are identified and described in *Chapter 7* of this thesis.

1.3.2 Delimitations

The research was limited to the IT profession within South Africa.

1.3.3 Assumptions

The following assumptions regarding IT career management were made:

- Environmental factors were stable and had no major affect on the IT professional's career.
- Individual factors affecting the IT professional's career can be represented by career anchors.
- Organisational factors affecting the IT professional's career can be represented by job type characteristics.

- Dependent factors affecting the IT professional's career can be represented by skills/knowledge portfolios.
- An individual's organisational commitment and turnover are sufficiently represented by their turnover intentions.
- The term Information Technology professionals includes Information Systems professionals and other business technology related professionals.

1.3.4 Methodology

The research began with a literature survey that focused on the following areas and their application to the IT professional: 1) Career anchors, 2) Job type characteristics, 3) Skill/knowledge portfolios, 4) Career management, 5) Career variables, 6) Career dynamics, and 7) Career paths.

The critical analyses of the literature lead to the development of a model for EITCM. The Critical Success Factors (CSFs) were extracted from the model and suitable hypotheses derived. A pilot study was conducted within the Rhodes University departments of IT, Computer Science, and the IT division.

Using feedback from the pilot study an online questionnaire was designed to test the hypothesis and was answered by members of the Computer Society of South Africa (CSSA). The results of the empirical study were used to make recommendations and modifications regarding the EITCM model.

1.4 Summary of Results

The main contributions of this work lies in the development of the EITCM model. The model is aimed at creating an awareness of IT careers and providing IT career management with a tool that accounts for the various factors influencing an individual's career dynamics. A summary of the results is presented below.

- The literature review revealed nine career anchors that can be measured and used to represent an individual's evolved set of motives and needs, basic values and attitudes, and self perceived talent and abilities. These career anchors influenced the individual's career decision and career outlook.

- The literature review revealed thirteen job characteristics that represented organisational factors that influence an individual's career. The literature also revealed that the number of IT job types is too large to examine them individually and an alternative of seven categories was identified and selected.
- The literature review revealed that the IT professional's skills portfolios had an influence on their careers. This influence was represented by a dependent factor with a two way relationship between both the individual and organisational factors. The literature also revealed that the number of different IT skills/knowledge is too large to examine them individually and an alternative of five categories was identified and selected.
- The literature review revealed that there are a number of different directions in which an IT professional's career can progress. The literature combined these movements into patterns of career path models.
- The literature revealed the dynamic interactions between the factors influencing an individual's career are known as career dynamics. Career dynamics represent the extent to which the influencing factors surrounding an individual's career are in a state of compatibility. The literature also revealed that this compatibility can be measured through observation of various career variables.
- The literature review revealed that there are various career management techniques and planning tools that can be used to influence and adjust the compatibility of an individual's career dynamics.
- All this information was combined to develop an EITCM model. The most important aspects of the model were then defined as the CSFs, and were tested through the use of an empirical study.

The empirical study confirmed all seven of the CSFs. Six CSFs were first subjected to some modifications in line with the results of the study. The CSFs are listed below:

1) It is critical that IT professionals experience an appropriate form of career guidance or management in order to experience:
   - High job satisfaction.

- High career satisfaction. *(Modified)*

2) It is critical that IT professionals experience some form of career guidance or management in order to experience:
   - Low turnover intentions. *(Not Modified)*
3) It is critical that IT professionals experience some form of career guidance or management in order to experience:
   - Medium career plateauing.
   - High professional plateauing. *(Modified)*
4) It is critical to account for an IT professional's skills portfolio in order to understand how they will dynamically interact with:
   - Individual factors.
   - Organisational factors. *(Modified)*
5) It is critical to account for an IT professional's job type in order to attain:
   - High levels of professional plateauing and contribute to the overall compatibility of career dynamics. *(Modified)*
6) It is critical to account for an IT professional's career anchors (specifically entrepreneurial creativity, geographical, and pure challenge) in order to attain:
   - High levels of career satisfaction.
   - High levels of career plateauing

   and contribute to the overall compatibility of career dynamics. *(Modified)*
7) It is critical that IT professionals with different career anchors are provided with multiple career paths that offer them the opportunity to make a transition out of the core IT area. *(Not Modified)*

The validation of the CSFs indicates that the interpretation of the literature and the development of the EICTM model are sound. Complete validation of the model would require practical application within the IT profession.

1.5 Thesis Organisation

The thesis is organised into ten chapters and two appendices.

Chapter One: Introduction

Chapter one introduces the research area. The problem under investigation is depicted, contextual background information is provided, and the motivation for conducting the research is given. The problem statement is then divided into specific sub-problems which will be examined. The assumptions under which the research is conducted, the delimitations of the research, a summary of the results and the thesis organisation are also presented in this Chapter.

Chapter Two: Career Anchors

Chapter two examines the concept of career anchors. Career anchors represent the individual factors that influence an individual's career. Nine career anchors identified by Schein (1985) are examined, including: 1) Security/Stability, a) Organisational, and b) Geographical, 2) Autonomy/independence, 3) Managerial competence, 4) Technical competence, 5) Entrepreneurial creativity, 6) Sense of service/dedication, 7) Pure challenge, and 8) Lifestyle. The link between motivational theory and career anchors is examined and the importance of career anchors is explained.

Chapter Three: Job Type

Chapter three examines the organisational factors that influence an individual's career. This Chapter examines characteristics inherent of a job type that affect an individual's career. The different job types over time and common job types are examined in order to select a categorisation scheme that can be utilised by the research. Finally career stage and career outlook are discussed and the importance of job type explained.

Chapter Four: Skills/Knowledge Portfolio

Chapter four examines the dependent factors that influence an individual's career. The skills portfolios of an entry level IT employee are discussed and the historical changes to IT skills portfolios examined. Categorisations of IT skills are explored and a categorisation scheme that can be utilised by the research is selected. Finally the impact of skills portfolio on an individual's career is examined

Chapter Five: Career Dynamics

Chapter five examines the career movement types and the models that they combine into, including: 1) Pyramid model, 2) Dual path model, 3) Multiple career paths, and

4) Career anchor model. The following career variables are identified and discussed: 1) Satisfaction, 2) Turnover intentions, and 3) Plateauing. Finally career management, corrective actions and career planning tools are examined.

Chapter Six: Model for Effective IT Career Management

Chapter six proposes a model for EITCM. The model is illustrated diagrammatically, and each component discussed. Seven CSFs are derived for the purpose of validating the EICTM model through an empirical study.

Chapter Seven: Design of the Empirical Study

Chapter seven describes the design of empirical study carried out to validate the EITCM model proposed in *Chapter six*. The hypotheses derived from the CSFs are listed and discussed. The research methodology is examined.

Chapter Eight: Results of the Empirical Study

Chapter eight presents the statistical data gathered from the empirical study. Demographic data is presented and then each of the seven hypotheses is statistically tested. Finally descriptive statistics are presented.

Chapter Nine: Discussions of Findings and Recommendations

Chapter nine examines the results put forward in *Chapter eight*. Confirmation of the CSFs based on the hypotheses tests is discussed. This is followed by a discussion and comparison of the descriptive data. Based on these discussions recommendations and modifications with regards to the proposed model are made. A modified EITCM model is proposed.

Chapter Ten: Conclusion

Chapter ten summarises the research undertaken and indicates the contributions of the research. This Chapter provides the conclusion to the research and briefly examines areas of future research.

Appendix A

Reference Appendix.

Appendix B

Online questionnaire printout.

Chapter 2 Career Anchors

2.1 Introduction

To effectively manage a career both the individual and organisational factors that influence it must be explored. *Chapter 3* will explore the organisational factors. This Chapter will examine the individual factors. Past research collectively agrees that individual factors are best represented by career orientation or career anchors (for the purpose of the research the terms career anchor and career orientation will be referred to as career anchor). This Chapter explores the career anchors identified by Schein (1985) and expanded by De Long (1982) and links them to the IT professional's career decision making process.

Igbaria, et al (1991:151) state that "A career anchor refers to a cluster of self-perceived needs, values, and talents that give shape to an employee's career decision". The career anchors identified by Schein (1985) were not specifically developed for IT professionals. However, when applied to an IT professional they are particularly relevant '(Crook, 1997). An IT professional's career anchors can be measured using the short-form measure developed by Igbaria and Baroudi (1993). Knowledge of career anchors and their connection with motivational theory allows their influence over career decisions and career variables to be used in the management of IT careers. Career anchors determine what an individual is seeking in life and allow them to make difficult decisions by refusing to surrender the vision shaped by their career anchor (Shi and Bennett, 1998:43).

The majority of literature examined was not in a South African context. However, IT professionals across nationalities have been shown to exhibit similar motivations (Lee, 1999:34). *Section 2.2* explores career anchors, how they stabilize over time and how they are measured. *Sections 2.2.2 - 2.2.9* examine the nine career anchors highlighting their importance and how they are identified. *Section 2.3* links career anchors to motivational theory. *Section 2.4* discusses the importance of career anchors.

2.2 Career Anchors

The concept of career anchors was proposed by Schein (1985). Career anchors are based on the idea that career decisions are influenced by an individual's: 1) Self perceived talent and abilities, 2) Basic values, and 3) The evolved set of motives and needs as they pertain to the career (Agarwal and Ferratt, 2000:161). Career anchors represent these three career decision influencing factors. Schein (1985) originally identified five career anchors: 1) Managerial Competence, 2) Technical Competence, 3) Organisational Security, 4) Geographic Security, and 5) Autonomy. Delong (1982) suggested an additional three: 1) Identity, 2) Service, and 3) Variety (Jiang, Klein, and Balloun, 2001). After further research Schein (1987) extended his own list with a further three career anchors: 1) Sense of Service, 2) Pure Challenge, and 3) Lifestyle Integration (Igbaria, et al, 1991). This early research by Schien (1985, 1987) and De long (1982) identified eleven career anchors (Jiang, Klein, and Balloun, 1995:3).

Career anchor research has predominately been conducted using eight or nine career anchors. For example, Igbaria and Baroudi (1993) used nine career anchors, Igbaria, Meredith, and Smith (1995) used eight career anchors, Ramakrishna and Potosky (2002) used nine career anchors, and Crepeau, Crook, Goslar, and McMurtrey (1992) used eight career anchors. The disparity between using eight or nine career anchors is a result of authors either combining geographical security and organisational security into one security/stability career anchor (eight career anchors) or examining them individually (nine career anchors). The research will follow the majority of authors and focus on nine career anchors, testing and discussing geographical security and organisational security separately. In this Chapter they are grouped under the sub-heading security/stability for the sake of clarity. The career anchors omitted from the research are: 1) Variety, a desire for several different challenges and 2) Identity the desire for status and prestige (Crepeau, et al, 1992:148). These were omitted as it is the author's opinion that they are variants on the nine core career anchors commonly researched. Each of the nine career anchors are discussed in detail under the sections shown in the Table 2.1 below.

Career Anchor	Section
Geographical	*2.2.2.1*
Organisational	*2.2.2.2*
Autonomy/independence	*2.2.3*
Managerial competence	*2.2.4*
Technical competence	*2.2.5*
Entrepreneurial creativity	*2.2.6*
Sense of service/dedication	*2.2.7*
Pure challenge	*2.2.8*
Lifestyle integration.	*2.2.9*

Table 2-1: Career Anchor Sections

2.2.1 Measuring Career Anchors

Identification of career anchors allows the impact of their influence on an individual's career decisions and career variables to be determined, predicted and managed. The influences of career anchors are examined in *Section 2.4*. Schein (1985) developed the COI (Career Orientations Inventory) that measures an individual's career interests, career values, and career motivators in order to identify their career anchors. It consists of 41 statements which are measured on a Likert scale. The COI has since been widely tested and modified. The greatest modification was made by Igbaria and Baroudi (1993:134) who conducted a two part study (first development and then validation) in order to develop a short-form measure of career orientations. The short-form measure was aimed at reducing the COI's original 41 statements to 25. Like the original COI, the 25 statements are measured using a Likert scale. The relevant statements are listed with the relevant career anchors later in this Chapter. Igbaria and Baroudi (1993:133) developed the short-form measure as it has three advantages:

1) Allows comparison of scores across functions, organisations, and industries.
2) Allows both practitioners and researchers to utilize a readily available instrument, avoiding the time consuming process of developing a new

measure each time an assessment is required.

3) A short-form measure ensures that the length of the instrument will not be a barrier in its use.
(Igbaria and Baroudi, 1993:133)

The research will make use of the short-form measure as have many previous studies. For example Igbaria, et al (1995), Igbaria, et al (1991), Wynne, Ferratt, and Biros (2002), and Igbaria and McCloskey (1996). Utilization of the short-form measure allows the career anchors that dominate an individual's motivational needs and self perceptions to be identified.

2.2.2 Security/stability

As mentioned in *Section 2.2* the security stability career anchor causes a disparity between authors using eight or nine career anchors. The security/stability career anchor can be further subdivided into geographical and organisational security as is done in the two sub-sections below. The research will examine geographical and organisational security as two separate career anchors. However, the research will also briefly examine security/stability for the purpose of comparison and completeness.

Individuals with security/stability career anchors are concerned with predictable career developments that allow them to feel secure and stable within their careers (Igbaria, et al, 1995:323). An employee who has a dominant security/stability career anchor is likely to seek longer employment duration within an organisation or location (Agarwal, De, and Ferratt, 2001:133). Research conducted by Ramakrishna and Potosky (2002) found that the dominant career anchor for IT professionals is moving away from the managerial and technical career anchors towards the security/stability career anchor. The dominance of the security/stability career anchor within the IT profession has risen from around 9% in 1991 to just below 60% in 2001. Crepeau, et al (1992:155) conducted an investigation into the career anchors of IT personnel and revealed that the security/stability career anchor was dominant in the early 90's alongside the managerial and technical career anchors and has since surpassed them.

2.2.2.1 Geographical

The geographical security career anchor manifests itself when employees link themselves to a particular area. Employees will have begun putting roots down in the community and investing in fixed assets such as housing. They are at a stage where they require a stable life style in order to start a family. This is reflected in their preference for stable and predictable work within a specific location (Igbaria and Baroudi, 1993:133).

The geographical security career anchor was ranked as the third most dominant career anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests two statements to measure the geographical security career anchor, the statements aimed at identifying this career anchor include:

- Remaining in one geographical area rather than moving because of a promotion is...
- It is more important for me to remain in my present geographical location than to receive a promotion or new job assignment in another location.
  (Igbaria and Baroudi, 1993:141)

2.2.2.2 Organisational

The organisational security career anchor has become more prevalent in the rapidly changing IT environment. Employees are more concerned with developing their careers within a single organisation as opposed to risking unemployment. Uncertain times result in a concern for job security. Individuals with a dominant organisational career anchor concern themselves with predictable stable work that gives them a feeling of having 'arrived' (Igbaria, et al, 1995:323). Jiang, et al (1995) measured the career anchors of IT personnel and found the organisational security career anchor to be dominant. They (Jiang, et al, 1995:3) consider organisational security to be a desire for company loyalty, tenure, and financial security.

The organisational security career anchor was ranked as the second most dominant career anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The

short-form measure developed by Igbaria and Baroudi (1993) suggests two statements to measure the organisational security career anchor, the statements aimed at identifying this career anchor include:

- An employer, who will provide security through guaranteed work, benefits, a good retirement program, etc., is...
- An organisation that will give me long-run stability is...
  (Igbaria and Baroudi, 1993:141)

2.2.3 Autonomy/independence

Employees with a dominant autonomy/independence career anchor (the autonomy/independence career anchor is hereafter referred to as the independence career anchor) will seek work situations in which they will be maximally free of organisational constraints and restrictions to pursue their professional competence (Igbaria, et al, 1991:155). Constraints and restrictions include the way in which employees work, their rate of work, and the standards applied to their efforts. Individuals with an independence career anchor desire freedom from organisational rules and regulations that affect their working life. They would even go to the extent of refusing a promotion if it entailed less freedom (Igbaria, et al, 1995:323). The independence career anchor will drive employees to seek careers in smaller organisations where the hierarchical reporting structure is not strictly adhered to. However, modern management techniques in larger organisations are beginning to allow for this desired independence. The independence career anchor was, unexpectedly, equally dominant throughout the various positions and levels within the IT field (Igbaria, et al, 1991:161).

The dominance of the independence career anchor within the North American IT profession has dropped from around 14.5% in 1991 to just below 5% in 2001 (Ramakrishna and Potosky 2002:87). The independence career anchor was ranked as the sixth most dominant career anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993:329) suggests three statements to measure the independence career anchor, the statements aimed at identifying this career anchor include:

- The chance to do things my own way and not to be constrained by the rules of an organisation is...
- A career that is free from organisational restrictions is...
- I do not want to be constrained by either an organisation or the business world. (Igbaria and Baroudi, 1993:141)

2.2.4 Managerial Competence

Early studies found the dominant career anchor amongst IT professionals to be either managerial competence or technical competence. These are commonly referred to as the two traditional career anchors (Ramakrishna and Potosky, 2002:84). Employees driven and motivated by a managerial competence wish to supervise, influence, and lead others. In order to achieve this they seek promotions to managerial positions. This promotion also provides them with feelings of success (Igbaria, et al, 1991:155). The move into management enables them to accomplish results through others (Jiang, et al, 1995:3). IT professionals with a managerial career anchor have ambitions to make a transition into general management as opposed to remaining in a single functional area (Igbaria, et al, 1995:322).

The managerial competence career anchor is considered an important career anchor to IT professionals who wish to make the transition from the IT field to a new functional area. This is supported Ramakrishna and Potosky (2002:84) who consider managerial competence a necessary characteristic for IT professionals seeking occupations outside the IT field. Crepeau, et al (1992:155) supports the dominance of managerial competence, finding leadership to be one of three dominant career anchors identified by their research. Changes that occurred in the nineties within the IT field saw the decline of the managerial career anchor dominance. However, it is still relevant and remains one of the top career anchors amongst IT professionals (Ramakrishna and Potosky, 2002:86)

The dominance of the managerial competence career anchor within the North American IT profession has dropped from around 17% in 1991 to 5% in 2001 (Ramakrishna and Potosky, 2002:87). The managerial competence anchor was ranked as the fifth most dominant amongst South African IT professionals (Igbaria, et

al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three items to measure the managerial competence career anchor, the statements aimed at identifying this career anchor include:

- The process of supervising, influencing, leading, and controlling people at all levels is...
- To be in charge of a whole organisation is...
- To rise to a high position in general management is...
  (Igbaria and Baroudi, 1993:141)

2.2.5 Technical Competence

As mentioned in *Section 2.2.4* the technical competence career anchor is one of the two traditionally dominant career anchors followed by IT professionals. The technical career anchor has a primary focus on the intrinsic technical content of the work (Igbaria, et al, 1991:155). Employees with a technical career anchor have a strong identification with their area of expertise and are likely to remain within their functional area. This area of expertise does not necessarily have to be within a traditionally technical area, but rather in any area where an individual identifies with their work. A technical career anchor is usually accompanied by a dislike for any managerial responsibilities. Individuals with a technical career anchor will avoid promotion to management in favour of remaining a specialist in their field (Igbaria, et al, 1995:323).

A technical orientated employee may seek out multiple employment opportunities, within a specific functional area as it provides opportunities to develop skills (Agarwal, et al, 2001:133). A study conducted by Jiang, et al (1995) revealed that technical competence was considered "relatively unimportant". This differs from the findings of most authors. Crepeau, et al (1992:155) included technical competence as one of their three major career anchors. Ramakrishna and Potosky (2002:85) clarify this differing view by identifying the technical career anchor as dominant in the early nineties.

The dominance of the technical competence career anchor within the North American IT profession has dropped from 25% in 1991 to a significantly lower 2% in 2001

(Ramakrishna and Potosky, 2002:87). This statistic matches the dominance of the technical competence anchor amongst South African IT professionals where it was ranked as ninth, the least dominant anchor (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three items to measure the technical competence career anchor, the statements aimed at identifying this career anchor include:

- Remaining in my specialised area as opposed to being promoted out of my area of expertise is...
- Remaining in my area of expertise throughout my career is...
- I will accept my management position only if it is in my area of expertise. (Igbaria and Baroudi, 1993:141)

2.2.6 Entrepreneurial Creativity

The entrepreneurial creativity career anchor is associated with a desire to create and own something. This creation can include a new product, service, business enterprise, or starting a business (Igbaria, et al, 1991:155). An individuals desire to create something of their own is accompanied by a need for recognition that the new product, service, or business exists entirely through their efforts and is considered theirs. An entrepreneur is usually considered a risk taker and as such an individual with this anchor may enjoy risk as part of their activities. The entrepreneurial employee requires a means by which their success can be measured. Individuals will also require a certain amount of freedom to operate in the manner and time they find conducive to their creativity (Igbaria, et al, 1995:323).

The dominance of the entrepreneurial creativity career anchor within the North American IT profession has decreased slightly from around 3% in 1991 to 1% in 2001 (Ramakrishna and Potosky, 2002:87). The entrepreneurial creativity career anchor was ranked as the eight most dominant amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three items to measure the entrepreneurial creativity career anchor, the statements aimed at identifying this career anchor include:

- Building a new enterprise is...
- I am always on the lookout for ideas that would permit me to start and build my own enterprise.
- I have always wanted to start and build up a business of my own.
  (Igbaria and Baroudi, 1993:141)

2.2.7 Sense of Service/dedication

A sense of service/dedication career anchor (the sense of service/dedication career anchor is hereafter referred to as the sense of service career anchor or the service career anchor) is associated with individuals who have a specific cause they feel strongly about and are willing to improve in some way. These individuals are dedicated to serve other people and to make the world a better place in which to live and work (Igbaria and Baroudi, 1993:133). They may find themselves working in a charity organisation or teaching in order to fulfil the intrinsic need to help others (Igbaria, et al, 1991:155). A service career anchor may be satisfied through a contribution of effort to a greater cause where no individual recognition may be forthcoming (Jiang, et al, 1995:4). The sense of service career anchor is fostered by company commitment and culture. It is one of the most dominant career anchors throughout the IT profession. An individual with a sense of service career anchor may embody all or part of the characteristics associated with someone who is considered benevolent.

The dominance of the sense of service career anchor within the North American IT profession has dropped from 9% in 1991 to 7.5% in 2001 (Ramakrishna and Potosky, 2002:87). The sense of service career anchor ranked as the most dominant career anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three statements to measure the sense of service career anchor, the statements aimed at identifying this career anchor include:

- Using my skills to make the world a better place to live in is...
- Begin able to use my skills and talents in the service of an important cause is...

- I want a career in which I can be committed and devoted to an important cause.
  (Igbaria and Baroudi, 1993:141)

2.2.8 Pure Challenge

The pure challenge career anchor is defined by Igbaria and Baroudi (1993:133) as an employee having a "Preference for overcoming impossible obstacles, solving unsolvable problems, and winning against extremely capable opponents." It is in overcoming these obstacles that the individual derives their satisfaction and is motivated. The challenge needs to be constant in order to keep the employee motivated. An individual with a pure challenge career anchor will remain committed to an organisation as long as the challenge is present. The pure challenge career anchor is shared by employees who need opportunities to test themselves. The consequence of this career anchor is the individual has little time for those whose interests are not aligned with their own ambitions (Igbaria, et al, 1991:155).

The dominance of the pure challenge anchor within the North American IT profession has increased from 9% in 1991 to 15% in 2001 (Ramakrishna and Potosky, 2002:87). The pure challenge anchor was ranked as the seventh most dominant anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three items to measure the pure challenge career anchor, the statements aimed at identifying this career anchor include:

- Working on problems that are almost insoluble is...
- The only real challenge in my career has been confronting and solving tough problems, no matter what area they are in.
- I feel successful only if I am constantly challenged by a tough problem or a competitive situation.
  (Igbaria and Baroudi, 1993:141)

2.2.9 Lifestyle Integration

The lifestyle integration career anchor represents a need to integrate both family and

career concerns (Jiang, et al, 1995:4). The lifestyle integration career anchor is the only career anchor found to differ significantly between genders. Women are more likely to desire a lifestyle that integrates family concerns, career concerns, and concerns for self development (Igbaria, et al, 1991:155). The cause of this may be the home maker role traditionally filled by women combined with the modern career driven women who needs to strike a balance between these two expected roles. The overall theme is to achieve a balance in all sectors of their lives. In modern society both the husband and wife are careerists and this is likely to lead to the lifestyle integration career anchor becoming more common as a reflection of societal trends for both male and female IT professionals (Igbaria, et al, 1995:323).

The dominance of the lifestyle integration anchor within the North American IT profession has dropped from 12% in 1991 to less than 5% in 2001 (Ramakrishna and Potosky, 2002:87). The lifestyle integration anchor was ranked as the fourth most dominant anchor amongst South African IT professionals (Igbaria, et al, 1995:329). The short-form measure developed by Igbaria and Baroudi (1993) suggests three items to measure the lifestyle integration career anchor, the statements aimed at identifying this career anchor include:

- Developing a career that permits me to continue to pursue my own life-style is...
- A career is worthwhile only if it enables me to lead my life in my own way.
- Choosing and maintaining a certain life-style is more important than is career success.

  (Igbaria and Baroudi, 1993:133)

2.3 Career Anchors and Motivational Theory

Career anchors are comprised of an individual's self perceived motivational needs. It is important to link traditional motivational theory to career anchors in order to demonstrate that career anchors, like motivational needs, stabilise over time. The main models of motivational theory are Maslow's 1954 hierarchy of needs, Herzberg's 1959 two factor theory, McClelland's 1961 need for achievement, affiliation and power, and Alderfer's 1972 ERG model (Smits, Tanner, and McLean,

1993). A longitudinal study of IT careers suggests that an individual will progress from Herzberg's hygiene factors to motivational ones within 46 months (Smits, McLean, and Tanner, 1997:40). This is just under 4 years and corresponds with the timeline of 5 years suggested by Schein (1985) for the stabilisation of career anchors (Crook, Crepeau, and McMurtrey, 1991:27). The period of five years is reliant on work experience. Ramakrishna and Potosky (2002:84) link career anchors to events and experiences at work. It is recognised by the majority of authors that career anchors are modified by work experiences. Crook (1997:140) conducted a study comparing the career anchors of students against those of IT professionals. He found that it may be inappropriate placing considerable importance on the students' career anchors as they do not stabilize until employees have faced work experiences, not unlike motivational needs.

Jiang, Klein, Balloun (2001:37) support this link between motivational needs and career anchors and suggest the extent of one's career anchors should be seen as an IT professional's motivations. The stabilising of career anchors after exposure to work events and experiences is a reflection of the progression of an individual's motivational need as described by early motivational theorists.

2.4 Importance of Career Anchors

Effective career management ensures compatibility between the individual and organisational factors that influence a career. The level of compatibility between the factors is reflected by career dynamics. To achieve compatible career dynamics knowledge and understanding of the individual factors represented by career anchors is important. Career dynamics are measured through career variables such as: low satisfaction, plateauing, turnover, burnout, limited advancement potential, nominal corporate commitment, supervisory aversion, and exceptional compensation (Crepeau, et al, 1992:146). *Chapter 5* discusses career dynamics and career variables in detail. Negative levels of career variables are indicative of incompatible career dynamics. To rectify this incompatibility it is necessary to possess knowledge of an individuals career anchors and how these influence their career variables and career decisions.

IT and Human Resource Management (HRM) need to understand the importance of

career anchors and take the logical step of relating them to specific career related outcomes (Ramakrishna and Potosky, 2002:87). Relating the individual's career anchors to specific career outcomes can result in positive career variables. Crepeau, et al (1992:155) states that "conscious recognition of other individual internal career anchors and incorporation of these perspectives for planning and development will yield significant benefits for both employers and employees". These benefits will be in the form of positive career anchors, compatible career dynamics, and beneficial career decisions.

2.5 Conclusion

Nine career anchors will be used to represent the individuals self perceived talent and abilities, basic values, and evolved set of motives and needs. The career anchors are: 1) Organisational security, 2) Geographical security, 3) Independence, 4) Managerial competence, 5) Technical competence, 6) Entrepreneurial creativity, 7) Sense of service, 8) Pure challenge, and 9) Lifestyle Integration. They will be measured using the short-form measure COI. These career anchors influence the career decisions an individual IT professional makes. Understanding and identification of IT professionals' career anchors is necessary to predict and manage how they influence their career variables. IT career management must cater for the various career anchors and their influence on career decisions and career variables. This Chapter can best be represented by a diagram showing the nine career anchors, the motivational characteristics they represent, and their ability to effect career decisions and career variables. This is presented in Figure 2.1.

Individual factors represent one side of a dynamic relationship. *Chapter 3* explores the organisational factors that form the other side of this relationship and interact with individual factors to influence IT careers.

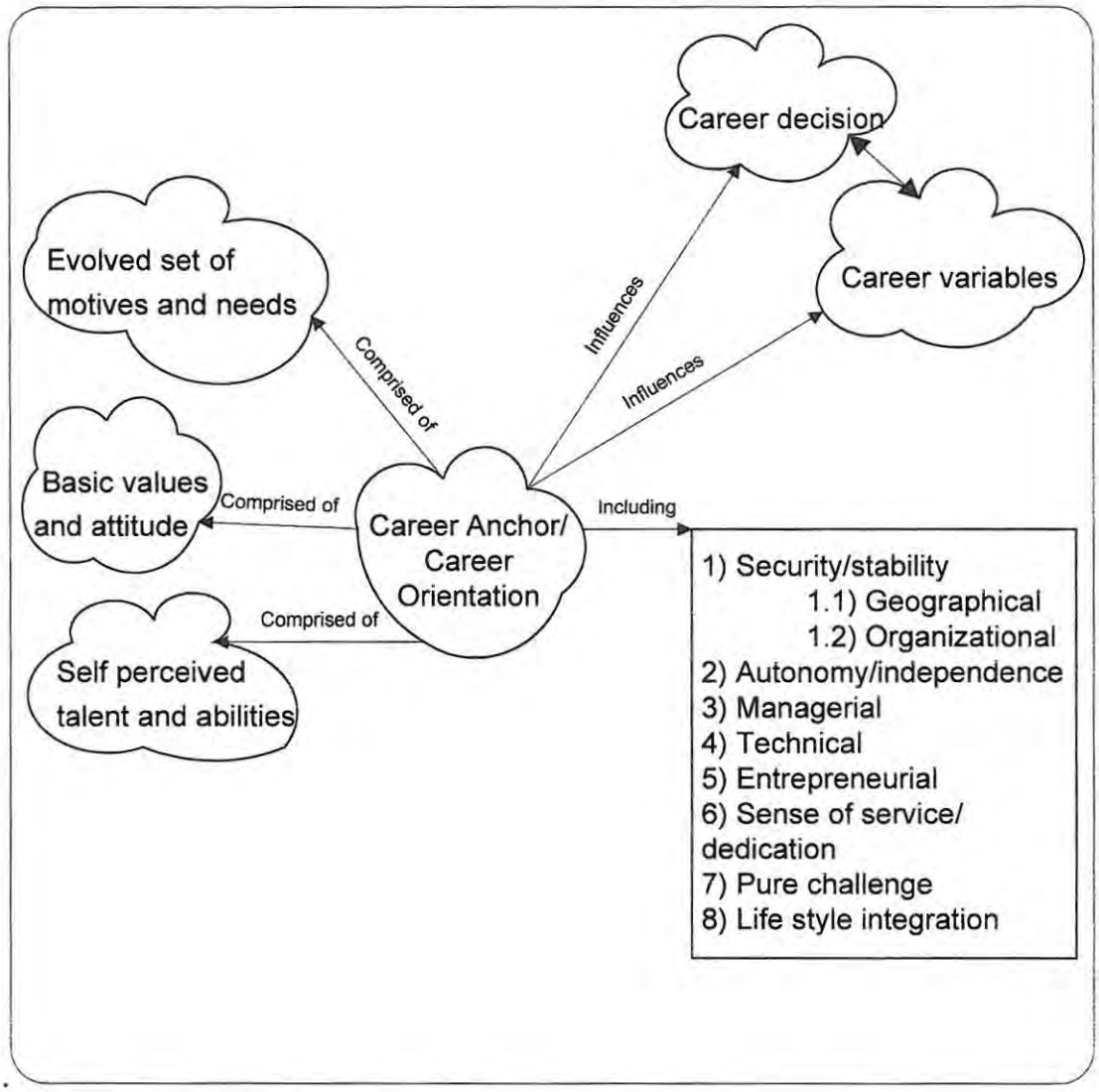

Figure 2-1: Individual Factors

Chapter 3 Job Type

3.1 Introduction

Effective career management strives to match the individual factors and the organisational factors (Jiang, et al, 2001:33). *Chapter 2* examined one side of this relationship, the individual factors (represented by career anchors) and how they influence career dynamics. To effectively research IT career management within the profession it is necessary to examine the other side of this relationship, the organisational factors (represented by job type).

The organisational factors (for the purpose of the research organisational factors will incorporate the term external career situation) are best represented by a specific job type or position and its associated characteristics (for the purpose of the research the terms job type and job position will be referred to as job type). Authors such as Ashenhurst (1972), Agarwal and Ferratt (2002), and Crook, et al, (1991) have studied the relationship between job types and career anchors. Job types possess a number of characteristics. Due to a large number of job types commonalities between these characteristics have been used to categorise job types. The research has selected a categorisation scheme of seven categories that best represents the common job types and the majority of job types over time. An individual's career outlook is influenced by their job type and the stage of their career they are currently experiencing or have experienced. The job type is the component of an individual's career that influences and satisfies their outlook and expectations. It is through this influencing and satisfying of expectations that organisational factors influence the compatibility of career dynamics.

Section 3.2 identifies the characteristics associated with job types. *Section 3.3* examines IT job types over time to provide a foundational understanding of IT job types. *Section 3.4* examines four common job types that have previously been used in career research to understand how they may fit into a categorisation scheme. *Section 3.5* identifies and justifies the categorisation scheme to be used by the research. *Section 3.6* examines career outlook and career stages that influence the expectations an individual may develop. The importance of job type is discussed in *Section 3.7.*

3.2 Characteristics Associated with Job Type

There are a number of characteristics that are associated with an employee's job type. The characteristics associated with a job type determine the extent to which an individuals career anchors are satisfied. The job type is also partly responsible for shaping the work experiences that affect an individuals career anchors. After the five year stabilisation period suggested by Schein (1985) an individual should be able to use their experiences from past job types and determine their job preference more accurately. An employee's job preference is determined by the characteristics associated with a job type. Lonergan and Maher (2001:213) refer to the job characteristics model put forward by Hackman and Oldham (1975) as the most comprehensive of its kind. The job characteristics model identifies several job characteristics that will influence an individual's career dynamics. Medcof (1996:203) provides excellent definitions of the seven characteristics identified by the Job characteristics model as listed in Table 3.1:

1)	Autonomy, the degree to which the job provides substantial freedom, independence and discretion to employees in scheduling the work and in work procedures.
2)	Skill variety, the degree to which the job requires a variety of different activities in carrying out the work.
3)	Task identity, the degree to which the job requires completion of a whole and identifiable piece of work
4)	Task significance, the degree to which the job has substantial impact upon the lives and work of other people.
5)	Feedback from the job, the degree to which carrying out the work gives employees clear and direct information about their performance.
6)	Feedback from agents, the degree to which employees receive clear information about their performance from supervisors and co-workers.

7)	Dealing with others, the degree to which the job requires employees to work closely with other people in carrying out the work.

Table 3-1: Seven Job Characteristics

In their examination of organisational factors Jiang, et al (2001:35) identified four factors that will influence the match between an individual's career anchors and job type: 1) Job titles, 2) Changes in working conditions, 3) Promotional opportunities, and 4) Salary status (compensation and benefits). Agarwal and Ferratt (2002:79) developed retention strategies for IT personnel and included two additional organisational factors that will influence career dynamics: 1) Opportunities for recognition, and 2) Training and development opportunities.

It is important to understand that these organisational factors are how the individual perceives them and not the organisation. For example Igbaria and Greenhaus (1992:37) identify 'self perceived' promotability as a component of career experience. Combining the seven characteristics identified by Hackman and Oldham (1975) with the four organisational influencing factors identified by Jiang, et al (2001:35) and the two identified by Agarwal and Ferratt (2002:79) results in a comprehensive list of thirteen characteristics associated with job type as listed in Table 3.2 below. It is sufficient to be aware of these characteristics and understand they are the underlying reasons for the matching and mismatching of career anchors to job types.

Hackman and Oldham (1975)		Jiang, et al (2001:35)		Agarwal and Ferratt (2002)	
1)	Autonomy	8)	Job titles	12)	Opportunities for recognition
2)	Skill variety	9)	Changes in working conditions	13)	Training and development opportunities
3)	Task identity	10)	Promotional opportunities		
4)	Task significance	11)	Salary status (compensation and benefits)		
5)	Feedback from the job				
6)	Feedback from agents				
7)	Dealing with others				

Table 3-2: Authors and their Lists of Job Characteristics

The characteristics associated with a job type influence the extent to which an individual will experience motivation and satisfaction. The presence and mix of these characteristics within a job type determines whether an individual's career anchors will be matched. It is possible to identify and measure an individual's self perceived

motivational needs in the form of their career anchors. It is also possible to identify career anchors that best discriminate amongst a given set of job types whose characteristics are mixed differently. Awareness of the characteristics associated with job type along with an understanding of why they influence career dynamics allows the research to focus on the job types themselves. The import of this will be examined further in *Section 3.6*.

3.3 Information Technology Job Types Over Time

Ashenhurst (1972:368) states that "There are as yet no industry-wide standards for positions related to information systems in organizations." To develop or select a suitable categorisation scheme of IT job types a brief chronological examination of the job types produced by past research is useful. It provides an understanding of how IT job types have progressed and how the manner of thinking surrounding the IT professional's career movements changed.

Ashenhurst (1972:368) presented a number of job types found within the IT field in 1972. He held firmly to the distinction between technical and managerial job types. However, he believed they required a foundational understanding of one another. He states that "At the entry level these two separations exist, however a good understanding of the other is also required." Entry levels for IT included assistants to various line and staff managers which would lead to supervisory job types in these areas. When dealing with the advancement of either a technically or managerially orientated entry level employee he stated that an individual with either career anchor could advance to project leader in the development group. Following the project leader job type was the assistant or associate manager of either computers or information systems. This progression into a line managerial job type may be attained after several years experience and was the limit of how far an IT professional could climb the hierarchical ladder whilst remaining a part of the core IT area.

Titles such as Computer Systems Analyst describe a person who is able to deal with the computer and its operating system. This differs from an Advanced Information Systems Specialist who can perform the valuable function of interfacing the two cultures of organisation environment and computer environment. Information specialists are presented with the opportunity to achieve high line managerial status

and are motivated as such. Ashenhurst (1972:368) also identified the Information Systems Planners job type as providing a route to top corporate job types. He considered the consulting job type an attractive opportunity for IT professionals. The consulting job type requires organisational and technological knowledge, along with an understanding of auditing procedures, legal requirements, and other external aspects of information systems use. He also considered the database administrator and information security officer as recognised IT job types. His study considered many job types that followed a clear linear progression. Evenson (1974:4) produced a list of job types that also represented a linear promotion scheme: Computer Operators → Programmers → Systems Programmers → Programmer/Analysts → Systems Analysts.

A decade later Shore (1983:3) investigated the changing shape of the IT organization and produced a hierarchical list of IT job types: Analysts/Programmers → Senior analysts/programmers → Project Leaders → Supervisors → Managers. Shore (1983:12) believed these job types to be antiquated and had to make space for new job types such as Online Specialists, Database Management Specialists, Analysts for application packages, Database Administrators, Internal Business Consultants, and various other specialist job types. These new job types still followed a linear progression and arose due to changes in technology, not as an attempt to restructure the IT career. It was not until Cheney's (1988:2) research that IT job types were recognised as executive job types. There were a smaller number of job types recognised, but their importance within the organisational hierarchy was greater, Vice President (VP) of IT, Director of IT, Data centre manager, Director of IT and development, Systems analyst/ project leader, and Systems consultant/ information centre manager. He found the number of job types in the IT function to have grown since 1980.

In the 1990's research confirmed Cheney's (1988) research and began to categorise IT job types in order to provide structure to the increasing number of IT job types. Lee, Trauth, and Farwell (1995:320) defined five job categories including:

1) Programmers (coding, software development, etc).
2) Technical Specialists (hardware, operating systems, networks, etc).
3) Business analysts/systems analysts (planning, analysis, design and

implementation of business applications).

4) End user support consultants (hotlines, etc).

5) Computer operators and data entry clerks.

Research began to make use of these categorisations in order to clarify IT job types and improve the research process. Agarwal and Ferratt (2000:163) made use of the categories that appeared in Computerworld's 12th annual survey of IT professionals conducted in June 1998. Twenty seven job titles were identified and categorised under the following five categories:

1) IT management.

2) Networks.

3) PC-end-user support.

4) Systems development and integration.

5) Technical services and operations.

Commonalities exist between Agarwal and Ferratt (2000:163) and Lee, et al (1995:320) job type categorisations such as the presence of technical/programming job types, systems development/analyst job types, and end user support job types. However, Agarwal and Ferratt (2000:163) did not categorise the programmer as a specialised job type, but rather incorporate it into a technical job type. Nakayama and Sutcliffe (2001:101) followed the same principle when they identified the following job types, Chief information officer (CIO), IT manager, General IT professional, Maintenance, Systems analysts, and Web based systems workers. Research has shown that the number of IT job types has increased. In order to have a clear view of the organisational factors that influence the IT professional's career dynamics it is necessary to learn from this past research and make use of a suitable categorisation scheme.

3.4 Common Job Types

Crook, et al, (1991) conducted research into the utilization of career anchors for management of IT professionals. Their first research question examined the possibility of using career anchors to better match the employee to a job type. To

achieve this they evaluated the discriminating power of the career anchors on job type using four job categories: 1) Computer Operator, 2) Programmer/analyst, 3) Manager, and 4) Other. To examine the compatibility between the organisational factors (represented by the job type) and the individual factors (represented by career anchors) job categorisations are necessary. Following Crook, et al, (1991:28) example this Section will examine four job categories namely: 1) Programmer, 2) Analyst, 3) Project Manager, and 4) CIO. This examination will allow the research to determine the relationships of the four job types with career anchors and gain an idea of their suitability as categorisations for the research. *Section 3.5* will then identify the categorisations selected for the research and the justification behind their selection.

The traditional entry level job type for an IT professional has always being the programmer. Cheney (1988:3) defines the programmer as being primarily responsible for program development once the system analyst has defined the inputs, outputs, and files. They are responsible for the coding role in software development and maintenance. Ashenhurst (1972:368) states that "Programmers exist in all groups associated with information systems but are generally involved in implementation, not analysis and design." The linear career path views the programmer as the starting point from which an IT professional will progress, this would infer that a demand for IT professionals will always be accompanied by a demand for programmers. Lee, et al (1995:320) found programming job types to be the most highly employed job category, however their research predicted a decrease in programmers. Part of the popularity of the programming job type was due to the assumption that one learns to be a system analyst by first becoming a good programmer. Lash and Sein (1995:118) states that "As several researchers have pointed out, the programmer and systems analyst roles are vastly different in terms of skills requirements." The popularity of the programming role is diminishing as it is no longer the only option for entry level employees. The characteristics associated with the programming job type are high autonomy with low task significance and variety.

The systems analyst job type is generally divided into analysis and design roles, both of which require an understanding of systems relationship and human behaviour (Ashenhurst, 1972:368). The characteristics associated with the analyst job type

required an IT professional to deal with other people and be prepared to handle a number of different projects with varying levels of significance. He (Ashenhurst, 1972:368) refers to the analysis analyst as the information analyst or Management of Information Systems (MIS) analyst. The analysis analyst is accompanied by people or organisational motivational factors. The design analyst is also known as the system designer or system developer or computer specialist for the design side. The design analyst is accompanied by computer or technological motivational factors. Cheney (1988:3) does not divide the analyst in such a manner and simply refers to the systems analyst as being "concerned with defining user information needs and then building a system to generate the required information. He will define the content and structure of input forms, output reports, and files." This definition incorporates both the analytical and design aspects of the analyst job type.

However, most authors follow Ashenhurst's (1972) approach. For example Mo Kaiser and King (1982:50) used the distinction between Information Analyst (people or organisationally orientated) and the Systems Analyst (computer or technologically oriented). Mo Kaiser and King (1982:56) express a concern for the lack of user experience on the part of the analyst but explain it as due to their career progression. The career progression referred to here is a linear progression, at the time of the study an analyst had to come from the ranks of the programmers. This is no longer the case and the analyst job type is associated with high levels of promotability. Lee, et al (1995) predicted the demand in analyst job type to increase over the next decade.

Cheney (1988:3) defines the project manager as "A member of a project team who coordinates the team's efforts and schedules the team's resources in the creation of the system on-time and within budget." The characteristics associated with the modern project manager job type are similar to those of the data centre manager job type of the past. An examination of the project manager job type is important as it is the most common job type that allows for transition to other functional areas or executive management. The project manager job type is associated with high levels of autonomy, task significance, task variance, promotability, and a good salary status. In comparing the project manager job type to that of other line managers one distinct difference was identified, "the career of a project manager was characterised by self-governance, while that of a functional manager by being paternalistic" (El-Sabaa,

2001:4). This distinction will impact on the career path of the IT professional and is discussed in *Chapter 5.*

The CIO is a relatively new job type that represents the increased strategic involvement of the IT department within the organisation. The CIO job type has numerous titles that have varied over time and across organisations. One of the most common was director of MIS. Kaye (1972:125) suggests the director of MIS must be prepared to partake in a variety of tasks with significant impacts. It was revealed that the majority of MIS directors saw their limits of advancement beyond the Vice President (VP) of systems and data processing job type. Historically executive job types were occupied by managers from functional areas considered core to the organisation and not supportive, the IT function was considered the latter. The new characteristics associated with the CIO job type are essential to keep the IT professional motivated over time as it firmly supports promotability (Faasen, 1998).

Enns, Huff, and Golden (2002:13) concluded a study of the CIO influencing behaviours with the statement "This research suggests that an IT professional with a highly technical background should not necessarily be precluded from consideration for a CIO job type." It is generally assumed that a CIO with a technical background is unable to exhibit the interpersonal skills necessary to influence other top executives. The modern CIO job type is accepted as an executive job type and as such requires interpersonal tasks to be completed. The CIO job type spends a lot of time attempting to convince other top managers to commit to strategic IT initiatives, share in a vision for IT, and allocate resources to IT projects (Enns, et al, 2002:1). The CIO job type epitomises the transformation experienced within IT job types and their associated characteristics. It is no longer a string of linear job types where the final managerial role is considered a dead end.

3.5 Job Categorisations to be used by the Research

Crook, et al (1991:30) found that only five career anchors discriminate between the four common job types, namely the technical, managerial, geographical, security, and service and variety career anchors. The four job types placed equal importance upon independence and organisational security career anchors. The author is of the opinion that the use of four job types is no longer sufficient to effectively encompass all of the

modern IT job types available. Having decided that the four job type categorisation scheme was inadequate for the research it was necessary to select a categorisation scheme other than that of Crook, et al (1991). Using knowledge of job type characteristics, job types over time, and details of the four common job types seven job type categorisations were selected. Five job type categories were extracted from Faasen's (1998) book 'Computers the South African Training and Education Guide'. This text has the additional benefit of placing the job types in a South African context. Two additional categories were included: 1) Management, and 2) Consultant. These were included after reviewing the history of the IT job types and the four commonly researched job types. It was necessary to include the two additional categories for the sake of completeness. For each of the seven categories examples of job types are provided. This allows the categorisation to initially encompass a broad spectrum of IT job types and then itemize specific job types. The categorisation scheme selected represented and shared characteristics of the four commonly researched job types. The CIO job type was related to the management category. The project manager job type was related to the systems management and consultant categories due to the similarity in the characteristics of the work. The analyst job type was related to the systems analysis category. The programmer job type was related to the software systems development, end user computing and networks categories due to their technical nature. The seven categories and example job types are listed below:

1) **End User Computing** e.g. Product trainer, Installation and support technician.
2) **Systems Analysis** e.g. Business Information Analyst, and Systems Analyst.
3) **Software Systems Development** e.g. Software Engineer, and Application Programmer.
4) **Systems Management** e.g. Database Administrator, Systems Programmer, and Computer operations.
5) **Networks** e.g. LAN architect, LAN Supervisor, LAN Administrator, WAN Architect, Email Specialist, Internet Engineer, and Web Page Developer.
6) **Consultant** e.g. Business Consultant, and Technical Consultant.
7) **Management** e.g. CIO, Project Manager and Line Manager.
(Faasen, 1998)

3.6 Career Stage and Career Outlook

Career stage and career outlook are two concepts that link the IT professionals career dynamics to the IT job types available. These concepts and the way in which they link career dynamics to job types are explained below. The first of these, career stage, is a model based on the notion that work attitudes and aspirations might vary systematically as an individual progresses in a career and acquires a range of occupational and life experiences (Agarwal and Ferratt, 2000:160). "The earliest models of career stages is that described by Super (1957) who argues that an individual's career progresses through three stages: 1) Exploration, 2) Establishment, and 3) Maintenance" (Agarwal, et al, 2001:134). A later model put forward by Dalton, Thompson, and Price (1977) comprises of four stages including:

1) Apprentice – an initiate who learns the ropes under tutelage of knowledgeable others.
2) Colleagues – are employees who are capable of making independent contributions to organisational work.
3) Mentor – an employee who acts as an interface agent and trainer, and assumes responsibility for others.
4) Sponsor – the last stage where an employee exercises power and helps shape the direction of the organisation.

Agarwal, et al (2001:134) states that "In all conceptualisations of career stages, a key aspect is that movement through career stages is differentiated by the skill level or experience possessed by the individual." Cognisance of an individual's career stage and how they got there is an essential input to management decisions about that individual. The job characteristics an employee experiences at each of the various career stages determines what job expectations they will develop. The job expectations they develop will manifest themselves in the form of desired job characteristics. To meet these job expectations an organisation must facilitate an individual to progress from a current job type to a desired job type. Knowledge of the employee's career stage will ease and improve this facilitation process. The job expectations are represented by an employee's career outlook as discussed below.

McLean, Tanner, and Smits (1994:49) explored the career outlook (the anticipated developments in ones career) of IT professionals and concluded that in the long term it seems to be influenced most by bread and butter issues, such as income, benefits, stability, and opportunities for promotion. Career outlook is also influenced by managerial practices such as job design, job enrichment and career progression. These bread and butter issues and other influencing factors represent the organisational factors influencing a career (McLean, Smits, and Tanner, 1996).

Career outlook deals with the present and the long term view an individual has on their career. The expectations that an individual develops are based on work experiences to date (McLean, et al, 1994:49). IT professionals with no work experience base their career outlook on their academic settings and seem to encounter a large amount of reality shock when transitioning from their academic settings to the world of work. An IT professional's career outlook is based on their own perceptions of income, benefits, stability, opportunities for promotion, managerial practices such as job design and enrichment, and career progression they attach to a current or future job type (McLean, et al, 1994:49).

These perceptions focus on the characteristics associated with a job type as discussed in *Section 3.2*. An individual's present career outlook is based on questions such as: 1) Am I performing well? 2) Did I make the right decision? and 3) Does this line of work meet my needs? Long term career outlook asks similar questions but the time frame shifts to the future (McLean, et al, 1996:7). The importance of matching an individual's career outlook with a job type is discussed below in *Section 3.7*.

3.7 Importance of Job Type

The job type encompasses organisational factors that influence an individual's career dynamics. The job type occupied by an individual is not merely a title but includes a number of characteristics (*Section 3.2*) that result in the matching of an individual's career anchors and career outlook. The importance of a job type and the associated characteristics is expressed through the level of career variables an individual exhibits. Career variables such as turnover intention, satisfaction, plateauing, and organisational commitment are directly related to the compatibility of an individual's career anchor and job type, career variables are discussed in detail in *Chapter 5*. This

is supported by Agarwal et al (2001:132) who relate employment duration in the IT function to two individual variables: 1) Career stage, which is measured through job types and outlook, and 2) Career anchors. A well structured and characterised job type can result in positive career variable levels. An individual possesses a certain career anchor and maintains a career outlook. It is the job type that will ensure these self perceived needs and expectations are met. Once employed in a job type an individual must bridge the gap between expectation and reality in order to achieve compatible career dynamics. Career management is vital in this bridging process and will be discussed in detail in *Chapter 5* (McLean, et al, 1996).

"Since career orientations influence the selection of specific occupations and job settings, MIS employees with different orientations are likely to be found in somewhat different types of jobs within their organisations" (Igbaria, et al, 1991:152). This statement highlights the close relationship between career anchors and the type of job held by an IT professional. An awareness of job types within and outside of the IT field is important to understand the options available throughout the development of a career path. For example Igbaria, et al (1991) linked programmers, software engineers, and consultants to a technical orientation, whilst analysts, project leaders, and computer managers were linked with a managerially orientation. An individual will attempt to attain a job type that matches their internal needs. This attempt will be based on their current career stage and the career outlook they maintain. The organisation must ensure that the necessary mix of characteristics associated with job types are in place to meet the employee's internal needs.

3.8 Conclusion

Associated with a job type are various characteristics. *Section 3.2* develops a comprehensive list of thirteen job type characteristics. An awareness of these characteristics is essential to understanding the interactions of career dynamics. In order to examine how an individual's career anchor discriminates between job types it is necessary to develop a suitable categorisation scheme. Examining the history of IT job types along with four commonly researched job types resulted in the selection of a categorisation scheme consisting of seven categorisations and examples. To achieve compatible career dynamics it is essential that the job type and career anchors are

matched. Knowledge of an individual's career stage and career outlook assists in this matching process. A summarisation of this Chapter is presented diagrammatically in Figure 3.1.

The final factor influencing career dynamics is one that is affected by both individual factors and organisational factors. *Chapter 4* examines individuals' skills/knowledge portfolio.

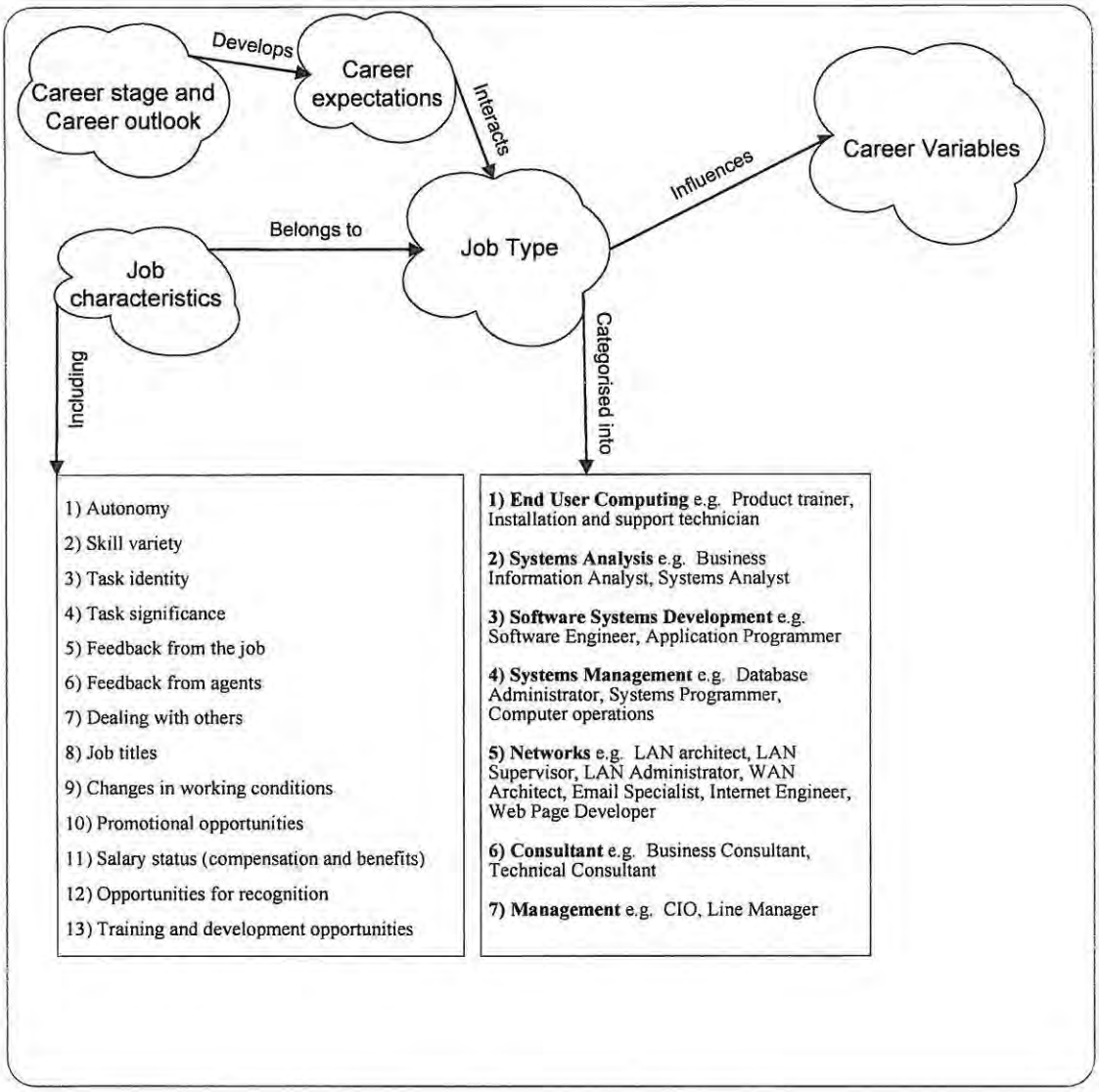

Figure 3-1: Organisational Factors

Chapter 4 Skills/Knowledge Portfolios

4.1 Introduction

Chapter 2 examined the individual factors involved in career dynamics whilst *Chapter 3* examined the organisational factors involved. An individual's skills/knowledge portfolio (for the purpose of the research the term skills/knowledge will be referred to as skills) is a third element that interacts with both the individual and organisational factors. The skills portfolio is possessed by an individual, required by a job type and developed by both. This Chapter explores and categorises the dependent factor, IT skills, influencing career dynamics.

An individual enters an organisation with a portfolio of skills. This portfolio expands and changes as an individual is trained, engages in self learning, and is exposed to different experiences. The importance of the various IT skills varies according to the perception of academia and practitioners. An awareness of these discrepancies prior to the selection of a categorisation scheme will alleviate their impact on the research. Nakayama and Sutcliffe (2001:100) observed that there are many ways to classify IT skills. A suitable skills categorisation scheme is necessary to effectively research the extent to which the skills portfolio interacts with individual and organisational factors and affects career dynamics. Identification of existing skill categorisations produced alternatives from which the categorisation scheme to be used by the research was selected. The skills portfolio of an individual plays an important role in determining the direction, and pace of an employee's career path.

This Chapter identifies a skills categorisation scheme that will facilitate the research and generate utilizable results. This will be achieved by first examining the skills of an entry level IT employee in *Section 4.2*. The historical changes of IT skills will then be discussed in *Section 4.3*. *Section 4.4* will identify existing categorisations of IT skills. *Section 4.5* examines the categorisation scheme to be used by the research. Finally the impact of an individual's skills on the career path will be explored in *Section 4.6*.

4.2 Entry Level Employee

The entry level IT professional provides an ideal baseline from which the influences of a skills portfolio can be observed. Gorgone, Davis, Valacich, Topi, Feinstein, and Longenecker (2003:13) suggest four guidelines as the desired exit characteristics of IT graduates. These are examined in detail in *Section 4.4*. These guidelines all link together to develop technology enabled business development as represented in Figure 4.1. The skills expected at the entry level are broad and shallow and will be expanded through experience, training and self-learning. The IT graduate should initially be equipped with a foundational understanding. This will then be developed further when they enter the organisation. The area developed will be dependent on the IT professional's career anchors and subsequent job types. Leea, et al (2002:51) states that "The graduate of an IT program should possess the required skills and training to perform well at an entry level position and the person should have a basis for continued career growth as a professional". There is an ongoing debate surrounding the required foundational skills, as perceived by industry and academia. Evenson (1974:13) suggests that fundamental skills are left out of the education provided by academia. A focus on the wrong fundamental skills results in industry not only having to add to existing skills, but also having to break them down and rebuild them. This is a far more involved task than simple addition.

Todd, McKeen, and Gallupe (1995:20) identified the main areas of disagreement between academia and practitioners as an excessive focus on either technical skills or business skills. They refer to the differentiation in two parts: 1) The education gap where academic efforts are focused on business skills, and 2) The recruitment gap where practitioners emphasise business skills to academia but fail to carry this emphasis through to the recruitment process. Todd, et al (1995:20) concludes "As always the truth of the matter probably lies somewhere in the middle".

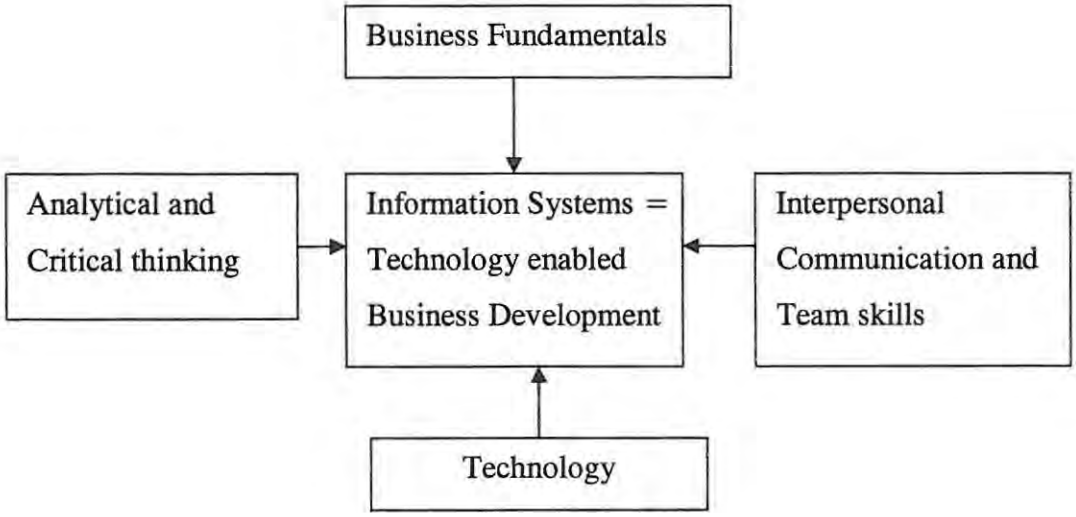

Figure 4-1: Desired Exit Characteristics

(Gorgone, et al, 2003:13)

The importance of the composition of the skills portfolio is not always limited to business versus technical skills. For example Misic and Russo (1999:201) found the fundamental difference was that practitioners rated analytical skills as the most important and interpersonal skills as the least. However educators were spending the majority of their time improving interpersonal skills and the least amount on analytical skill development. A study by Leea, et al (2002) found the entry level positions in industry emphasized the technological skills more than the organisational knowledge. This dilemma that exists between the perceptions of academia and practitioners is common to most of the IT professional's skills categories. Ives, Valacich, Watson, Zmud, Alavi, Baskerville, Baroudi, Beath, Clark, Clemons, Davis, Davis, Dennis, El Sawy, Fedorowicz, Galliers, George, Ginzberg, Gray, Hirschheim (2002:467) highlighted that this omission partially stems from the failure of the information systems academic community to communicate what comprises the core knowledge of information systems and why exposure to this core knowledge is essential.

Academia and practitioners both have views on the skills an entry level employee should possess. However, analysis of the entry level employee highlights the importance of developing a well rounded skills portfolio. This can then cater to the

requirements and needs of the individual and job type. A broad foundational skills portfolio provides the individual with the freedom necessary to satisfy their career anchors. It also allows an organisation to train and develop their employees as they require.

4.3 Historical Changes of Information Technology Skill Requirements

Examining the changing skill requirements allows the relationship between the IT professional's skills portfolio, career anchors and job positions to become clearer. An understanding of the causes and results of these changes is important. The IT skills required by industry are constantly changing. Lee, et al (1995:315) identified three driving forces behind these changes:

1) Changing technologies such as new software and methodologies.
2) A changing business environment as IT now provides a powerful strategic weapon.
3) The changing role of IT from a task orientation to a role orientation.

These driving forces result in a new type of IT professional who is required to be adept in multiple functional areas within an organisation. An IT professional is no longer restricted to technical development and maintenance. The experiences associated with the new roles and skills results in an increasing diversity amongst the IT professional's career anchors. Shi and Bennett (1998:44) discuss the increased desire for leadership becoming instilled in the IT profession. They attribute the desire of today's firms for IT leaders who not only understand technology but can also comprehend technology's potential to affect business strategy to the increasing importance and complexity of the IT function. The increasing importance and complexity of the IT department leads to organisations requiring different skills and knowledge. In response to this IT professionals are developing diverse career anchors and are exposed to diverse work experiences.

The mix between technical and managerial skills has been the main focus of research into changing skills requirements over the past decade. Cheney's (1988:6) follow up of a study conducted in 1980 concluded that it was still not important for the analyst

and programmer to have managerial skills. Thirteen years later Nakayama and Sutcliffe (2001:101) revealed that regardless of the job type and duties IT work requires equally or even more business and organisational skills than technical skills. These opposing views show how the IT profession has evolved and the skill requirements changed. This change appears to have occurred over a fairly long period from the 1970's to the 2000s. However, Trauth, Farwell, and Lee (1993:293) suggested that the skill mix for many IT professionals in the early nineties favours technical expertise over people-handling ability. Just two years later in the mid-nineties Lee, et al (1995:327) showed the opposite as the IT professionals they surveyed considered technical knowledge to be the least important skill currently and in the future.

Nakayama and Sutcliffe (2001:101) express the idea that the type of IT skills is not the only major issue. The proportions between the selected IT skills must also be managed at the various levels in the organisation. These past studies acknowledge the fact that IT skills change rapidly and this must be catered for by career management. One solution put forward by Bailey and Stefaniak (2001:95) is to develop general skills that allow the IT professional to work with others, solve problems, and adapt to the rapidly changing environment.

Changing skills often results in organisations lacking staff with specific skills. The method they employ to fill these missing skills has an impact on the IT professional's career path. Heckman (1998:9) specifies four basic methods for replacing missing skills: 1) Re-skill existing staff, 2) Replace or augment existing staff, 3) Outsource, and 4) Borrow skills through formal or informal partnering arrangements. Nakayama and Sutcliffe (2001:103) support the first three options. When selecting a method it must be remembered that experienced and skilled IT professionals enhance a firm. Organisations must account for this through the career paths they offer. The methods used to re-skill employees are an integral part of career management and is examined in *Chapter 5.*

4.4 Existing Categorisations of Information Technology Skills

The categorisations examined by the research are drawn from a number of studies ranging from general portfolio requirements to specific skills required for a given IT

position. The categorisations are examined from three perspectives: 1) Organisational needs, 2) Academic needs, and 3) A combination of 1 and 2. Gorgone, et al (2003) co-authored the IS 2002 model curriculum and guidelines for undergraduate degree programs in information systems as a joint effort between the Association for Computing Machinery (ACM), the Association for Information Systems (AIS), and the Association of Information Technology Professionals (AITP). It is a case where industry and academia collaborated in the setting of an IS curriculum. Within their guidelines they suggest four assumptions about the information systems profession that have been constant over time:

1) IT professionals must have a broad business and real world perspective.
2) IT professionals must have strong analytical and critical thinking skills.
3) IT professionals must exhibit strong ethical principles and have good interpersonal communication and team skills.
4) IT professionals must design and implement IT solutions that enhance organizational performance.
(Gorgone, et al, 2003:6-7)

These assumptions were integrated into the guidelines for the IS 2002 curriculum and the result was four categorisations of IT skills that contribute towards technology enabled business development: 1) Business Fundamentals, 2) Analytical and Critical thinking, 3) Interpersonal Communication and Team skills, and 4) Technology (Gorgone, et al, 2003:13).

Examination of research from the last two decades has revealed a range of categorisations of IT skills. The majority of these categorisations are variations on the four suggested by the IS 2002 curriculum guidelines. However, it is beneficial and necessary to analyse the categorisations and how they have developed in order to gain an understanding of the skills portfolio of the modern IT professional.

A survey conducted by Cheney and Lyons (1980:36) examined four main areas of IT skills as they were perceived in 1980: 1) Information skills inventory and personnel projections, 2) Hardware configurations, 3) Software characteristics, and 4) Information system department characteristics. Their (Cheney and Lyons, 1980:40)

research revealed that technical skills, such as application programming, were more important than the business fundamentals and managerial skills. As a result of their survey it was suggested that if an IT professional were to move into management it was essential they receive further training. A follow up survey was conducted by Cheney (1988:6) and over an eight year period the four categories of skills had evolved into: 1) Systems design, 2) Hardware and software, 3) Information systems management, and 4) Quantitative management. The main outcome was that managerial skills were now receiving more focus. However, they suggested that additional training would still be required for any move to management.

Levinson (1998) investigated the implications of repositioning the IT function. This was one of the major changes occurring in the IT field during the 1980's. The study highlighted necessary skills for IT professionals to acquire in order to change along with the field: 1) Communication skills, 2) Business skills a) take actions through an understanding of how decision makers in the organisation think; and b) substantive business skills, and 3) Change agent skills (Levinson, 1988:172) and (Wynne, et al, 2002:172). The business fundamentals and interpersonal communication skills received much more focus than had previously been the case. This reflects the importance placed on the strategic integration of the IT department that is prevalent in organisations today. This increased focus on managerial and business related skills (soft skills) is supported by Green (1989:116) who examined the perceived importance of the systems analysts skills using Vitalari's (1985) four categorisations: 1) Organisational specific knowledge, 2) Applications domain knowledge, 3) Functional domain knowledge, and 4) Technical skills. They found that the behavioural skills were perceived more important than the technical skills.

In 1991 Nelson (1991:509) expanded the traditional four skills categories into six constructs. These six constructs shown in Table 4.1 were used to group IT skills and ease the process of obtaining data.

1) Organisational Knowledge • Organizational goals and objectives • Primary Organizational functions • Critical success factors • Environmental constraints	**2) Organisational Skills** • Interpersonal communication • Interpersonal behaviour • Group dynamics • Project management
3) Organisational Unit • Work unit objectives • Work unit problems • Links with other work units	**4) General IT knowledge** • IT policies and plans • Fit between IT and organization • Existing IT applications • IS/IT potential • IS/IT for competitive advantage • Privacy issues (re: databases)
5) Technical skills • Programming • Use of software packages • Model building • Model application • Data access • Database development • Data communication	**6) IT Product** • Use of specific application systems • Use of office automation products • Use of operating systems • Preparation of documentation • Use/understand documentation • IT evaluation and maintenance

Table 4-1: Nelson's Six Constructs

(Nelson, 1991:509)

Todd, et al (1995:3) also made use of skills categories in order to ease the collection of empirical evidence and provide a clearer picture for their research into IT skill requirements over time. The three categories they defined were: 1) Technical, 2) Business, and 3) Systems knowledge. Over the same time period Lee, et al (1995:323) took part in a joint academic/industry investigation into the critical skills requirements of an IT professional. Four broad categories of critical IT skills were included in the study: 1) Technical specialties skills, 2) Technology management skills (concerned with when and how to deploy information technologies effectively and profitably), 3) Business Functional skills (focus on applying IT to serve business goals), and 4) Interpersonal and management skills (boundary spanning role assumed by IT within organization). These four categories are similar to those employed by Nelson (1991) in that the technical skills are present and the business skills are separated into functional/organisational and general managerial abilities. This is a common trend seen throughout more recent categorisations.

Today IT professionals are expected to possess a wide variety of skills. Over the last five years (1998-2002) the categorisations of these have differed. However they all share the same fundamental qualities. Below in table 4.2 is a list of categorisations and their respective authors who highlight the characteristics common to modern IT skills categorisations.

Heckman, 1998	1) Market place skills, 2) Social Skills, 3) Conceptual skills, and 4) Technology skills
Lidtke and Stokes, 1999	1) Personal skills, 2) Interpersonal skills, and 3) Technical knowledge and skills
Misic and Russo, 1999	1) Interpersonal skills, 2) Technical skills, 3) Analytical skills, and 4) Communication skills
El-Sabaa, 2001	1) Communication, 2) Organizational, 3) Team building, 4) Leadership, 5) Coping, and 6) Technological skills
Leea, et al, 2002	1) IT core knowledge, 2) Organisation and society, 3) Interpersonal, and 4) Personal traits

Table 4-2: Authors and their Skills Categorisations

All of the authors referred to have included the following underlying elements in their categorisations: 1) Interpersonal/communication skills, 2) Managerial/functional skills, and 3) Technical skills. Although the terminology or the number of categories may differ, the skills categorisations that are a necessary part of research into IT skills portfolios are clear. Trauth, et al (1993:299) highlight this understanding and summarise the skills necessary for an IT professional as, key technical skills, a deep understanding of their business units, interpersonal skills necessary to work with others, and an ability to effectively apply technology in seeking business solutions to business problems.

4.5 Categorisation to be used by the research

There are a large number of IT skills. This makes it necessary to examine the skills as part of a category. The research will focus on five categories of skills represented in Figure 4.1. In this way all skills can be accounted for, including firm specific skills. The categorisation used by the research is one developed and suggested by Gorgone, et al (2003) in the IS 2002 model curriculum and guidelines for undergraduate degree programs in Information Systems. The IS 2002 curriculum guidelines were selected as it provides a detailed description of subcategories and specific skills to be included in each categorisation. The curriculum guideline is a recognized credible source and provides justification for the inclusion of each category. They are as follows:

1) **Business Fundamentals**

- Business Models e.g. *Contemporary and emerging business models, Organizational theory, structure, and functions, and System concepts and theories.*
- Functional business areas e.g. *Accounting, Finance, Marketing, Human Resources, Logistics and Manufacturing.*
- Evaluation of business performance e.g. *Benchmarking, Value chain and value network analysis, Quality, effectiveness, and efficiency, Valuation of organizations, and Evaluation of investment performance.*
  (Gorgone, et al, 2003:14)

2) **Analytical and Critical thinking**

- Organizational problem solving e.g. *Problem solving models, techniques, and approaches, Personal decision making, Critical thinking, Methods to collect, summarize, and interpret data, and Statistical and mathematical methods.*
- Ethics and Professionalism e.g. *Codes of conduct, Ethical theory, Leadership, Legal and regulatory standards, Professionalism - self directed, leadership, time management, and Professionalism - commitment to and completion of work.*
- Creativity e.g. *Creativity concepts, Creativity techniques, and The systems*

approach.

(Gorgone, et al, 2003:14)

3) Interpersonal, Communication, Team skills

- Interpersonal team e.g. *listening, Encouraging, Motivating, Operating in a global and culturally diverse environment.*
- Work and leadership e.g. *Building a team, Trusting and empowering, Encouraging, Developing and communicating a vision/mission, Setting and tracking team goals, Negotiating and facilitating, Team decision making, Operating in a virtual team environment, Being an effective leader*
- Communication e.g. *Listening, observing, interviewing, and documenting, Abstraction and precise writing, Developing multimedia content, Writing memos, reports, and Documentation, and Giving effective presentations.*

(Gorgone, et al, 2003:14)

4) Technology

- Application Development e.g. *Programming principles, objects, algorithms, modules, testing, Application development – requirements, specs, development, Algorithmic design, D, Object, and File structures, and Client-server software development.*
- Internet systems architecture and development e.g. *Web page development, Web architecture design and development, and Design and development of multi-tiered architectures.*
- Database design and administration e.g. *Modelling and design, construction, schema tools, and DB Systems, Triggers, stored procedures, design and development of audit controls, Administration: security, safety, backup, repairs, and replicating.*
- Systems infrastructure and integration e.g. *Computer systems hardware, Networking (LAN/WAN) and telecommunications, LAN/WAN design and management, Systems software, and Operating systems management.*

(Gorgone, et al, 2003:14)

These four categories cover the majority of IT skills likely to be encountered. The categorisation provides a useful means of simplifying the data for the purpose of incorporating the results into a model. The four major categories all lead to one final category, technology enabled business development. This includes skills that will allow an organisation to effectively employ the skills found in the previous four categories.

5) **Technology enabled business development**

- Systems Analysis and design e.g. *Systems analysis, Logical and physical design.*
- Business Process Design e.g. *Strategic utilization of information technology and systems, and IT planning.*
- Systems Implementation e.g. *Design execution, and Testing.*
- IT Project Management e.g. *Deployment, Maintenance, Use of IT, and Customer service.*

(Gorgone, et al, 2003:14)

This categorization scheme is to be utilized as:

1) The joint collaboration between academia and industry avoids the discrepancies between academia and practitioners as to the required skills.
2) The commonalities between existing skill categorisations are all present in this categorization
3) It originates from a credible source
4) It is easy to understand and implement.

4.6 Impact of Skills on Information Technology Careers

IT professionals continuously learn new skill sets as their careers evolve. This results in a need to manage skills portfolios and identify the "best" career progressions for IT professionals under various circumstances. Career paths must be known in order to maintain an optimal skills portfolio within an organisation (Nakayama and Sutcliffe, 2001:105). Evenson (1974) identifies this relationship between skills and career path

as a 'train path', the skills and education needed to develop careers in a desired direction.

Within the IT profession during the 1980's a computer manager was required to possess technical and managerial skills. When an organisation found such an employee they were reluctant to release them as the mix of skills was hard to locate. At the same time organisations viewed promotion from the ranks of programmers and analysts as too risky. This lead to professionals avoiding the IT career path as it was a 'dead end'. Cheney and Lyons (1980:43) state that the pressure placed on computer managers for technical and managerial skills was more than required of other middle managers. Trauth, et al (1993:300) discuss a similar situation in which the IT professional is pulled in a technical direction and a business direction. The result of such a position was a knowledge upsurge in which the skills available to a firm expanded and diversified. It is essential that the organisation expand and diversify the IT career paths to match this knowledge explosion. Klenke (1993:217) clarifies this concept when viewing the leadership roles to be assumed by the modern IT professional. Four specific leadership roles exist for the IT professional: 1) Decision makers, 2) Motivators, 3) Change agents, and 4) Strategic leaders. These leadership roles are a result of the IT professional's ability to work in multidisciplinary teams through their understanding of business processes, project management, and systems analysis. The transformation from technical manager to strategic leader and partner differs from the concept of IT careers as a series of promotions only accompanied by salary increases (Klenke, 1993:223).

Given the importance of the IT professional's skills and its impact on their career paths an understanding of how these skills are acquired and developed is necessary. Potosky and Ramakrishna (1998:174) state that the single most important characteristic of successful IT professionals is their ability to learn. They consider a learning ability to be extremely relevant in order to keep current in terms of new technology and expand their skill sets to include new management and business-related skills. The motivation to update skills stems from a desire to progress a career in a specific direction. This specific direction is represented by the IT professional's career anchors. Potosky and Ramakrishna (1998:177) conclude that IT professionals who engage in updating behaviours will be more successful in their jobs and in their

careers.

A measure of career success is advancement. This advancement is dependent on skills and the ability to continuously acquire and expand them. This view is supported by Shi and Bennett (1998:46) who identify self learning behaviour as a CSF for IT executive careers. They identify three approaches to acquiring knowledge: 1) most important is self learning, 2) followed by formal education, and then 3) work experience. The scope and direction of the three knowledge acquiring approaches is guided by individual factors.

Evenson (1974) found that managers are informed whether a trainee has passed or failed a course, if the course was passed the employee was assumed to possess the new skills and a promotion was offered. No other information about the trainee was required except that they now possessed the skills. This indicates a close relationship between career path and skills and highlights the importance of training. However, training is dependent on previous training experience and personality traits which determine the speed at which an employee may be trained. This strengthens the relationship identified between careers and skills, as it integrates an individuals career anchors.

Training and self learning offers IT professionals the opportunity to develop new skills and shift their career paths into different functional areas. An example of this method of training is the development of a *'zig—zag'* type career path where IT personnel work for a 6 month period in non-IT departments before returning to IT. This allows them to acquire cross functional skills and will increase their opportunities for transition to management positions outside of the core IT area. This opportunity for transition is created by the acquisition of new skills and causes ripples that impact the traditional linear career path of Programmer → Analyst → Lead analyst → Project manager → IT manager (Levinson, 1988:174).

Heckman (1998:8) refers to IT professionals who make the transition as boundary spanners. A boundary spanner is usually an IT professional who possesses a balanced portfolio of technology, conceptual, social and marketplace skills. These skills are acquired through training and self learning. Ives, et al (2002:472) suggest two

reasons why organisations should encourage the training of IT professionals who may become boundary spanners:

1) Business practitioners would have problems communicating their needs to information technologists unfamiliar with the language and fundamentals of business.

2) A gap would be created between the market's demand for professionals and managers competent in the business of IT (e.g., systems analysts, project managers, CIO's) and the supply.

4.7 Conclusion

At the entry level an IT professional's skills portfolio consists of fundamental skills. This allows an organisation and the individual to develop careers in a number of directions. IT skills have changed over time with the importance shifting from one skill to another and sometimes back again. After an examination of existing categorization schemes five skill categories were selected. The categories were developed by both practitioners and academia and exhibited most of the common traits of other skill categorisation schemes. The need for IT professionals to possess a vast array of skills across multiple functions has a large impact on their career path. It allows for the IT professional to become a boundary spanner and if the skills satisfy the career anchors of the IT professional they will begin to engage in productive self learning and training opportunities. A summarisation of this Chapter is presented diagrammatically in Figure 4.2.

Having examined the factors that influence an individual's career dynamics it is now necessary to examine how management can use this knowledge to ensure compatible career dynamics. *Chapter 5* examines career dynamics and corrective actions.

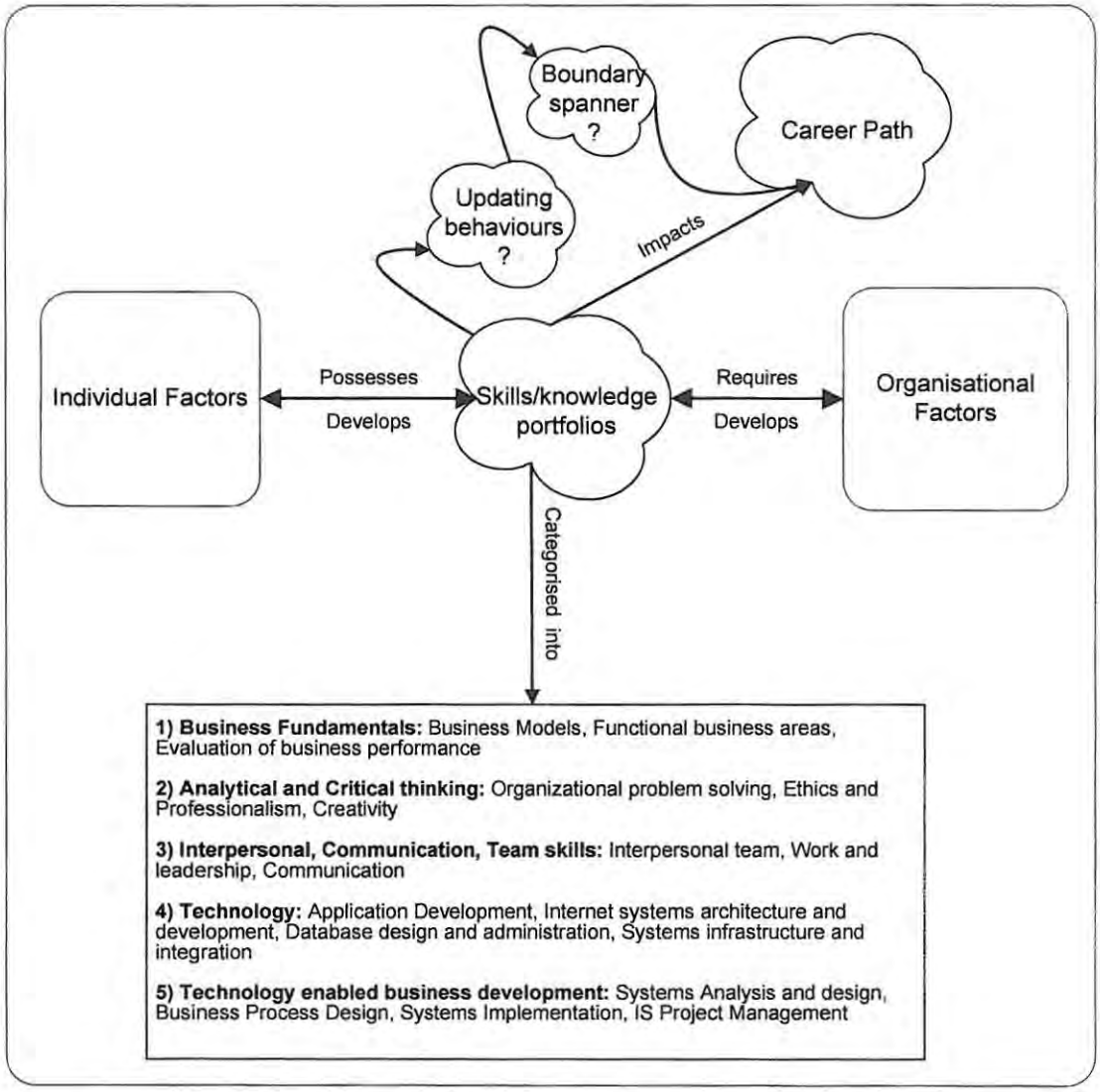

Figure 4-2: Dependent Factors

Chapter 5 Career Dynamics

5.1 Introduction

Schein (1985) introduced the concept of career dynamics as the matching of individual and organisational needs (McLean, et al, 1991:3). *Chapters 2, 3* and *4* examined individual, organisational, and dependent factors respectively. This Chapter examines how these three factors interact to affect the compatibility of career dynamics.

As research into IT careers expands it becomes evident that little is known about the career dynamics of the IT professional (McLean, et al, 1996:3). Career dynamics involves interactions between organisational, individual, and dependent factors. To manage the career dynamics of the IT professional knowledge of career movements, career path models, and career variables are needed. Knowledge of these will provide career management with the ability to rectify incompatible career dynamics. Corrective actions available to career management may be initiated by the organisation, the individual, or a combination of the two.

A career consists of three related dynamics: 1) a career involves moving on a path over time, 2) a career involves the interactions of the individual and organizational factors, and 3) a career provides an occupational identity (El-Sabaa, 2001:2). *Section 5.2* addresses the first dynamic and identifies and discusses the known career movement types. Career movements combine into career paths. *Section 5.3* examines three career path models namely: *Section 5.3.1* The Pyramid model, *Section 5.3.2* The Dual path model, and *Section 5.3.3* The Multiple career path model. Following this examination of career path models *Section 5.4* examines the career variables that reflect the compatibility of career dynamics. Three career variables are identified and discussed, *Section 5.4.1* looks at plateauing, *Section 5.4.2* examines satisfaction, and *Section 5.4.3* examines turnover intentions. Knowledge of career dynamics will assist with the implementation of corrective actions in the event of a mismatch between the individual and organisational factors. *Section 5.5* examines career management and corrective actions.

5.2 Career Movement Types

Career movement types are differentiated by direction and frequency of movement. The three movement types identified by Schein (1971) are: 1) Vertical, 2) Radial, and 3) Circumferential (Lash and Sein, 1995:118). El-Sabaa (2001) proposes four movement types that share some commonality with those suggested by Schein (1971): 1) Linear, 2) Spiral, 3) Expert, and 4) Transitory. These two sets of movement types are grouped and defined below.

Vertical movement or linear progression refers to a progressive series of steps up or down the organisational hierarchy. These progressions are associated with ever increasing authority and responsibility. Linear movement is the most traditional of the movement types and is still found firmly imbedded in the IT career path (El-Sabaa, 2001:2) and (Lash and Sein, 1995:118). The individuals who engage in linear movements are motivated by authority and power over others. This reflects the character of an individual with a dominant managerial career anchor. However, it is not always the individual's choice to engage in linear movements and it may be forced on them by the organisational structure and culture.

Radial movement represents movement in terms of centrality to the organisation. This centrality can refer to physical location or strategic involvement. An IT professional may move to different offices in order to increase or decrease their relationship with an organisation's head office (Lash and Sein, 1995:118). This movement may be associated with an individual who desires independence and freedom from an organisational structure.

Circumferential or spiral movement depicts major moves across functions, divisions, occupations, or disciplines (El-Sabaa, 2001:2) and (Lash and Sein, 1995:118). The ideal field moved to is usually one where the knowledge and skills developed in the original field are applicable. Spiral movements are periodic and eventually create new movement opportunities through the acquisition of an entirely new set of knowledge and skills. This type of movement is becoming more common throughout the IT profession as IT professionals attempt to extend their careers through the expansion of their skills portfolios (El-Sabaa, 2001:2).

Expert movement involves a lifelong commitment to some occupational field or specialty. This type of movement is usually suited to a technically orientated individual. Individuals involved in expert movements are usually searching for stability and security within their careers (El-Sabaa, 2001:3).

Transitory movement identified by El-Sabaa (2001:3) is similar to that of circumferential or spiral except the new field or job moved to will be very different and wholly unrelated to their original work. This is the least traditional of the career movement types. Employees seeking variety and independence will engage in transitory movements. Reich and Kaarst-Brown (1999:348) researched the characteristics involved in the transition from IT to non-IT careers. The non-IT career is not limited to a wholly related IT field or a wholly unrelated IT field, rather it refers to one or the other or a combination of the two. They referred to careers following the transitory movement type as 'boundaryless careers', where individuals are able to move within and between organisations.

These movement types are collectively represented by career path models. *Section 5.3* below examines the major career path models.

5.3 Career Path Models

"Keen (1998) asserts that there are no career paths anymore, only career trajectories" (Lash and Sein, 1995:117). Whether the situation is a managed career path or a career trajectory that takes shape, there is a need for knowledge of career path models to help improve career management systems. According to Lash and Sein (1995) a career path is fashioned by the influences of organisational needs, the changing environment, organisational roles and an individual's career anchor. From these constructs they developed a career path model in which the IT professional has internal and external options.

The need for IT career path modelling arose when technical professionals were required to perform administrative and people-orientated duties in the same amounts as their technical skills (Leibowitz, Kaye, and Farren, 1992:31). They hold the view that technical professionals will become unhappy and tempted to move if this drive towards a managerial or generalist direction is unforeseen. This idea is supported by

the common economic view of workers moving frequently and freely between jobs to take advantage of better employment opportunities (Ang and Slaughter, 1995:182).

The changing technological environment demands the presence of skilled technical professionals. Organisations need to retain and develop their technical professionals through a career plan. Leibowitz, et al (1992:32) suggest three to five career path options should be available to the IT professional within any given organisation. These career path options need to be modelled in order to effectively communicate them and implement them throughout an organisation.

The most traditional career path is the pyramid model where linear movement dictates progression. This single outdated career path led to the need for a dual path that accommodated the managerial and technical IT professional. The diverse skill of the modern IT professional demands more than two options for career progression that is multiple career paths. These career path models are examined below.

5.3.1 Pyramid Model

The pyramid model identifies a single career path leading from the entry level to management, for example programmer to IT manager. This is the traditional view of progression through the ranks of an organisational hierarchy. The pyramid model is problematic as it only allows for vertical or linear movement as shown in Figure 5.1. Vertical movement follows the assumption that the position below will provide the necessary training and skills acquisition for the higher role. For an IT professional this would mean that to be a systems analyst one must first be a good programmer. However, the skills required and career anchors related to these two roles are very different (Lash and Sein, 1995:118). Wynne, et al (2002:173) identifies the introduction of successful business managers as heads of the IT department as a major change agent within the linear structure of the pyramid model. This limits the senior positions available to the IT professional and has consequences all the way down the linear career path.

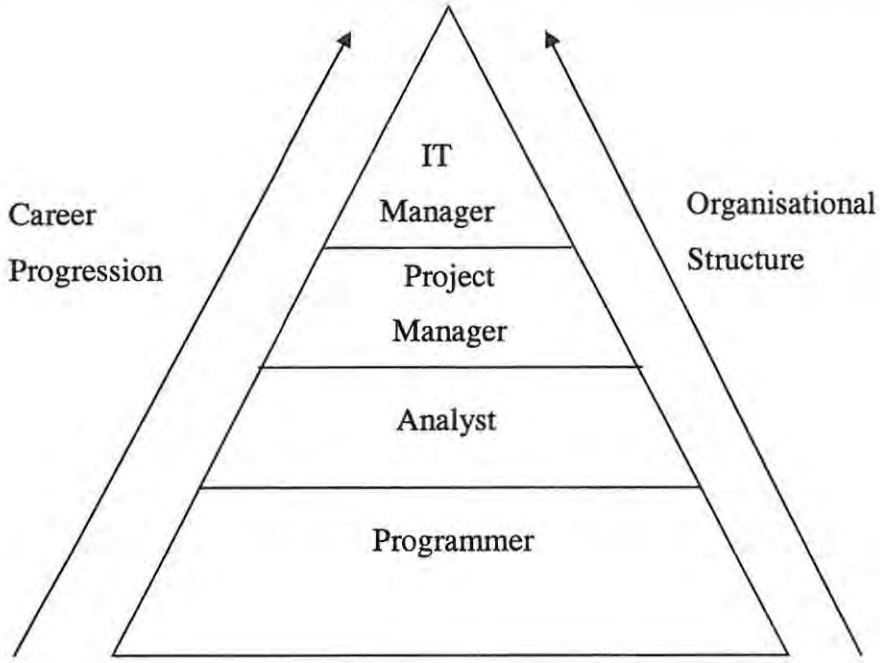

Figure 5-1: Pyramid Model

Ang and Slaughter (1995:182) found that a positive aspect of the linear model was that it enables the employer to recoup investment in training the worker. This is especially applicable to IT professionals trained in firm specific skills. Firm specific skills mean transition costs are higher for both the employer and employee, and thus movement outside of the organisation is not a viable option. The pyramid model is outdated for the IT professional. However, this does not mean it will always fail. Shi and Bennett (1998:38) documented the career paths of five successful IT executives. The initial progressions made by each of these followed the traditional pyramid model until the 1990's. For example, Executive 1=Bachelor degree→ Programmer→ Analyst programmer→ Systems analyst→ Senior systems analyst→ Project manager. However, during the 1990's IT executives found the revised perspective on IT career movements providing them with non linear directions such as Quality Assurance manager→ Deputy General manager.

5.3.2 Dual Path Model

In the past IT departments have either focused on a defined managerial career path or none at all. However, not all employees have a desire or are able to perform in managerial positions, this lead to the development of a dual career path. The dual career path allowed an individual's career to progress in one of two possible

directions as shown in Figure 5.2. The dual path provided career progression in which technical employees could attain professionalism without having to switch to a management track and *vice versa*. Technically orientated employees are concerned that managerial positions will allow their technical skills to become obsolete. The new technical career path allows progression to higher roles without increasing managerial responsibilities. Ridings and Eder (1999:8) found that setting up two career paths has been shown to reduce turnover while enabling companies to build more efficient IT groups. Shore (1983:14) conducted a case study where the dual path model was employed in order to accommodate the technicians who were unable or unwilling to make the transition to management. This resulted in the average skill of the companies increasing and a pentagonal shaped hierarchy. However, the dual path has received much criticism owing to a number of flaws.

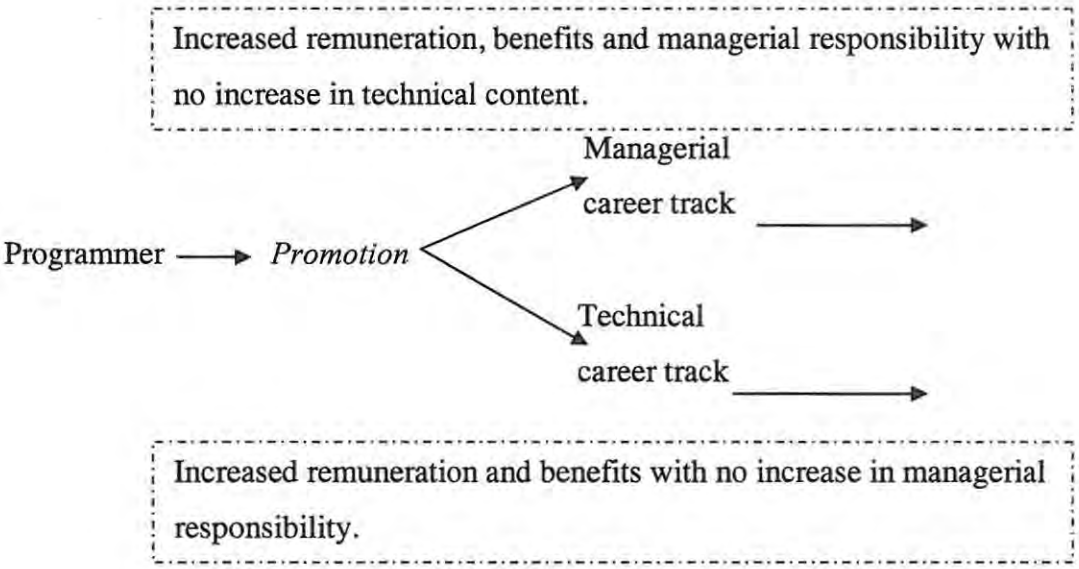

Figure 5-2: Dual Path Model

Leibowitz, et al (1992:32) view the main pitfalls of the dual path to include: 1) inequalities in compensation between managers and technical workers, 2) poor selection criteria as technical career tracks become dumping grounds for good performers, and 3) a failure to provide ways for technical workers to influence organisational decisions. The dual path did provide a means for technical employees to attain professionalism whilst avoiding managerial responsibilities. However, it was not successful and its failings are attributed to poor design and implementation.

Ridings and Eder (1999) revealed that equity must be achieved in terms of status, career planning tool availability, and decision making in order to achieve equal job satisfaction. Their research found the main inequality perceived by the technical employees to be the availability of career planning tools.

A negative view of the dual career path is not always the case as demonstrated by Ginzberg and Baroudi (1992:41) who found two consistent suggestions voiced by both IT practitioners and researchers to be: 1) pay more attention to career planning, and 2) implement dual career path planning. However, with regards to career planning the dual career path and its upward career movements alone (reflected in job title, promotions, and pay rises) does not provide satisfactory progress through the various career stages an individual must pass (Agarwal and Ferratt, 1998:294).

The major area of concern with regards to the dual path model is that the dual career path does not deal effectively with the various career options desired by IT employees as it assumes two options are sufficient (Igbaria, et al, 1995:322). The dual career path was found to be lacking when it came to consideration of all the possible individual career anchors. Crepeau, et al (1992:152) supports this and their results demonstrate that study respondents possessed several, largely independent, career anchors. However, the dual career path suggests that the IT professional may only possess either a technical or managerial career orientation, past studies have found this not be the case (Jiang, et al, 1995).

5.3.3 Multiple Career Paths

"Lee, Trauth and Farwell (1995) suggest that changes in industry will lead to the development of multiple career tracks due to the variety of skills in technology and management" (Ridings and Eder, 1998:171). This view is shared by many authors as a solution to the problems associated with the dual path model. The idea of multiple career paths suggests a flexible structure able to adjust to changes in the environment and the individuals rather than a set of rigid career paths (Jiang, et al, 1995:3). Leibowitz, et al (1992:32) state that multiple career path systems usually consist of three to five career paths as shown in Figure 5.3. These career paths provide opportunities to make lateral and vertical career moves. Career paths could be selected after employees have been allowed to make informed decisions using self

assessment tools, and career workshops. As with the dual path model a multiple career path model must ensure perceived equity between the various paths. They (Leibowitz, et al, 1992:31) put forward three challenges organisations might face when implementing a multiple career path system:

1) To meet the technical challenge the firm should establish career paths that provide meaningful rewards.
2) To meet the political challenge the firm should alter power bases to include technical employees in decisions.
3) To meet the cultural challenge the firm should establish and maintain a commitment to the new system so that it is viewed as a prestigious route to career growth.
   (Leibowitz, et al, 1992:31)

However, the presence of multiple career paths is not the entire solution. An organisation must have a basis by which the career paths are aligned to the individual IT professional. *Section 5.3.4* examines such a basis in the form of a career anchor model.

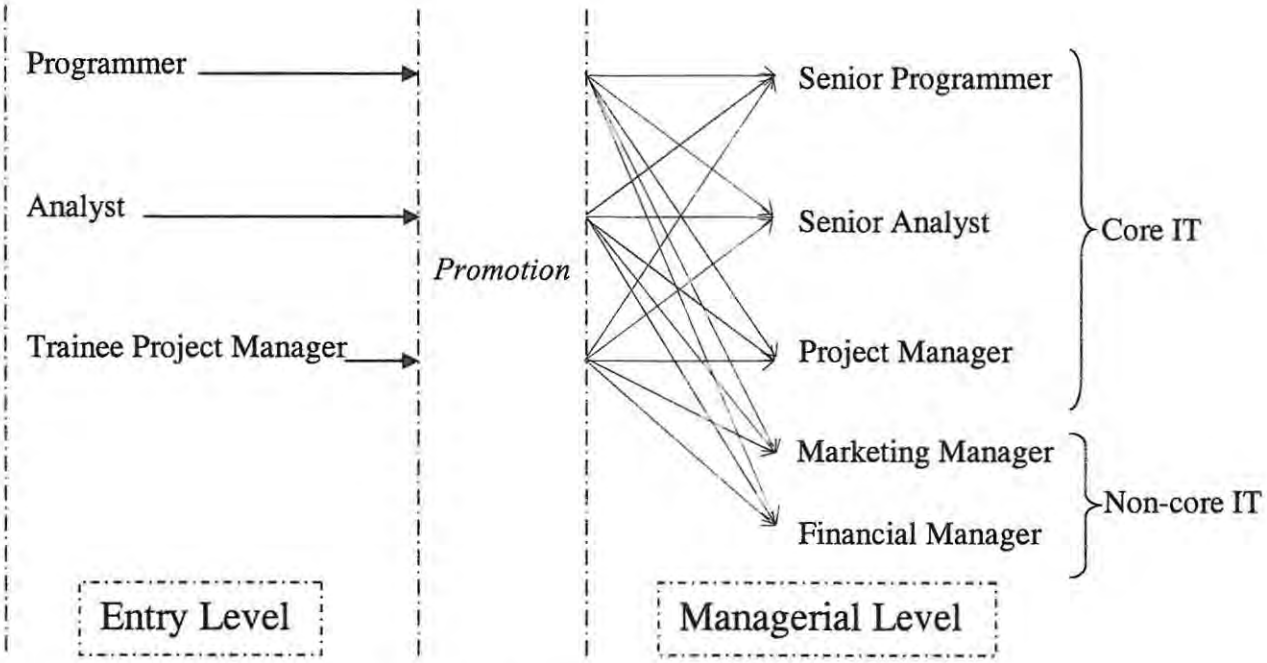

Figure 5-3: Multiple Career Path Model

5.3.4 Career Anchor Model

"Ginzberg and Baroudi (1998) suggest the use of internal career anchors to examine the diversity of desires in IT professionals, job satisfaction, the appropriateness of dual career paths, and the match between actual career anchors and career selection" (Jiang, et al, 1995:3). This statement supports the use of career anchors for the implementation of a dual career path system. However, the career anchors of IT professionals are diverse and require multiple career paths. Through the application of the career orientation inventory survey it is possible to identify the diverse career anchors of an individual. Igbaria, et al (1995:320) express the importance of career anchors as affecting an individual's career choices, job movement, and reactions to work experiences. Career anchors identify the type of work that would result in job satisfaction for an individual employee. Jiang, et al (2001:36) showed that a positive relationship between internal career anchors and career satisfaction exists. An understanding of career anchors may allow managers to better advise IT professionals on which career path is a better fit (Nakayama and Sutcliffe, 2001:104).

The career anchor model underscores evolutionary changes to career anchors as workers gain work experience (Crepeau, et al, 1992:147). An IT professional's needs are likely to change as they experience working life. These changing needs are reflected in the individual's career anchors. These needs are no longer satisfied solely by financial rewards, it is suggested that a simple readjustment of career paths, such as allowing lateral movement, and incentive schemes according to career anchors be implemented (Igbaria, et al, 1995:335). Jiang, et al (2001:32) highlight the need for multiple career paths and the importance of aligning them with career anchors, "Collectively the IT HRM literature suggests that employers should provide a variety of career opportunities to match the variety of individual's career anchors. Accordingly, creating opportunities besides technical or managerial career fulfilment to attract and retain IT professionals has been encouraged." The career anchor model requires managerial attention, especially when linking positions within the company to an individual's career anchors. Knowledge of the career anchor model is not sufficient, but rather this knowledge must be combined with effective career management practices.

5.4 Career Variables

Managing the career dynamics of an individual requires a standard by which the compatibility of individual and organisational needs can be measured, these standards are career variables. Career variables refer to the factors that represent the motivational state of an individual. There are a set of common career variables that are researched in order to determine the current state of an individual's needs fulfilment. The career variables include career and professional plateauing, career and job satisfaction, and turnover intentions. Organisational commitment is another career variable that can be measured but was left out of the research in favour of turnover intentions. Igbaria and Greenhaus (1992:36) suggest that turnover intentions tend to be a better indicator of turnover than other factors such as organisational commitment. Turnover intention is also under more individual control, can provide results more quickly, and is easier to predict than actual turnover. These career variables are discussed below.

5.4.1 Plateauing

Lee (1999:26) defines career plateau as "The point where the likelihood of additional hierarchical promotion is very low." The IT profession is regarded as a distinct occupational group and as such organisations must concern themselves with career plateauing as many employees regard organisational careers as their ultimate objective and view promotions as primary indicators of success. Additionally the high achievement and growth needs amongst IT professionals leads to a salient desire for career advancements. IT professionals need to be challenged and blockages can be stifling, adding to the organisations turnover rate as the employees seek positions elsewhere (Lee, 1999:27). Ference, Stoner, and Warren (1977:602) explain career plateaus as a natural consequence of the way organisations are shaped, since there are fewer positions than aspirants at each higher rung of the organisational ladder. From this explanation the career plateau can be viewed as simply describing an IT professional's current career status within a particular organisation.

Lee (1999:26) defines the professional plateau as "the point where employees find their job unchallenging and it provides few opportunities for professional development and future employability." To avoid the professional plateau employees

must acquire new skills thereby ensuring career mobility. This is especially relevant to IT professionals as constant skills acquisition is essential to success in the IT field. This has lead to a new focus on professional development that organisations and individuals must prepare to cope with, especially when the signs of plateauing are present (Slocum Jr, Cron, and Yows, 1987:32).

Slocum Jr, et al (1987:33) distinguishes between plateaued employees as being either:

1) *Solid citizens* who are high performers that are satisfied with their positions.

Or

2) *Deadwood* employees who produce work of poor quality and generally do not have positive feelings about their jobs.

And non-plateaued employees as being either:

3) *Comers* are employees with promotion possibilities who are not yet high performers because they are still high on the learning curve.

Or

4) *Stars*, employees who are high performers and anticipate continued promotion.

IT professionals in a certain job type within an organisation are able to slot into anyone of these four categorisations. Slocum Jr, et al (1987:35) identifies the major reasons for job changes as: 1) New opportunity, 2) Reorganisation, 3) Financial reason, 4) Personal reason, 5) Family issue, 6) Company reason, and 7) Career change. The first two reasons are the major contributors to extending the IT professionals career through the creation of new positions. They also suggest four measures that managers may employ to counteract plateauing: 1) make the facts about plateauing known, 2) try to eliminate content plateauing (repetitious work), 3) use rewards other than promotions and money to motivate, and 4) give honest feedback. Ference, et al (1977) put forward four different approaches to solving plateauing: 1) prevent plateauees from becoming ineffective, 2) integrating the relevant career related information system, 3) managing ineffective plateauees and frustrated managers more effectively, and 4) job rotation to provide a change of scene, new duties, skill demands, or location. There are common elements present in the methods

suggested by Ference, et al (1977) and Slocum Jr, et al (1987). However, the important aspect for career management is the applicability of each method to the individual IT professional. For example Ference, et al (1977:608) identify harmful practices that encourage plateauing. Two of these are highly relevant to the IT professional:

1) Failure to provide training, skill upgrading, and development
2) Failure to appraise, counsel and develop career paths in the context of an individual's total life situation

There are several incorrect assumptions about plateauees such as: 1) Lower job performance, 2) Lower motivation and satisfaction, 3) Lower aspirations, 4) Bad attitude and behaviour in non-work factors, and 5) Lower rating of their own jobs (Slocum Jr, et al, 1987:33). Although these assumptions may sometimes be true plateauing is not necessarily a negative career variable. An individual may reach a point of their career where they desire to plateau and there other career variables such as job satisfaction will remain high. Plateauing must not be considered in isolation to the other career variables. It is necessary to consider whether the plateauing is occurring at the right time (high levels of plateauing) or whether the plateauing is occurring too early (low levels of plateauing).

5.4.2 Satisfaction

Satisfaction consists of two components: 1) Job satisfaction, and 2) Career satisfaction. Satisfaction is concerned with the meeting of an employees needs within the work place. These needs may be at the job level or the career level. The meeting of the individual's needs results in high job or career satisfaction or both. Both job and career satisfactions are negatively related to turnover intentions (Wynne, et al, 2002:80). This is supported by Igbaria and Greenhaus (1992:37) who relate high career satisfaction to high organisational commitment and low turnover intentions. Therefore a failure to meet the individual needs results in high turnover intentions and low satisfaction. An individual's needs are represented by their career anchors. Ridings and Eder (1999:9) highlight this point and conclude that offering alternative career paths that are supported by an individual's career anchor results in higher job satisfaction. Large discrepancies between available and perceived career paths lead to

lower job satisfaction. Igbaria and McCloskey (1996:6) recommend that a measure of career anchors enables an organisation to restructure jobs according to an employees needs, thus providing more career satisfaction.

There are a number of factors affecting satisfaction. However, satisfaction is a relatively well tested and well understood construct. Table 5.1 lists the factors affecting job satisfaction as put forward by two sets of research.

Author	Satisfaction Factors
Wagner and Benham (1993:147)	1) Pay and benefits, 2) Challenge, 3) Conditions, 4) Promotion, 5) Advancement within job, 6) Training, 7) Security, 8) Supervisor, 9) Skill Development, and 10) Job Overall
Ridings and Eder (1999:9)	1) Career path status equity, 2) Career tool availability equity, 3) Decision making equity, and 4) Monetary compensation equity

Table 5-1: Satisfaction Factors

Both career and job satisfaction rank highly amongst the career variables in terms of indicating the compatibility achieved through career dynamics. Jiang, et al (2001) support this and state that better career management is one popular candidate for increasing career or job satisfaction of IT professionals.

5.4.3 Turnover Intentions

Organisations continue to be plagued with high turnover amongst staff. This turnover is driven by the failure to meet an individual's needs (Agarwal, et al, 2001). Turnover intention is the best indicator of actual turnover and measuring it is important in determining the compatibility of an individual's career dynamics. Wagner and Benham (1993:142) conducted a longitudinal study into the career paths of IT professionals and observed that job tenure is influenced by: 1) The income of the initial IT job, 2) Age at entry level, 3) Levels of job satisfaction, 4) Field of study, and 5) Degree type. These variables establish a link between career anchors, job satisfaction and turnover that is highly evident in their research. Their study ascertained the average tenure within the IT field to be three years. This three year period is reinforced by Agarwal and Ferratt (2000) who refer to individuals changing organisations within a two to three year period as 'careerists'.

Factors affecting turnover intentions can be accounted for by examining their influences and incorporating solutions into career anchor based management system. This is highlighted by Nakayama and Sutcliffe (2001) who found that one critical aspect involved in effectively managing IT workers is that a firm must have career paths for its IT workers. Understanding career anchors and relating them to the IT professionals career path can lead to individual needs being met and turnover rates reduced (Igbaria, et al, 1991).

5.5 Career Management

Research into the area of IT career management is necessary in order to provide managers and individuals with the knowledge and ability to make informed career decisions (Crook, 1997:141). Crepeau, et al (1992:146) state that the lack of strategies for IT career management has been associated with several problems including: 1) poor career variables, 2) burnout, 3) limited advancement potential, 4) nominal corporate commitment, 5) supervisory aversion, and 6) exceptional compensation. There have in the past been attempts at career management. However, the traditional career management associated with linear movement is no longer applicable. The diverse skills portfolio and career anchors possessed by IT professionals require a new model of career management to be developed (Richens, 1998:289). Acknowledging the need for career management is not adequate. There must be corrective actions available to an individual or the organisation that will ensure career dynamics are compatible. Shi and Bennett (1998) identified that an understanding of career anchors is a prominent CSF for a successful IT career. To realise the benefits of career anchors an organisation needs to understand individual career anchors and apply this knowledge effectively. Evenson (1974:14) extends this idea and maintains that career management must be based on the combination of the needs of both the employee and the company. This view is reiterated by Crepeau, et al (1992:154), "Human resource planning, utilization, and evaluation in the information systems arena must involve both organisational and individual interests to avoid unproductive career decision making." *Section 5.5.1* examines the main corrective actions available to the individual and the organisation.

5.5.1 Corrective Actions

IT career management requires knowledge of an individual's current career state and how they arrived at that point (Ference, et al, 1977:605). Career state and progression consists of a job type and responsibilities, skills acquired and the effects of work experience on the individual's career anchors. It is these dynamic interacting factors that career management corrective actions need to focus on. These factors include skills development, a multiple career path system based on individual career anchors, and job type. Igbaria, et al (1995:320) states that there is a need for a career management system to focus on these areas. They suggest HRM ensures that the right mix of skills with the right people at the right organisational levels. Hunter's (1998:19) research into managing IT professionals highlights a recent shortage of IT professionals with the right skills and identifies the lack of credible HR practices as the root of this problem. Thus a career management system must consider the organisational factors (job types and the sequencing of them available to an employee), the individual factors (career anchors), and dependant factors (skills portfolio of the individual).

5.5.1.1 Skills Development

Career management is fundamentally concerned with the development of appropriate skills. An IT professional is prone to having their skills become outdated. Outdated skills result in plateauing or the end of a career. To avoid this situation and extend their careers in a desired direction IT professionals need to engage in skills development. Skills development can be engaged through two main avenues: either self learning or training. Potosky and Ramakrishna (1998:177) identified those IT professionals who engage in updating behaviours will be more successful in their jobs and in their careers. Heckman (1998:13) recommends that skills be part of the planning process and identifies four stages of evolution for skills planning:

1) Unilateral skills planning:
    - Assessing what skills are present, what skills are needed, and how can they be acquired. This occurs within a single organisational unit.
2) Cross functional skills planning:
    - Involves stakeholders in a collaborative skills assessment across

functional areas.

3) Planning formal integrating mechanisms:
   - Tactical planning focused on establishing formal cooperative skills acquisitions mechanisms.

4) Planning for discretionary collaboration:
   - The individual's discretionary contribution is influenced by 1) Satisfaction, 2) Relational bonds (with organisation), and 3) Individual attributes.

Managing the development of a professional's career must take into account the values of the professional. Lee's (1999:34) research shows that IT professionals value professional development and suggest skill enhancement programs such as training or job rotations can aid this motivation. Skill development is not only important to ensuring a future career but also influences the current satisfaction of an individual. Richens' (1998:290) established that "Compensation must be skill-based and constantly monitored against the market." Development of IT staff must be dynamic and responsive to business needs. This emphasises the need for the HR career management strategies to equip employees with the skills they need.

5.5.1.2 Implementing a Multiple Career Path System

Better career path management is a popular corrective action for increasing career or job satisfaction of professionals (Jiang, et al, 2001:32). Organisations that recognise the need for positive career variables will remove obstacles and provide better career path planning (Shore, 1983:17). Richens (1998:290) furthers this argument by stating that "there is no career path designated by the HR department for the IT function." This confirmed Crepeau, et al (1992:147) earlier finding of little evidence that formal paths exist. Career management needs to offer a solution to this problem. Wynne, et al (2002:171) lists providing career paths as one of the main issues to be addressed by IT career management. The need for multiple career paths is clear, but what to base these paths on and how to implement them requires clarification. Career anchors provide an ideal basis for implementing a multiple career path system. To effectively apply knowledge of career anchors the diversity of individuals has to be recognised

and appropriate reward systems and career paths developed (Igbaria, et al, 1991).

Leibowitz, et al (1992:34-35) recommend a method by which a multiple path system can be employed to manage the careers of technical employees. This can be applied to career management of IT professionals. The first step is to establish a task force consisting of representatives from departments throughout the organisation. This task force is required to assess the needs of IT professionals, responsiveness and commitment, identify a champion, and look for innovation and bottlenecks.

The next step is to formalize the systems goals with a mission statement, for example "to seek to improve overall effectiveness by maximising employees potential and by expanding opportunities for individual career growth" (Leibowitz, et al, 1992:34). This mission statement along with details of available career tracks and sources of support must be made known to the employees. Career management plans must be communicated to employees. Lee (1999:33) found that it is necessary for managers to communicate the available IT career paths in order to minimize the perception of plateauing. Richens (1998:291) supports the importance of communicating and reinforcing the company's values.

The method then requires that IT professionals about to embark on a particular career path must be given an opportunity to compare their skills, values and interests with those higher up on the desired career path (Leibowitz, et al, 1992:34). This will include examining compensation and benefits such as status, salaries, responsibilities, and other incentives. Ridings and Eder (1998:171) state that salaries, status, and incentives that are comparable across career paths will lead to a more effective career management system. Employees must be satisfied that the compensation on a set career path is comparable to other options they may have.

The final step proposed by Leibowitz, et al (1992:35) suggests management must encourage employees to think about work that they might want to do in the future and engage in updating behaviours to ensure they have the necessary skills to avoid becoming obsolete.

Throughout this process the IT manager or supervisor plays a critical role as communicator of the management system and its mission. The IT manager must

encourage the IT team and ensure that the individual needs and organisational needs are balanced and compatible career dynamics are achieved (Richens, 1998:291). A multiple career path initiative may not always be spearheaded by management. If this is the situation then it falls on both the individual and organisation to ensure that their respective needs are looked after.

5.5.1.3 Job Type Management

An individual's long term career outlook is reliant on managerial practices such as career progression, job enrichment and job design (McLean, et al, 1994:55). The characteristics associated with a specific job type represent the organisational factors. The organisation can manipulate the job type by changing the characteristics through job design and job enrichment. For example Richens (1998:289) found that IT skills are much in demand and new technologies are assimilated too quickly into the IT professional's resume to allow for a structure where a set salary is associated with a set job type. The IT professional's career development requires individual attention, with compensation and rewards tied directly to the skills and vision that the person possesses. A major approach to ensuring the job type suits the individual is to provide an IT professional with the opportunity to select from a wide range of job types. It is necessary for the IT professional to update and acquire new skills to make a career transition. *Section 5.5.1.4* examines how different job type opportunities are created through career transition.

5.5.1.4 Career Transition

Career transition expands the job type opportunities available to an IT professional and allows them to match their needs with the job type characteristics. The transition may be encouraged by either the individual or the organisation in order to achieve compatible career dynamics. Transition to different job types requires that either the individual or the organisation focus on career management.

Shi and Bennett (1998:34) perceive career path planning to be a particular challenge in today's environment. An integral part of this challenge is preparing for career advancement prospects. Within the core IT function these prospects may be limited. However, IT personnel are usually equipped to develop their careers outside of the IT

function. Faasen (1998:6) agrees with Shi and Bennett's' (1998) understanding of career progressions and lists the advancement environment as one of the major factors associated with job preference. This environment consists of promotional opportunities into functional areas and into general management within and outside of the IT field. This kind of career transition is heavily reliant on the skills development an individual has experienced. Career transition usually requires that a career management dimension be added to an individual's career experience.

Reich and Kaarst-Brown (1999:338) identified two major benefits associated with movement from IT to non-IT career paths as: 1) Career extensions for IT professionals, and 2) Increased knowledge of IT in the line. They investigated four areas of characteristics that influence a career transition. The areas and their characteristics are found below in Table 5.2. Perhaps the most important aspect of these characteristics is the level of detail that needs to be considered during transitions.

Transition related area		**Characteristics**
1)	Organisational Characteristics	a) Corporate practices in support of internal mobility, b) Relationships between IT department and the business units, c) Status differences between IT and business units, d) Desirability of IT skills/knowledge in business units, and e) Formal transfer programs or champions for IT to business unit transfers
2)	Characteristics specific to the individuals who transitioned from IT to non-IT jobs	a) Career expectations and motivations, b) Affiliations with the IT profession, c) Dissatisfaction with the IT job, and d) Preparation for a move out of IT

3)	Characteristics specific to the first non-IT job	a) Tangible benefits provided by the first Non-IT job, b) Existing IT skills used in first non-IT job, and c) Perceived risks of the first non-IT job
4)	Characteristics specific to the Transition itself	a) Adjustment periods and initial loss of productivity and b) Supportive role of mentors and friends during transition

Table 5-2: Transition Characteristics

(Reich and Kaarst-Brown, 1999:343)

Reich and Kaarst-Brown (1999:356) realized that these characteristics resulted in two major implications for the IT professional: 1) if there is little opportunity to learn business skills seek them through additional education, and 2) develop a better understanding of where your skills and interests fit best. Their research found that an IT professional will experience an initial loss of productivity in the new position. This requires friends and mentors to play a supportive role through this adjustment period in order for the transition to be made successfully. Career management must ensure these supportive roles are present in either a formal or informal program.

Multiple career path planning must be prepared to deal with the increasing number of IT professionals making the transition into different functional areas. Career management must be geared towards supporting individuals making the transition as it allows the organisation to retain experienced individuals who are able to communicate between the business units and IT.

5.5.2 Career Management Planning Tools

The perceived equity between multiple career paths is fundamental to the success of such a system. Ridings and Eder (1999:11) found that the availability of career planning tools between the technical and managerial career paths was not perceived to be equitable. This perception resulted in decreased job satisfaction for technical employees. Of the four equity factors examined by Ridings and Eder (1999), career

planning tool availability was found to be the only major source of perceived inequity between career paths. IT career management needs to understand what the individual and organisational needs are in order to make sure they match. Career planning tools are designed to help employees and management assess an individual's career interests, preferences, strengths and weaknesses. Provision of this knowledge and the tools used to capture the knowledge is vital to a successful career management system.

Career planning tools may include interviews, workshops, self assessment exercises, and software. The British Computer Society has produced and supports a number of software packages aimed at aiding career management in order to further professional development. Examples of these career planning tools are examined below.

Career Development Framework (CDF), is a part of the Information Technology Quality at Work (ITQW) package. The purpose of CDF is to support an existing career management system through the application of structured and objective quality control to the training and development of individuals. The standards are applied to specific positions that encompass a level of responsibility and technical expertise. The standards state the entry level experience required are, task competence level and knowledge, and skills and training requirements (British Computer Society, 2003).

Professional Development Scheme (PDS) was introduced to provide a "valuable management tool for applying quality control to the practical experience and training of individuals making a career in Information Systems" (British Computer Society, 2003). Like the CDF it is designed to enhance an existing career management system, not replace it. The PDS contains four essential elements:

1) External performance standards
2) Individual Career Development Plans (CDPs)
3) Validation
4) Professional Log Books

(British Computer Society, 2003)

Professional Development Portfolio (PDP), consist of in-house courses designed to promote key personnel and provide financial and business skills to IT professionals

with a technical background (British Computer Society, 2003).

Career planning tools are essential to a successful career management system. They allow an individual's career anchors to be ascertained and provide opportunities to gain standardised accredited skills that can be used throughout the organisation and profession. The British Computer Society is dedicated to supporting career development. Their understanding of the importance of career planning tools allows them to achieve this career development though the provision of career planning tools. "The British Computer Society is continuously reviewing, setting, maintaining and supporting the standards for all aspects of the training and development of IT practitioners. The BCS is committed to raising skill levels throughout the IT industry" (British Computer Society, 2003). This is best achieved through contributing career planning tools to the efforts of career management systems.

5.6 Conclusion

An individual moves along a career path in a number of different ways including: Vertical, Radial, Circumferential, Linear, Spiral, Expert, and Transitory. These different movement types are modelled into career path models such as: Pyramid model, Dual path model, and multiple career path models. Knowledge of these career path models can be combined with an understanding of the career variables: Plateauing, Satisfaction, and Turnover intentions. This combined understanding and knowledge can lead to effective career management. Career management is able to implement corrective actions such as: skills development, implementing a multiple career path system, and job type management. These corrective actions are supported by career management planning tools and are aimed at achieving compatible career dynamics. Career management may be practiced by the organisation, the individual, or a combination of the two. A summarisation of this Chapter is presented diagrammatically in Figure 5.4.

Chapters 2, 3, 4, and *5* have examined the various factors surrounding career dynamics and career variables. *Chapter 6* combines these factors into a model for EITCM.

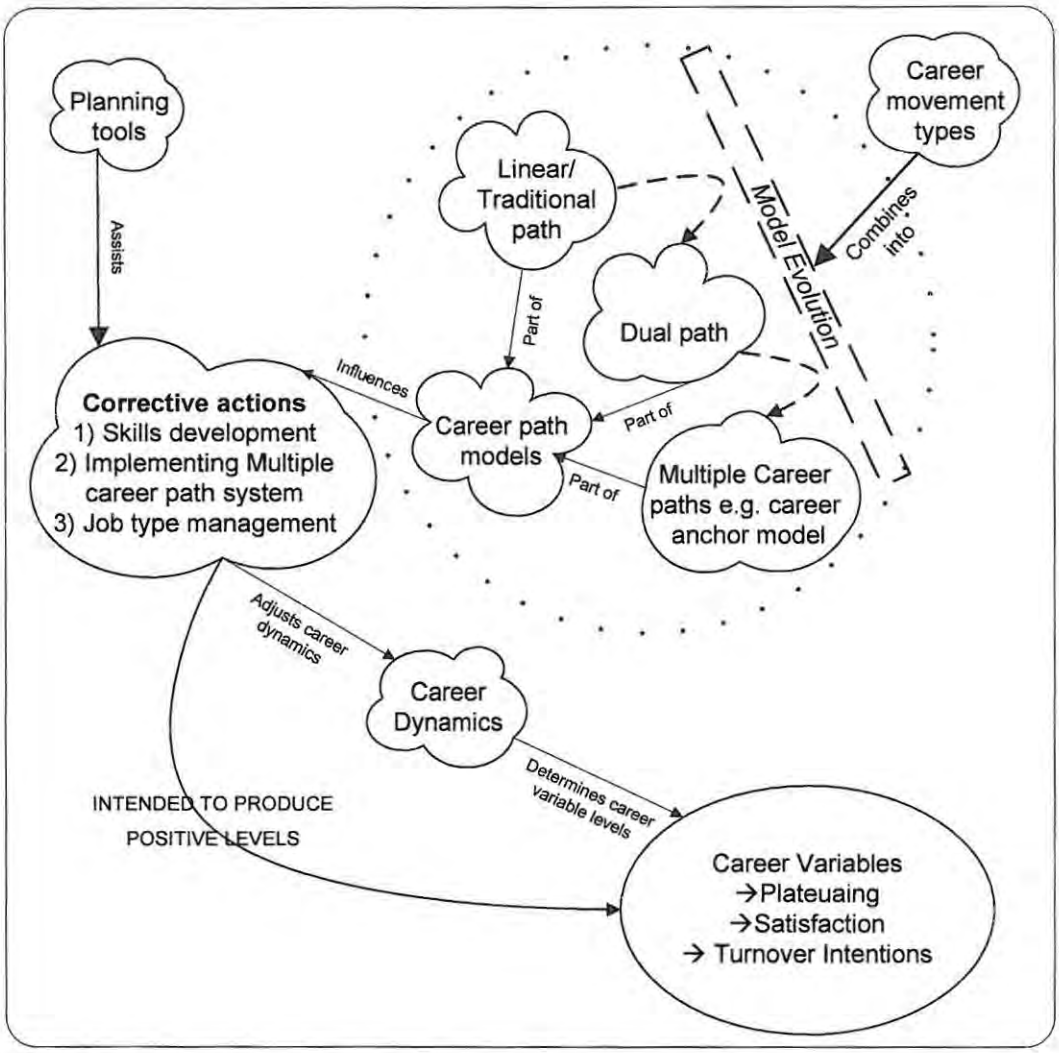

Figure 5-4: Career management

Chapter 6 Model for Effective IT Career Management

6.1 Introduction

Chapters two, three, four, and five reviewed literature surrounding the career of an IT professional. The knowledge and ideas drawn from the literature are combined and presented as a theoretical model for EITCM. The theoretical model will be tested by means of an empirical study detailed in *Chapter seven*. The model is aimed at creating an awareness of IT careers and providing IT career management with a tool that accounts for the various factors influencing an individual's career dynamics. The purpose of this Chapter is to present how the author combined the information gathered from the literature into components and produced a model designed to assist IT career management.

The factors affecting an IT professional's career are combined into three groups of factors. Each group of influencing factors is a component of the model for EITCM. These are discussed under the following sections: *Section 6.2.1* Individual factors, *Section 6.2.2* Organisational factors, and *6.2.3* Dependent factors. The influence of these components can be measured through the career dynamics component (examined in *Section 6.2.4)*. The final component of the model for effective career management is discussed in *Section 6.2.5* Career management. Once the components are identified *Section 6.3* presents the complete model for EITCM shown in Figure 6.5. The EITCM model is designed to emphasize areas that must be considered and to provide an understanding of how they interact. *Section 6.4* identifies the CSFs of the model that must be tested to ascertain the accuracy and usefulness of the model.

The EITCM model represents the concept that individual factors, organisational factors, and dependent factors interact dynamically, known as career dynamics. The success of an individual's career dynamics is determined by the compatibility of the factors involved. This compatibility can be measured through the levels of an individual's career variables. If career variable levels are good then career dynamics are compatible and career management has been effective. However, if career

variable levels are poor then career dynamics are incompatible and career management needs to intervene through corrective actions. Corrective actions are intended to increase the compatibility of career influencing factors and create positive levels of career variables thus giving rise to effective career management.

6.2 Components of the Model

6.2.1 Individual Factors

An IT professional has a core set of needs and motives that combine with their basic values, attitude, self perceived talent, and abilities to give rise to their career anchors. *Chapter 2* examined career anchors and how they influence an individual's career decision. Career anchors guide and influence career decisions that an individual may take such as accepting a promotion or leaving a company. Individuals are guided by one or more of the following nine career anchors:

1) Security/Stability
    a. Geographical
    b. Organisational
2) Autonomy/Independence
3) Managerial
4) Technical
5) Entrepreneurial
6) Sense of service/dedication
7) Pure challenge
8) Life style integration

(Schein 1987)

Each of the career anchors are associated with a common set of motives, needs, values, attitudes, self perceived talents, and abilities that individuals with a given career anchor will possess.

Individual factors form a part of the EITCM model as they influence the career outlook an individual may have or career decisions they may take. Career decisions

and a career outlook are part of an individual's career dynamics. It is through interaction with the other two factors that the individual factors influence the levels of career variables. Individual factors need to be accounted for and identified by career management if it is to be effective. Figure 6.1 below diagrammatically represents the individual component of the EITCM model.

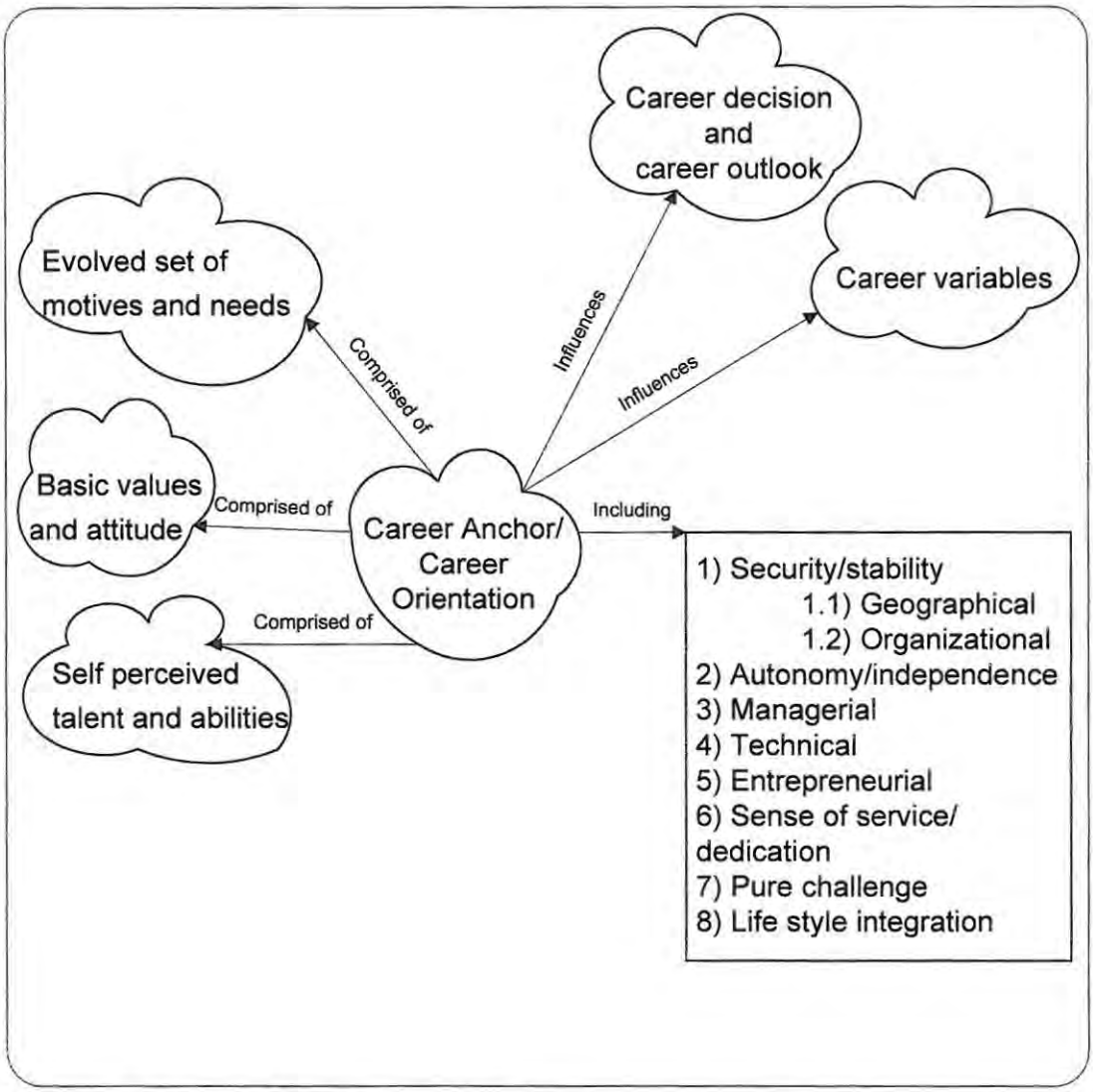

Figure 6-1: Individual Factors Component

6.2.2 Organisational Factors

A successful career requires a balance between the wants and needs of the individual and those of the organisation. A comprehensive model of career management must account for the organisational factors that are an integral part of career dynamics. Organisational factors are most accurately reflected by the various job types and the

characteristics they represent. All job types encompass a number of job characteristics. It is the nature of these characteristics that varies from job type to job type. *Chapter 3* examined job type characteristics and how they influence an individual's career dynamics. The organisational factors component of the EITCM model identified thirteen job characteristics that were extracted from the literature reviewed. The job characteristics are:

1) Autonomy
2) Skill variety
3) Task identity
4) Task significance
5) Feedback from the job
6) Feedback from agents
7) Dealing with others
8) Job titles
9) Changes in working conditions
10) Promotional opportunities
11) Salary status (compensation and benefits)
12) Opportunities for recognition
13) Training and development opportunities

To effectively examine the effect of job characteristics through job type it was necessary to categorise the large number of job types present in the IT function. For the EITCM model job types were categorised into seven categories with examples. Using job type to represent organisational factors allows for the interactions with the other factors to be observed. The job types selected are:

1) **End User Computing** e.g. Product trainer, Installation and support technician.
2) **Systems Analysis** e.g. Business Information Analyst, and Systems Analyst.
3) **Software Systems Development** e.g. Software Engineer, and Application Programmer.
4) **Systems Management** e.g. Database Administrator, Systems Programmer, and Computer operations.
5) **Networks** e.g. LAN architect, LAN Supervisor, LAN Administrator, WAN Architect, Email Specialist, Internet Engineer, and Web Page Developer.

6) **Consultant** e.g. Business Consultant, and Technical Consultant.

7) **Management** e.g. CIO, and Line Manager.
(Faasen, 1998)

An individual develops certain expectations of their careers. These expectations are influenced by their career outlook and change as an individual passes through the various career stages. Organisational factors then interact with the individual's career expectations by meeting or failing to meet them. The result of this dynamic interaction with an individual's career expectations affects the individual's career variables levels. A model for EITCM must account for organisational factors. The author decided on using job type to represent organisational factors after thoroughly exploring other alternatives suggested by literature as it most fully represents the organisational factors and the categorisations allow for the model to be effectively tested. Figure 6.2 below diagrammatically represents the organisational component of the EITCM model.

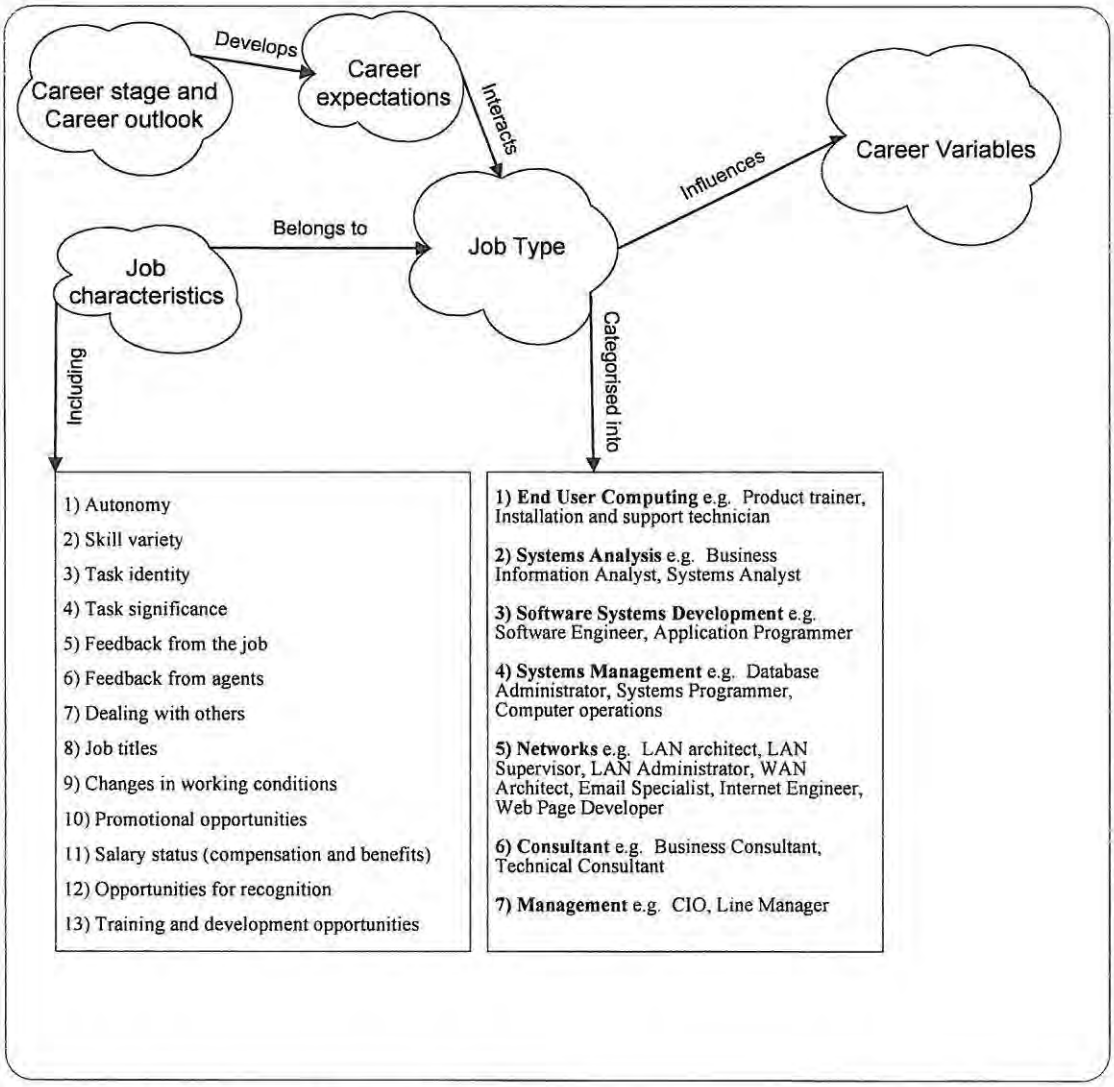

Figure 6-2: Organisational Factors Component

6.2.3 Dependent Factors

The dependent factors incorporated into the model for EITCM share a two way relationship with both the individual and the organisation. The dependent factors in an IT professional's career are the skills portfolio that they possess and the organisation requires. Both the individual and the organisation influence the type of skills that an IT professional develops. Skills development is done in a number of ways and in an ideal situation is carried out by both the individual and the organisation. To observe the dynamic interaction of an individual's skills portfolio it was necessary to categorise the vast array of possible IT skills. The author decided on a scheme of five categorisations with examples. *Chapter 4* examined skills portfolios categorisations and their influence on an individual's career dynamics.

1) **Business Fundamentals:** Business Models, Functional business areas, and Evaluation of business performance.
2) **Analytical and Critical thinking:** Organizational problem solving, Ethics and Professionalism, and Creativity.
3) **Interpersonal, Communication, Team skills:** Interpersonal team, Work and leadership, and Communication.
4) **Technology:** Application Development, Internet systems architecture and development, Database design and administration, and Systems infrastructure and integration.
5) **Technology enabled business development:** Systems Analysis and design, Business Process Design, Systems Implementation, and IT Project Management.

The Skills portfolio has a major influence on the direction in which an individual's career may move. The type of skills an individual possesses has a large impact on the job type and organisation for which they are suitable. Similarly an organisation and the job type will attract individuals who wish to develop the associated skills. The development of certain skills will allow an individual to move into functional areas more suited to their wants and needs. The development of certain skills is also associated with the ability to move into management and extend an individual's career. Individuals are given a number of development avenues of which the most important is engaging in updating behaviours. Updating behaviours expand an individual's skills portfolio and may allow them to move to areas previously unattainable, this is known as boundary spanning. Figure 6.3 below diagrammatically represents the dependent component of the EITCM model.

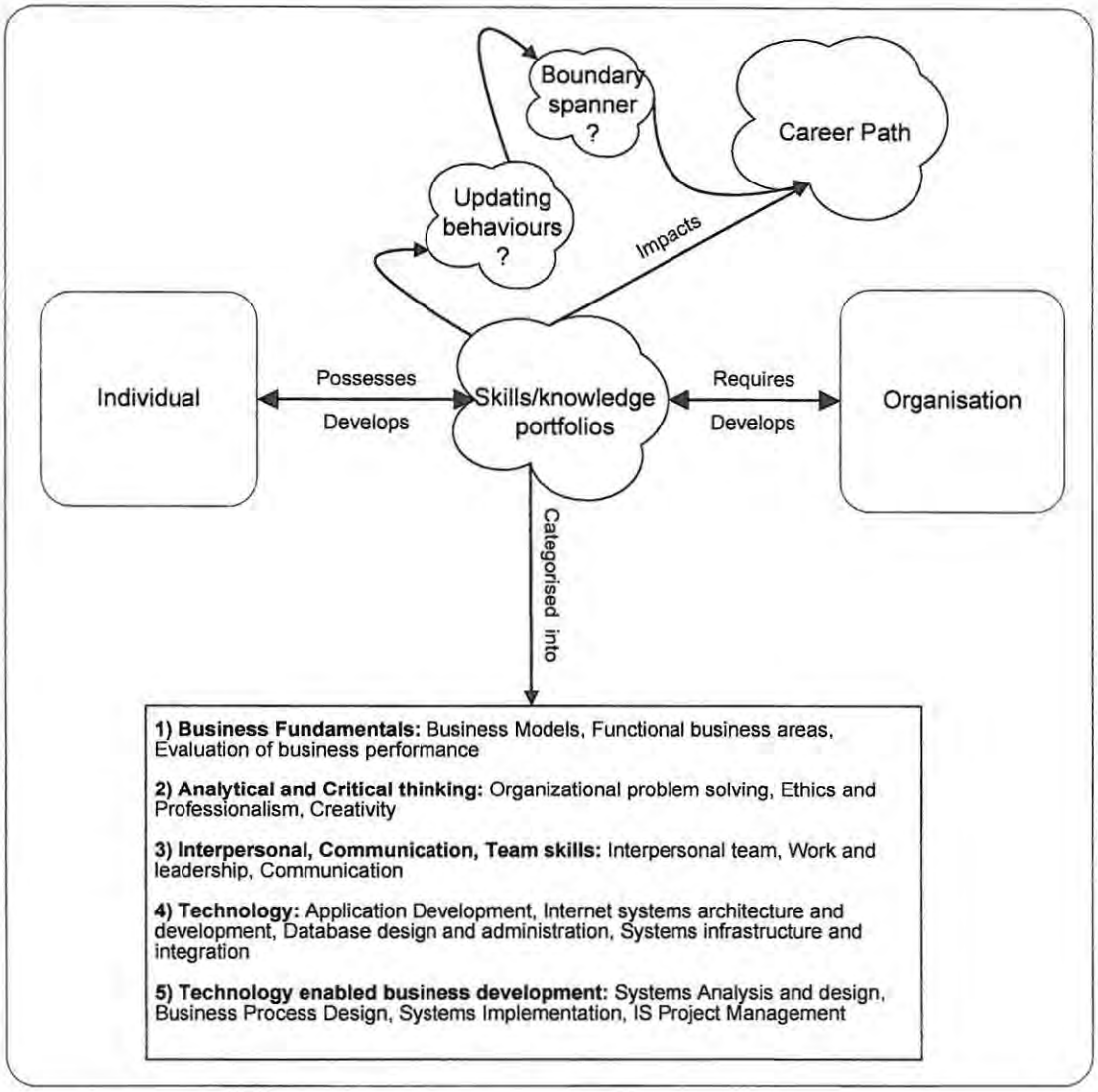

Figure 6-3: Dependent Factors Component

6.2.4 Career Dynamics and Career Variables

The three components discussed up to this point, individual factors, organisational factors, and dependent factors all interact in a dynamic manner. It is this interaction known as career dynamics that determines whether a career is doing well. Career dynamics and career variables were examined in *Chapter 5*. The success of the career is based on the compatibility of the factors involved. In order to determine how compatible the factors are an individual's career variables are measured. Good levels of career variables reflect a match between the factors involved and poor levels reflect a mismatch.

The career variables measured by the EITCM model were selected by the author after

extracting the most prominent and relevant variables from existing literature. They include:

1) Job satisfaction
2) Career satisfaction
3) Turnover intentions
4) Professional plateau
5) Career Plateau

When an individual is experiencing compatible career dynamics they will exhibit positive career variables such as high job and career satisfaction, high plateauing, and low turnover intentions. It is the role of career dynamics and career variables to provide feedback on the effectiveness of career management hence its inclusion in the EITCM model.

Individuals with incompatible career dynamics will exhibit negative career variables and it is at this point that the final component of the EITCM model fits in. *Section 6.2.5* examines career management.

6.2.5 Career Management

Chapter 5 examined career management. The purpose behind career management is to either initiate actions that will start a career off with compatible career dynamics or to initiate corrective actions when the career dynamics are incompatible. Career management is not restricted to actions initiated by organisational management but may also include actions by: 1) An individual monitoring their own career, 2) An outside party who was hired or chose to take responsibility, and 3) The most common is a combination of the organisation and the individual.

Career management is based on manipulation of the dynamic interacting factors in order to achieve compatibility. Part of career management stems from the various career movements available to an individual. These movements were placed into career path models that allow career management to predict and direct the direction in which a career should travel. Like any management activity career management requires planning. To assist this planning process tools are available that are

predominately aimed at identifying the motivational character of an individual. Career management can employ a combination of corrective action alternatives. The author took a large number of career management activities suggested in literature and combined them into a list of three main corrective actions:

1) Skills development
2) Implementing multiple career path systems
3) Job type management

It is the purpose of these corrective actions to adjust the career dynamics in the hopes of producing positive levels of career variables. Figure 6.4 diagrammatically represents the career management component of the EITCM model.

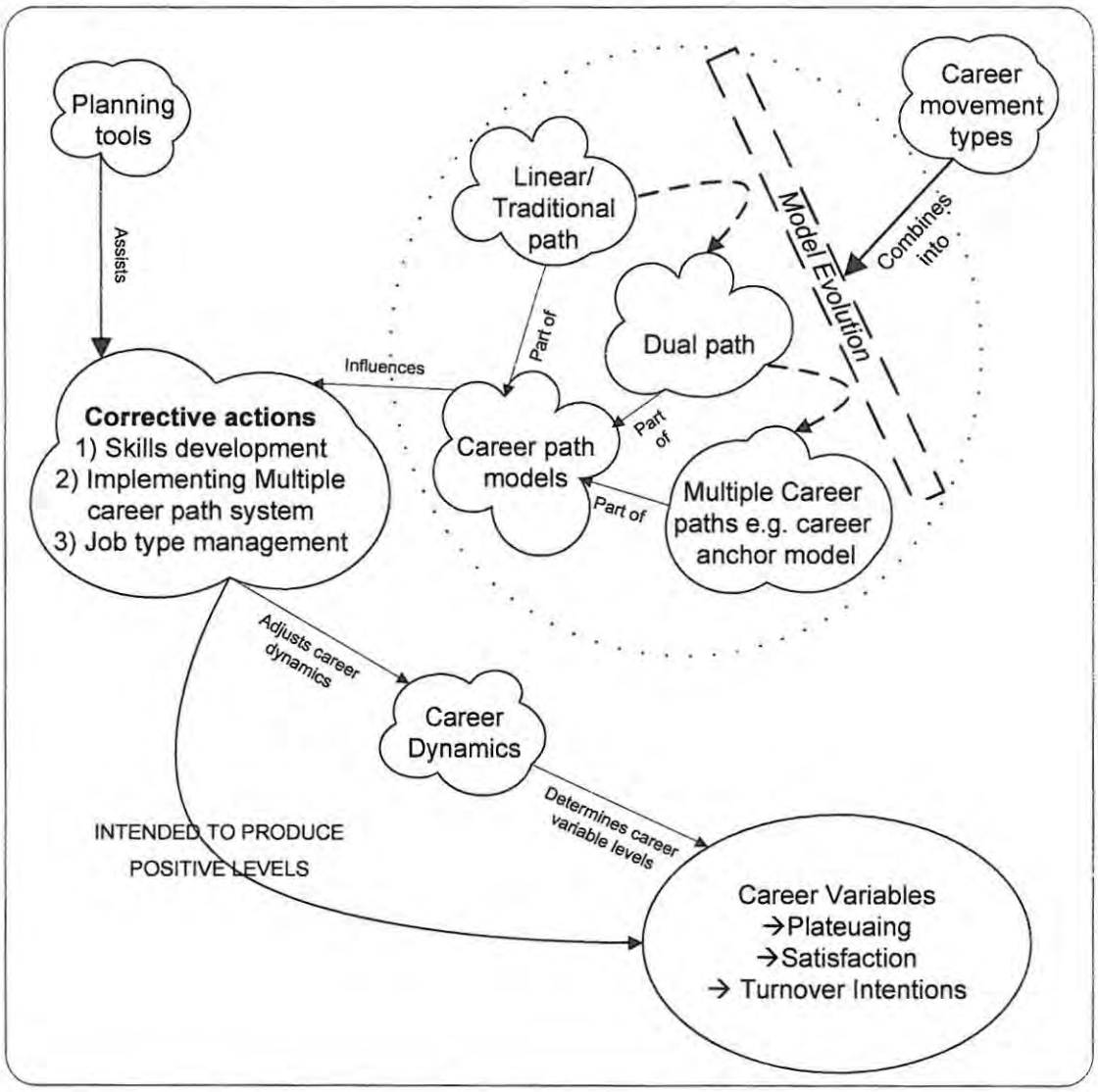

Figure 6-4: Career Management Component

6.3 The Model for Effective IT Career Management

There are five major components that belong to the EITCM model: 1) Individual component, organisational component, dependent component, career management component, and the career dynamics component. These components interact with each other in a dynamic manner. *Section 6.2* individually examined these. Figure 6.5 shows the complete model for EITCM, the following discussion is based on the dynamic interactions of the components.

The individual component (bottom left bubble of the EITCM model shown in Figure 6.5) represents the individual factors that influence an IT professional's career. The individual component has a two way interaction with the dependent component (bottom middle bubble of the EITCM model shown in Figure 6.5) that represents an IT professional's skills portfolio. The individual component possesses those skills represented by the dependent component and also influences the way in which those skills develop. An individual's career anchors and outlook will influence the skills they would like to possess in the future. For example an individual with a dominant technical career anchor will be inclined to develop technical skills. This is discussed in detail in *Chapter 2*.

The dependent component also has a two way interaction with the organisational component (bottom right bubble of the EITCM model shown in Figure 6.5) that represents organisational factors. The organisational component consists of job types and their characteristics. A job type requires certain types of skills and also provides an opportunity to develop those skills. The organisational component can provide a number of avenues through which skills can be gained or developed as discussed in *Chapter 3.*

The individual and organisational components also interact with each other. This dynamic interaction influences (dynamic interactions arrows seen in the EITCM model shown in Figure 6.5) the career dynamics component (middle bubble of the EITCM model shown in Figure 6.5). Individuals are constantly changing their attitudes and perceptions of 'the perfect' job type they desire. This change or adaptation is a result of experiences with various job types they have occupied along

their career path. This adaptation is expressed through their career decisions and career outlook. Similarly the organisational factors will adapt and change the characteristics it provides as the individual's and the work they perform change. If these changes and adaptations are compatible then this will be reflected in the career dynamics component.

The career dynamics component tests the compatibility of the individual, dependent, and organisational components. Compatibility is determined by the levels of career variables. Compatible components are represented by high plateauing, high job satisfaction, high career satisfaction, and low turnover intentions. If these career variables are present then the EITCM model proposes that effective career management has taken place (top left bubble of the EITCM model shown in Figure 6.5). If the components are incompatible then there is need to consult the career management component (top right bubble of the EITCM model shown in Figure 6.5). The career management component uses knowledge of influencing factors, career movements, and career path models to implement corrective actions. The corrective actions will alter one or more of the individual, organisational, and dependent components. Following alteration of the influencing factors career dynamics compatibility will be re-determined and if career management was successful the effective career management will be reflected in the levels of career variables.

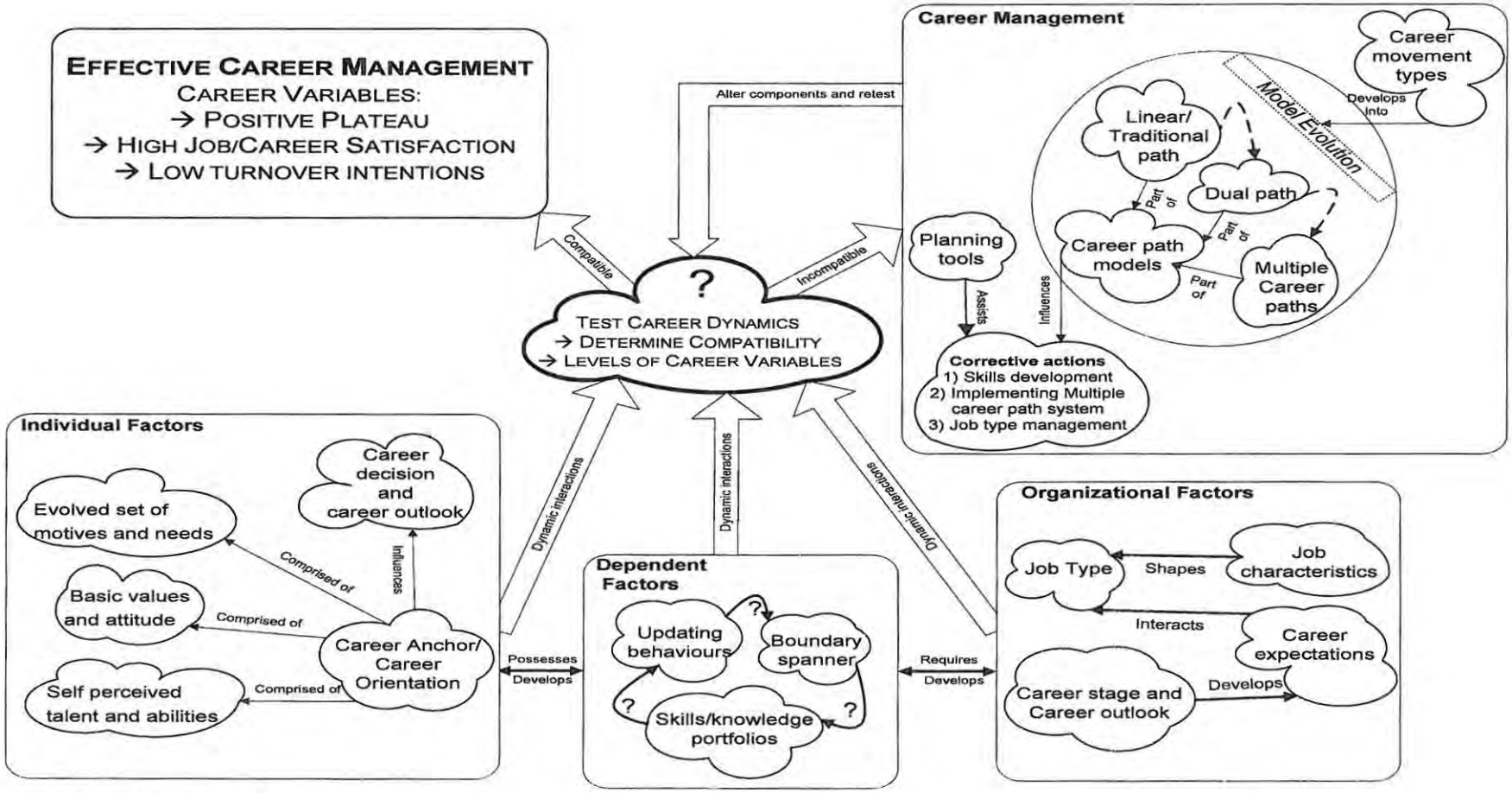

Figure 6-5: Model for EITCM

6.4 Critical Success Factors (CSFs)

The EITCM model is composed of a number of interacting components that were identified and discussed in the previous *Sections 6.2 and 6.3*. Certain aspects of the models components and the way in which they interact can be observed. Of these observable aspects there are some that are critical to the overall success of the model. These are known as CSFs and are imperative to the achievement of effective career management of an IT professional's career. CSFs of the EITCM model are factors that must be present or carried out correctly in order to produce effective career management. This does not suggest that there are no other factors necessary for a successful IT career. However, the CSFs are those factors that must be present within career management to ensure success. The author has identified the following CSFs for the EITCM model:

1) It is critical that IT professionals experience some form of career guidance or management in order to experience:
   - High job satisfaction.
   - High career satisfaction.
2) It is critical that IT professionals experience some form of career guidance or management in order to experience:
   - Low turnover intentions.
3) It is critical that IT professionals experience some form of career guidance or management in order to experience:
   - High career plateauing.
   - High professional plateauing.
4) It is critical to account for an IT professionals skills portfolio in order to attain:
   - Compatible career dynamics.
5) It is critical to account for an IT professionals job type in order to attain:
   - Compatible career dynamics
6) It is critical to account for an IT professionals career anchors in order to attain:
   - Compatible career dynamics.

7) It is critical that IT professionals with different career anchors are provided with a multiple career path that offers them the opportunity to make a transition out of the core IT area.

The seven CSFs above represent areas and relationships in the EITCM model that affect whether an IT professional's career will be managed effectively or not. CSFs 1, 2, and 3 relate to the author's suggestion that an individual's career must receive some form of management or guidance to result in suitable levels of career variables. CSFs 4, 5, and 6 represent the need to account for the individual factors, the dependent factors, and the organisational factors to result in suitable levels of career variables. CSF 7 represents the need to provide career paths that suit the needs of individuals with various career anchors.

6.5 Conclusion

This Chapter has examined the components of the EITCM model and how they fit into the model. Three major factors were identified as components: 1) those relating directly to the individual, 2) those relating directly to the organisation, and 3) those dependent on both. These three factors interact dynamically with each other to produce another component of the model, career dynamics. It is the career dynamics component that relies on an individual's levels of career variables to determine how compatible that individual's dynamically interacting factors are. It is in trying to achieve this compatibility that the final component is introduced, career management. Career management represents the efforts and avenues available to create compatible career dynamics.

Once the EITCM was complete seven factors that were crucial to its success were identified. CSFs for any model are ones theorised by the author and need to be empirically tested to ensure their validity and that of the model. In this case the CSFs are tested by means of an online questionnaire examined in *Chapter 7*.

Chapter 7 Design of the Empirical Study

7.1 Introduction

In order to test the theoretical model proposed in *Chapter 6* it was necessary to conduct an empirical study. An empirical study requires careful planning and design to ensure that the results effectively test the model. This Chapter describes the design of the empirical study that was used to test the EITCM model.

The EITCM model is tested by statistically examining the seven CSFs identified in the previous Chapter. This Chapter begins by converting the CSFs into the relevant hypotheses in *Section 7.2*. *Section 7.3* considers the research methodology including the pilot study that was conducted, the respondents targeted, the collaboration that took place, and details of questions included in the survey instrument (found in Appendix B).

The CSFs were converted into seven hypotheses that were each matched with a null hypothesis for testing. The validity of the hypothesis was tested using an online questionnaire with a quantitative focus. A pilot study was conducted. The final online questionnaire was then launched in conjunction with Hilary Speight from the University of Cape Town. The sample was restricted to members of the Computer Society of South Africa (CSSA). The questionnaire was primarily designed to gather data that would test the hypotheses. The questionnaire also captured descriptive statistics of the respondents.

7.2 Hypothesis

The CSFs identified in *Chapter 6* are those factors that are imperative to the overall success of the EITCM model. Therefore to test the validity of the model the empirical study was primarily aimed at gathering data that would test the seven hypotheses that were derived from the CSFs. Hypotheses 1, 2, and 3 examine the relationship between the IT professionals' career management experiences and their career variables. Hypotheses 4, 5, and 6 examine the interaction between the IT

professionals' career variables and the individual, organisational, and dependent components of the model. These three hypotheses show whether there is a significant relationship between the components and career dynamics. Hypothesis 7 is aimed at determining whether there is a significant relationship between the IT professionals' career anchors and their perception of the need or benefit in transitioning out of the core IT area. Transition out of IT is a key aspect linked to multiple career paths. Knowledge of an individual's feelings towards transition and identifying their career anchors would allow this hypothesis to gather evidence that would support the need for a multiple carer path.

The hypotheses are listed below along with their null hypothesis. Together the null and the alternative should constitute mutually exclusive and collectively exhaustive descriptions of all possible situations in the population relating to the variable under scrutiny.

1) $H0_1$=IT professionals who have experienced career path management will experience no effect on their job or career satisfaction.
   $H1_1$=IT professionals who have experienced career path management will have higher job and or higher career satisfaction.

2) $H0_2$=IT professionals who have experienced career path management will experience no effect on their turnover intentions.
   $H1_2$=IT professionals who have experienced career path management will have lower turnover intentions.

3) $H0_3$=IT professionals who have experienced career path management will experience no effect on their career or professional plateauing.
   $H1_3$=IT professionals who have experienced career path management will have high career and or professional plateauing.

4) $H0_5$= There is no mean difference between the career variables of IT professionals with different current skills portfolios.
   $H1_5$= There is a mean difference between the career variables of IT

professionals with different current skills portfolios.

5) $H0_5$= There is no mean difference between the career variables of IT professionals with different current job types.
   $H1_5$= There is a mean difference between the career variables of IT professionals with different current job types.

6) $H0_6$=There is no significant relationship between an IT professional's career anchors and their career variables.
   $H1_6$=There is a significant relationship between an IT professional's career anchors and their career variables.

7) $H0_7$=There is no mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area.
   $H1_7$=There is a mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area.

7.3 Methodology

7.3.1 Pilot Study

An anonymous paper based pilot study consisting of 52 questions was conducted in the Rhodes University departments of Computer Science, Information Systems and the IT division. The pilot study was intended to assess and evaluate the design of the questionnaire. The pilot study included an extra question asking for feedback from respondents. Eleven responses were received and useful feedback obtained. The pilot study ensured the questions necessary to test the hypotheses were present and asked in the correct manner. The pilot study provided the author with some experience regarding data collection. This pilot study lead to adjustments such as: 1) refinement in the wording of questions, 2) changing of the response scales, 3) the addition of questions, and 4) the removal of questions.

7.3.2 Collaboration

Hilary Speight a Masters student in the Information Systems Department at the University of Cape Town (UCT) was involved in similar career related research with a working title "Antecedents of Personnel Turnover among IT professionals in South Africa". She was about to launch a study into IT personnel turnover at the same time as this empirical study into effective career management was to be launched. It was decided to conduct a joint survey to avoid overloading the target audience and risk reducing the response rate. The joint survey consisted of questions that were common to both pieces of research as well as questions specific to each of the authors. Table 7.1 below shows the distribution of questions between the two pieces of research.

Derek Tedder	Hilary Speight	Common
Questions 66-68 *(Career anchor experience)* Questions 94 and 95 *(Skills Portfolio)* Question 96 *(Job type)* Questions 97-103 *(Plateauing)* Questions 104-106 *(Transition)* Questions 107-110 *(Career management experiences)*	Questions 12, 13, 14, 16 *(Turnover intentions)* Questions 17-40 *(Attitudes towards organisation)* Questions 69-93 *(Job work characteristics)*	Questions 1-9 *(Career and job satisfaction)* Questions 10, 11, 15 *(Turnover intentions)* Questions 41-65 *(Career orientations inventory)* Questions i-x *(Background)*

Table 7-1: Joint Survey Question Distribution

The survey instrument discussed in *Section 7.3.4* examines the questions used by the research. The questions relevant to the research have been removed from the combined survey and can be found in Appendix B.

7.3.3 Respondents and Channel

After careful consideration the respondents selected were to be members of the CSSA. CSSA members were selected as:

- They represent a wide variety of organisations, positions, and industries.
- They are actively employed or associated with the IT field.
- Strict rules govern full membership: Must possess a computer related qualification and a minimum number of years experience (from three to eight, depending on qualification)
- Associate members must be employed or studying on a full time basis in the computer filed.
  (Igbaria, et al, 1995:325)

CSSA members were e-mailed details regarding the research and the location of the electronic questionnaire online. The email required members to visit the site and complete the questionnaire online or alternatively to request the questionnaire via email. The questionnaire was available online for a period of ten days.

7.3.4 The Survey Instrument

The survey instrument was hosted on an IS departmental server at UCT. It was designed and implemented in HTML and catered for various versions of Internet explorer and Netscape. The questionnaire was entitled "Turnover intentions and career paths of IT professionals in South Africa". An introduction to the questionnaire briefly explained the research, suggested an estimated time to complete it, and ensured the respondents of confidentiality. The respondent was then asked to indicate their willingness to participate of their freewill. If they indicated agreement they were allowed to continue, if they did not agree they were excluded from the survey. Preceding each section of questions were instructions clearly informing respondents on how to answer the various types of questions. The questions and their response types are discussed in the *Section 7.3.4.1 - 7.3.4.4* below. The exact layout of the questionnaire can be seen in Appendix B.

7.3.4.1 Career Variables

The first set of questions were aimed at determining the respondents career and job satisfaction. Questions 1-9 dealt with career and job satisfaction and were on a five point Likert scale from "Strongly agree to Strongly disagree". Questions 1-6 were related to career satisfaction and 7-9 related to job satisfaction. The questions were partly adapted from Lee (1999). From the questions listed in Table 7.2 below it was possible to determine the respondents career and job satisfaction levels.

1. I am satisfied with the success I have achieved in my career
2. I am satisfied with the progress I have made toward achieving my overall career goals
3. Overall, I would say that my personal needs have been met with my current career
4. I am satisfied with my rate of promotion during my career
5. I am satisfied with the pay level I have achieved during my career
6. I am satisfied with the status that I have achieved during my career
7. Generally speaking, I am very satisfied with my job
8. I frequently think of changing my job
9. I am generally satisfied with the kind of projects I work on in my job

Table 7-2: Career and Job Satisfaction Questions
(Lee:1999)

These questions were included to gather data that would test hypothesis 1, 4, 5, and 6.

The next set of questions were aimed at determining the respondents turnover intentions. Questions 10, 11, and 15 dealt with turnover intentions and were on a five point Likert scale from "Highly unlikely to Highly likely" and from "Never to Constantly", the scale used was dependent on the wording of the question. The questions were partly adapted from Lee (1999). From the questions listed in Table 7.3 below it was possible to determine the respondents turnover intentions.

10. How likely is it that you will actively look for a *different job* in the next year?
11. Do you intend to change the *organisation* with which you are now associated?
15. How frequently do you think of leaving *your organisation*?

Table 7-3: Turnover Intention Questions

(Lee:1999)

These questions were included to gather data that would test hypothesis 2, 4, 5, and 6.

Appendix B shows a further four questions associated with professional turnover intentions. These were specific to Speight's research but have been included in the Appendix B for the sake of completeness.

Questions 97-103 were aimed at determining the respondents career and professional plateau state. The career plateau questions (97-99) were on a five point Likert scale from "Strongly agree to Strongly disagree" and the professional plateau questions (100-103) were on a scale from "Very accurate to Very inaccurate". The questions were partly adapted from Lee (1999). From the questions listed in Table 7.4 below it was possible to determine the respondents state of career and professional plateau.

97. I believe that I am getting ahead in my organisation
98. I believe my promotion opportunities have been limited in my organisation
99. I think I have stayed at my current job for much too long
100. My job provides opportunities to learn skills that keep me up to date in my profession
101. My job is challenging
102. I am constantly learning new things in my job
103. I like the contents of my job

Table 7-4: Career and Professional Plateau Questions

(Lee:1999)

These questions were included to gather data that would test hypothesis 3, 4, 5, and 6.

7.3.5 Individual, Organisational, and Dependent Factors

Igbaria and Baroudis' (1993) short form measure of career orientations discussed in *Chapter 2* was placed in the questionnaire from question 41-65. The questions are designed to determine the respondents career anchors. Each of the nine career anchors had questions relating directly to them. These were randomly sorted and then tested using a five point Likert scale. The scale for questions 41-55 ranged from "Of no importance to Very important" and questions 56-65 ranged from "Not at all true to Completely true". From the questions listed in Table 7.5 below it was possible to determine the respondents career anchors.

41. The process of supervising, influencing, leading and controlling people at all levels is	54. Remaining in one geographical area rather than moving because of a promotion is ...
42. The chance to do things my own way and not be constrained by the rules of an organisation is ...	55. Being able to use my skills and talents in the service of an important cause is ...
43. An employer who will provide security through guaranteed work, benefits, a good retirement program, etc, is ...	56. The only real challenge in my career has been confronting and solving tough problems, no matter what they were in
44. Working on problems that are almost insoluble is ...	57. I am always on the lookout for ideas that would permit me to start and build my own enterprise
45. Remaining in my specialised area as opposed to being promoted out of my area of expertise is ...	58. It is more important for me to remain in my present geographic location than to receive a promotion or new job assignment in another location
46. To be in charge of a whole organisation is ...	59. A career is worthwhile only if it enables me to lead my life in my own way

47. A career that is free from organisational restrictions is ...	60. I will accept a management position only if it is in my area of expertise
48. An organisation that will give me long-run stability is ...	61. I do not want to be constrained by either an organisation or the business world
49. Using my skills to make the world a better place to live and work in is ...	62. I want a career in which I can be committed and devoted to an important cause
50. Developing a career that permits me to continue to pursue my own lifestyle is ...	63. I feel successful only if I am constantly challenged by a tough problem or a competitive situation
51. Building a new business enterprise is ...	64. Choosing or maintaining a certain lifestyle is more important than career success
52. Remaining in my area of expertise throughout my career is ...	65. I have always wanted to start and build up a business of my own
53. To rise to a high position in general management is ...	

Table 7-5: Short Form Measure of Career Orientations
(Igbaria and Baroudi, 1993:133)
These questions were included to gather data that would test hypothesis 6 and 7.

To test the organisational factor it was necessary to determine the respondents current and initial job types. The respondent was also asked if there was one other significant job type they would like to mention. For each of these job types the respondent was also asked to indicate the length of time they had spent within this job type. The job type categorisations were adapted from Faasen (1998) as discussed in *Chapter 3.* The respondent was presented with a table listing the categories and their examples. They were then asked to select the category that most aptly described their job type from a drop down list. The first job type question will be used for descriptive purposes. The current job type question was included to gather data that would test hypothesis 5.

To test the dependent factor the respondents was asked to select the skills categorisation that most accurately reflected their area of specialisation when initially

entering the IT profession and currently. The skills categorisations were adapted from the IS 2002 model curriculum and guideline as discussed in *Chapter 4.* The respondent was presented with a table listing the categories and their examples. They were then asked to select the category that most aptly described their skills area from a drop down list. The initial skills question is used for descriptive purposes. The current skills question was included to gather data that would test hypothesis 4.

7.3.5.1 Career Management Experience and Transition

In order to test hypothesis 1, 2, and 3 it was necessary to determine whether the respondent had any career management experiences. Question 108 is phrased in a Yes/No format and determines whether the respondent had experienced any career management. The experiences ranged from formal managerial advice to informal conversation with a third party. If the respondent had experienced any of the options they were deemed to have had career management experience. The decision to use a range of career management experiences stemmed from the need to include a variety of career management sources and types. This question not only gathered data to test three hypotheses but also gathered data that could be drilled down into to provide descriptive information on the various types of career management experiences. The simple design of the question allowed important career management information to be retrieved without confusing the respondent. A more complex question or range of questions may have resulted in conflicting data due to misinterpretations and misunderstandings. The question is in Table 7.6 below:

108. Have you ever experienced any of the following career path management or guidance?
a) Formal advice from an appointed mentor/manager
b) Formal advice from an HR councillor
c) Informal advice from an HR councillor
d) Advice as part of a recruitment program
e) Advice from an external source hired by your organisation or yourself
f) None at all

g) Other Please Specify

Table 7-6: Career Management Experiences Question

Hypothesis 7 was aimed at linking an individual's career anchor to their perception of transition which is a key aspect of a multiple career path. The questionnaire included questions 104-106 which determined whether respondents felt specialisation or transition was necessary and/or beneficially. The questions were framed in a Yes/No format and are listed in Table 7.7:

104. In your opinion does an IT professional need to specialise in order to have a successful career?
105. In your opinion will a transition to a non-core-IT job be beneficial to an IT professional?
106. In your opinion is it necessary to make a transition to a non-core-IT job in order to have a successful long-lasting career?

Table 7-7: Transition Questions

7.3.5.2 Descriptive Questions

This empirical study's primary aim was the gathering of data to test the hypotheses. The study's secondary aim was the collecting of descriptive data relating to the respondents. The questions designed to gather the descriptive data are detailed below.

The first set of descriptive questions was aimed at gathering respondents' background data. There were ten background questions referring to: 1) Province, 2) Gender, 3) Age group, 4)Race, 5) Highest level of education, 6) Current departmental area, 7) Level in the organisational hierarchy, 8) Duration in the IT field, 9) Duration in current organisation, and 10) Duration in current position. The background questions were formatted appropriately and can be found in Appendix B.

As stated in *Section 7.3.4.2* the respondents were asked to indicate their initial skills and first job type as well as their current circumstances. The current data was used to test the relevant hypothesis. The current data is also used as a comparison with the initial data for descriptive purposes.

The remaining descriptive questions were aimed at gathering data relating to how respondents ranked IT skills (question 95), respondents experience with career anchors (questions 66-68), the presence of formal career paths within the respondents organisation (question 107), the timeline in which the respondent last received career management (question 109), and whether it involved planning tools of any sort (question 110). The descriptive questions were selected as they provided a better picture of the respondent and their perceptions regarding various aspects of the EITCM model. The full descriptive questions can be found in Appendix B.

7.4 Conclusion

This Chapter provided a detailed description of the empirical study to be undertaken. The seven CSFs relating to the EITCM model were converted into seven hypotheses. The research methodology was then discussed. The empirical study began with a pilot study that provided feedback before the final survey was launched online. The survey was targeted at members of the CSSA who were e-mailed details of the research and were asked to fill in the questionnaire online. The questionnaire sat on a UCT server as this survey was a joint effort between the author and Hilary Speight of UCT.

The empirical study was primarily aimed at testing the hypotheses. To this end the questionnaire had sections of questions that gathered data that would test each of the hypotheses. The sections of questions related to career variables, individual factors, organisational factors, dependent factors, career management experiences, and transition out of the core IT area. The empirical study had a secondary aim of gathering descriptive data relating to the respondents and appropriate questions were included to achieve this.

Having designed and launched the empirical study successfully *Chapter 8* examines the results of the empirical study

Chapter 8 Results of the Empirical Study

8.1 Introduction

The seven hypotheses listed in *Section 7.2* were designed to test the EITCM model. The data required to test the hypotheses was extracted through an online questionnaire detailed in *Chapter 7.* This Chapter presents the statistical tests and results extracted from the survey. This Chapter will present the results of the empirical study. Discussion and recommendations of the results will be conducted in *Chapter 9*. The statistical results are presented in two groups: 1) Descriptive data, and 2) Results of the hypothesis tests.

Section 8.2 provides descriptive statistics relating to the demographics and background of the respondents. *Section 8.3* examines the seven hypotheses, the statistical tests applied to each of them, and the results. *Section 8.4* examines the descriptive statistics collected by the empirical study.

The majority of the 129 respondents were white males employed in the IS/IT department in the Gauteng province. The sample is considered a suitable reflection of the South African IT profession as reflected by Igbaria, et al (1995). This 1995 study was used for comparison of samples as it was conducted within the CSSA as was this survey. The CSSA is considered a suitable which reflection of the South African IT profession. One of four tests was applied to the 129 respondents' data in order to test the relevant hypothesis. The four tests included: 1) Correlation Tests, 2) One-way ANOVA, 3) t-test, and 4) Crosstabulation. Finally, a comprehensive compilation of descriptive statistics is presented in the form of graphs.

8.2 Demographics

The online questionnaire received a favourable response rate. 129 utilisable responses were received over the ten day period that the questionnaire was available online and via email. The respondents' background and demographic data is presented below in order to outline the sample. Figures 8.1 to 8.10 depict the demographic and background information captured by the survey.

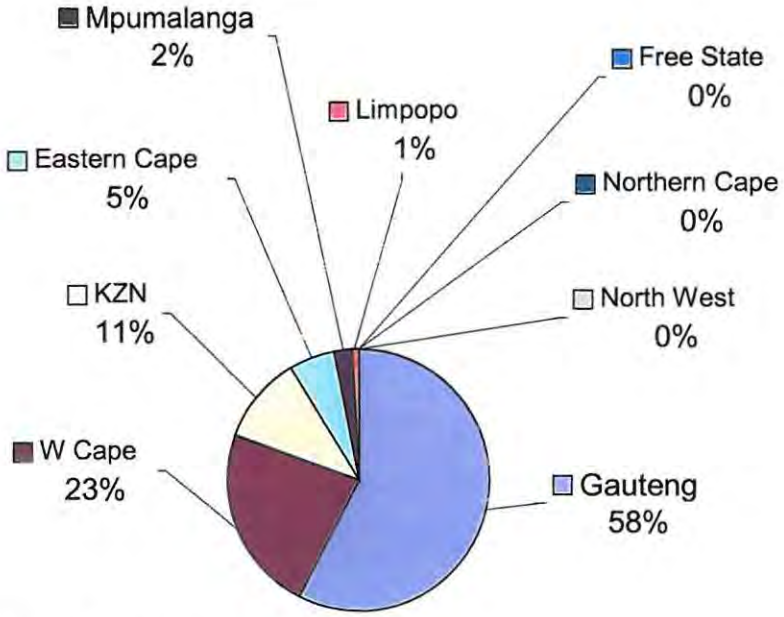

Figure 8-1: Respondents by Province

Figure 8.1 shows that of the 129 respondents, 58% come from Gauteng, 23% from the Western Cape, 11% from Kwazulu Natal, 5% from the Eastern Cape, 2% from Mpumalanga, and 1% from the Limpopo province.

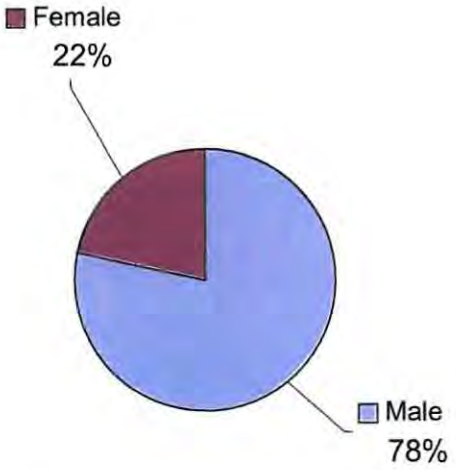

Figure 8-2: Respondents by Gender

Figure 8.2 shows that of the 129 respondents, 78% are male, and 22% are female. This gender distribution is considered a broad reflection of the South African IT profession as reflected by Igbaria, et al (1995:327) in their study of career orientations of Information Systems employees in South Africa.

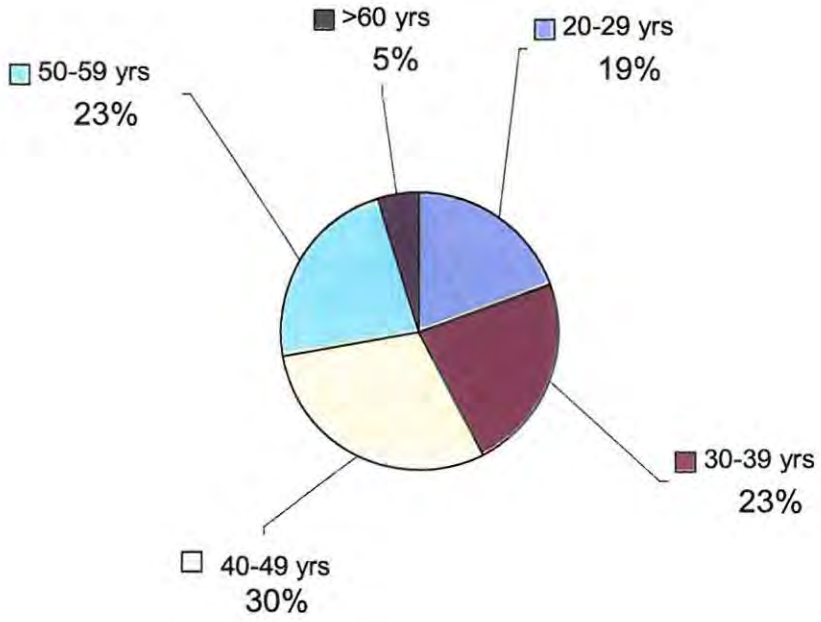

Figure 8-3: Respondents by Age

Figure 8.3 shows that of the 129 respondents, 30% are between 40 and 49 years of age, 23% between 30 and 39 years of age, 23% between 50 and 59 years of age, 19% between 20 and 29 years of age, and 5% are 60 years or older. This age distribution is considered a broad reflection of the South African IT profession as reflected by Igbaria, et al (1995:327) in their study of career orientations of Information Systems employees in South Africa.

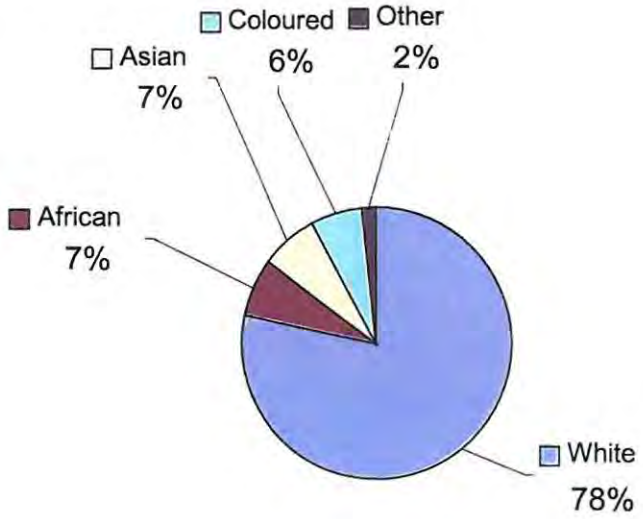

Figure 8-4: Respondents by Race

Figure 8.4 shows that of the 129 respondents, 78% are White, 7% African, 7% Asian, 6% Coloured, and 2% are other. The 2% listed as other consists of respondents who confused nationality with race. This distribution is expected to rapidly change with a decline in white professionals and an increase in African, Asian, and Coloured professionals through employment equity efforts.

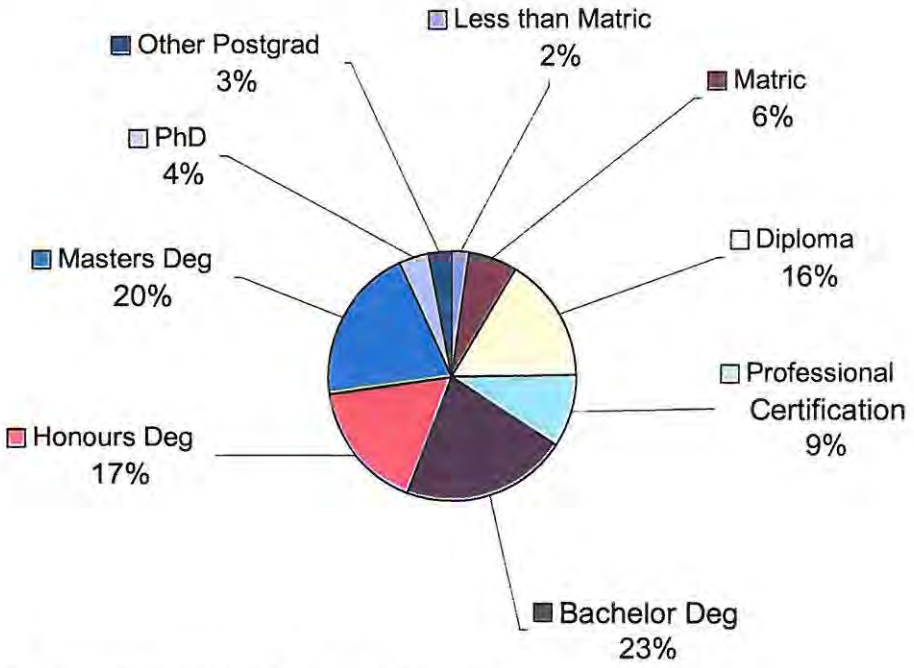

Figure 8-5: Respondents by Level of Highest Education

Figure 8.5 shows that of the 129 respondents, 23% possess a Bachelor degree, 20% a Masters degree, 17% an Honours degree, 16% a Diploma, 9% a Professional certification, 6% completed Matric, 4% possess a PhD, 3% possess some other postgraduate qualification, and 2% had an education less than Matric. This educational distribution is considered a broad reflection of the South African IT profession as reflected by Igbaria, et al (1995:327) in their study of career orientations of Information Systems employees in South Africa.

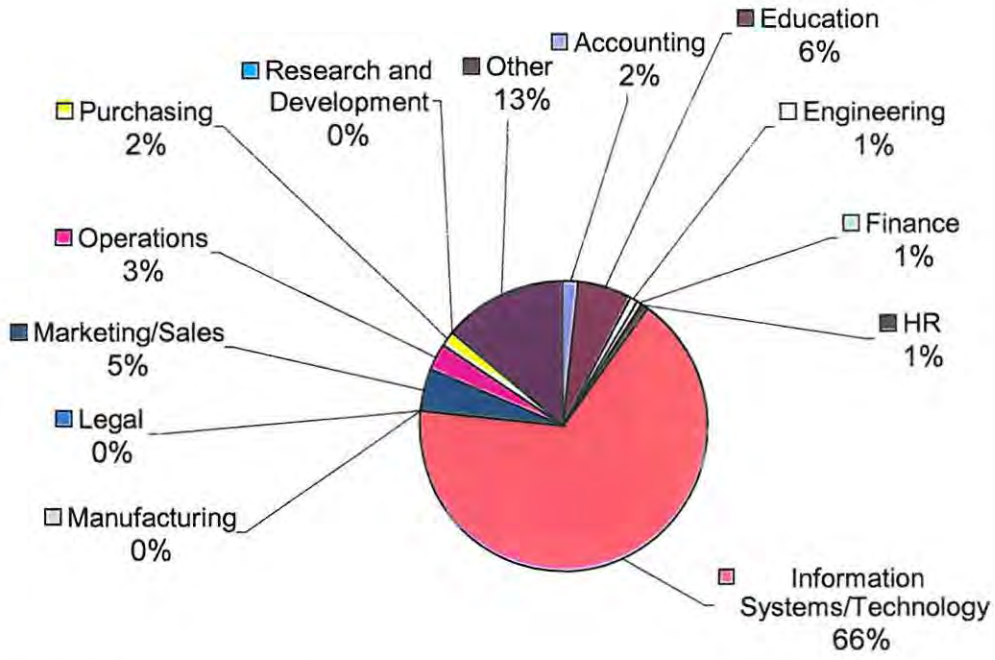

Figure 8-6: Respondents by Departmental Area

Figure 8.6 shows that of the 129 respondents, 66% are part of the Information Systems/technology department, 13% are part of a department not listed in the questionnaire, 6% are in Education, 5% in Marketing/Sales, 3% in Operations, 2% in Purchasing, 2% in accounting, and 1% in each of Human Resources, Finance, and Engineering. This departmental distribution was skewed in the direction of the Information Systems/Technology department as would be expected from an investigation of IT professionals.

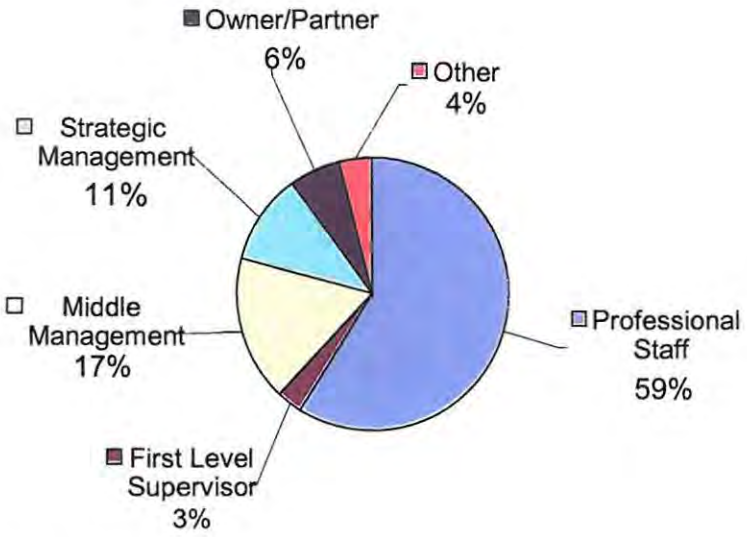

Figure 8-7: Respondents by Organisational Level

Figure 8.7 shows that of the 129 respondents, 59% are professional staff, 17% Middle management, 11% Strategic management, 6% Owner/Partners, 3% First level supervisors, and 4% are at other organisational levels. This organisational level distribution is not reflected in Igbaria, et al (1995:327) study of career orientations of Information Systems employees in South Africa. The number of professional staff within the IT profession has grown with the number of managerial positions declining.

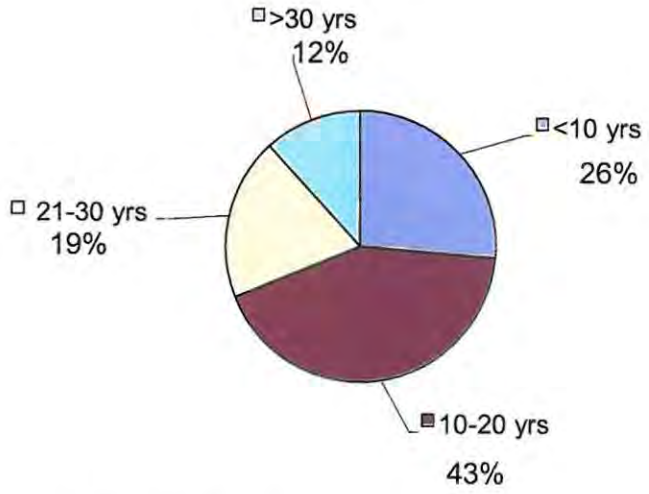

Figure 8-8: Respondents by Years in IT field

Figure 8.8 shows that of the 129 respondents, 43% have been in the IT field between 10 and 20 years, 26% for less than 10 years, 19% for between 21 and 30 years, and 12% for more than 30 years. This distribution of time spent in the IT field has a mean that is 5 years longer (17.2 years) than that reflected by Igbaria, et al (1995:327) study (12.71 years) of career orientations of Information Systems employees in South Africa

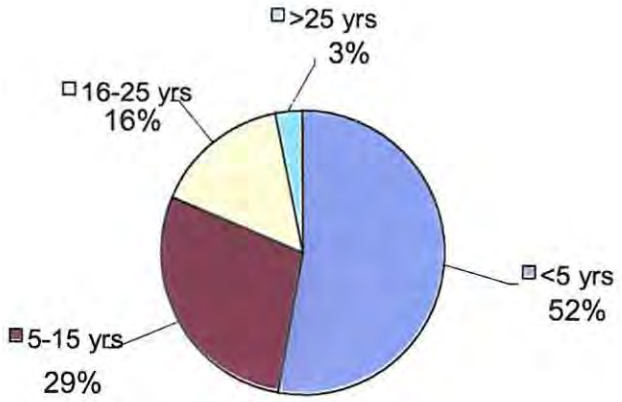

Figure 8-9: Respondents by Years in Current Organisation

Figure 8.9 shows that of the 129 respondents, 52% have been in their current organisation for less than five years, 29% for between 5 and 15 years, 16% for between 16 and 25 years, and 3% for more than 25 years. This distribution of organisational tenure has a mean of 7.85 years. This is considered a broad reflection of the South African IT profession as reflected by Igbaria, et al (1995:327) study where the mean was 7.46 years.

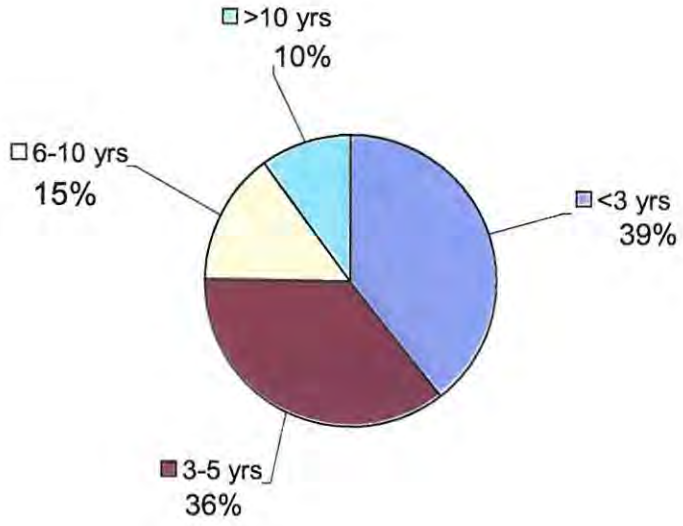

Figure 8-10: Respondents by Years in Current Position

Figure 8.10 shows that of the 129 respondents, 39% have been in their current position for less than 3 years, 36% for between 3 and 5 years, 15% for between 6 and 10 years, and 10% for more than 10 years. This distribution of job tenure has a mean of 4.59 years that is one and a half years longer than that found by Igbaria, et al (1995:327) study where the mean was 3.13 years. This is explained by the increase in the number of years spent in the IS field shown in Figure 8.8.

The majority of respondents were white males from Gauteng province between the ages of 30-39. The majority of respondents worked in the IS/IT departmental area as professional staff and had been in the IT industry for more than ten years. The majority of respondents had attained a bachelors or masters degree and had been in their current position for less than five years. The demographics of this sample are not an ideal reflection of the South African population. However, the sample does provide a broad reflection of the South African IT profession.

8.3 Hypothesis Tests

All seven hypotheses results are examined for a statistical significance (p-level). The p-level of a result is an estimated measure of the degree to which it is "true" (in the sense of "representative of the population"). The higher the p-level, the less we can

believe that the observed relation between variables in the sample is a reliable indicator of the relation between the respective variables in the population. All seven hypotheses are tested at a significance level of $p < 0.05$ (95%).

8.3.1 Hypothesis 1

The first hypothesis examines the relationship between exposure to career management experience and job and career satisfaction.

H0₁=IT professionals who have experienced career path management will experience no effect on their job or career satisfaction.
H1₁=IT professionals who have experienced career path management will have higher job and or higher career satisfaction.

The most appropriate statistical test given the nature of the data relating to this hypothesis and the sample size is the Pearson Chi-square test. The Pearson Chi-square is the most common test for significance of the relationship between categorical variables. A crosstabulation between the frequencies of the two variables is conducted in order to produce the Chi-square result. The career and job satisfaction frequencies are crosstabulated against the career management experience frequencies. This allows a relationship between the variables to be identified.

Experienced Career Management	Career Satisfaction High	Career Satisfaction Medium	Career Satisfaction Low	Row Totals
Yes	63	7	14	84
% of total	49.22%	5.47%	10.94%	65.63%
No	24	6	14	44
% of total	18.75%	4.69%	10.94%	34.38%
Totals	87	13	28	128
% of total	67.97%	10.16%	21.88%	

Table 8-1: Crosstabulation of Career Satisfaction and Career Management Experience Frequencies

	Chi-square	df	p
Pearson Chi-square	5.607266	df=2	p=.06059

Table 8-2: Chi-square for Career satisfaction and Career Management Experience

Experienced Career Management	Job Satisfaction High	Job Satisfaction Medium	Job Satisfaction Low	Row Totals
Yes	37	45	2	84
% of total	28.91%	35.16%	1.56%	65.63%
No	13	30	1	44
% of total	10.16%	23.44%	0.78%	34.38%
Totals	50	75	3	128
% of total	39.06%	58.59%	2.34%	

Table 8-3: Crosstabulation of Job Satisfaction and Career Management Experience Frequencies

	Chi-square	df	p
Pearson Chi-square	2.608023	df=2	p=.27145

Table 8-4: Chi-square for Job satisfaction and Career Management Experience

Table 8.2 shows career satisfaction significance at $p=0.06059$ and Table 8.4 shows job satisfaction $p=0.27145$. Both career and job satisfaction do not meet the required significance level of $p<0.05$ therefore the author fails to reject null hypothesis 1. Failure to reject the null hypothesis means that hypothesis 1 can not be accepted. This means that there is no significant relationship between IT professionals' career and job satisfaction and their career management experience.

8.3.2 Hypothesis 2

The second hypothesis examines the relationship between exposure to career management experience and turnover intentions.

$H0_2$=IT professionals who have experienced career path management will experience no effect on their turnover intentions.

$H1_2$=IT professionals who have experienced career path management will have lower turnover intentions.

Hypothesis 2 is tested using Pearson Chi-square and crosstabulation for the reasons mentioned in *Section 8.3.1*.

Experienced Career Management	Turnover Intentions High	Turnover Intentions Medium	Turnover Intentions Low	Row Totals
Yes	27	19	38	84
% of total	21.09%	14.84%	29.69%	65.63%
No	23	10	11	44
% of total	17.97%	7.81%	8.59%	34.38%
Totals	50	29	49	128
% of total	39.06%	22.66%	38.28%	

Table 8-5: Crosstabulation of Turnover Intentions and Career Management Experience Frequencies

	Chi-square	Df	P
Pearson Chi-square	6.084881	df=2	p=.04772

Table 8-6: Chi Square for Turnover Intentions and Career Management Experience

Table 8.6 shows turnover intentions significance at $p=0.04772$. Turnover intentions satisfy the required significance level of $p<0.05$ therefore the author rejects null hypothesis 2. Rejection of the null hypothesis means that hypothesis 2 can be accepted. This means that there is a significant relationship between IT professionals' turnover intentions and their career management experience.

8.3.3 Hypothesis 3

The third hypothesis examines the relationship between exposure to career management experience and career and professional plateauing.

H0$_3$=IT professionals who have experienced career path management will experience no effect on their career or professional plateauing.
H1$_3$=IT professionals who have experienced career path management will have high career and or professional plateauing.

Hypothesis 3 is tested using Pearson Chi-square and crosstabulation for the reasons

mentioned in *Section 8.3.1*.

Experienced Career Management	Career Plateau High	Career Plateau Medium	Career Plateau Low	Row Totals
Yes	19	49	16	84
% of total	14.84%	38.28%	12.50%	65.63%
No	21	19	4	44
% of total	16.41%	14.84%	3.13%	34.38%
Totals	40	68	20	128
% of total	31.25%	53.13%	15.63%	

Table 8-7: Crosstabulation of Career Plateau and Career Management Experience Frequencies

	Chi-square	df	p
Pearson Chi-square	8.904915	df=2	p=.01165

Table 8-8: Chi Square for Career plateau and Career Management Experience

Experienced Career Management	Professional Plateau High	Professional Plateau Medium	Professional Plateau Low	Row Totals
Yes	69	4	11	84
% of total	53.91%	3.13%	8.59%	65.63%
No	26	7	11	44
% of total	20.31%	5.47%	8.59%	34.38%
Totals	95	11	22	128
% of total	74.22%	8.59%	17.19%	

Table 8-9: Crosstabulation of Professional Plateau and Career Management Experience Frequencies

	Chi-square	df	p
Pearson Chi-square	8.623476	df=2	p=.01341

Table 8-10: Chi Square for Professional Plateau and Career Management Experience

Table 8.8 shows career plateau significance at p=0.01165 and Table 8.10 shows professional plateau p=0.01341. Both career and professional plateauing satisfy the

significance level of $p < 0.05$ therefore the author rejects null hypothesis 3. Rejection of the null hypothesis means that hypothesis 3 can be accepted. This means that there is a significant relationship between IT professionals' career and professional plateauing and their career management experience.

8.3.4 Hypothesis 4

The fourth hypothesis examines the variance of career variables amongst IT professionals who possess different IT skills portfolios.

$H0_4$= There is no mean difference between the career variables of IT professionals with different current skills portfolios. $H1_4$= There is a mean difference between the career variables of IT professionals with different current skills portfolios.

The most appropriate statistical test given the nature of the data relating to this hypothesis and the sample size is the analysis of variance (*ANOVA*) test. ANOVA tests for significant differences between means by comparing variances. Given the categorical nature of data a one-way ANOVA test will be used. The dependent variable is the career variables whilst the categories of skills portfolios act as a grouping variable.

Career Variables	F	p
Career Satisfaction	F=.392129	p=.813962
Job Satisfaction	F=.293579	p=.881679
Turnover Intentions	F=.418603	p=.794973
Career Plateau	F=.727110	p=.575054
Professional Plateau	F=.860077	p=.490047

Table 8-11: One-way ANOVA Results for Current Skills Portfolios

Table 8.11 shows the significance of variance between career variables and current skills portfolios as: 1) Career Satisfaction $p=0.813962$, 2) Job Satisfaction $p=0.881679$, 3) Turnover Intentions $p=0.794973$, 4) Career Plateau $p=0.575054$ and 5) Professional Plateau $p=0.490047$. All the career variable p-levels fail to meet the required significance level of $p < 0.05$ therefore the author fails to reject null hypothesis 4. Failure to reject the null hypothesis means that hypothesis 4 can not be

accepted. This means that there is no significant variance between the career variable means of IT professionals with different skills portfolios. Figure 8.11 presents descriptive data surrounding the respondents' current skills portfolios. 39% of respondents specialised in technology related skills, 22% in analytical and critical thinking skills, 20% in interpersonal, communication, and team skills, and 12% in business fundamentals.

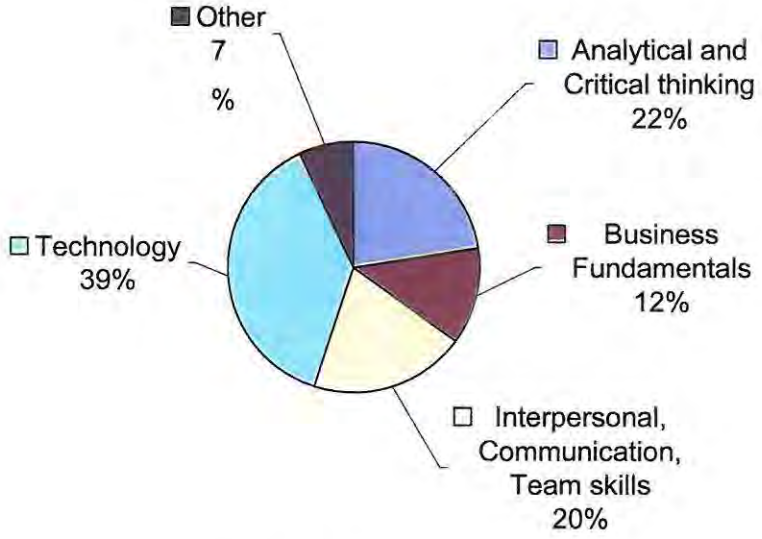

Figure 8-11: Respondents Current Skills Portfolios

8.3.5 Hypothesis 5

The fifth hypothesis examines the variance of career variables between IT professionals who occupy different job types.

H0$_5$= There is no mean difference between the career variables of IT professionals with different current job types. *H1*$_5$= There is a mean difference between the career variables of IT professionals with different current job types.

Hypothesis 5 is tested using one-way ANOVA for the reasons mentioned in *Section 8.3.4*.

Career Variables	F	p
Career Satisfaction	F=.230561	p=.291291
Job Satisfaction	F=.593119	p=.760497
Turnover Intentions	F=.827806	p=.566141
Career Plateau	F=1.079896	p=.380439
Professional Plateau	F=3.526048	p=.001763

Table 8-12: One-way ANOVA Results for Current Job Types

Table 8.12 shows the significance of variance between career variables and current job types as: 1) Career Satisfaction $p=0.291291$, 2) Job Satisfaction $p=0.760497$, 3) Turnover Intentions $p=0.566141$, 4) Career Plateau $p=0.380439$ and 5) Professional Plateau $p=0.001763$. Four of the five career variables exhibited p-levels greater than the significance level of $p<0.05$. However, professional plateau satisfied the required significance level of $p<0.05$ therefore the author rejects null hypothesis 5. Rejection of the null hypothesis means that hypothesis 5 can be accepted. This means that there is a significant variance between some of the career variable means of IT professionals in different job types.

Figure 8.12 presents descriptive data surrounding the respondents' current job types. The majority of respondents were employed in either management (32%) or consultancy (26%) job types. 12% of respondents were employed in Systems analysis and 12% in Software systems development. The remaining 19% were divided between Systems management (8%), End user computing (7%), and currently unemployed (2%).

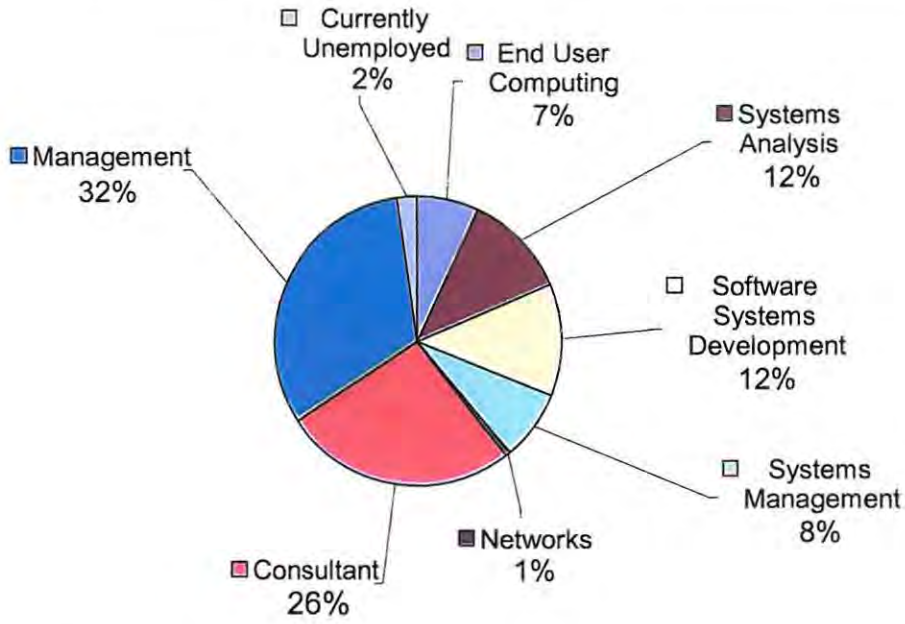

Figure 8-12: Respondents Current Job Type

8.3.6 Hypothesis 6

The sixth hypothesis examines the significance of the relationship between IT professional career variables and career anchors.

$H0_6$=There is no significant relationship between an IT professional's career anchors and their career variables.
$H1_6$=There is a significant relationship between an IT professional's career anchors and their career variables.

The most appropriate statistical test given the nature of the data and the sample size is a measure of correlation. Correlation is a measure of the relationship between two or more variables. The measure shows the significance of the relationship on interval scales. Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 represents a lack of correlation.

	Career Satisfaction	Job Satisfaction	Turnover Intentions	Career Plateau	Professional Plateau
Managerial	.1020	-.0372	-.1303	-.1309	.0036
	p=.250	p=.676	p=.141	p=.139	p=.967
Technical	.0285	.1168	-.0545	-.1366	.0951

	p=.749	p=.187	p=.540	p=.123	p=.284
Organisational	.1325	.1226	-.1506	-.0885	.0512
	p=.134	p=.166	p=.089	p=.319	p=.565
Geographical	-.1509	.0122	-.0058	.2104	.0945
	p=.088	p=.891	p=.948	p=.017	p=.287
Life Style	-.0600	-.1424	.0016	.0525	.0741
	p=.500	p=.107	p=.986	p=.554	p=.404
Entrepreneurial creativity	.2137	-.1623	.1318	-.0244	.0501
	p=.015	p=.066	p=.136	p=.784	p=.573
Pure challenge	.1125	.0999	.0466	-.1730	.0460
	p=.205	p=.260	p=.600	p=.050	p=.605
Service	.0288	-.0700	-.0914	-.1153	.0706
	p=.746	p=.431	p=.303	p=.193	p=.426
Independence	.0764	-.0555	-.0115	-.0505	.0819
	p=.390	p=.532	p=.897	p=.570	p=.356

Table 8-13: Correlation between Career Anchors and Career Variables

Table 8.13 shows the significance of relations between career variables and career anchors. Listed below are the main results:

- Career satisfaction shows no significant correlation with eight of the nine career anchors. However, it does exhibit a significant positive correlation of .2137 with the entrepreneurial creativity career anchor with a significance level of p=0.015.
- Job satisfaction shows no significant correlation with all nine career anchors.
- Turnover intentions show no significant correlation with all nine career anchors.
- Career plateau shows no significant correlation with seven of the nine career anchors. However, it does exhibit a significant positive correlation of .2104 with the geographical career anchor with a significance level of p=0.017. And a significant negative correlation of .1730 with the pure challenge career anchor with a significance level of p=0.05.
- Professional plateau shows no significant correlation with all nine career anchors.

Based on these observations the author rejects null hypothesis 6. Rejection of the null

hypothesis means that hypothesis 6 can be accepted. This means there is a significant relationship between the career anchors 1) entrepreneurial creativity, 2) geographical, and 3) pure challenge and the career variables career satisfaction (1) and career plateau (2 and 3). Figure 8.13 presents descriptive data surrounding the respondents' career anchors. The career anchors are ranked below in order of their means:

1) Service
2) Life Style
3) Organisational
4) Independence
5) Pure challenge
6) Managerial
7) Entrepreneurial creativity
8) Geographical
9) Technical

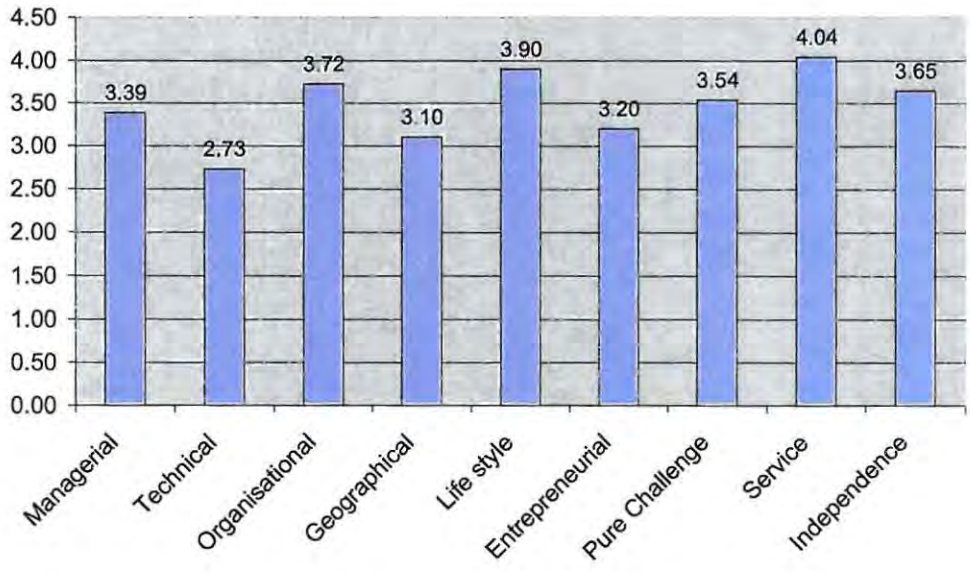

Figure 8-13: Respondents Mean Career Anchors

8.3.7 Hypothesis 7

The seventh hypothesis examines the difference in the career anchors of IT professionals who perceive a benefit or need for career transition out of the core IT

area and those who do not.

H0₇=There is no mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area.
H1₇=There is a mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area.

The most appropriate statistical test given the nature of the data and the sample size is a t-test. The independent t-test to be used makes use of one categorical predictor for grouping (Perception of transition groups =yes/no) and a continuous dependent variable (mean career anchors). The t-test is the most commonly used method to evaluate the differences in means between two groups. The means of the dependent career anchor variable will be compared between the two groups based on the specified values of the independent variable Yes and No.

Transition beneficial	Mean Yes	Mean No	t-value	df	p
Managerial	3.481013	3.240000	1.41346	127	p=.159967
Technical	2.556962	3.006667	-2.38682	127	p=.018470
Organisational	3.550633	4.000000	-2.55493	127	p=.011801
Geographical	3.000000	3.270000	-1.21637	127	p=.226100
Life Style	3.902954	3.893333	0.07164	127	p=.943004
Entrepreneurial creativity	3.286920	3.066667	0.96126	127	p=.338250
Pure challenge	3.400844	3.760000	-2.31991	127	p=.021942
Service	3.924051	4.220000	-1.90227	127	p=.059400
Independence	3.632911	3.666667	-0.23482	127	p=.814724
Transition necessary	Mean Yes	Mean No	t-value	df	p
Managerial	3.746032	3.214559	3.08391	127	p=.002507
Technical	2.682540	2.754789	-0.36100	127	p=.718699
Organisational	3.511905	3.827586	-1.70267	127	p=.091077

Geographical	2.904762	3.201149	-1.28510	127	p=.201095
Life Style	3.761905	3.965517	-1.47061	127	p=.143870
Entrepreneurial creativity	3.380952	3.114943	1.11803	127	p=.265665
Pure challenge	3.690476	3.467433	1.36717	127	p=.173987
Service	4.119048	4.000000	0.72721	127	p=.468433
Independence	3.619048	3.659004	-0.26736	127	p=.789625

Table 8-14: T-test Results for the Perception of Career Transition

Table 8.14 shows the mean difference between career anchors of IT professionals and their perception of career transition as:

- *Is there a benefit to transition?* 1) No significant mean difference for the Managerial, Geographical, Life style, Entrepreneurial creativity, Service, and Independence career anchors, 2) A significant mean difference for the Technical career anchor with p=0.018470, 3) A significant mean difference for the Organisational career anchor with p=0.011801, and 4) A significant mean difference for the Pure challenge career anchor with p=0.021942.
- *Is there a need for transition?* 1) No significant mean difference for the Technical, Organisational, Geographical, Life style, Entrepreneurial creativity, Pure challenge, Service, and Independence career anchors, and 2) A significant mean difference for the Managerial career anchor with p=0.002507.

Based on these observations the author rejects null hypothesis 7. Rejection of the null hypothesis means that hypothesis 7 can be accepted. This means that there is a significant mean difference between the career anchors (specifically Technical, Organisational, Pure challenge, and Managerial) of IT professionals who have different perceptions with regards to the need or benefit of transition.

Figure 8.14 and 8.15 present descriptive data surrounding the respondents' perceptions of career transition. 61% of respondents expressed that there was some benefit to transitioning out of the core IT area. 33% of respondents expressed that there was a need to transition out of the core IT area in order to have a successful

long-lasting career.

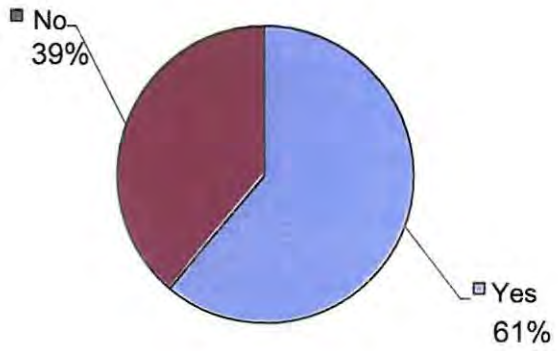

Figure 8-14: Respondents Perception on the Benefits of Career Transition

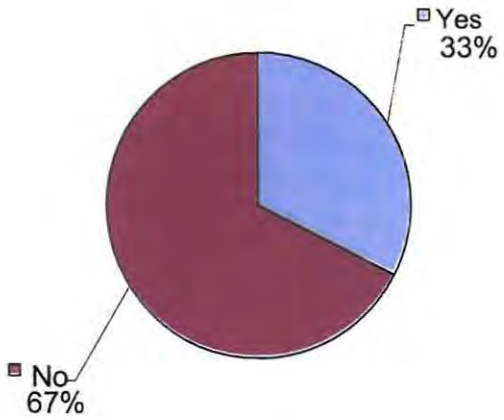

Figure 8-15: Respondents Perception on the Need for Career Transition

8.4 Descriptive Statistics

The empirical study had a secondary aim of collecting descriptive data. The graphs that follow present descriptive data relating to the respondents career anchors, career management experiences, skills portfolios, and job types.

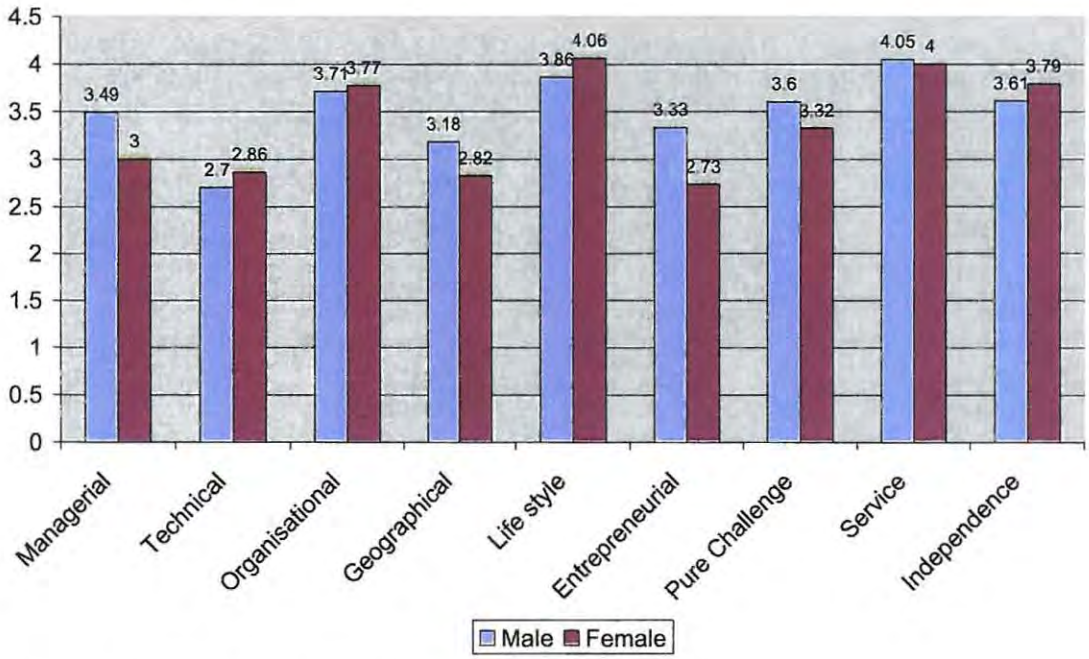

Figure 8-16: Respondents Career Anchors by Gender

Figure 8.16 shows that female respondents had higher lifestyle, organisational, independence, and technical career anchor means. Male respondents exhibited higher managerial, geographical, entrepreneurial creativity, service and pure challenge career anchor means.

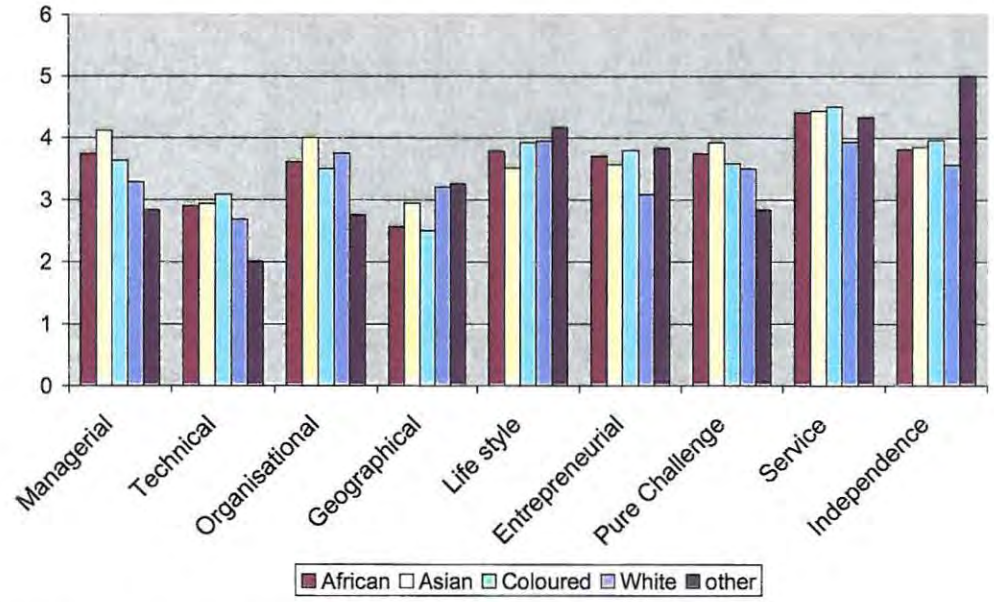

Figure 8-17: Respondents Career Anchors by Race

Figure 8.17 shows that Asian respondents had the highest managerial, organisational, and pure challenge career anchor means. Coloured respondents had the highest

technical and service career anchor means. Respondents who selected other possessed the highest geographical, life style, entrepreneurial creativity, and independence career anchor means.

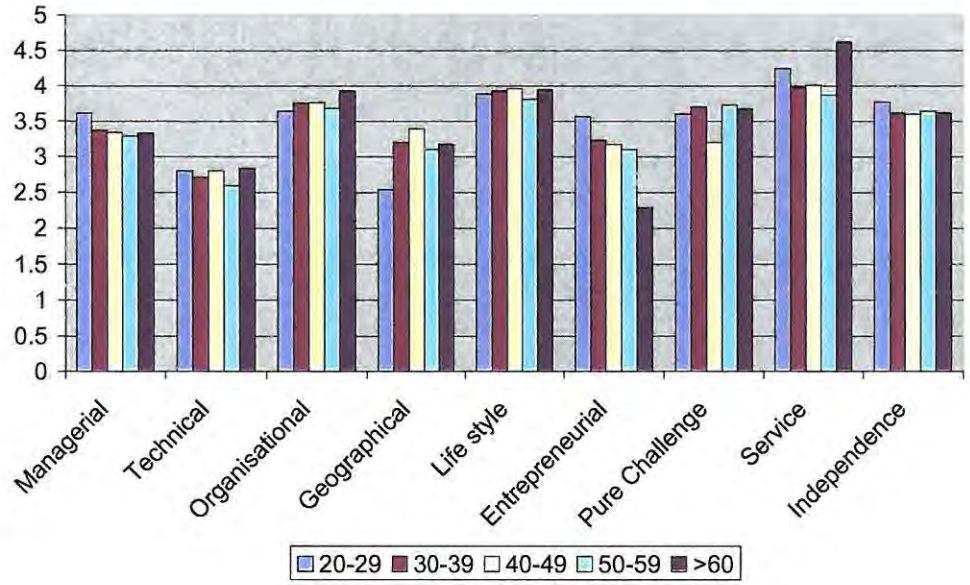

Figure 8-18: Respondents Career Anchors by Age

Figure 8.18 shows that the youngest respondents between the ages of 20 and 29 exhibited the highest managerial, entrepreneurial creativity, and independence career anchor means. The oldest respondents above 60 years of age possessed the highest technical, organisational, and service career anchor means. Middle aged respondents between the ages of 40 and 49 had the highest geographical and lifestyle career anchor means. The highest pure challenge career anchor mean was exhibited by respondents between ages 50 and 59.

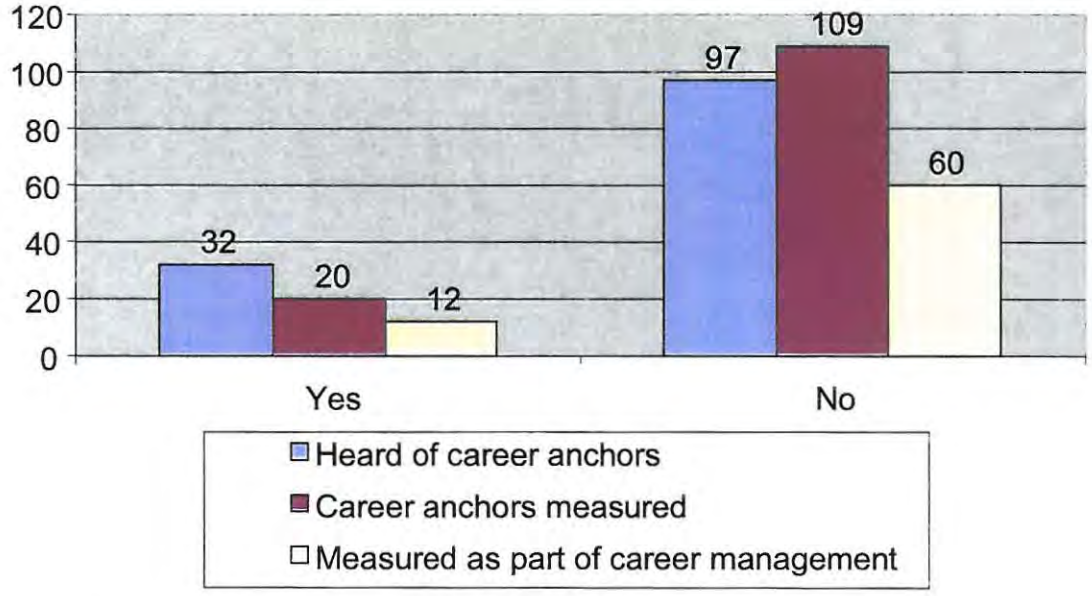

Figure 8-19: Respondents Experience with Career anchors

Figure 8.19 shows that the majority of respondents had not heard of or had their career anchors tested. Of the 129 respondents 32 had heard of career anchors, 20 had their career anchors measured of which 12 had been during a career management activity.

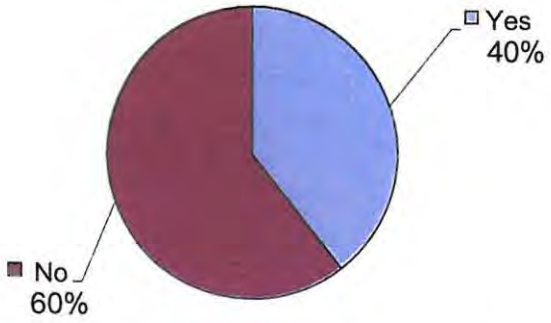

Figure 8-20: Availability of Formal IT Career Path within Organisation

Figure 8.20 shows that 60% of respondents had no formal IT career paths available within their organisations.

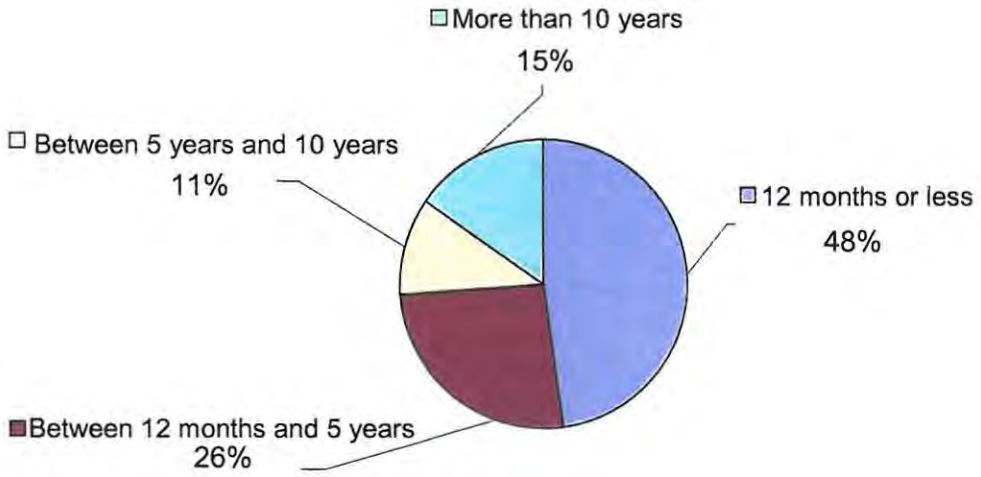

Figure 8-21: Timeframe of Last Career Management Experience

Figure 8.21 shows that fewer than half the respondents (48%) had their last career management experience in the last 12 months. 26% experienced career management between 12 months and 5 years ago and 15% had their last career management experience over 10 years ago.

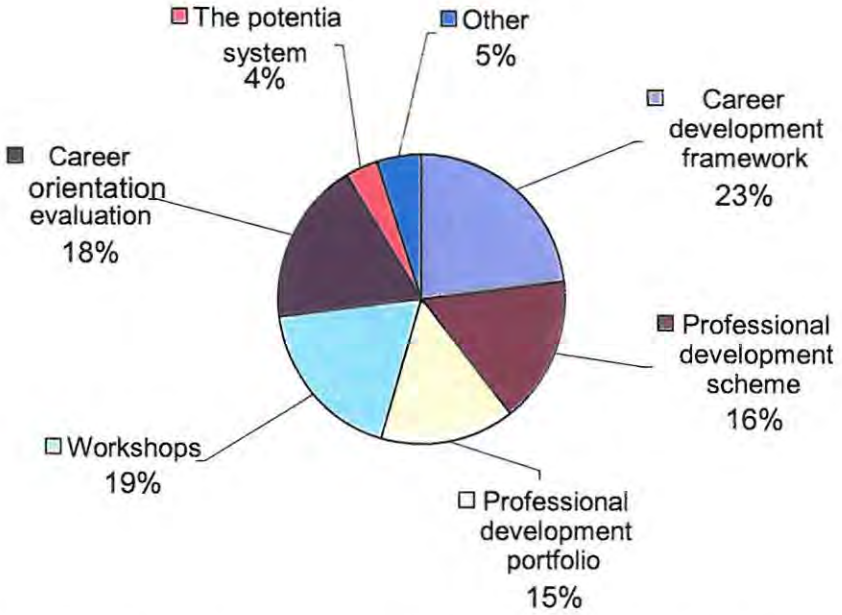

Figure 8-22: Respondents Experience with Career Management Planning Tools

Figure 8.22 shows that of the respondents who experienced career management planning tools 23% experienced the career development framework, 19% experienced workshops, 18% experienced career orientation evaluation, 16% experienced the

professional development scheme, 15% experienced the professional development portfolio, 4% experienced the potentia system, and 5% experienced some other career management planning tool.

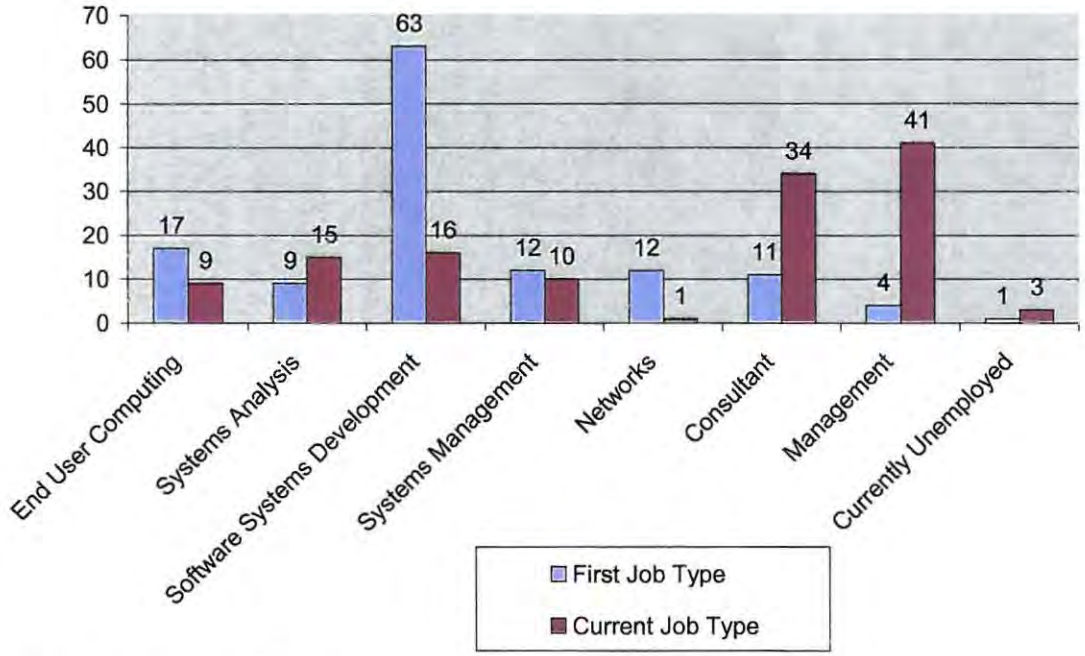

Figure 8-23: Comparison of Respondents First and Current Job Types

Figure 8.23 shows that respondents' most common first job type by a large margin was in software systems development which includes job types such as software engineer and application programmer. Respondents' most common current job type is in management closely followed by consultant positions.

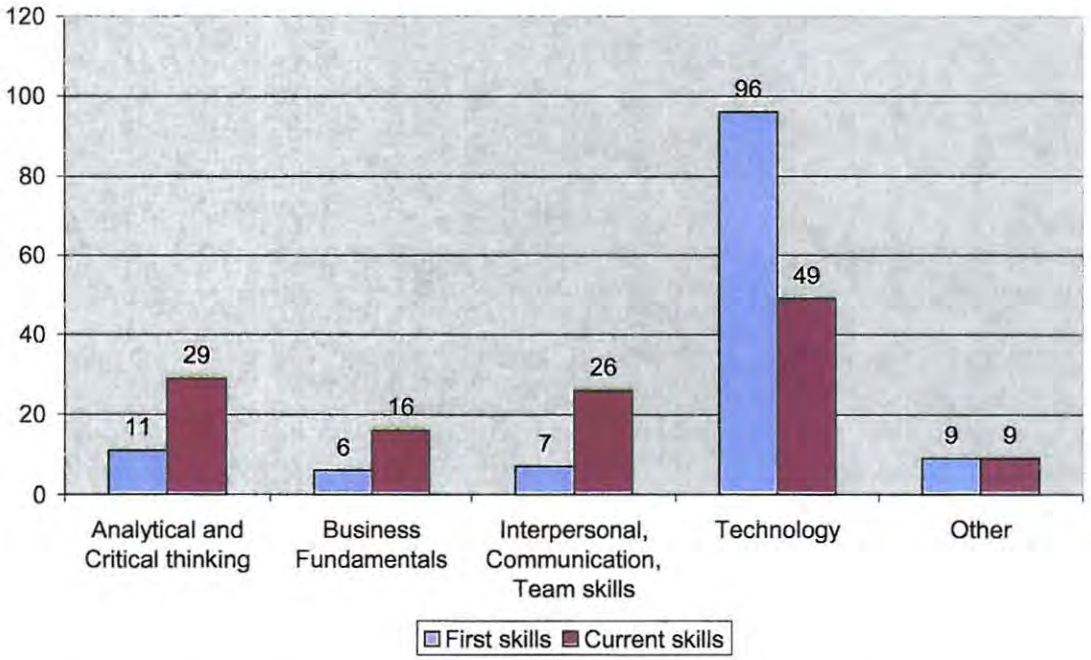

Figure 8-24: Comparison of Respondents First and Current Skills portfolios

Figure 8.24 shows that respondents most common first skills by a large margin was technology including skills such as application development, internet systems, database design, and systems infrastructure. Respondents' most common current skills are also in technology followed by analytical and critical thinking skills and interpersonal, communication, and team skills.

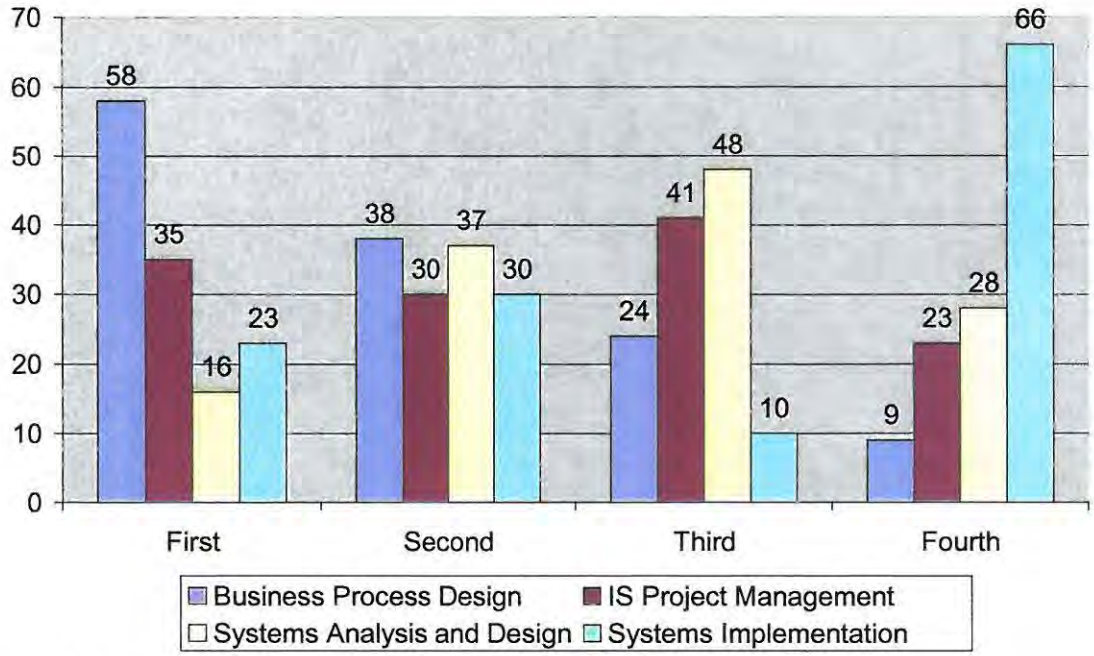

Figure 8-25: Respondents Ranking of Skills

Figure 8.25 shows that of the 129 respondents 58 ranked business process design skills as first or the most important set of skills. 66 respondents ranked systems implementation skills as fourth or the least important skills for an IT professional.

8.5 Conclusion

The sample of 129 respondents is considered a broad reflection of the South African IT profession. Hypothesis 1 was rejected and hypotheses 2 and 3 were accepted based on the Pearson Chi-square results attained from crosstabulation. Hypothesis 4 was rejected based on one-way ANOVA results. Hypothesis 5 was accepted based on one-way ANOVA results. Hypothesis 6 was accepted based on correlation results. Hypothesis 7 was accepted based on t-test results. Descriptive data relating to respondents and their career management experiences, career anchors, job types, and skills was presented in graphs.

This Chapter presents a number of results that require discussion. *Chapter 9* discusses the results and makes recommendations regarding the EITCM model.

Chapter 9 Discussion of Findings and Recommendations

9.1 Introduction

Having identified CSFs relating to the EITCM model (*Chapter 6*), developed appropriate hypotheses to be tested by means of an empirical study (*Chapter 7*), and produced statistical results (*Chapter 8*) it is now possible to discuss the results and ramifications. The purpose of this Chapter is to discuss the results of the empirical study and make appropriate recommendations.

The primary aim of the empirical study was to gather data and produce statistical results that would test each hypothesis. The result of each hypothesis allows conclusion about the relevant CSF to be drawn. *Section 9.2* examines the results of each hypothesis, the confirmations of the CSFs, any necessary modifications to the CFS, and any further implications. The secondary aim of the empirical study was to gather and produce descriptive statistics surrounding the EITCM model. *Section 9.3* discusses descriptive statistics and compares some of them against previous research. Having discussed confirmation of the CSFs descriptive statistics the author then makes recommendations with regards to the EITCM and the necessary modifications in *Section 9.4*.

Five of the seven CSFs were modified in order to ensure their validity. These modifications along with descriptive data gathered by the study contributed towards recommendations regarding effective career management. These recommendations resulted in modification of the EITCM model.

9.2 Confirmation of the Critical Success Factors

Confirmation of the CSFs is reliant on the result of the hypothesis tests. This *Section 9.2* examines those results and their implications. Where necessary additional statistical information is provided in order to explain and support the conclusions reached.

9.2.1 Critical Success Factor 1

Critical Success Factor 1
It is critical that IT professionals experience some form of career guidance or management in order to experience: ▪ High job satisfaction. ▪ High career satisfaction.
Hypothesis 1
$H0_1$=IT professionals who have experienced career path management will experience no effect on their job or career satisfaction. ***Failed to reject*** $H1_1$=IT professionals who have experienced career path management will have higher job and or higher career satisfaction. ***Failed to accept***

Table 9-1: Critical Success Factor 1 and Hypothesis 1

Table 9.1 shows that null hypothesis 1 was not rejected. Therefore the need for IT professionals to experience some form of career guidance or management in order to experience high job and career satisfaction can not be confirmed. Although there was no significant relationship found, the career satisfaction p-level=0.0659 is only slightly higher than the required $p<0.05$. The author is of the opinion that although no significant relationship exists there is evidence of an important positive connection between the two. Analysis of the crosstabulation between career satisfaction and career management experience shows that the majority (49.22%) of respondents belonged to a group who had experienced career management and had high career satisfaction.

The p-level=0.27145 derived for job satisfaction supports a firm failure to reject null hypothesis 1. Further examinations of the observed frequencies produced no evidence to suggest any pattern between career management experience and job satisfaction.

The results imply that career management will have no effect on an IT professionals job satisfaction and too a lesser extent their career satisfaction. This requires that CSF 1 either be discarded or modified. Respondents were deemed to have career management experience if they selected just one of a number of career management experiences. In order to further examine this CSF each type of career management

experience was crosstabulated against respondents' career and job satisfaction. The results are below in Table 9.2.

Career management experience	**Career satisfaction**	**Job satisfaction**
Formal advice from an appointed mentor/manager	p=.01243	p=.12002
Formal advice from an HR councillor	p=.06084	p=.01804
Informal advice from an HR councillor	p=.21327	p=.24257
Advice as part of a recruitment program	p=.01896	p=.00101
Advice from an external source hired by your organisation or yourself	p=.14420	p=.51322

Table 9-2: Results of Different Career Management Experiences

Table 9.2 shows significant relationships between formal advice from an appointed mentor/manager and career satisfaction, between formal advice from an HR councillor and job satisfaction, and between advice as part of a recruitment program and both career and job satisfaction. These results suggest that CSF 1 does not need to be discarded but modified. The modified CSF 1 reads as:

It is critical that IT professionals experience an appropriate form of career guidance or management in order to experience:

- **High job satisfaction.**
- **High career satisfaction.**

High job and career satisfaction reflects good career dynamics and as such appropriate types career management are necessary to maintain the desired levels The modification of CSF 1 holds minor implications for and requires modification of the EITCM model to be discussed in *Section 9.4*.

9.2.2 Critical Success Factor 2

Critical Success Factor 2
It is critical that IT professionals experience some form of career guidance or management in order to experience: ▪ Low turnover intentions.
Hypothesis 2
$H0_2$=IT professionals who have experienced career path management will experience no effect on their turnover intentions. ***Rejected*** $H1_2$=IT professionals who have experienced career path management will have lower turnover intentions. ***Accepted***

Table 9-3: Critical Success Factor 2 and Hypothesis 2

Table 9.3 shows that null hypothesis 2 was rejected. Therefore the need for IT professionals to experience some form of career guidance or management in order to experience low turnover intentions can be confirmed. Analysis of the crosstabulation between turnover intentions and career management experience revealed that a low figure of 8.59% of respondents belonged to a group who had not experienced career management and had low turnover intentions. 29.69% of respondents had experienced career management and exhibited low turnover intentions. However, a high portion of respondents (21.09%), exhibited high turnover intentions and had experienced career management. This implies that career management encourages low turnover intentions but does not avoid high turnover intentions.

Low turnover intentions reflect compatible career dynamics and as such career management is necessary to maintain the desired levels. CSF 2 does not require modification and as a result neither does the related area of the EITCM model.

9.2.3 Critical Success Factor 3

Critical Success Factor 3
It is critical that IT professionals experience some form of career guidance or management in order to experience: ▪ High career plateauing. ▪ High professional plateauing.
Hypothesis 3
H0₃=IT professionals who have experienced career path management will experience no effect on their career or professional plateauing. ***Rejected*** *H1₃*=IT professionals who have experienced career path management will have high career and or professional plateauing. ***Accepted***

Table 9-4: Critical Success Factor 3 and Hypothesis 3

Table 9.4 shows that null hypothesis 3 was rejected. Although the CSF can be confirmed further analysis revealed that it needs to be modified first. Analysis of the crosstabulation between career plateauing and career management experience revealed that 3.13% had low career plateau levels with no career experience and 16.41% exhibited high levels of career plateauing with no career experience. 12.5% had low career plateau levels with career experience, 38.28% had medium levels with career management, and 14.84% exhibited high levels of career plateauing with career management. The results imply an absence of career management encourages high levels of professional plateauing and avoids low levels. And the presence of career management encourages medium levels of career plateauing. A career that is experiencing medium levels of career plateuaing in this context is defined as a career that has realised most of it potential but has reached its plateau prematurely. CSF 3 requires modification with regards to career plateauing before it can be confirmed.

Analysis of the crosstabulation between career plateauing and career management experience revealed that of the respondents who had experienced career management a majority of 53.91% had high professional plateau levels and only 3.13% exhibited low levels of professional plateauing. The results imply that career management encourages high levels of professional plateauing and avoids low levels. CSF 3

requires no modification with regards to professional plateauing before it can be confirmed. The modified CSF 3 reads as:

It is critical that IT professionals experience some form of career guidance or management in order to experience:

- **Medium career plateauing.**
- **High professional plateauing.**

High levels of professional plateauing reflect compatible career dynamics and as such career management is necessary to maintain the desired levels. High levels of career plateauing reflect compatible career dynamics and as such career management must be avoided to maintain the desired levels. It is not possible to achieve both of these simultaneously. However, it is possible to achieve medium levels of career plateauing in the presence of career management. The author makes a recommendation in *Section 9.4* based on the modification of CSF 3 that will lead to the appropriate modification of the EITCM model.

9.2.4 Critical Success Factor 4

Critical Success Factor 4
It is critical to account for an IT professional's skills portfolio in order to attain: ▪ Compatible career dynamics.
Hypothesis 4
$H0_5$= There is no mean difference between the career variables of IT professionals with different current skills portfolios. ***Failed to reject*** $H1_5$= There is a mean difference between the career variables of IT professionals with different current skills portfolios. ***Failed to accept***

Table 9-5: Critical Success Factor 4 and Hypothesis 4

Table 9.5 shows that null hypothesis 4 was not rejected. The critical nature of accounting for IT professional skills portfolio in order to attain compatible career dynamics can not be confirmed. However, the author suggests the skills portfolio that represents the dependent component of the EITCM model is still very important due to its interactions with both the individual and organisational factors. In an effort to

modify CSF 4 to reflect this importance a crosstabulation between skills and job type was conducted as well as an independent t-test involving career anchors and skills. Table 9.6 shows that the relationship between the initial skills and the first job type and the current skills and job type are both highly significant with p=0.00000 and p=0.01773 respectively. Table 9.7 shows highly significant results for the majority of career anchors namely:

- *Initial skills:* A significant mean difference for the managerial, technical, geographical, lifestyle, entrepreneurial creativity, and service career anchors.
- *Current skills:* A significant mean difference for the managerial, organisational, lifestyle, pure challenge, service, and independence career anchors.

Skills and job comparisons	df	p-level
Initial skills and first job	df=28	p=.00000
Current skills and current job	df=28	p=.01773

Table 9-6: Crosstabulation of Dependent and Organisational Factors

Career anchors	df	Initial skills	Current skills
Managerial	256	0.021286	0.002024
Technical	256	0.000000	0.148069
Organisational	256	0.637743	0.000000
Geographical	256	0.000069	0.314440
Life Style	256	0.033211	0.000000
Entrepreneurial creativity	256	0.001148	0.110906
Pure challenge	256	0.275682	0.000023
Service	256	0.001483	0.000000
Independence	256	0.852984	0.000000

Table 9-7: Independent t-test for Individual and Dependent factor.

These results allow CSF 4 to be modified as follows:

It is critical to account for an IT professional's skills portfolio in order to <u>understand how they will dynamically interact with:</u>

- **Individual factors.**
- **Organisational factors.**

The modification of CSF 4 holds implications for and requires modification of the EITCM model to be discussed in *Section 9.4*.

9.2.5 Critical Success Factor 5

Critical Success Factor 5
It is critical to account for an IT professional's job type in order to attain: ▪ Compatible career dynamics
Hypothesis 5
$H0_5$= There is no mean difference between the career variables of IT professionals with different current job types. ***Rejected*** $H1_5$= There is a mean difference between the career variables of IT professionals with different current job types. ***Accepted***

Table 9-8: Critical Success Factor 5 and Hypothesis 5

Table 9.8 shows that null hypothesis 5 was rejected. The critical nature of accounting for IT professional job types in order to attain compatible career dynamics can be confirmed. There was a significant variance of the level of professional plateauing between job types. The significance was only found for professional plateauing and there is a need to modify CSF 5. The modified CSF 5 reads as follows:

It is critical to account for an IT professional's job type in order to attain:

- **High levels of professional plateauing and contribute to the overall compatibility of career dynamics.**

The modification of CSF 5 holds implications for the EITCM model but will require no modifications to the model.

9.2.6 Critical Success Factor 6

Critical Success Factor 6
It is critical to account for an IT professional's career anchors in order to attain: ▪ Compatible career dynamics.

Hypothesis 6

$H0_6$=There is no significant relationship between an IT professional's career anchors and their career variables. ***Rejected***

$H1_6$=There is a significant relationship between an IT professional's career anchors and their career variables. ***Accepted***

Table 9-9: Critical Success Factor 6 and Hypothesis 6

Table 9.9 shows that null hypothesis 6 was rejected. The critical nature of accounting for IT professional career anchors in order to attain compatible career dynamics can be confirmed. The following career anchors 1) entrepreneurial creativity, 2) geographical, and 3) pure challenge shared a significant correlation with career satisfaction (1) and career plateauing (2 and 3). The significance was only found with two of the career variables and there is a need to modify CSF 6. The modified CSF 6 reads as follows:

It is critical to account for an IT professional's career anchors (specifically entrepreneurial creativity, geographical, and pure challenge) in order to attain:

- **High levels of career satisfaction.**
- **High levels of career plateauing.**

and contribute to the overall compatibility of career dynamics.

The modification of CSF 6 holds implications for the EITCM model but will require no modifications to the model.

9.2.7 Critical Success Factor 7

Critical Success Factor 7

It is critical that IT professionals with different career anchors are provided with a multiple carer path that offers them the opportunity to make a transition out of the core IT area.

Hypothesis 7

$H0_7$=There is no mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area. ***Rejected***

$H1_7$=There is a mean difference between the career anchors of IT professionals who perceive a need or benefit for transition out of the core IT area. ***Accepted***

Table 9-10: Critical Success Factor 7 and Hypothesis 7

Table 9.10 shows that null hypothesis 7 was rejected. The critical nature of providing multiple career paths that afford the opportunity for IT professionals with different career anchors to make a transition out of the IT core area can be confirmed. The career anchors that showed significant mean differences in the perception of transitional benefit were technical, organisational, and or pure challenge career anchors. Respondents who felt there was no benefit to transition out of the core IT area had dominant technical, organisational, and or pure challenge career anchors. Respondents with these career anchors would most likely have this perception as they 1) have no managerial aspirations being content with technical work, 2) are committed to their field or organisation, and 3) perceive the core IT area provides more challenge than areas outside of it. This result requires no modification of CSF 7.

The career anchor that showed significant mean differences in the perception of the need for transition was managerial competence. Respondents who felt there was a need for transition out of the core IT area had dominant managerial career anchors. This is indicative of the perceived lack of managerial development within the core IT area. This result requires no modification of CSF 7.

The presence of different perceptions surrounding the immediate issue of transition and the extended issue of multiple career paths supports the need for different career paths. CSF 7 has strong implications for the EITCM model but will require no modifications of the model.

9.3 Discussion of descriptive results

9.3.1 Career Anchors

Part of the empirical study was designed to measure respondents' career anchors. Combining the mean career anchors with background statistics provides insight into how career anchors may vary across demographic variables. *Chapter 8* provided graphical images representing career anchors across various demographic traits. This *Section 9.3.1* will examine the most relevant of those and compare them to previous career anchor measurements found in Igbaria, et al (1995). Other studies and statistics surrounding career anchors exist, such as Ramakrishna and Potosky (2002), Igbaria and Baroudi 1(993), Crepeau, et al (1992). However, these studies were not conducted within the South African IT profession therefore Igbaria, et al (1995) study was chosen for comparison due to its relevance as it was also conducted amongst CSSA members.

Figure 9.1 shows the mean career anchors as researched by this study in comparison to Igbaria, et al (1995:329) study. The bar graph shows that there is no major difference between the studies career anchor means. The largest discrepancy is 0.53 for the geographical career anchor and the smallest is 0.02 for the technical career anchor. Table 9.11 ranks the career anchors according to their means. Both studies show service as the number one career anchor with technical as the number nine. With the exception of the geographical career anchor all the career anchors are ranked by the two studies in the same place or within two places of each other. The geographical career anchor is ranked as number eight in this study and number three in Igbaria, et al (1995:329). This discrepancy could be due to 1) a more stable post independence South African environment and or 2) the fact that Igbaria, et al (1995) study was conducted in Cape Town which is known for its geographical appeal. Another explanation could be the older age sample targeted by Igbaria, et al (1995:329). Examination of career anchors by age would seem to support this second explanation. Respondents aged 40-49 and 30-39 had the highest and second highest organisational career anchor means respectively. Their study targeted respondents between the ages of 30 and 44. It is likely that these middle aged respondents are

beginning families and a stable location is high on their list of motivators.

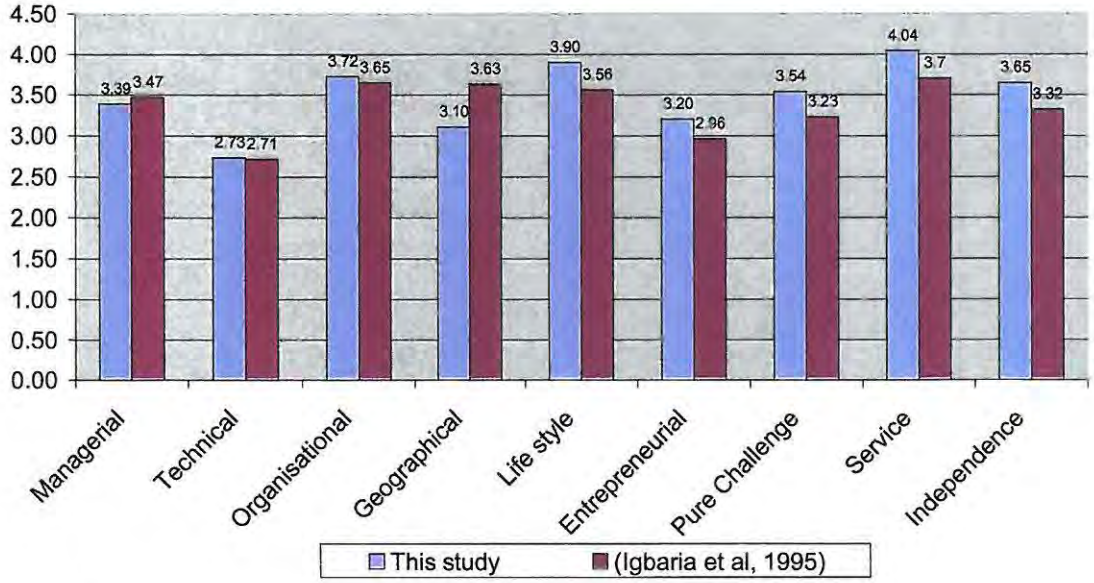

Figure 9-1: Comparison of Career Anchors across South African Studies

This study		Igbaria, et al (1995)	
1)	Service	1)	Service
2)	Life Style	2)	Organisational
3)	Organisational	3)	Geographical
4)	Independence	4)	Life Style
5)	Pure challenge	5)	Managerial
6)	Managerial	6)	Independence
7)	Entrepreneurial creativity	7)	Pure challenge
8)	Geographical	8)	Entrepreneurial creativity
9)	Technical	9)	Technical

Table 9-11: Comparison of Career Anchors across South African Studies

This study				Igbaria, et al (1995)			
Male		Female		Male		Female	
1)	Service	1)	Life Style	1)	Organisational	1)	Geographical
2)	Life Style	2)	Service	2)	Service	2)	Service

3)	Organisational	3)	Independence	3)	Geographical	3)	Life Style
4)	Independence	4)	Organisational	4)	Life Style	4)	Pure challenge
5)	Pure challenge	5)	Pure challenge	5)	Managerial	5)	Independence
6)	Managerial	6)	Managerial	6)	Independence	6)	Organisational
7)	Entrepreneurial creativity	7)	Technical	7)	Pure challenge	7)	Managerial
8)	Geographical	8)	Geographical	8)	Entrepreneurial creativity	8)	Entrepreneurial creativity
9)	Technical	9)	Entrepreneurial creativity	9)	Technical	9)	Technical

Table 9-12: Comparison of Male and Female Career Anchors across two Studies

This study did not show any large discrepancies between the career anchors of males and females. The career anchors were either ranked in the same place or within two places. The only major difference between the gender career anchors across the two studies is a reflection of the discrepancy of geographical career anchor found in the entire population.

9.3.2 Job Type and Skill Portfolio

The correlation between the first job type and the current job type is well understood. The traditional career path maps out future jobs from the entry level. An individual following a traditional career path can accurately predict what their future job type will be (current job type). The same applies to initial skills and current skills. An individual with a specific skill set initially and follows a traditional career path can accurately predict what skills they will acquire in the future (current skills). This empirical study reveals evidence that clearly suggests a traditional career path is one that is still firmly embedded in the IT profession.

75% of respondents had their initial skills in technology (Application Development, Internet systems, Database design and administration, and Systems infrastructure and integration). 63% of respondents also had their first job type in software system development or end user computing which are programmer orientated jobs. These figures differ greatly when considering the current jobs and skills. Current skills are

evenly distributed between analytical and critical thinking, business fundamentals, and interpersonal, communication, team skills. Less than half of the respondents who had initial skills in technology had their current skills in technology. The majority of those that had maintained technical skills were still in the early years of their career. Similarly 63% of respondents had current job types in management and consultancy with less than 20% currently occupying technical jobs. These figures reflect careers that are begun in a technical environment (programmer) and progress to managerial environments (managers) as suggested by the traditional linear career path.

9.3.3 Career Experience

There are various career management techniques and tools that are available to individuals and organisations. One of these is the setting up of an IT career path. This career path may be a linear career path or a multiple one. Initially it is just the presence of a formal career path that indicates organisations career management efforts. Only 40% of respondents said there organisations had a formal career path of any sort for IT professionals. This figure suggests there is not enough effort been put into career management. This is further emphasised by failure to utilise career anchors. Career anchors are available to play an important role in career management. The empirical study showed that industry has failed to take advantage of career management through career anchor knowledge. Only 24% of respondents had heard of career anchors, 15% had actually had theirs measured, and only 9% had their career anchors measured as part of a career management system.

Figure 9.2 shows that it is not only the organisations that are failing to participate in career management. 34% of respondents had failed to engage in career management experience including such options as informal advice and workshops. This suggests IT professionals are failing to explore career management techniques. This failure can not be attributed to a lack of support tools for career management. Of the 66% of respondents who had experienced career management 62% had made use of one or more career planning tools ranging from complex professional development schemes to simple workshops.

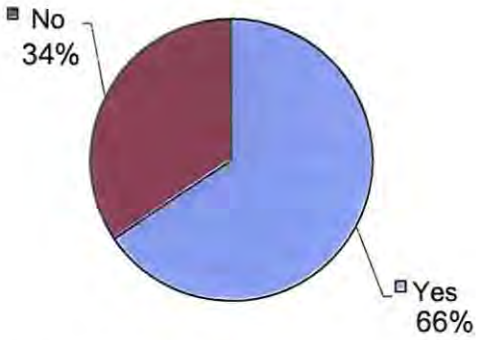

Figure 9-2: Respondents Career Management Experience

9.4 Recommendations and Modifications

Having confirmed or modified the CSFs and examined descriptive statistics it is now possible to make recommendations concerning IT career management and modifications to the EITCM model. Figure 9.3 shows the modified EITCM model and will be referred to as recommendations and modifications are examined. The modified areas of the EITCM model are highlighted by red ellipses in Figure 9.3.

The following changes have been made to the EITCM model:

1. *The 'Career Management' component from the original EITCM model has been replaced with the 'Appropriate Method of Career Management' component.* See Figure 9.3.

This modification is a direct result of the modified CSF 1. Modified CSF 1 recommends that an appropriate type of career management be selected. The original model proposed that the presence of career management was enough to ensure high job and career satisfaction. Further examination of career management and career and job satisfaction through the empirical study has shown that career management was not enough. The empirical study revealed that specific types of career management resulted in high job and career satisfaction. This finding resulted in the modification of CSF 1 and the original EITCM model.

The author recommends that career managers evaluate the individual, organisational, and dependent component and based on this evaluation select an appropriate career

management technique.

2. *The 'Effective Career Management' component from the original EICTM model has been modified to include a 'Medium Career Plateauing' and 'High Professional Plateauing' in place of 'Positive Plateau'.* See Figure 9.3.
3. *The 'Career Management' component from the original EITCM model has been modified to include an 'Awareness of impact on career plateau' factor that affects the new 'Appropriate Method of Career Management' component.* See Figure 9.3.

These modifications are a direct result of the modified CSF 3. Modified CSF 3 recommends that the experiencing of career management will result in high levels of professional plateauing and medium levels of career plateauing. The original model proposed that the experiencing of career management was enough to ensure positive levels of plateauing. However, further examination through the empirical study showed that career management was associated with high levels of professional plateauing and medium levels of career plateauing. The empirical study also revealed that the medium career plateauing levels associated with career management are not considered negative but neutral. The author is of the opinion that career management provides benefits that outweigh this single neutral outcome of medium career plateauing levels. Awareness of the effect of career plateauing may in fact negate the problem. If awareness of the problem does not negate the problem then effective career management can be considered to be achieved at levels of medium career plateauing. This finding resulted in the modification of CSF 3 and the original EITCM model.

The author recommends that career management still be implemented but with an additional awareness of its effects on career plateauing and the possibility that effective career management can be considered to be achieved at medium levels of career plateauing.

4. *The 'Dynamic Interactions' between the dependent component and career dynamics of the original EITCM model has been removed.* See Figure 9.3.

This modification is a direct result of the modified CSF 4. Modified CSF 4 reflects

the interactions of the dependent component and career dynamics are channelled through the individual and organisational components. The original model proposed direct interactions between the dependent component and career dynamics. Further examination of the dependent component and career dynamics through the empirical study has shown that there is no evidence of direct dynamic interaction between career dynamics and the dependent component. The empirical study revealed that there was no significant relationship between career variables and IT professional skills. This finding resulted in the modification of CSF 4 and the original EITCM model.

The author recommends that career management still account for the dependent component as it shares such strong interactions with the individual and organisational components.

5. *The 'Career Management' component from the original EITCM model has been modified to include the factor 'Suggested basis of carer anchors' for multiple career paths and their implementation that affects the new 'Appropriate Method of Career Management' component.* See Figure 9.3.

This modification is a direct result of the CSF 7. CSF 7 confirmed that there is a strong correlation between IT professional career anchors and their perceptions of transition out of the core IT area. This implies that there is a need to offer IT professionals alternative career paths to the traditional linear path. This is further emphasised by descriptive data surrounding job types and skills portfolios collected through the empirical study. The descriptive data shows a relationship of initial jobs and skills with current jobs and skills that is consistent with that of the outdated traditional linear career path. This finding confirmed CSF 7 and resulted in the modification of the original EITCM model.

The author recommends that this need for transition combined with the continued prevalence of the traditional linear career path be satisfied through the implementation of a multiple career path system. It is further recommended that career management consider the use of career anchors as a perspicacious basis for multiple career paths.

It is the author's recommendation that the final modified EITCM model be used as a

holistic picture for the dynamic interaction of factors affecting IT professional careers. The author recommends that career management make use of the EITCM and other career management tools. Career management tools should be utilised by organisations and the individuals who will benefit from them.

The author recommends that IT professionals take a more proactive role and utilise the tools and techniques available for effective management of their own careers. To allow individuals and managers to become more proactive in managing careers a simplified EITCM model is presented in Figure 9.4. The simplified EITCM model makes use of a step by step process to apply the career management and analysis proposed by the EITCM model. The simplified EITCM model and the final EITCM model are linked as shown in Table 9.3.

Simplified EITCM model	**Final EITCM model**
Step 1→ Determine Individual Factors	Individual Factors Component
Step 2→ Determine Organisational Factors	Organisational Factors Component
Step 3→ Determine Dependent Factors	Dependent Factors Component
Step 4→ Determine Career Variable Levels	Career Dynamics Component *Levels of Career variables*
Step 5→ Determine Compatibility	Career Dynamics Component *Compatibility*
Step 6a→ Effective Career Management	Effective Career Management Levels Component
Step 6b→ Implement Career Management	Appropriate Method of Career Management Component

Table 9-13: Connections between final and simplified EITCM model

Use of the simplified EITCM is dependent on knowledge and understanding of the final EITCM model shown in Figure 9.3, it does not replace it.

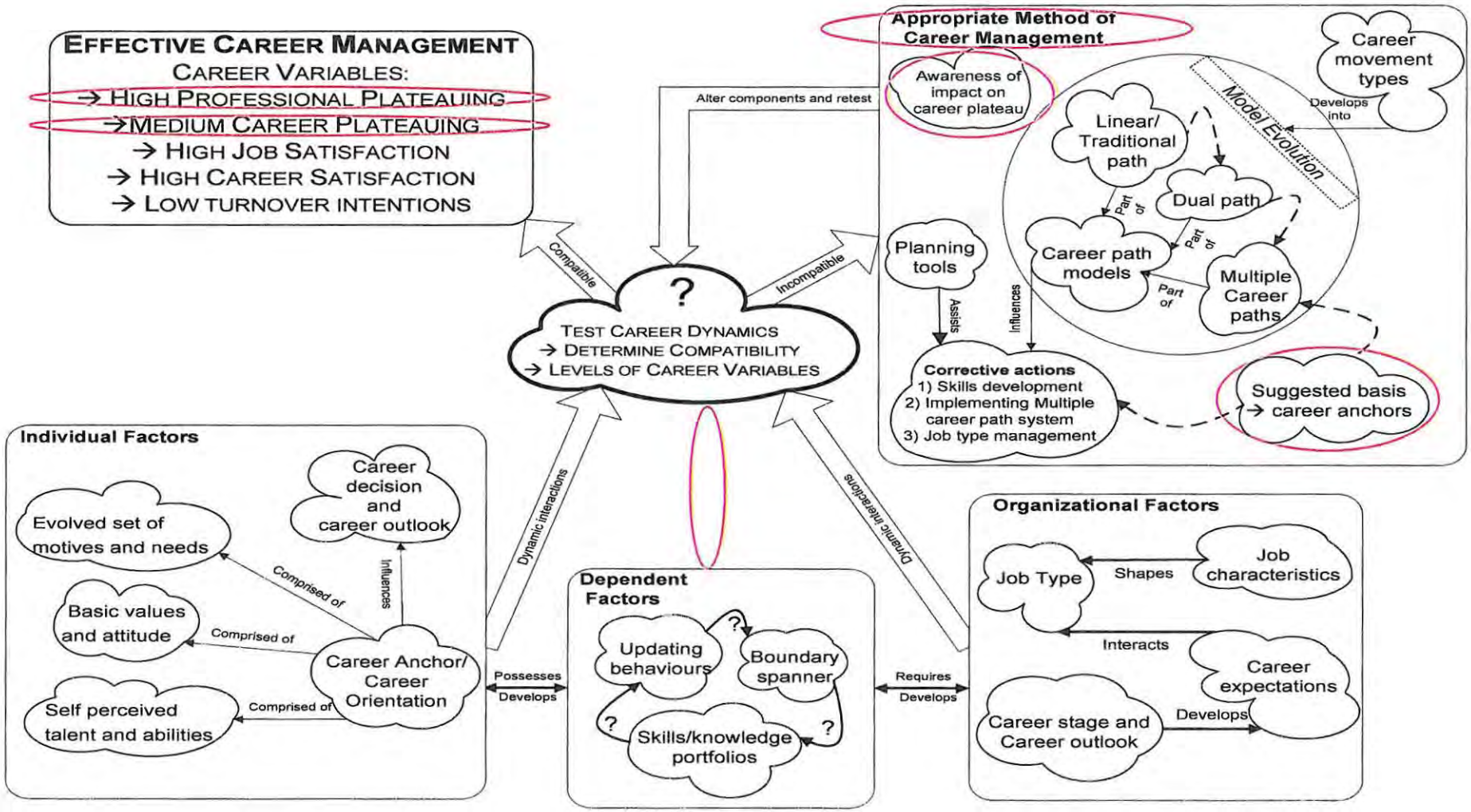

Figure 9-3: Modified EITCM model

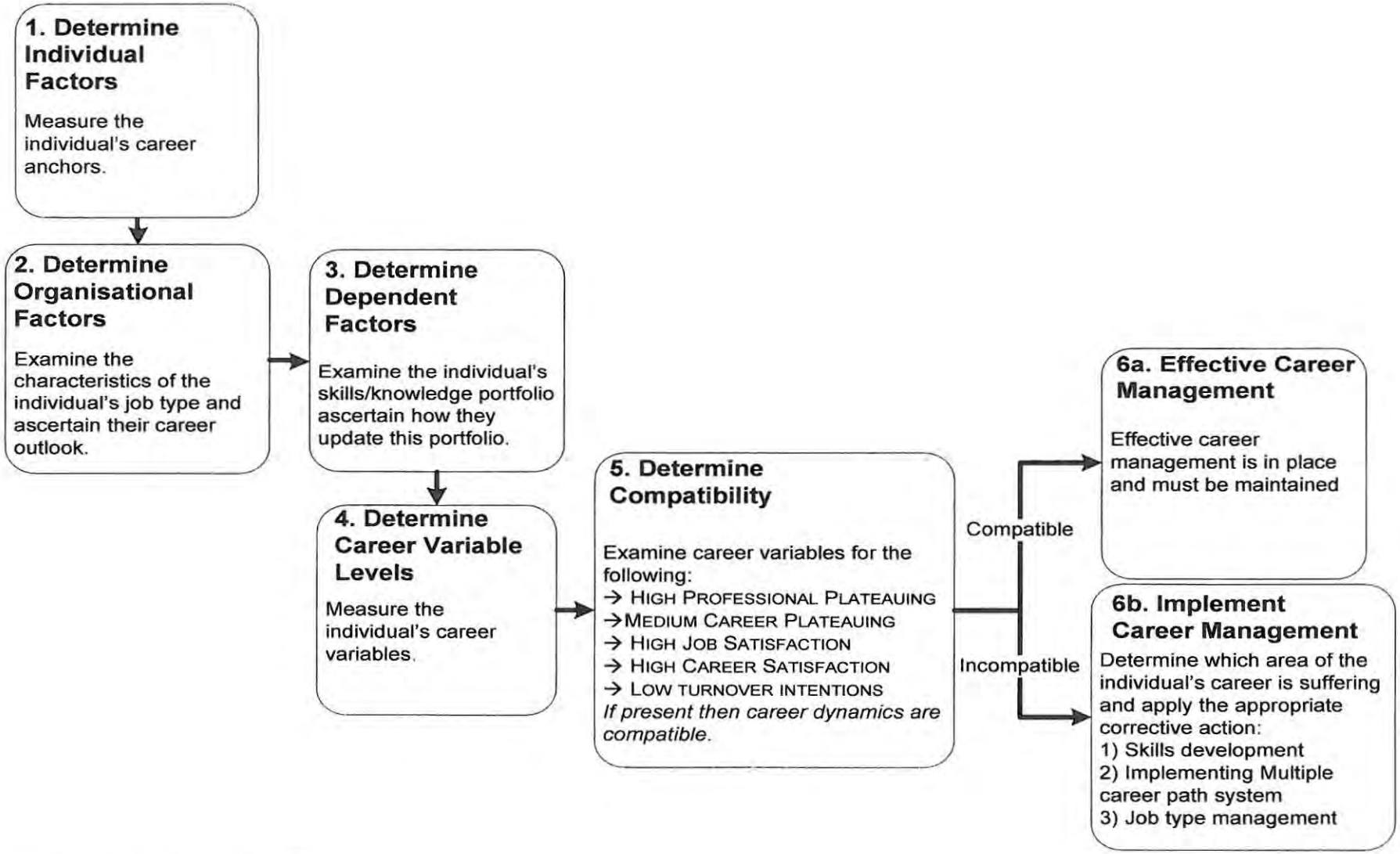

Figure 9-4: Simplified EITCM model

9.5 Conclusion

Following further examination and discussion of the CSFs all seven were confirmed. CSFs 1, 3, 4, 5, and 6 were confirmed after modification. CSFs 2 and 7 were confirmed with no modification necessary. Examination and comparison of descriptive statistics concerning career anchors, job types and skills, and career experience revealed interesting and insightful patterns concerning IT professional career management. Combining the modifications and patterns revealed by the CSFs and descriptive data allowed the author to make recommendations concerning IT professional career management. These recommendations were illustrated through modifications to the EITCM model and the addition of a simplified EITCM model for regular use. The modified EITCM model was presented and is considered the final proposed model.

This Chapter has discussed the results of the study into career management and made recommendations concerning effective career management. *Chapter 10* concludes the research by summarising the major aspects of the study and describing the contributions of the research to IT career management.

Chapter 10 Conclusion

10.1 Introduction

The research detailed in this thesis developed a model for EITCM that can be used to highlight and examine central areas affecting IT careers. This was accomplished and a final proposed model is presented in *Chapter nine.* This Chapter concludes the research.

Section 10.2 examines the methodology of the research. *Section 10.3* discusses the contributions of the research to the career management body of knowledge. The contributions of each CSF and each model component are examined. *Section 10.4* outlines possible areas of future research. *Section 10.5* concludes this Chapter and the research.

All seven confirmed CSFs and each of the EITCM models components make contributions towards the body of career management knowledge, as does the model as a whole. Future research relating to the EITCM model and other IT career related areas is suggested.

10.2 The Research

The research was undertaken in order to address the problem of insufficient information and awareness surrounding IT career management. The aim was to develop a model that highlighted the factors that influence the IT career, provide a means of measuring the compatibility of the various factors, and propose suggestions to adjusting the influencing factors when necessary.

To achieve this, general and IT specific literature was surveyed for information regarding: 1) Career anchors, 2) Job type characteristics, 3) Skill/knowledge portfolios, 4) Career management, 5) Career variables, 6) Career dynamics, and 7) Career paths. Using the knowledge provided by the literature an EITCM model was developed. CSFs were derived for the EITCM model and converted into hypotheses to be tested.

An empirical survey was designed to test the hypotheses and provide descriptive IT

career data. The survey was conducted amongst members of the CSSA and 129 utilisable responses were received. The results of the empirical study provided feedback that allowed the author to make recommendations concerning IT career management. The results of the empirical study required that some modification of the CSFs and EITCM model be made resulting in a final proposed EITCM model (Figure 9.3).

10.3 Contributions of the Research

Organisations and IT professionals are experiencing career related problems such as low satisfaction, early plateauing, high turnover, burnout, limited advancement potential, nominal corporate commitment, supervisory aversion, poor organisational culture, and exceptional compensation. These problems are worsened by the rapidly changing nature of the IT industry.

The EITCM model developed from the research provides IT career management with a holistic view of IT career management. It highlights the most essential areas influencing the IT career and provides corrective actions to alleviate problems.

The model consists of seven CSFs and five major components that require the attention of career management. The components, the CSFs and the overall model are listed below with their major contributions. Although there is some overlap between the contributions of the CSFs and of the components it is valuable to present them in this logical layout.

10.3.1 Model Component Contributions

Individual Factors

IT professionals possess diverse career anchors. These career anchors affect career decisions and are shaped by career experiences. This diversity must be recognized and catered for through appropriate career paths and training opportunities. The EITCM model highlights the need to be aware of the individual factors by considering an individual's evolved set of motives and needs, basic values and attitudes, and self perceived talent and abilities. The EITCM model suggests a means of measuring the individual factor through career anchors which determine career decisions and outlook. This knowledge can be used in conjunction with the other components of the

EITCM model to develop effective career management.

Organisational Factors

IT professionals occupy diverse job types. The job type desired by an individual is based on career expectations. These career expectations are met by an individual's career experience as determined by the job type characteristics. The job type characteristics must be recognized and structured to meet the career expectations. The EITCM model highlights the need to be aware of the organisational factors by considering job types and their associated characteristics. The EITCM model proposes that the interactions of an individual's career expectations with the job type they occupy be monitored. This interaction is then used to reflect the impact of organisational factors on an IT professional's career. This knowledge can be used in conjunction with the other components of the EITCM model to develop effective career management.

Dependent Factors

IT professionals possess diverse skills. These diverse skills are shaped by career decisions and job types characteristics. The skills can be updated through certain behaviours and provide a means by which individuals can make the transition out of the core IT area. The two way interaction between an individual, their job types and their skills must be recognized and understood in order to effectively manage the IT career. The EITCM model highlights the need to be aware of an individual's skills portfolio, their updating behaviours, and their ability to become boundary spanners. The EITCM model combines the knowledge of an individual's skills set with their individual factors and organisational factors in order to determine or predict its affect on their career. This knowledge can be used in conjunction with the other components of the EITCM model to develop effective career management.

Career Dynamics and Career Variables

Career dynamics provide am excellent means by which the success of a career and effectiveness of its management can be monitored. Monitoring the right combination of career variables allows career management to detect problems. The EITCM model highlights the need to be aware of the direct dynamic interactions between individual and organisational factors as well as their indirect interactions with the dependent

factors. The EITCM monitors these career dynamics though assessing their compatibility. The EITCM model proposes this compatibility be assessed through the levels of career variables such as, career and professional plateauing, job and career satisfaction, and turnover intentions. Acceptable levels of these career variables as indicated by the EITCM model verify compatible career dynamics. The acceptable career variable levels are: 1) High professional plateauing, 2) Medium career plateauing, 3) High job satisfaction, 4) High career satisfaction, and 5) Low turnover intentions. This knowledge can be used in conjunction with the other components of the EITCM model to develop effective career management.

Appropriate Method of Career Management

The EITCM model shows that incompatible career dynamics can be rectified. This can be achieved through corrective actions. The EITCM model highlights the need for knowledge of career movement types and career path models that influence corrective actions. The EITCM model shows that this knowledge assisted by career planning tools results in three proposed corrective actions: 1) Skills Development, 2) Implementing multiple career path system, and 3) Job type management. The EITCM model includes the need to conduct these corrective actions with an awareness of the neutralising impact they may have on career plateau. These corrective actions can induce the desired levels of career variables by adjusting the necessary dynamically interacting component.

EITCM Model

The major contribution of the holistic EITCM model is to create an awareness of IT career management and guide it in the right direction. It suggests areas where corrective efforts should be concentrated. One of the key contributions of the model and the research is showing the importance of active career management. Individuals and organisations should actively engage in career management for mutual benefit.

10.3.2 Critical Success Factor Contributions

CSF 1

It is critical that IT professionals experience an appropriate form of career guidance or management in order to experience:

- *High job satisfaction.*

- *High career satisfaction.*

CSF 1 shows that IT professionals who are receiving an appropriate form of career management are more likely to have high job and career satisfaction. The contribution of this CSF is that career management can be used to create happier more motivated IT professionals.

CSF 2

It is critical that IT professionals experience some form of career guidance or management in order to experience:

- *Low turnover intentions.*

CSF 2 shows that IT professionals who are receiving some form of career management are more likely to have low turnover intentions. The contribution of this CSF is that career management can be used to encourage organisational commitment. A well managed career will encourage valuable experienced IT professionals to remain with an organisation.

CSF 3

It is critical that IT professionals experience some form of career guidance or management in order to experience:

- *Medium career plateauing.*
- *High professional plateauing.*

CSF 3 shows that IT professionals who are receiving some form of career management are more likely to exhibit medium levels of career plateauing and high professional plateauing. The contribution of this CSF is that career management can be used to provide indiviudals with a long tenure within the IT profession that will end in a timely manner. Career management can provide indiviudals with a sufficient length career that will end in a timely manner.

CSF 4

It is critical to account for an IT professional's skills portfolio in order to understand how they will dynamically interact with:

- *Individual factors.*
- *Organisational factors.*

CSF 4 shows that IT professional skills portfolios have a two way interaction with individual and organisational factors. The contribution of this CSF is that IT skills portfolios must be monitored and managed well. Careful supervision of IT skills will have an impact on the IT professional career dynamics via the organisational and individual factors.

CSF 5

It is critical to account for an IT professional's job type in order to attain:

- *High levels of professional plateauing and contribute to the overall compatibility of career dynamics.*

CSF 5 shows that IT professionals' job type influences their careers. The contribution of this CSF is that IT job types must structured carefully. The correct combination of job type characteristics will have a positive impact on the IT professional's career dynamic especially through the career variable professional plateauing.

CSF 6

It is critical to account for an IT professional's career anchors (specifically entrepreneurial creativity, geographical, and pure challenge) in order to attain:

- *High levels of career satisfaction.*
- *High levels of career plateauing.*

and contribute to the overall compatibility of career dynamics.

CSF 6 shows that IT professionals' career anchors influence their careers. The contribution of this CSF is that IT professional career anchors must be identified. Individual's career anchors will have an impact on the IT professional's career dynamic especially through the career variables career plateauing and career satisfaction.

CSF 7

It is critical that IT professionals with different career anchors are provided with a multiple carer path that offers them the opportunity to make a transition out of the core IT area.

CSF 7 shows that IT professionals with different career anchors hold different perceptions of career transition. The contribution of this CSF is that IT professionals

have diverse career anchors and this must be provided for through diverse career paths. Multiple career paths will help IT professionals to satisfy their career anchors.

10.4 Future Research

The author recommends future research to be conducted in the following areas.

10.4.1 The Proposed Model

The proposed EITCM model has been validated through the research. However, the author is of the opinion that a longitudinal study that monitors the individual, organisational, dependent, and career management experiences of a sample of IT professionals be carried out.

10.4.2 Other areas

The following is a list of research areas that were out of scope of the research, but would produce information beneficial to IT career management:

- Empirical research into the implementing of multiple career paths based on career anchors.
- Development of standardised global IT skills and job type categorisations for the purpose of career related research.
- Investigation of the most suitable and most effective career management methods.
- Exploration of the influences of environmental factors, such as political policy, on IT careers.
- Further investigation into transition out of the core IT area.
- Investigating the relationship, if any, between specific career variable problems and specific influencing factors. This would allow incompatible career dynamics to be rectified more quickly.
- Investigating the applicability of the EITCM model to functional areas other than IT.

10.5 Concluding Remarks

This research creates an awareness of and provides information about IT career management. It was realised that the development of a model for EITCM within the South African environment would allow this aim to be achieved. After reviewing related literature the author constructed such a model. An empirical study was designed and launched to provide data that would test the CSFs relating to the proposed model. The results of the empirical study required modification of the CSFs and EITCM model before they were accepted. The development and testing of the EITCM model showed that there are advantages to both individuals and organisations of actively managing IT careers, it is hoped that the research contributes to a better understanding of IT career management.

Appendix A References

Agarwal, R., De, P., and Ferratt, T. (2001) How long will they stay? Predicting an IT professional's preferred employment duration. **Proceedings of the 2001 ACM SIGCPR conference on Computer personnel research**. San Diego, California, United States, pp 132-138. ACM Press.

Agarwal, R. and Ferratt, T. (1998) Recruiting, retaining, and developing IT professionals: an empirically derived taxonomy of human resource practices. **Proceedings of the 1998 ACM SIGCPR conference on Computer personnel research.** Boston, Massachusetts, United States, pp 292-302. ACM Press.

Agarwal, R. and Ferratt, T. (2000) Retention and the career motives of IT professionals. **Proceedings of the 2000 ACM SIGCPR conference on Computer personnel research**. Chicago, Illinois, United States, pp 158-166. ACM Press.

Agarwal, R. and Ferratt, T. (2002) Enduring practices for managing IT professionals. **Communications of the ACM.** Vol. 45(9), pp 73-79.

Ang, S. and Slaughter, S. (1995) Alternative employment structures in information systems: a conceptual analysis. **Proceedings of the 1995 ACM SIGCPR conference on Supporting teams, groups, and learning inside and outside the IS function reinventing IS**. Nashville, Tennessee, United States, pp 181-193. ACM Press.

Ashenhurst, R. (1972) A Report of the ACM Curriculum Committee on Computer Education for Management. **Communications of the ACM.** Vol. 15(5), pp 364-384.

Bailey, J. and Stefaniak, G. (2001) Industry perceptions of the knowledge, skills, and abilities needed by computer programmers. **Proceedings of the 2001 ACM SIGCPR conference on Computer personnel research**. San Diego, California, United States, pp 93-99. ACM Press.

British Computer Society (2003) **Professional Development.** [Online]. Available: http://www1.bcs.org.uk/portal/ [Accessed 12 May 2003]

Brousseau, K., Driver, M., Eneroth, K., and Larson, R. (1996) Career Pandemonium: Realigning organisations and individuals. **Academy of Management Executive.** Vol. 10(4), pp 4.

Cheney, P. (1988) Information systems skills requirements: 1980 & 1988. **Proceedings of the ACM SIGCPR conference on Management of information systems personnel.** College park, Maryland, United States, pp 1-7. ACM Press.

Cheney, P. and Lyons, N. (1980) Information System Skill Requirements: a Survey. **MIS Quarterly.** Vol. 4(2), pp 35-43.

Crepeau, R., Crook, C., Goslar, M., and McMurtrey, M. (1992) Career Anchors of Information Systems Personnel. **Journal of Management Information Systems.** Vol. 9(2), pp 145-161.

Crook, C. (1997) A study of the career orientations of information systems students and professionals. **Proceedings of the 1997 conference on Computer personnel research**. San Francisco, California, United States, pp 138-144. ACM Press.

Crook, C., Crepeau, R., and McMurtrey, M. (1991) Utilization of the career anchor/career orientation constructs for management of I/S professionals. **Proceedings of the 1991 conference on SIGCPR**. Athens, Georgia, United States, pp 26-31. ACM Press.

Dalton, G., Thompson, P., and Price, R. (1977) The four stages of Professional Careers: A new look at performance by professionals. **Organisational Dynamics.** Vol. 6(1), pp 19-42.

Delong, T. (1982) Re-examining the career anchor model. **Personnel.** Vol. 5(3), pp 50-61.

El-Sabaa, S. (2001) The skills and career path of an effective project manager. **International Journal of Project Management.** Vol. 19, pp 1-7.

Enns, H., Huff, S., and Golden, B. (2002) CIO influence behaviours: the impact of technical background. **Information & Management.** 2000, pp 1-19.

Evenson, B. (1974) Career development for computer programmers in the business environment. **Proceedings of the twelfth annual SIGCPR conference**. Boulder, Colorado, United States, pp 3-14. ACM Press.

Faasen, R. (1998) **Computers: the South African Education and Training Guide.** Woodbay Books, Cape Town.

Ference, T., Stoner, J., and Warren, K. (1977) Managing the Career Plateau. **Academy of Management Review.** Vol. 2(4), pp 602-612.

Ginzberg, M. and Baroudi, J. (1992) Career orientations of I.S. personnel. **Proceedings of the 1992 ACM SIGCPR conference on Computer personnel research**. Cincinnati, Ohio, United States, pp 41-55. ACM Press.

Gorgone, J., Davis, G., Valacich, J., Topi, H., Feinstein, D., and Longenecker, Jr. H. (2003) IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems. **Communications of the Association for Information Systems.** Vol. 11(1), pp 1-49.

Green, J. (1989) Perceived Importance of Systems Analysts' Job Skills, Roles and Non-Salary Incentives. **MIS Quarterly.** Vol. 13(2), pp 115-133.

Hackman, J. and Oldham, G. (1975) Motivation through the design of work: Test of a theory. **Organisational Behaviour and Human Performance.** Vol. 16, pp 150-179.

Heckman, R. (1998) Planning to Solve the "Skills Problem" in the Virtual Information Management Organization. **International Journal of Information Management.** Vol. 18(1), pp 3-16.

Hunter, M. (1998) Managing information systems professionals: implementing a skill assessment process. **Proceedings of the 1998 conference on Computer personnel research**. Boston, Massachusetts, United States, pp 19-27. ACM Press.

Igbaria, M. and Baroudi, J. (1993)	A short-form measure of career orientations: A psychometric evaluation. **Journal of Management Information Systems.** Vol. 10(2), pp 131-155.
Igbaria, M. and Greenhaus, J. (1992)	Determinants of MIS employees' turnover intentions: a structural equation model. **Communications of the ACM.** Vol. 35(2), pp 34-49.
Igbaria, M., Greenhaus, J., and Parasuraman, S. (1991)	Career Orientations of MIS Employees: An Empirical Analysis. **MIS Quarterly.** Vol. 15(2), pp 151-169.
Igbaria, M. and McCloskey, D. (1996)	Career orientations of MIS employees in Taiwan. **ACM SIGCPR Computer Personnel.** Vol. 17(2), pp 3-24.
Igbaria, M., Meredith, G., and Smith, D. (1995)	Career orientations of information systems employees in South Africa. **Journal of Strategic Information Systems.** Vol. 4(4), pp 319-340.
Ives, B., Valacich, J., Watson, R., Zmud, R., Alavi, M., Baskerville, R., Baroudi, J., Beath, C., Clark, T., Clemons, E., Davis, G., Davis, F., Dennis, A., El Sawy, O., Fedorowicz, J., Galliers, R., George, J., Ginzberg, M., Gray, P., Hirschheim, R., Jarvenpaa, S., Jessup, L., Kemerer, C., King, J., Konsynski, B., Kraemer, K., Luftman, J., March, S., Markus, M., Mason, R., McFarlan, F., McLean, E., L.Olfman, Olson, M., Rockart, J., Sambamurthy, V., Todd, P., Vitale, M., Weber, R., and Whinston, A. (2002)	What Every Business Student Needs to Know About Information Systems. **Communications of the Association for Information Systems.** Vol. 9(30), pp 467-477.

Jiang, J., Klein, G., and Balloun, J. (1995) The diverse career orientations of MIS personnel. **ACM SIGCPR Computer Personnel.** Vol. 16(4), pp 3-14.

Jiang, J., Klein, G., and Balloun, J. (2001) The joint impact of internal and external career anchors on entry-level IS career satisfaction. **Information & Management.** Vol. 39, pp 31-39.

Kaye, D. (1972) MIS career paths. **Proceedings of the tenth annual SIGCPR conference**. Toronto, Ontario, Canada, pp 123-134. ACM Press.

Klenke, K. (1993) Changing roles of information systems professionals: from technical managers to strategic leaders. **Proceedings of the 1993 conference on Computer personnel research**. St Louis, Missouri, United States, pp 214-225. ACM Press.

Lash, P. and Sein, M. (1995) Career paths in a changing IS environment: a theoretical perspective. **Proceedings of the 1995 ACM SIGCPR conference on Supporting teams, groups, and learning inside and outside the IS function reinventing IS**. Nashville, Tennessee, United States, pp 117-130. ACM Press.

Lee, D., Trauth, E., and Farwell, D. (1995) Critical Skills and Knowledge Requirements of IS Professionals: A Joint Academic/Industry Investigation. **MIS Quarterly.** Vol. 19(3), pp 313-340.

Lee, P. (1999) Career plateau and professional plateau: impact on work outcomes of information technology professionals. **ACM SIGCPR Computer Personnel.** Vol. 20(4), pp 25-38.

Leea, S., Kohb, S., Yena, D., and Tangc, H. (2002) Perception gaps between IS academics and IS practitioners: an exploratory study. **Information & Management.** Vol. 40, pp 51-61.

Leibowitz, Z., Kaye, B., and Farren, C. (1992) Multiple career paths. **Training and Development.** Vol. 46(10), pp 31-35.

Levinson, N. (1988) Repositioning the information systems management function: Implications for information systems personnel. **Proceedings of the ACM SIGCPR conference on Management of information systems personnel.** College park, Maryland, United States, pp 167-175. ACM press.

Lidtke, D. and Stokes, G. (1999) An information systems-centric curriculum, ISCC '99. **The Journal of Systems and Software.** Vol. 49, pp 171-175.

Lonergan, J. and Maher, K. (2001) The Relationship Between Job Characteristics and Workplace Procrastination as Moderated by Locus of Control. **Journal of Social Behavior & Personality.** Vol. 16(1), pp 213-225.

McLean, E., Smits, S., and Tanner, J. (1996) The career dynamics of information systems professionals: a longitudinal study. **ACM SIGCPR Computer Personnel.** Vol. 17(4), pp 3-26.

McLean, E., Tanner, J., and Smits, S. (1991) Self-perceptions and job preferences of entry-level information systems professionals: implications for career development. **Proceedings of the 1991 conference on SIGCPR**. Athens, Georgia, United States, pp 3-13. ACM Press.

McLean, E., Tanner, J., and Smits, S. (1994) The career outlooks of I/S professionals. **Proceedings of the 1994 computer personnel research conference on Reinventing IS: managing information technology in changing organizations**. Alexandria, Virginia, United States, pp 46-56. ACM Press.

Medcof, J. (1996) The job characteristics of computing and non-computing work activities. **Journal of Occupational & Organizational Psychology.** Vol. 69(2), pp 199-213.

Misic, M. and Russo, N. (1999) An assessment of systems analysis and design courses. **The Journal of Systems and Software.** Vol. 45, pp 197-202.

Mo Kaiser, K. and King, W. (1982) The Manager-Analyst Interface in Systems Development. **MIS Quarterly.** Vol. 6(1), pp 49-59.

Nakayama, M. and Sutcliffe, N. (2001) IT skills portfolio research in SIGCPR proceedings: analysis, synthesis and proposals. **Proceedings of the 2001 ACM SIGCPR conference on Computer personnel research**. San Diego, California, United States, pp 100-113. ACM Press.

Nelson, R. (1991) Educational Needs as Perceived by IS and End-User Personnel: A Survey of Knowledge and Skill Requirements Introduction. **MIS Quarterly.** Vol. 15(4), pp 502-525.

Potosky, D. and Ramakrishna, H. (1998) A conceptual framework for predicting the career success of IS professionals. **Proceedings of the 1998 conference on Computer personnel research**. Boston, Massachusetts, United States, pp 174-179. ACM Press.

Ramakrishna, H. and Potosky, D. (2002) Structural shifts in Career Anchors of Information Systems Personnel: A preliminary empirical analysis. **Journal of Computer Information Systems.** Vol. 42(2), pp 83-90.

Reich, B. and Kaarst-Brown, M. (1999) "Seeding The Line": Understanding The Transition From IT to Non-IT Careers. **MIS Quarterly.** Vol. 23(3), pp 337-360.

Richens, E. (1998) HR strategies for IS professionals in the 21st century. **Proceedings of the 1998 conference on Computer personnel research**. Boston, Massachusetts, United States, pp 289-291. ACM Press.

Ridings, C. and Eder, L. (1998) The determinants of job satisfaction for IS professionals in technical career paths. **Proceedings of the 1998 conference on Computer personnel research**. Boston, Massachusetts, United States, pp 170-173. ACM Press.

Ridings, C. and Eder, L. (1999) An analysis of IS technical career paths and job satisfaction. **ACM SIGCPR Computer Personnel.** Vol. 20(2), pp 7-26.

Schein, E. (1985) **Career Anchors: Discovering Your Real Values.** University Associates, Inc., San Diego, CA.

Schein, E. (1987)	**Individuals and Careers. Handbook of Organisational Behaviour**. Englewood Cliffs, NJ, pp 155-171. Prentice-Hall.
Shi, N. and Bennett, D. (1998)	Critical success factors for IS executive careers—evidence from case studies. **ACM SIGCPR Computer Personnel.** Vol. 19(3), pp 34-54.
Shore, E. (1983)	Reshaping the Organisation. **MIS quarterly.** Vol. 7(4), pp 11-18.
Slocum Jr, J., Cron, W., and Yows, L. (1987)	Whose Career is Likely to Plateau? **Business Horizons.** Vol. 30(2), pp 31-39.
Smits, S., McLean, E., and Tanner, J. (1997)	A longitudinal study of I/S careers: synthesis, conclusion, and recommendations. **Proceedings of the 1997 ACM SIGCPR conference on Computer personnel research.** San Francisco, California, United States, pp 36-48. ACM Press.
Smits, S., Tanner, J., and McLean, E. (1993)	Job characteristic preference-reality discrepancies and the job and career attitudes of I/S professionals. **Proceedings of the 1993 conference on Computer personnel research**. St Louis, Missouri, United States, pp 120-130. ACM Press.
Todd, P., McKeen, J., and Gallupe, R. (1995)	The Evolution of IS Job Skills: A Content Analysis of IS Job Advertisements From 1970 to 1990. **MIS Quarterly.** Vol. 19(1), pp 1-27.
Trauth, E., Farwell, D., and Lee, D. (1993)	The IS Expectation Gap: Industry Expectations Versus Academic Preparation. **MIS Quarterly.** Vol. 17(3), pp 293-307.
Wagner, J. and Benham, H. (1993)	Career paths in information systems: a longitudinal analysis. **Proceedings of the 1993 conference on Computer personnel research**. St Louis, Missouri, United States, pp 139-150. ACM Press.
Wynne, L., Ferratt, T., and Biros, D. (2002)	Career anchors of United States Air Force information systems workers: a turnover predictor? **Proceedings of the 2002 ACM SIGCPR conference on Computer personnel research**. Kristians and, Norway, pp 79-89. ACM Press.

Appendix B Online Questionnaire Printout

TURNOVER INTENTIONS AND CAREER PATHS OF IT PROFESSIONALS IN SOUTH AFRICA

This questionnaire is the cornerstone of a Master's research project investigating turnover intentions and career orientations of South African IT professionals.

The questionnaire should take approximately 15 minutes to complete and your participation will be most appreciated. All information will be recorded anonymously and will only be used for research purposes.

I acknowledge that I am participating in this research project of my own free will. I understand that I may refuse to participate without penalty. I understand that the information I supply on this questionnaire will be held in confidence and will be used for research purposes only.

Yes No

1. I am satisfied with the success I have achieved in my career	1	2	3	4	5
2. I am satisfied with the progress I have made toward achieving my overall career goals	1	2	3	4	5
3. Overall, I would say that my personal needs have been met with my current career	1	2	3	4	5
4. I am satisfied with my rate of promotion during my career	1	2	3	4	5
5. I am satisfied with the pay level I have achieved during my career	1	2	3	4	5
6. I am satisfied with the status that I have achieved during my career	1	2	3	4	5
7. Generally speaking, I am very satisfied with my job	1	2	3	4	5
8. I frequently think of changing my job	1	2	3	4	5
9. I am generally satisfied with the kind of projects I work on in my job	1	2	3	4	5

TURNOVER INTENTIONS

Please consider the statements reflecting turnover intentions below and select the number to the right of the statement which corresponds most closely to your desired response. Please try to avoid answering neutral.

```
1 = Highly unlikely / Never
2 = Somewhat unlikely / Occasionally
3 = Neutral / Neutral
4 = Somewhat likely / Often
5 = Highly likely / Constantly
```

10. How likely is it that you will actively look for a *different job* in the next year?	1	2	3	4	5
11. Do you intend to change the *organisation* with which you are now associated?	1	2	3	4	5
12. How likely is it that you will actively look for a *different profession* in the next year?	1	2	3	4	5

13. Do you intend to leave the *IT profession*?	1	2	3	4	5
14. How likely is it that you will seek employment outside South Africa in the near future?	1	2	3	4	5
15. How frequently do you think of leaving *your organisation*?	1	2	3	4	5
16. How frequently do you think of leaving the *IT profession*?	1	2	3	4	5

CAREER ORIENTATIONS INVENTORY

When answering the questions in this inventory, think about the kinds of criteria you have used in recent years to make decisions about job moves, company moves, whether or not to accept new assignments, and other career options. Also think about the kinds of criteria that are important to you as you consider future career decisions.

If you feel that your present or future criteria are different from those of the past, answer in terms of the present or future. It is important that you answer these questions in terms of how you look at these criteria now, and how they will influence future career decisions, even though some of the questions are worded in terms of the past. There are no right or wrong answers, except in terms of their importance to you, so be honest with yourself.

For each criterion or statement, please select the number that best describes how important or how true it has been and continues to be in your career decision. How important is each of the following statements for you? Please try to avoid answering neutral.

```
1 = Of no importance
2 = Slightly important
3 = Neutral
4 = Relatively important
5 = Very important
```

41. The process of supervising, influencing, leading and controlling people at all levels is ...	1	2	3	4	5
42. The chance to do things my own way and not be constrained by the rules of an organisation is ...	1	2	3	4	5
43. An employer who will provide security through guaranteed work, benefits, a good retirement program, etc, is ...	1	2	3	4	5
44. Working on problems that are almost insoluble is ...	1	2	3	4	5
45. Remaining in my specialised area as opposed to being promoted out of my area of expertise is ...	1	2	3	4	5
46. To be in charge of a whole organisation is ...	1	2	3	4	5
47. A career that is free from organisational restrictions is ...	1	2	3	4	5
48. An organisation that will give me long-run stability is ...	1	2	3	4	5
49. Using my skills to make the world a better place to live and work in is ...	1	2	3	4	5
50. Developing a career that permits me to continue to pursue my own lifestyle is ...	1	2	3	4	5
51. Building a new business enterprise is ...	1	2	3	4	5
52. Remaining in my area of expertise throughout my career is ...	1	2	3	4	5

53. To rise to a high position in general management is ... 1 2 3 4 5

54. Remaining in one geographical area rather than moving because of a promotion is ... 1 2 3 4 5

55. Being able to use my skills and talents in the service of an important cause is ... 1 2 3 4 5

How true is each of the following statements for you? Please try to avoid answering neutral.

1 = Not at all true
2 = Slightly true
3 = Neutral
4 = Relatively true
5 = Completely true

56. The only real challenge in my career has been confronting and solving tough problems, no matter what they were in 1 2 3 4 5

57. I am always on the lookout for ideas that would permit me to start and build my own enterprise 1 2 3 4 5

58. It is more important for me to remain in my present geographic location than to receive a promotion or new job assignment in another location 1 2 3 4 5

59. A career is worthwhile only if it enables me to lead my life in my own way 1 2 3 4 5

60. I will accept a management position only if it is in my area of expertise 1 2 3 4 5

61. I do not want to be constrained by either an organisation or the business world 1 2 3 4 5

62. I want a career in which I can be committed and devoted to an important cause 1 2 3 4 5

63. I feel successful only if I am constantly challenged by a tough problem or a competitive situation 1 2 3 4 5

64. Choosing or maintaining a certain lifestyle is more important than career success 1 2 3 4 5

65. I have always wanted to start and build up a business of my own 1 2 3 4 5

The previous 25 questions serve to measure your career anchors/orientations, the following 3 questions are designed to determine your experience with career anchors/orientations.

66. Have you previously heard of career anchors? Yes No

67. Have you previously had your career anchors measured in a similar manner or in any other way? Yes No

68. If you answered yes to Question 67 above, were your career anchors measured as part of a career management system? Yes No

SKILLS PORTFOLIO

94. Which would you consider your area of specialisation?

Business Fundamentals e.g. Business Models, Functional business areas, Evaluation of business performance
Analytical and Critical thinking e.g. Organizational problem solving, Ethics and Professionalism , Creativity
Interpersonal, Communication, Team skills e.g. Interpersonal team, Work and leadership, Communication
Technology e.g. Application Development, Internet systems, Database design and administration, Systems infrastructure and integration

Initially entered the IT Profession Currently

Other: Other:

95. Please rank these areas of skill in order of importance to the IT professionals' career. Where number 1 is the skill you consider the most important and number 4 is the one you consider the least.

Systems Analysis and Design e.g. Systems analysis, Logical and physical design	1st
Business Process Design e.g. Strategic utilization of information technology and systems, IT planning	2nd
Systems Implementation e.g. Design execution, Testing	3rd
IT Project Management e.g. Deployment, Maintenance, Use of IT, Customer service	4th

JOB POSITIONS

96. Which would you consider your area of specialisation?

End User Computing e.g. Product trainer, Installation and support technician

Systems Analysis e.g. Business Information Analyst, Systems Analyst

Software Systems Development e.g. Software Engineer, Application Programmer

Systems Management e.g. Database Administrator, Systems Programmer, Computer operations

Networks e.g. LAN architect, LAN Supervisor, LAN Administrator, WAN Architect, Email Specialist, Internet Engineer, We Page Developer

Consultant e.g. Business Consultant, Technical Consultant

Management e.g. CIO, Line Manager

Current Job Position	First Job Position	Other significant Job Position
Years in job position: year(s)	Years in job position: year(s)	Years in job position: year(s)

CAREER PLATEAU

Please indicate your agreement or disagreement with each of the following items by selecting the number to the right of each statement that corresponds most closely to your desired response. Please try to avoid answering neutral.

1 = Strongly disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly agree

97. I believe that I am getting ahead in my organisation	1	2	3	4	5
98. I believe my promotion opportunities have been limited in my organisation	1	2	3	4	5
99. I think I have stayed at my current job for much too long	1	2	3	4	5

PROFESSIONAL PLATEAU

Please indicate the accuracy of the following statements by selecting the one number to the right of each statement that corresponds most closely to your desired response. Please try to avoid answering neutral.

1 = Very Inaccurate
2 = Inaccurate
3 = Neutral
4 = Accurate
5 = Very Accurate

100. My job provides opportunities to learn skills that keep me up to date in my profession	1	2	3	4	5
101. My job is challenging	1	2	3	4	5
102. I am constantly learning new things in my job	1	2	3	4	5
103. I like the contents of my job					

BENEFIT/NEED FOR TRANSITION

Please indicate whether you agree or disagree with the following statements by selecting YES or NO to the right of each statement.

104. In your opinion does an IT professional need to specialise in order to have a successful career?	Yes	No
105. In your opinion will a transition to a non-core-IT job be beneficial to an IT professional?	Yes	No
106. In your opinion is it necessary to make a transition to a non-core-IT job in order to have a successful long-lasting career?	Yes	No

CAREER MANAGEMENT EXPERIENCES

Please indicate your career management experiences by answering the following questions.

107. Does your organisation have any type of formal career path that an IT professional may follow?	Yes	No
108. Have you ever experienced any of the following career path management or guidance?		
a) Formal advice from an appointed mentor/manager	Yes	No
b) Formal advice from an HR councillor	Yes	No
c) Informal advice from an HR councillor	Yes	No
d) Advice as part of a recruitment program	Yes	No
e) Advice from an external source hired by your organisation or yourself	Yes	No
f) None at all	Yes	No
g) Other Please Specify		

Please answer the following two questions if you answered that you had received some form of career path management or guidance in the above question

109. Please indicate the timeline in which you revised your last career path management or guidance

110. Did this career management involve any forms of planning tools or applications?

a) Career Development Framework	Yes	No
b) Professional Development Scheme	Yes	No
c) Professional Development Portfolio	Yes	No
d) Workshops	Yes	No
e) Career orientation evaluation	Yes	No
f) The Potentia System	Yes	No

g) Other

BACKGROUND INFORMATION

The remaining questions in the survey are concerned with your background and work experience. This information will help identify trends in data for different groups of employees and will allow for comparisons with similar research. Please remember that responses are completely anonymous and confidential. No one from your organisation will have access to any individual's responses to any of the items in this survey.

i. Province

Eastern Cape
Gauteng
Free State
KwaZulu-Natal
Limpopo
Mpumalunga
Northern Cape
North West
Western Cape

ii. Gender Male Female

iii. Age Group

Younger than 20
20 - 29
30 - 39
40 - 49
50 - 59
60 or older

iv. Race - (Demographic analysis only.)

African
Asian
White
Coloured
Other

v. What is the highest level of education you have completed?

< Matric

Matriculation
Diploma
Professional Certification (e.g. MCSE, Oracle, Novell)
Bachelors Degree
Honours Degree
Masters Degree
PhD
Other Postgraduate Degree

vi. What is your current functional or departmental area?

Accounting
Education
Engineering
Finance
Human Resources
Information Systems/technology
Legal
Manufacturing
Marketing/Sales
Operations
Purchasing
Research and Development
Other (please specify)

vii. What is your level in the organisational hierarchy?

Professional Staff (for example, Programmer, Analyst, Consultant)
First Level Supervisor
Middle Management (Department Head)
Strategic Management (Executive)
Owner / Partner
Other (please specify)

viii. For how many years have you been employed in the IT field (to the nearest year)?

Years

ix. For how many years have you been employed in your current organisation (to the nearest year)?

Years

x. For how many years have you been employed in your current position (to the nearest year)?

Years

Thank you very much for your cooperation. Please check that you have answered all questions. If you would like to receive a summary of this research after it has been evaluated, please fill in your name and contact details below.

Name:

Address:

Email:

If you have any comments you would like to make, please feel free to write them below.