



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

# TOWARDS A THEORETICAL FRAMEWORK FOR FEMALE IT PROFESSIONALS' ADVANCEMENT TO IT EXECUTIVE POSITIONS: A SOUTH AFRICAN PERSPECTIVE

by

**Mosima Jane Meela**  
(Student Number: 12352269)

Submitted in partial fulfilment of the requirements for the degree

Philosophiae Doctor (Information Technology)

in the

Faculty of Engineering, Built Environment and Information Technology

at the

UNIVERSITY OF PRETORIA

Supervisor:  
Dr H. W. Pretorius

Co-supervisors:  
Dr M. J. Hattingh  
Prof. C. de Villiers

Date of submission  
21/05/2018

## ABSTRACT

The representation of female Information Technology Executives in South Africa is far from ideal. Research shows that there are more women in Information Technology management support functions than in leadership roles. Even though every year the total number of Information Technology Executives profiled has increased, from 153 in 2011 to 172 in 2016, only 10% average of them are female. This is despite women comprising the majority of South Africa's population. Given the existence of female Information Technology Executives, albeit a few, this study discusses factors that contribute to the success of South African female Information Technology professionals in achieving Information Technology Executive positions, despite the challenges they are faced with. A qualitative research approach was followed in conducting the study. Data was gathered using semi-structured interviews with fifteen (15) South African female Information Technology Executives. The Individual Differences Theory of Gender and Information Technology was employed to understand each Information Technology Executive's influence on her career progression. The results indicated the approximate age that female Information Technology professionals are likely to achieve Information Technology leadership levels. In addition, the results indicated the type of Information Technology management experience that is advantageous to female Information Technology professionals' advancement to Information Technology Executive positions. Considering the masculine nature of the Information Technology field, the results further indicated the type of support structures that are valuable in manoeuvring through the Information Technology leadership labyrinth. The study also found that cultural beliefs were changing to accommodate and accept femininity within masculine roles. The study contributes to both academia and the Information Technology industry. First, Eileen Trauth's Individual Differences Theory of Gender and Information Technology theory was used to understand how Information Technology career challenges faced by South African female Information Technology professionals could be overcome to reach Information Technology Executive positions. Secondly, the adoption of interpretive methods enabled an analysis of multiple case studies, thereby adding to the body of knowledge on women in Information Technology. Lastly, the research findings were used to develop a theoretical framework that female Information Technology professionals in South Africa could adopt on their career advancement journeys. This, in turn, may improve the representation of female Information Technology Executives in South Africa.

**Keywords:** *Female IT Executives, IDTGIT, IT career advancement*

## DECLARATION

I declare that this thesis is my own work and that I have referenced all the sources that I have used and that no part was previously submitted at any tertiary institution.

---

***Mosima Jane Meela***

## ACKNOWLEDGEMENTS

First and foremost, I express my sincerest gratitude to the almighty God, for without Him my pursuit for a doctoral degree would not have been possible. I thank Him for the strength he gave me throughout this journey.

To my late father, I am forever thankful for all the sacrifices he has made to afford his children the opportunity to have an education. You continue to inspire me in memory. To my dearest mother, whose tremendous love and constant support encouraged me to soldier on when I was on the brim of giving up. My beloved siblings and cousins, thank you for the emotional support.

I could not have successfully completed my PhD without the guidance and wisdom of my supervisor Dr H Pretorius and co-supervisors Dr M J Hattingh and Prof. C. de Villiers. Thank you for graciously holding my hand and seeing me through to the end. You gave me valuable feedback with so much humility. I am eternally grateful.

I also acknowledge the kind assistance of Khomotso Bopape of Let's Edit (Pty) Ltd for helping with the editing of my thesis.

I am also thankful to all my friends and colleagues for their prayers and understanding during this process. Moloisi Mabeba, your visits and regular messages of love gave me strength. My support system, Nombulelo Lekota and Nita Mennega, thank you for the continuous encouragement and unfailing support throughout this journey. I cherish and value the friendship we have built.

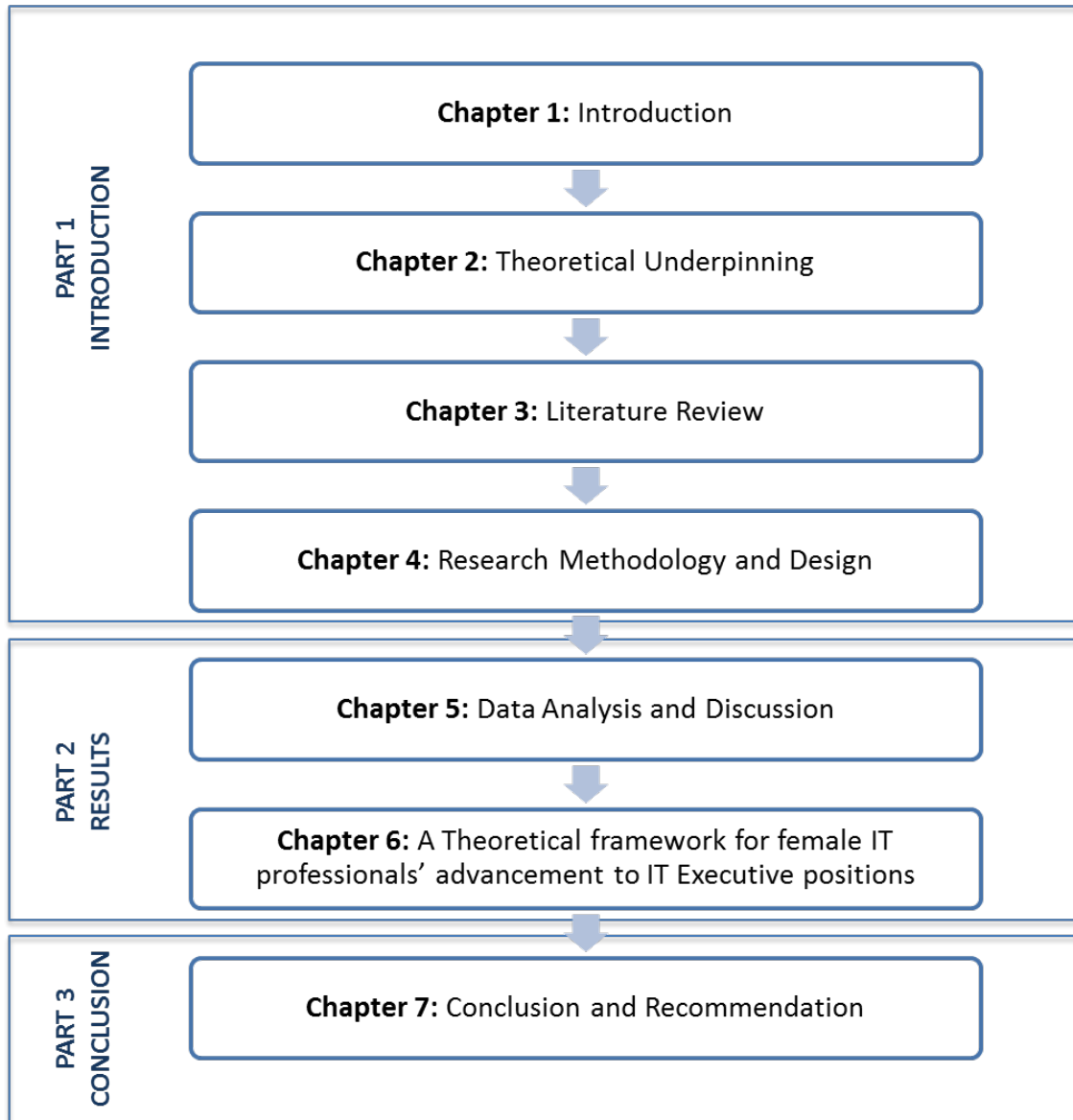
This research would not have been possible without the willingness of the female Information Technology Executives who participated in my study. You took time in your busy schedules to share your experiences with me. You are true examples of possibility and perseverance for female Information Technology professionals in South Africa.

The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged.

Last but not least, my employer, Armscor, for providing financial support towards this research.

## THESIS MAP

The thesis map shown below illustrates the structure of the thesis. A block highlighted in blue ( ) will indicate the current position of the reader in the thesis.



## TABLE OF CONTENTS

ABSTRACT.....	ii
DECLARATION .....	iv
ACKNOWLEDGEMENTS .....	v
THESIS MAP.....	vi
LIST OF FIGURES .....	xi
LIST OF TABLES .....	xiii
ABBREVIATIONS AND ACRONYMS.....	xv
TERMS AND DEFINITIONS .....	xvii
1 INTRODUCTION .....	2
1.1 INTRODUCTION.....	3
1.2 PROBLEM BACKGROUND.....	5
1.2.1 The international situation.....	7
1.2.2 The South African situation .....	9
1.3 PROBLEM STATEMENT.....	11
1.4 RESEARCH MOTIVATION AND SIGNIFICANCE.....	11
1.5 RESEARCH OBJECTIVES AND QUESTIONS .....	13
1.6 DELINEATION AND LIMITATIONS .....	15
1.7 UNDERLYING ASSUMPTIONS .....	15
1.8 EXPECTED CONTRIBUTIONS OF THE STUDY .....	16
1.9 THESIS STRUCTURE .....	16
1.10 CONCLUSION .....	18
2 THEORETICAL UNDERPINNING .....	21
2.1 INTRODUCTION.....	22
2.2 INDIVIDUAL DIFFERENCES THEORY OF GENDER AND INFORMATION TECHNOLOGY.....	22
2.3 RATIONALE FOR THE CHOICE OF THEORY .....	27
2.4 CONCLUSION .....	29
3 LITERATURE REVIEW .....	32
3.1 INTRODUCTION.....	33

3.2	SCOPE OF LITERATURE .....	33
3.3	THEME A: DESCRIBING THE JOB OF THE IT EXECUTIVE .....	36
3.3.1	Evolution of the role of the IT Executive .....	37
3.3.2	The IT Executive job description .....	38
3.3.3	THEME A Summary.....	57
3.4	THEME B: UNDERSTANDING THE IT CAREER PATHWAY .....	58
3.4.1	Shrinking IT career pipeline .....	61
3.4.2	IT career anchors .....	65
3.4.3	THEME B Summary.....	69
3.5	THEME C: THE CONCEPT OF LEADERSHIP .....	70
3.5.1	Leadership traits.....	72
3.5.2	Gender and leadership.....	75
3.5.3	THEME C Summary.....	84
3.6	THEME D: BARRIERS IN IT .....	85
3.6.1	The glass ceiling .....	86
3.6.2	The leadership labyrinth.....	88
3.6.3	THEME D Summary.....	92
3.7	THEME E: EXPLAINING THE SOUTH AFRICAN IT SECTOR .....	93
3.7.1	South Africa's ICT labour market .....	95
3.7.2	Participation of women in IT .....	98
3.7.3	THEME E Summary.....	102
3.8	THEME F: THE CONCEPT OF CULTURE .....	103
3.8.1	Hofstede's dimensions of culture .....	109
3.8.2	Gender roles .....	116
3.8.3	THEME F Summary.....	118
3.9	CONCLUSION .....	119
4	RESEARCH METHODOLOGY AND DESIGN .....	123
4.1	INTRODUCTION.....	124
4.2	RESEARCH PHILOSOPHY .....	125
4.2.1	Interpretive research .....	126
4.2.2	Motivation for using interpretivism.....	127
4.3	RESEARCH DESIGN .....	129
4.3.1	Research strategy .....	131



4.3.2	Case study research .....	136
4.3.3	Motivation for using case study approach .....	138
4.3.4	Data collection .....	139
4.3.5	Data analysis .....	143
4.4	ETHICAL CONSIDERATIONS.....	147
4.5	CONCLUSION .....	148
5	DATA ANALYSIS AND DISCUSSION.....	151
5.1	INTRODUCTION.....	152
5.2	PROFILES OF FEMALE IT EXECUTIVES .....	153
5.2.1	Summary of participant demographics.....	169
5.3	RESULTS .....	172
5.3.1	Individual identity construct.....	173
5.3.2	Individual influences construct .....	185
5.3.3	Environmental influences construct.....	205
5.4	CONCLUSION .....	212
6 A	THEORETICAL FRAMEWORK FOR FEMALE IT PROFESSIONALS' ADVANCEMENT TO IT EXECUTIVE POSITIONS .....	215
6.1	INTRODUCTION.....	216
6.2	TOWARDS A THEORETICAL FRAMEWORK FOR FEMALE IT PROFESSIONALS' ADVANCEMENT TO IT EXECUTIVE POSITIONS.....	216
6.2.1	Construction of the theoretical framework.....	218
6.3	CONCLUSION .....	229
7	CONCLUSION AND RECOMMENDATIONS .....	232
7.1	INTRODUCTION.....	233
7.2	ANSWERS TO RESEARCH QUESTIONS .....	233
7.2.1	Addressing the secondary research questions .....	234
7.2.2	Addressing the primary research question.....	240
7.3	EVALUATION OF CONTRIBUTION TO THE BODY OF KNOWLEDGE.....	241
7.3.1	Criteria for evaluating contribution to knowledge in Information Systems research .....	242
7.4	CONTRIBUTIONS OF THE STUDY .....	244
7.5	RECOMMENDATIONS FOR FURTHER RESEARCH .....	245

7.6	CONCLUDING REMARKS .....	246
	REFERENCES .....	247
	APPENDIX A – PARTICIPANT DEMOGRAPHICS FORM.....	274
	APPENDIX B – INTERVIEW QUESTIONS .....	276

## LIST OF FIGURES

Figure 1-1: Proportion of women leadership roles globally .....	6
Figure 1-2: South African IT Executives by gender.....	10
Figure 2-1: Relationship between IDTGIT constructs and literature study themes .....	31
Figure 3-1: Scope of literature .....	33
Figure 3-2: Relationship between IDTGIT constructs and literature study themes .....	35
Figure 3-3: Model of Managing .....	41
Figure 3-4: Leadership skills and career .....	51
Figure 3-5: Framework for career development of women in IT .....	59
Figure 3-6: Leaky pipeline.....	61
Figure 3-7: Social and structural determinants of women’s careers in IT.....	68
Figure 3-8: Components of gender stereotyping.....	80
Figure 3-9: Leadership labyrinth for gender-leadership gaps.....	88
Figure 3-10: ICT sector contribution to gross value added compared with other industries .....	93
Figure 3-11: Number of employees .....	96
Figure 3-12: IT skills shortage causes .....	97
Figure 3-13: Employee gender distribution in the IT sector.....	101
Figure 3-14: Three levels of uniqueness in mental programming .....	105
Figure 3-15: Manifestations of culture at different levels of depth.....	106
Figure 4-1: Research onion .....	124
Figure 4-2: Research design.....	130
Figure 4-3: Qualitative data analysis phases .....	143
Figure 5-1: Participant population group composition .....	169
Figure 5-2: Percentage composition by age .....	170
Figure 5-3: Percentage composition by marital status .....	170
Figure 5-4: Percentage composition by IT leadership experience .....	172
Figure 5-5: Thematic content map .....	173
Figure 5-6: Responsibilities of female IT Executives .....	182
Figure 5-7: Support received by participants .....	201
Figure 6-1: Stage model of barriers that affect women’s IT career .....	217
Figure 6-2: Barriers to IT career advancement .....	218

Figure 6-3: Influences of women’s IT career development .....219

Figure 6-4: Individual identity factors for female IT professionals’ career progression.....222

Figure 6-5: Individual influence of female IT professionals’ career progression.....225

Figure 6-6: Environmental influences of female IT professionals’ career progression.....227

Figure 6-7: A theoretical framework for female IT Professional’s advancement to IT  
Executive positions .....228

Figure 7-1: Female IT Executive career path.....239

## LIST OF TABLES

Table 1-1: Summary of Chapter 1 .....	20
Table 2-1: IDTGIT constructs and sub-constructs .....	26
Table 2-2: Implications of theory choice.....	30
Table 3-1: General IT Executive responsibilities.....	40
Table 3-2: Mintzberg's managerial roles .....	45
Table 3-3: IT Executive roles .....	46
Table 3-4: Summary and insights of Theme A: The IT Executive job .....	58
Table 3-5: IT categories .....	60
Table 3-6: Factors contributing to the leaking IT career pipeline .....	64
Table 3-7: Summary and insights of Theme B: IT career pathway .....	70
Table 3-8: Leadership traits .....	73
Table 3-9: Male and Female characteristics .....	79
Table 3-10: Comparison between descriptive and prescriptive stereotypes .....	80
Table 3-11: Summary and insights of Theme C: Leadership.....	85
Table 3-12: Summary and insights of Theme D: IT barriers .....	92
Table 3-13: Number of IT companies in South Africa .....	94
Table 3-14: Summary and insights of Theme E: South Africa's IT sector .....	102
Table 3-15: Characteristics of cultural dimensions .....	113
Table 3-16: Hofstede's criticisms .....	116
Table 3-17: Summary and insights of Theme F: Culture.....	119
Table 4-1: Comparison of research strategies .....	135
Table 4-2: Case study quality tests.....	138
Table 4-3: Sampling techniques .....	141
Table 4-4: Phases of data analysis.....	144
Table 4-5: Phases of coding .....	146
Table 4-6: Summary of methodology and design .....	149
Table 5-1: Profile of IT Executive 1 .....	154
Table 5-2: Profile of IT Executive 2.....	155
Table 5-3: Profile of IT Executive 3.....	156
Table 5-4: Profile of IT Executive 4.....	157
Table 5-5: Profile of IT Executive 5.....	158

Table 5-6: Profile of IT Executive 6 .....	159
Table 5-7: Profile of IT Executive 7 .....	160
Table 5-8: Profile of IT Executive 8 .....	161
Table 5-9: Profile of IT Executive 9 .....	162
Table 5-10: Profile of IT Executive 10 .....	163
Table 5-11: Profile of IT Executive 11 .....	164
Table 5-12: Profile of IT Executive 12 .....	165
Table 5-13: Profile of IT Executive 13 .....	166
Table 5-14: Profile of IT Executive 14 .....	167
Table 5-15: Profile of IT Executive 15 .....	168
Table 5-16: Summary of participants' demographic data.....	171
Table 5-17: Individual identity construct related questions and objectives.....	174
Table 5-18: Individual identity construct themes .....	175
Table 5-19: Data analysis extract for individual identity construct.....	176
Table 5-20: Participants' career sequences.....	179
Table 5-21: Individual influences construct related questions and objectives.....	187
Table 5-22: Individual influences construct themes .....	188
Table 5-23: Data analysis extract for individual influences construct.....	190
Table 5-24: IT career selection theme .....	191
Table 5-25: Summary of participants' adopted personality traits .....	195
Table 5-26: Female IT Executive leadership traits.....	196
Table 5-27: Participants' formal IT qualifications .....	198
Table 5-28: Training courses for soft skills.....	200
Table 5-29: Environmental influences construct related questions and objectives .....	206
Table 5-30: Environmental influences construct themes .....	206
Table 5-31: Data analysis extract for environmental influences construct .....	207
Table 7-1: Female IT professionals' strategies for overcoming barriers in IT.....	236
Table 7-2: Types of theories in IS research .....	243

## ABBREVIATIONS AND ACRONYMS

BWASA	: Business Women's Association of South Africa
CEO	: Chief Executive Officer
CFO	: Chief Financial Officer
CIO	: Chief Information Officer
COO	: Chief Operating Officer
DoL	: Department of Labour
EU	: European Union
GDP	: Gross Domestic Product
HEMIS	: Higher Education Management Information System
IBM	: International Business Machines
ICASA	: Independent Communications Authority of South Africa
ICT	: Information and Communication Technology
IS	: Information Systems
IT	: Information Technology
MAS	: Masculinity versus Feminity
MICT SETA	: Media, Information and Communication Technologies Sector Education and Training Authority
PD	: Power Distance
PDI	: Power Distance Index
SA	: South Africa

STATSSA : Statistics South Africa

TCA : Thematic Content Analysis

TMT : Top Management Team

US : United States of America



## TERMS AND DEFINITIONS

### Information Technology (IT)

IT is a term that commonly used to refer to all things related to computers because it covers all derivations of Computer Science, Information and Communication Technology (ICT), Computing, and Information Systems (Lang, 2007: 206). It includes a combination of software, hardware, and services (James, Beeby, Moutloutsi, Shackleton & Evans, 2006; Sivakumar & Tamilselvan, 2014). Any form of technology that is used to create, store, transmit, and use information of any type falls within the IT space. Much of IT has to do with the integration of computer and communication technologies and multimedia. The term IT is sometimes referred to as ICT (Moghaddam, 2010: 722).

### IT Executives

Guadalupe, Li and Wulf (2014) define executive managers as the CEO and the managers that report directly to him or her. They “have a significant leadership role in the organisation; have control over day-to-day operations and have decision-making powers” (Catalyst, 2005; BWASA, 2015). From an IT point of view, these executive managers are accountable and responsible for ensuring the proper management of IT operations. They are the highest-ranking executives within the IT fraternity and are often members of top management teams (Chen & Preston, 2007; Fortino, 2008: 139; Preston, Chen & Leidner, 2008; Chen & Wu, 2011; Karanja & Zaveri, 2012). IT Executives occupy executive positions such as Chief Information Officer (CIO), IT Director, Chief Technology Officer (CTO), and Chief Operations Officer (COO). Keeping in mind that these roles are executive roles, Peppard (2010: 75) posits that the label given to the incumbent is not as important as the role that he or she fulfils.

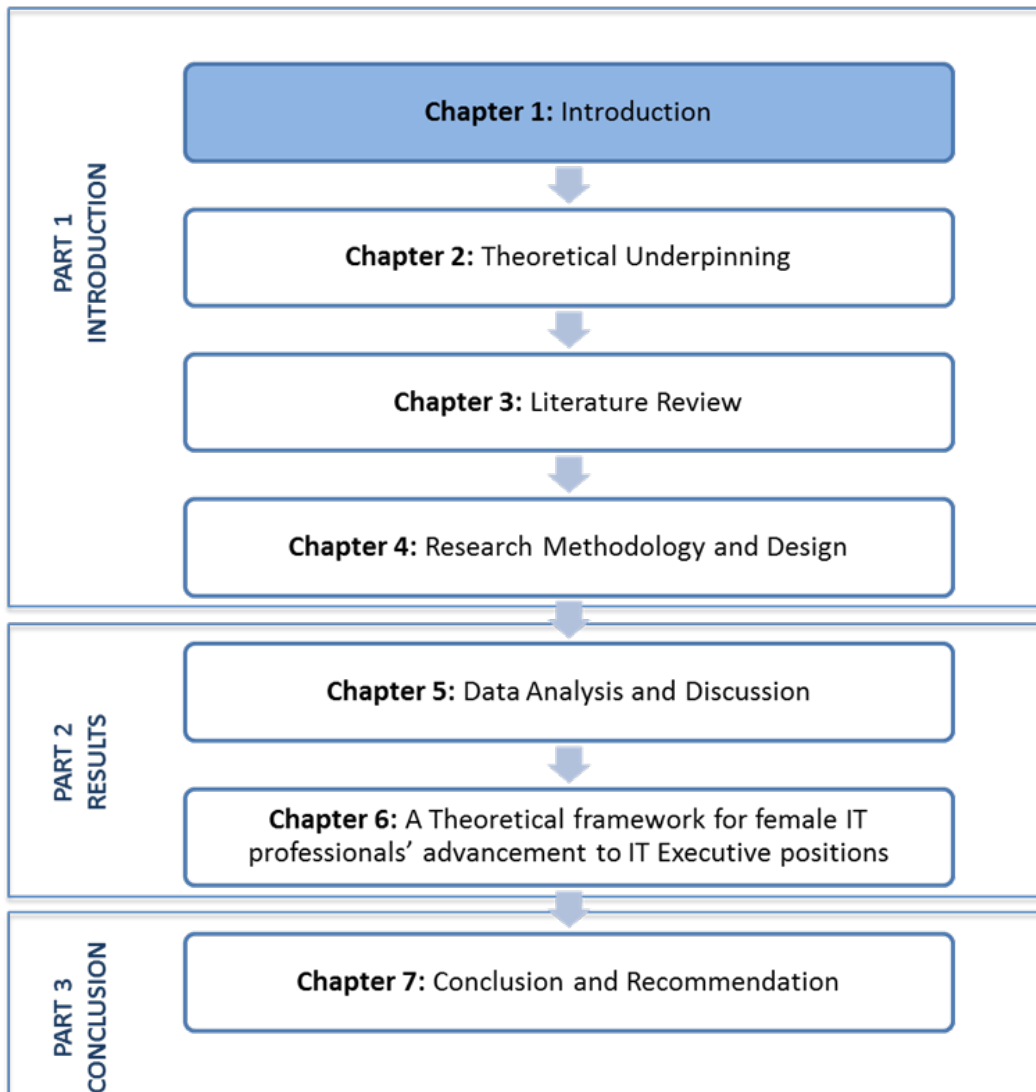
## Top Management Team (TMT)

The Top Management Team is defined as a team of individuals who represent the top tier in an organisation (Auh & Menguc, 2005). They are generally key executives who are responsible for making critical strategic decisions and providing direction to the organisation at large. The team consists of diverse people with different expertise and experience to improve decision quality and organisational performance (Buyl, Boone & Hendriks, 2014). Moreover, the members of the TMT work together effectively to achieve organisational goals (Dawson & Kauffman, 2010). They essentially have the overall responsibility for running the organisation (Ranganathan & Jha, 2008). Some of the TMT executives include the Chief Executive Officer (CEO), the Chief Financial Officer (CFO), and the Chief Operating Officer (COO). The top management team is also known as the C-suite and reports directly to the CEO, who is the main actor of the team (Buyl *et al.*, 2014; Guadalupe *et al.*, 2014).

# **PART 1**

# **INTRODUCTION**

# 1 INTRODUCTION



## 1.1 INTRODUCTION

The number of women in the workplace has increased over the years (Fernandez, 2007: 1; Branson, Chen & Redenbaugh, 2013). Despite the continued increase of women in the workplace, the progression of women to top management levels is generally slow, compared to their male counterparts (Davidson & Burke, 2011: 1; Fisher & Neihouser, 2013). Cheung and Halpern (2010) state that women tend to get stuck in middle management, with very few making it to top leadership positions. Thornton (2015: 11) concurs that “while women make up 22% of senior management globally, they continue to be concentrated in management support functions rather than in leadership roles”. The concentration of women in management support roles suggests that there are barriers for women to progress to executive management positions. O’Neil, Hopkins and Bilimoria (2008) posit that even though women move up the ranks in organisations, most organisations are still male-dominated.

While the representation of women at executive management level is still low, there has been some improvement over the years. For instance, the International Business Review (IBR) survey reported a 3% global increase in the number of women in leadership positions from 2011 to 2012 (Thornton, 2013: 4). The increase in the number of women in executive management positions in South Africa is also evident, albeit nominal, with women constituting 14.7% of all executive management in 2004 (BWASA, 2007) and 29% in 2017 (BWASA, 2017). The improvement in the number of women in executive positions can be attributed to the South African government recognising the crucial role that women play in stimulating economic growth (Mathur-Helm, 2011: 362). In a drive towards improving female representation at executive levels, the South African government put in place measures to break down the barriers that prevent women from progressing upward in the organisation’s hierarchy. These measures included the introduction of policy and legislative instruments such as the Employment Equity Act (ICT Empowerment Charter Working Group, 2004).

Much as women’s participation in the labour force is improving, their underrepresentation in the Information Technology (IT) field has nevertheless been experienced globally (Mathur-Helm, 2011: 363). Notwithstanding the efforts of concerned leaders, the percentage of women in the IT industry has remained stubbornly low (Harvey Nash, 2014). Typical factors

that have been cited as the reasons for hindering women's participation in the IT field include the traditional masculine culture of the IT environment (Drury, 2011) and cultural stereotyping of women who work in a male-dominated field such as IT (Lee, Stewart & Calugar-Pop, 2016). Other factors include job descriptions subtly discouraging women from applying for IT jobs (Ashcraft, Mclain & Eger, 2016) and lack of appropriate mentoring and sponsorship for women to advance in their IT careers (Drury, 2011).

In South Africa, the IT sector is one of the major contributors to South Africa's gross domestic product (GDP) (ICT Empowerment Charter, 2004; Gillwald, Moyo & Stork, 2012). In her speech at the Women's Month commemoration in August 2015, Deputy Minister of the Department of Telecommunications and Postal Services Hlengiwe Mkhize made a note of the government's continued drive towards the transformation and inclusion of women in the IT sector (Mkhize, 2015). The drive towards transformation extends to IT Executive positions, where the underrepresentation of women is more apparent (Clark, 2012: 1; Thiele, Miller & Berg, 2013; Rogers, 2015: 95). The IT industry is perceived to be gender biased; as such, there are fewer female IT Executives (Evans, 2006: 91; Major, Davis, Sanchez-Hucles, Downey & Germano, 2007: 77).

The various editions of the CIO Directory from ITWeb, which profile South African IT leaders at executive level in both private and public sectors, show the extent to which female IT Executives are underrepresented. Even though every year the total number of IT Executives profiled has increased, from 153 in 2011 to 172 in 2016, only 10% average of the IT Executives profiled are female (ITWeb, 2011, 2012, 2013, 2014, 2015, 2016). Mathur-Helm (2011: 371) posits that "barriers and challenges remain deep-seated for women of all races embarking on executive careers". This is because women are not seen to exhibit the commanding and controlling leadership style that men exhibit. Nonetheless, the fact that there are female IT Executives in South Africa, though a few, shows that these barriers are surmountable. These female IT Executives were essentially able to break through the glass ceiling<sup>1</sup> that exists in the IT environment, despite it being outside the norm. For South Africa to improve the representation of women in IT Executive levels, a deeper understanding is

---

<sup>1</sup> The glass ceiling is a term referring to situations where women find it hard to advance beyond a certain level within an organisation (Eagly & Carli, 2007; Clark, 2012: 4; Fisher & Neihouser, 2013).

needed of how the existing female IT Executives succeeded to overcome the inherent barriers of a male-dominated field. After all, having more women in leadership positions may lead to a genderless concept of leadership (Koenig, Eagly, Mitchell & Ristikari, 2011).

This chapter continues to provide the background to the problem, the problem statement, the motivation for conducting the study, along with the objectives that the study aims to achieve. The chapter concludes with the expected research contribution of the study.

## 1.2 PROBLEM BACKGROUND

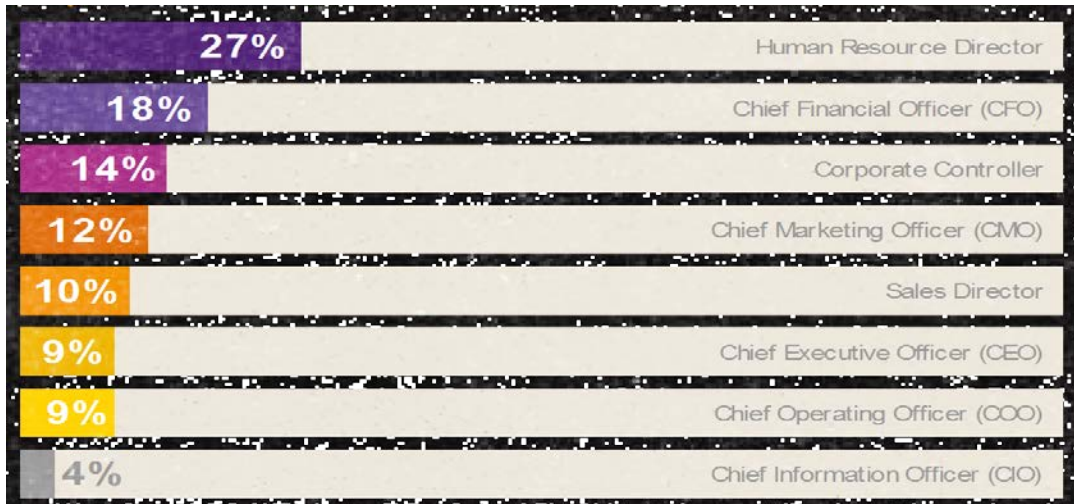
The IT sector was traditionally considered to be a male-dominated environment (Trauth & Quesenberry, 2006; Pretorius & Villiers, 2010; Appelbaum, Asham & Argheyd, 2011; Clark, 2012: 3), which has resulted in masculine values predominating in the profession (Reid, Allen, Armstrong & Riemenschneider, 2010). Because of these masculine values, the IT discipline has become more attractive to men than women (Lang, 2007: 221). Furthermore, research shows that the masculine culture of IT discourages girls at a very young age from participating in the discipline (Clark, 2012: 4). This ultimately results in a low presence of women in the IT field.

Much as the IT sector has continued to grow over the years, this growth has not led to an increase in women's presence in the IT workforce (Griffiths & Moore, 2010; Castaño & Webster, 2011). One study (Harvey Nash, 2014) confirmed that "gender diversity in the IT workplace remains very unbalanced". Moreover, initiatives such as gender diversity programmes are not making significant progress, hence the reality of women's underrepresentation in the IT workforce in general (Major *et al.*, 2007: 72; Griffiths & Moore, 2010; Evans, 2012; Lee *et al.*, 2016).

The IT sector provides many unprecedented opportunities for IT professionals (Arun & Arun, 2002; Lumley, Coetzee, Tladinyane & Ferreira, 2011). Despite the many opportunities within the IT sector, Evans (2012) argues that women are nonetheless underrepresented. Even with the increasing number of female managers, Eagly and Carli (2007) posit that women are still a minority at executive levels. Having fewer women in entry-level positions within the IT field subsequently results in the underrepresentation of women in leadership positions (Adya, 2008: 602; Mckinney, Wilson, Brooks, Leary-Kelly & Hardgrave, 2008).

Thornton (2015: 11) states that 18% of Chief Financial Officer (CFO) roles are held by

women globally, with only a third of women (9%) likely to be Chief Executive Officers (CEOs) or Chief Operating Officers (COOs). Only 4% of women are likely to be IT Executives. This is shown in Figure 1-1.



**Figure 1-1: Proportion of women leadership roles globally**

Source: Thornton (2015: 11)

On the contrary, Gartner estimates a global average population of female IT Executives to be between 10% and 14%, with variances in different regions of the world (Nunno, Edwards & Lee, 2015). However, “there is still a huge underrepresentation of women in IT leadership roles” (Harvey Nash, 2012). After all, leaders are predominantly portrayed as masculine, an image which is more congruent with men’s than women’s self-perception (Bosak & Sczesny, 2008).

The underrepresentation of women in IT is a worldwide phenomenon (Trauth, Quesenberry & Huang, 2008). The underrepresentation of women in South Africa’s IT sector “corresponds with the current reality for women across the globe” (Mathur-Helm, 2011: 363). It is worthwhile to explore the status of women in executive IT leadership positions in a few international countries to determine how South Africa compares with them. The problem background is therefore described by exploring the underrepresentation of female IT Executives internationally and in South Africa.



### 1.2.1 The international situation

The number of women in the US labour force has been fluctuating over the past years. In 2008, the US had 46.5% of women in the labour force, which was an increase from 46.4% in 2007 and 46.3% in 2006 (Mathe, Michie & Nelson, 2011: 205). However, the female US labour force has been slightly decreasing over the past few years, with a 0.5% decrease from 2012 to 2013 (57.9% and 57.2% in 2012 and 2013 respectively) and a 0.2% decrease from 2013 to 2014 (57.2% and 57% in 2013 and 2014 respectively) (United States of America, 2014a, 2014c).

According to Mathe *et al.* (2011: 209), “women in the workplace are making significant progress in obtaining managerial and professional positions”. In fact, of the 57.2% employed women in 2013, 51.4% of them were employed in management, professional and related occupations, with 28.8% in chief executive positions (United States of America, 2014c). Nevertheless, only 21% of women in the US hold senior management roles, a rate which has not improved much since 2004 (Thornton, 2015: 5).

Even though women in the US comprise approximately half of the labour force, they are nonetheless underrepresented in the US IT workforce (Trauth *et al.*, 2008; Lee *et al.*, 2016). Of the employed women in 2014, 46.9% made up the US IT workforce (United States of America, 2014b). Ashcraft and Blithe (2010) maintain that the percentage of women in IT has been declining since 1991.

It was found that 30% of US IT Executives did not have women in management level positions (Harvey Nash, 2012). Furthermore, a decrease in the number of female IT Executives in the US was noted. With the lack of women in IT management levels and because such positions in part lead to IT Executive positions, it is therefore expected that women would be underrepresented in IT Executive roles in the US.

The representation of women in the US IT labour force also varies by race. People in the US are generally classified into four primary races, namely, Asian, white, Hispanic, and black or African American (United States of America, 2014c). In 2009, the US Bureau of Labor Statistics reported that the overall IT workforce constituted 18% of white women, 4% of Asian women, 2% of African American, and 1.5 Hispanic women (Ashcraft & Blithe, 2010). These figures suggest that female IT Executives in the US are also not proportionally

represented at race levels.

The underrepresentation of women in leadership roles is also seen in countries that belong to the European Union (EU). In fact, countries in the EU are reported to be worse than the US when it comes to the representation of women in executive IT leadership roles (The Guardian, 2014a). While the EU has upheld legislative reforms that encourage gender equality (BBC, 2012 cited in Claus, Callahan & Sandlin, 2013), attempts to create a gender balance among leadership ranks have not yielded substantive practical results (Claus *et al.*, 2013).

The UK has also seen an increase in the number of women in junior and middle management; however, progress in executive management has stalled (Chartered Management Institute, 2013). The number of men in general leadership positions exceeds that of women, reporting 18% of male managers and senior officials and 11% of women managers and senior officials (Labour Force Survey, 2015). Much of these large gaps in the UK are attributed to the thinking that men possess characteristics that are required in management (Wilson, 2011: 112).

Thornton (2015: 8) states that women hold only 15% of top IT jobs in Europe; nevertheless, the UK is trailing behind the rest of Europe when it comes to gender diversity in the IT discipline (The Guardian, 2014b). In 2014, recruiter Harvey Nash reported only 7% of female IT Executives in the UK, which was a decrease from 2013 (Harvey Nash, 2015). The percentage of female IT Executives in the UK is considered to be below the global average, which therefore makes the UK even less diverse in IT Executive positions (Harvey Nash, 2015).

In India, where the IT industry continues to grow fast (Gupta, Raychaudhuri & Haldar, 2015), the growth of women participating in the IT labour force has been noted (Gupta, 2015: 666; Shanmugam, 2017: 353). In 2011, the Indian National Sample Survey (NSS) reported that women represented 21% of the IT labour force, and in 2016 the figure had risen up to 30% (Raghuram, Herman, Ruiz-Ben & Sondhi, 2017). Nonetheless, there are fewer women in IT management positions (Arun & Arun, 2002), thus indicating the gender imbalance in IT leadership levels. Eighteen per cent of female IT Executives in India were reported in 2014 (Raghuram *et al.*, 2017). This is despite women being equally qualified and capable as their male counterparts (Suriya, 2008).

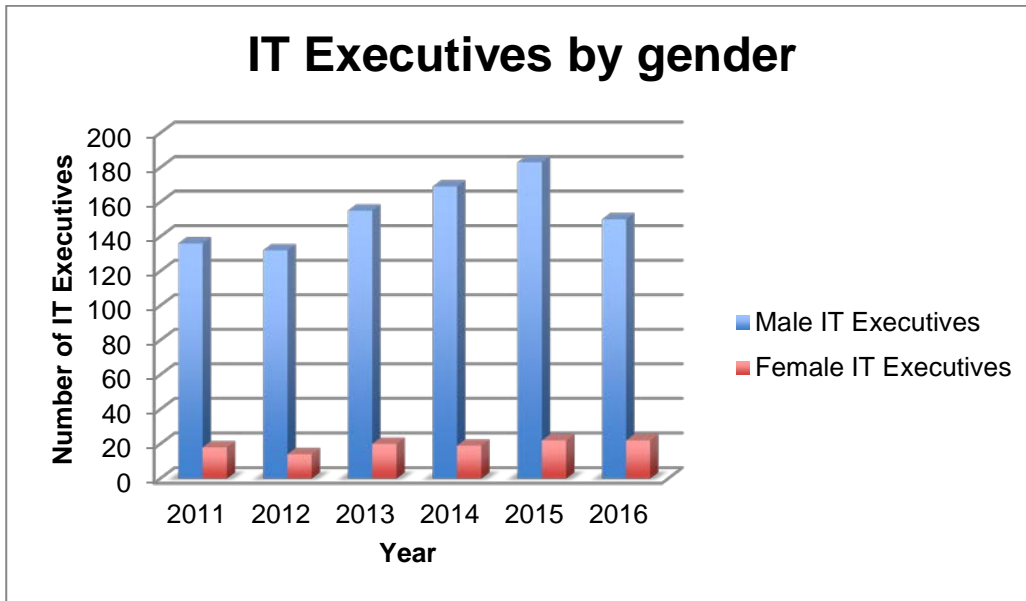
## 1.2.2 The South African situation

Between 1995 and 2005, South Africa experienced more than double the number of female managers, resulting in an average annual growth rate of 8.4% of female managers (South Africa, 2006). According to Evans (2006: 90), one of the reasons South Africa saw an increase in the number of women in management positions was its emancipation from the apartheid regime, which introduced a culture that supports equal accessibility for all to the business world. Nonetheless, South Africa has not made significant progress in terms of senior roles held by women since 2004 (Thornton, 2015: 7). This is despite the change in laws and the availability of access to equal opportunities (April, Dreyer & Blass, 2007).

Davidson and Burke (2011: 15) submit that passing country legislation to equalise or improve the representation of women at higher-level managerial jobs does not work as well as expected. To concur, Mathur-Helm (2011: 367) highlights that “South African organisations have failed to see their women managers in the role of senior leaders”. Compared to private sector organisation, government institutions are however making positive strides in ensuring a better representation of women in leadership positions (BWASA, 2015).

In 2016, women accounted for 51.1% of the total South African population (STATSSA, 2016). Essentially, women represent the majority of the South African population; therefore, one would expect a significantly higher representation of women in all sectors, at different levels, including executive positions. However, the published results of the BWASA 2017 census found that women constitute only 29% of executive managers.

An analysis of the South African IT leaders at executive level as profiled by ITWeb in the CIO directories from 2011 to 2016 gives an indication of the extent to which female IT Executives are underrepresented in both the public and private sectors. This is indicated in Figure 1-2.



**Figure 1-2: South African IT Executives by gender**

The data in Figure 1-2 shows that there is a far-from-ideal participation of female IT Executives in South Africa. Male IT Executives are clearly dominating executive IT leadership positions in significant numbers. In essence, the proportion of women in executive IT leadership positions to their presence in the overall population is significantly below average. Nonetheless, there have been slight improvements over the years.

According to Littrell and Nkomo (2010), women are perceived not to have leadership potential, and their leadership behaviours differ from traditional male leaders. These societal stereotypes contribute to the underrepresentation of female IT Executives. Furthermore, Trauth *et al.* (2008) assert that cultural diversity also plays a role in the underrepresentation of women in the IT workforce. This holds true for South Africa given that the country is culturally diverse with multiple racial groups.

The roles of women in society and in the IT sector are based on socio-cultural beliefs that vary across countries (Trauth *et al.*, 2008). April *et al.* (2007) add that the societal values and expectations to which women are subject to are unique to South Africa. Thus the socio-cultural explanations for the glass ceiling in South Africa's IT sector are specific to South Africa and do not apply to other countries (April *et al.*, 2007). Trauth *et al.* (2008) state that "diversity of cultural backgrounds of women in a single country can result in wide variation in their relationships with IT". It is deduced that the cultural beliefs in the different South

African racial groups can filter through to organisations, therefore resulting in the inability of women to advance to IT Executive positions.

### **1.3 PROBLEM STATEMENT**

The lack of proportional gender representation at IT leadership levels in South Africa is illustrated in Figure 1-2. Based on these statistics, an average of only 10% of women occupy IT Executive positions. This is despite the majority of the population of South Africa consisting of women. The problem of lack of adequate participation of women in the IT field is cited to be a result of structural and societal factors (Ahuja, 2002; Mathur-Helm, 2005: 62). Compared to other traditionally male-dominated fields such as medicine and law, Trauth and Quesenberry (2006) posit that the dominance of males over females in the IT field is not changing.

### **1.4 RESEARCH MOTIVATION AND SIGNIFICANCE**

Women around the world continue to face persistent gender gaps in the workplace, with South Africa ranking 18 out of 142 countries on the 2014 World Economic Forum's Global Gender Gap Index (BWASA, 2015). The concern regarding the underrepresentation of women in leadership positions is not only an equal rights or human rights issue but is also because "excluding women from leadership roles impacts on productivity and militates against a workforce characterized by a diversity of workers" (Noble & Moore, 2006). "The 2014 Global Gender Gap Report found that companies with top quartile presentation of women in executive positions generally perform better than companies with no women at the top with a 47.0% average return on equity" (BWASA, 2015). There is even more compelling evidence that shows the benefits of having women at leadership levels, but still there is minimal progress in the representation of women at all levels of management (Chartered Management Institute, 2013).

According to Trauth *et al.* (2008), "the IT workforce is diverse with respect to nationality but not sufficiently diverse with respect to gender". The gender imbalance in IT has a significant impact on the industry (Adya, 2008: 602) because it limits innovation. The different perspectives that women bring to the innovation process provide an added benefit to both consumers and organisations (Wentling & Thomas, 2009). Therefore, it would serve organisations well to reduce the gender gap at all levels of IT.

Clark (2012: 1) adds that IT Executives constitute the least diverse segment of IT's overall population in terms of gender. From a South African perspective, the Gender Initiative Institute (2004 cited in Mathur-Helm, 2011: 363) suggests that the lack of representation of South African women in IT leadership positions has as much to do with race as it does with gender. However, based on the data depicted in Figure 1-2, an assertion is made that gender is a dominant factor when it comes to the underrepresentation of female IT Executives in South Africa.

Despite the extensive literature on the general underrepresentation of women in IT (e.g. Evans, 2006; Quesenberry & Trauth, 2007; Lang, 2007; Trauth *et al.*, 2008; Reid *et al.*, 2010), Dawson and Kauffman (2010) contend that "there has been a great deal written about gender differences in top management positions, including in the IT field". Such literature on gender differences in IT top management positions focuses more on the statistics, race, education levels, salary disparities, and workplace culture (e.g. Eagly & Carli, 2007; Wentling & Thomas, 2009). Nevertheless, not much is known about why some women have succeeded in fulfilling IT Executive roles, despite existing structural and social barriers particularly in a culturally diverse country such as South Africa. Soe and Yakura (2008) stress that it is the responsibility of women to overcome these barriers.

The presence of few female IT Executives in South Africa motivated the researcher to conduct a study that would provide insights into the influences that shape South African females in the IT profession to advance to top IT leadership positions at an individual level. Furthermore, by conducting this study, the researcher would be able to discover and understand the challenges faced by female IT professionals as they pursue IT Executive positions and how to navigate through these challenges. The findings will lead to the development of intervention programmes that will improve the representation of female IT Executives in South Africa. Such programmes will support the government's drive towards the transformation and the inclusion of women in the IT sector, particularly in top IT leadership levels. After all, it is not good enough that South African women can easily become senior managers but not advance to become executive managers (Mathur-Helm, 2005: 59). Barsh and Yee (2012) assert that the advancement of women to leadership positions is encouraged by other leaders due to the identified benefits of a diverse leadership structure. The South African IT industry therefore stands to generate stronger business results with an improved representation of female IT Executives.

## 1.5 RESEARCH OBJECTIVES AND QUESTIONS

The main aim of the study is to establish enabling factors for South African female IT professionals' advancement to IT Executive positions. Understanding how South African female IT professionals can break through the glass ceiling and successfully advance to IT Executive positions will subsequently increase women's participation in IT leadership roles. The study is informed by narratives of female IT Executives who have overcome systematic negative influences to occupy IT leadership positions. Based on the main research objective, the following primary research question is answered:

***What are the factors that can enable female IT professionals in South Africa advancing to IT Executive positions?***

The main research objective will be achieved when the following secondary objectives are met:

***Secondary research objective 1:*** The IT field is known to be a masculine field that socialises women away from it. Moreover, Powell (2012: 131) indicates that leadership is originally associated with men and masculinity. Littrell and Nkomo (2010) support that women are perceived not to have the leadership potential and their leadership behaviours differ from traditional male leaders. This infers that a leader is expected to possess specific competencies that are associated with men. It is however noted that in South Africa there are female IT Executives in various organisations who have defied these stereotypes. Therefore the objective is to explore those competencies that benefit female IT professionals when advancing to IT Executive positions. This research objective addresses the following research question:

***Secondary research question 1:*** Which competencies are required for one to be a successful female IT Executive?

***Secondary research objective 2:*** Women are confronted with a variety of obstacles that impede them from attaining leadership positions (Rhode & Kellerman, 2007: 6). The same applies to the IT field whereby female IT professionals encounter barriers or challenges that prohibit them from reaching IT leadership levels (Eagly & Carli, 2007). Acknowledging the presence of female IT Executives in South Africa, albeit small, it is noted that these women have overcome these barriers. To understand how barriers for women to advance to IT

leadership positions are overcome, the following research question is asked:

**Secondary research question 2:** What are the strategies for overcoming barriers to progressing to IT Executive positions?

**Secondary research objective 3.1:** Since its inception, IT revolved around men and the machines they built (Clark, 2012: 3). This made women's positions in the IT field secondary to men's, resulting in them being given supporting roles in the field (Clark, 2012: 3; Rogers, 2015: 96). Furthermore, leadership roles are traditionally considered male-stereotypic roles (Cutler, 2014). In view of the fact that the IT Executive is more a leading role than a supporting role, this infers that female IT Executives are occupying roles traditionally meant for men. This objective seeks to understand the role of the IT Executive as occupied by women by asking the following research question:

**Secondary research question 3.1:** What are the job expectations of female IT Executives?

**Secondary research objective 3.2:** Exploring the female IT Executives' job expectations gives an indication of a typical career pathway one would need to follow to attain the IT leadership role. As Clark (2012) states, it is crucial for women with aspirations to fulfil IT leadership roles to understand the pathways that might lead them there. With women in IT usually given supporting roles in the field (Clark, 2012: 3), inference is made that the progression of female IT professionals to IT leadership positions follows a route that starts with fulfilling support roles. As a result, this research objective aims to determine the female IT professionals' career pathways that lead to IT Executive roles. The secondary research objective results in the following research question:

**Secondary research question 3.2:** What is the career path followed by female IT professionals towards the fulfilment of the IT Executive role?

**Secondary research objective 4:** South Africa is culturally diverse with multiple racial groups, namely, African, white, coloured, and Indian (Statistics South Africa (STATSSA), 2011; Adams, Van de Vijver & De Bruin, 2012). Mathur-Helm (2011: 371) posits that "barriers and challenges remain deep-seated for women of all races embarking on executive careers". It is noted from the review of literature that the underrepresentation of female IT Executives is more focused on race, education levels, salary disparities, and leadership levels (e.g. Lang, 2007; Quesenberry & Trauth, 2007), but not much is known about the



influence that culture has on the underrepresentation of female IT Executives, particularly in a culturally diverse country such as South Africa. Within the IT sector, the roles of women are defined according to socio-cultural beliefs (Trauth *et al.*, 2008). As such, women individually experience various socio-cultural influences that shape their inclinations to participate in the IT field (Trauth, 2002). To gain clarity on how cultural factors influence the underrepresentation of female IT Executives, this study explores the cultural beliefs that influence attitudes about female IT Executives in South Africa. The secondary objective results in the following research question:

**Secondary research question 4:** How does culture influence the progression of South African female IT professionals to IT Executive positions?

## 1.6 DELINEATION AND LIMITATIONS

Contributions of the study cannot be assessed without examining the study's limitations. The following limitations apply:

- The study is confined to South African female IT Executives residing in the Gauteng province. Only those women who belong to the four officially recognised racial groups in South Africa, namely, African, coloured, Indian, and white racial groups, were considered. Gauteng province has the highest population size (STATSSA, 2011) and contributes the highest percentage (34%) to the overall national economy (SouthAfrica.info, 2015).
- The theoretical framework that will be constructed as part of this study will be a generic guideline for improving the representation of female IT Executives in South African organisations, irrespective of the industry that they are in. Much as women are generally underrepresented in executive positions (BWASA, 2017), there might be limitations in the framework if applied to improve the representation of women in other top leadership levels in South African and international organisations.

## 1.7 UNDERLYING ASSUMPTIONS

The study will be based on the following assumption:

- South African women in the IT industry are equally marginalised across different race groups when it comes to leadership appointments. As a result, the underrepresentation of female IT Executives is irrespective of racial group.

## 1.8 EXPECTED CONTRIBUTIONS OF THE STUDY

This study will contribute to the field of Information Systems (IS) from the perspective of women in IT management in the following ways:

- A theoretical framework is developed to guide the advancement of female IT professionals to IT leadership positions. This will subsequently result in the improvement of the representation of female IT Executives in South Africa
- To explain the bearing that cultural beliefs have on the underrepresentation of female IT Executives
- To articulate personality traits that female IT professionals need to have in order to advance to IT Executive positions
- To highlight expected job functions of female IT Executives

## 1.9 THESIS STRUCTURE

The thesis consists of seven (7) chapters. Each chapter is described below.

**Chapter 1: Introduction to the Study** – This chapter provided an overall introduction to the study by articulating the identified research problem. To give context to the research problem, the problem background is outlined from both the international and South Africa perspectives. Based on the research objectives, the research questions that the study will answer were formulated.

**Chapter 2: Theoretical Underpinning** – This chapter presents Eileen Trauth's Individual Differences Theory of Gender and IT (IDTGIT) as it relates to the study.

**Chapter 3: Literature Review** – This chapter explores available literature that relates to the study. This will give better insight into the research problem. The literature survey will cover the following topics:

- *Theme A: Describing the Job of an IT Executive* – Understanding what the IT Executive role entails is of crucial importance to the study. The theme provides context by first explaining how the IT Executive position evolved.
- *Theme B: Understanding the IT Career Pathway* – The aim of this theme is to provide a broad understanding of the underrepresentation of women in IT by exploring the points in the IT pipeline where women are lost. This includes the challenges that women are faced with throughout the IT career pipeline along with motivations to enter, stay in the IT field, and advance to IT Executive levels.
- *Theme C: Defining the Leadership Concept* – The IT Executive role is itself a leadership role in IT. Leadership is generally perceived to be suitable for men. As such, leadership traits are discussed. Additionally, leadership from the perspective of gender is explored.
- *Theme D: Barriers in the IT Field* – This theme explores the typical barriers that women are faced with as they advance towards IT Executive positions. The concepts of the glass ceiling and labyrinth are discussed in detail.
- *Theme E: South Africa's IT Environment* – Trauth, Quesenberry and Morgan (2004) posit that information about the geographic region within which data is collected provides context to the responses of the research participants. This theme therefore puts the South African IT Environment into context as it relates to the study.
- *Theme F: Defining the Concept of Culture* – The environmental influences construct of the Individual Differences Theory of Gender and IT includes a sub-construct that deals with cultural attitudes and values. “Recognizing the significance of culture is essential within our global world” (Claus *et al.*, 2013). As Hofstede, Hofstede and Minkov (2010: 25) point out, to understand how people relate in organisations, it is essential to understand the societies they live in. As such, the concept of culture is described through the lens of Geert Hofstede. The theme also touches on the perceived gender roles.

**Chapter 4: Research Design and Methodology** – This chapter discusses the research design and methodology employed to conduct the study. This also includes the data collection and data analysis methods that were adopted.

**Chapter 5: Data Analysis and Discussion** – The aim of this chapter is to present the analysis of the data collected from each research participant and an interpretation thereof. As part of the data analysis, emerging themes from all the responses were identified. The discussion around the identified themes was also aligned with constructs of the adopted theoretical framework.

**Chapter 6: A Theoretical Framework for Female IT Professionals' Advancement to IT Executive Positions** – The outcomes of Chapters 6 form the basis of a theoretical framework for improving the representation of female IT Executives in South Africa.

**Chapter 7: Conclusion and Recommendations** – The study is concluded by answering the primary research question. The research contribution is also evaluated, and recommendations for future research are provided based on the insights gained through the findings from the study.

## 1.10 CONCLUSION

It has been reported that organisations with a good representation of women in executive leadership positions perform better (e.g. 2014 Global Gender Gap Report). If South African organisations have a better representation of women at executive level, the country's economy could potentially improve. The underrepresentation of female IT Executives in South Africa is an issue that is noticeable in both the private and public sector. Although South Africa's affirmative action legislation to a large extent addressed gender inequality in women's career advancement, it is not adequately resolving the poor representation of women in IT leadership roles. With the IT industry being one of the top industries in South Africa, it is indispensable to better the representation of female IT Executives.

Noting that there are female IT Executives in South Africa, though a few, shows that barriers in the IT field are surmountable. To understand the complex factors that contribute towards the underrepresentation of female IT Executives in South Africa, the IDTGIT was adopted.

The secondary research objectives relate to the three constructs of the theory: (1) Individual identity; (2) Individual influences; and (3) Environmental influences.

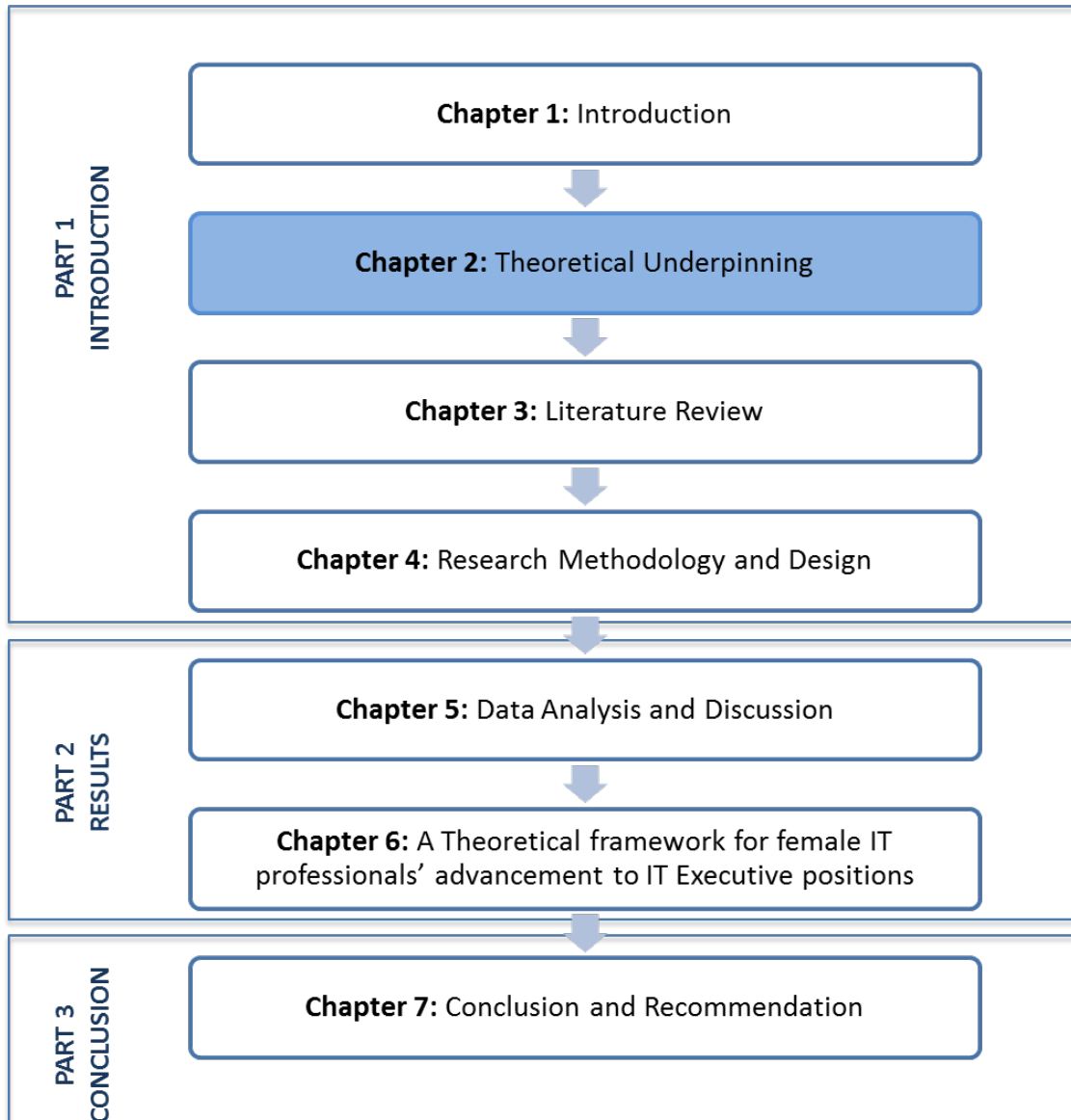
This chapter has provided a background to the study and an outline of the study by highlighting the research problem from both the international and South African perspectives. The chapter also specified the rationale behind conducting this study. In so doing, research objectives were also emphasised.

Chapter 1 Summary	
Research Problem	The problem of the underrepresentation of women in IT is a global problem, most of which is prevalent at leadership levels. South Africa is facing far-from-ideal participation of female IT Executives/IT leaders in South Africa.
Research Motivation	Existing literature concentrates more on the general underrepresentation of women in IT but not so much on the underrepresentation of women at IT leadership positions. Given the presence of female IT Executives in South Africa, it is vital to understand how and why these women succeeded in breaking through the glass ceiling that exists in the IT sector despite existing structural and social barriers particularly in a culturally diverse country such as South Africa. The South African IT industry stands to generate stronger business results with an improved representation of female IT leaders. This will benefit South Africa's economy, keeping in mind that the IT sector is one of the major contributors to South Africa's GDP.
Research Objective	The main aim of the research is to determine how South African female IT professionals can break through the glass ceiling and successfully advance to IT Executive positions.

**Table 1-1: Summary of Chapter 1**

The next chapter explains the theoretical framework that was used to guide the study.

## 2 THEORETICAL UNDERPINNING



## 2.1 INTRODUCTION

The previous chapter provided an introduction and background to the study. This study belongs within the gender and IT research discipline; therefore, this chapter reviews theoretical foundations that relate to gender and IT researches. Adam, Howcroft and Richardson (2004) maintain that the concept of gender and IT in research is not adequately theorised. In agreement, Trauth *et al.* (2004) bring out that the lack of sufficient theory in understanding the basis of the underrepresentation of women in IT is one of the research challenges. Lack of such theories will result in the gender implications of new IT transformations being continuously ignored. Nevertheless, there are three theoretical perspectives that are typically used in gender and IT researches, namely, gender essentialism, social construction, and individual differences. Social construction is considered another form of gender essentialism (Trauth, 2013). Both essentialism and social construction are typically found in gender researches that focus on exploring gender differences. Unlike essentialism and social construction, the focus of individual differences gender theorisation is on individuals of a particular gender.

Since the objective of this study is to understand how female IT Executives in South Africa managed to overcome the barriers in the IT field, a theoretical framework that explores influencing factors at an individual level was sought. As a result, the IDTGIT was then employed as a theoretical lens for guiding the research. The next section discusses aspects of IDTGIT in detail. A detailed discussion on IDTGIT forms the foundation for the rationale behind the use of this theory.

## 2.2 INDIVIDUAL DIFFERENCES THEORY OF GENDER AND INFORMATION TECHNOLOGY

Trauth (2009) identified three forms in which the under-theorisation of gender and IT research exists. The first form of under-theorisation is called pre-theoretical research. With this form, there is no theory that guides the research project nor informs the data collection and analysis methods. Another form is whereby research is guided by a theory-in-use; however, the theory itself is not explicitly discussed. In such cases, the research becomes difficult to discuss, challenge, or extend. This particular form of under-theorisation is referred to as implicit-theoretical research. The last condition, insufficient-theoretical research, is a result of theories about gender and IT not fully catering for the variation in men and women's



relationships to IT and the IT field. Typical examples of these theories are gender essentialism and social construction. These two theories have been identified as dominant theories in gender and IT researches (Trauth, 2002; Trauth *et al.*, 2004; Trauth, 2006), with the gender social constructionist theory being the most dominant theory (Trauth, Cain, Joshi, Kvasny & Booth, 2016). They provide differing perspectives as far as women's participation in IT is concerned.

Gender essentialism argues that the gender imbalance in IT is attributed to the underlying people's fixed biological or psychological attributes (Trauth, 2002; Trauth *et al.*, 2004; Trauth, 2006; Trauth, 2013). Because of the gender biological differences, Trauth (2006) draws inference that the essentialist perspective to gender and IT research is that women and men should be treated differently. On the other hand, the social construction perspective considers the internalised and accepted social shaping or social construction of gender to be informative of women's participation in IT (Trauth, 2002; Trauth, 2013; Trauth *et al.*, 2016). This means that the social construction of female identity and that of the IT field as a main domain are incompatible (Trauth, 2002; Trauth *et al.*, 2004; Trauth, 2006).

The distinguishing attribute between the two theories is that the former attributes the underrepresentation of women in IT to biological forces, whereas the latter focuses on societal forces. Nonetheless, they have three common features when explaining the underrepresentation of women in IT. First, they both bear the assumption that observed differences in men and women's behaviours are fixed, inherent, and immutable (Trauth, 2002; Trauth *et al.*, 2004; Trauth, 2013). The differences are derived from the underlying biological sources (for essentialism) or societal forces (for social construction). Secondly, they provide compatible theoretical orientation for researches whose focus is to explore gender differences (Trauth, 2013). Lastly, when theorising using either essentialism or social construction factors influencing the participation of women in IT are analysed at a group level (Trauth, 2002; Trauth, 2013). That is, men are treated as a single group and women are treated as a single group.

The two aforementioned prevailing theoretical perspectives discussed suggest gaps in literature for a theory that explains gender participation in IT at an individual level (Trauth, 2002; Trauth *et al.*, 2004). Such a theory would form the middle ground between the essentialist and social constructionist perspectives. In an effort to address the insufficient-

theoretical research form, Eileen Trauth formulated IDTGIT to bridge the gaps between the essentialist and social constructionist views. IDTGIT rejects the essentialist argument but deepens the understanding of social construction theory (Trauth, 2002). It is further considered a theoretical alternative to the essentialist and socialist perspectives on the topic of underrepresentation of women in a technical work environment (Trauth, 2006; Cain & Trauth, 2013).

IDTGIT was developed so that (1) the underrepresentation of women in the IT field could be explained by identifying influencing factors and (2) the justification for those women who overcame barriers and entered the IT field could be determined (Trauth *et al.*, 2016). The primary purpose of this theoretical framework is so that the various reasons for the gender gap in the IT sector could be understood (Trauth, 2002). It is an alternative theory for explaining the underrepresentation of women in IT, as it provides an extension of existing feminist theories such as feminist standpoint theory and liberal feminism (Trauth, Quesenberry & Yeo, 2008; Trauth, 2013). It does so by first focusing specifically on women in IT by putting emphasis on understanding the social shaping of gender and IT at an individual level. Secondly, the theory aims to provide more depth into the nature of influencing factors. It takes into consideration the underlying gaps of the essentialist and constructivist perspectives by embracing the notion of individual differences in gender and IT research studies (Trauth, 2002; Trauth *et al.*, 2004; Trauth, 2006; Trauth, Quesenberry & Huang, 2006; Trauth, 2013). This is why it is called Individual Differences.

The viewpoint for IDTGIT is based on the argument that women individually experience a variety of factors that explain their participation in IT (Trauth, 2002; Trauth *et al.*, 2008a; Trauth, 2013). "It looks to socio-cultural interpretation of IT work and power relations to explain the level of participation by women in IT" (Trauth *et al.*, 2004). The theory acknowledges that women and men are individuals with different IT skills and therefore respond to the social shaping of gender in unique ways that vary across cultures (Trauth, 2006; Trauth *et al.*, 2006; Trauth *et al.*, 2008a). This means that while women in a particular society may experience similar situations relating to gender roles and IT, their interpretation and response will vary as a result of individual factors (Trauth *et al.*, 2008a). In other words, IDTGIT looks at individual differences among women through their interaction with the IT environment. With that said, it focuses on differences *within* the genders rather than *between* the genders with the aim of understanding specific influencing factors (Trauth, 2006; Trauth

*et al.*, 2008a, 2008b). IDTGIT is expressed in gender intersectionality and minority gender theories which “introduce the nuance and within-gender group variability found by considering biological sex in conjunction with other salient identity characteristics” (Trauth, 2013).

The individualistic perspective is contrary to the essentialist and constructivist views which both treat gender at a group level of analysis as opposed to the individual level (Trauth, 2002; Trauth, 2013). Essentially, with the individualistic perspective, emphasis is on the relationship between an individual’s gender and the IT profession. IDTGIT finds the reasons for gender underrepresentation through the analysis of individual responses to generalised societal influences (Trauth, 2006). This means that the theory allows for women to be analysed in a social context, thus contradicting research that “decontextualizes women’s experiences by generalizing from a single data set to all women everywhere” (Trauth *et al.*, 2008a).

IDTGIT identifies the causes of gender underrepresentation by examining factors that contribute to how individuals internalise and respond to gendered messages (Trauth *et al.*, 2008a). The theory argues that by understanding both the personal characteristics and environmental influence, the individual responses to societal influences can also be understood (Trauth *et al.*, 2004; Trauth, 2006). It recognises that social influences and personal characteristics have a bearing on the participation of women in IT.

IDTGIT comprises three primary constructs which form the structure of the conceptual framework of individual gender differences for participating in the IT field (Trauth *et al.*, 2004; Cain & Trauth, 2013). They collectively provide an explanation as to why women enter and remain in the IT field (Trauth *et al.*, 2004; Trauth, 2006; Trauth *et al.*, 2008a, 2008b; Trauth *et al.*, 2016). The constructs assist in understanding the individual and environmental factors that influence women’s decisions to pursue IT professions. As shown in Table 2-1, each construct has embedded sub-constructs.

Construct	Sub-construct	Examples
<b>Individual Identity</b>	Personal demographics	Age, ethnicity, socio-economic class
	Type of IT work (i.e. career items)	Software development, IS design
<b>Individual Influences</b>	Personal characteristics	Educational background, personality traits, abilities
	Personal influences	Mentors, role models, significant life experiences
<b>Environmental Influences</b>	Cultural influences	Attitudes about women and IT
	Economic influences	Cost of living, availability of IT employment
	Societal infrastructure influences	Availability of childcare facilities, institutional climate
	Policy influences	Laws about gender discrimination and maternity leave

**Table 2-1: IDTGIT constructs and sub-constructs**

Source: Trauth *et al.* (2016)

The individual identity construct captures the data that describes an individual (Trauth *et al.*, 2004). It includes both personal demographic items and information on the type of IT work that an individual is involved in (i.e. professional/career items). The construct is essential for refining the notion of IT work with respect to the underrepresentation of women (Trauth *et al.*, 2004). The data is further correlated with each individual woman's differences in experiences and influence, including their responses to such influences. The construct looks

at individual ways that each woman responds to challenges and issues that they are faced with in the IT field (Trauth, 2002).

The individual influences construct includes personal characteristics and personal influences of women in the IT field. Personal characteristics are about factors such as one's educational background and personality traits. The focus of personal influences is on the people and experiences that moulded one's career in the IT profession.

Environmental influences are those factors that provide context to an individual's response to a situation within his or her geographical region (Trauth *et al.*, 2004; Cain & Trauth, 2013). The construct comprises four sub-constructs that are related to geographical data. These include cultural attitudes about women and IT in a particular geographic area; the region or the country's economic and policy influences; as well as the availability of infrastructure in that region. Cultural influences refer to attitudes towards women in IT as they inform their career choices and lives. The societal infrastructure relates to information about the kind of infrastructure that is available to support women in the IT field. Economic and policy data is used to give further context on socio-cultural factors.

### **2.3 RATIONALE FOR THE CHOICE OF THEORY**

A theory provides a possible explanation or explanations to a particular situation (Hofstee, 2006: 30). According to Trauth (2006), the choice and use of theory are fundamental in understanding factors resulting in the underrepresentation of women in IT. Therefore, it is imperative to select and employ a theoretical perspective that is suitable for understanding factors that influence the underrepresentation of female IT Executives in South Africa. Upon understanding these factors, recommendations that address the IT gender gap at leadership levels can be formulated.

Among three theoretical perspectives that are typically used to explore the causes of the underrepresentation of women in IT, the researcher opted for IDTGIT to guide the study. Essentialism and social construction perspectives were eliminated for the following key reasons:

- 1) Essentialism and social construction analyse women at a group level. These views neglect to see women as individuals and therefore assume that they respond to the

challenges in IT in the same way. This can result in a distorted outcome of the research.

- 2) Both essentialism and social construction perspectives equate “gender research” with “gender differences research”, thus they are most suitable when exploring differences between genders. The purpose of this study is not to explore differences between genders but rather to understand typical characteristics that female IT professionals need to overcome as barriers in IT as they progress towards IT leadership levels.
- 3) The essentialist perspective attributes the underrepresentation of women in IT to biological factors only, whereas the social construction perspective only focuses on the social construction of IT as a male domain that is deemed not suitable for women (Trauth *et al.*, 2004).

The advantage of IDTGIT is that it characterises various factors that account for the poor representation of women in IT (Trauth *et al.*, 2008a). It does not only limit the causes of the underrepresentation of women in IT to biological or societal forces. This is similar to Ahuja’s model of factors influencing the participation of women in IT. The primary aim of Ahuja’s model is “to reduce sources of leakage in the IT career paths of women” (Ahuja, 2002). The model focuses on the social and structural factors that affect women’s IT careers at three different stages: choice, persistence, and advancement. However, its biggest limitation is the difficulty in separating external influences from individual influences (Ahuja, 2002). Contrary to Ahuja’s model, the IDTGIT finds the causes of gender underrepresentation by examining a combination of individual characteristics and environmental influences (Trauth *et al.*, 2004; Trauth *et al.*, 2008b). Employing IDTGIT for this study will therefore give a better understanding of the gender gap at IT Executive levels.

Another added advantage of IDTGIT is its consideration of women as individuals rather than grouping them as a single entity. Trauth (2006) states that varied individual responses to societal influences help in determining the reasons for gender underrepresentation. Moreover, Adam and Richardson (2001) contend that gender researches emphasise “the making of knowledge through the lived experiences of women’s lives”. This can be achieved by understanding the within-gender variations of the female IT Executives. Thus, using IDTGIT the researcher was able to gather the individual responses from female IT

Executives so as to determine the causes of the underrepresentation of female IT Executives in South Africa.

All the three constructs of IDTGIT were employed in the study. The individual identity construct was applied to analyse the IT Executive role as fulfilled by women. The individual influences construct was used to study the traits and educational backgrounds of the female IT Executives. The presence, or lack, of mentors for female IT professionals pursuing IT leadership roles was also studied as part of the individual influences construct. Wentling and Thomas (2009) argue that cultural factors influence the participation of women in IT. As a result, the environmental influences construct was adapted to examine the cultural influences (i.e. attitudes about female IT Executives) for female IT professionals pursuing IT Executive positions. The constructs of IDTGIT were used to analyse the interview data so as to develop a theoretical framework that will guide female IT professionals to advance to IT Executive positions in South Africa.

## **2.4 CONCLUSION**

The chapter presented the theoretical framework on which the study is based. Although the essentialist and social construction theories are both used in gender and IT-related research studies, they were found not sufficient for this study. The primary reason these two theories were not chosen is that they do not adequately address all the encompassing factors contributing to the underrepresentation of women in IT. On that account, Eileen Trauth's Individual Differences Theory of Gender and Information Technology was selected as the theoretical foundation for guiding this study. Research implications of the theory choice are outlined in Table 2-2.

Theory	Description	Implications
<b>Essentialism</b>	Gender participation in IT is evaluated based on differences relating to biological or psychological factors. Analysis is done at a group level.	IT is male-dominated; therefore, women are not deemed suitable to fulfil IT Executive roles because they are biologically different from men.
<b>Social-construction</b>	Gender participation in IT is evaluated based on societal factors. Analysis is done at a group level.	Only the perceived IT culture is used to explain the underrepresentation of women in IT. Attitudes towards the IT environment are the same; thus, female IT professionals would react in the same manner.
<b>Individual differences of gender and IT</b>	Gender participation in IT evaluated based on both personal and environmental factors. Differences are within gender rather than between genders. Analysis is done at an individual level.	Responses to participation in IT are captured per individual. This gives variations of factors that influence women to pursue careers in IT. This inhibits generalisation of results as each individual responds to environmental messages differently.

**Table 2-2: Implications of theory choice**

The next chapter provides a theoretical base that addresses the study through a review of relevant literature underlining the key concepts that are crucial to the study. The IDTGIT constructs were used to inform the literature study outlined in Chapter 3. Figure 2-1 illustrates the relationship between the IDTGIT constructs and the literature study themes.



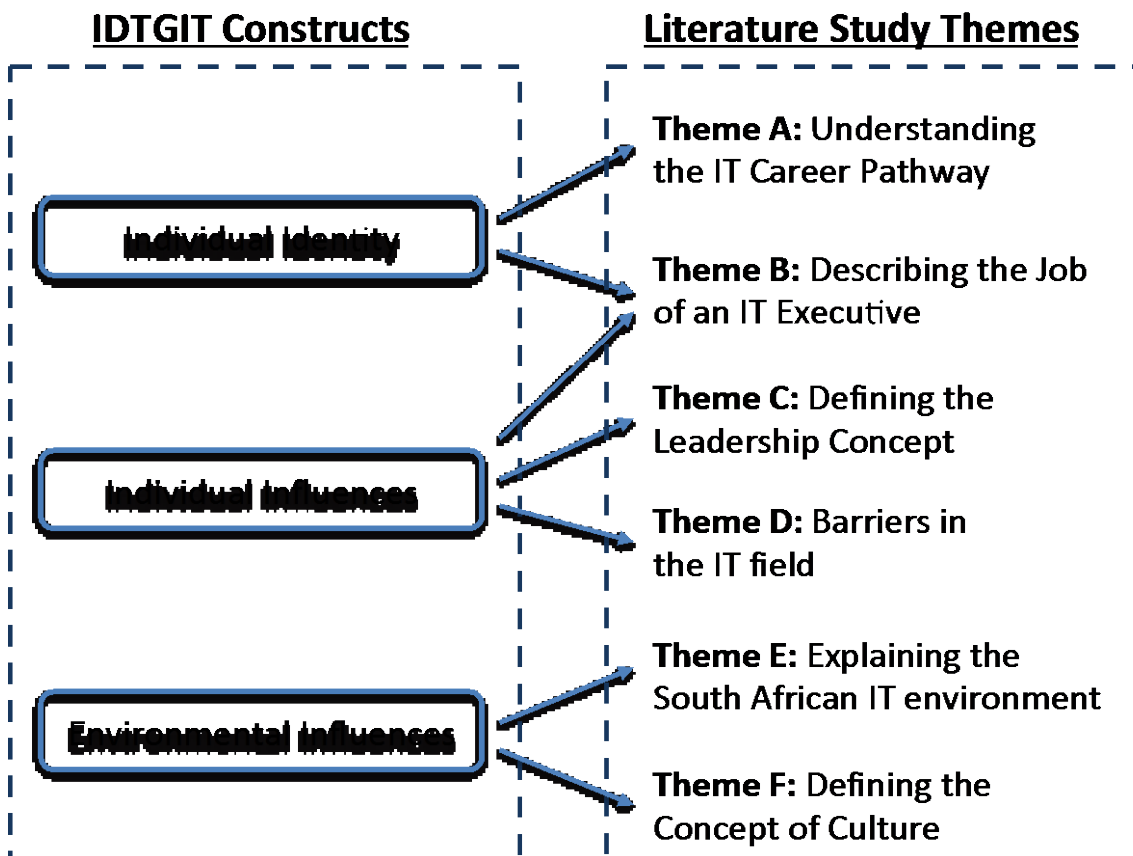
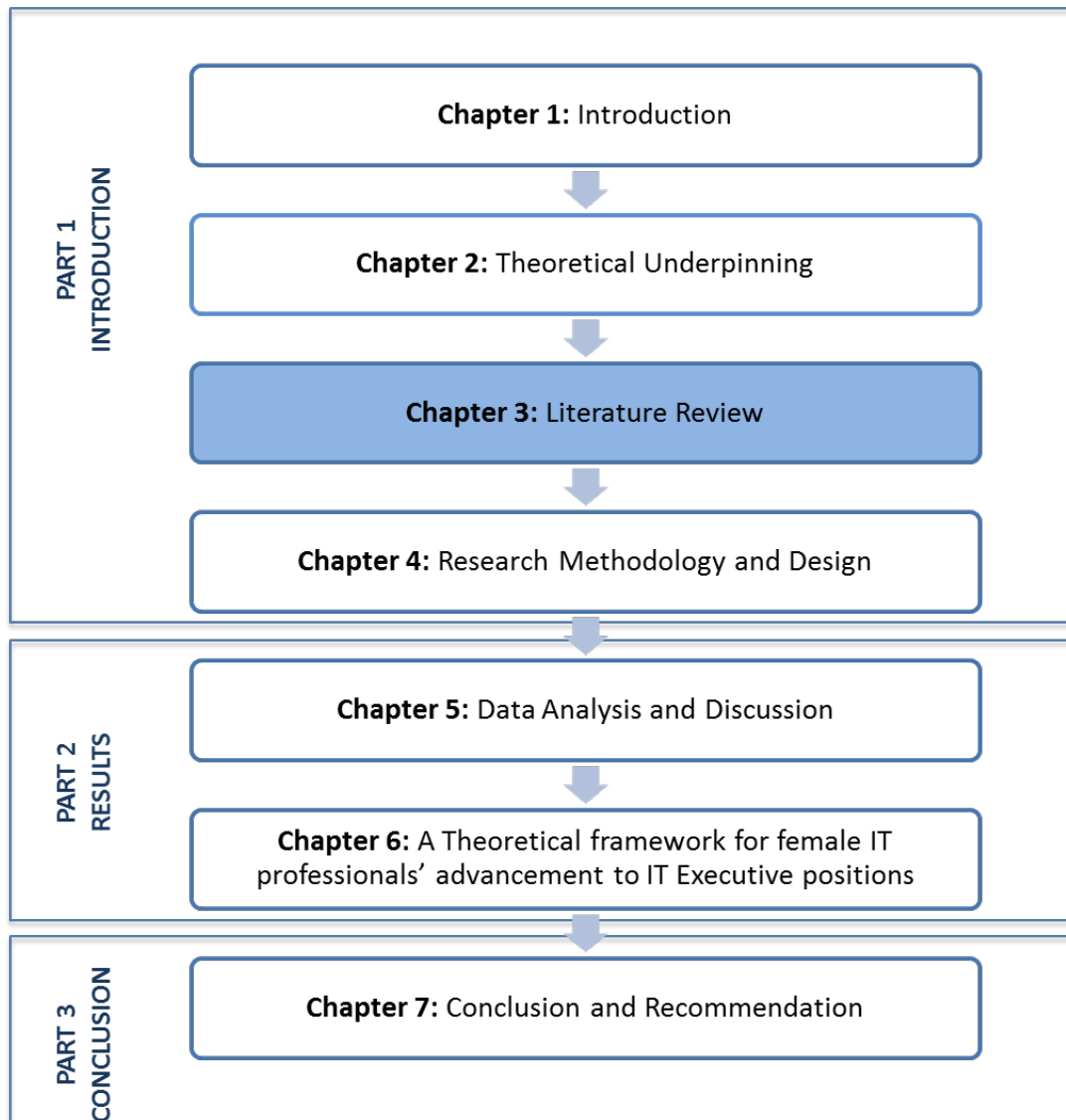


Figure 2-1: Relationship between IDTGIT constructs and literature study themes

### 3 LITERATURE REVIEW



### 3.1 INTRODUCTION

The preceding chapter focused on the theoretical underpinning of the study. This chapter provides context to the overall study by reviewing the literature that is related to the research problem. Considering the amount of literature work one has to review and the importance of balance, it is crucial to have the literature review structured properly (Hofstee, 2006: 94). The researcher structured the literature review into relevant themes that relate the IDTGIT constructs outlined in Chapter 2. This ensured that the discussion around relevant literature is organised.

The next section presents the scope of the literature review in relation to the research themes.

### 3.2 SCOPE OF LITERATURE

Figure 3-1 depicts the scope of the literature review that covers the various topics to be studied in this study.

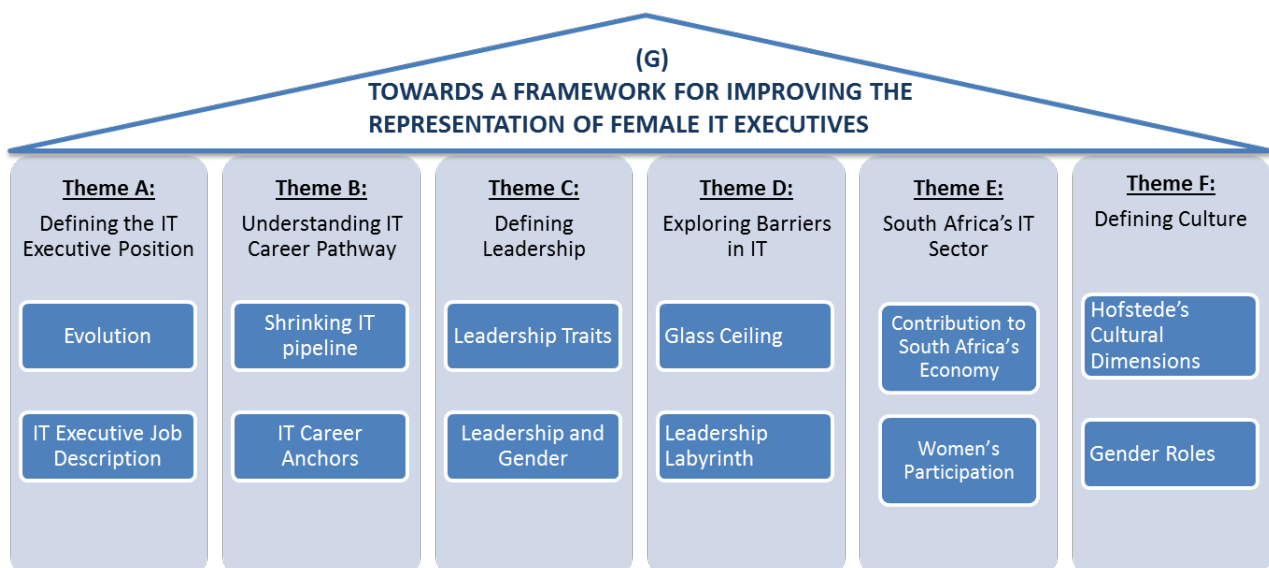


Figure 3-1: Scope of literature

To develop a framework that will aid South Africa's female IT professionals to progress to IT Executive positions (area G in Figure 3-1), the literature study covering themes A to F of Figure 3-1 was conducted. A high-level description of each theme is provided below.

**THEME A – Describing the job of the IT Executive:** This part of the literature review describes what it means to be an IT Executive. This is done by first examining how the role evolved. Secondly, the expectations of an IT Executive are outlined by reviewing the typical functions and required competencies to effectively execute these functions. The competencies are discussed in terms of applicable skills (both soft and technical) and knowledge (with respect to the required knowledge and background education).

**THEME B – Understanding the IT career pathway:** The IT discipline bears many career opportunities for all genders. This section provides an overview of the IT career pathway. An evaluation of the IT career pipeline is provided to understand why there is low representation of women in the IT field. Career anchors are discussed to understand the motivations for choosing a career. Despite the issues in the IT career pipeline, there are women who have entered and stayed, hence the need to explore typical career anchors that exist.

**THEME C – Definition of leadership:** In view of the IT Executive being a leadership role in the IT field, this theme discusses the concept of leadership. Leadership traits of an effective leader are also presented. According to Eagly and Johannesen-Schmidt (2001), the impact of gender on leadership style becomes apparent on measures of style that reflect agentic and communal traits. As such, literature on leadership from the perspective of gender is reviewed to establish gender differences in leadership styles.

**THEME D – Barriers in IT:** The poor representation of female IT Executives necessitates a discussion around the obstacles that women are confronted with that impede them from attaining IT leadership positions. The "glass ceiling" is a phenomenon used to explain the barriers in IT. This phenomenon has however been contended by other researchers who subsequently argued for the IT leadership labyrinth as a form of IT barrier for women. On that account, this section discusses

how the glass ceiling and labyrinth phenomena influence the underrepresentation of female IT Executives.

**THEME E – Explaining the South African IT sector:** South Africa’s IT sector is considered one of the major contributors to South Africa’s GDP (ICT Empowerment Charter, 2004; Gillwald *et al.*, 2012). In this theme, the contribution of South Africa’s IT sector to the country’s economy is reviewed in terms of IT employment and the overall participation of women in the IT sector.

**THEME F – Understanding the concept of culture:** The definition of culture is described and explained from various perspectives. This includes a discussion around the history behind Hofstede’s cultural dimensions. This section also reviews literature to explore the gender roles that are considered typical for men or women.

The six literature review themes collectively address the IDTGIT constructs. Figure 3-2 depicts the literature study themes that address the respective constructs. Some of the themes have an overlap with other constructs because they cover topics that relate to these constructs.

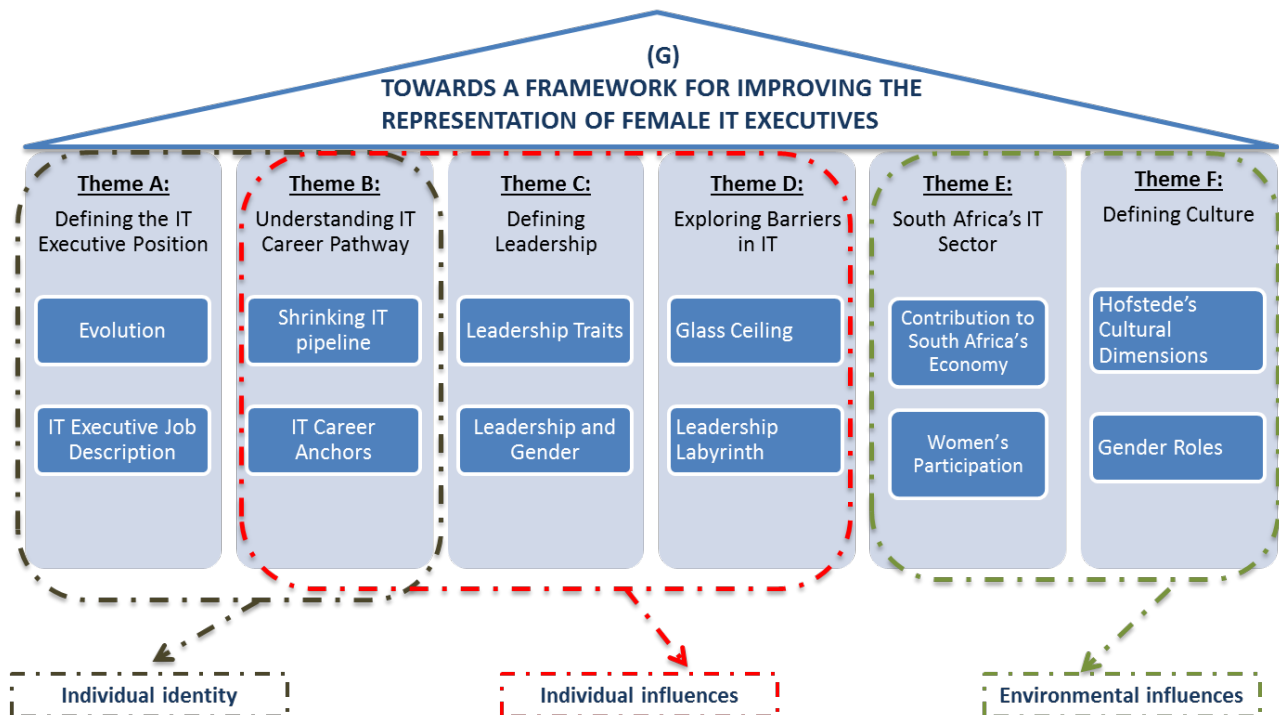


Figure 3-2: Relationship between IDTGIT constructs and literature study themes

The individual identity construct is covered by theme A and in part theme B. The respective topics in these themes relate to factors that lead to understanding the make-up of an IT Executive. This way an individual can determine whether he or she identifies with the role or not. In theme A, the IT Executive job is defined from the perspective of expected job responsibilities and required competencies. In light of the fact that the IT Executive position is a highest-level position in IT, the IT career pipeline is discussed in theme B to highlight career path points that result in the underrepresentation of women at IT leadership level.

Factors associated with the individual influences construct are addressed by the remaining parts of theme B and topics covered in themes C and D. Career anchors discussed in theme B form the basis of one's influences to career choices. Traits that define leadership are discussed in theme C, as they are associated with personal characteristics of individuals in leadership positions. To further explain personal influences that mould people's careers, theme D looks into the typical barriers that exist in the IT field.

Both themes E and F provide a link with the environmental influences construct. Theme E explores the IT industry in the context of South Africa. Theme F, on the other hand, discusses the typical cultural gender norms that inform and influence people's behaviours.

### **3.3 THEME A: DESCRIBING THE JOB OF THE IT EXECUTIVE**

Guadalupe *et al.* (2014) define executive managers as the CEO and the managers that report directly to him or her. They "have a significant leadership role in the organisation; have control over day-to-day operations and have decision-making powers" (Catalyst, 2005; BWSA, 2015). From an IT point of view, these executive managers are accountable and responsible for ensuring the proper management of IT operations. They are the highest-ranking executives within the IT fraternity and are often members of top management teams (Chen & Preston, 2007; Fortino, 2008: 139; Preston *et al.*, 2008; Chen & Wu, 2011; Karanja & Zaveri, 2012). IT Executives occupy executive positions such as Chief Information Officer (CIO), IT Director, Chief Technology Officer (CTO), and Chief Operations Officer (COO). Because these roles are executive roles, Peppard (2010: 75) posits that the label given to the incumbent is not as important as the role that he or she fulfils.

### 3.3.1 Evolution of the role of the IT Executive

The IT function was previously considered a support function primarily focused on ensuring that IT systems were functioning properly and meeting business needs (Gerow, 2012: 78). However, as organisations grew more dependent on IT, both operationally and strategically, IT systems became a critical resource for the daily operations of organisations (Karahanna & Watson, 2006). As such, top management teams recognised the strategic and more central role that the IT function plays (Gerow, 2012: 78; Lim, Stratopoulos & Wirjanto, 2012). The shift from IT being just a support function in organisations to being a driver of competitive advantage, strategic change, and innovation resulted in the natural evolution of the management of the IT function (Peppard, Edwards & Lambert, 2011; Lim *et al.*, 2012). To reflect the perceived strategic role of IT in organisations, the IT Executive role was subsequently created (Lim *et al.*, 2012; Hunter, 2010: 125). Essentially, the existence of an IT Executive is as a result of organisations recognising the importance of information and the underlying technologies, including the management thereof (Chen & Preston, 2007; Hunter, 2010: 125).

According to Hunter (2010: 126), the rationale behind having IT Executives in organisations is to ensure that there is alignment between the business and technology. Cano, Fernandez-Sanz and Misra (2012) state that aligning technology and organisational goals is the top priority for the IT Executive. Chen and Wu (2011) add that such an alignment creates business value and helps to shape business vision and strategy in order to gain competitive advantages for an organisation. Lim *et al.* (2012) posit that having an IT Executive will result in the effective management of IT resources and capabilities. This means that the change in the focus of IT made way for a more comprehensive approach to the management of the IT discipline. Cano *et al.* (2012) postulate that the poor management and productivity of IT raised many concerns for CEOs, thus the need to have an IT Executive.

The requirement for business and technology alignment prompted the need for the IT Executive to be a technical and business manager responsible for deploying IT solutions that generate value-adding information for organisations (Chun & Mooney, 2009). Because of the strategic positioning of the IT function and the need for IT Executive role, the role of the data processing manager was henceforth replaced by an executive dealing with the use of IT from a strategic management viewpoint (Hunter, 2010: 125; Lim *et al.*, 2012). Chun

and Mooney (2009) echo the same sentiments by stating that the role of the IT Executive evolved from data processing to acquiring, implementing, and maintaining the technical infrastructure required to process the organisation's information.

In essence, the IT Executive role was traditionally a role that focused on technology and the management of IT operations. The reason for the narrow and limited focus on technology was because the IT function in organisations operated in silos and mainly provided an efficiency-based support function (Chen, Preston & Xia, 2010). Gerow (2012: 78) asserts that many organisations place IT at the centre of their business strategies, thus eliminating the silo functioning of IT. Chen and Wu (2011) agree that the IT function has now become ubiquitous and prevalent across the entire organisation.

### **3.3.2 The IT Executive job description**

To understand expectations from individuals fulfilling the IT Executive roles, the IT job description is evaluated. A job description is a statement that articulates functional information of the job such as tasks, responsibilities, skills, and level of authority (Durai, 2010; Rohlander, 2014). Rohlander (2014) also adds that a series of qualifications related to the job must be stated in the job description. Exploring the IT Executive job description gives an indication of a typical career pathway one would need to follow to attain the IT leadership role. As Clark (2012) claims, it is vital for women with aspirations to fulfil IT leadership roles to understand the pathways that might lead them there.

This section describes the job of an IT Executive in terms of the overall role and the associated competencies. The role of the IT Executive covers job responsibilities, while competencies cover the required skills. The level of authority is explained in terms of the IT Executive's reporting hierarchy.

#### **3.3.2.1 The role of the IT Executive**

As IT becomes increasingly important towards the organisation's strategy and operations, so does the role of the IT Executive (Banker, Hall & Hu, 2008; Chen *et al.*, 2010; Hodgson & Lane, 2010). As such, IT Executives have become high-ranking executive-level leaders rather than mere service providers (Chen & Preston, 2007; Chun & Mooney, 2009), who are hired essentially as strategists first and infrastructure manager second (Fortino, 2008: 140). However, Chen *et al.* (2010) note that the constant changes in technology and business



have made it difficult to clearly define the role of the IT Executive. Initially, the role of the IT Executive was meant to provide a link between the data processing department and the organisation's executive managers (Hunter, 2010: 125). This implied that the IT Executive had to focus more on IT operations. However, given the strategic positioning of IT, the focus of the IT Executive role changed to be primarily on business imperatives (Chun & Mooney, 2009). The role of the IT Executive changed significantly over the years from being an operational IT provider to a strategic organisational leader leveraging the knowledge and use of IT for shaping corporate strategy (Fortino, 2008: 141; Chen *et al.*, 2010; Hunter, 2010: 125). This is attributed to the growing complexity of organisations and continuously changing technology environments (Chen *et al.*, 2010). Kahn and Blair (2009: 140) add that the IT Executive role changes regularly as a result of the increasing dependency on digital information. Smaltz, Sambamurthy and Agarwal (2006) further highlight that the ambiguity in the role of the IT Executive results in lack of clearly defined tasks and roles. Moreover, given that the role is at times devised to accommodate the environment in which it operates, it will inevitably continue to evolve (Peppard *et al.*, 2011). Hence this role is in itself argued to be dynamic (Allison, 2010: 2).

As the role of the IT Executive continues to evolve, the responsibilities thereof continue to expand (Hunter, 2010: 125; Peppard *et al.*, 2011). According to Fortino (2008: 141), the responsibilities of IT Executives are influenced by how the organisation operates and its current business strategy. The general responsibilities of an IT Executive as suggested by literature are listed in Table 3-1.

Fortino (2008)	Chun and Mooney (2009)	Thudugala and Weerawarana (2013)
Customer management	IT strategy alignment to business strategy	Change management
IT strategies alignment to organisation vision	Purchasing and vendor management	Stakeholder management
Process management	Contribute to corporate strategy	IT service management
Identifying opportunities to improve the business by	Business process innovation and	IT budgeting

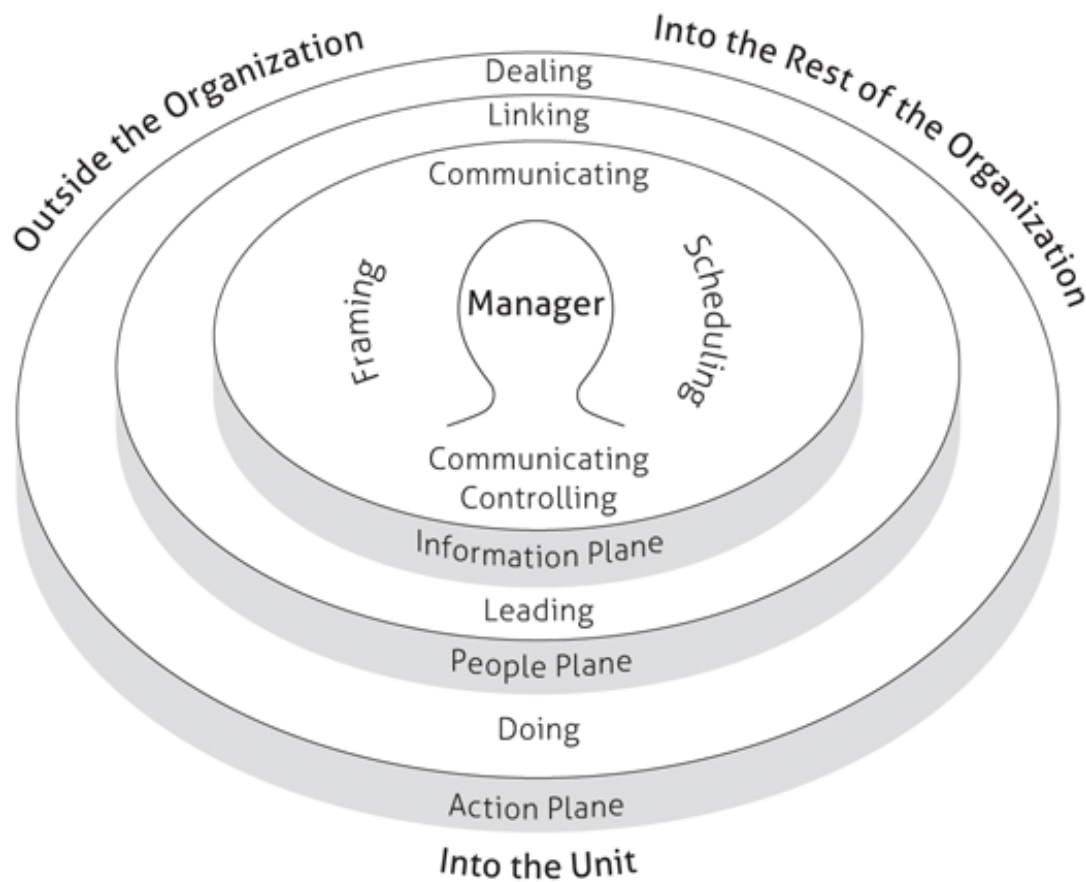
Fortino (2008)	Chun and Mooney (2009)	Thudugala and Weerawarana (2013)
leveraging IT	design	
Build flexible and scalable IT business architectures	Managing IT costs	Project management
Manage IT budgets	Contract facilitation	IT and business strategy alignment
Manage IT performance	Architecture planning	People management
Relationship management	IT service delivery and management	IT governance
Change management		
People management		

**Table 3-1: General IT Executive responsibilities**

Chen and Wu (2011) submit that for IT Executives to be able to perform optimally, it is imperative that they recognise and understand their responsibilities and the contributions they make to the organisation.

There are many varying views about the role of the IT Executive (Smaltz *et al.*, 2006). Various authors have sought to examine the role of the IT Executive (e.g. Banker *et al.*, 2008; Chen *et al.*, 2010; Hunter, 2010; Peppard *et al.*, 2011). To describe the generic role of the IT Executive, Mintzberg's Model of Managing is adopted (Figure 3-3). Mintzberg (2013) provides a generic model to describe the role of senior executives in any organisation as shown in Figure 3-3. In essence, the model shows the manager between the unit he or she manages, the rest of the organisation, and what is outside the organisation (e.g. customers, suppliers, and trade officials) (Mintzberg, 2013). In Mintzberg's context, a manager and a leader mean the same thing. According to Baschab and Piot (2007), the complexity around the role of the IT Executive is as a result of the wide variety of business constituencies, outside suppliers, and staff that he or she must manage on an ongoing basis.

Baschab and Piot's argument provides the basis for applying Mintzberg's Model of Managing in describing the generic role of the IT Executive.



**Figure 3-3: Model of Managing**

Source: Mintzberg (2013)

The model specifies the following roles to describe what senior executives do:

- Communicating
- Controlling
- Leading
- Linking (to the outside)
- Doing
- Dealing
- Framing
- Scheduling

Each of the aforementioned roles are described in Table 3-2.

Role	Description
Communicating	<p>Involves collecting and disseminating information in an effort to ensure information flow around the manager. This information can either be documented or transmitted verbally. The role encompasses the following aspects:</p> <ul style="list-style-type: none"> <li>- Accessing any available and useful information about internal operations and external events, trends and analyses, and everything imaginable.</li> <li>- Since the manager oversees an entire business unit, he or she is expected to know a bit about every speciality that exists internally or externally, thus making him or her the nerve centre of the unit.</li> <li>- Disseminating information to other people within the business unit.</li> <li>- Representing information about the business unit to various stakeholders, thus making the manager the spokesperson of the business unit.</li> </ul>
Controlling	<p>Involves directing the behaviour of subordinates. Control of a business unit is typically done by exercising formal authority. The following forms of controlling exist:</p> <ul style="list-style-type: none"> <li>- Guiding the behaviour of their subordinates by designing and implementing projects, structures, and systems.</li> <li>- Delegating specific decision-making activities and execution of certain tasks to someone else within the business unit.</li> <li>- Passing judgement on other people's decisions.</li> <li>- Allocating necessary and sufficient resources such as</li> </ul>

Role	Description
	<p>money, materials, equipment, and human resources.</p> <ul style="list-style-type: none"> <li>- Getting beyond targets into the operations of the business unit they are responsible for.</li> </ul>
Leading	<p>Leadership is a necessary component of management that is exercised with individuals (one on one), with teams, and with the entire business unit or organisation. It involves:</p> <ul style="list-style-type: none"> <li>- Helping individuals to bring out the energy that exists naturally within them.</li> <li>- Helping to develop individuals within the business unit.</li> <li>- Helping to build and maintain teams inside the business units. This requires team-building efforts that involve bonding people into cooperative groups as well as resolving conflicts within and between these groups so that they can get on with their work.</li> <li>- Helping to establish and strengthen organisational culture.</li> </ul>
Linking	<p>Involves building and maintaining a web of relationships with numerous individuals and groups outside the business units. Linking comprises the following components:</p> <ul style="list-style-type: none"> <li>- Networking, whereby managers spend time building up networks of outside contacts and establishing coalitions with external supporters.</li> <li>- Playing a figurehead role by representing the business units officially to external stakeholders.</li> <li>- Using networks to gain support for the business units by conveying relevant information to appropriate stakeholders.</li> <li>- Transmitting influence to others in the business unit.</li> </ul>

Role	Description
	<ul style="list-style-type: none"> <li>- Controlling what information and influence should be passed and how. Managers are not just channels for passing through information and influence but are also valves in these channels. Basically, managers are gatekeepers and buffers in the flow of influence and information.</li> </ul>
Doing	<p>Refers to active involvement in tasks whereby the manager is personally hands-on with the actions that determine what the business unit should do. There are two aspects of the doing role, namely:</p> <ul style="list-style-type: none"> <li>- Managing projects proactively, whereby managers can head up projects themselves or join others on the projects mostly because they are concerned about the outcomes.</li> <li>- Handling disturbances by reacting to changes forced on the business unit.</li> </ul>
Dealing	<p>Managers do deals with internal and external stakeholders. The two main components of the dealing role are: building coalitions around specific issues (mobilising support) and using these coalitions with established networks to conduct negotiations. As figureheads, managers add credibility to the negotiations; as nerve centres, they bring comprehensive information to bear on them; in positions of authority, they are able to commit the necessary resources in real time.</p>
Framing	<p>It refers to how the manager identifies purpose, by focusing on issues and developing strategies. With framing, the context for everyone else working in the business unit is established.</p>
Scheduling	<p>Scheduling brings the frame to life, by determining what the manager seeks to do and how to use his or her available degrees of freedom to do it. Moreover, the manager's schedule can have enormous influence over everyone else in the business unit</p>

Role	Description
	because whatever gets into the manager’s agenda is considered a crucial matter for the business unit.

**Table 3-2: Mintzberg’s managerial roles**

Source: Mintzberg (2013)

IT Executives are required to provide guidance in the strategic exploitation of information and IT resources (Banker *et al.*, 2008; Chen *et al.*, 2010; Chun & Mooney, 2009; Peppard *et al.*, 2011). Hunter (2010: 126) maintains that the IT Executive “must attempt to bridge the gap between information technology and the business”. In support of the notion by Hunter, Fortino (2008: 139) and Cano *et al.* (2012) assert that the primary goal of the IT Executive is to align technology and organisational mission, vision, and strategic goals. This involves carefully considering the future and direction of the organisation when implementing technological innovation in the organisation (Fortino, 2008: 139). In so doing, technology can be leveraged to add value to the organisation by enhancing business decisions.

Over and above the general roles of the senior executive as defined by Mintzberg, Chen and Wu (2011) conducted a study to identify the most significant roles of an IT Executive. These are outlined in Table 3-3.

Role	Description
Business visionary	To lead the executive team in developing a business vision that captures opportunities presented by IT.
Business system thinker	To think through new business models and introduce new management processes that leverage the emerging/enabling IT/IS to achieve strategic alignment between business and technology and integrate firm-wide IT efforts with business purposes and activities.
Value configure	To define an organisation's strategic future, with an unrivalled understanding of the ideas that are being deployed throughout the organisation and even outside its boundaries.
Entrepreneur	To identify business needs and develop solutions that change business situations and ensure that rapidly evolving technical opportunities are understood, planned, implemented, and strategically exploited in the organisation.
Infrastructure builder	To create the coherent blueprint for a technical platform/infrastructure which responds to present and future business needs.
Organisational designer	To devise and continuously adapt an IT organisation that responds to the business-side (business model/process) realities.
Relationship builder	To facilitate a wider dialogue, establishing understanding, trust, and cooperation among business users and IT specialists.
Informed buyer	To strategically deploy external resources in a manner that maximises the effectiveness of internal resources and lower organisational costs.

**Table 3-3: IT Executive roles**

Source: Chen and Wu (2011)



To add to the list, other authors have also identified the following additional roles of the IT Executive:

- To occupy a central role in visioning, guiding, and implementing the organisation's IT management practices (Smaltz *et al.*, 2006).
- To ensure seamless service delivery to the organisation by contributing to the organisation's strategy (Karahanna & Watson, 2006). This can be done by incorporating IT effectively into the overall business strategies (Khallaf & Skantz, 2011).
- To oversee the organisation's overall IT deployments that contribute to the organisation's performance in terms of efficiency and strategic growth (Chen *et al.*, 2010). Taking into account that strategic leadership "entails substantive decision-making responsibilities in that the strategic choices they make can have profound effects on organisational performance" (Karahanna & Watson, 2006), it therefore suffices to consider IT Executives as strategic leaders.
- To provide an intermediary between IT and the business at large by integrating the IT function with business operations (Chen & Wu, 2011). This requires the IT Executive to have a holistic understanding that crosses functional boundaries (Karahanna & Watson, 2006).

Considering that the IT Executive is the leader of the IT function, Smaltz *et al.* (2006) maintain that the IT Executive should be judged in terms of the role that he or she performs. After all, a leader role represents the "beliefs about the behaviours that are appropriate for leaders" (Powell, 2012: 121). According to Fortino (2008: 141), the role of the IT Executive is primarily business focused. Hence the study by Hodgson and Lane (2010) found four business-orientated dominant roles of the IT Executive, namely, Leadership; Process improvement and innovation; Relationship building; and Value-add services – strategic leadership.

### 3.3.2.2 *IT Executive competencies*

There are different meanings associated with the word competency, with no consensus on the correct definition (Yang, Wu, Shu & Yang, 2006; Hashim, 2008: 261; Stevenson & Starkweather, 2010). For example, Boyatzis (2008: 6) defines competency as “a set of related but different sets of behaviour organized around an underlying construct”. On the other hand, Willcocks and Feeny (2006) define a competency as a distinctive set of suitable skills, motivations, and behaviours that contribute to achieving specific activities and influencing business performance. According to Hashim (2008: 261), “competencies place equal weight on attitudes, feelings, and motivation, in addition to knowledge and skills”.

Based on these definitions, it is evident that a competency can be regarded as a capability or ability to perform a task. Most of the definitions are noted to suggest that knowledge, skills, abilities, and other characteristics underlie effective job performance, thus enabling employees to add value to the organisation (Bozkurt, 2011: 10). Hashim (2008: 262) concurs that the definitions of competency show a relationship between competencies and performance rather than personal qualities. Regardless of the elusive definition of the term competency, competencies are considered essential in completing specific tasks (Yang *et al.*, 2006; Stevenson & Starkweather, 2010).

According to Yang *et al.* (2006), the term competency encapsulates different aspects of things, such as employee qualities, skills, knowledge, characteristics, and attributes required to perform a task. Hashim (2008: 261) points out that competency can be viewed as the things that organisations do well; the qualities that people should possess; or the knowledge and skills required to perform a task. Bozkurt (2011: 10) adds that to perform a task successfully, it is crucial for one to have the right personal attributes, skills, and the necessary knowledge. Boyatzis (2008: 10) asserts that one of the benefits of a competency is that it can be learned and developed in adulthood.

Xiao (2006: 374) notes that it is not easy to define common competencies that are required to do work well. Such competencies are vital because they are linked to individuals rather than the jobs they perform (Hashim, 2008: 262). Competencies in leadership positions have been evaluated over a number of years (Stevenson & Starkweather, 2010). Effective leadership competencies are viewed either through generalisability or contextually (Xiao, 2006: 375). Through generalisability, it is argued that if someone is effective in his or her

own culture, then they will be effective in another context (Xiao, 2006: 375). Effective leadership competencies, on the other hand, are viewed as context-specific and involve occupational differences as well as cultural differences (Xiao, 2006: 376). Competencies are also used to distinguish outstanding performers from others in a defined job context (Bozkurt, 2011: 10). To distinguish outstanding leaders from average leaders, Boyatzis (2008: 6-7) suggests that the outstanding leaders need to possess the following clusters of competencies:

- Cognitive competencies
- Emotional intelligence competencies
- Social intelligence competencies

Bozkurt (2011: 32) contends that competencies differ from leader to leader. This is because the leader's competencies have to correspond specifically with organisational goals (Fortino, 2008: 145). Cano *et al.* (2012) support that each IT Executive requires a different set of competencies that are in line with the organisation's strategic goals. Such competencies will ensure that IT is embedded in and aligned with the business strategy (Gerow, 2012: 78).

Cano *et al.* (2012) argue that there are extensive competencies associated with IT Executives. Moreover, to be effective in his or her role as an IT Executive, the incumbent requires a wide variety of competencies (Von Urff Kaufeld, Chari & Freeme, 2009). However, it is deemed unrealistic for the IT Executive to have all the related competencies (Fortino, 2008: 145; Cano *et al.*, 2012). In addition, given the dynamic nature of the role of the IT Executive, Allison (2010: 2) states that some competencies become insufficient for future success. Consequently, Bozkurt (2011: 32) contends that it is imperative for a leader to possess only core competencies because they increase the chance of the leader to be successful. With core IT competencies, Willcocks and Feeny (2006) assert that the IT Executive will be able to facilitate the use of IT in order for an organisation to be successful. Additionally, SpencerStuart (2005 cited in Hodgson & Lane, 2010) states that the IT Executive should embody the leadership competencies of the CEO so that he or she can ensure alignment of IT and organisational objectives. Chen and Preston (2007) maintain that IT Executives' competencies refer primarily to the personal skills, knowledge, and abilities of IT Executives. This means that for an IT Executive to be able to perform his or her work adequately, specific skills and knowledge are required. In addition to knowledge

and skills, competencies also place equal weight on attitudes, feelings, and motivation (Hashim, 2008: 261).

Yukl (2010: 44) refers to skill as the ability to do something effectively. Inglis and Aers (2008: 170) state that a skill is a key concept that is extremely broad and applied everywhere such that it can potentially become meaningless. Xiao (2006: 374) shares the same views that the meaning of skills is dependent on the context in which it is applied. This means different people can have a different understanding of skills. Despite the different understandings of what a skill is, researchers agree that a skill is acquired through training. For example, Bhattacharyya (2011) asserts that a skill involves training on a series of actions that must be performed to accomplish a goal or a task. Similarly, Bozkurt (2011: 25) brings out that a skill is a competency that is learned in order to carry out pre-determined activities. Xiao (2006: 377) and Yukl (2010: 44) also agree that skills are acquired through education or learning and are transferable across firms.

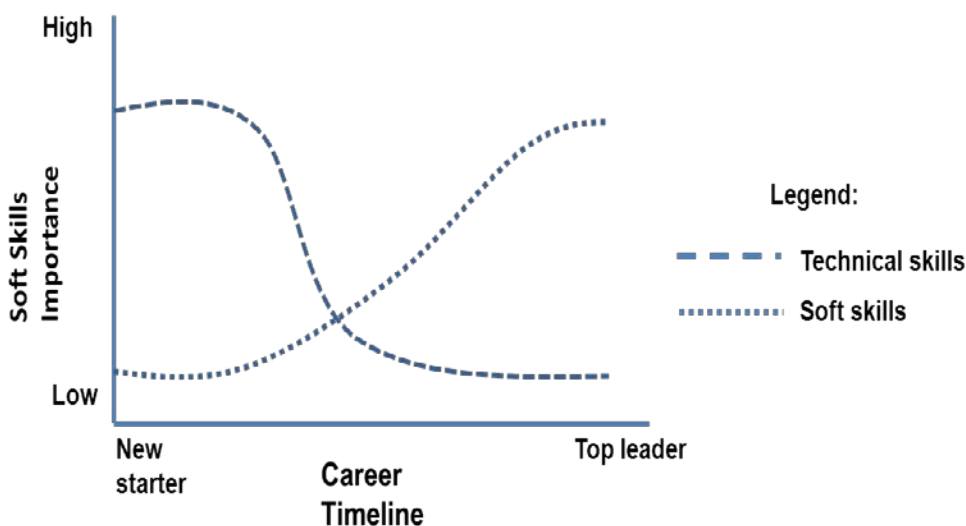
Skills can be categorised into two parts (Bhattacharyya, 2011), namely:

- Soft skills – these include supervisory skills, interpersonal skills, and general business skills. Interpersonal skills are those that enable effective communication and interaction between people. General business skills enable managers to be able to successfully run the organisation and support available organisational infrastructure.
- Technical skills – these can be observed, demonstrated, and tested. These relate to skills that are only useful for a specific job (Bozkurt, 2011: 25)

Because the IT Executive evolved from a technical environment, IT Executives are inclined to have strong technical backgrounds. However, given that IT Executives have the immense and difficult task of solving broad organisational challenges, Costello (2011: 64) points out that the skills of the IT Executive should span beyond IT. Chester (2011: 62) agrees that if the IT Executive puts much focus on technical skills, he or she runs the risk of being reactive. Rust (2012: 1) supports that technical skills on their own are not sufficient for the IT Executive to successfully lead the organisation. Conversely, Smith (2013) argues that IT Executives who rely solely on their technical subordinates for technical decisions can jeopardise their careers, as inappropriate decisions could easily be made. After all, IT Executives who do not have technical skills find it challenging when it comes to evaluating

and assessing complex technological issues (Ernest & Young, 2012). Moreover, given that the IT Executive is a member of the top management team (TMT), possessing technical skills also enables them to better give advice to the executive team in terms of appropriate technologies to invest in (Chen & Wu, 2011; Cano *et al.*, 2012). Much as technical skills are essential in ensuring the IT Executive's success (Smith, 2013), these must be mixed with soft skills. The extent to which technical skills are required for competent IT Executives, as compared to soft skills, is demonstrated by Owen (2012).

According to Owen (2012: 24) and Von Urff Kaufeld *et al.* (2009), as one advances in his or her IT career, technical skills become less important, as shown in Figure 3-4. This means that the IT Executive is not expected to have the same level of both the soft and technical skills.



**Figure 3-4: Leadership skills and career**

Source: Owen (2012: 24)

Figure 3-4 shows that the IT Executive's soft skills outweigh the technical skills in terms of importance. Fortino (2008: 144) and Cano *et al.* (2012) concur that the IT Executive's core competencies are based more on a business-orientated set of skills than technical skills because of the critical need to have regular contact with other executives, customers, and personnel. This is expected because the IT Executive, as already mentioned, is part of the top management team, and therefore needs to operate at a strategic level. Rust (2012: 2) points out that IT Executives are required to have soft skills so that they can engage

adequately with all employees in their respective departments. In so doing, they will be fully recognised as leaders. On the contrary, Dawson and Kauffman (2010) argue that since the IT Executive oversees all aspects of IT, he or she is expected to possess significant technical knowledge over and above process and business knowledge. This is disputed by Peppard (2010: 85) who states that the assumption that the IT Executive position requires strong technical skills results in many organisations hiring a technologist for the role. The IT Executive is arguably more than a technology expert who must be able to express IT benefits to the organisation using business terms (Gerow, 2012: 78). Having superior management competencies ensures that IT Executives are able to understand business priorities, opportunities, and needs for the strategic exploitation of IT (Chen & Wu, 2011).

As far as knowledge is concerned, Becerra-Fernandez and Sabherwal (2010: 17) guard against using the concept of knowledge interchangeably with data and information, as these concepts have completely different meanings. Information is derived from data, whereby data is processed and structured in a way that provides context, relevance, and purpose (Becerra-Fernandez & Sabherwal, 2010: 18). Bozkurt (2011: 24) defines knowledge “as expertise and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject, what is known in a particular field or in total; facts and information or awareness or familiarity gained by experience of a fact or situation”. Knowledge is essentially derived from some type of information (Becerra-Fernandez & Sabherwal, 2010: 18). There are two common types of knowledge: explicit and tacit knowledge (O’Dell & Hubert, 2011: 3). O’Dell and Hubert (2011: 3) define explicit knowledge as what is typically found in documents, formulas, procedures, models, manuals, and other places. The authors define tacit knowledge as that which is based on one’s belief or experience. Contrary to explicit knowledge, tacit knowledge cannot be documented because it is individualistic (Becerra-Fernandez & Sabherwa, 2010: 26).

Cheung and Halpern (2010) claim that few women make it to executive management level, in positions such as CEO and IT Executives, despite their level of education. The reasoning behind this claim is that more women across the world are noticeably enrolling in higher education in pursuit of careers in management (Appelbaum *et al.*, 2011). Cano *et al.* (2012) assert that a good academic education, as well as solid professional experience, can serve the IT Executive well.

According to Aiken and Gorman (2013), there are no uniform mandated qualifications for the IT Executive, as opposed to TMT members such as the CFO. Nonetheless, Fortino (2008: 1878) has found that typical IT Executives' qualifications are computer science or management information systems degrees, plus an appropriate master's degree. Cano *et al.* (2012) highlight that a master's level qualification in an IT-related discipline is the main requirement for someone in an IT Executive position. However, McGee (2008: 2) points out that organisations these days do not put much emphasis on tertiary education when hiring IT Executives. It is rather preferable for the IT Executive to have prior experience in IT management or have previously fulfilled the same role in another organisation (Cano *et al.*, 2012). Therefore, it is fundamental for IT Executives to develop a broad competency in business management so that they are able to deal with the challenges of the changing environment (Chen & Wu, 2011). As such, McGee (2008: 1) recommends that people who wish to pursue IT Executive opportunities should acquire at least one or two years' experience in non-IT business unit management, particularly if they are technically educated and/or have extensive IT experience.

### **3.3.2.3      *IT Executive reporting hierarchy***

According to Smaltz *et al.* (2006), the IT Executive's structural power is described in terms of the hierarchical level of the IT Executive and his or her presence in the TMT. There are differing views on the appropriate level of the IT Executive's strategic decision-making authority (Preston *et al.*, 2008; Peppard *et al.*, 2011). According to Peppard *et al.* (2011), some perceive the IT Executive role not to be strategic enough to be part of the top management team, while others argue that the role is not only critical to IT strategic planning but also to organisational strategic planning. When regarded as a true peer by the top management team, the IT Executive can provide a unique way of shaping the future of the organisation (Enns, Mcfarlin & Huff, 2007). Conversely, the IT Executive is seen only as managing a support function, therefore not worthy to be part of the top management team. This infers that organisations position the IT Executive differently on their organisational structures. The opposing viewpoints are due to the diverse responsibilities of the IT Executive across organisations (Peppard *et al.*, 2011).

Despite the existence of the IT Executive role, Ranganathan and Jha (2008) point out that IT Executives in many organisations do not have the necessary authority and decision-

making right. Preston *et al.* (2008) posit the following factors to be determinants of the IT Executive's strategic decision-making authority: (1) organisation climate; (2) organisational support for IT; (3) IT Executive's structural power; (4) IT Executive's personal level of strategic effectiveness; and (5) partnership between the IT Executive and top management team. To make IT strategic decisions, the IT Executive needs to have the necessary level of power in the organisation (Preston *et al.*, 2008). This level of authority is called structural power. Structural power is the IT Executive's "level of legitimate power due to his or her formal position within the hierarchy of the organisation" (Chen *et al.*, 2010).

Enns *et al.* (2007) note that managing issues that are of strategic importance to the organisation is one of the key roles of the IT Executive. Therefore, without the appropriate level of structural power for the IT Executive, strategic IT initiatives will not be in line with the overall organisational strategy, thus resulting in IT not necessarily contributing towards the success of the organisation (Banker *et al.*, 2008). According to Chen *et al.* (2010), a higher level of structural power provides the IT Executive "with the legitimacy, opportunity, and leeway to bridge the gap between business and IT and shape the perceptions of other business executives about the strategic value of IT". This infers that the structural power of the IT Executive warrants a formal membership in the TMT.

Preston *et al.* (2008) submit that the IT Executive's power base within the organisation determines the level of authority that the IT Executive has. Banker *et al.* (2008) support that the IT Executive's reporting level has a significant reciprocal relationship with the orientation of the IT department in the organisation. According to Karahanna and Watson (2006), most frequently the IT Executive is part of the top management team. Enns *et al.* (2007) posit that the role of the IT Executive "has progressed from 'new kid on the block' to member of the top management team". Guadalupe *et al.* (2014) state that the composition of the TMT forms the basis of the firm's organisational structure. Being a member of the TMT, the IT Executive gets to enhance his or her business knowledge through interaction with other business executives (Lim *et al.*, 2012).

Furthermore, the IT Executive adds to the diversity of TMTs, which, in turn, results in enhanced heterogeneity with the TMT structures and a common understanding of the role of IT (Ranganathan & Jha, 2008; Karanja & Zaveri, 2012). Karahanna and Watson (2006) maintain that in order to exercise the strategic options afforded by IT, it is imperative that



there be a strategic partnership between the IT Executive and the top management team. The implications of this partnership include providing a better understanding of the IT Executive's strategic domain and the ability of the IT Executive to have greater decision-making latitude (Preston *et al.*, 2008). As a result, IT Executives are considered valuable to the organisation because they bring a different perspective to the TMT and ensure alignment between IT and organisational strategy is achieved (Chun & Mooney, 2009).

Preston *et al.* (2008) concur that the IT Executive who is at peer level with other senior executives is "successful in educating, advising, and actively influencing other senior executives". Peppard (2010: 86) reports that if there are no strong relationships between the IT Executive and the members of the top management team, the IT Executive is likely to struggle to influence the organisation's strategic direction. Members of the top management team have a varying impact on strategic decisions, with the CEO delegating the decision influence to the appropriate TMT member based on level of expertise (Buyl *et al.*, 2014). Karanja and Zaveri (2012) note that because of the dominance of IT in organisations, the IT Executive can influence strategic decision making. Therefore the presence of the IT Executive in TMTs will improve decision making around IT-related matters and ensure effective deployment of IT (Preston *et al.*, 2008; Ranganathan & Jha, 2008).

According to Karanja and Zaveri (2012), even though the role of the IT Executive is newer than the roles of other members of the top management team such as the CEO and CFO, the IT Executive has become more influential due to the multifaceted role of IT in organisations. The elevated status of the IT Executive to member of the top management team is a result of the increased reliance of organisations on IT (Ranganathan & Jha, 2008). Lim *et al.* (2012) suggest that "there is a positive relationship between the hierarchical power of senior IT Executives and the likelihood that the firm will develop superior IT capability". This is probable considering that IT is seen as a strategically valuable asset to the organisation (Ranganathan & Jha, 2008; Chen *et al.*, 2010). The positioning of the IT Executive at top leadership level is evidence of the recognised importance of the IT department to the fulfilment of the organisational strategy.

Bearing in mind that members of the top management team report directly to the CEO (Guadalupe *et al.*, 2014) does not necessarily mean the IT Executive reports to the CEO. For instance, IT Executives can report to the COO or CFO, in order to bridge the gap

between IT and operations or finance respectively (Gerow, 2012: 78). However, Chun and Mooney (2009) claim that studies have shown that many IT Executives report directly to the CEO. Gerow (2012: 78) posits that the IT Executive who reports directly to the CEO, thus a member of the TMT, has the greatest influence on the joint development of organisational and IT strategies. In cases where the IT Executive reports to a higher reporting structure such as the CEO or CFO and is a member of the TMT, the IT department tends to be strategically orientated (Raghunathan & Raghunathan, 1993 cited in Banker *et al.*, 2008). Otherwise, the IT department is seen as purely operational.

Although the IT Executive has to effectively influence the CEO (Enns *et al.*, 2007), Banker *et al.* (2008) report that what is valuable is to have the IT Executive reporting structure aligned with the strategic positioning of the organisation. In other words, it does not really matter if the IT Executive reports to the CEO or the CFO, as long as the IT Executive's positioning is aligned with the organisation's strategy. Therefore the CEO-CIO reporting structure is not always the best approach for all organisations. On the contrary, Fortino (2008: 139) highlights that it is ideal for the IT Executive to report directly to the CEO and be a member of the TMT.

Banker *et al.* (2008) suggest that the alignment between the organisation's strategic position and the IT Executive reporting structure has an influence on the performance of the organisation. This means that if there is no alignment between the IT Executive reporting structure and the strategic position of the organisation, then organisational performance would be poor, regardless of to whom the IT Executive reports. Ranganathan and Jha (2008) share the same views that organisations that have IT Executives as members of the TMT are likely to perform better than those with IT Executives not sitting at the TMT table. According to Gerow (2012: 78), some of the IT Executive's attributes that may influence the organisation's performance include the IT Executive's business and technical knowledge and the connections that he or she has established.

### 3.3.3 THEME A Summary

#### Summary:

The strategic positioning of the IT field has resulted in the introduction of an IT Executive position. The IT Executive role has evolved from being focused on technology and the management of IT to being primarily focused on business imperatives. These business imperatives include providing guidance on the strategic exploitation of information and IT resources as part of bridging the gap between IT and the business. The IT Executive role continues to evolve due to changing business environments. The continuous evolution of the IT Executive role means the responsibilities thereof continue to expand. Nonetheless, there are general responsibilities of the IT Executive that are cited in literature. To perform these responsibilities, IT Executives need to possess a set of competencies. Competencies in themselves differ from leader to leader, and they need to correspond with organisational goals. The IT Executive competencies, in particular, include soft skills, technical skills, and relevant IT knowledge. For the IT Executive to be influential in his or her role, it is critical that the role be appropriately placed on the organisational structure. The common trend is that the IT Executive reports to either the CEO or CFO. However, there is no standard for the IT Executive reporting level in the industry.

#### Insights:

It is noted that the role of the IT Executive is accountable for all functions of IT. The role has evolved from just overseeing IT operations to being a strategic partner to the business at large. This implies that whatever the IT Executive does, it must be in line with the strategic direction of the organisation. It is furthermore required that the individual fulfilling the IT Executive role have the right competencies to execute his or her function as the head of the IT department. Contrary to popular belief, literature shows that technical skills are not as important as soft skills. Although there is no uniform formal IT qualification that the IT Executive should possess, it is still necessary to have a backing of a formal IT qualification. Understanding the type of work that an IT Executive gets involved in and the competencies required to do the work, an individual can determine if she identifies with the role or not. In addition, given that the IT Executive is a member of the top management structures, he or she would need to engage with the business at a strategic level. This means that the IT Executive would be required to

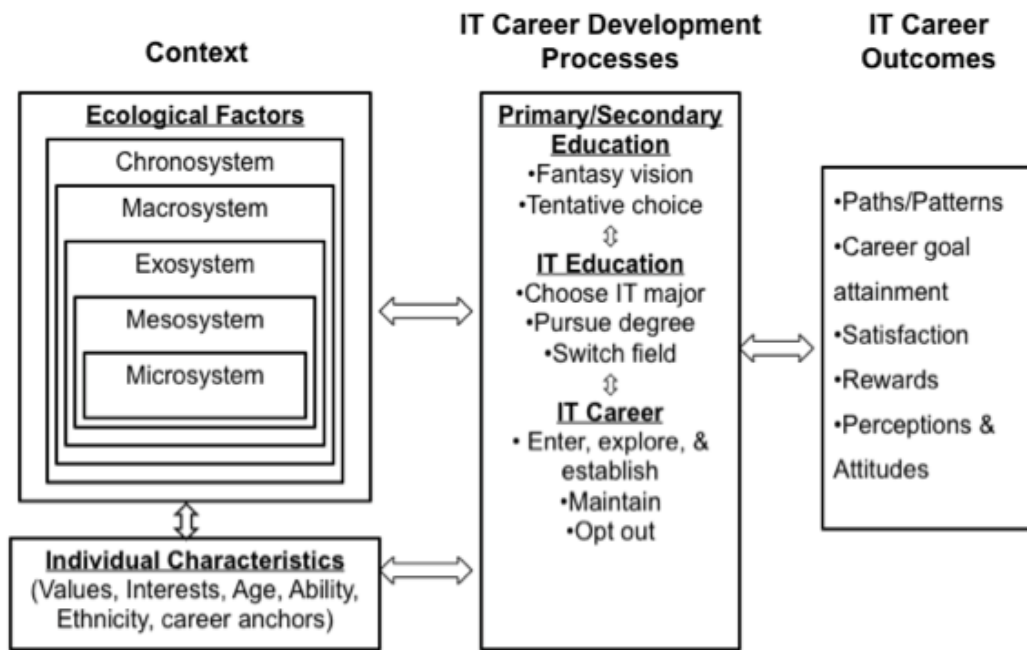
mostly speak business language rather than IT language. This is the reason why some authors recommend a business type qualification for IT professionals pursuing IT Executive positions. This way, the IT Executive role will be able to contribute meaningfully to the organisation. As far as the reporting level of the IT Executive is concerned, there is no prescription as to whom the role should report. What is important is that the role is aligned to the business strategy.

**Table 3-4: Summary and insights of Theme A: The IT Executive job**

### **3.4 THEME B: UNDERSTANDING THE IT CAREER PATHWAY**

The definition of a career is “a sequence or combination of occupational positions held during the course of a lifetime” (Super, 1957: 286 cited in Joseph, Boh, Ang & Slaughter, 2012). Career paths are defined as “models or prototypes characterising the career sequences of a group of individuals” (Joseph *et al.*, 2012). Typically, a traditional career path suggests that career progression follows an orderly fashion in sequential stages through education, labour market entry, and career development (Castaño & Webster, 2011). The implication of this linear approach is that successfully completing all stages results in a positive outcome.

Castaño and Webster (2011) contend that the linear progression through an IT career does not make provision for other factors that influence entry into the IT field. Nelson and Veltri (2011) agree that an approach to IT career development comprises a set of decision-making processes. This means that women who aspire to be IT professionals base their decisions on various factors. On that account, Nelson and Veltri developed a framework that combines both process and factor approaches to embrace the complexities of career development of women in IT (Figure 3-5).



**Figure 3-5: Framework for career development of women in IT**

Source: Nelson and Veltri (2011)

The ecological factors in Figure 3-5 are associated with five subsystems. The microsystem relates to personal interactions with people in various environments such as the home, school, peers, or the work setting. The mesosystems include interactions between two or more microsystems, for example, the relations between an individual's home and work environments. Exosystems portray linkages between subsystems that indirectly influence the individual's immediate context such as neighbours and friends of the family. Macrosystems describe the cultural attitudes and ideologies of the environment in which an individual lives. Lastly, the chronosystem refers to the patterns resulting from environmental events and transitions over the life course, as well as socio-historical circumstances (Bronfenbrenner, 2004 cited in Nelson & Veltri, 2011). The framework also considers individual differences that influence the IT career development process. The dynamic person-process-context-time interactions subsequently result in different IT career outcomes.

Joshi, Kvasny, McPherson, Trauth, Kulturel-Konak and Mahar (2010) posit that there are promising career prospects in the IT field. Individuals can follow either one of the distinct IT career paths: a technical IT career or a managerial IT career (Joseph *et al.*, 2012). An IT

profession with technical orientation is usually divided into three categories: IT-specific disciplines, IT-intensive, and IT supportive discipline (Njoki, Wabwoba & Micheni, 2016). Table 3-5 lists examples of each category of the technical IT discipline.

IT-specific disciplines	IT-intensive disciplines	IT-supportive occupations
<ul style="list-style-type: none"> <li>• <b>Artificial Intelligence</b></li> <li>• <b>Computer Science</b></li> <li>• <b>Computer Engineering</b></li> <li>• <b>Computational Science</b></li> <li>• <b>Database Engineering</b></li> <li>• <b>Computer Graphics</b></li> <li>• <b>Human-Computer Interaction</b></li> <li>• <b>Network Engineering</b></li> <li>• <b>Operating Systems</b></li> <li>• <b>Performance Engineering</b></li> <li>• <b>Robotics</b></li> <li>• <b>Scientific Computing</b></li> <li>• <b>Software Architecture</b></li> <li>• <b>Systems Security</b></li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace Engineering</li> <li>• Bioinformatics</li> <li>• Cognitive Science</li> <li>• Digital Library Science</li> <li>• E-commerce</li> <li>• E-financial Services</li> <li>• Genetic Engineering</li> <li>• Information Sciences</li> <li>• Information Systems</li> <li>• ICT-mediated Instructional Design</li> <li>• Knowledge Engineering</li> <li>• Multimedia Design</li> <li>• Telecommunications</li> <li>• Transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Computer Technician</li> <li>• Helpdesk Technician</li> <li>• Network Technician</li> <li>• Professional IT Trainer</li> <li>• Security Specialist</li> <li>• Systems Administrator</li> <li>• Web Service Administrator</li> <li>• Web Identity Designer</li> <li>• Database Administrator</li> </ul>

**Table 3-5: IT categories**

Source: Njoki *et al.* (2016)

Lumley *et al.* (2011) point out that the IT labour market continues to present increased career opportunities for IT professionals. Nonetheless, there is still a shortage of IT professionals (Quesenberry & Trauth, 2012). Despite the many available career opportunities in the IT field, Castaño and Webster (2011) argue that the entry of women in IT has not only stalled

but has gone into reverse. Some companies are experiencing staffing shortfalls as far as women in IT are concerned (Kindsiko & Türk, 2017). The underrepresentation of women in IT is as a result of varied and complex factors (Castaño & Webster, 2011). The next section discusses where and how the shortfalls of women in IT came into being.

### 3.4.1 Shrinking IT career pipeline

The pipeline model is primarily used to illustrate “the flow of people who move through different transition points or junctions along this path and to look for trends that are specific to women and minorities” (Vitores & Gil-Juárez, 2015). It is essentially used to highlight the decreasing number of people along the pipeline. The pipeline model is also applied to the career stages. The career pipeline consists of distinct segments corresponding to educational stages (Soe & Yakura, 2008). From one stage of the pipeline to the next, the pipeline becomes narrow as a result of the diminishing number of girls or women (Blickenstaff, 2005: 369; Castaño & Webster, 2011; Vitores & Gil-Juárez, 2015). This metaphor is referred to as the “leaky pipeline” (illustrated in Figure 3-6).



**Figure 3-6: Leaky pipeline**

Source: Soe and Yakura (2008)

Vitores and Gil-Juárez (2015) explain the leaky IT career pipeline as follows: A girl should be entering the pipeline when she enters school by taking IT-related preparatory courses which help her become experienced in the use of computers. Further along the pipeline, a young woman would then major in an IT-related course such as computer science, thus graduating from an IT discipline. At the end of the educational pipeline, this woman would

enter the IT workforce pipeline, advancing from entry-level positions to more senior positions.

Soe and Yakura (2008) assert that a leakage at one stage of the pipeline naturally accounts for the shortage in subsequent stages. This implies that the loss of girls/women in IT starting in elementary school level all through to tertiary level subsequently results in the gender imbalance seen in the IT workforce. Castaño and Webster (2011) submit that due to the leaky IT career pipeline, the female talent pool that employers can recruit from is small. Hence this phenomenon is frequently used to explain the underrepresentation of women in IT (Nelson & Veltri, 2011; Vitores & Gil-Juárez, 2015). Castaño and Webster (2011) add that the IT career pipeline also leaks throughout employment as IT career progresses to an extent that women are almost absent from senior roles in IT professions. This, in turn, explains the underrepresentation of women in IT Executive positions.

According to Vitores and Gil-Juárez (2015), research shows that exclusion from and disaffection of the IT field is usually formed before secondary or high school. Adya and Kaiser (2005) support that decisions to enter the IT field are possible at age 11-17. Although girls in this age group may not be fully exposed to the long-term implication of their career choices, the majority of them have already decided against careers in technology. It is during secondary or high school stages that gender interests in IT are well established, including girls' lack of interest in IT-related careers. In contrast, though, Ahuja (2002) argues that career choices are made at tertiary level and also at entry-level jobs. Nonetheless, high school girls with an interest and aptitude in IT begin majoring in IT and end up opting for another area of study before graduation, whereas those who graduate with IT degrees choose an alternative field as a career (Blickenstaff, 2005: 369).

The "leakages" of women from the IT career pipeline are sometimes attributed to women considering alternatives to careers in IT or failure to advance through the various stages of the IT career pipeline (Appianing & Van Eck, 2015). Various reasons have been cited to explain why women disappear from the ICT career pipeline. These reasons are outlined in Table 3-6.



Contributing factor	Description
Long work hours	The IT work demands sometimes require women to work long periods. Long hours are sometimes also associated with travel (Griffiths & Moore, 2010; Castaño & Webster, 2011).
Lack of work-life balance	As female IT professionals become mothers, they find it difficult to manage the work-life balance. Managing both domestic and work duties is considered “living two lives”. Women struggle to separate career and personal goals. Attempting to detach domestic and work encourages a personal conflict. However, men can trade one off for the other to maintain a balance (Griffiths & Moore, 2010; Castaño & Webster, 2011).
Masculine IT environment	Girls, college students, and parents perceive the IT field as a male domain based on the experiences of many women in IT fields (Appianing & Van Eck, 2015).
Parents' influence	Parents have influence on their children's career aspirations and choices. Therefore, their perception of the IT environment being suitable for men may lead girls to describe the IT field as ‘uncool’. Only girls who receive the support from their parents pursue careers in IT (Appianing & Van Eck, 2015).
Absence of female role models	Female models/mentors in IT environments are seldom talked about; hence, female college students with an aptitude for IT become discouraged, as they do not have female figures they can relate to in the field. However, the situation has improved over the years, as there are more strong female role models in the IT industry than there were a decade ago

Contributing factor	Description
	(Castaño & Webster, 2011; Nelson & Veltri, 2011; Appianing & Van Eck, 2015).
<b>Cultural pressures</b>	There are stereotypes about gender roles and IT. In some cultures, the IT occupation is believed to be suitable for men only. Therefore, college women in such cultures refrain from pursuing careers in IT (Nelson & Veltri, 2011; Appianing & Van Eck, 2015).
"Nerdy" IT profession	Female students believe that the IT field is for nerds and involves sitting in front of computers all days with minimal social interaction. The perceived nerdy culture of the IT field undermines women's interest in the field and their confidence in being able to succeed in it. As a result, they reject IT courses and cite that they would prefer people-orientated careers (Nelson & Veltri, 2011; Warren, Young & Williams, 2012; Appianing & Van Eck, 2015).
Computer self-efficacy	Women tend to see themselves lacking IT-related abilities. Low computer self-efficacy impacts women's attitudes towards IT, thereby influencing their IT career intentions (Joshi <i>et al.</i> , 2010; Nelson & Veltri, 2011; Appianing & Van Eck, 2015).

**Table 3-6: Factors contributing to the leaking IT career pipeline**

Regardless of the inhibiting factors discussed above, there are women who manage to enter and stay in the IT career pipeline. Ahuja (2002) states that there are three dependent stages of an IT career: career choices, career persistence, and career advancement. Career choice is the probability of a woman choosing a career in IT. Career persistence refers to the likelihood that a woman will not drop out of the IT workforce. Career advancement is the possibility of a woman advancing in her IT career. The next section discusses the motivating factors driving women to pursue careers in IT.

### 3.4.2 IT career anchors

A person's measure of success is subjective and driven by a need for meaningful and fulfilling work that is in line with his or her career anchors (Coetzee & Schreuder, 2014). Bhattacharyya (2011) defines a career anchor as "a syndrome of talents, motives, and values, which gives stability and direction to a person's career". These talents, motives, and values shape a person's attributes that help him or her to conceptualise his or her own career. In other words, career anchors provide a starting point for career development (Tinline & Cooper, 2016). Moreover, they act as motivational forces that influence a person's career decisions and preferences for work (Schein, 1990 cited in Coetzee & Schreuder, 2014).

Edgar H. Schein has defined eight mutually exclusive career anchors that help people to make effective career decisions and achieve career success (Bhattacharyya, 2011; Quesenberry & Trauth, 2012; Coetzee & Schreuder, 2014; Tinline & Cooper, 2016):

1. **Technical/Functional competence (TF)** – People with such competence prefer technically satisfying jobs to managerial level. They are committed to the profession and consider their work as primarily important rather than the benefits and/or future prospects. They value the achievement of expert status among peers and recognition for skills.
2. **General Managerial competence (GM)** – This competence is a fundamental characteristic for those who desire power, influence, and advancement up the corporate ladder. These people are found to have interpersonal competence (the ability and desire to handle a variety of interpersonal and group situations; analytic competence (ability to identify problems, analyse the same, and develop situations to resolve the problems); emotional competence (ability to handle high levels of responsibility and remain cool in challenging situations)). They value being a generalist rather than a specialist, which makes them suitable for managerial positions in an organisation.
3. **Autonomy/Independence (AU)** – People with this competence prefer to work at their own pace. They value increased autonomy and personal freedom in job content and settings. They desire freedom to achieve and demonstrate one's competence. They

value the freedom to define their own work in their own way.

4. **Security/Stability (SE)** – These people value job stability and security (financial and employment tenure). They desire predictability and recognition for loyalty. This type of people get motivated only when they are ensured a stable career environment which may not at times be fitting for their level of knowledge and skills.
5. **Entrepreneurial Creativity (EC)** – People with this competence value income, profitability of the organisation, opportunity for creativity, and identification of new businesses, products, or services. They desire power and freedom to create wealth, high personal visibility, and public recognition.
6. **Service/Dedication to a cause (SV)** – This type of people value helping others, organisational mission, and working for the greater good of organisations or communities. They desire influence and the freedom to operate autonomously in the pursuit of personal values or higher life purpose/goal.
7. **Pure Challenge (CH)** – This competence is for people who value novel or challenging work and testing personal endurance through risky projects or physically challenging work. These are people who desire power and influence to be competitive and win.
8. **Lifestyle (LS)** – People with such competence value a balanced lifestyle and flexibility. They desire the freedom to balance work with family and personal growth.

In 1982, DeLong extended Schein's career anchors by adding Identity and splitting the Security/Stability anchor into independent anchors, namely, Organisational Stability and Geographic Stability (Quesenberry & Trauth, 2012). Quesenberry (2007) defined these as follows:

9. **Identity** – This refers to people with a desire for status resulting from working at prestigious organisations.
10. **Organisational Security** – This is one's desire for organisational/job security such that an individual stays loyal to an organisation. A trade-off of security can be career advancement.

**11. Geographical Security** – This type of people value geographical security. They stay faithful to a geographic region where they work. Security can be in the form of geographic stability such as living in a single community for an extended period of time. A trade-off of security can be career advancement.

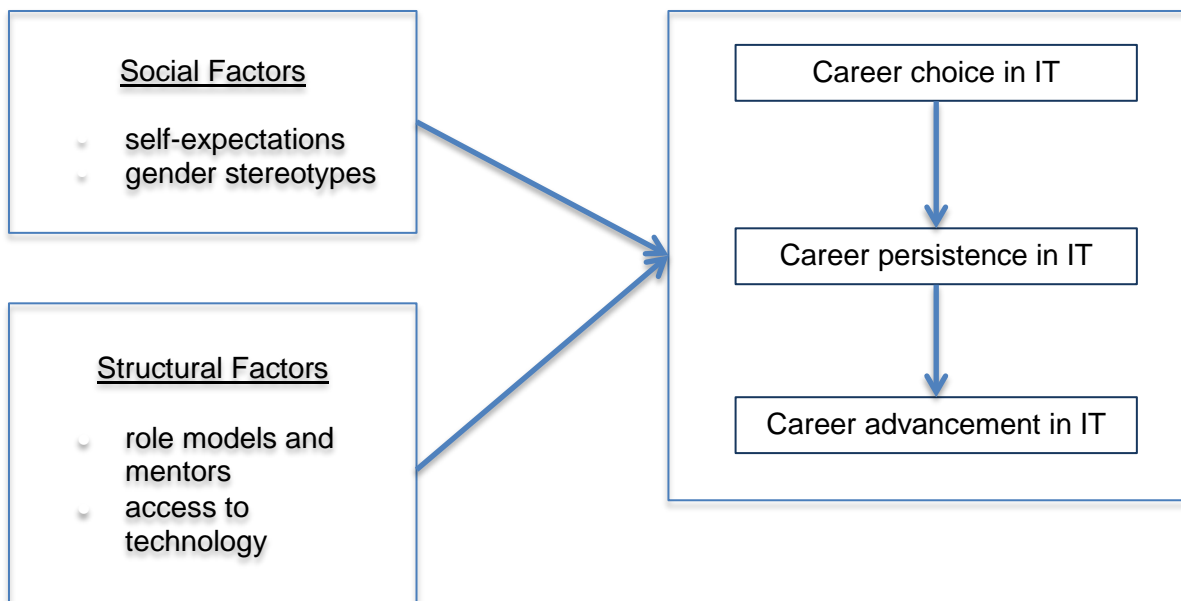
Based on his research, Schein maintained that over time, people develop a single career anchor that stabilises, guides, and constrains a person's individual career path (Wils, Wils & Tremblay, 2010). He argued that people who are unable to identify with a single dominant anchor means that their occupational identity has not been established yet (Rodrigues, Guest & Budjanovcanin, 2013). However, later research has contradicted Schein's notion by proving that people identify with more than one career anchor (Tinline & Cooper, 2016).

Rodrigues *et al.* (2013) revealed that people have primary and secondary anchors. The primary anchors are what people primarily use when making career decisions. The secondary anchors also play a role in influencing a person's career, however not as strong as the primary ones. Considering secondary anchors provides rich insights for understanding people's career choices and pattern (Rodrigues *et al.*, 2013). Wils *et al.* (2010) concur that having several career anchors allows individuals more options and flexibility to manage their career path. After all, people are expected to move through career cycles, thus increasing their knowledge base and employability prospects rather than achieving and seeking to remain at one stage of their career (Rodrigues *et al.*, 2013).

Bhattacharyya (2011) suggests that there are certain career anchors that relate to specific occupations. Hence evidence of career anchors among IT professionals has also been established, however with research showing mixed specific findings (Quesenberry & Trauth, 2012). The majority of researchers have reported managerial competence and technical competence as the two primary career anchors among IT professionals (Quesenberry, 2007).

With regard to the career anchors of the female IT workforce, a study by Quesenberry and Trauth (2012) revealed that all career anchors were found among female IT professionals. One major finding of the study was that the majority of female IT professionals identified with a diversity of career anchors that included managerial competence and technical competence.

Schein's career anchor metaphor is grounded in an individualistic perspective of careers and disregards other structural pressures that shape people's career preferences (Rodrigues *et al.*, 2013). This means that the anchor metaphor emphasises agency over social and family relations. Structural and social factors play a role in women's decisions to pursue careers in IT (Ahuja, 2002; Vitores & Gil-Juárez, 2015). Diekman, Brown, Johnston and Clark (2010) agree that social roles are critical in understanding the reasons why people pursue technology-related careers. Figure 3-7 represents a model for the social and structural determinants of women's careers in IT.



**Figure 3-7: Social and structural determinants of women's careers in IT**

Source: Adapted from Ahuja (2002)

According to Ahuja (2002), social factors include women's view of themselves and the views of women held by society at large. Structural factors are exhibited in institutional support structures (Adya & Kaiser, 2005).

Creamer, Lee and Meszaros (2006) also identified key factors that are directly associated with women's interest and choice in IT career. These key factors include race, parental support, positive attitudes about the attributes of IT workers, amount of computer use, and frequency of communication with various information sources.

### 3.4.3 THEME B Summary

#### **Summary:**

Women's IT career development involves decision-making processes. Ecological factors and individual characteristics contribute to women's IT career development. The IT career development processes result in different IT career outcomes. One of these outcomes includes distinct career paths. An IT professional can either follow a technical IT career path or a managerial IT career path. Despite the many career opportunities in the IT field, it has been noted that there are various factors that "force" women off the IT career pipeline. The IT career pipeline starts from elementary or pre-schooling until the workplace. Losing young girls in the early stages of the IT career pipeline results in fewer women in the IT talent pool. A number of reasons have been cited that attribute to the leakages of women from the IT career pipeline. Nevertheless, there are some women who remain motivated to pursue careers in IT, with some even attaining top IT leadership levels that are usually achieved by men. Women's IT career anchors can either be primary or secondary. Both types of career anchors play a role in influencing a person's career, with the primary anchors being stronger than the secondary ones. Women make decisions to pursue careers in IT based on social and structural factors.

#### **Insights:**

The IT field is multi-disciplined, providing many career opportunities for all genders. However, career development in IT is not a linear process. Considering that the IT field has many disciplines, different IT professionals can follow different paths that ultimately reach the same goal. Some women who pursue careers in IT find themselves opting out of the IT career pipeline for various reasons. Similarly, other female IT professionals, albeit a few, stay in the field. By virtue of staying in the field and progressing to leadership positions, it is inferred that these women can identify with the IT Executive role. Additionally, there could also be specific career anchors that drive them to persist and advance to IT leadership levels once they have entered the IT field. Despite the many opportunities in the IT field, women who choose to leave the field are actually more than those who choose to stay. This infers that factors that make the IT field unattractive to women could be stronger than those that make women stay in the field. It is for

this reason that the IT career pipeline leaks even more in the workplace than it does in the schooling phases.

**Table 3-7: Summary and insights of Theme B: IT career pathway**

### 3.5 THEME C: THE CONCEPT OF LEADERSHIP

The term leadership is defined differently across leadership studies (Cutler, 2014; Northouse, 2016: 2). Moreover, there is no consensus on a standard working definition, as leadership scholars explain it according to a perspective that is of interest to them (Yukl, 2010: 20; Northouse, 2016: 2). The reason for the varying definition for the term leadership is because the term itself is a word taken from the common vocabulary and applied as a technical term in a scientific discipline without it being properly defined (Yukl, 2010: 20). This has caused confusion with regard to the meaning of leadership. Yukl goes on to state that sometimes terms such as power, authority, management, administration, control, and supervision are used to describe leadership, with management being the most controversial.

There is agreement among scholars of leadership that management and leadership are not equivalent. However, the degree of overlap is the bone of contention (Yukl, 2010: 24). For example, Bennis and Nanus (1985) and Zaleznik (1977) assert that leadership and management are not only qualitatively different, but they are also mutually exclusive (cited in Yukl, 2010: 24). This means that an individual cannot be both a leader and a manager at the same time. Managers are seen to be primarily focused on how things get done, whereas leaders are interested in what things mean to people (Yukl, 2010: 25). Yukl argues that empirical research does not support the association of leadership and management with different types of people. Such views are prone to negative stereotypes.

Because of the many leadership definitions that exist, in the mid-1960s Ralph M Stogdill conducted an analysis and review of literature on these (Cutler, 2014). From the study, Stogdill observed that the various definitions of leadership have common features. He grouped these features into 11 classifications, namely:

1. A focus of group process



2. Personality and its effects
3. The art of inducing compliance
4. The exercise of influence
5. Act or behaviour
6. A form of persuasion
7. A power relation
8. An instrument of goal achievement
9. An effect of interaction
10. A differentiated role
11. The initiation of structure

Despite the differing leadership definitions, there is however a general agreement that the act of leading people involves a process of influencing them to contribute towards the achievement of the leader's vision (Yukl, 2010: 21; Cutler, 2014). There are two forms of influence that a leader can exert on people: direct and indirect leadership (Yukl, 2010: 23). Direct leadership is when a leader influences his or her subordinates, whereas indirect leadership is when influence is cascaded from the top to the lower levels of the organisational hierarchy.

Yukl (2010: 26) points out that the definition of leadership is both arbitrary and subjective; hence, it is difficult to give a universal definition. However, Northouse (2016: 6) posits that leadership comprises the following components:

- Leadership is a process – this implies that leadership is not a trait or characteristic that a leader has, but rather a transactional event between the leader and his or her followers. Denis, Langley and Rouleau (2010) also concur that leadership is not an individual attribute but rather a coalitional phenomenon within the organisation and among top leaders of an organisation.
- Leadership involves influence – this is concerned with effects that the leader has on followers.
- Leadership occurs in groups – a leader influences a group of individuals to accomplish a common goal.

- Leadership involves common goals – given that the leader and followers are meant to have a mutual purpose, the leader has to work with followers toward a common goal.

Northouse (2016) subsequently indicates that “leadership is a process whereby an individual influences a group of individuals to achieve a common goal”. However, for the purpose of this study, the definition of leadership as provided by Yukl is adopted. “Leadership is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives” (Yukl, 2010: 26). The definition includes efforts to influence (both direct and indirect), takes into consideration facilitation of work done by a group, and ensures that everyone works towards a common goal. Although the two definitions are similar, Yukl’s one is more robust and explicit. Hence it is justifiably adopted in this study.

### **3.5.1 Leadership traits**

An individual is expected to possess a particular set of traits to become a successful leader (Yukl, 2010: 45). Therefore leadership traits are usually associated with leader effectiveness as a form of high performance (Zaccaro, 2007). According to Cutler (2014), people having leadership traits are considered to be suitable for positions authority. Zaccaro (2007) notes that leadership traits have shifted from being defined as heritable qualities. Only traits such as height, weight, and physique are hereditary, whereas others such as knowledge about a particular subject matter are dependent on experience and learning (Kirkpatrick & Locke, 1991).

Zaccaro (2007) defines leadership traits as “relatively coherent and integrated patterns of personal characteristics, reflecting a range of individual differences, which foster consistent leadership effectiveness across a variety of group and organizational situations”. Zaccaro’s definition of leadership traits encompasses three key components. First, leadership traits should be considered as a collection of attributes that influence leadership performance. As such, they cannot be treated in isolation. Secondly, the definition includes personal attributes that promote stability in leader effectiveness. Although traditionally leadership traits referred to personality attributes, the new perspective of leadership traits includes motives, values, and expertise. This perspective is shared by Yukl who considers traits as individual attributes covering aspects of personality, temperament, needs, motives, and values (Yukl, 2010: 43).

This definition puts emphasis on individual differences that contribute towards effective leadership. The last component of Zaccaro’s definition relates to the enduring quality of leader attributes (Zaccaro, 2007).

Schermerhorn (2013) reports that early leadership research involved the identification of universal leadership traits that distinguish effective from ineffective leaders. However, a study conducted by Stogdill (1974 cited in Yukl, 2010: 46) concluded that there are no universal leadership traits. Yukl (2010: 46) notes that although some traits may increase the likelihood that a leader will be effective, they however do not guarantee effectiveness. This implies that leaders with different sets of traits could be equally successful if presented with the same situation.

Cutler (2014) posits that as much as male and female leaders require a certain set of traits to be effective in their role, there is no consensus as to a definitive list of those required. Table 3-8 lists some leadership traits as identified by various leadership scholars.

Kirkpatrick and Edwin Locke (1991 cited in Schermerhorn, 2013)	Stogdill (1974 cited in Yukl, 2010: 46) and Cutler (2014)	Daft (1999 cited in Judge, Bono, Ilies & Gerhardt, 2002)
Drive	Adaptable to situations	Alertness
Self-confidence	Alertness	Originality
Creativity	Assertive	Creativity
Cognitive ability	Cooperative	Personal integrity
Job-relevant knowledge	Decisive	Self-confidence
Motivation	Dependable	
Flexibility	Dominant	
Honesty and integrity	Persistence	
	Self-confident	

**Table 3-8: Leadership traits**

Schermerhorn (2013) asserts that certain traits are common among the best leaders. On that account, they have been repeatedly identified by various leadership researchers as illustrated in Table 3-8.

Leadership traits can be categorised into either agentic or communal characteristics. Agentic characteristics are associated with men, whereas communal characteristics are ascribed more to women than men (Eagly & Johannesen-Schmidt, 2001). Agentic characteristics include assertiveness, influence, dominance, independence, and ambition. Communal characteristics include being affectionate, kind, sympathetic, and cooperative.

Rosette and Tost (2010) argue that communal traits are increasingly becoming valued leadership characteristics associated with effective leadership. As women continue to occupy male-stereotypic roles, they are also adopting agentic attributes (Cutler, 2014).

### 3.5.2 Gender and leadership

The last two centuries have seen the presence of women in the workforce increasing significantly (Fernandez, 2007: 1; Branson *et al.*, 2013). Despite women being just as equally qualified as men to fulfil leadership roles, they are found to be saturated in middle management levels and few making it to top leadership positions (Cheung & Halpern, 2010). Thornton (2015: 11) agrees that “while women make up 22% of senior management globally, they continue to be concentrated in management support functions rather than in leadership roles”. Similarly, Rhode and Kellerman (2007: 2) posit that there are fewer women at the top of the most influential leadership hierarchies and more at the bottom. Much as a growing number of women aspire to leadership positions (Rhode & Kellerman, 2007: 6), their progress to reach leadership positions is however slower than their male counterparts (Davidson & Burke, 2011: 1; Fisher & Neihouser, 2013).

Taking into consideration the scarcity of women in leadership positions, it is therefore warranted to explore leadership in association with gender. Rosette and Tost (2010) note that stereotypes for men are in line with traditional expectations of leadership behaviours, while stereotypes for women tend to diverge from traditional expectations of leadership behaviours. In fact, societal stereotypes are considered to be the greatest barriers for women reaching executive management levels (Ahuja, 2002). It is not that women cannot do the job, but it is because “women do not carry the symbols, do not correspond to the hero images, do not participate in the rituals, or are not supposed to foster the values dominant in the men’s culture” (Hofstede *et al.*, 2010: 45-46). Hence the stereotype around how women behave is associated with non-leadership (Bosak & Sczesny, 2008). Thornton (2015: 13) points out that stereotypes and gender bias have a significant impact on women’s path to leadership. It is therefore not surprising that women are underrepresented in IT leadership positions.

Research also suggests that female leaders display different leadership styles compared to their male counterparts (Butterfield & Grinnell, 1999 cited in Littrell & Nkomo, 2010). Exploring differences in male and female leaders’ leadership styles assists in explaining the underrepresentation of females in executive leadership levels (Cuadrado, Navas, Molero, Ferrer & Morales, 2012). As a result, this section explores gender and leadership differences by focusing on gender stereotypes and leadership styles.

### **3.5.2.1 Gender stereotypes**

Gender stereotyping is a topic that has been widely explored, with extensive literature around it. For example, a search on Google Scholar for articles that contained the words “gender stereotype” or “gender stereotyping” in their titles returned in total about 377 results from the years 2005 to 2015, that is, over a 10-year period (Google Scholar, 2016). There is no firm consensus among gender scholars on the appropriate use of the terms “sex” and “gender” in relation to gender stereotyping (Wharton, 2009: 18). The terms are either used almost interchangeably, or “gender” is used completely instead of “sex”, while in some cases the two concepts are differently employed. It is therefore important to clarify what is meant by the term “gender” in the context of this study.

Gender is a notion that is said to be usually complicated by class, race/ethnicity, and other differences (Acker, 2006: 442). In its simplest form, gender represents the differences between men and women based on societal perceptions (Acker, 2006: 444; Ridgeway, 2011: 1). Alesina, Giuliano and Nunn (2013) add that the differences between men and women are explained in terms of the differences in cultural beliefs about the appropriate role of women in society.

Much as gender is related to the sex of an individual (Mihalčová, Pružinský & Gontkovičová, 2015), it is also attributed to various characteristics of people (Wharton, 2009: 23). These characteristics are also considered to be influenced by cultural attributes (Ridgeway & Kricheli-Katz, 2013). Also, it is more than sets of traits or behavioural dispositions that people possess based on a sex category that they are assigned to (Wharton, 2009: 7). If conceived merely as a representation of male and female characteristics in social life and culture, Wharton (2009: 6) emphasises that the definition will be narrow. This implies that a concise and less narrow definition of gender comprises both the biological and the social aspects.

There are different definitions of gender; however, these definitions embody the natural (i.e. biological, physiological, or genetic) and social features. For example, Wharton (2009: 7) defines gender as a system of social practices that creates and maintains gender differences and also organises relations of inequality based on these differences. A similar definition is provided by Ridgeway (2011: 7), which states that gender is “a system of social practices within society that constitutes distinct, differentiated sex categories, sorts people into these categories, and organises relations between people on the basis of the differences defined

by their sex category”. This means that gender forms the basis upon which social resources are distributed, thus indicating relations of inequalities in the social scene (Wharton, 2009: 39).

Wharton (2009) provides three reasons why gender plays a pivotal role in social life. The first reason is that gender shapes the identities of individuals and determines individuals' behavioural characters. It is noted that people may have many identities; nonetheless, Wharton (2009: 9) argues that gender identity may be the most crucial in influencing the standards which people hold for themselves. There is no agreement as to how gendered characteristics are acquired; however, researchers understand and accept that gender defines “how people see themselves, the ways they behave, and how they view others” (Wharton, 2009: 9). The second reason that Wharton gives around the importance of gender in social life is that gender shapes how people interact in social settings. Taking into account that identities are derived from and sustained through social interactions, social interaction provides a setting in which gender is materialised and enacted (Wharton, 2009: 10). Lastly, Wharton states that gender is important because it organises social institutions which are either formally or less formally organised. Overall, gender plays a vital role in shaping and providing meaning to individuals, social relations, and institutions of any type. Over and above the reasons provided by Wharton on the importance of gender, Ginige, Amaratunga and Haigh (2007) add that gender also provides a means of describing the cultural, social and psychological traits of individuals in terms of masculinity or femininity.

According to Wharton (2009: 39), people learn what is expected of them because of their gender, and they also learn how to display specific characteristics. This means that people are not necessarily born with such characteristics. Learning and instilling typical male or female characteristics influences behaviour (Mihalčová *et al.*, 2015). Wharton (2009: 31) refers to the process through which people learn what society expects of them as male or female as socialisation. Having these societal expectations infers that people can tend to be judged according to what is appropriately masculine or feminine. After all, the perceived conceptions about men and women are not only different but sometimes also contradict one another (Heilman, 2012: 115). Wharton (2009: 128) thus maintains that the different characteristics associated with each gender can result in gender stereotypes. Dandapat and Sengupta (2012) also affirm that dividing the behaviours according to different genders furnish the potential for gender stereotyping.

Duehr and Bono (2006) define gender stereotypes as “categorical beliefs regarding the traits and behavioural characteristics ascribed to individuals on the basis of their gender”. Mihalčová *et al.* (2015) share the same sentiments that gender stereotypes are conventional ideas in people’s minds about the characteristics and social roles of men and women. Cunningham and Macrae (2011) concur that the stereotypes stem from specific beliefs about the sexes as prescribed by culture. “These cultural beliefs about social difference are shared stereotypes” (Ridgeway & Kricheli-Katz, 2013). As a result, the power of gender beliefs to influence behaviour is not necessarily endorsed by individuals but rather merely accepted as public rules by which they will be judged and expected to act (Ridgeway & Kricheli-Katz, 2013). Cunningham and Macrae (2011) further add that these beliefs are generally developed by associating a particular object, role, or behaviour with the concepts of masculinity and femininity.

In simple terms, gender stereotypes are generalisations of men and women in terms of their attributes or characteristics (Heilman, 2012: 114). Essentially, gender stereotypes are the specific characteristics, attitudes, values, and behaviours that the society deems appropriate for a particular gender (Ginige *et al.*, 2007). This implies that gender stereotypes serve as expectations about what attributes each gender should have and how they should behave. Ridgeway and Kricheli-Katz (2013) assert that gender stereotypes are used to also form the basis for people to compare themselves against others, and therefore establishing a probable behaviour of the individuals. Examples of typical characteristics of males and females are outlined in Table 3-9.

Male Characteristics	Female Characteristics
Have higher social status.	Inability to make quick decisions
Orientated on achievements, therefore are highly competent, aggressive, ambitious, task-focused.	Show concern for others by being kind, helpful, caring, and sympathetic.
Inclined to take charge, therefore are assertive, dominant, self-sufficient, forceful, independent.	Denote collaborative deference by being obedient and respectful.



Male Characteristics	Female Characteristics
Denote rationality, therefore are more analytical, logical, objective.	Lack logical thinking.
	Are emotionally sensitive.
	Have affiliative tendencies such as warmth and friendliness.

**Table 3-9: Male and Female characteristics**

Source: Heilman (2012: 115), Acker (2009: 225), and Mihalčová *et al.* (2015)

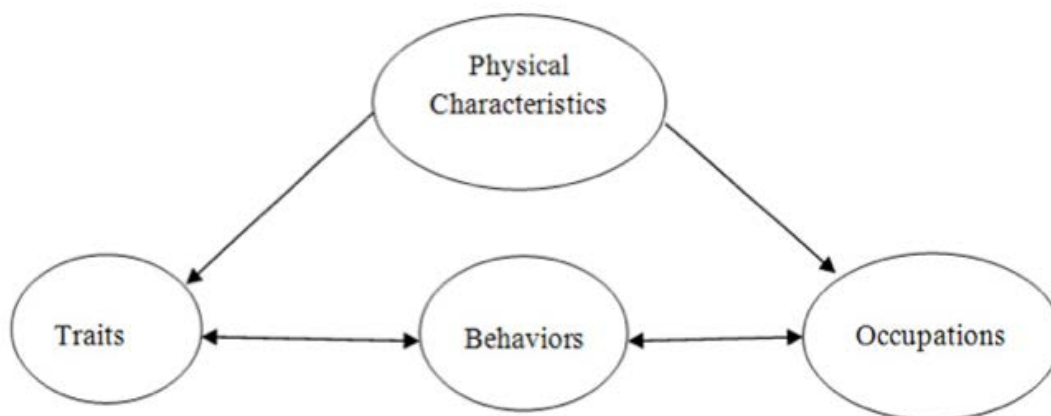
The expectations from each gender have descriptive and prescriptive properties (Vinkenburg, Van Engen, Eagly & Johannesen-Schmidt, 2011; Heilman, 2012: 114) and can at times be biased against the different genders (Mihalčová *et al.*, 2015). Descriptive gender stereotypes state exactly what women and men are like, while prescriptive gender stereotypes state what women and men should be like (Vinkenburg *et al.*, 2011; Heilman, 2012: 114). The key difference between these categories of stereotypes is that one is explicit and the other is implicit. Table 3-10 provides a comparison of the two categories.

Descriptive Stereotype	Prescriptive Stereotype
Characterisations of men and women are consistent across culture, time, context.	Designate the “should” or “should not”.
Serves as heuristics for forming quick impressions about people.	Penalties are imposed if violated.
Automatically influence the perceiver’s judgement without the perceiver being aware of it.	

**Table 3-10: Comparison between descriptive and prescriptive stereotypes**

Source: Heilman (2012)

To analyse the content of gender stereotypes, Dandapat and Sengupta (2012) propose four separate components, namely, traits, behaviours, physical characteristics, and occupations. These four components are used to differentiate males from females and are represented in Figure 3-8.



**Figure 3-8: Components of gender stereotyping**

Source: Dandapat and Sengupta (2012)

Although the components in Figure 3-8 differ, people use information about one to make judgements about another, thus creating an interdependent network of associations (Dandapat & Sengupta, 2012). The potential problem with such associations is that they serve to promote gender stereotyping (Cunningham & Macrae, 2011). Dandapat and Sengupta (2012) concur that the network of information is used to make certain conclusions regarding gender-related characteristics. The way people are viewed simply because of the gender group they belong to can either be a positive or negative thing (Heilman, 2012: 115). According to Mihalčová *et al.* (2015), most of the time gender stereotypes give rise to discrimination towards women. However, given that women are considered to lack what is prevalent in men, just as much as men are considered to lack what is prevalent in women, Heilman (2012: 115) contends that the assumption that women are always negatively affected by gender stereotypes is incorrect.

The impact of gender stereotypes can be observed in society and also in the work environment. Within the societal context, the impact is so vast that Cunningham and Macrae (2011) consider it an insidious societal problem. In the work environment, gender stereotypes are considered one of the direct factors that lead to discrimination (Dovidio & Hebl, 2005 cited in Duehr & Bono, 2006). According to Dandapat and Sengupta (2012), women are victimised by gender stereotypes and are thus forced to view their environment with fear and suspicion. In fact, Heilman (2012: 116) states that descriptive gender stereotypes are said to be most problematic for women in the work environment only if they negatively affect expectations about their performance. Through the process of gender socialisation, men and women tend to develop different skills to the extent that they approach work differently and consequently end up in different kinds of occupations (Wharton, 2009: 168). Heilman (2012: 114) argues that whether the gender stereotype is descriptive or prescriptive, it can influence a woman's career progress from different angles. From a descriptive stereotype point of view, Heilman explains that women are perceived not to have the attributes necessary to succeed in traditionally male positions. For instance, women are stereotyped as communal and men as agentic, thus qualifying men for leadership roles (Duehr & Bono, 2006; Eagly & Carli, 2007).

Prescriptive stereotypes, on the other hand, create normative expectations for men's and women's behaviour such that women who directly or indirectly violate gender norms are devaluated and derogated (Heilman, 2012: 115; Powell, 2012: 122). Women who are

dominantly communal are criticised for not being agentic enough, while those who are highly agentic are criticised for lacking communion (Eagly & Carli, 2007; Powell, 2012: 125). These double standards negatively impact women's career progression into leadership roles as a result of them being perceived not to have the right qualities. Women who have succeeded in attaining leadership roles or highly masculine roles requiring agentic qualities are considered to be exceptionally competent (Rosette & Tost, 2010).

### **3.5.2.2 Leadership styles**

Research shows that men and women somewhat have different leadership styles (Eagly & Carli, 2007). As women are starting to occupy roles that were traditionally occupied by men, the subject of differing leadership styles becomes important to explore. Leadership style is defined as "relatively stable patterns of behaviour that are manifested by leaders" (Eagly & Johannesen-Schmidt, 2001). A number of leadership styles exist in literature. For this study, the most popular leadership styles found in research studies are discussed.

**Autocratic Leadership** – This style refers to leaders who make all the unilaterally decisions without consulting other team members (Cuadrado *et al.*, 2012; Cutler, 2014). It is the most appropriate style for when a leader is required to make decisions quickly, and there is no need for team input or agreement.

**Democratic Leadership** – This style is participative because leaders involve and consult other team members in the decision-making process (Cuadrado *et al.*, 2012; Cutler, 2014). The style is effective when team consensus is required.

**Task-orientated Leadership** – Leaders are concerned with accomplishing tasks by organising task-relevant activities (Eagly & Johannesen-Schmidt, 2001; Cuadrado *et al.*, 2012).

**Relationship-orientated Leadership** – Leaders put emphasis on maintaining quality relationships with others by tending to their followers' well-being and satisfaction (Eagly & Johannesen-Schmidt, 2001; Cuadrado *et al.*, 2012).

**Transformational Leadership** – With the transformational leadership style, leaders are focused on inspiring, mentoring, and motivating employees to go beyond the call of duty and add value to their organisation (Hoyt, 2010; Vinkenbunrg *et al.*, 2011). Leaders act as role

models and use their personal influence to encourage their subordinates to perform at their full potential (Eagly & Johannesen-Schmidt, 2001; Cuadrado *et al.*, 2012).

**Transactional Leadership** – This style is about establishing exchanging relationships between the leader and the subordinates and focuses on subordinates' self-interests (Hoyt, 2010; Vinkenbunrg *et al.*, 2011; Cuadrado *et al.*, 2012). "Such leaders manage by clarifying subordinate responsibilities, monitoring their work, and rewarding them for meeting objectives and correcting them for failing to meet objectives" (Eagly & Johannesen-Schmidt, 2001).

**Laissez-faire Leadership** – The style gives subordinates a high degree of decision making (Cutler, 2014). Because leaders take a step back as far as decision making is concerned, this style of leadership fails to take responsibility for managing and is thus a sort of non-leadership (Eagly & Johannesen-Schmidt, 2001; Eagly & Carli, 2007; Vinkenbunrg *et al.*, 2011).

According to Cuadrado *et al.* (2012), men generally assume autocratic and task-orientated leadership styles because of their agentic qualities. Women, on the other hand, exhibit democratic and relationship-orientated leadership styles because of their relationship with the components of the "communal" dimension. It is therefore inferred that democratic and relationship-orientated leadership styles are feminine leadership styles, whereas autocratic and task-orientated are considered masculine leadership styles. Hoyt (2010) agrees that women lead in a more democratic manner than men, although this tendency decreases when they are in male-dominated roles.

Although transformational and transactional leadership styles are different to each other, Eagly and Carli (2007) posit that most leaders adopt at least some elements of both types. They argue that female leaders, however, often struggle to cultivate a leadership style that combines communal and agentic qualities. On the contrary, Hoyt (2010) asserts that the transformational leadership style can be an effective leadership style for women, as it is not a distinctly masculine style. It encompasses communal components that are associated with women (Eagly & Johannesen-Schmidt, 2001; Cuadrado *et al.*, 2012).

### 3.5.3 THEME C Summary

#### Summary:

Leadership is defined differently across various studies. Although there is no consensus around the meaning of leadership, the distinction between leadership and management is acknowledged. Leadership is made up of four components. Leaders exude leadership traits. Such traits can be classified as either agentic or communal. Agentic leadership traits are associated with men, while communal leadership traits are associated with women. Because leadership is mostly associated with men, most women fulfil middle management positions. Only a few women advance to leadership positions. Their progression to leadership positions is slower than that of their male counterparts. Gender stereotypes regard men more suitable for leadership positions. Gender stereotyping is common both in society and the work environment. Most prevalence in the work environment is observed at senior leadership levels. Gender stereotypes are classified as either descriptive or prescriptive. They are also analysed in terms of traits, behaviours, physical characteristics, and occupations. Women who attain leadership positions typically adopt agentic leadership traits. A leader typically employs a particular leadership style in his or her functions. These leadership styles are also associated with gender.

#### Insights:

There are many definitions of leadership. Literature shows that there is a clear distinction between management and leadership. What is common, though, from the varying definitions is that leadership revolves around people, whereas management is more focused on tasks. Consequently, the two terms cannot be used interchangeably. Leadership requires an individual to possess a particular set of traits. Effective leaders have the right set of leadership traits. This means that traits can either make or break a leader. Some traits are considered feminine, while others are considered masculine. Evidently, female IT professionals would identify with the IT leadership role, since they predominantly possess feminine leadership traits. The classification of leadership traits subsequently results in gender stereotypes associated with leadership. These gender stereotypes are portrayed both in the social and professional settings. Certain leadership traits are deemed to be more appropriate for men than women. Expectations about how people must behave are influenced by their gender. This means that what is expected of

men differs from what is expected of women. The set expectations from the different genders subsequently result in gender inequalities. Hence women are generally frowned upon when they are seen to possess leadership traits associated with men. The IT industry is not exempt from gender stereotyping. For instance, IT is traditionally perceived to be a masculine industry. This has resulted in the current underrepresentation of women at IT Executive levels. However, female IT professionals who are able to exude masculine traits could be influenced to progress to IT leadership levels. It is also noted in literature that men and women lead differently; thus, they possess different leadership styles.

**Table 3-11: Summary and insights of Theme C: Leadership**

### 3.6 THEME D: BARRIERS IN IT

“Barriers” generally refer to obstacles that prevent people from progressing further. In the IT context, the term “IT barriers” is used to describe obstacles that prevent individuals from participating in the IT workforce (Soe & Yakura, 2008). The barriers in the IT field contribute to the leakage in the IT career pipeline because they restrict women from persisting and advancing in the field (Ahuja, 2002). Rhode and Kellerman (2007: 6) agree that women are confronted with a variety of obstacles that impede them from attaining leadership positions. This infers that female IT professionals face a number of obstacles that prevent them from reaching IT Executive levels. Eagly and Carli (2007) posit that barriers or challenges that prohibit women from becoming IT Executives are not always obvious.

A number of IT barriers have been cited in literature. Previous research studies have identified social barriers to be responsible for the advancement of women into senior positions (Mathur-Helm, 2005: 62). In support, Ahuja (2002) and Castaño and Webster (2011) have indicated social expectations and work-family conflict as a typical barrier for women in IT. Castaño and Webster (2011) argue that IT work at times requires people to put in long working hours. This poses a challenge for women, as they either choose to postpone maternity or juggle parenthood and work simultaneously. As O’Neil *et al.* (2008) point out, women’s careers are embedded in life contexts whereby families continue to be liabilities to women’s career development. Regardless of the situation, Wajcman (1998 cited in Castaño & Webster, 2011) asserts that women still face stereotyped assumptions about family responsibilities undermining their career commitment. Another example of an IT barrier relates to the masculine gender stereotypes associated with the skills and knowledge

required to succeed in the IT field (Trauth *et al.*, 2016). The perception here is that women are not equipped to acquire technical knowledge and skills.

To explain the barriers in IT, the glass ceiling phenomenon is used. However, some researchers have identified limitations with the glass ceiling concept and subsequently introduced the labyrinth phenomenon. The next sections describe the IT barriers in detail using both the glass ceiling and labyrinth concepts.

### 3.6.1 The glass ceiling

Ryan and Haslam (2007) maintain that the most commonly documented explanation of the poor representation of women in leadership positions is the glass ceiling phenomenon. To have a label defining this situation indicates that difficulties in women attaining leadership roles are not only confined to IT.

The phenomenon was coined by the Wall Street Journal in the 1980s (Bendl & Schmidt, 2010; Zeng, 2011: 312; Clark, 2012: 4). Generally, the glass ceiling is a term referring to situations when women find it hard to advance beyond a certain level within an organisation (Eagly & Carli, 2007; Clark, 2012: 4; Fisher & Neihouser, 2013). It is a phenomenon used to describe the largely invisible or transparent barrier to women's access to leadership positions in organisations because of their gender (Ryan & Haslam, 2007; Acker, 2009: 223; Stainback, Kleiner & Skaggs, 2015). The glass ceiling is specifically encountered by women, while men often accelerate into leadership positions by means of a glass escalator (Haslam & Ryan, 2008). According to Zeng (2011: 312), the barrier is subtle and impenetrable, blocking women's advancement in a management hierarchy. The transparent barrier "suggests that women are being misled about their opportunities, because the impediment is not easy for them to see from a distance" (Eagly & Carli, 2007).

Because women are denied advances in the organisation because of their gender, April *et al.* (2007) reason that the glass ceiling does not cause gender inequality but rather is a result thereof. However, Zeng (2011: 312) asserts that the glass ceiling is not about the outcome of gender but rather the adverse experience of women in the process of advancing to leadership positions. Moreover, Fisher and Neihouser (2013) state that the glass ceiling further creates a social disadvantage for women. This is because the glass ceiling emulates policies and practices that deliberately aim at discriminating against women when it comes



to senior positions (Clark, 2012: 4). The IT sector was traditionally considered to be a male-dominated environment (Trauth & Quesenberry, 2006; Pretorius & Villiers, 2010; Appelbaum *et al.*, 2011; Clark, 2012: 3), which has resulted in masculine values predominating in the profession (Reid *et al.*, 2010).

The fact that there is some representation of women in executive management, including in IT, shows that the glass ceiling can be broken. Moreover, a number of barriers for women advancing into leadership positions have been identified. Such barriers exist globally (Schein, 2007: 7). For example, according to Mathur-Helm (2005: 62), previous studies have identified social barriers to be responsible for the advancement of women into senior positions. The work-life conflict that women professionals experience because of their strong commitment to family responsibilities has also been identified as one of the most important reasons for women not attaining leadership positions (Buddhapriya, 2009: 31). Trauth *et al.* (2006) cite issues such as social contexts, media influences, education, and work environment as the reasons for the underrepresentation of women in IT.

These different barriers as identified by various researchers infer that the glass ceiling phenomenon does not adequately describe the experiences of women who reach barriers at executive level. Hence the existence of the glass ceiling has been challenged. This is despite the acknowledgement and acceptance of the glass ceiling phenomenon over the years.

Eagly and Carli (2007: 6) believe that the idea of the glass ceiling as an invisible, absolute, and impassable barrier does not incorporate the complexity around the advancement of women into leadership positions. They argue that more barriers, which are not as subtle as the glass ceiling phenomenon implies, exist not only above women but are all around. As such, the authors suggest that the labyrinth metaphor better captures the essence of those factors that confront women in their professional endeavours.

### 3.6.2 The leadership labyrinth

The leadership labyrinth conveys a challenge-riddled journey that women navigate through towards leadership positions. The notion of the labyrinth is clearly supported by Mihalčová *et al.* (2015) by arguing that the concept of the glass ceiling is created by various barriers.

There are various barriers that make up the leadership labyrinth (Eagly & Carli, 2007: 6), thus resulting in gender-leadership gaps. According to Mihalčová *et al.* (2015), these barriers are the results of stereotypes that generate more suitable working conditions for men than women. Northouse (2016: 399) contends that the leadership labyrinth revolves around three types of barriers (Figure 3-9).



**Figure 3-9: Leadership labyrinth for gender-leadership gaps**

Source: Adapted from Northouse (2016)

**Human Capital Differences:** Education, work experience, and skills are cited as contributing factors towards the gender-leadership gap (Eagly & Carli, 2007; Fisher & Neihouser, 2013). Eagly and Carli (2007: 64) claim that women have less human capital investment (e.g. education, work experience, and skills) than men. This argument is based

on the fact that men are considered to be more orientated on career development, while women are more focused on family care (Mihalčová *et al.*, 2015). The dearth of qualified women is a result of the leaking pipeline (Northouse, 2016: 399). The leaking pipeline refers to a situation whereby women face a disadvantage at each step of their career and “leak out” on the way to the top (Zeng, 2011: 313).

Conversely, Cheung and Halpern (2010) posit that there is a growing trend of women’s higher educational achievement. Northouse (2016: 399) concurs that women are achieving higher education levels at a faster rate than men. Nonetheless, few of them make it to the executive management levels such as CEO and IT Executives despite their level of education (Cheung & Halpern, 2010). Having more educated women results in an overflowing “pipeline” of managers ready for advancement to top-level executive positions (Cheung & Halpern, 2010).

Because women put more effort on managing family responsibilities than men, their careers are frequently interrupted (Eagly & Carli, 2007: 64). This results in women having shorter careers and ultimately less work experience than men (Eagly & Carli, 2007: 64, 2008). Despite men sharing in nurturing roles (Perrone, Wright & Jackson, 2009), women are still the primary caregivers (Rhode & Kellerman, 2007: 11). Buddhapriya (2009: 33) asserts that men and women both have the challenge of balancing work and life; however, women are affected more since they do most of the work associated with household activities. Domestic obligations contribute to women’s job experience and subsequently their advancement to leadership positions (Eagly & Carli, 2007: 58), thus resulting in a leadership gap. Mihalčová *et al.* (2015) agree that the problem of harmonisation of work and family requirements is a source of the underrepresentation of women in leadership positions. According to Northouse (2016: 401), women have fewer developmental opportunities than men. Northouse (2016) argues that the “gender differences in developmental opportunities may be driven in part by the prejudice women experience in the domain of leadership”.

**Gender Differences:** Gender differences help explain why women are less likely to be considered for leadership positions than similarly situated men (Rhode & Kellerman, 2007: 9; Northouse, 2016: 401). Northouse (2016: 402) posits that women are underrepresented in leadership positions because of the perceived differences in leadership style and effectiveness. The beliefs that women’s leadership styles are different from men’s

(descriptive beliefs) or the expectation that women should have certain leadership styles (prescriptive beliefs) hinder women's leadership path (Koenig *et al.*, 2011; Vinkenburg *et al.*, 2011). Women are said to use transformational leadership styles more than men (Cheung & Halpern, 2010; Northouse, 2016: 402). "Transformational leadership is more congruent with the interpersonal characteristics associated with women leaders than with the aggressive and hierarchical characteristics associated with male leaders" (Cheung & Halpern, 2010).

In view of the fact that transformational leadership has a greater association with effective outcomes, it would then be expected that women would generally be more effective leaders (Cheung & Halpern, 2010; Northouse, 2016: 402). However, it has been found that female leaders are devaluated by their male subordinates because of their transformational leadership style (Ayman, Korabik & Morris, 2009). When comparing male and female leadership effectiveness, studies have found that male and female leaders were equally effective (Northouse, 2016: 402). Nevertheless, the leadership effectiveness is also dependent on the congruity between the leader role and the gender role (Powell, 2012: 125). Bearing in mind that leadership is originally associated with men and masculinity (Eagly & Carli, 2007: 90; Schein, 2007: 7; Powell, 2012: 131), women are therefore at a disadvantage.

As noted in Section 3.5.1, leaders require a certain set of traits if they are to be effective (Cutler, 2014), most of which are masculine (Rhode & Kellerman, 2007: 7; Koenig *et al.*, 2011; Heilman, 2012: 116). Rhode and Kellerman (2007: 8) add that on average women lack the willingness to engage in self-promoting or assertive behaviours. Traits or characteristics that people assign to women, men, and leaders contribute to the challenges that women face on their journey towards leadership positions (Koenig *et al.*, 2011). The underrepresentation of women in leadership positions is in part attributed to the perception that women do not possess the traits required of a leader (Ryan & Haslam, 2007; Schein, 2007: 8). Rhode and Kellerman (2007: 6) add that the mismatch between the qualities traditionally associated with women and those traditionally associated with leadership serve as obstacles for women seeking leadership positions. Moreover, the presence of women in top leadership positions is considered a violation of the feminine gender norm (Major *et al.*, 2007: 77; Heilman, 2012: 116; Powell, 2012: 122). This is because women leaders have to adapt to a typically "male" way of work (Mihalčová *et al.*, 2015).

**Prejudice:** Women's progress in leadership is also hindered by gender stereotypes (Giscombe, 2007: 390; Schein, 2007: 7). All else being equal, men appear more qualified to fulfil leadership roles by virtue of their gender alone (Schein, 2007: 7). "Men are seen as more similar to the leader stereotype than women are, producing disadvantage for women" (Koenig *et al.*, 2011). If women conform to the female gender role, they are deemed not suitable for leadership roles because they do not meet the expected requirements (Powell, 2012: 125). Additionally, women are faced with feminine competency bind, whereby acting feminine is perceived negatively and acting competently is considered masculine (Major *et al.*, 2007: 77). Women leaders are prejudiced based on the usual mismatch between people's mental associations about women and leaders (Eagly & Carli, 2007: 96). Giving consideration to the fact that women are subjected to prejudice when they are considered for leadership roles (Powell, 2012: 134), it is henceforth not surprising that even to date leadership-related functions are still dominated by men (Mihalčová *et al.*, 2015).

Powell (2012: 125) affirms that "leader and gender stereotypes put female leaders at a distinct disadvantage by forcing them to deal with the perceived incongruity between the leader role and their gender role". The leader stereotypes represent beliefs about the psychological traits that define the characteristics of a leader (Powell, 2012: 121). For as long as leadership positions are considered male in gender type, it is therefore expected that the positions would be held by men as they possess the required characteristics (Schein, 2007: 7). Moreover, Schein (2007: 7) and Powell (2012: 126) agree that gender-stereotyping leadership positions create a bias against women when making leadership selection, placement, promotion, and training decisions.

Men are generally rated higher than women on leadership qualities, even if women behave in exactly the same manner (Rhode & Kellerman, 2007: 7; Ryan & Haslam, 2007). After all, leader stereotypes reflect the dual notion of "think manager – think masculine" and "think manager – think male" (Powell, 2012: 126). Koenig *et al.* (2011) add that the gender stereotypical belief of "think manager – think male" is mostly found in organisations regardless of the sector to which they belong or the culture of the country. The strength and persistence of the "think male – think manager" attitude makes the efforts to improve the representation of women in leadership positions difficult (Schein, 2007: 12). As a result, the incongruity between the leadership role and the female gender role increases the gender-leadership gap.

Stainback *et al.* (2015) posit that women who successfully navigate through the leadership labyrinth and gain access to leadership positions are likely to be exceptional. However, Haslam and Ryan (2008) indicate that women’s “leadership positions are relatively risky or precarious since they are more likely to involve management of organisational units that are in crisis”. The authors refer to this notion as the “glass cliff”, an extension of the glass ceiling. Fisher and Neihouser (2013) add that women encounter the glass cliff when they are placed in positions doomed for failure from the start.

### 3.6.3 THEME D Summary

**Summary:**

The IT field has barriers that prevent individuals from pursuing careers in IT. Although there are a number of barriers in the IT field, social barriers are noted to be responsible for women’s IT career advancement. Both the glass ceiling and labyrinth metaphors are used to explain the underrepresentation of female IT professionals. The difference between the two is that the former focuses only on obvious barriers for women advancing to top positions, while the latter recognises that women face more challenges throughout their IT careers that are usually not so obvious. The leadership labyrinth consists of barriers relating to human capital differences, gender differences, and prejudice. The existence of female IT Executives means that the barriers in IT are surmountable.

**Insights:**

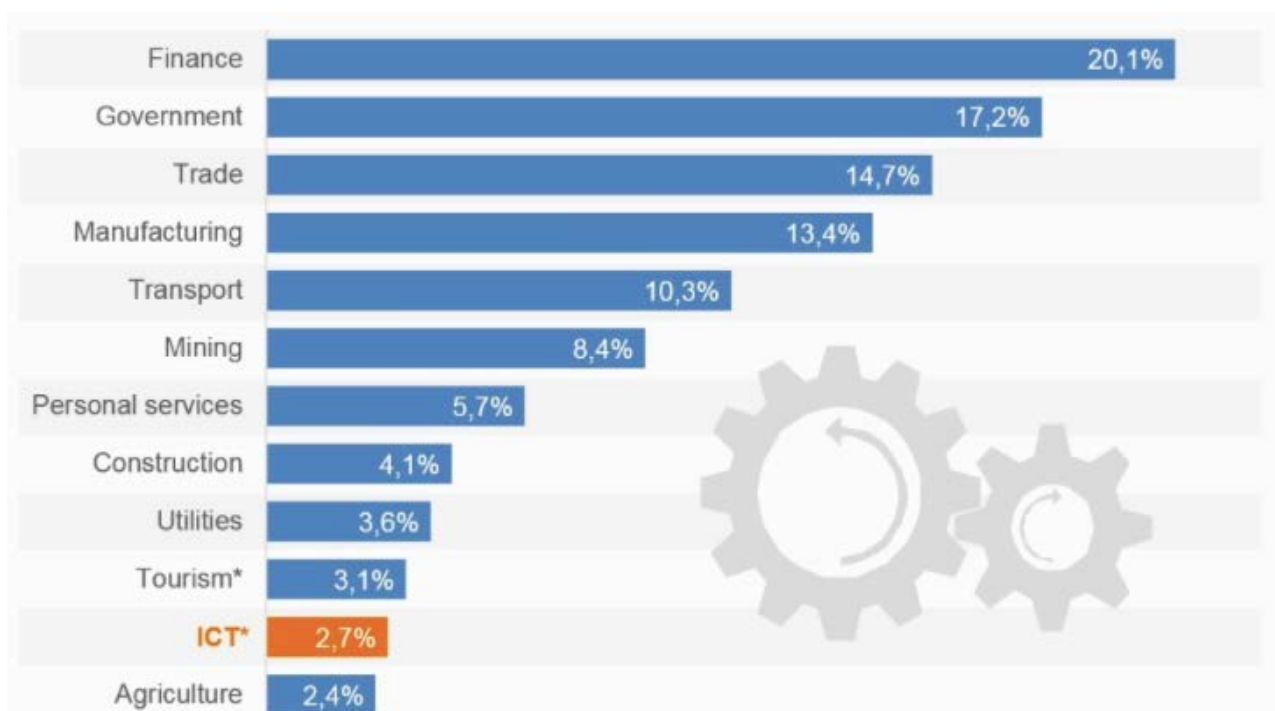
The IT industry has a myriad of obstacles that prevent women from participating substantially in the field. This implies that the poor representation of female IT Executives can be attributed to the obstacles that women face in the IT field. These obstacles are sometimes visible, hence the glass ceiling phenomenon. Other obstacles are not as visible; thus, there is the leadership labyrinth. The labyrinth metaphor gives full context to the difficult challenges that women face in their pursuit of leadership positions. Despite the barriers that exist in the IT field, it is evident that female IT professionals who have succeeded in achieving IT Executive positions broke the glass ceiling and manoeuvred through the IT leadership labyrinth.

**Table 3-12: Summary and insights of Theme D: IT barriers**

### 3.7 THEME E: EXPLAINING THE SOUTH AFRICAN IT SECTOR

South Africa’s IT sector is the responsibility of the Department of Telecommunications and Postal Services (South Africa, 2014). It has been identified as one of the key sectors of South Africa (James *et al.*, 2006). The sector is one of the major contributors to South Africa’s economy (ICT Empowerment Charter, 2004; Gillwald *et al.*, 2012; STATSSA, 2017a).

According to the Information and Communication Technology satellite account for South Africa report of 2017, the IT sector was found to have directly contributed 2.7% of South Africa’s total GDP and fared better than only the agriculture sector (STATSSA, 2017a). Figure 3-10 shows the percentage contribution of the IT sector to gross value added in comparison with other industries.



**Figure 3-10: ICT sector contribution to gross value added compared with other industries**  
Source: STATSSA (2017a)

The less than 10% contribution to the GDP of South Africa shows that the IT industry is not

contributing enough towards economic development in South Africa (Breytenbach & De Villiers, 2012). It is additionally a far cry compared to the leading developing nations such as India, Taiwan, and China (ICT Empowerment Charter, 2004). This is because South Africa is primarily a consumer of IT products and services, rather than a manufacturer thereof. Nonetheless, the South African IT sector is the largest in Africa in terms of technological capacity, investment, and turnover (ICT Empowerment Charter, 2004).

With respect to the employer base, the Media, Information and Communication Technologies Sector Education and Training Authority (MICT SETA) reported a total of 11 317 IT organisations as per the SARS database. Small-sized IT organisations (those with less than 50 employees) constitute 95.96% of all the employers in the sector. Table 3-13 shows the number of IT organisations in South Africa according to size.

Small (0-49)	Medium (50-149)	Large (150+)
10 860	303	154
	<b>Total</b>	<b>11 317</b>

**Table 3-13: Number of IT companies in South Africa**

Source: MICT SETA (2015)

Most of the employers are based in the industrialised provinces of South Africa. The Gauteng province has the most representation of IT employers, at 42% share of employers (MICT SETA, 2015).

Although the industry is not contributing substantially to the country's economy, it is noted in the MICT SETA Sector Skills Plan (MICT SETA, 2015) that South Africa's IT industry is mature. Despite the government recognising the IT sector to be of strategic importance to the future growth and prosperity of South Africa (ICT Empowerment Charter, 2004), the World Economic Forum Report found that the country is yet to leverage the potential benefits of the IT sector (DTPS, 2014). Gillwald *et al.* (2012) agree that South Africa has ignored the transformative potential of information technologies to stimulate economic growth and employment. This is because large sections of the South African population lack basic IT skills; IT services are costly and thus inaccessible; and there is an insufficiently developed

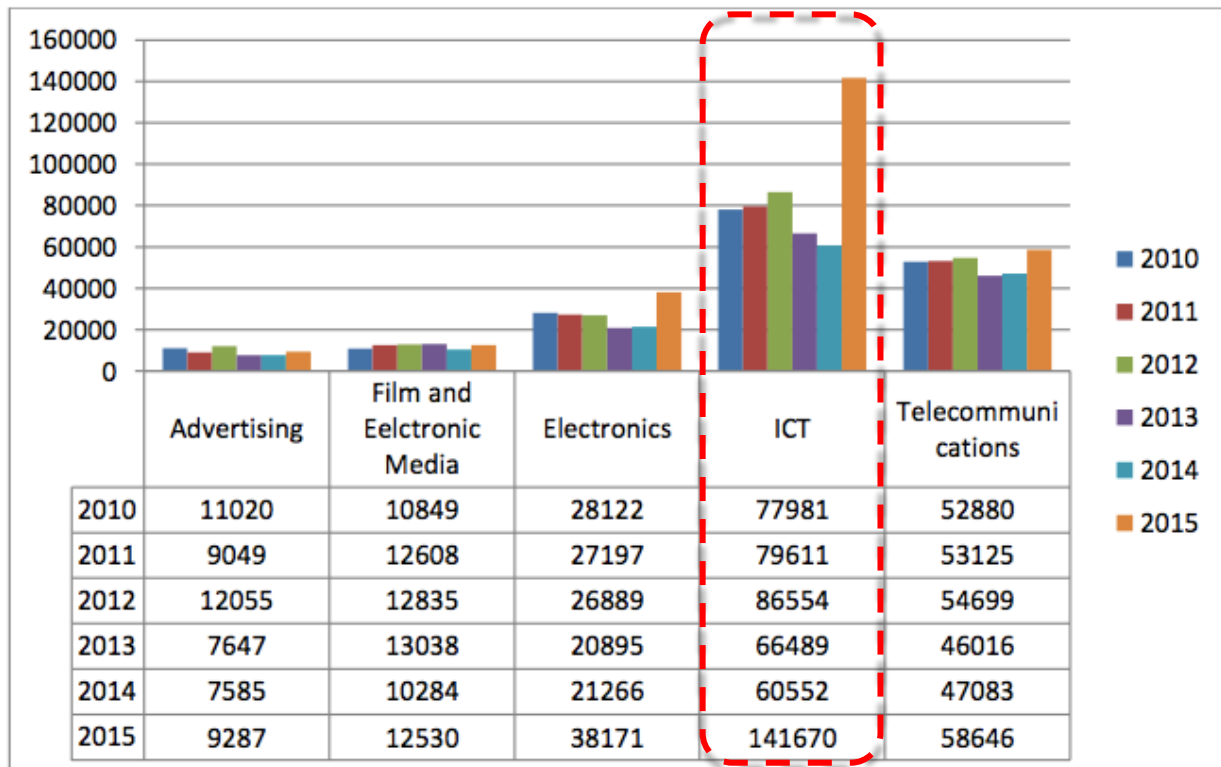


infrastructure.

In light of the IT sector's low contribution to South Africa's economy, it is therefore paramount to understand the employment status in this sector. In the next section, a review of literature is undertaken to provide context around South Africa's IT labour market. "The labour market is the key arena in which most individuals engage with the economy" (Department of Women, 2015a).

### **3.7.1 South Africa's ICT labour market**

Indicators show that the IT labour-consuming industries such as in South Africa's are growing, but South Africa's ICT labour market is not suitably positioned to be in a competitive state (Breytenbach & De Villiers, 2012). A report on the state of South Africa's IT sector as published by the Independent Communications Authority of South Africa (ICASA) shows that the sector employed 335 000 people (ICASA, 2016). It is argued that it is difficult to determine the exact number of people employed in the IT sector (MICT SETA, 2015). Because of the unavailability of disaggregated employment data from STATSSA, MICT SETA estimated the number of employees using workplace skills plan submissions as illustrated in Figure 3-11. The difference between the figures from ICASA and MICT SETA confirms the difficulty in estimating the number of people employed in South Africa's IT sector.



**Figure 3-11: Number of employees**

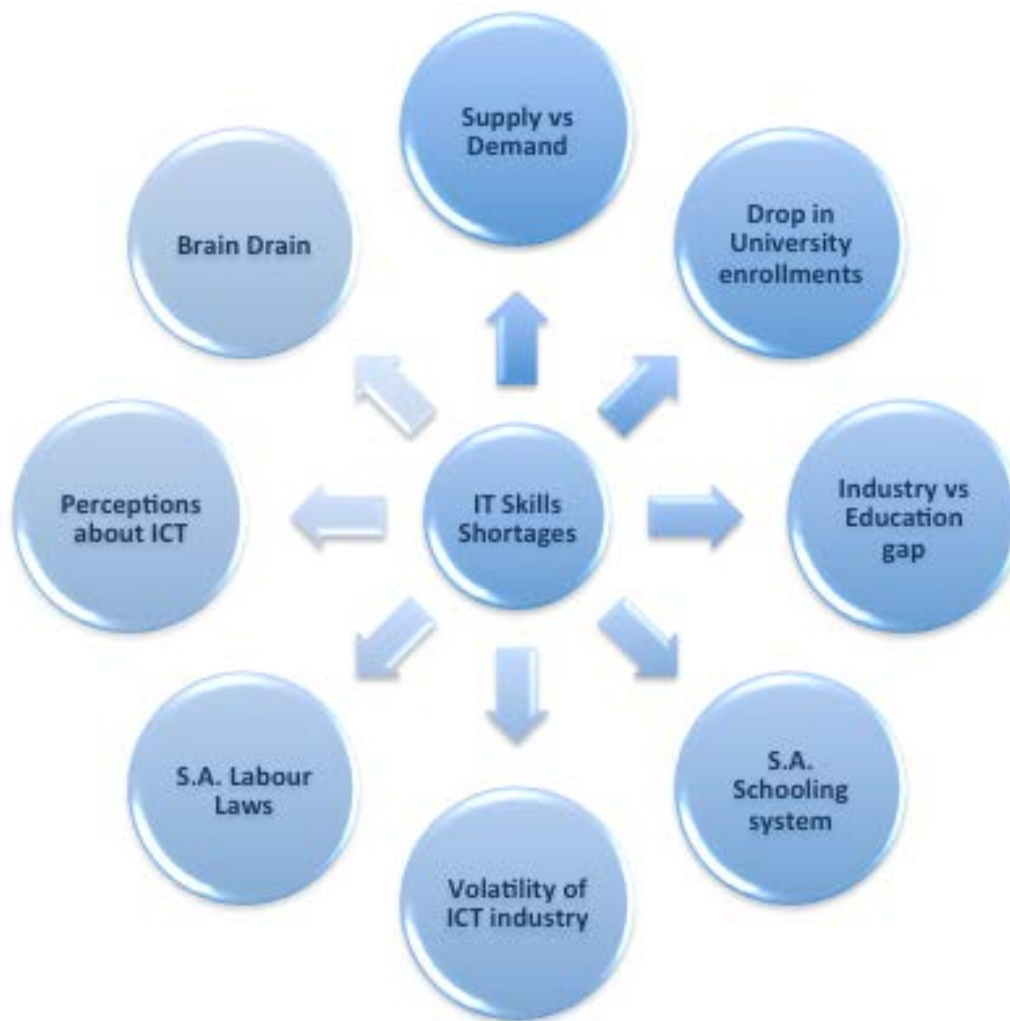
Source: MICT SETA (2015)

As shown in Figure 3-11, the employment numbers in the IT sector were fluctuating between 2010 and 2015. The reason thereof is because of the changing nature of the IT industry, which requires varying skills as technologies develop (ITWeb, 2010). Moreover, the demand side of the South African IT labour market is usually uncertain and regularly changing (Breytenbach, De Villiers & Hearn, 2013). The dynamic nature of the IT industry has resulted in the industry experiencing skills shortages that are difficult to address, as it is never-ending (Lotriet, Matthee & Alexander, 2010). The Career Junction’s “Information Technology Job Report” found that poor skills availability was a major contributing factor towards South Africa’s IT industry struggling to compete globally (ITWeb, 2010).

The shortage of IT skills in the South African market has been noted and acknowledged by various stakeholders such as the government, training providers, and industry (Roodt & Paterson, 2008; Lotriet *et al.*, 2010; Cohen, 2012; De Villiers, Johnson & Cremer, 2012; Kirlidog, Van der Vyver, Zeeman & Coetzee, 2016). However, Lotriet *et al.* (2010) assert that “establishing the extent of the shortage and the nature of skills needed is difficult”. In an

effort to attempt to estimate the extent of South Africa's IT skills shortage, the ITWeb and the Joburg Centre of Software conducted a survey and found the skills shortage to be as high as 70 000 IT practitioners (which is more than 25% of the current workforce) (Cohen, 2012).

De Villiers *et al.* (2012) identified several factors that contribute to the IT skills shortage in South Africa. These are summarised in Figure 3-12.



**Figure 3-12: IT skills shortage causes**

There is a general acceptance that having people with IT skills can boost the economies of the 21<sup>st</sup> century (Lotriet *et al.*, 2010). The IT skills shortage in South Africa is in itself a concern for the industry and the country as a whole (Roodt & Paterson, 2008; Calitz, Evert & Cullen, 2015). This is because the shortage of skilled IT professionals in South Africa

contributes to the weakening economy (ITWeb, 2010). De Villiers *et al.* (2012) concur that IT skills have an immense influence on the growth of the South African economy; thus, the shortage thereof may hinder the country's economic growth if left unattended to.

According to Calitz *et al.* (2015), the IT labour market sources its workers through a supply chain starting at secondary school level, through tertiary education to graduate level. Kirlidog *et al.* (2016) identify IT service providers and in-service training initiatives as other channels for supplying skilled workers into the occupational IT labour market. Kirlidog *et al.* (2016) state that an educated workforce is the most critical aspect of an IT industry in any country. Consequently, the South African government has invested resources in infrastructure and institutions to address the growing IT labour supply concerns (Breytenbach *et al.*, 2013). Despite these investments, the IT skills gap in South Africa is increasing (Kirlidog *et al.*, 2016). Breytenbach and De Villiers (2012) point out that investing in the education of IT graduates will serve as stimulation for the growth of South Africa's economy.

Of the 335 000 people employed in the IT sector in 2015, the state of South Africa's IT sector report highlights that less than a third (31%) of these were female (ICASA, 2016). The next section explores the participation of women in South Africa's IT sector.

### **3.7.2 Participation of women in IT**

Women in South Africa make up the majority of the South African population at 51.1% (STATSSA, 2016), of which 38.3% of women are part of the country's workforce (STATSSA, 2017b). The overall South African labour force is estimated to have seen an average annual increase of 3.9% in 2010 to 2015, with employment among women growing rapidly than men at 2.5% per annum (Department of Women, 2015b). These increases were as a result of the introduction of policy and legislative instruments such as the Employment Equity Act (ICT Empowerment Charter Working Group, 2004). The Employment Equity Act, among other things, aims to "promote the constitutional right of equality and the exercise of true democracy" (South Africa, 1998). The Act aims to ensure that people in designated groups, e.g. black people and women of all races, are reasonably represented at all levels of the workforce. In addition, the Department of Women had implemented programmes aimed at facilitating and promoting economic empowerment and participation of women in the labour market (Department of Women, 2015a).

Although economically active women have higher levels of education than their male counterparts, few of them are found to be participating in high-skilled areas that have traditionally been dominated by men (James *et al.*, 2006; Department of Women, 2015b). Such high-skilled areas include the IT sector. The participation of women in the IT sector has been identified as one of the challenges facing the sector (ICT Empowerment Charter, 2004). This is a problem that starts early on with girls at a young age because they perceive the IT field to be biased towards men (Margolis & Fisher, 2003 cited in Clark, 2012: 4). This perception is a result of the established tradition that careers in IT are for males (Rogers, 2015: 96).

The underrepresentation of women in IT is noted both in education and employment (Dlodlo, Mvelase & Krause, 2010; Pretorius & De Villiers, 2010). Kırıldoğ and Zeeman (2011) assert that IT education will result in ease of employment in the South African IT sector.

### **3.7.2.1 Education**

South Africa's gender equity efforts have seen an increase in the proportion of female higher education students, albeit at a slower pace (Kırıldoğ & Zeeman, 2011). However, most female students are observed to be enrolling in the humanities, health, and social sciences (Kırıldoğ & Zeeman, 2011; Powell & Chang, 2016). Data from the Department of Education's Higher Education Management Information System (HEMIS) and from universities' published annual financial statements shows that 41 284 people enrolled for IT-related courses (i.e. computer and information sciences) across South Africa in 2015 (Centre for Higher Education Trust (CHET), 2017). The enrolments range from undergraduate degrees to doctorate degrees. The size of higher education enrolments sets the maximum number of potential people graduating with IT qualifications and ultimately joining the IT labour force (Roodt & Paterson, 2008). However, according to Breytenbach and De Villiers (2012), most students in South Africa do not seem to be attracted to IT education regardless of the existing shortage of skills.

Keeping in mind that the majority of South Africa's population comprises women, few women enrol for IT-related courses in higher educational institutions (Pretorius, Mawela, Strydom, De Villiers & Johnson, 2015). Kırıldoğ and Zeeman (2011) concur that IT education is not popular among South African women. They have found that almost half of women consistently enrolled in IT courses as compared to their male counterparts. Since the HEMIS

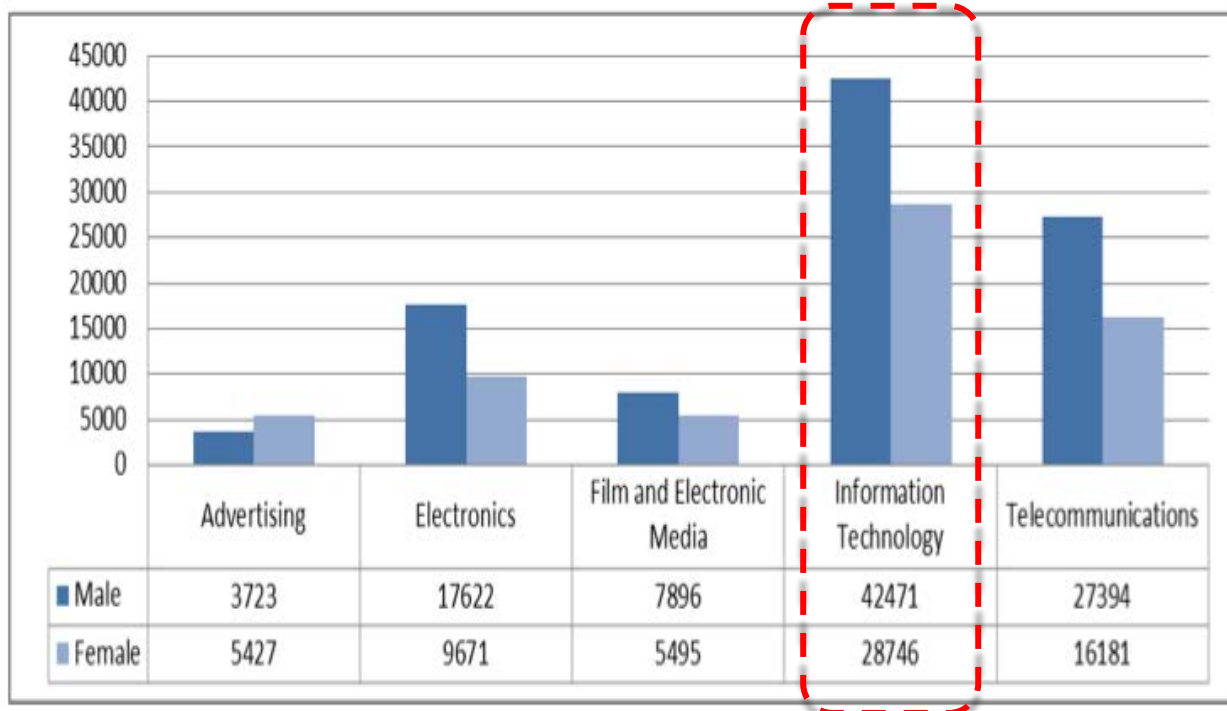
data does not give an indication of how many female students register for IT courses, it is therefore inferred that almost half of 41 284 people who enrolled for IT-related courses in 2015 were women.

Kirlidoğ and Zeeman (2011) assert that there is a general trend of declining IT enrolments, with the rate of enrolments for women declining at about the same rate as for men. This decline has a negative impact on the number of women in the IT workforce of the country (Pretorius *et al.*, 2015; Kirlidog *et al.*, 2016). Alexander, Schoeman, De Kock, Alexander and Piderit (2011) agree that the noticeable shortage of female students enrolling for IT-related degrees results in the underrepresentation of female IT professionals in the IT workforce.

### **3.7.2.2      *Employment***

In the past, South African women of all races were not allowed to achieve their full economic potential due to both legislative and non-legislative discrimination (James *et al.*, 2006). During the country's emancipation from the apartheid era, gender equity policies that aimed at granting everyone access to equal opportunities were implemented (Evans, 2006: 90; James *et al.*, 2006). Moreover, South Africa has constructed an all-inclusive Constitution that promotes women empowerment and gender equality. To support the Constitution, the Department of Women, Children and People with Disabilities (DWCPD) passed the Women Empowerment and Gender Equality bill. Other pieces of legislation used to enforce the empowerment of women include the Commission on Gender Equality Act (1996), the Skills Development Act (1998), the Employment Equity Act (1998), and the Promotion of Equality and Prevention of Unfair Discrimination Act (2000). Despite the existence of these laws, the underrepresentation of women in South Africa's IT industry prevails (Pretorius *et al.*, 2015)

Figure 3-13 shows the gender distribution of employees in the IT sector.



**Figure 3-13: Employee gender distribution in the IT sector**

Source: MICT SETA (2015)

The low participation of women in the IT sector is not only a problem for industry but also for women themselves and the country as a whole (James *et al.*, 2006). A study conducted by Pretorius and Villiers (2010) found the following as factors that contribute to South Africa having few female IT professionals:

- Women perceive the IT industry to be technical, whereas women generally prefer non-technical or softer jobs.
- The IT industry is considered masculine, thus not attractive to women.
- The demanding nature of the IT industry in terms of long working hours conflicts with the traditional role of women as homemakers.

### 3.7.3 THEME E Summary

#### Summary:

South Africa's IT sector is key to the country's economy, although its GDP contribution is unsatisfactory. Nevertheless, the country's IT industry is deemed mature. The poor contribution of the IT sector to South Africa's economy is due to a lack of basic IT skills; costly and inaccessible IT services; and an insufficiently developed infrastructure. The number of people employed in South Africa's IT sector has been fluctuating substantially over the years. This is as a result of the changing nature of the IT industry. The country is also faced with a shortage of IT skills. Several factors that contribute to the IT skills shortage in South Africa have been identified. The IT sector is not considered attractive to women both in education and employment. Less than a third of IT professionals employed in South Africa's IT sector are women. The country has however put in place pieces of legislation to support women empowerment and gender equality.

#### Insights:

An international study has found that South Africa was not leveraging the potential benefits of IT. This explains why the country's IT sector ranks lower than other developing nations as far as contribution to GDP is concerned. Another reason for the IT sector's poor performance can be attributed to the country's lack of basic IT skills. In light of the dynamic nature of the IT industry, the continuous introduction of new IT skills is thus inevitable. This subsequently gives rise to South Africa's IT industry experiencing skills shortages. Furthermore, the extent of the IT skills shortages is difficult to assess and address. Over and above the shortage of IT skills, South Africa also has a problem of the underrepresentation of women in IT education and workplace. The poor representation of women in both IT education and the workplace ultimately results in the underrepresentation of female IT Executives in the country. This is despite women making up over 50% of the country's total population. To promote women's participation in the IT workforce, the government has put in place programmes and pieces of legislation in this regard.

**Table 3-14: Summary and insights of Theme E: South Africa's IT sector**



### 3.8 THEME F: THE CONCEPT OF CULTURE

Trauth *et al.* (2008a) assert that underrepresentation of women in the IT workforce combined with increased cultural diversity has resulted in a practical problem within the IT field. As such, practical interventions that consider cultural diversity in an effort to improve the representation of women in the IT field are required. This is because complex cultural and societal factors have a direct influence on the participation of women in IT (Ahuja, 2002).

To conduct research relating to culture, it is imperative to first understand what culture means. The concept of culture is so broad and complex that it is difficult to arrive at a single definition. Cohen (2009: 194) even goes as far as saying “defining culture is exceptionally tricky”. Fischer (2009: 29) also agrees that defining culture is a formidable challenge, which is fuzzy and includes many facets (Leung & Van de Vijver, 2008). Newman (2005: 11) considers culture as a slippery and elusive subject “because it is part of taken-for-granted, everyday reality, it is hard to see”. Chhokar, Brodbeck and House (2008) add that culture is generally used to differentiate collectivities from one another using certain parameters; however, there is no standard definition of culture.

For over a hundred years, culture has been a concept of interest studied in the cultural anthropology discipline and also in academic areas (Straub, Loch, Evaristo, Karahanna & Srite, 2002). Thus scholars in these areas have produced numerous, diverse, and sometimes contradictory definitions of culture with different levels of complexity (Straub *et al.*, 2002; Leidner & Kayworth, 2006). Despite the varying definitions of culture, Straub *et al.* (2002) argue that historically the definitions of culture tended to be based on a conceptual – rather than based on deductive processes – line of reasoning. Moreover, the authors add that most definitions of culture were formulated through argumentation or were empirically derived.

What makes culture challenging to define is the multiple constituents of it, which include material culture, subjective culture, and social culture (Cohen, 2009: 195). Therefore, defining culture could depend on the form of and the domain within that culture. Broadly, culture refers to the result of human interaction (Luthans & Doh, 2012: 108). According to Cohen (2009: 199), culture can be defined in terms of meaning, information, or knowledge. However, Leung and Van de Vijver (2008) submit that there is consensus among anthropologists that the definition of culture comprises two characteristics. The two

characteristics are that (1) culture is a collective phenomenon that is shared and (2) culture is learned and not genetically transmitted. Over and above these two characteristics, Luthans and Doh (2012: 108) state that scholars of culture believe that other characteristics of culture include that:

- Culture is passed down from one generation to the next, that is, it is transgenerational.
- Culture is based on the human capacity to symbolise or use one thing to represent another; thus, it is symbolic.
- Culture is patterned, which means it has structure and is integrated. This implies that a change in one part will bring changes in another.
- Culture is adaptive, whereby it is based on the human capacity to change or adapt, as opposed to the more genetically driven adaptive process of animals.

In contradiction, Straub *et al.* (2002) bring out that shared values are the central feature and distinguishing characteristic of a culture.

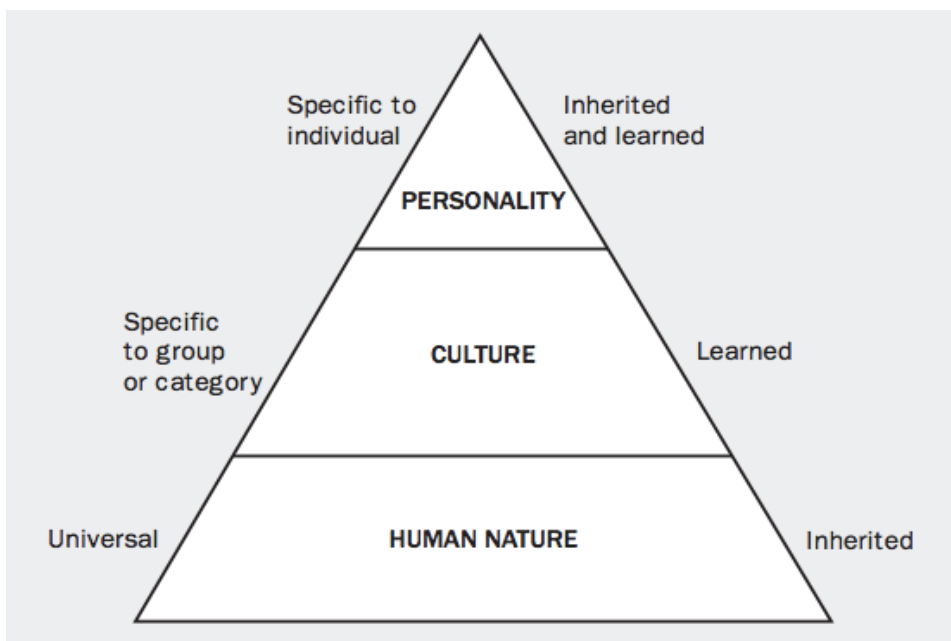
Hofstede's work, which is more frequently used in cross-cultural research (Straub *et al.*, 2002), supports most definitions. In defining culture, Hofstede's argument was that for people to act together, they need to understand and be aware of the differences between their cultures (Ford, Conelly & Meister, 2003). The premise of Hofstede's definition of culture is from the view that culture is a collective phenomenon, comprising unwritten rules, which is partly shared with people in the same environment wherein it is learned (Hofstede *et al.*, 2010: 6). Luthans and Doh (2012: 108) concur that culture is acquired knowledge that people use to interpret their experiences and to generate social behaviour. This implies that culture is not something that people are born with, but rather learned from society. In this context, learned means modified by culture and unique personal experiences (Hofstede *et al.*, 2010: 7). As such, Hofstede's definition of culture states that culture "is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede *et al.*, 2010: 6).

According to Chiang (2005: 1546), Hofstede's definition of culture is arguably the most widely used. Ford *et al.* (2003) point out that Hofstede's definition had in essence been accepted prior to Hofstede's work; however, by developing a taxonomy of culture, Hofstede

was able to extend the field of research in culture.

Hofstede is considered one of the most prominent scholars of all time to study and research on culture (Straub *et al.*, 2002). Moreover, Straub *et al.* (2002) state that Hofstede's work is unique, as it provides a way in which culture value can be assigned to a particular group of people. Hofstede's definition of culture is therefore accepted as central to this study.

According to Hofstede *et al.* (2010: 6), culture is not embedded in genes, but it rather stems from the social environment that one interacts with. It is for this reason that the distinction between human nature, culture, and an individual's personality is necessary. Such a distinction is illustrated in Figure 3-14. It should be noted that the boundaries between nature and culture, and between culture and personality are still to be clarified (Hofstede *et al.*, 2010: 6).



**Figure 3-14: Three levels of uniqueness in mental programming**

Source: Hofstede *et al.* (2010: 6)

**Attributes of Human Nature** (Hofstede *et al.*, 2010: 6)

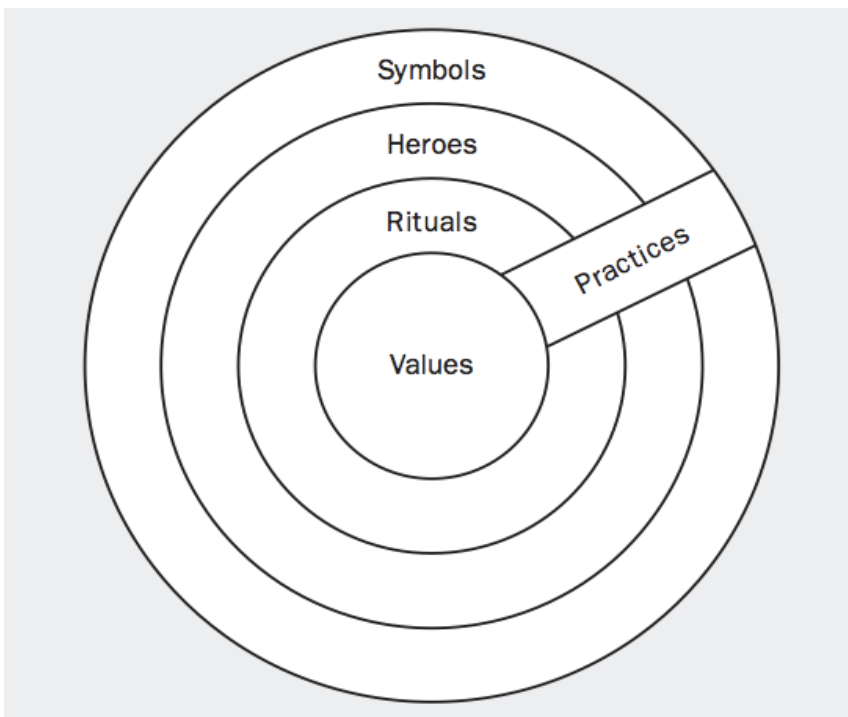
- Represents the universal level in one's mental software.
- It is hereditary, that is, transmitted genetically.

- Determines an individual's way of functioning from a physical and psychological point of view. However, such can be modified by culture.

**Attributes of an Individual's Personality** (Hofstede *et al.*, 2010: 7)

- Represents a person's unique set of mental programmes that are not necessarily shared with others.
- Based on traits that are partly inherited and partly learned.

There are different ways in which cultural differences manifest (Hofstede *et al.*, 2010: 7). For example, Leidner and Kayworth (2006) argue that “values represent a manifestation of culture that signify espoused beliefs identifying what is important to a particular cultural group”. Straub *et al.* (2002) posit that culture is primarily manifested through core values. Hofstede, on the other hand, has used the metaphor of an “onion” to explain and understand culture. Hofstede *et al.* (2010: 7) suggest that culture is manifested through a combination of symbols, heroes, rituals, and values, with values being the core of culture. Using the onion metaphor, each level that manifest culture is illustrated as the skin of an onion (see Figure 3-15). This illustration shows the levels of depth that each of these attributes contributes to the manifestation of culture.



**Figure 3-15: Manifestations of culture at different levels of depth**

Source: Hofstede *et al.* (2010: 8)

The outer layers of the onion, i.e. symbols, heroes, and rituals are grouped together as practices of culture. Symbols include words, gestures, or objects that are associated with a particular meaning recognised by those who share the culture (Hofstede *et al.*, 2010: 8). Heroes, on the other hand, are people who possess highly valued characteristics in a culture and thus serve as models for behaviour (Hofstede *et al.*, 2010: 8). These people can either be alive, dead, real, or imaginary. Rituals are a sequence of collective activities performed as prescribed in culture and are considered socially essential (Hofstede *et al.*, 2010: 9).

At the core of the onion, values are found. “To understand a culture more deeply, we need to peel the ‘onion’ layer by layer to touch its core” (Fang, 2006: 74). Values are in essence cultural norms that are unconsciously embedded in society and in each individual (Kohun, Burcik & Skovira, 2012). “Values refer to relationships among abstract categories that are characterised by strong affective components and imply a preference for a certain type of action” (Straub *et al.*, 2002). Luthans and Doh (2012: 113) add that values are the basic and firm beliefs that people have regarding what is right and wrong, good and bad, important and unimportant. Values are tendencies to prefer one thing over another (Hofstede *et al.*, 2010: 9). Preston, Karahanna and Rowe (2006) contend that values and attitudes inform people’s behaviour and preferences. Similarly, Straub *et al.* (2002) and Luthans and Doh (2012: 113) agree that values influence people’s cognitions, attitudes, and behaviours. Therefore, Hofstede *et al.* (2010: 158) argue that “culture is heavy with values, and values imply judgment”. Considering that values are core to culture, it suffices to say that culture has a fundamental influence on people’s behaviour in a predictable and uniform way (Chiang, 2005: 1546).

Hofstede clearly differentiates values and practices. According to Hofstede *et al.* (2010: 9), values are acquired early in life and are not visible to outsiders observing or studying a particular culture. Moreover, they are learned from the culture in which an individual is raised (Luthans & Doh, 2012: 113). Once values are learned, they become integrated into an organised system of values that is relatively stable in nature (Straub *et al.*, 2002). Practices, on the other hand, are learned later on in life and are the visible part of cultures (Hofstede *et al.*, 2010: 19). This means that as practices change, the values remain firm and

unchanged. Because they are at the deepest level, it is henceforth suggested that values are the most persistent element of culture. Furthermore, given that values determine behaviours (Fang, 2006: 74), inference is made that the cultural values that were learned and adopted at a young age can influence people's practices as they grow older.

Like most definitions of culture, Hofstede's definition is based on values (Preston *et al.*, 2006). Hofstede's definition suggests that culture consists of a set way of thinking that is based on values and is shared across members of a particular society (Straub *et al.*, 2002). The shared cultural attributes, which are inherently psychological, include "motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives and are transmitted across age generations" (House & Javidan, 2004: 15 cited in Chhokar *et al.*, 2008). These values are passed on from one generation to another without discussion, thought, or action (Kohun *et al.*, 2012). Transmitting culture from one generation to the next is done through socialisation processes (Fischer, 2009: 29). This implies that culture is created through sharing of common attributes. The shared component is what distinguishes one group of people from another (Fischer, 2009: 29). After all, collectively, members of the same culture prefer to view the world in a similar way (Preston *et al.*, 2006). Identifying and describing culture on the basis of value patterns that are shared across individuals and within groups is widely accepted (Straub *et al.*, 2002). Earley (2009: 24) argues that culture is not a value (or set of values), but rather the meaning associated with aspects of the world around people. Leung and Van de Vijver (2008) concur that culture is emphasised to be an interpretation of meanings.

Culture endures through generations; therefore, there is no group that can escape its own culture (Hofstede *et al.*, 2010: 11-12). The rationale behind this argument is that each group of people, to which almost everyone belongs, carries several layers of mental programmes that correspond to different levels of culture (Hofstede *et al.*, 2010: 17-18). Hofstede *et al.* (2010) highlight the following levels at which culture can be conceptualised:

- National level (i.e. one's country)
- Regional and/or ethnic and/or religious and/or linguistic affiliation level
- Gender level (i.e. male or female)

- Generation level (i.e. grandparents, parents or children)
- Social class level (i.e. educational opportunities in relation to one's occupation)
- Organisation, departmental, and/or corporate levels

Another barrier is “a set of widely shared conscious and unconscious mental associations about women, men, and leaders” (Eagly & Carli, 2007). Understanding that “culture is the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede *et al.*, 2010: 6), it is inferred that this barrier is closely associated with cultural beliefs. It is worth noting that no one can be separated from his or her cultural and social environment (Lang, 2007: 223). People who live or lived within the same social environment typically share the same culture (Hofstede *et al.*, 2010: 6).

Hofstede *et al.* (2010: 18) note that sometimes there is a conflict between the mental programmes from these levels; for example, gender values might conflict with ethnic values. Differences in values are commonly attributed to cultural differences (Taras & Steel, 2009: 43). Chiang (2005: 1546) maintains that cultural differences are often more visible when comparing societies. “The distinctions in societies can improve our understanding related to people’s values and behaviours. Hofstede’s paradigm provides a clear and consistent way of comparing different cultures through the use of cultural dimensions” (Fang, 2006: 72). These dimensions are mostly concerned with values (Kohun *et al.*, 2012). A discussion around these dimensions is explained in the section that follows.

### **3.8.1 Hofstede’s dimensions of culture**

To describe how cultures differ and to predict people’s behaviours, Hofstede applied a wide variety of disciplines which include psychology, sociology, history, political science, economics, and anthropology (Chiang, 2005: 1546). While there are a number of methodologies available for understanding the influence of national cultures on IT management and IT as a whole, Hofstede’s cultural dimensions are commonly used (Ford *et al.*, 2003). Preston *et al.* (2006) concur that Hofstede’s cultural dimensions enable researchers to examine how different cultural values relate to relevant IT behaviours or preferences. Moreover, Hofstede’s cultural dimensions are considered to be stable and useful in conducting empirical studies in various disciplines (Preston *et al.*, 2006).

Hofstede conducted a survey in International Business Machines (IBM) with the aim of studying the values of people from different countries. According to Hofstede *et al.* (2010: 28), cultures are compared by measuring their values. Thus, Hofstede's study of values ultimately aimed at comparing the cultures of IBM employees. Hofstede's approach to studying people's values in various countries involved a study of a large body of survey data obtained from IBM's employees. The study was in the form of questionnaires, whereby 116 000 questionnaires were sent out to IBM employees who spanned over 70 countries. According to Luthans and Doh (2012: 116), Hofstede's study is the largest organisationally based study to have ever been conducted. Hofstede preferred questionnaires because they eliminated bias by showing the differences in answers between the respondents (Hofstede *et al.*, 2010: 28). Of the 116 000 questionnaires that were sent out, responses were received from over 60 000 people from over 50 countries.

Hofstede's study of values emanated from the study that was done in 1954 by sociologist Alex Inkeles and psychologist Daniel Levinson in 1954 (Hofstede *et al.*, 2010: 29-30). The two researchers' study was in relation to national culture. The study highlighted the following common worldwide issues which were classified as problems that had an impact on the functioning of societies and their members (Hofstede *et al.*, 2010: 29-30):

- Relation to authority
- The relationship between individual and society
- The individual's concept of masculinity and femininity
- Ways of dealing with conflicts, including the control of aggression and the expression of feelings

The empirical findings from Hofstede's study matched the findings from Inkeles and Levinson of 20 years prior (Hofstede *et al.*, 2010: 30). This means that the answers of IBM employees in the different countries identified the same problems that were identified by Inkeles and Levinson. The results from the survey essentially demonstrated that the way people think is constrained by culture (Hofstede *et al.*, 2010: 37). Based on the identified problem areas, Hofstede defined four cultural dimensions. "A dimension is an aspect of a culture that can be measured relative to other cultures" (Hofstede *et al.*, 2010: 31). These cultural dimensions, which together form a four-dimensional model (4D model) of differences



between national cultures, were named (1) Power Distance; (2) Collectivism versus Individualism; (3) Femininity versus Masculinity; and (4) Uncertainty Avoidance (Hofstede *et al.*, 2010: 31). A fifth cultural dimension was later added when a new questionnaire called the Chinese Value Survey (CVS) was administered by Michael Bond and Hofstede. The new cultural dimension was then labelled Long-Term versus Short-Term Orientation (Hofstede *et al.*, 2010: 38), thus giving rise to the five-dimensional model (5D model).

Table 3-15 outlines the characteristics of the five cultural dimensions. These five dimensions represent common issues in the cultural systems of countries and are centred on five fundamental areas of human behaviour (ITIM International Culture and Management Consultants, 2015). Additionally, they form the basis of what Culture GPS Lite refer to as the 5D model. Culture GPS Lite is an app developed for the iPhone, iPad, and Android devices to navigate through intercultural differences based on Hofstede's 5D model.

<b>5D Model</b>		
<b>Cultural Dimension</b>	<b>Low Characteristics</b>	<b>High Characteristics</b>
<p><b>Power Distance (PDI)</b></p> <p>The extent to which the less powerful members of society expect and accept power is distributed unequally.</p>	<ul style="list-style-type: none"> <li>- Low dependence needs</li> <li>- Inequality minimised</li> <li>- Hierarchy for convenience</li> <li>- Superiors accessible</li> <li>- All should have equal rights</li> <li>- Change by evolution</li> </ul>	<ul style="list-style-type: none"> <li>- High dependence</li> <li>- Inequality accepted</li> <li>- Hierarchy needed</li> <li>- Superiors often inaccessible</li> <li>- Power holders have privilege</li> <li>- Change by revolution</li> </ul>
<p><b>Individualism (IDV)</b></p> <p>Individualism: people look after themselves and their immediate family only.</p> <p>Collectivism: people belong to in-groups (families, clans, or organisations) who look after them in exchange for loyalty.</p>	<ul style="list-style-type: none"> <li>- “We” consciousness</li> <li>- Relationships have priority over tasks</li> <li>- Fulfil obligations to family, in-group, society</li> <li>- Penalty implies loss of “face” and shame</li> </ul>	<ul style="list-style-type: none"> <li>- “I” consciousness</li> <li>- Private opinions</li> <li>- Fulfil obligations to self</li> <li>- Penalty implies loss of self-respect and guilt</li> </ul>
<p><b>Masculinity/Femininity (MAS)</b></p> <p>Masculinity: the dominant values are achievement and success.</p>	<ul style="list-style-type: none"> <li>- Quality of life, serving others</li> <li>- Striving for consensus</li> <li>- Work in order to live</li> <li>- Small and slow are beautiful</li> <li>- Sympathy for the unfortunate</li> <li>- Intuition</li> </ul>	<ul style="list-style-type: none"> <li>- Performance ambition, a need to excel</li> <li>- Tendency to polarise</li> <li>- Live in order to work</li> <li>- Big and fast are beautiful</li> <li>- Admiration for the</li> </ul>

<b>5D Model</b>		
<b>Cultural Dimension</b>	<b>Low Characteristics</b>	<b>High Characteristics</b>
Femininity: the dominant values in society are caring for others and quality of life.		successful achiever - Decisiveness
<p><b>Uncertainty Avoidance (UAI)</b></p> <p>The extent to which people feel threatened by uncertainty and ambiguity and to try to avoid such situations.</p>	<ul style="list-style-type: none"> <li>- Relaxed, less stress</li> <li>- Hard work is not a virtue per se</li> <li>- Emotions not shown</li> <li>- Conflict and competition seen as fair play</li> <li>- Acceptance of dissent</li> <li>- Flexibility</li> <li>- Less need for rules</li> </ul>	<ul style="list-style-type: none"> <li>- Anxiety, greater stress</li> <li>- Inner urge to work hard</li> <li>- Showing of emotions accepted</li> <li>- Conflict is threatening</li> <li>- Need for agreement</li> <li>- Need to avoid failure</li> <li>- Need for laws and rules</li> </ul>
<p><b>Long-Term Orientation (LTO)</b></p> <p>The extent to which a society shows a pragmatic future-orientated perspective rather than a conventional historical or short-term point of view.</p>	<ul style="list-style-type: none"> <li>- Absolute truth</li> <li>- Conventional/traditional</li> <li>- Concern for stability</li> <li>- Quick results expected</li> </ul>	<ul style="list-style-type: none"> <li>- Many truths</li> <li>- Pragmatic</li> <li>- Acceptance of change</li> <li>- Perseverance</li> </ul>

**Table 3-15: Characteristics of cultural dimensions**

Source: Adapted from Culture GPS Lite (ITIM International Culture and Management Consultants, 2015)

Another cultural dimension was later identified by Misho Minkov through his in-depth analysis of the World Values Survey (Hofstede *et al.*, 2010: 38). This particular dimension showed a correlation with the Long-Term versus Short-Term Orientation dimension and was

therefore named Indulgence versus Restraint. The introduction of the sixth cultural dimension resulted in the six-dimensional model (6D Model). The Indulgence versus Restraint is fairly new; therefore, there is no sufficient data collected to make it as significant as the other dimensions (Kohun *et al.*, 2012). Ford *et al.* (2003) state that “these dimensions allow national-level analysis and are standardized to allow multiple country comparisons”.

### **3.8.1.1 Critique of Hofstede’s cultural framework**

Despite the popularity and importance of cultural research, Hofstede’s work has endured some criticism (Chiang, 2005: 1545; Jones, 2007: 3). Hofstede’s critics spanned different disciplines, for example, Myers and Tan in Information Systems; McSweeney in Human Resources; and Baskerville in Accounting. The issues raised regarding Hofstede’s framework are primarily methodological and theoretical (Baskerville-Morley, 2005: 389; Chiang, 2005: 1547). The theoretical basis on which Hofstede established his methodology has resulted in Hofstede’s dimensions being rejected in social sciences of sociology and anthropology (Baskerville, 2003: 6).

Table 3-16 sets out a summary of Hofstede’s criticisms by various scholars.

## Methodological Concerns

Hofstede's survey was only restricted to one large multinational corporation: International Business Machines (IBM). Therefore, this limited the generalisability of the findings mostly at societal level. A study fixated on only one company cannot possibly provide information on the entire national cultures.

Because the surveys were focused only on IBM, it is believed that a strong corporate culture may dilute the scores on the dimensions.

Hofstede used a single method of data collection for measurement, which is considered too limited.

Surveys are not deemed appropriate instruments for accurately measuring cultural differences.

The outcomes of Hofstede's work have a possibility of arbitrariness. This is based on Hofstede's assumption that national culture is a homogenous whole, whereas most nations comprise groups of ethnic units or subcultures.

Taking into consideration that the survey was conducted during the times of political instabilities, the outcomes, particularly those pertaining to Masculinity and Uncertainty Avoidance, may have been subjected to political influences. Moreover, the sample used lacked data from socialist countries as well as from less affluent Third-World Countries.

Hofstede's analysis was based on only 40 subjects (40 data points corresponding to 40 countries); thus, it had an increased likelihood of sample error. Furthermore, some of Hofstede's questions were used more than once, whereas others had significant cross-loadings. This questioned the statistical integrity of Hofstede's results.

## Theoretical Concerns

The construction of Hofstede's dimensions is deemed too narrow and confined only to the study of work-related values, which are not the same as national values.

Some dimensions were considered inappropriately labelled, particularly the masculinity vs

femininity cultural dimension. Some perceive the label to be sexist.

The dimensions restrict the measurement of culture. For example, Power distance is considered a poor indicator of inequality.

Cultural values are assumed to be stable over time. However, Hofstede's work is considered too old to be of any modern value and no longer valid given today's rapidly changing global environments, internationalisation, and convergence.

The identified number of cultural dimensions is not sufficient to give information about cultural differences.

Hofstede's work has also been criticised for being culture-bound, whereby the cultural dimensions assume that culture falls along national boundaries. It is argued that since cultures are not necessarily bound by borders, therefore culture cannot be studied by analysing nations. After all, cultures do not equate to nations.

Hofstede's work does not provide valuable guiding intelligence.

Hofstede's cultural dimensions are used to analyse and measure culture at a national level; however, several studies apply this national measure to groups or individuals.

**Table 3-16: Hofstede's criticisms**

Source: Ford *et al.* (2003), Baskerville (2003), Baskerville-Morley (2005), Chiang (2005), Jones (2007), and Luthans and Doh (2012)

Despite all the criticisms around Hofstede's work, "it is generally accepted that Hofstede's framework provides a coherent theory for explaining national variations in culture" (Chiang, 2005: 1547).

### 3.8.2 Gender roles

Buddhapriya (2009: 33) posits that almost every society can attest that gender differences exist in both work and family boundaries. Historically, there was a belief that the work and family are "separate worlds", thus corresponding with the belief that the responsibilities of women and men are distinct and non-overlapping (Wharton, 2009: 109). The division of responsibilities into male and female domains forms the basis for gender roles (Dandapat &

Sengupta, 2012). Wharton (2009: 82) notes that throughout history and the world, tasks have been assigned on the basis of gender, thus resulting in divisions of labour.

According to Alesina *et al.* (2013), the gender division of labour differs significantly from society to society. The roles of women and men are carefully divided within family structures (Wharton, 2009: 105). Globally, in comparison to men, the lives of women are more home-centred (Mikkola & Miles, 2007). Depending on the culture, women can either participate in employment outside of the home or remain within the home while the men are the breadwinners (Perrone *et al.*, 2009; Alesina *et al.*, 2013). Where women participate solely in the domestic sphere, they are therefore primarily responsible for taking care of children and providing emotional support and the men are wage-earners (Wharton, 2009: 106). “These roles were transmitted to each generation through processes of socialisation” (Wharton, 2009: 106). As boys and girls observe these gender-specific roles around them in their families, they develop a tendency to try to fit in with this model, thus triggering a cycle of inequalities between women and men throughout life (Dandapat & Sengupta, 2012). Nonetheless, it is argued that this type of traditional structure was functional for both family solidarity and the larger society (Wharton, 2009: 106).

Perrone *et al.* (2009) posit that gender roles in family and work domains are continuously changing. Wharton (2009: 109) agrees that “work and family are not static, unchanging institutions, but reflect and adapt to developments in the wider society”. The traditional view that men are breadwinners and women are caregivers and homemakers has shifted over time (Gordon & Whelan-Berry, 2005). This view changed as women entered into the paid labour force. Wharton (2009: 109) asserts that as women entered the paid labour force, it was acknowledged that work and family were not separate, but rather they intersected in complex ways. Moreover, because of the changes in social norms, men and women deem both work and family roles important (Gordon & Whelan-Berry, 2005).

The introduction of women to the paid labour force has resulted in the role of women changing to focus beyond the home front (Dandapat & Sengupta, 2012). As such, men and women end up sharing both provider and nurturing roles (Gordon & Whelan-Berry, 2005; Perrone *et al.*, 2009). This implies that with the continuous change in the relations between men and women, the relations between work and family are also expected to be redefined (Wharton, 2009: 109). Consequently, there is a tight link relationship between gender,

family, and work.

Taking into account these changes in the social norms, Rhode and Kellerman (2007: 11) argue that women are still expected to be the primary caregivers. This is because in some cases the home sphere is considered a woman's territory and therefore men are excluded from childcare (Mikkola & Miles, 2007). Similarly, Ramírez and Ruben (2015) suggest that there is an assumption that women are expected to focus more on reproductive tasks instead of productive tasks inherent in the labour force. As a result, women have to take up both the responsibilities of the housewife and that of a professional career woman (Dandapat & Sengupta, 2012). As career women, women are not able to spend enough time during the tender age of their children; therefore, they often suffer from a guilt complex (Buddhapriya, 2009: 33). Additionally, much is expected from working mothers than working fathers, and they are occasionally criticised as parents or professionals (Rhode & Kellerman, 2007: 12). The challenges of dual responsibilities occasionally produce role conflict and eventually result in much stress and role strain (Buddhapriya, 2009: 33; Perrone *et al.*, 2009). These challenges, in turn, limit women's access to paid work (Ramírez & Ruben, 2015) and often dictate women's career choices (Dandapat & Sengupta, 2012).

### 3.8.3 THEME F Summary

#### Summary:

Culture bears many definitions in research, but the most popular definition is that of Hofstede. Culture is manifested through a combination of symbols, heroes, rituals, and values, with values being its core. Culture sets expectations as to how people should behave. Because culture can be conceptualised at different levels, including gender, stereotypes are therefore expected. The core of culture is values. Values are norms that are unconsciously embedded in society and in each individual. Cultural differences are often more visible when comparing societies. People who live or lived within the same social environment typically share the same culture. Hofstede defined six cultural dimensions in order to compare different cultures. These cultural dimensions are mostly concerned with people's values. The application of Hofstede's cultural dimensions is common and well accepted in IT research. The popularity of Hofstede's work has inevitably endured criticism from other culture research scholars. Culture inherently influences gender



roles in society. The introduction of women to the paid labour force has resulted in the role of women changing to focus beyond the home front.

**Insights:**

Literature shows that culture is not a static concept. Since culture is learned, it is susceptible to evolution as people's circumstances change. This implies that a change in culture will result in a change in how people behave. Moreover, there are defined gender roles associated with cultural beliefs. Since the South African government is driving initiatives to include women in paid labour force, such initiatives are sometimes contradictory to cultural norms. The issue is exaggerated further as women are encouraged to join male-dominated fields such as IT. The general underrepresentation of women in the IT workforce combined with the country's cultural diversity poses a practical problem within South Africa's IT sector. Hofstede's cultural dimensions can be adopted to determine the influence of culture on the underrepresentation of female IT Executives in South Africa.

**Table 3-17: Summary and insights of Theme F: Culture**

### 3.9 CONCLUSION

The growing importance and dependence of IT in organisations have resulted in the need to manage IT at a strategic level. This saw the role of the data processing manager evolving from a mainly technology and IT operations management role to a more strategic role. Elevating this role to a higher level was primarily to ensure that there is alignment between the business and technology. Because the IT function was strategically positioned, the role of the IT Executive emerged. Literature also mentions that the poor management and productivity of IT raised many concerns for CEOs, hence the need to have an IT Executive. Much ambiguity around the exact role of the IT Executive has been noted. This is as a result of the constant changes in technology and the growing complexities of organisations. At times, the IT Executive role is devised to accommodate the environment in which it operates, thus making it dynamic. In view of the many varying views about the role of the IT Executive, Mintzberg's Model of Managing was adopted in order to describe the generic role of the IT Executive. The model generally specifies the roles that senior executives must perform.

Some scholars have also identified additional roles that are specific to the IT Executive (e.g. Smaltz *et al.*, 2006; Chen & Wu, 2011; Khallaf & Skantz, 2011).

In light of the strategic position of the IT function, there are differing views around the appropriate level of the IT Executive's strategic decision-making authority. It is argued that IT Executives of some organisations do not have the necessary authority and decision-making right. To make IT strategic decisions, the IT Executive needs to have structural power within the organisation. Such decisions can be made if the IT Executive is properly positioned in the organisation. Moreover, the IT department will also be in a position to better serve the organisation and deliver on its mandate. According to literature, having the IT Executive as part of the top management team is becoming a more acceptable and common approach. In this manner, the strategic partnership between the IT Executive and the top management team will be enhanced. Additionally, the TMTs will be more diversified, resulting in a common understanding of the role of IT in the organisation. Although members of the top management team report directly to the CEO and with studies showing that many IT Executives report directly to the CEO, what is essential is to have the IT Executive position aligned with the organisation's strategy. This implies that whomever the IT Executive reports to is immaterial. After all, the CEO-CIO reporting structure is not always the best approach for all organisations.

Competencies required for an IT Executive have been highlighted. It is noted that competencies differ from leader to leader; however, to be an effective leader, it is crucial for one to possess cognitive competencies, emotional intelligence competencies, and social intelligence competencies. There is a wide variety of competencies that are associated with IT Executives, but it is not realistic for one to possess all of them, as some of them might be insufficient in the long run. Only core competencies are therefore necessary. These core competencies should be sufficient enough for the IT Executive to successfully facilitate the use of IT for organisational success. Competencies are primarily made up of skills and knowledge. With regard to the required skills of an IT Executive, soft skills are considered more important than technical skills. As far as the required IT Executive's knowledge is concerned, literature shows that IT and business management expertise are vital.

Gender influences much of what is expected of individuals. Subsequently, individuals learn how to display specific characteristics pertaining to their gender. Gender in its own provides

a means of describing the cultural, social, and psychological traits of individuals in terms of masculinity or femininity. These gender characteristics result in gender stereotypes. Most often gender stereotypes discriminate against women, particularly when it comes to senior management levels. For instance, one of the stereotypes bears the notion that leadership positions require masculine traits other than feminine traits. With the IT sector traditionally considered to be a male-dominated environment, this has resulted in masculine values predominating in the profession. With that said, there is a low representation of women in IT leadership positions.

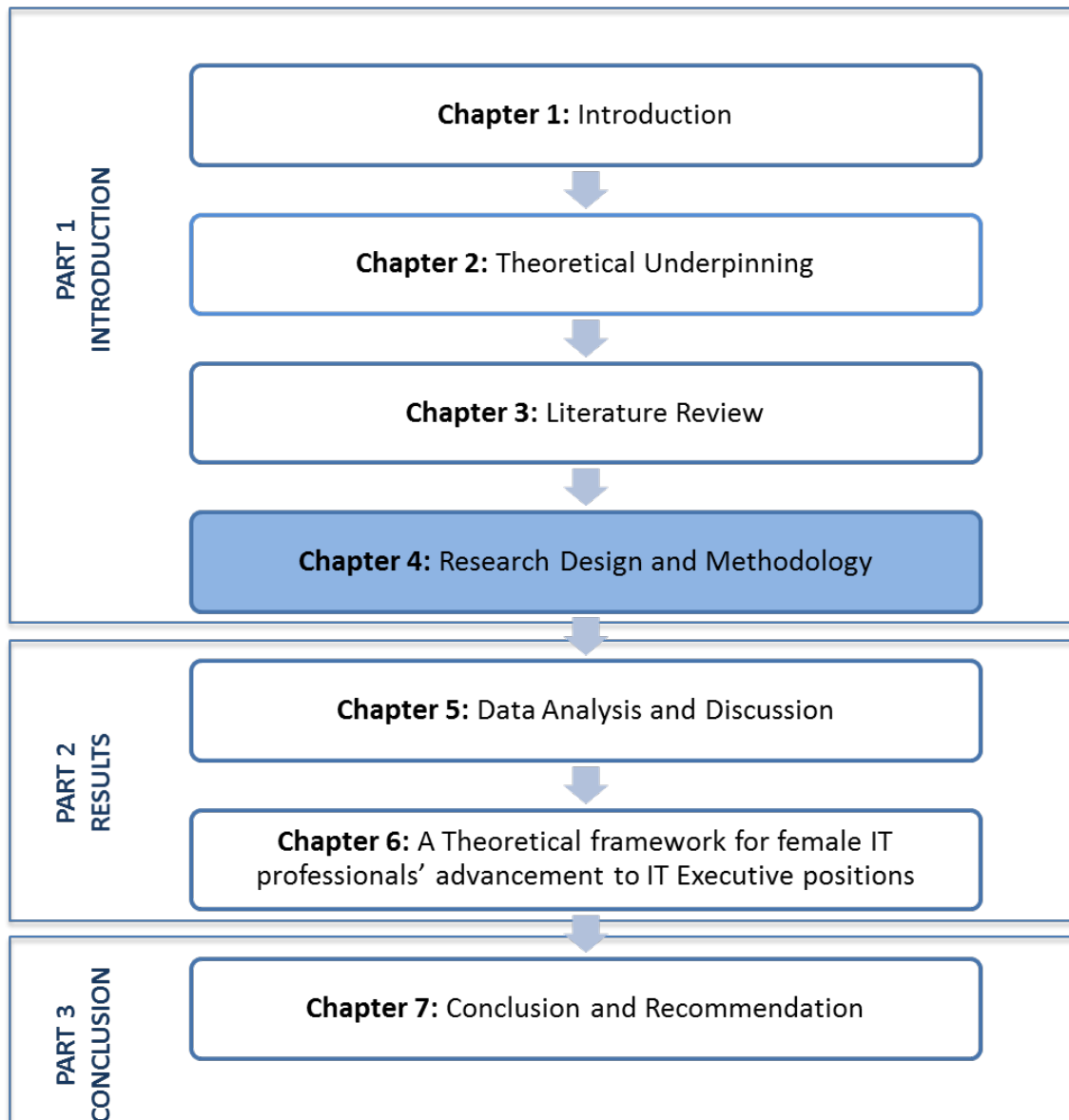
Over and above the gender stereotypes, women are further confronted with a variety of obstacles that impede them from attaining leadership positions. The glass ceiling phenomenon is often used to explain the poor representation of women in leadership positions. However, this phenomenon is only focused on an invisible, absolute and impassable barrier that women tend to experience when they pursue leadership positions. However, given the complexity around the advancement of women into leadership positions and the many barriers that women come across, most authors suggest that the labyrinth metaphor better captures the essence of those factors. The leadership labyrinth conveys a challenge-riddled journey that women navigate through towards leadership positions. The various barriers that make up the leadership labyrinth result in gender-leadership gaps.

The leadership labyrinth is also evident in South Africa's IT sector, whereby female IT professionals find it difficult to progress to IT leadership positions. South Africa, like other countries, is faced with the challenge of the underrepresentation of women in the IT sector as a whole. The underrepresentation of women in IT is noted both in education and employment. This is despite more than half of the country's population comprising women. However, measures are in place to ensure women's participation in South Africa's IT labour force gradually improve. The IT sector is one of the major contributors to South Africa's economy, contributing 2.9% of South Africa's total GDP. The dynamic nature of the IT industry has resulted in the industry experiencing skills shortages that are difficult to address. The IT skills shortage in South Africa is attributed to several factors ranging from a reduced number of IT enrolments to the brain drain. The shortage of skills has a negative impact on the IT sector's contribution to the country's economy.

With cultural norms playing a role in gender stereotyping, literature on concepts of culture was reviewed. Despite the many meanings associated with culture, it is agreed that culture is mainly shared and is learned. Hofstede's definition of culture encompasses most definitions; therefore, it is adopted for this study. Hofstede's cultural domains are typically used to describe how cultures differ and to predict people's behaviours. Despite the popularity and importance of Hofstede's work in cultural research, it has endured some criticism by scholars from different disciplines. Such criticism is classified as either methodological or theoretical.

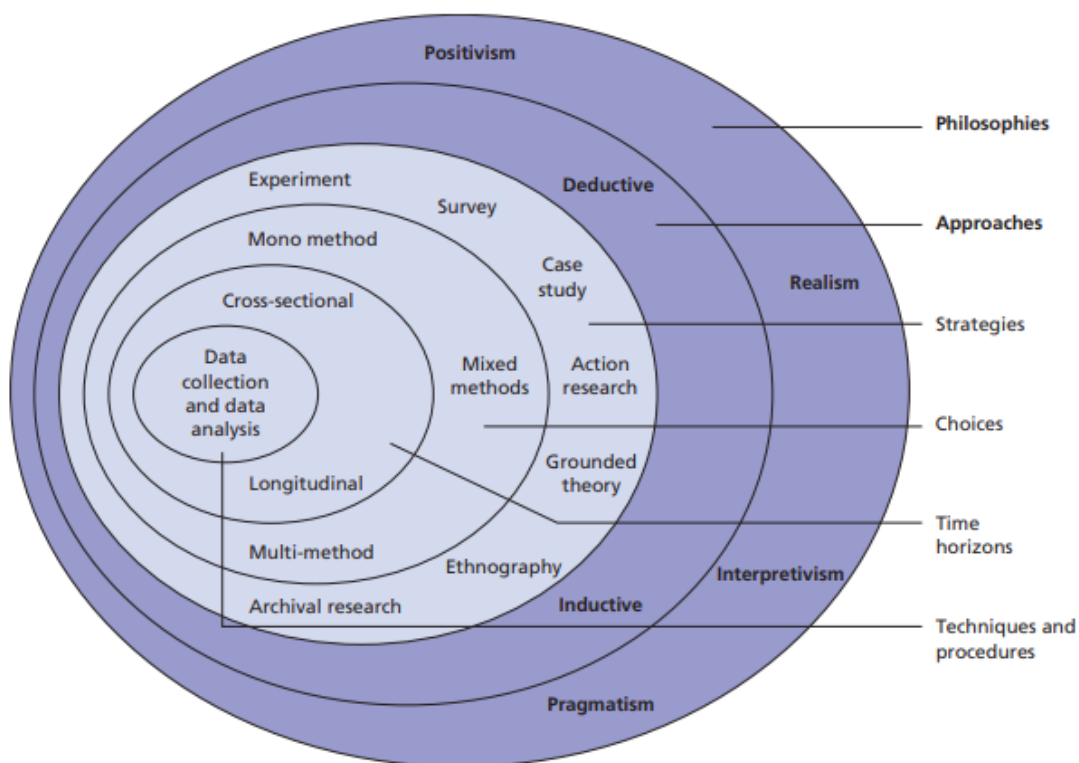
The next chapter describes the research design and methodology that was adopted to conduct the study.

## 4 RESEARCH METHODOLOGY AND DESIGN



## 4.1 INTRODUCTION

The foregoing chapter reviewed literature relevant to this study. This chapter explains the research methodology that was followed in conducting the study with the aim of addressing the research problem posed in Chapter 1. The researcher adopted the research onion defined by Saunders, Lewis and Thornhill (2009: 108) to formulate the research methodology (see Figure 4-1). The research onion describes the steps followed by researchers when formulating a research methodology.



**Figure 4-1: Research onion**

Source: Saunders *et al.* (2009: 108)

To answer the research question, the researcher is dependent on the data that is collected and subsequently analysed. However, as depicted in Figure 4-1, this is the centre of the research onion. To get to this central point, first the research philosophy is defined. Secondly, an appropriate research approach is attached to the defined research philosophy. Thirdly, the research design is adopted. The research design focuses on the three layers of the onion, namely, research strategy, research choice for data collection techniques and

analysis procedures, and the time horizons within which the research project is undertaken. According to Hofstee (2006: 108), a research design describes an overall individual's design to conducting a research project, whereas a research method explains in detail how one or more research designs were applied for the individual's specific purposes.

## 4.2 RESEARCH PHILOSOPHY

The research philosophy is explored through the concept of research paradigms (Saunders *et al.*, 2009: 118). Saunders *et al.* (2009) define a research paradigm as "a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted". Research studies are based on underlying philosophical assumptions that form the foundation of the research (Myers, 2013: 24). The assumptions in this study relate to the underlying ontology and epistemology that guide it. According to Joubish, Khurram, Ahmed, Fatima and Haider (2011: 2084), a typical research paradigm framework comprises ontological (perceived realities around the research phenomena), epistemological (grounds upon which the validity and scope of the knowledge obtained are based), and methodological components. It is henceforth vital to first classify and characterise the research inquiry such that the appropriate ontological and epistemological assumptions are properly defined.

Considering that the main aim of this study is to explore ways in which female IT professionals can successfully reach IT Executive levels, this study was classified as qualitative (non-numeric). This is in accordance with Myers' categorisation that qualitative research studies are conducted for exploration purposes (Myers, 2013: 9). De Villiers (2005: 112) and Anderson (2006: 4) point out that with qualitative research methods, the phenomena are understood in their natural settings. The phenomenon is interpreted according to the meanings that people associate with it (Joubish *et al.*, 2011: 2083). For the researcher to adequately answer the stated primary and secondary research questions, it was critical to capture the views and perspectives of the participants in the study. This ability is an attribute of a qualitative research type (Yin, 2011: 8).

There are various research philosophies that are used to guide qualitative researches. Examples of research philosophies include positivist, interpretive, and critical research paradigms (Olivier, 2009: 112; Myers, 2013: 37). This study adopted an interpretive research philosophy. The next section describes an interpretive research philosophy based on its

ontological, epistemological, and methodological stances.

#### 4.2.1 Interpretive research

Interpretive research is appropriate for studying human behaviour and social phenomena (De Villiers, 2005: 111). Furthermore, this approach does not aim to prove or disprove a hypothesis, but rather identifies, explores, and explains the relationship and interdependency between specific factors in a particular social setting (Oates, 2006: 292; Saunders *et al.*, 2009: 116). Keegan (2009: 25-26) agrees that interpretive research is a “useful approach to qualitative research when the aim is to understand research participants, how they think and behave within a certain context, at a particular moment in time”. Goldkuhl (2012: 142) and Johari (2009: 25) assert that in an interpretive study, the researcher is primarily engaged in understanding the phenomenon within cultural and contextual situations. This draws the inference that interpretive research provides researchers with a better understanding of how people interpret their social and contextual situations. As a result, researchers can discover new interpretations through interpretive research methods.

Interpretive research holds the ontological position of multiple realities that are based on people’s perceptions and are dependent on time and context (De Villiers, 2005: 111; Joubish *et al.*, 2011: 2082). In other words, as people’s perceptions change, so does their reality. Myers (2013: 39) and Goldkuhl (2012: 137-138) bring out that social reality is constructed through language, consciousness, and subjective shared meanings. From an ontological point of view, the researcher considered that individual’s realities to be different and subjective. It is noted that ontology and epistemology in interpretive researches are linked; therefore, they cannot be viewed separately (Goldkuhl, 2012: 137-138).

Epistemologically, interpretive inquiries are subjective because of the assumption that knowledge is purely based on the research participants’ interpretations of the world (Keegan, 2009: 22). Goldkuhl (2012: 137-138) and Olivier (2009: 112) maintain that subjectivity is essential in interpretive research inquiries, as the subjective meanings in the social world are used as building blocks in theorising. Considering that reality is created by people’s opinions of situations, De Villiers (2005: 111) posits that interpretive research studies yield subjective research outcomes. This is because when conducting an interpretive study, the researcher is both the research participant and the observer (Myers, 2013: 39). Goldkuhl (2012: 138-139) emphasises that “the researched subjects (‘the participants’) are



interpreters and co-producers of meaningful data”. Evidently, both the researcher and the participants contribute towards the knowledge acquired through interpretivism, thus socially constructing the reality. Because “knowledge has meaning only within a given situation or context” (Joubish *et al.*, 2011: 2082), it is therefore imperative for the researcher to have the shared meaning of a social phenomenon as the people being studied. This will ensure that the researcher understands the social or cultural phenomenon from the inside without any imposition of prior understanding of the situation (Myers, 2013: 39).

Bearing in mind that an interpretive research is qualitative, it is therefore inherent that qualitative approaches to data collection are used. Qualitative data collection methods are those that allow for the capturing of a respondent’s language and behaviour (Joubish *et al.*, 2011: 2084). Such data is not mathematically quantifiable because it consists of words and sentences rather than numbers. Unstructured data collection methods such as interviews, documents, participant observations, and videotapes are typically used to collect qualitative data (Joubish *et al.*, 2011: 2084). The use of techniques such as case studies, interviews, and observations in interpretive inquiries allows the researcher to get insight into cultural aspects, organisational practices and human interactions (De Villiers, 2005: 112).

Myers (2013: 26) posits that qualitative methods generate a great deal of data; thus, it is imperative to have an adequate plan in place to analyse such data. Qualitative data analysis results in findings that relate to human experiences; as such, data interpretation is crucial (De Villiers, 2005: 112). There are unique strategies that are employed when analysing qualitative data which involve identifying, coding, and categorising patterns and themes within the collected data (Joubish *et al.*, 2011: 2084). These strategies ensure that emphasis is given to the important aspects of the data collected such that the subject at hand can be better understood or explained (Myers, 2013: 166). According to Oates (2006: 267), qualitative data analysis is “dependent on the skill of the researcher to see patterns and themes within the data”, which Joubish *et al.* (2011: 2084) argue that it is a weakness of the qualitative inquiry. Identifying themes is an important task in qualitative research (Ryan & Bernard, n.d. cited in Welman, Kruger & Mitchell, 2005: 211).

#### **4.2.2 Motivation for using interpretivism**

According to De Villiers (2005: 112), interpretivism investigates research questions that use verbal data. Moreover, “interpretive techniques allow participants to use their own words

and images, and to draw on their own concepts and experiences” (Johari, 2009: 27), hence the need for a research paradigm that will allow the researcher to verbally interact with participants in order to determine factors that influence the underrepresentation of female IT Executives in South Africa. The rationale for adopting an interpretive philosophy for this study was primarily built on the ontological and epistemological assumptions behind it.

Interpretive studies are typically ideal for projects whose participants are from underrepresented or marginalised groups of any form (Ladson-Billings & Donnor, 2005 cited in Creswell, 2007: 24). Statistics show that female IT Executives are underrepresented in South Africa (*cf.* Section 1.2.2, Figure 1-2). This served as justification for the researcher to take an interpretive stance in conducting this study.

The interpretive research philosophy aims to make sense of an existing social reality whereby certain conditions serve to disadvantage other individuals in societies (Creswell, 2007: 24), which in this case are the female IT Executives in South Africa. The subjective nature of interpretive studies is important for the researcher to fully understand the different views of research participants regarding the factors that hinder progression of female IT professionals to IT Executive positions. The interpretive research philosophy helped the researcher to subjectively and contextually interpret the collected data in order to understand the factors that influence the underrepresentation of female IT Executives.

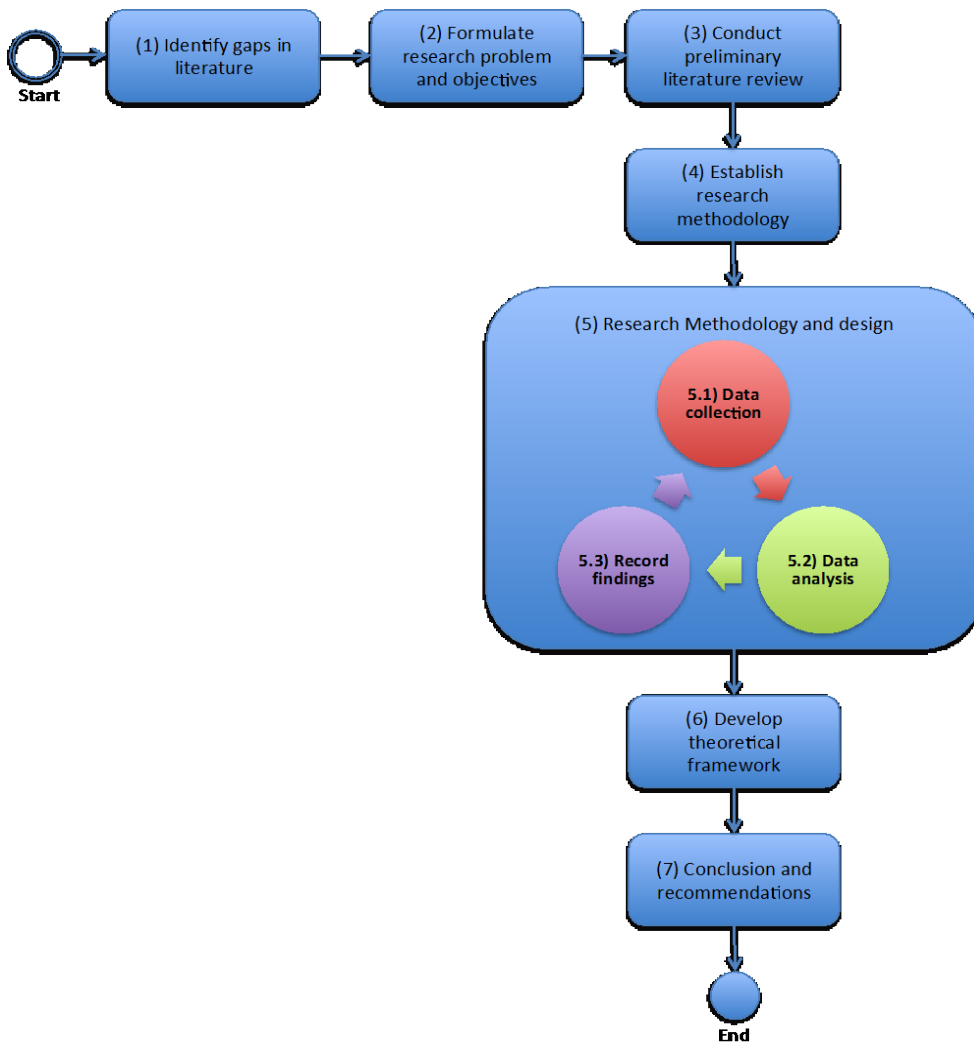
As mentioned in Chapter 2, the IDTGIT was used as the theoretical underpinning of the study. The IDTGIT informed the theoretical framework that was developed as part of the research. As a result, the research approach adopted was inductive. With an inductive research approach, Saunders *et al.* (2009: 126) assert that data is collected and a theory is developed based on the outcome of the data analysis.

### 4.3 RESEARCH DESIGN

A research design is a logical plan for conducting the entire research project (Myers, 2013: 19; Yin, 2011: 75). Yin (2011) further adds that research designs are used to strengthen the research validity and also ensure that the data collected addresses the research topic being studied (Yin, 2011: 75).

To determine how female IT professionals can advance to IT leadership positions, gathering insights from female IT Executives is beneficial. This involves understanding their motivations and actions that led them to beat the odds and achieve IT leadership levels. According to Myers (2013: 5), “to understand peoples’ motivations, their reasons, and the context for their beliefs and actions in an in-depth way” is a key feature of qualitative research. It is for this reason that qualitative research methods were applied when conducting this study.

Figure 4-2 provides a roadmap of the activities that were performed throughout the entire research project.



**Figure 4-2: Research design**

The research project started when a problem was identified. This was done via an analysis of literature on the topic of interest (1). From the identified gap in literature, a primary research problem and the related objectives of the study were defined (2). Giving consideration to the wide scope of the primary research question, the related research objectives were converted into secondary research questions. A literature review related to the overall research topic was conducted in order to provide context to the complete study (3). The literature review focused on general themes that encompassed the secondary research questions. The focused literature survey provided more depth into the theory base pertaining to the study. The research methodology concepts were discussed in an effort to establish the appropriate research methodology for conducting the study (4).

Details on how the data was collected (5.1) and further analysed (5.2) were presented for the study. The data collection and analysis approaches discussed in Section 4.3 were implemented accordingly. Subsequent to the analysis of data, a record of the study findings was captured (5.3). Research findings were based on the outcome of the analysis of the collected data.

The research findings from the study informed the development of theoretical framework (6). The theoretical framework explains how female IT professionals in South Africa can advance to IT Executive positions. The study was concluded by answering the primary question and providing recommendations for taking the research work further (7).

#### **4.3.1 Research strategy**

A number of qualitative research methods have been developed for studying social and cultural phenomena (Myers, 2013: 8). According to Myers (2013: 25), action research, case study research, ethnography, and grounded theory are the most common qualitative research methods in business and management, each providing strategies for collecting and analysing empirical data.

	Action Research	Case Study Research	Ethnographic Research	Grounded Theory
<b>Purpose</b>	Aims to solve current practical problems and concerns while emphasising on effecting change (Oates, 2006: 155; Myers, 2013: 59).	Aims to provide “empirical evidence to convince other researchers of the applicability (or inapplicability) of a particular theory or proposition” (Myers, 2013: 74) and to understand complex social phenomena (Yin, 2014: 4).	Aims to understand peoples’ culture by observing and being part of the population under study (Oates, 2006: 173; Myers, 2013: 93).	Primarily for theory development based on the data gathered from individuals sharing the same experiences (Creswell, 2007: 63; Myers, 2013: 104).
<b>Features</b>	Researcher actively participates in the research process by deliberately interfering with the subject matter and while simultaneously studying the effect of the intervention (Myers, 2013: 60).	Used for studying contemporary real-life situations without the researcher controlling the events (Myers, 2013: 76; Yin, 2014: 14).	The researcher is heavily involved in fieldwork whereby he or she is completely immersed in the day-to-day activities of the participants (Creswell, 2007: 68; Myers, 2013: 79).	Results in new and rich findings (Myers, 2013: 104)

	Action Research	Case Study Research	Ethnographic Research	Grounded Theory
		The researcher is an observer rather than an active participant (Myers, 2013: 61)	“Focuses on an entire cultural group” (Creswell, 2007: 68).	Theoretical sampling is adopted so that a theory can be formulated (Creswell, 2007: 64).  Can also be used for coding data (Creswell, 2007: 64; Myers, 2013: 104).
<b>Advantages</b>	Research study is practically relevant (Myers, 2013: 65).	Research study is realistic because it addresses problems that other researchers can identify with (Myers, 2013: 82).	Provides in-depth understanding of the research participants and the broader context within which they operate (Myers, 2013: 97).	Ideal for studying regular, repeated processes, such that patterns are identified (Myers, 2013: 109-110).
		Theories are tested or explored in any real-life situations (Myers, 2013: 82).	Being involved in fieldwork allows the researcher's assumptions to be challenged	Research is conducted systematically, with detailed steps for data analysis (Creswell, 2007:

	Action Research	Case Study Research	Ethnographic Research	Grounded Theory
			(Myers, 2013: 97).	68; Myers, 2013: 110).
		The distinct advantage of case study research is when “a how or why question is being asked about a contemporary set of events, over which a researcher has little or no control” (Yin, 2014: 14).		
<b>Disadvantages</b>	Researcher plays both the participant and observer role, which can be difficult and time-consuming (Myers, 2013: 65).	Researcher does not have control of the situation, which can jeopardise the progress of the study (Myers, 2013: 83).	Fieldwork and data analysis take a longer time than other methods (Myers, 2013: 98).	First-time users become overwhelmed at coding level, whereby scaling up to larger concepts or themes is considered a difficult task (Myers, 2013: 110).



	Action Research	Case Study Research	Ethnographic Research	Grounded Theory
	Results in biased findings whereby the researcher can overstate the importance of the intervention (Myers, 2013: 66).	Case study findings cannot be generalised beyond the case under study (Yin, 2014: 20).	Because the researcher is not a detached observer, therefore the findings might be based on objectivity (Oates, 2006: 174).	
		Time-consuming as a result of the high dependency on research participants and the data analysis process (Myers, 2013: 83).		

**Table 4-1: Comparison of research strategies**

Each of the research strategies in Table 4-1 can be used with the interpretive approach (Myers, 2013: 25) because they allow the use of field studies to gather knowledge by examining humans within their social settings (Johari, 2009: 25). Comparing the different approaches outlined above, the case study and ethnographic researches were deemed equally attractive for this study. However, Creswell (2007: 68) submits that ethnography focuses an entire cultural group whereby there is interaction with the research participants through observation. Another key distinguishing factor between ethnography and case study is that ethnography relies primarily on fieldwork (Myers, 2013: 79). In view of the study at hand, ethnography was therefore deemed a less suitable approach. The next section describes the case study research approach in detail.

### 4.3.2 Case study research

The objective of case study researches is to contribute to researchers' knowledge of individual, group, organisational, social, and related phenomena (Yin, 2014: 4). Different definitions for case study exist in literature; however, they all focus on the need to understand a complex social phenomenon. For instance, Moore, Lapan and Quartaroli (2011: 243) and Hancock and Algozzine (2006: 11) define a case study as an investigative approach that is aimed at exploring complex phenomena and the meanings for those involved in order to gain an in-depth understanding thereof. Similarly, Yin (2014) provides a twofold definition of a case study that covers the scope and the features of a case study:

- “A case study research is an empirical inquiry that investigates a contemporary phenomenon (the case) in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2014: 16).
- “A case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and another results benefits from the prior development of theoretical propositions to guide data collection and analysis” (Yin, 2014: 17).

Case study research is an all-encompassing method that can be conducted according to positivist, interpretive, or critical tenets, thus indicating that case study research can adopt any philosophical paradigm (Oates, 2006: 147; Myers, 2013: 79). When conducting case study researches, Myers (2013: 77) states that context and the phenomenon being studied cannot be separated because context is part and parcel of the story. A case study research includes individuals, groups, and institutions as the units of analysis (Welman *et al.*, 2005: 193).

There are different case study researches. A case study can either be (1) exploratory – used to provide a better understanding of the research problem; (2) descriptive – for providing a thorough analysis of the phenomenon being studied; and (3) explanatory – which is an extension of the descriptive case study for explaining situations, testing, or comparing theories (Oates, 2006: 144; Myers, 2013: 75; Yin, 2014: 7). Hancock and Algozzine (2006:

16) argue that case study researches are generally more exploratory than confirmatory whereby themes or categories of behaviour and events are identified, rather than prove relationships or test hypotheses.

With case studies, Yin (2014: 4) maintains that researchers focus on a “case” and retain a holistic and real-world perspective. Case study research strategies can be based on either a single case or multiple cases (Oates, 2006: 144; Yin, 2014: 18). Typically if the study aims to build a theoretical framework and has implications towards different cultural settings, multiple case studies are therefore deemed necessary (Johari, 2009: 26-27). Multiple case studies can either be conducted at one or multiple sites where a number of cases with common characteristics are examined so that they can be compared (Moore *et al.*, 2011: 247). Oates (2006: 144) agrees that each case in a multiple case study approach should be investigated on an individual basis with the aim of identifying similarities and differences between the different cases. The main advantage of multiple case studies over single case studies is that the latter is considered to yield more compelling evidence (Oates, 2006: 144).

According to Yin (2014: 45), the quality of a case study research is judged according to the commonly used logical tests in Table 4-2.

Test	Description
<b>Construct validity</b>	Sufficient operation measures for the concepts being studied are developed. Researcher used subjective judgements to collect data.
<b>Internal validity</b>	Inferences are made about causal relationships whereby the researcher believes certain conditions resulted in other conditions.
<b>External validity</b>	The study's findings are generalisable within a particular domain of study.
<b>Reliability</b>	Different researchers are able to reach the same findings and conclusions if the same procedures are followed for the same case study.

**Table 4-2: Case study quality tests**

Source: Yin (2014)

### 4.3.3 Motivation for using case study approach

The case study approach was suitable for this study for the following reasons:

- Context is crucially significant for this study, and case study supports the interpretive stance that was adopted.
- Hancock and Algozzine (2006: 15) assert that case studies address a phenomenon, which for this research project is the underrepresentation of female IT Executives in South Africa.
- Case study approaches allow for the phenomenon being researched to be studied in its natural context, bounded by space and time (Hancock & Algozzine, 2006: 15). As such, the study was grounded in Gauteng, South Africa.
- De Villiers (2005: 112) highlights that case studies provide insight into cultural

aspects, organisational practices, and human interactions. Considering that this research project involves exploring cultural aspects, adopting a case study approach was therefore justified.

- If a study is focused on building a theoretical framework, multiple case studies with distinctive identities are necessary. Building a theoretical framework is one of the objectives of this study, hence the use of multiple case studies (Johari, 2009: 26).

A multiple case study research approach was followed because the study is about the experiences of female IT Executives. Moreover, a multiple case study was preferred, since the comparisons contribute to the research conclusions (Olivier, 2009: 14).

#### **4.3.4 Data collection**

Qualitative approaches for data collection were used for the study. Data collection in qualitative researches involves collecting data at the site where participants experience the problem being studied, rather than bringing them into a contrived situation or sending out instruments to complete (Creswell, 2007: 37). For case study approaches, data can be obtained from multiple sources such as interviews, documentation, and observations (Hancock & Algozzine, 2006: 16; Creswell, 2007: 38; Myers, 2013: 26; Yin, 2014: 103). Collecting data from multiple sources allows the researcher to cover a broader spectrum of historical and behavioural issues (Yin, 2014: 120). These sources of information are what make the case study research descriptive (Hancock & Algozzine, 2006: 16).

Yin (2014: 119) posits that “case studies using multiple sources of evidence were rated more highly in terms of their overall quality, than those that relied on only single sources of information”. According to Yin (2014: 113), “interviews are an essential source of case study evidence because most case studies are about human affairs or actions” and are corroborated with information from other sources. Thus, the researcher used both interviews and documentation as sources of evidence.

##### **4.3.4.1 Interviews**

Myers (2013: 119) points out that interviews are commonly used in gathering qualitative data and are usually found in case study research inquiries (Yin, 2014: 110). One major characteristic of a qualitative research is its ability to represent the views and perspectives

of the participants in a study (Yin, 2011: 8), which is what the researcher was aiming for with the use of interviews. Walsham (2006: 323) brings out that “interviews are a part of most interpretive studies as a key way of accessing the interpretations of informants in the field”. As such, the researcher was able to capture the actual information as provided by the participants without her own preconceptions. The data collected through interviews was the primary data because it reflected the interviewees’ own sense of reality. Myers (2013: 120) defines primary data as that which is unpublished and gathered directly from people.

In qualitative research, data is generally collected in an unstructured way (Joubish *et al.*, 2011: 2084), using unstructured interviews (Welman *et al.*, 2005: 197). Additionally, Myers (2013: 121) reasons that because there are few, if any, pre-formulated questions, unstructured interviews allow participants the freedom to say everything they want without a set time limit. The researcher used semi-structured open-ended interviews in order to gain a better understanding of the participants’ experiences. A few pre-formulated questions were contained in the questionnaire purely to guide the interview; however, additional questions were added as the interviews progressed. This was crucial, as the researcher needed as much information as possible around the experiences of the female IT Executives throughout their career paths towards IT leadership roles. The interview questions were tested and continuously improved prior to conducting the official interviews with the identified participants. This allowed the researcher to capture the actual information as provided by the participants without any preconceptions. The researcher grouped the interview questions into themes to guide the conversation and for easy reference during data analysis. Moreover, the interview questions were structured to be in line with the IDTGIT constructs.

Interaction between the researcher and the participants during data collection is one of the principles of an interpretive research paradigm, which basically means “that empirical data generation is seen as a process of socially constructed meanings; that is socially constructed by researchers and participants” (Goldkuhl, 2012: 138-139). The interviews were conducted on a one-on-one basis rather than as focus groups, as the researcher wanted to get individualistic views from each participant.

The interviews were recorded to ensure that information was captured accurately. Permission to record the interviews was sought at the start of the interview. In addition, the researcher made notes so that the process for evaluating the responses was seamless.

## **Participant selection**

Considering that the researcher used interviews for collecting data, it is thus relevant to discuss the sample of the participants that was selected. The sampling frame was based on a population of South African individuals working in the IT field. Keegan (2009: 35) defines a research sample as the research participants to be included in the overall study, who will reflect the objective of the research along with the target audience. However, according to Myers (2013: 9), the outcome of the study cannot be easily generalised from a sample to a population.

Sampling can be done in two ways, namely, probability and non-probability sampling (Oates, 2006: 96). When selecting a sample using a probability sampling technique, the respondents are randomly chosen with the belief that they represent the population being studied. This method provides a better position for generalising to the wider population. On the contrary, with non-probability sampling, the samples are chosen without any knowledge of a proper representation of the population. This, in turn, makes generalisation difficult.

Table 4-3 lists different sampling techniques.

Probabilistic	Non-probabilistic
Random	Purposive
Systematic	Snowball
Stratified	Self-selection
Cluster	Convenience

**Table 4-3: Sampling techniques**

Source: Oates (2006: 96)

Yin (2011: 88) posits that for qualitative researches, purposive sampling is usually used in order to ensure that the study units selected yield the most relevant and abundant information about the research topic at hand. According to Oates (2006: 98), purposive sampling is done by deliberately selecting the sample that typically offers a wide variety instead of choosing a cross-section of people to represent the wider population. For this

study, the researcher adopted purposive sampling technique.

The sample consisted of 15 female IT Executives representing the four population groups of South Africa. To ensure the correct balance of all population groups, South Africa's percentage distribution of the population according to the population groups was used as a guideline. South Africa's total population comprises 79% black Africans, 8.9% coloureds; 2.5% Indians, and 2.5% whites (STATSSA, 2011). The population group split of the 15 participants mirrored the South African population group split. All the participants were based in Gauteng, which is the economic hub of South Africa with three large cities and over 65% of the country's IT industry (Cohen, 2012). It is in this province where most organisations' IT Executives are found; hence, it was the area of choice. The interviews were conducted to the point of saturation, whereby no new information was discovered. The point of saturation was reached after the 12<sup>th</sup> interview; however, the additional three interviewees were included to confirm the point of saturation. The interviews were conducted over a period of two and half months and each interview took an average of one hour. The participants were female IT professionals who have successfully advanced to IT leadership positions.

Keeping in mind that the participants were IT Executives at the time the study was conducted, the study followed a cross-sectional time horizon. A cross-sectional time horizon is when a particular phenomenon (or phenomena) is studied at a particular time (Saunders *et al.*, 2009: 155).

#### **4.3.4.2 Documents**

Documents were also used as another data collection method, though a secondary source of data. Yin (2014: 107) states that when conducting case study researches, documents are important in corroborating and augmenting evidence from other sources. Evidence from documents has an added advantage of building a richer picture than that obtained from interviews (Myers, 2013: 151). As such, the researcher used documents to supplement the data collected from the interviews. These documents were obtained from the Internet and libraries. The quality of the documents used was assessed in terms of authenticity, credibility, representativeness, and meaning (Scott, 1990 cited in Myers, 2013: 158).

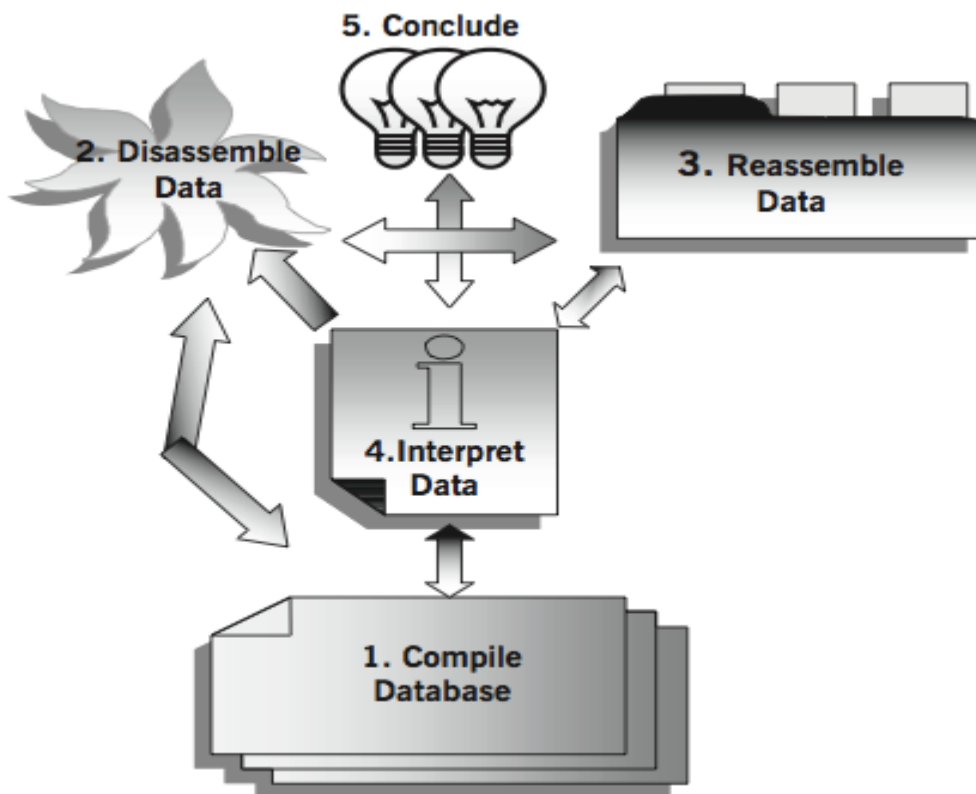
In the next section, the approach that was followed for data analysis is described including



the outcomes thereof.

### 4.3.5 Data analysis

“Data analysis consists of examining, categorising, tabulating, testing or otherwise recombining evidence to produce empirically based findings” (Yin, 2014: 132). With the vast amount of data that gets collected through qualitative researches, qualitative data analysis approaches assist in focusing on the most critical aspects of the data collected (Myers, 2013: 166). Yin (2011: 177) argues that even though there is no prescribed and standard way of analysing qualitative data, the process generally entails following a five-phased cycle as depicted in Figure 4-3.



**Figure 4-3: Qualitative data analysis phases**

Source: Yin (2011: 178)

The two-way arrows in Figure 4-3 illustrate that the five-phased qualitative data analysis is not performed in a linear fashion, but rather imply that the phases are recursive. Table 4-4 presents a brief description of each phase.

Data analysis phase	Description
Compiling	The data collected from different sources is organised in a systematic manner to ensure a better and thorough analysis.
Disassembling	The compiled data is broken down into more abstract units of information such that apparent themes are identified.
Reassembling	Themes are used to reorganise the disassembled data into different groups.
Interpreting	Once the data has been reassembled, a new narrative is created.
Concluding	Conclusions for the entire study are drawn from the interpretations made.

**Table 4-4: Phases of data analysis**

Source: Yin (2011: 178-179)

Before conducting the data analysis, the researcher transcribed the recordings into written text. Welman *et al.* (2005: 211) posit that recordings can only be processed the same way as handwritten notes if they are transcribed to text first. During the disassembling and reassembling phases, the researcher applied the thematic content analysis (TCA) technique. The TCA technique is used to analyse data that is in textual form. According to Clarke and Braun (2013), TCA is effective as a basic method because (a) it can be used with a wide range of research questions, varying from those about people's experiences or understandings to those about the representation and construction of particular phenomena in particular contexts; (b) it can be used to analyse different types of data ranging from secondary sources such as media to transcripts of focus groups or interviews; (c) it works with any size of data sets; and (d) it can be applied to produce data-driven or theory-driven analyses. The researcher followed the six phases of TCA as outlined by Clarke and Braun (2013) to ultimately identify the common themes emanating from the interviews. The six TCA phases are (1) familiarisation with the data, (2) coding, (3) searching for themes, (4)

reviewing themes, (5) defining and naming themes, and (6) writing up (Clarke & Braun, 2013). The process was conducted in a linear fashion whereby the preceding phase was completed prior to commencing with the succeeding phase.

The researcher analysed the data based on her own interpretation, since the data collected from the interviews and documents was of a qualitative nature. IDGIT was also used to guide the analysis of data. The considerable amount of data resulting from a qualitative research method requires the data to be reduced to manageable and understandable texts (Welman *et al.*, 2005: 213). In the coding phase of TCA, the researcher assigned codes to the smaller pieces of data, with similar items assigned the same code. Myers (2013: 167) defines a code as a word “used to describe or summarise a sentence, a paragraph, or even a whole piece of text, such as an interview”. Welman *et al.* (2005: 214) also share the same view that codes are labels that give meaning to the raw data so that it can be organised and categorised according to the identified themes. Myers (2013: 167) asserts that coding is one of the easiest ways to analyse qualitative data.

There are different types of codes, for example, descriptive codes (open codes), interpretive codes (axial or selective codes), theoretical codes, and pattern codes (Myers, 2013: 168). According to Welman *et al.* (2005: 214), descriptive codes need minimal interpretation, whereas interpretive codes “relate to the reasons, explanations, and motives behind the factual information”. Coding is done in three sequential stages, namely, open coding, selective coding, and theoretical coding (Oates, 2006: 275; Myers, 2013: 105-107). Table 3-5 describes these coding stages.

Coding Stage	Description
Open coding	Analysing and summarising terms and concepts found in the data by using succinct code. Open codes are descriptive, implying that they identify, name, and categorise phenomena found in the text.
Selective coding	Involves an interpretation of categories and properties. The focus is on the codes that have emerged as being vital in explaining the complex phenomenon under study.
Theoretical coding	Inferential and/or predictive statements about the phenomena are created, thereby formulating a theory. This is achieved by specifying explicit relationships between individual interpretive constructs.

**Table 4-5: Phases of coding**

Source: Myers (2013) and Oates (2006)

For the study, open coding was used to summarise terms and concepts found in the collected data. This was done by assigning specific codes to the selected words and phrases until reaching a higher conceptual level of category within which the texts fell. Selective coding was done after open coding, whereby the conceptual constructs were refined to such an extent that the researcher was able to explain the interaction between the descriptive categories. Theoretical coding was guided by IDTGIT. Theoretical coding was further used to define the theoretical framework that explains the phenomena under investigation.

#### 4.4 ETHICAL CONSIDERATIONS

The researcher applied moral principles when planning, conducting, and reporting her research so that there are no negative effects from the research project.

This study involved human participants; therefore, ethical considerations were anticipated. As a result, the researcher:

- Sought informed consent from the people who were interviewed beforehand. A consent form was developed that explained the purpose of the study and the risks and benefits of participating. Participants were not forced to participate and were given the freedom to withdraw at any time should they chose to.
- Compiled an information sheet that included information about the research project and how the data was used.
- Ensured confidentiality and privacy of the people being interviewed. As such, the names of the participants were not divulged under any circumstance without permission from the participants. Pseudonyms were used where applicable. This is also in line with the Protection of Personal Information (POPI) Act.
- Remained responsible to the participants where there was any conflict of interest.
- Informed the participants of the results of the study.
- Ensured that no harm befell the participants by conducting interviews in safe locations.

With regard to data collection and analysis, the following ethical principles were considered:

- Data was collected honestly using the appropriate data collection methods.
- Only findings based on the collected data were reported on, including any negative findings.
- Collected data was kept for as long as required by the university.

- All information copied or referenced from other sources was acknowledged accordingly.
- The researcher maintained subjectivity at all times while acknowledging that the research participants owned the information collected.

Ethical clearance was obtained from the University of Pretoria's ethics committee. The researcher did not proceed with the research without review and approval from the committee.

#### **4.5 CONCLUSION**

The study employed an interpretive research paradigm in order to understand how female IT Executives in the study successfully maneuverer the challenges in the IT field to achieve IT leadership levels. Adopting the interpretive research paradigm ensured that the researcher gained a better understanding of how people interpret their social and contextual situations pertaining to the phenomena under study.

With the adopted research strategy being the case study approach, the chapter also presented an overview of case study researches. The rationale for choosing a multiple case study approach was also clearly articulated (*cf.* Section 4.3.5).

Data was collected by conducting interviews with 15 female IT Executives. When analysing the collected data, Yin's five-phased qualitative data analysis process was followed. The five-phased qualitative data analysis process was also supported by the TCA method. Following this process ensured that data analysis was done properly and rigorously in order to obtain accurate research results. Table 4-6 shows a summary of the research design and methodology.

Method	Option
Research Philosophy	Interpretivism
Research Approach	Inductive
Research Strategy	Multiple Case Study
Time Horizon	Cross-sectional
Data Collection	Interviews using semi-structured, open-ended interview questions
Data Analysis	Yin's five-phased qualitative data analysis process with open coding and theoretical coding. The TCA technique was used to identify emerging themes from the collected data

**Table 4-6: Summary of methodology and design**

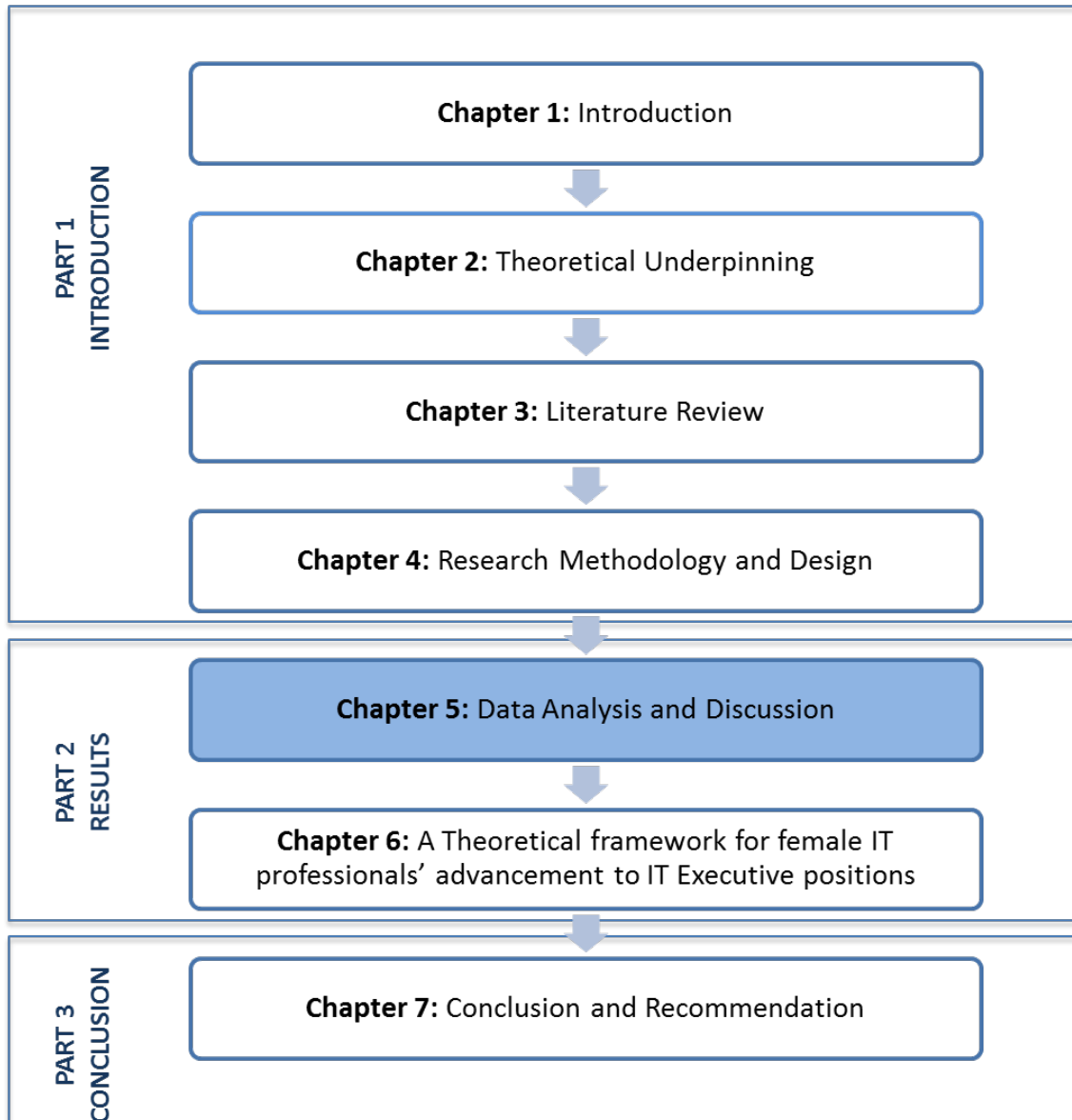
The next chapter presents an analysis results from the study.

# **PART 2**

# **RESULTS**



## 5 DATA ANALYSIS AND DISCUSSION



## 5.1 INTRODUCTION

The previous chapter described the methodology that was employed in conducting the study. It explained the use of interviews as a method for data collection. In this chapter, interview data collected from fifteen (15) research participants is analysed and presented. The participants were female IT professionals who have successfully advanced into IT leadership positions.

This study aims to explore the individual factors that contributed to the success of female IT professionals in reaching IT Executive positions. Since the IDTGIT focuses on individuals, each participant was treated as a single case study. This aided the researcher to identify and understand the uniqueness of each case where applicable. To understand how these individuals found their way through the IT leadership labyrinth, it is crucial to examine not only their demographic differences but also their experiences. These experiences provide full insight into each research participant.

To give context to the experiences of each research participant, the chapter starts by first presenting background profiles of each IT Executive. Then an analysis of the data obtained from the interviews is provided. Consistent with the study questions, the interview questions were grounded on the three constructs of IDTGIT, namely, individual identity, individual influences, and environmental influences. The transcribed interview data was analysed using the TCA method whereby common themes were identified. These themes represent the factors that influenced the participants' entry into the IT field and their advancement to IT Executive positions. The discussion of results explains how these factors contributed to the career advancement of the IT Executives who participated in the study. The chapter concludes by providing a summary of the chapter.

## **5.2 PROFILES OF FEMALE IT EXECUTIVES**

Fifteen (15) women were interviewed for this study. The selection of the participants was based on their occupation. Table 5-1 is a brief background profile of each participant. The overview of the participants is represented using the adapted research constructs defined by Lamb and Kling (2003). The participants' names are concealed to maintain anonymity. The participants were not asked for their exact ages, but rather an indication of their age ranges.

**Case description: IT Executive 1**

Personal Demographics	Executive 1 is a black African woman in her late 40s. She is married with two children. She has an undergraduate diploma in IT and a master’s degree in IT. She also has various management certificates including project management and leadership management.
Career Background	She has occupied various positions ranging from software development, business analysis, project management, and other IT management positions. She worked for companies in the mining, financial, aerospace, ICT, and telecommunications sectors. She has been in three IT Executive positions. Her first one was as a CIO, then CTO, and she is currently working as a CIO. She has more than eight years of experience in an IT Executive role. In total, she has 24 years’ work experience in IT.
Achieving the IT Executive role	Executive 1 found the male-dominated IT environment not accommodative for females, especially when she started to occupy management roles. Often she was regarded as being less committed because she had female responsibilities at home. Acknowledging the challenges she was faced with, she learned to be assertive. Moreover, she identified senior people in the industry and sought advice from them on how to overcome IT barriers.
Networking channels	Occasionally joins IT forums that add mutual value and attends conferences.  Also uses LinkedIn as a platform for networking.
IT Industry Affiliations	Affiliated with Women in ICT, which is an entity of the Black IT Forum), African Data Science Association, and Project Management Institute.
Other	Provides mentorship to other female IT professionals.

**Table 5-1: Profile of IT Executive 1**

**Case description: IT Executive 2**

Personal Demographics	Executive 2 is a short and petite black African woman in her early 40s. She is single and does not have children. Her qualifications include a computer science degree and a master’s degree in project management.
Career Background	Before occupying an IT Executive role, she worked as a software engineer, project manager, and programme manager. She worked for companies in the academic, transport, public, and aerospace sectors. She is currently working as a General Manager Service Development (IT). She has been in this role for two years. Overall, she has 16 years’ work experience in IT.
Achieving the IT Executive role	Executive 2 attributes her success mostly to her past experiences. In her early years when she had just started in a management position, her height, race, and gender worked against her. The tri-factor challenge ultimately affected her emotionally. As she matured, she learned that hard work, an above-average work ethic, and composure were the best attributes. In fighting the boys-club attitude, she has learned to be assertive and stand her ground so that she is not taken for a pushover.
Networking channels	Uses the forums she is affiliated with for networking.
IT Industry Affiliations	She is a member of the Institute of Directors in Southern Africa (IoDSA), Project Management South Africa (PMSA), and International Institute of Business Analysis (IIBA).
Other	She served on two boards.

**Table 5-2: Profile of IT Executive 2**

**Case description: IT Executive 3**

Personal Demographics	Executive 3 is a black African woman in her early 40s. She is single with one child. She is a qualified chemical engineer and has a number of IT-related certificates including business analysis, project management, and business process management.
Career Background	Even with an engineering degree, her first job was a systems engineer. She also occupied roles such as business analysis, project management, business process specialist, and IT management. Her first IT Executive position was as a CIO in the public sector. She is currently working as a CIO in a railway company. Overall, she has 18 years' work experience in IT.
Achieving the IT Executive role	Executive 3 had the advantage of having mentors, who were influential to her success. Coming from an engineering background with a passion for IT, she knew from the start of her IT career that she would need guidance to navigate the industry challenges. She noted that she was often undermined because of her gender. As a result, she would get buy-in from male colleagues regarding certain aspects because they were listened to. She continues to be successful in her current role because of this approach.
Networking channels	Attends ICT conferences and uses platforms such as LinkedIn.
IT Industry Affiliations	None. However, used to be a member of the Institute of IT Professionals of South Africa.
Other	None.

**Table 5-3: Profile of IT Executive 3**

**Case description: IT Executive 4**

Personal Demographics	Executive 4 is a black African woman in her late 30s. She is married with two children. She has two undergraduate degrees, one in natural sciences and another one in IT. She also has a master’s degree in management, along with IT specialist certificates such as IT governance and project management.
Career Background	She has worked in the public sector for 15 years. Her previous occupations include IT programmer, systems analysis, knowledge management, and IT management. She has been in the IT Executive role for almost one year. Overall, she has 16 years’ work experience in IT.
Achieving the IT Executive role	When she was promoted to a management position, her direct reports were mostly older and were men. The cultural stereotypes were an impediment to her management role. To overcome these challenges, she equipped herself with leadership and people management skills. Through these skills, she learned how to deal with male direct reports in a firm but respectful manner. In addition, she was also mentored by successful men and women from whom she leveraged off their experiences.
Networking channels	Attends ICT conferences and uses platforms such as LinkedIn.
IT Industry Affiliations	She is a member of the Information Systems Audit and Control Association (ISACA).
Other	None.

**Table 5-4: Profile of IT Executive 4**

**Case description: IT Executive 5**

Personal Demographics	Executive 5 is a black African woman in her mid-40s. She is married with three children. She has an undergraduate degree in science and an undergraduate diploma in IT. She also has a master’s degree in business administration. Some of her professional development certificates include IT service management and fundamental management.
Career Background	Her first job in IT was as a system administrator. She worked mostly in the IT infrastructure domain in a middle- and senior management capacity before working as an IT Executive. She has occupied IT Executive roles in various public sector entities. She has more than nine years’ experience of IT leadership. Overall, she has 17 years’ work experience in IT.
Achieving the IT Executive role	Being resilient and relentless are two personality traits that helped Executive 5 to achieve the IT Executive role. When she would find herself being discriminated against because of her gender, she confronted the situation by being assertive. To break the stereotypes that women were not capable of leading in IT, she learned IT operations concepts and acquired leadership skills by completing a master’s degree in business administration. The other strategy that she employed to ensure career progression success was to regularly consult senior IT professionals for advice.
Networking channels	Partakes in a couple of formal networking sessions that are held around Gauteng.
IT Industry Affiliations	Affiliated with Gartner & TM Forum.
Other	Mentors female IT professionals.

**Table 5-5: Profile of IT Executive 5**



**Case description: IT Executive 6**

Personal Demographics	Executive 6 is a black African woman in her late 30s. She is married with three children and one more on the way. She has a national diploma in information science and an honours degree in information management. She is currently studying towards a master’s degree in business information systems. She has also done courses such as business analysis, information security management, and IT governance.
Career Background	She started her career as an administration officer before working as an information officer. She worked mainly in the IT knowledge management discipline in a middle- and senior management capacity. She is currently working as an IT Executive and has been in the role for less than one year. Overall, she has 14 years’ work experience in IT.
Achieving the IT Executive role	Since Executive 6 did not come from an IT background, she learned IT concepts so that she could engage properly with other IT professionals. She also learned that living according to cultural stereotypes was not going to help her career advancement opportunities. As a result, she developed masculine personality traits by going for general management training courses. She additionally made sure that she had good working relationships with her managers who, in turn, became supportive towards her career aspirations.
Networking channels	Networks within the organisation only.
IT Industry Affiliations	None.
Other	None.

**Table 5-6: Profile of IT Executive 6**

**Case description: IT Executive 7**

Personal Demographics	Executive 7 is a black African woman in her late 30s. She is married and has two children. She completed a national IT diploma as an undergraduate study. She has two master’s degrees, one in business information systems and another one in business administration management.
Career Background	She started her IT career as an analyst programmer. Prior to occupying management roles, she also worked as a business information consultant. She worked in various middle-management positions before working as a senior manager. She has occupied three IT Executive positions in private sector companies within the hospitality and telecommunications industries. She has more than seven years’ experience in IT leadership. Overall, she has 16 years’ work experience in IT.
Achieving the IT Executive role	Executive 8 is career-driven. She put much energy in her career; as a consequence, she had children when she was older. She always identified opportunities that would make her recognised. In additions, she took the initiative to approach people in the IT industry to coach and mentor her. She deliberately chose male coaches and mentors because the IT industry respects such. Her eagerness and drive drew attention to other male IT professionals who took an interest in her career progression.
Networking channels	Uses LinkedIn as a networking platform.  Attends various conferences in the industry.
IT Industry Affiliations	Member of the Tshwane University of Technology Council providing ICT advisory services. She also has a CIO practice certificate as one of her professional development qualifications.
Other	Gives motivational talks and participates in round-table discussions with women in leadership positions.

**Table 5-7: Profile of IT Executive 7**

**Case description: IT Executive 8**

Personal Demographics	Executive 8 is a black African woman in her mid-40s. She is married and has three children. She has a bachelor of commerce degree and a master's degree in IT.
Career Background	Her first job in IT was as a software consultant offering system support services. She worked in the telecommunications, mining, public, and health sectors. She is currently working as a CIO and has been in the position for two years. Overall, she has 17 years' work experience in IT.
Achieving the IT Executive role	Executive 8 attributes her success to consistently proving herself by excelling in her job. She realised that in order to be acknowledged by male colleagues, she had to put in more effort in her duties. At times, she had to sacrifice spending time with her family because of the demanding IT environment. The harder she worked, the more recognition she got, which subsequently helped her career progression.
Networking channels	Attends many IT conferences, summits, and symposiums.
IT Industry Affiliations	None.
Other	None.

**Table 5-8: Profile of IT Executive 8**

**Case description: IT Executive 9**

Personal Demographics	Executive 9 is a black African woman in her early 50s. She is married and has one child. Her qualifications include a bachelor’s degree in social sciences and a master’s degree in IT.
Career Background	She started working as an IT consultant and has occupied roles such as business architect, IT account manager, project manager, and senior manager in business processes management. She worked for companies in the IT, utilities, and traffic management sectors. She has less than one year’s experience as a CIO. Overall, she has 19 years’ work experience in IT.
Achieving the IT Executive role	Executive 9 gives credit to a female mentor who played a role in her career advancement. Her mentor was from a business environment instead of IT. She needed someone whom she could relate to and who would understand women’s struggles in a male-dominated environment. Her mentor imparted leadership skills to her, which she consequently applied in her work environment. From the experiences and lessons shared by her business mentor, she learned how to deal with traditional IT stereotypes that she was consistently faced with. She also learned when and how to apply masculine traits while maintaining her feminine stature. Through guidance from her mentor, she gained respect from her male counterparts and was therefore recognised to be a worthy leader.
Networking channels	Uses LinkedIn as a networking platform.  Attends various conferences in the industry.
IT Industry Affiliations	None.
Other	None.

**Table 5-9: Profile of IT Executive 9**

**Case description: IT Executive 10**

Personal Demographics	Executive 10 is a black African female in her late 30s. She is divorced with two children. She holds a computer science degree and an honours degree in informatics.
Career Background	Her early IT career occupations include IT system test analyst and testing manager. She worked mostly in the IT systems implementation domain. She worked for companies in the telecommunications and banking sectors. She has less than two years' experience as an IT Executive. Overall, she has 15 years' work experience in IT.
Achieving the IT Executive role	Most of Executive 10's career success is attributed to having mentors, being ambitious, and creating her own opportunities. Being a black African in a male-dominated environment, she was faced with various challenges. Her mentors trained and guided her to overcome these challenges. Her career ambition helped her to take chances with positions that she was not necessarily qualified for but knew she was capable of doing. By taking such positions, it meant she needed to work hard to prove herself. Furthermore, they also helped her to advance to higher-level positions.
Networking channels	Attends CIO symposiums.  She also used to attend networking breakfast sessions hosted by Microsoft. However, she has since stopped because of lack of time.
IT Industry Affiliations	Affiliated with Gartner, Information Systems Audit and Control Association, and the Institute of IT Professionals of South Africa.
Other	None.

**Table 5-10: Profile of IT Executive 10**

**Case description: IT Executive 11**

Personal Demographics	Executive 11 is a coloured woman in her mid-40s. She is divorced and has three children. She has an undergraduate and honours degrees in informatics. She acquired a management development certificate in addition to her informatics qualifications.
Career Background	Her first IT job was as a technical systems support officer. Prior to fulfilling an IT Executive position, she occupied roles such as information systems advisor, business applications manager, and IT relationship manager. She has less than one year’s experience in an IT Executive role. She has only worked in one company in the utilities sector. Overall, she has 19 years’ work experience in IT.
Achieving the IT Executive role	Executive 11 advanced her studies by completing a postgraduate degree. She identified this as a key difference between her and 90% of male IT professionals who were already occupying management positions. When a management position became available in the organisation, she knew she was on par with most male contenders. Because she matched the required skills for the job, she was then appointed. The same approach worked for her in moving up the career ladder whereby she identified the skills required for the role and equipped herself accordingly.
Networking channels	Informal networking sessions at work with peers.
IT Industry Affiliations	A member of the Institute of IT Professionals of South Africa.
Other	None.

**Table 5-11: Profile of IT Executive 11**

**Case description: IT Executive 12**

Personal Demographics	Executive 12 is a coloured woman in her late 30s. She is single and does not have children. She has an information systems degree, coupled with an honours degree in technology management. She also studied for a postgraduate diploma in business administration.
Career Background	She started her IT career work as a business support officer. She worked mainly in the IT service management environment, where she occupied roles such as application support manager, project manager, and service delivery senior manager. She has been in an IT Executive role for less than one year. She has only worked for a company in the utilities sector. Overall, she has 13 years' work experience in IT.
Achieving the IT Executive role	Over and above acquiring the right skills, Executive 12 managed to successfully advance to a leadership role through the help of mentors, hard work, and adopting masculine behaviours. She has had mentors throughout her career whom she regularly consulted for advice on how to deal with work challenges. Her relationships with the mentors helped her to navigate power struggles in the field. In every task that she was given, she made sure that she performed exceptionally well. This, in turn, opened career doors for her. To earn respect from her male colleagues, she acquired technical skills to complement her soft skills. She learned early in her career that she needed to operate on the same level as her male counterparts so that she could be noticed for her abilities.
Networking channels	None.
IT Industry Affiliations	None.
Other	None.

**Table 5-12: Profile of IT Executive 12**

**Case description: IT Executive 13**

Personal Demographics	Executive 13 is an Indian woman in her mid-30s. She is married and has no children. Her qualifications include a degree in computer science and an honours degree in computing. Some of the professional development courses she attended include financial management, project management, leadership development, and IT services management.
Career Background	Her first IT role in her early career years was a systems analyst. She has also worked as a project manager, IT contracts manager, senior IT advisor, before advancing to an IT leadership level. She has been in the IT leadership position for less than a year. She has only worked for a utilities company; however, she worked in multiple business areas including finance and supply chain management. Overall, she has 13 years' work experience in IT.
Achieving the IT Executive role	Executive 13 achieved the leadership role by working twice as hard as her male counterparts. In so doing, she proved that she was on par with them technically and intellectually. To earn respect from her male counterparts, she also learned to emulate masculine leadership styles where necessary. Furthermore, she increased her skills set through finance management, project management, and general leadership training. Empowering herself with the right leadership skills and gaining work experience put her at an advantage for the IT leadership role.
Networking channels	Attends casual network sessions especially when there is an IT product launch.
IT Industry Affiliations	A member of the Institute of IT Professionals of South Africa.
Other	None.

**Table 5-13: Profile of IT Executive 13**

**Case description: IT Executive 14**



Personal Demographics	Executive 14 is a white woman in her late-50s. She is married with children. Her qualifications include an undergraduate computer science degree and postgraduate degrees such as <b>Masters in Information Systems</b> and <b>PhD in Information Systems</b> .
Career Background	She started her IT career as a systems developer. Some of the occupations she fulfilled include systems analysis, project management, business analyst, and various IT management roles. She has been an IT Executive for about six years and worked in the television and telecommunications industries. Overall, she has 28 years' work experience in IT.
Achieving the IT Executive role	Executive 14 had male mentors who were supportive throughout her career advancement journey. She also grabbed opportunities that made her abilities visible to others. Through these opportunities, she gained exposure to areas that allowed her to move up the career ladder. She additionally embarked on soft skills training initiatives that provided her with a foundation for a leadership role.
Networking channels	Uses LinkedIn and conferences as networking channels.
IT Industry Affiliations	Affiliated with the Association of Information Systems (AIS), South African Institute of Computer Scientists and Information Technologists (SAICSIT), Institute of IT Professionals of South Africa (IITPSA), and Knowledge Management Society of SA (KMSA).
Other	None

**Table 5-14: Profile of IT Executive 14**

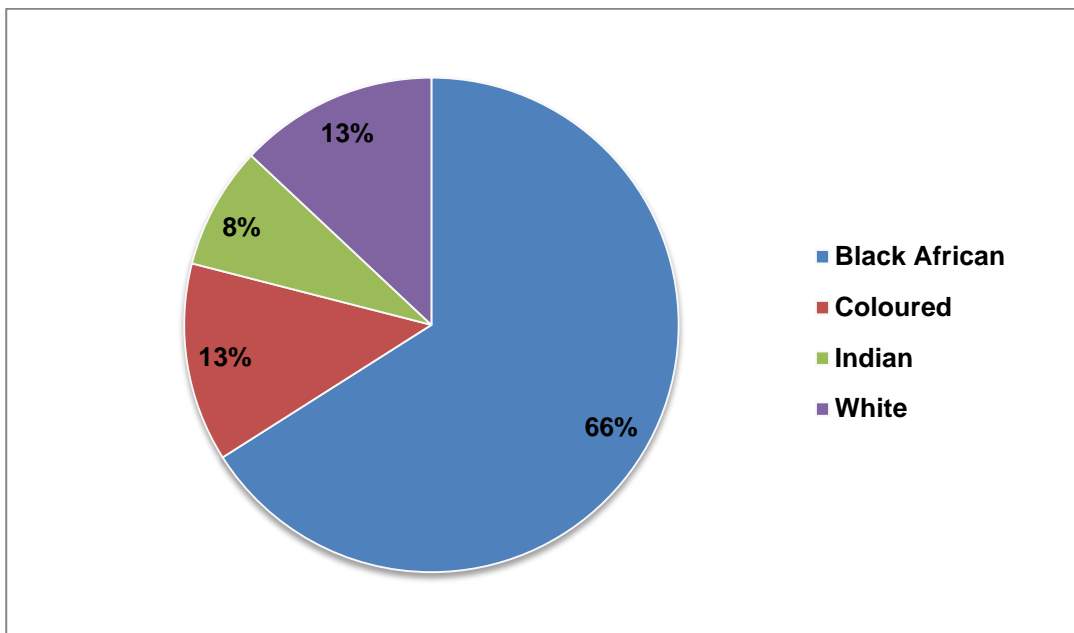
**Case description: IT Executive 15**

Personal Demographics	Executive 15 is a white woman in her late-50s. She is married with two children. She does not have tertiary education but has acquired training in courses such as project management, data management, and leadership management.
Career Background	She started her IT career journey as a systems developer. She occupied roles such as data analysis, data architect, project management, and various IT management roles. She is currently working as the Head of IT in a financial services company. She has also worked for companies within the financial services sector. Overall, she has more than 25 years' work experience in IT.
Achieving the IT Executive role	Executive 15 has strong masculine personality traits which helped her progress to IT leadership positions. To develop her skills, she consistently identified projects that needed skills that she did not have. Such opportunities provided her with hands-on training and challenged her to work hard and succeed. She additionally sacrificed her time with her family over work responsibilities. Making such sacrifices demonstrated her eagerness to succeed.
Networking channels	Networks through the Data Management Association and the International Institute of Business Analysis.
IT Industry Affiliations	None.
Other	None.

**Table 5-15: Profile of IT Executive 15**

### 5.2.1 Summary of participant demographics

This section provides a summary of the demographics of the research participants. The population representation of the 15 participants is in line with South Africa's population group composition. The black African population group constitutes the majority of South Africa's population, followed by coloureds and whites who are equally represented, and then the Indian population group who are the least represented (STATSSA, 2011, 2017a). As a result, the majority of the research participants were black African (10), followed by an equal representation of both coloureds (2) and whites (2), and lastly one (1) Indian. The percentage split by population group is illustrated in Figure 5-1.



**Figure 5-1: Participant population group composition**

The participants' ages ranged between 31 and 60. The majority of women (46.67%) were between the ages of 41 and 50. None of the participants were below the age of 30 or over the age of 60. Figure 5-2 shows the percentage composition of the sample by age.

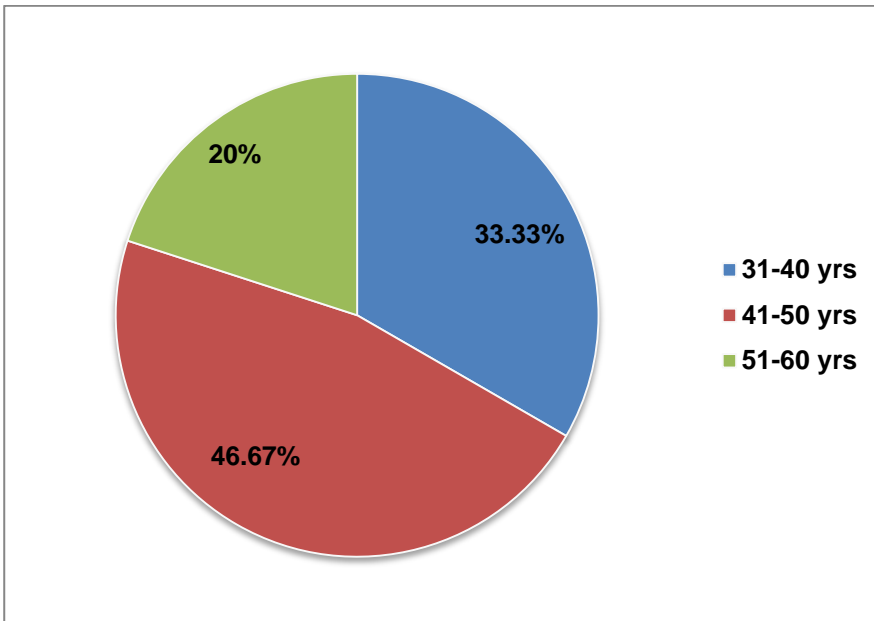


Figure 5-2: Percentage composition by age

As far as the marital status of the participants is concerned, 66.67% of them are married, 26.67% of them are single, and only 6.67% of them are divorced (see Figure 5-3). Moreover, the majority of the female IT Executives (73.33%) have kids, whereas 26.67% does not have kids.

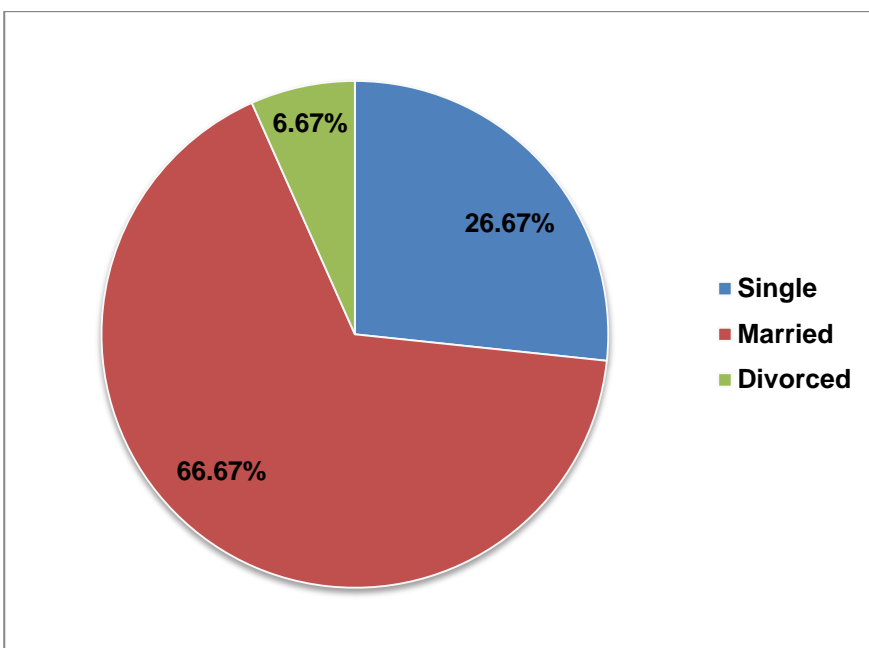


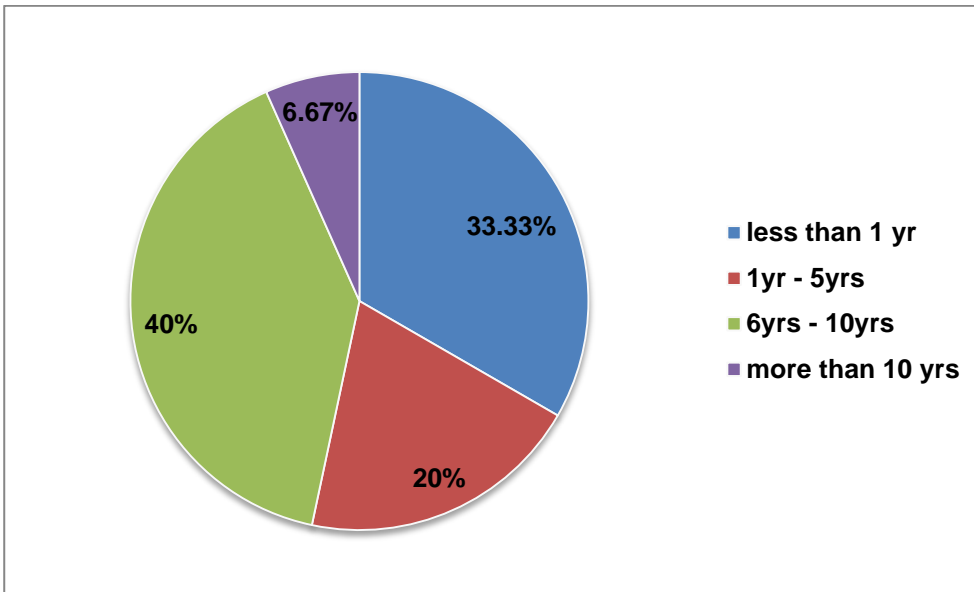
Figure 5-3: Percentage composition by marital status

Table 5-16 provides a summary of the participants' demographic data.

Participant ID	Population Group	Age	Marital Status	Children
1	Black African	41-50	M	Y
2	Black African	41-50	S	N
3	Black African	41-50	S	Y
4	Black African	31-40	M	Y
5	Black African	41-50	M	Y
6	Black African	31-40	M	Y
7	Black African	31-40	M	Y
8	Black African	41-50	M	Y
9	Black African	51-60	M	Y
10	Black African	41-50	D	Y
11	Coloured	41-50	D	Y
12	Coloured	31-40	S	N
13	Indian	31-40	M	N
14	White	51-60	M	Y
15	White	41-50	S	Y

**Table 5-16: Summary of participants' demographic data**

All the participants are IT Executives with IT leadership experience ranging from less than one year to more than ten years (see Figure 5-4).

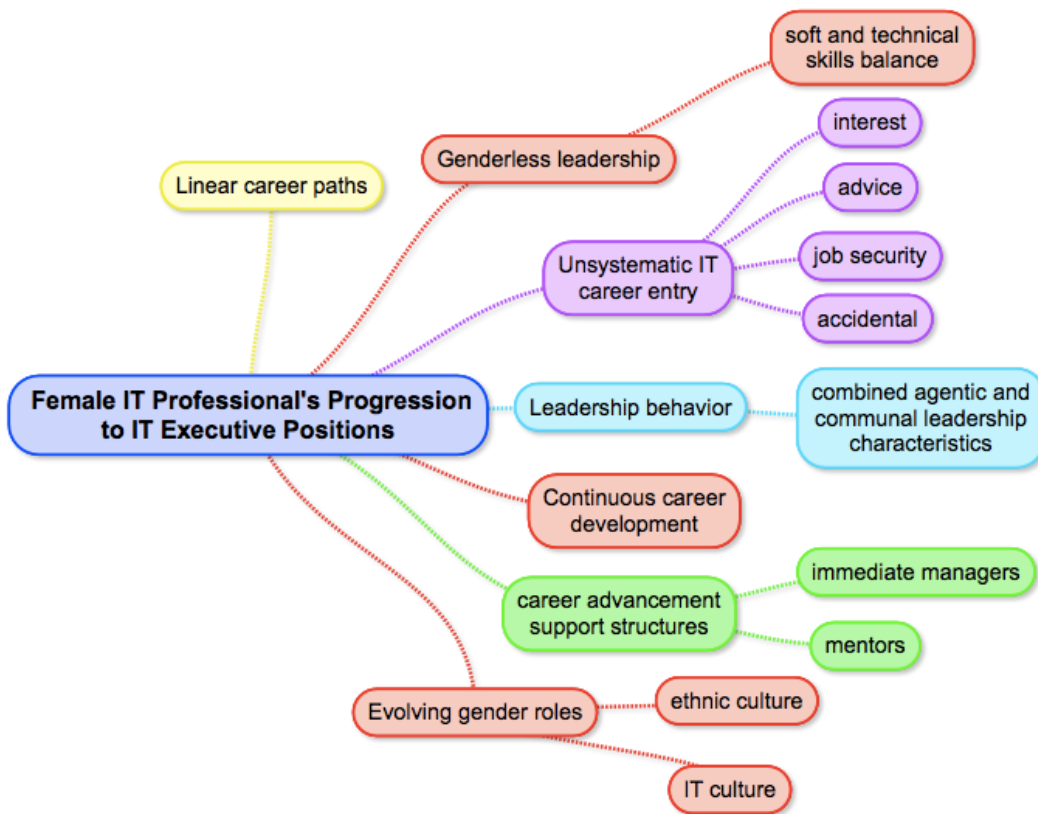


**Figure 5-4: Percentage composition by IT leadership experience**

### **5.3 RESULTS**

The analysis of the interview data was based on the researcher's interpretation thereof. Since the basis of the interview questions was the IDTGIT, the data analysis is guided by the IDTGIT constructs, namely, Individual Identity, Individual Influences, and Environmental Influences.

To address the objectives of the study, the six steps of TCA were followed as described in Section 4.3.7. Through the TCA process, some key themes and sub-themes were identified in Figure 5-5.



**Figure 5-5: Thematic content map**

The sections that follow present the results of the analysed data in relation to each IDTGIT construct. After the presentation of the results, a discussion thereof is provided.

### 5.3.1 Individual identity construct

The individual identity construct captures the data that describes an individual (Trauth *et al.*, 2004). It includes both personal demographic items and information on the type of IT work that an individual is involved in (i.e. professional/career items). The IT Executives' personal data such as age, race, and marital status aimed to capture the general characteristics that identified each individual (see Appendix A for the demographic data as asked in the interview instrument). This information also enabled the researcher to group the responses during the analysis phase. Along with the participants' personal data, the research questions that follow addressed the individual identity construct:

***What are the job expectations of female IT Executives?***

Taking into consideration that women are generally associated with support roles and not leadership roles, the objective of this research question is to explore the role of the IT Executive as occupied by the female IT Executives. In describing the IT Executive role, the responsibilities and the traits thereof are taken into account. Additional to the description of female IT Executives' role, the path to achieving the role is explored. The following research question also adds to the holistic understanding of the role of female IT Executives:

***What is the career path followed by female IT professionals towards the fulfilment of the IT Executive role?***

Table 5-17 shows the interview questions that addressed the individual identity construct.

Interview Questions	Interview Question Objective
<b>Explain the functions of your job, i.e. what does your job entail?</b>	The individual identity construct captures an individual's type of IT work, which in this case is the IT Executive job. This question aims to understand the role of the IT Executive as fulfilled by women and the responsibilities thereof.
<b>Explain your career path into an IT Executive role.</b>	The IT Executive is a top position in the IT field; therefore, one has to work his or her way up the career ladder to achieve this role. The question aims to determine the paths that female IT Executives followed to achieve this level.
<b>What are the typical skills required for an IT Executive position?</b>	To effectively and successfully perform the functions of the IT Executive, it is vital to possess the relevant skills. The question seeks to understand the skills required for one to be an IT Executive as perceived and possessed by the participants.

**Table 5-17: Individual identity construct related questions and objectives**



### 5.3.1.1 *Presentation of results*

From the analysis of the responses from the IT Executives to the questions outlined in Table 5-17, the key themes and sub-themes in Table 5-18 were identified.

Theme	Sub-theme
Linear career path	None
Genderless leadership	Soft and technical skills balance

**Table 5-18: Individual identity construct themes**

Table 5.19 shows an example of the data extract from which themes relating to the individual identity construct emerged.

Raw Data	Identified Themes	Sub-themes	Interpretation of themes
<p>“I started working in IT as an officer providing technical system support services. I then progressed to management and later became an IT Executive.” (IT Executive 11)</p> <p>“I started a career in IT as developer and progressed to IT Executive level over the years.” (IT Executive 1, 14)</p>	Linear career path	None	Progression to the IT Executive level follows a linear and hierarchical path. There are key career stages that one goes through to get to the top IT leadership position.
<p>“To be regarded as an effective leader, you are expected to make decisions and make sure that they are implemented. This requires one to be assertive. Because you also work with people, you need to show compassion and be trustworthy.” (IT Executive 5)</p> <p>“In a nutshell, my job is about managing the IT operations and ensuring that there is alignment between the IT strategy and the organisational strategy.” (IT Executive 8)</p> <p>“I am accountable for delivering IT systems that address the business needs. I also lead a team of IT professionals; therefore, I am responsible for the general well-being of the team.” (IT Executive 15)</p>	Genderless leadership	Soft and technical skills balance	This theme indicates that IT leadership is suitable for both females and males. The research participants possess the skills presumably found mainly in males.

**Table 5-19: Data analysis extract for individual identity construct**

### **5.3.1.2 Discussion of results**

In an effort to understand the IT Executive role from a female perspective, it is necessary to explore this role holistically. Not only is it vital to examine the job responsibilities of a female IT leader but also the path towards the IT leadership level. The experience gained on the path to IT leadership positions prepares one to be able to undertake the responsibilities of the IT Executive role. The discussion of results is organised according to the themes that emerged from the data.

#### (a) Linear career path

For the participants to have achieved the IT Executive positions, they had varying career sequences. A career sequence refers to a series of occupations in an individual's work history (Joseph *et al.*, 2012). Table 5-20 presents the career sequences of each participant.

Participant Number	IT Support occupations	Middle IT management occupations	Senior IT management occupations	IT Executive
1	Software Developer Business Analyst Data Architect	Senior Business Consultant Process Manager Manager (Process Architecture and Quality Strategy and Integration)	Line Manager (Process Management)	
2	Software Developer System Requirements Analyst/ Business Analyst	Project Manager Programme Manager	Portfolio Manager	
3	System Engineering Process Engineering Business Analyst	Project Manager	IT Management Consultant	
4	IT Programmer System Analyst	Assistant Manager (IS) Deputy Director IM	IT Senior Manager	
5	System Administrator	Production Manager Risk Manager	Senior Manager IT Infrastructure	
6	Information Officer Principal Information Officer	Assistant Director (KM) Deputy Director (KM)	KM Manager	
7	Data Technologist (Programmer) Data Analyst Analyst Programmer Strategy and Planning Analyst	Lead Architect	Manager: IT Strategy and Enterprise Architecture	
8	SAP Consultant	Manager SAP Support Business Solutions Manager	Global Applications Manager	
9	IT Consultant Business Architect Senior Consultant	IT Account Manager IT Project Manager Manager (Business Processes)	Senior Manager (Business Processes)	
10	System Developer Test Analyst Test Automation Specialist	Test Lead Testing Manager Business Area Manager	Senior Manager – IT Solution Delivery	

Participant Number	IT Support occupations	Middle IT management occupations	Senior IT management occupations
		Testing and Implementation Manager	
11	System Support Services Officer Information Systems Advisor	Business Applications Manager	Business Relationship Manager
12	Business Support Officer	IT Change and Release Manager Manager IT Services IT Business Relationship Manager	Senior Manager Infrastructure Services
13	Systems Analyst Business Process Analyst Contract Manager	Project Manager	Business Manager (IT)
14	Systems Developer System Analyst	IT Project Manager	Facilities Manager
15	System Developer Data Analyst Data Architect	Data Architecture Team Lead Project Manager	Head of Data Management IT Programme Manager

**Table 5-20: Participants' career sequences**

The results show that there is no uniform career sequence for IT Executive positions. For instance, 40% of the participants have previously worked as system developers or programmers, while the majority (60%) of them have not. Nonetheless, they have all successfully progressed to IT Executive positions. This means that system development experience does not necessarily imply that one will not be considered for an IT Executive position and vice versa. However, it is noted that most of those who did software development/programming (83.33%) have also occupied analyst positions. Moreover, an analyst-type occupation is noted to be a common occupation for most of the participants (53.33%). It is inferred that analyst-type occupations require analytic competence. Analytic competence is considered one of the characteristics of those desiring to advance to leadership positions (Coetzee & Schreuder, 2014; Tinline & Cooper, 2016). Furthermore, the analyst-type occupations provide a platform for one to engage with the business. Essentially, this means that an analyst-type occupation is advantageous to progressing to an IT Executive role.

The IT workforce is heterogeneous (Joseph *et al.*, 2012); as a result, organisations have different names for different IT job occupations. As illustrated in Table 5-20, the different IT job occupations have been categorised into four groups, namely, IT Support, Middle IT management, Senior IT management, and IT Executive occupations. Each category makes up an IT work stage. Based on the data analysis, it is seen that upon IT job entry, the female IT Executives in the study advanced to leadership positions by following a linear career path. The IT career paths of the participants comprised four IT work stages.

Support occupations are classified as IT entry-level jobs. At this level, all participants indicated that they were new to the IT work environment and had no job experience. As a result, they could not have had management skills to have people reporting to them. It is noted that men and women are considered ready for high-level positions after several years of work experience (Ahuja, 2002). Considering that support occupations are lower than management positions, inference is made that the participants needed to gain work experience prior to advancing to management roles. Entry into a management role was when they advanced to middle management positions. It was at this stage that they all had small teams of people reporting team. The teams consisted of people in support occupations. The management experience gained in middle management positions assisted them to progress to senior management positions. At senior management level, they

indicated that the responsibilities were more and they were responsible for bigger teams. Senior management positions prepared the participants for IT Executive positions. As IT Executive 7 stated:

*“When I was senior manager, I had managers reporting to me, as the area I was heading was big. It was at this time where I would sometimes stand in for our IT Executive when he was not available.”*

From the results, it is noted that advancement to a high-level position is dependent on the experience gained from a lower-level position. According to Castaño and Webster (2011), a linear career path means that following and completing sequential career stages will result in a positive outcome. Evidently, the IT Executives in the study followed a hierarchy of positions to achieve the executive level. It is therefore deduced that progressing to IT Executive positions, female IT professionals need to first go through the aforementioned three IT work stages.

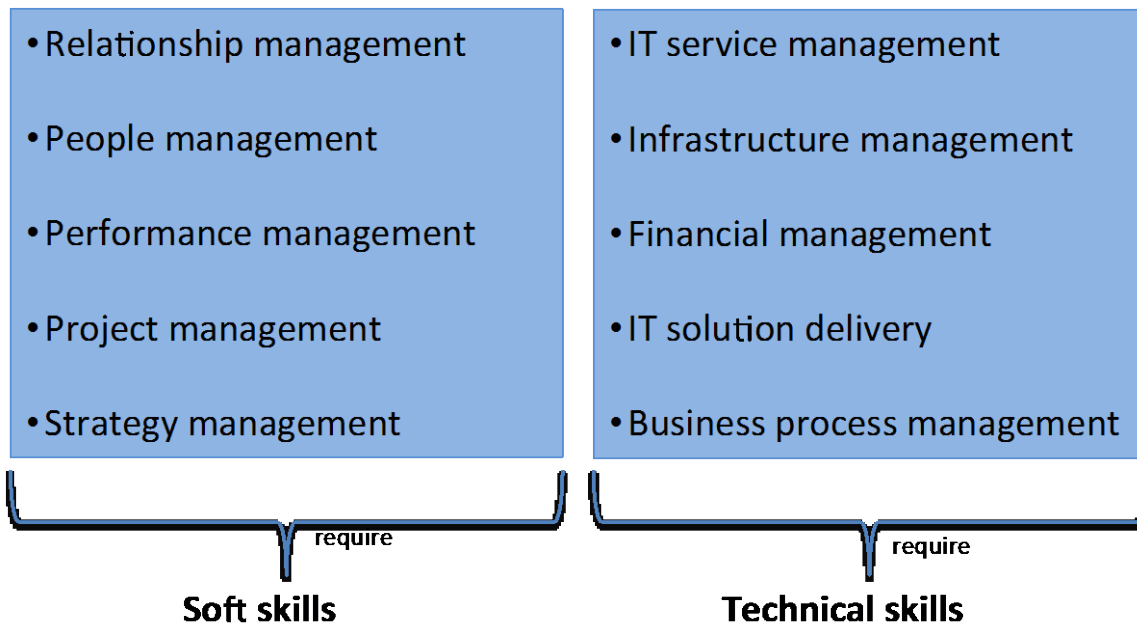
#### (b) Genderless IT leadership

The results indicate that IT leadership does not have gender. This means that female IT professionals are as equally capable of fulfilling IT Executive roles as their male counterparts. The capability of female IT Executives in the study is illustrated by discussing two emergent sub-themes.

##### *(i) Soft and technical skills balance*

As female IT Executives, the participants have certain job responsibilities that they are expected to do as part of their role. Figure 5-6 shows the general responsibilities that define the role of the female IT Executives as indicated by the participants. The identified responsibilities of the IT Executives are similar to the general responsibilities of any IT Executive as listed in Table 3-1 (*cf.* Section 3.3.2.1). It is therefore inferred that the expectations of female IT Executives are similar to those of male IT Executives. This supports the assertion by Fortino (2008: 141) that the responsibilities of the IT Executives are influenced by how the organisation operates and its current business strategy.

## Responsibilities of female IT Executives



**Figure 5-6: Responsibilities of female IT Executives**

To perform the responsibilities in Figure 5-6, the participants mentioned the need to possess the right skills. Skills give one an ability to do something effectively (Yukl, 2010: 44). Skills required to perform a task can either be soft skills or technical skills (Bhattacharyya, 2011). Soft skills are suitable in functions that deal mostly with communication and interaction with people (Bhattacharyya, 2011). On the other hand, technical skills are useful to accomplish specific tasks relating to technology or finances (Bozkurt, 2011: 25).

As illustrated in Figure 5-6, the responsibilities of the female IT Executives require both soft skills and technical skills. This shows that the skills of the interviewed female IT Executives are not limited to IT. As Costello (2011: 64) states, the skills of IT Executives should span beyond IT. The participants all possess a combination of both technical and soft skills that enable them to perform their responsibilities. Smith (2013) points out that much as technical skills are essential in ensuring the IT Executive's success, these must be mixed with soft skills. Rust (2012: 1) supports that for an IT Executive to successfully lead the organisation, technical skills alone are not sufficient.

The participants acknowledged that in pursuit of IT leadership positions, they had to acquire soft skills. This implies that their IT career foundation was based mostly on technical skills.



IT Executive 5 stated:

*“When I started working, I went on various technical training courses. They were relevant then and I believe they are still relevant now. However, when I got into management I realised that I needed to empower myself with people management, conflict management, and relationship management skills.”*

According to Owen (2012: 24) and Von Urff Kaufeld *et al.* (2009), as one advances in his or her IT career, technical skills become less important. This means soft skills for IT Executives outweigh technical skills. Considering that soft skills are generally associated with females (Clark, 2012: 3; Matteson, Anderson & Boyden, 2016), female IT Executives are better positioned to fulfil this role. Ultimately, the nature of the role of the IT Executive involves the difficult task of solving broad organisational challenges (Costello, 2011: 64). This is a demonstration of the strategic level at which the IT Executive operates. For this reason, there is justification for soft skills to outweigh technical skills.

Even though the technical skills of IT Executives are deemed less important than soft skills, it is essential to strike a balance between the two skills domains. Chester (2011: 62) argues that if the IT Executive puts a great deal of focus on technical skills, he or she runs the risk of being reactive to business needs. Similarly, soft skills are required for the IT Executive to be able to engage adequately with employees and IT business stakeholders (Rust, 2012: 2). Striking a balance between the soft skills and technical skills, the female IT Executives will be better equipped to apply the right skills for the right situations. After all, having the right skills increases the chances of a leader being successful (Bozkurt, 2011: 32).

### 5.3.1.3 *Summary of results*

#### **Summary:**

The data relating to the individual identity construct identified two themes, namely, linear career path and genderless leadership. With the linear career path, it was noted that the path to IT Executive positions involves going through three IT career stages before reaching the IT Executive levels. In the first stage of their IT careers, the female IT Executives occupied entry-level jobs, of which none involved management tasks. Exposure to management was when they moved to middle management positions. The third IT career stage towards the IT Executive position was occupying senior IT management positions. It is only after the IT senior management positions that the IT Executive roles were achieved. In the last theme, genderless leadership, it is noted that leadership capability is not related to gender. This is indicated by the soft and technical skills required for IT Executive roles. By virtue of women possessing both soft and technical skills, it was noted that the IT Executive job is just as suitable for men as it is for women.

#### **Insights:**

IT career progression requires some level of experience in the field. When one enters the IT field, a clear assertion is that she does not have adequate experience to occupy a senior position. As such, to be a female IT Executive, work experience is important. Such experience is gained through years of occupying various positions in a linear fashion, starting with support-level positions. Support-level positions essentially provide platforms for one to be accustomed to the IT field. Exposure to the IT field by occupying support-level positions paves the way for female IT professionals to advance to management-level occupations. Management positions also differ in level of seniority. At middle management level, female IT professionals are given the opportunity to gain management experience that would propel them to senior management levels. Similarly, senior management occupations prepare one to advance to IT leadership positions. IT management experience is pivotal to female IT professionals' advancement to IT Executive level. In essence, preparation is needed for IT Executive positions. This means one cannot move from being in a support occupation straight into IT Executive position. As one moves from a low-level occupation to a high-level occupation, the responsibilities thereof also differ. The responsibilities of female IT Executives are no different from the general

responsibilities of an IT Executive as derived from literature. This means that there are no IT Executive job descriptions designed specifically for a particular gender. The organisational expectations from female IT Executives are mainly driven by an organisation's strategic direction rather than gender. For female IT Executives to perform the responsibilities related to the role, necessary skills are also required. All in all, it means that a female IT professional is deemed eligible to perform IT Executive tasks if she is backed by both IT experience and skills. A combination of both soft and technical skills warrants the success of female IT Executives. Considering that for the role of the IT Executive, technical skills outweigh soft skills and that soft skills are generally associated with females, women therefore have an upper hand over men in a role. This means that despite the IT Executive position being traditionally directed at male IT professionals, it has since evolved to be suitable for females.

### 5.3.2 Individual influences construct

The individual influences construct covers personal characteristics and personal influences of women in the IT field. The focus of personal influences is on the people and experiences that moulded one's career in the IT profession. The following research questions relate to the individual influences construct:

***Which competencies are required for one to be a successful female IT Executive?***

The objective of this question is to understand the female IT Executive's competencies that enabled her career progression. Competencies essentially capture aspects such as an individual's knowledge and attributes required to perform a task (Yang *et al.*, 2006).

***What are the empirical strategies for overcoming barriers to progressing to IT Executive positions?***

As women progress to leadership positions, they are confronted with a variety of obstacles (Rhode & Kellerman, 2007: 6). The objective of this research question is to understand the typical challenges experienced by female IT professionals and determine how the female IT Executives in the study overcame these barriers.

Table 5-21 shows the interview questions that addressed the individual influences construct.

Interview Questions	Interview Question Objective
<p><b>What motivated you to pursue a career in IT?</b></p>	<p>In view of the IT field being male-dominated, the aim of this question is to understand factors that contributed to the participants embarking on a career in IT.</p>
<p><b>On your path towards the IT Executive role, what challenges did you experience as a woman? How did you overcome these challenges to reach the position you are in?</b></p>	<p>Literature notes that women are generally faced with obstacles that hinder them from achieving leadership levels. As a result, the glass ceiling concept was coined. Given that the IT participants in the study have managed to break the glass ceiling and advance to IT Executive positions, this question aims to explore the challenges that they faced and understand how they overcame them.</p>
<p><b>Which leadership traits do you perceive to be appropriate for an IT Executive role?</b></p>	<p>Leadership traits are associated with leader effectiveness (Zaccaro, 2007). Positions of authority such as the IT Executive require a certain set of leadership traits. The aim of this question is to establish leadership traits that are associated with IT Executive positions and how the IT Executives in the study identify with them.</p>
<p><b>What personality traits do you believe may have helped you to succeed in achieving the IT Executive role?</b></p>	<p>Working in a male-dominated field, it is expected that female IT Executives will be working mainly with men. Furthermore, leadership positions are generally associated with men. The question aims to identify personality traits that helped the participants succeed in achieving the IT Executive position. This data was further corroborated with the leadership traits identified as part of the individual identity construct.</p>

Interview Questions	Interview Question Objective
<p><b>What is your educational IT background, i.e. formal qualifications?</b></p>	<p>To be able to perform a task, one needs to be armed with the necessary skills. Knowledge acquired through formal education is also considered a skill. Considering that the IT field is broad with a variety of IT-related qualifications, the question seeks to determine the type of IT-related learning that the IT Executives in the study acquired.</p>
<p><b>Did you receive any professional development training that assisted with your career progression? If so, how did it/they assist with your career progression?</b></p>	<p>Formal education such as degrees and diplomas are not the only methods of acquiring knowledge. The question aims to identify other training interventions that are connected to the IT Executive role. The sub-question aims to determine the usefulness of such training interventions.</p>

**Table 5-21: Individual influences construct related questions and objectives**

### **5.3.2.1 Presentation of results**

An analysis of the responses from the IT Executives to the questions outlined in Table 5-21 revealed the key themes and sub-themes shown in Table 5-22.

Theme	Sub-theme
Unsystematic IT career entry	Interest Advice Job security Accidental IT career entry
Leadership <b>behaviour</b>	Combination of agentic and communal leadership traits
Continuous career development	None
Career advancement support structures	Mentors Immediate managers

**Table 5-22: Individual influences construct themes**

Table 5-23 shows an example of the data extract from which themes relating to the individual influences construct emerged.

Raw Data	Identified Themes	Sub-themes	Interpretation of themes
<p>“There was a hype around IT at the time, so I changed careers to guarantee a job.” (IT Executive 5)</p> <p>“I never had exposure to IT, so I decided to go for it.” (IT Executive 12)</p> <p>“I have always enjoyed STEM-related subjects, so I was motivated to pursue a career in IT.” (IT Executive 13)</p>	Unsystematic IT career entry	<p>Interest</p> <p>Advice</p> <p>Job security</p> <p>Accidental IT career entry</p>	People embark on a career in IT based on various factors. This implies that motivations for pursuing a career in IT differ from person to person.
<p>“I have had to continuously fight the ‘boys-club’ mentality and find ways of asserting myself.” (IT Executive 2)</p> <p>“The IT field is male-dominated; therefore, women are sometimes undermined and treated differently than men. As a result, women tend to change their behaviours.” (IT Executive 3, 8, 11)</p>	Leadership behaviour	Combination of agentic and communal leadership traits	The dominance of males in the IT fields has resulted in prevailing masculine values that favour men over women. As women occupy roles that were traditionally occupied by men, their leadership behaviours change to fit their profiles.
<p>“Over and above my formal IT education, I acquired management-type qualifications which focused more on soft skills.” (IT Executive 1)</p> <p>“Being in IT without a formal IT qualification, I went for professional certificates that enabled me to perform my job well.” (IT Executive</p>	Continuous career development	None	The skills relevant for advancement to the IT Executive role are acquired throughout one’s career journey. This means that learning new skills is not a once-off event.

Raw Data	Identified Themes	Sub-themes	Interpretation of themes
<p>3)</p> <p>“I found my formal IT qualification to be too generic and technical; therefore, I focused on programmes that were in line with my job aspirations of being a leading people.” (IT Executive 7)</p> <p>“As an IT Executive, I am the interface between IT and the business; therefore, communication, interpersonal, and negotiation skills are very important. I had to do management courses to acquire these skills.” (IT Executive 11)</p>			
<p>“I’ve never really had a mentor, but consulted various people for advice where needed.” (IT Executive 5)</p> <p>“My mentors were men in IT who held high positions.” (IT Executive 7)</p> <p>“I had very supportive managers who influenced my career progression.” (IT Executive 6, 13)</p>	<p>Career advancement support structures</p>	<p>Mentors</p> <p>Immediate managers</p>	<p>To overcome the challenges that female IT Executives were faced with as they pursued their leadership positions, they had support structures in the form of mentors and immediate managers. These support structures provided guidance when and where required.</p>

**Table 5-23: Data analysis extract for individual influences construct**



### 5.3.2.2 Discussion of results

The factors that influenced the IT Executives' progression to IT leadership levels were investigated from tertiary levels. According to Ahuja (2002), career decisions become well established at tertiary levels and entry-level jobs. In essence, the start of a career begins at tertiary level. The IT Executive's influences were explored from the start of their careers throughout their journeys to IT leadership levels. The discussion of results is categorised into the themes that emerged from the data.

#### (a) Unsystematic IT career entry

A career starts when a person makes a career choice (Ahuja, 2002). In light of the many careers that exist within various industries, there is a probability of an individual choosing a career in IT. However, making a career choice is dependent on various career anchors (Schein, 1990 cited in Coetzee & Schreuder, 2014). This infers that the female IT Executives' career choices were based on various factors, thus making IT career choices unmethodical. Unmethodical IT career entry means there is no standard method for choosing a career in IT. The data from the unmethodical IT career entry theme revealed four sub-themes that relate to reasons behind the female IT Executives' career choice. Table 5-24 shows the number and percentages of participants who addressed each sub-theme.

Sub-theme	Number of participants	% of participants	Executive ID
Job security	5	33.33	2, 4, 5, 7, 9
Accidental IT career entry	5	33.33	3, 6, 11,12, 7
Interest	4	26.67	1, 8, 10, 13
Advice	4	26.67	1, 4, 14, 15

**Table 5-24: IT career selection theme**

The sub-themes represent the factors that contributed to the IT Executives' career choice. From Table 5-24, it can be seen that some participants chose an IT career based on a combination of factors. Regardless of the women in the study being IT Executives, the results show that the majority of them (66.66%) did not have aspirations to be IT professionals. Half of them attribute their choice of a career in IT to a need for job security, while the other half regard their IT career choice as accidental. Notwithstanding the reasons

for choosing a career in IT, all the participants did not drop out of the field to pursue other careers. Instead, they persisted until they advanced to IT leadership positions. Ahuja (2002) confirms that career choice, career persistence, and career advancement are dependent on one another.

(i) *Job security*

Without regard for the women in the study being IT Executives, the results show that 33.33% of them did not initially have aspirations to be IT professionals. They attributed their choice of a career in IT to a need for job security. As IT Executive 4 said:

*“After completing my BSc in Natural Sciences, I found it difficult to find employment. I then pursued a career in IT, as there were many job opportunities at the time.”*

This implies that the South African IT sector offered better job opportunities than other sectors. The career opportunities in the IT field ensured a stable career environment for the research participants. The IT Executives identified a career in IT to be a better and easier option to join the labour force. Considering that the IT field has promising career prospects (Joshi *et al.*, 2010), this group of participants evidently sacrificed their passions for financial stability. Despite the IT career not being their first career choice, they nonetheless made a success of it. Choosing a career based on the need for job stability and security is one of the effective ways of pursuing a particular career and achieving career success (Coetzee & Schreuder, 2014; Tinline & Cooper, 2016).

(ii) *Accidental IT career entry*

Another 33.33% of the participants also did not have IT career aspirations from the start. At no point did they plan to be in the IT environment. Eighty per cent (80%) of them pursued other careers that landed them in the IT space while already in the workforce. IT Executive 6 stated:

*“I studied Library and Management science, which I had no idea it was linked to the IT field. It was only when knowledge management became a popular concept that I started working closely with people in IT.”*

Twenty per cent (20%) of this group of participants diverted to IT while they were still in their tertiary schooling. IT Executive 3 said:

*“I studied Electrical Engineering which included a Computer Science module. I then studied Biomedical engineering that exposed me to even more aspects of IT. It was then that I focused my studies towards IT.”*

This means that people can enter the IT field at any point of their career, be it during tertiary schooling or while already employed. Ahuja (2002) confirms that career choices are made at tertiary level and also at entry-level jobs. What is also noted is the relationship between the IT field and other fields. Exposure of these IT Executives to IT came as a result of them being exposed to other disciplines.

### *(iii) Interest*

Other IT Executives (26.67%) indicated that their decision to select a career in IT stemmed from an interest in the field. This interest was established mostly during their schooling years. Vitores and Gil-Juárez (2015) point out that exclusion from and disaffection of the IT field is usually formed before secondary or high school. Inference is made that these participants had developed some level of interest in IT in their primary schooling years, albeit not strong. This is because girls in primary school are not fully exposed to the long-term implications of their career choices (Adya & Kaiser, 2005).

IT Executive 1 and IT Executive 13 stated respectively:

*“I have always been fascinated by how computers work. Therefore it was a natural progression for me to lean towards a career in IT.”*

*“In my schooling years, I enjoyed STEM-related subjects. I generally enjoy learning and analysing information; therefore, a career in IT was an obvious choice for me.”*

Exposure to IT essentially sparked the participants' interest in the field. Had they not been exposed to IT at an early stage, they probably would have pursued different career paths. Structural factors such as access to technology have been noted as determinants of women's decisions to pursue careers in IT (Ahuja, 2002; Creamer *et al.*, 2006).

#### (iv) Advice

It came to light that 26.67% of the IT Executives based their career choice in IT on the advice received from either a parent or a teacher. The majority of them (75%) brought out that a parent was influential in their choosing a career in IT, while 25% of them attributed their decision to guidance given by a career advisor at secondary schooling level. In view of the IT field perceived to be mostly suitable for men, parental advice in this regard is bound to have an influence. Appianing and Van Eck (2015) posit that girls who receive support from their parents are likely to pursue careers in IT. This demonstrates girls' trust in their parents as far as making career decisions is concerned. The small percentage of the IT Executives who received career advice from their teachers demonstrates lack of career guidance in schools.

#### (b) Gender prejudice

Working in a male-dominated environment presented various challenges for the female IT Executives. One key challenge that the female IT Executives experienced was gender prejudice. This finding agrees with the assertion by Northouse (2016: 399) that prejudice is a barrier for women's attainment of IT leadership positions. Most of the IT Executives (86.67%) believed that their gender played a role in how they were treated by their male counterparts. In the words of IT Executive 5:

*"When I got the opportunity to be in a managerial role, there were males who blatantly refused to report to me. They requested to have me moved to another section that had a male manager. At some point, I was made to act in a senior manager position for four years, but a male was ultimately appointed in that position."*

Despite men dominating throughout the IT career hierarchy, the participants indicated that they experienced gender prejudice when they started occupying management positions. This means it is acceptable for women to work in entry-level IT occupations, but not advance to management occupations.

The results also show that prejudice came from both genders. Male and female IT professionals would rather report to a male leader than a female leader. Leadership is ultimately associated with men (Eagly & Carli, 2007: 90; Schein, 2007: 7; Powell, 2012: 131). Eagly and Carli (2007: 96) assert that women leaders are prejudiced based on the usual

mismatch between people’s mental associations about women and leaders. As IT Executive 7 pointed out:

*“My capability as a manager was questioned by both males and females. Neither gender trusted me to manage them largely because they were used to being managed by men.”*

Since the number of males in the IT field exceeds that of females, masculine values dominating the IT profession are inevitable (Reid *et al.*, 2010). Such values have created an IT environment that does not recognise women as capable IT leaders. As it is, the underrepresentation of women in leadership positions is in part attributed to the perception that women do not possess the traits required of a leader (Ryan & Haslam, 2007; Schein, 2007: 8). Therefore, to overcome the gender prejudice challenges, the participants mentioned that they had to change their behaviours accordingly by adopting new traits.

Yukl (2010: 45) and Cutler (2014) state that an individual is expected to possess a particular set of traits to become a successful and effective leader. All the participants acknowledged that there were specific personality traits that made them successful in their IT Executive roles. These traits were adopted to match the IT leadership role. IT Executive 2 stated:

*“The ‘boys-club’ attitude has taught me to be more assertive so that I could be recognised as an equal. Had I not done that, men would have considered me a pushover, which I’m not.”*

Table 5-25 lists the common traits that the participants adopted as they advanced to leadership positions.

Adopted Personality Traits	
Assertiveness	Career-driven (Ambitious)
Vocal (Outspoken)	Confidence
Decisiveness	Dominant
Flexibility	Persistence

**Table 5-25: Summary of participants’ adopted personality traits**

According to Eagly and Johannesen-Schmidt (2001), leadership traits are categorised into

either agentic or communal characteristics. It is said that men are associated with agentic traits that signify leadership (Rosette & Tost, 2010). This notion infers that the IT Executive role as a leadership position in IT would be more suitable for men. However, by virtue of the research participants being female IT Executives, it implies they portray agentic leadership characteristics that are generally associated with men.

IT Executive 6 stated:

*“As a female IT Executive, I have to be assertive and decisive so that my authority as a leader is not undermined. At the same time, because I work with people, I have to be sensitive to their emotions so that we can have a trusting relationship.”*

The results show that female IT Executives in the study consider both agentic and communal leadership traits to be vital for effective leaders (see Table 5-26).

Agentic traits	Communal traits
Assertive	Compassionate
Decisive	Humility
Bold	Caring
Influential	Appreciative
Negotiation	Approachable
	Empathetic
	Trustworthy
	Sensitive

**Table 5-26: Female IT Executive leadership traits**

Comparing the personality traits that the IT Executives adopted (*cf.* Table 5-20) with the ones listed in Table 5-26, it is noted that most of the adopted personality traits were agentic leadership traits.

Taking into consideration that the IT Executive position is stereotypically considered a male occupation, for the participants to adopt agentic characteristics is expected. The IT Executives in the study emulated their male counterparts in order to assert their power and influence. This is in line with the statement by Cutler (2014) that as women continue to occupy male-stereotypic roles, they are also adopting agentic attributes usually associated

with men. Adopting the agentic leadership traits infers that the participants supplemented their inherent communal personality traits with agentic ones. According to Cutler (2014), people having leadership traits are considered to be suitable for positions of authority. This means that for the participants to have been considered for and achieved IT leadership positions, they would have demonstrated the necessary leadership traits. Mihalčová *et al.* (2015) note that women in top leadership positions have to work and behave like men. As such, it is necessary for female IT Executives to adopt agentic traits and adapt to men's way of working.

The importance of applying different leadership traits in different situations is also noted. For instance, if a female IT Executive was to allow others to make decisions on her behalf, she will not be seen as an effective leader. Similarly, if she is caring and understanding, such qualities would come in handy when she needs to be bold. Women who are dominantly communal are criticised for not being agentic enough, while those who are highly agentic are criticised for lacking communion (Eagly & Carli, 2007; Powell, 2012: 125). To avoid the perception that women do not have the right leadership qualities, it is critical to balance the agentic and communal leadership traits.

Since communal traits are mostly associated with females (Rosette & Tost, 2010), it is deduced that females are also suitable for IT Executive positions. This means women signify IT leadership just as much as men do. This is contrary to the original belief that leadership is more associated with men (Powell, 2012: 131). The results further negate the notion that the masculine nature of the IT field socialises women from it. If that were the case, the need for communal leadership traits at IT Executive level would be futile. Rosette and Tost (2010) assert that communal traits are increasingly becoming valued leadership characteristics associated with effective leadership. It is henceforth warranted for the IT Executive role to encompass communal traits.

### (c) Continuous career development

To fulfil their responsibilities as IT Executives, the participants expressed the importance of possessing relevant competencies. Bozkurt (2011: 32) notes that possessing the right competencies increases the chances of a leader succeeding in his or her role. Competencies in the form of skills and knowledge are acquired through education or

learning (Yukl, 2010: 44; Bhattacharyya, 2011). The IT Executives acquired some of the competencies through academic education.

A good academic education is considered one of the requirements of becoming an IT Executive (Cano *et al.*, 2012). Some 93.33% of the participants indicated that they have formal academic qualifications. The majority of them (85.71%) have formal IT qualifications, while 14.29% have formal qualifications not related to IT. According to Aiken and Gorman (2013), there are no uniform mandated qualifications for the IT Executive. After all, people sometimes make their educational decisions at a young age with limited information, but later transcend those decisions (Hambrick & Mason, 1984). The formal IT qualifications of the participants vary, with a degree in information systems being most common among the participants, followed by a degree in computer science. This supports the finding by Fortino (2008: 1878) that a typical IT Executive's qualifications are computer science and information systems degrees. Table 5-27 shows the type of formal IT qualifications possessed by the participants.

Qualification	Number of participants	% of participants
Computer Science	3	25%
Information Systems	4	33.33%
Informatics	2	16.67%
Information Technology	3	25%

**Table 5-27: Participants' formal IT qualifications**

It was revealed that 53.33% of the participants indicated that they have master's level qualifications. Such qualifications can be considered as catalysts to the progression of women to leadership positions. According to Appelbaum *et al.* (2011), research shows that women enrol in higher education in pursuit of careers in management. This infers that a master's level qualification equips the individuals with management skills. Cano *et al.* (2012) posit that a master's level qualification in an IT-related discipline is the main requirement for someone in an IT Executive position. Taking into account that participants' focus is in the IT field, a master's level qualification in IT would therefore be advantageous. Seventy-five per cent (75%) of the IT Executives in the study have master's level qualifications in an IT-



related discipline, whereas 20% have master's level qualifications in general management. Depending on the area of development an individual seeks to address, an appropriate master's qualification is pursued. Regardless of the type of master's qualification the IT Executives obtained, they each had a common goal of empowering themselves to reach leadership positions. IT Executive 4 said:

*"I decided to enrol for a masters in management so that I can acquire the necessary skills to be an effective manager. The master's degree also became a stepping stone towards a leadership position."*

While IT Executive 9 stated:

*"I studied a master's degree in IT so that I could enhance my IT skills and knowledge. I also knew that having such a degree would put me one step towards reaching a leadership position."*

As shown in Table 5-20, the IT Executives advanced to leadership positions after having had exposure and experience in IT management. A combination of IT management experience and academic education helped the IT Executives in the study with their career progression. Cano *et al.* (2012) contend that organisations prefer individuals who have a good academic education as well as solid professional experience.

McGee (2008: 2) notes that tertiary education is no longer emphasised on when hiring IT Executives. However, there are a few women who make it to the executive management levels despite their level of education (Cheung & Halpern, 2010). These results also confirm that only 14.29% of IT Executives succeeded to achieve IT leadership positions without a formal IT qualification, while 6.67% had no formal qualification at all. A common attribute is that they all have IT management experience that worked to their advantage.

Over and above the formal qualifications, the participants expressed the importance of personal development training. They explained that this type of training was mainly to address the soft skills associated with an IT leadership role. Table 5-28 provides an example of professional development training courses from which the female IT Executives acquired soft skills.

Training course	Soft skill acquired
Project Management Professional (PMP)	Leadership Presentation Communication Change management Contract management
Programme for Management Development	Leadership Stakeholder management Performance management Conflict management
Power of Influence	Influencing behaviour Negotiation
Fundamental Management Programme	Leadership Stakeholder management Performance management
Advanced Executive Programme	Leadership Strategy management Stakeholder management Relationship management
Crucial Conversations	Communication Negotiation Conflict management

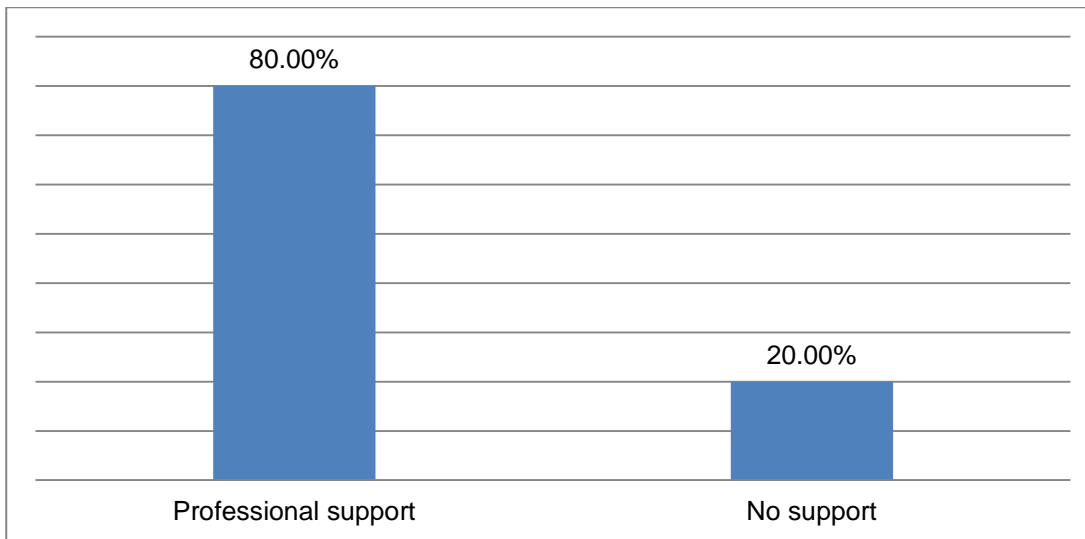
**Table 5-28: Training courses for soft skills**

Boyatzis (2008: 10) asserts that soft skills are typically learned and developed during adulthood. Considering that the participants attended the training listed in Table 5-28 while already in IT management occupations, this indicates that secondary and tertiary schooling is mainly focused on technical knowledge.

(d) Career advancement support structures

It is reported that career support is valuable in women's career advancement (Allen, Poteet, Eby, Lentz & Lima, 2004). The results show that having support had a positive influence on some of the women's advancement to IT leadership positions. The main support that participants received was more in the professional setting. A professional setting refers to

both the work environment and the IT industry as a whole. Figure 5-7 indicates the proportion of women who have received support as they pursued IT leadership positions.



**Figure 5-7: Support received by participants**

In the work environment, the findings show that the participants received professional support from their immediate managers. Within the IT industry but outside the work environment, participants received support from mentors.

*(i) Immediate managers*

Byrne, Dik and Chiaburu (2008) maintain that some employees do not have access to mentors; therefore, they rely on their superiors for career advancement support. Consequently, it is a norm for the IT Executives in the study to have had support from their immediate managers on their career advancement journey.

IT Executive 6 affirmed:

*“I was fortunate to have had approachable and supportive managers in my career journey. They assisted me in climbing the corporate ladder through their advice and continuous encouragement, considering the masculine culture of the IT field.”*

Since the participants reported directly to the managers, they evidently interacted with them on a regular basis. This made the managers easily accessible. The career advancement support from managers is noted to be common because managers are able to spend more

time with their subordinates (Kao, Rogers, Spitzmueller, Lin & Lin, 2014). The supportive relationship between the participants and their managers played a role in the participants' career advancement. For the IT Executives in this study to have opted for this type of support, it implies that they deemed it to be of greater benefit for their career progression. Bearing in mind that such support was available within the organisational context, it also means that organisations provided platforms that fostered such relationships.

(ii) *Mentors*

The findings also show that the women received support from people who were already in leadership positions but not necessarily within their organisations. Some of the participants (25%) did not regard such relationships as mentor-mentee relationships. They insisted that they never had mentors but had identified individuals in leadership positions whom they sought advice from when required.

In the words of IT Executive 1:

*“To close the mentor relationship gap, I identified people who were already established in their careers and asked them for advice whenever I needed assistance. They made themselves available to me and were always eager to help.”*

According to Kram and Isabella (1985), mentors are more experienced individuals who provide less experienced individuals with career-enhancing functions which help the latter to establish a role in the organisation. The typical career-enhancing functions as described by Kram and Isabella include facilitating exposure and visibility to knowledge, coaching, and sponsorship. Based on this explanation, it is therefore conceded that 25% of the participants unknowingly had mentor relations with the more experienced individuals they regularly consulted for advice on their journey to IT Executive positions. Ragins (1999 cited in O'Brien, Biga, Kessler & Allen, 2010) points out that mentoring is considered a helpful tool for the advancement of females in organisations. This is because women generally face additional barriers to career advancement compared to men (O'Brien *et al.*, 2010).

On the other hand, 58.33% of the participants explicitly mentioned that they had mentors who helped them advance to IT leadership positions.

IT Executive 4 stated:

*"I attribute my IT leadership achievement to the mentors I had throughout my career. These were successful individuals who were already in leadership positions across various fields including IT."*

IT Executive 14 said:

*"I had mentors early in my career and all the way through to senior management positions. I strongly believe that they played a big role in me being where I am today in terms of my career."*

A noteworthy finding from the results regarding professional support is the gender representation of individuals who rendered career advancement support. O'Brien *et al.* (2010) found that males tend to provide career development support more than females. Since the majority of IT Executives in the IT field are men, there are high chances of female IT professionals being mentored by males. The results show that the participants have equally received professional support from both male and female individuals.

Not all participants had access to professional support structures (see Figure 5-7). Ragins (1999 cited in O'Brien *et al.*, 2010) confirmed that despite women generally being less powerful than men in organisations, they may not have equal access to developmental relationships. To have female IT professionals advancing to IT Executive positions with no access to a career advancement structure is therefore expected. Although individuals with mentors are said to experience more positive career outcomes (Allen *et al.*, 2004), the results show that participants who were not mentored achieved the same level of success.

### 5.3.2.3 *Summary of results*

#### **Summary:**

The analysis of the data that focused on the IT Executives' influences and experiences that moulded their career identified four common themes. It emerged from the data that the drivers for pursuing a career in IT are based on individual factors. The need for job security and accidental entry into an IT field were common reasons given by most participants. Interest in the IT field and advice received from others were also mentioned as the reasons for some of the IT Executives pursuing a career in IT. With the second theme, it was noted that the male dominance in the IT field has affected the IT Executives' personality traits. New personality traits were adopted to align with the leadership traits. It also emerged that the IT Executives were continuously increasing their skills and knowledge base in order to be effective leaders. To overcome the barriers in the IT field, the IT Executives received support from senior individuals in the field.

#### **Insights:**

There are no barriers for women to enter the IT field in South Africa. Moreover, females' advancement to IT Executive positions is independent of the reasons for entering the IT field. If a female IT professional has aspirations to achieve IT leadership levels, it is crucial that she persevere and equip herself with the necessary skills. If one is to pursue an IT Executive position, she must identify the type of skills required for the job. If one is not adequately equipped to be an IT leader, the chances of them being considered for an IT Executive position are slim. If, however, they do get appointed in an IT Executive role without the necessary skills, they will struggle to perform. For a female IT Executive, the ability to successfully execute the IT Executive functions is key. This is because the stereotypical views that the IT Executive role is mostly suitable for men are eminent. These stereotypical views are entrenched by the masculine values in the IT field. The masculine values of the IT field have an impact on the behaviours of female IT Executives. As a result, female IT Executives tend to behave like men in certain instances. This means female IT Executives end up adopting leadership traits that are mostly associated with men. However, female IT Executives are women first before they are leaders. In essence, they also instil communal leadership traits as part of their role. Coincidentally, communal leadership traits are just as valuable as agentic traits for effective

leadership. Since communal leadership traits are associated with women, female IT Executives are therefore at an advantage.

The challenges that female IT professionals face in the IT field cannot be overcome by only adopting specific leadership traits. It is noted that although female IT professionals can progress to IT Executive positions without support from others, the likelihood of success is not always guaranteed. Therefore, it is imperative for one to surround herself with people who can mould her career. Such support can be from one's manager or a mentor, the gender of which is immaterial. These structures may not necessarily be the same, but their effects are similar.

### 5.3.3 Environmental influences construct

Environmental influences are those factors that provide context to an individual's response to a situation within his or her geographical region (Trauth *et al.*, 2004; Cain & Trauth, 2013). These factors include cultural attitudes and values. In the context of this study, the cultural attitudes towards women in IT Executive positions are examined. As Trauth *et al.* (2008a) state, the underrepresentation of women in the IT workforce combined with increased cultural diversity present a practical problem within the IT field. The research question that seeks to address the environmental influences is indicated below.

Hofstede's cultural dimensions are adopted as the basis for determining the influence of culture on the underrepresentation of female IT Executives in South Africa.

***How does culture influence the progression of South African female IT professionals to IT Executive positions?***

Within the IT sector, the roles of women are defined according to socio-cultural beliefs (Trauth *et al.*, 2008a). This research question aims to explore the cultural factors that influence attitudes about female IT Executives in South Africa.

"Interview Question"	Interview Question Objective/Goal
<b>Explain the typical gender stereotypes from the perspective of your culture,</b>	Expectations of people's behaviour are based on gender. Gender-specific characteristics result in gender stereotypes (Wharton, 2009: 128). The participants in the study come from different cultural backgrounds. The question aims to

“Interview Question”	Interview Question Objective/Goal
i.e. what is the perceived role of a woman?	establish the expectations of women from participants’ cultural beliefs.
Please explain the culture of an IT field based on your observation/experience.	Hofstede’s definition of culture suggests that culture consists of a set way of thinking that is based on values and is shared across members of a particular society (Straub <i>et al.</i> , 2002). As the IT field is male-dominated, the masculine values are expected to be instilled. This question was asked to understand the IT culture from the perspective of female IT Executives, as they have solid experience in the IT field.
What is it like to be a woman in an IT Executive role? How are women in IT leadership positions perceived by society, both at the workplace and socially?	Occupying an IT leadership position as a woman is a deviation from the norm, as such positions are considered to be suitable for men. Therefore, the question seeks to capture the experiences of female IT Executives on the attitudes of people towards them in both the social and professional settings.

**Table 5-29: Environmental influences construct related questions and objectives**

### 5.3.3.1 Presentation of results

An analysis of the responses from the IT Executives to the questions outlined in Table 5-29 revealed the key theme and sub-themes in Table 5-30.

Theme	Sub-theme
Evolving gender roles	Ethnic culture IT culture

**Table 5-30: Environmental influences construct themes**



Table 5-31 shows an example of the data extract from which themes relating to the environmental influences construct emerged.

Raw Data	Identified Themes	Sub-themes	Interpretation of themes
<p>“A woman is still expected to look after the household and children even though she is also working.” (IT Executive 8, 9, 11, 13)</p> <p>“It is no longer taboo to find a man looking after the kids while the woman is at work.” (IT Executive 12, 15)</p> <p>“The IT culture is not accommodative to women in general. It is even worse when one reaches an IT leadership position.” (IT Executive 10)</p>	Evolving gender roles	<p>Ethnic culture</p> <p>IT culture</p>	The existence of female IT Executives has created a shift in the gender roles within the ethnic, workforce, and IT cultural spheres.

**Table 5-31: Data analysis extract for environmental influences construct**

### 5.3.3.2 *Discussion of results*

Society has labelled certain roles to be suitable for either men or women respectively. The roles that are mainly fulfilled by men are considered masculine, whereas those fulfilled by women are viewed as feminine. Leadership roles are essentially perceived to be masculine. It is deduced that the IT Executive role is a masculine role, by virtue of it being in a male-dominated field and a leadership role. The presence of female IT Executives is evidently a violation of the feminine gender norm, since they are occupying masculine roles. This is because female IT Executives assume masculine identities in their role as IT Executives. Cunningham and Macrae (2011) note that associating a particular role with the concepts of masculinity and femininity originates from cultural beliefs. The discussion around the IT Executives' cultural influences is organised according to the theme that emerged from the data.

#### (a) Evolving gender roles

While historically it was believed that work and family were separate worlds, it has been acknowledged that the two spheres intersect in complex ways (Wharton, 2009: 109). Perrone *et al.* (2009) assert that gender roles in family and work domains are continuously changing. Budlender and Lund (2011) highlight that the high rates of unemployment and state-orchestrated disruption of family life created by the South African apartheid system contributed to the shift in gender roles. Since culture describes the expected roles that must be fulfilled by both men and women (Alesina *et al.*, 2013), working women experience situations that collide with patriarchal cultures and industries (Bierema, 2016: 120).

The participants belong to different population groups and different ethnicities. Considering that culture "is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede *et al.*, 2010: 6), it is concluded that the participants have different cultural beliefs. The data from this theme showed that changes in ethnic culture shaped the IT Executives' career progression. Similarly, the IT culture influenced the IT Executives' career progression because the occupation is in a field that has masculine values.

(i) *Ethnic culture*

Gender roles have specific responsibilities assigned to them. Some responsibilities are explicitly for men, while others are for women. This was confirmed by all the participants in the study who stated that in their cultures, men and women have different roles. IT Executive 10 said:

*“In my culture, there are specific jobs that are meant for men and specific jobs for females. For example, a woman is expected to cook for the family and look after the children while a man provides for his family.”*

Despite the participants' different cultural beliefs, the results show that the gender-specific responsibilities are similar. This is contrary to the assertion of Alesina *et al.* (2013) that gender responsibilities differ across cultures. Based on the results, it is noted that there is consensus among the participants that the key role of a man is that of the provider of the family, whereas the key role of a woman is to look after the children and the household. As the breadwinner or the provider of the family, the man provides the household's primary income through paid work (Chapman, 2004 cited in Meisenbach, 2010). Since the participants also get paid for their jobs as IT Executives, it is presumed that they also contribute to the household's income. As women entered the workforce, the traditional view that men are breadwinners and women are caregivers and homemakers shifted (Gordon & Whelan-Berry, 2005). Not only do the IT Executives in the study look after the household, but they also provide for their families. IT Executive 11 stated:

*“Even as an IT Executive, I still have family responsibilities that I must take care of. At times this works against me because other male colleagues see it as me being less committed to my work.”*

The results show that the roles of female IT Executives have shifted from being solely feminine to being a combination of feminine and masculine. As the role of women changed to focus beyond the home front (Dandapat & Sengupta, 2012), the IT Executives have to maintain a work-life balance. Maintaining a work-life balance was crucial for the 66.67% married IT Executives and 73.33% who are mothers. Those who are married indicated that they share household responsibilities with their husbands. IT Executive 14 said:

*“I come from a conservative Afrikaans culture whereby women were generally not allowed to work. However, the perceptions of women have changed a lot. It has become acceptable for a man to look after the children if the woman is not home.”*

Taking care of children is also a shared responsibility between the IT Executives and their husbands where applicable. In other cases, the IT Executives obtained help from childminders.

*(ii) IT culture*

Regardless of IT Executives in the study having the necessary competencies to fulfil the role of IT Executive, the results reveal that 86.67% are not trusted to lead in the male-dominated IT field. Their ability as IT leaders is questioned and doubted. Moreover, they are treated differently from their male counterparts because the perception is that women are not culturally socialised to assume leadership-type roles. Powell (2012: 134) points out that women are subjected to hostility when it comes to leadership roles. This implies that the IT culture embraces male IT leaders more than female IT leaders. Preference of male IT leaders over female IT leaders is because the IT field has always centred on men, thus placing women secondary in the field (Clark, 2012: 3). IT Executive 10 commented:

*“The IT culture is not accommodative to women in general. It is even worse when one reaches an IT leadership position. Most often the perception is one was given the job to meet employment equity standards.”*

Evidently, Davidson and Burke (2011: 15) highlight that passing country legislation to equalise or improve the representation of women at higher-level managerial jobs does not work as well as expected. The implication of the ineffectiveness of pieces of legislation such as the Employment Equity Act is that inequalities in female and male IT Executives will continue to prevail.

The lack of trust also stems from the stereotypical view that women have limited technical knowledge. This is largely because the IT Executive evolved from a technical environment that was deemed suitable for men (Hunter, 2010: 125). Acknowledging the scepticism around their leadership abilities, the participants have devised strategic means to ensure that their authority is not undermined. Over and above adopting agentic leadership traits, the participants indicated that at times they would seek support from males before making

decisions. The rationale is that male judgements and opinions are often valued. In essence, the IT Executives have adopted a demographic leadership style so that they can be accepted and trusted by their male colleagues. With democratic leadership style, leaders involve and consult other team members in the decision-making process (Cuadrado *et al.*, 2012; Cutler, 2014).

The cultural stereotypes of the IT field essentially undermine the creditability of female IT Executives. Consequently, the participants have to work harder than their male counterparts to prove their worth. At times this caused a work-life conflict.

### 5.3.3.3 *Summary of results*

#### **Summary:**

From the data relating to the environmental influences to IT Executives' progression to leadership positions, evolving gender roles were identified. It emerged that gender roles within the ethnic, cultural sphere and IT cultural sphere were changing. The changing gender roles showed an overlap between the roles and responsibilities of men and women. Men are doing responsibilities that are traditionally meant for women. Similarly, women are occupying masculine roles that were traditionally occupied by men.

#### **Insights:**

The existence of female IT Executives is a deviation from the cultural norm, both from the ethnic and industry perspectives. There are commonalities between South Africa's ethnic cultures in as far as the gender roles are concerned. From an ethnic culture point of view, women usually stay home and look after the household, while men take part in paid labour. As such, the experiences of the IT Executives are similar irrespective of their cultural backgrounds. Taking care of the household is no longer the sole responsibility of women. Even though the IT Executives contribute to the household income as well, they still need to play a role in taking care of the household. This means they have to juggle both their work and family lives. Acceleration to IT Executive role therefore does not take away women's household responsibilities; however, they are diminished, as these are shared with others. Female IT Executives therefore play double roles. From an IT culture perspective, women are not

expected to occupy IT leadership positions. Because of these expectations, women's move from IT support functions to leadership roles has been met with scepticism. Being a female IT Executive in a male-dominated field whose culture is based on masculine values, it is beneficial to find ways to deal with the cultural stereotypes. One of the primary ways of ensuring recognition as a female IT Executive is the adoption of male attributes and applying these where necessary. After all, being a female IT Executive does not change the femininity of an individual but rather enhances the masculinity thereof. The results show that culture is not constant and therefore it changes based on circumstances. The female IT Executives in the study have successfully managed to work around the cultural beliefs from both an ethnic and IT field perspective. This means that cultural beliefs are not hindrances to women's IT career progression.

#### 5.4 CONCLUSION

This chapter presented an analysis and a discussion of the results obtained from the interviews of 15 female IT professionals who have advanced to IT Executive positions. The profiles of the IT Executives in the study were provided to give a background history of the participants. In addition, a summary of the demographic data of the participants was provided to indicate the characteristics of the research sample.

The analysis of the data was based on IDTGIT so that each participant's experiences can be evaluated as a single instance. The findings from the interviews were summarised and grouped according to seven themes that emerged from the data.

Theme 1 – linear career path – showed that although there was no uniform path among the women to an IT Executive position in terms of the typical jobs they occupied throughout their journey, the path itself follows a linear progression. Advancement to IT Executive levels follows a linear career path starting with support occupations, followed by middle management, and then senior management occupations. None of the female IT Executives progressed to a leadership role without going through a sequence of occupations. As the participants moved from one position to another, they gained experience that prepared them for the IT Executive positions. For each participant, the different occupations that they fulfilled over the years before becoming IT Executives were indicated.

From the genderless leadership theme, theme 2, it was indicated that IT leadership is

suitable for both females and males. This is based on the finding that both soft skills (associated with women) and technical skills (associated with men) are essential for the effectiveness of an IT Executive.

Four key factors that influenced the female IT Executives to choose a career in IT were identified as part of the unsystematic IT career entry theme. The first reason that was provided is the need for job security taking into account the many opportunities that the IT field presented. The second reason is that the participants did not have any aspirations to be in IT, but situations in life landed them in the field. The third reason is the interest in IT at an early age that channelled the participants in that direction. Lastly, some of the participants made their decision based on the advice received from people who are influential in their lives. While some participants subconsciously made the decision to enter the IT field, others found themselves in the IT field by chance.

Theme 4 – male dominance – relates to the treatment received by the participants in a male-dominated field and how such treatment influenced their behaviour as IT leaders. Male dominance in the IT field was mostly felt when the participants entered into management positions. Masculine values that are not supportive of females are instilled as a result of the field being mostly occupied by men. Moreover, the stereotypical notion that leadership is a male role put women at a disadvantage as they pursued the IT leadership roles. To overcome the leadership stereotypes, the female IT Executives adopted agentic (masculine) traits which, combined with their communal (feminine) traits, made them succeed in achieving the leadership status.

The participants recognised the need for continuous career development in order to ensure the right skills balance. This is discussed in theme 5 – continuous career development. To perform the responsibilities of an IT Executive, the data showed that the participants needed to acquire specific skills for the job. The skills were mostly acquired through learning. Although there are no standard qualifications prescribed for IT Executives, common ones were identified from the participants' profiles. It was evident from the results that to guarantee a job in the IT Executive role, female IT professionals had to increase their skills by continuing with their studies in the form of postgraduate degrees and professional training programmes.

The female IT Executives indicated that they faced various challenges throughout their

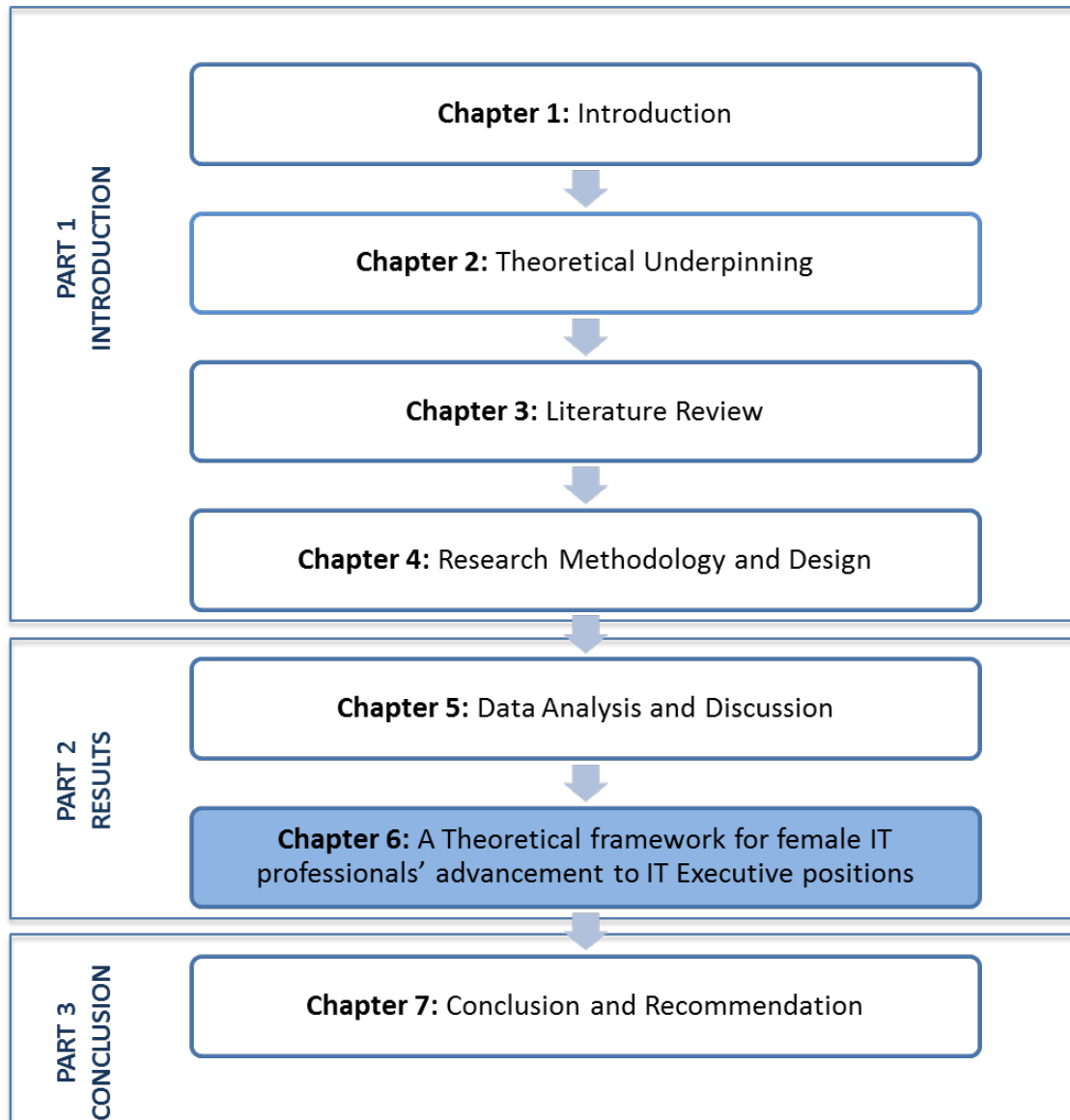
journey to leadership levels. To overcome the challenges in the IT field, some of them sought professional support. The support structures helped them to advance in their careers as they continued to stay in the IT field. Theme 6 focuses on the IT Executives' support structures. The support was received either from an individual's manager or mentor. Despite the IT field being male-dominated, the results showed that the female IT Executives received support from both female and male IT professionals. Most of the female IT Executives mentioned that the support structures were influential in their advancement to IT Executive positions.

It also emerged that culture plays a role in defining gender roles. However, the participants have experienced that a new norm was developing from a gender role perspective. The last theme is therefore about the evolving gender roles within the ethnic and IT industry culture. While it was previously unheard of for women to be part of the paid labour force, let alone work in male-dominated environments, the status quo has changed. Cultural values have changed to the point where both females and males share the nurturing and provider roles. The female IT Executives in the study indicated that their roles have shifted from being solely feminine to being a combination of feminine and masculine. Within the IT space, they highlighted that their capability as female IT Executives is often questioned. This is based on the notion that IT leadership is a role for men.

In the next chapter, a theoretical framework is developed to identify factors that will enable female IT professionals to progress to IT Executive positions.



## 6 A THEORETICAL FRAMEWORK FOR FEMALE IT PROFESSIONALS' ADVANCEMENT TO IT EXECUTIVE POSITIONS



## **6.1 INTRODUCTION**

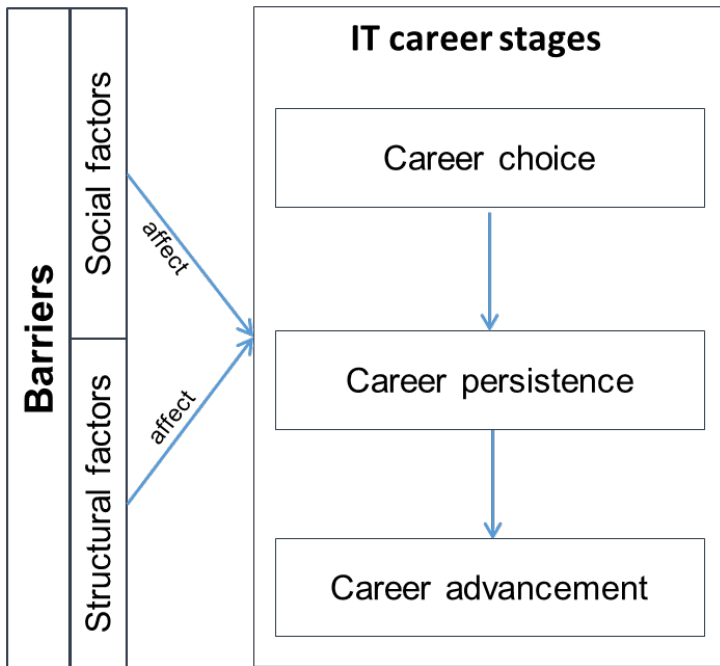
Literature shows that female IT professionals are confronted with a variety of barriers that prevent them from achieving IT leadership positions. The existence of these barriers has resulted in a poor representation of female IT Executives in South Africa. Despite the barriers that exist in South Africa's IT sector, some female IT professionals have successfully progressed to IT Executive positions. They have successfully navigated through the challenge-riddled IT field to achieve IT leadership levels.

The preceding chapter provided an analysis of data and discussion for the study. This chapter aims to propose a framework that female IT professionals in South Africa can adopt to enable their progression to IT Executive positions. The framework is developed based on the literature survey and the findings from the study. It uses the stage model of barriers that affect women's entry and performance in the IT field by Ahuja (2002) and the individual factors that contribute to women's participation in IT as defined in the IDTGIT (Trauth, 2002).

The chapter starts by showing the steps followed to arrive at the proposed framework depicted in Figure 6-6. It then provides a conclusion of the chapter.

## **6.2 TOWARDS A THEORETICAL FRAMEWORK FOR FEMALE IT PROFESSIONALS' ADVANCEMENT TO IT EXECUTIVE POSITIONS**

According to Ahuja (2002), an IT career comprises three stages or transitions that are dependent on one another. At each career stage, there are a set of opportunities and obstacles to achieving senior positions in the organisation (Ahuja, 2002). Ahuja (2002) developed a model that examines the barriers for women in each IT career stage. These barriers were classified into social and structural factors as illustrated in Figure 6-1. The barriers serve as contributing factors to the leakage of women in the IT career pipeline (Ahuja, 2002).



**Figure 6-1: Stage model of barriers that affect women's IT career**

Source: Adapted from Ahuja (2002)

Ahuja (2002) argues that during the career choice stage, women make decisions about the fields that they would like to pursue a career in. Their decisions are based on factors such as social expectations, the nature of the work, and the industry of interest. Once a woman has decided to pursue a career in IT, she continues to work in IT despite the challenges she may be faced with. It is at this stage that she persists to be in the IT workforce. After several years of work experience, a woman would then advance to senior IT positions.

According to Nelson and Veltri (2011), women make decisions relating to their IT careers throughout the different career stages. In accordance with the IT career stages defined by Ahuja (2002), it is inferred that women make decisions to either enter, persist, or advance in the IT field. The dependency between the IT career stages implies that if a woman decides to drop out of the IT field, then there is no likelihood of her advancing to the IT Executive position. As a result, Ahuja's model is used as a foundation for the construction of the theoretical framework for female IT professionals' advancement to IT leadership roles.

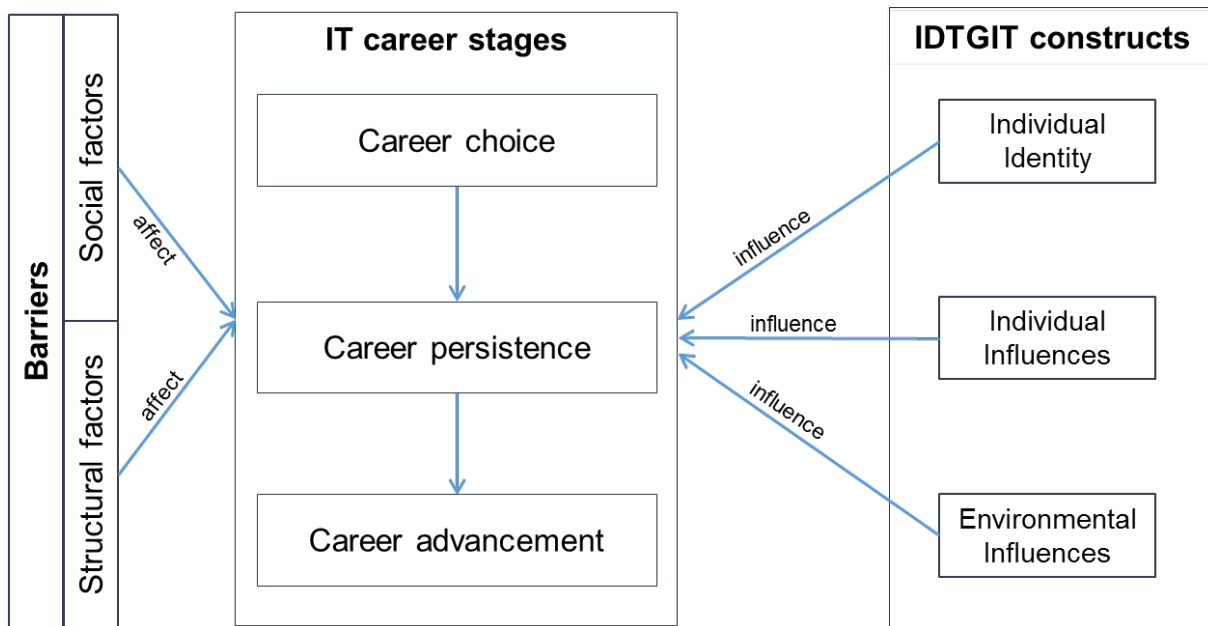
### 6.2.1 Construction of the theoretical framework

Women individually experience a variety of factors that explain their participation and career progression in IT (Trauth, 2002; Trauth *et al.*, 2008a; Trauth, 2013). The key barriers to female IT professionals' advancement that were identified from the study include gender stereotypes emanating from cultural beliefs, work-life conflict, and lack of support structures (see Figure 6-2). These barriers are similar to the typical IT barriers identified by Ahuja (2002), Mathur-Helm (2005), and Castaño and Webster (2011) (*cf.* Section 6.2).

<b>Barriers</b>	
<p><b>Structural factors</b></p> <ul style="list-style-type: none"> <li>•IT culture</li> <li>•Ethnic culture</li> <li>•Lack of support structures</li> </ul>	<p><b>Social factors</b></p> <ul style="list-style-type: none"> <li>•Gender stereotypes</li> <li>•Work-family conflict</li> </ul>

**Figure 6-2: Barriers to IT career advancement**

Each woman responds to the factors depicted in Figure 6-2 in different ways (Trauth *et al.*, 2008a). The manner in which each woman responds to career-influencing factors can either enable or inhibit her from advancing to IT leadership positions. The IDTGIT primary constructs (individual identity, individual influences, and environmental influences) are used to collectively explain why women enter, remain, and advance in the IT field (Trauth *et al.*, 2004; Trauth *et al.*, 2016). Since women's IT career development process is influenced by individual differences (Nelson & Veltri, 2011), Ahuja's model is therefore modified to embrace women's individual differences as they relate to Trauth's IDTGIT constructs (Figure 6-3).



**Figure 6-3: Influences of women’s IT career development**

The construction of the proposed theoretical framework is informed by literature and findings from the study (*cf.* Chapter 5). From the research findings, emphasis is placed on the individual factors that enabled the participants to reach IT Executive positions. Consistent with the focus of the study being on female IT professionals who are already in the IT workforce, the framework aims to promote female IT professionals’ career advancement in the IT field regardless of the reasons for entry into the IT workforce. As per findings of the study, the IT Executives had different motivations to pursue careers in IT; however, they all successfully achieved IT leadership levels. There was no pattern shown where the reasons for entering the IT career field influenced the IT Executives’ persistence in the field.

Taking into consideration the dependency between career persistence and career advancement stages (see Figure 6-1), the framework discussions are therefore limited to individual factors that enable both career persistence and career advancement of female IT Executives. After all, by virtue of the participants being IT Executives, it means that they persisted in their IT careers in order to advance to higher positions. The individual factors relating to the proposed framework are described in accordance with the IDTGIT constructs:

- **Individual identity:** This section describes personal demographic items of a female IT Executive and related IT Executive career items that influence career persistence and advancement.
- **Individual influences:** The focus of this section is to address personal influences that have an effect on the career persistence and advancement of female IT professionals.
- **Environmental influences:** This section outlines the influences associated with the environments in which the female IT professionals operate.

### 6.2.1.1 *Individual identity*

Organisations regard IT Executives as high-ranking executive-level leaders rather than mere IT service providers (Chen & Preston, 2007; Chun & Mooney, 2009). Because of that, they are hired essentially as strategists (Fortino, 2008: 140). The IT Executives therefore are expected to formulate and implement such IT strategies that align with business needs (Li & Tan, 2009). The view that demographics of top executives can influence the strategic decisions of the organisation is explained by the upper echelon theory.

According to the upper echelon theory, executives' characteristics such as demographics have an influence on organisational decisions and practices (Hambrick & Mason, 1984). In the upper echelon theory, Hambrick and Mason argued that characteristics such as age and career experiences are associated with perceptions that influence the decision making of executives. With regard to age, they state that the executive's age is "negatively associated with the ability to integrate information in making decisions and with confidence in decisions, though it appears to be positively associated with tendencies to seek more information, to evaluate information accurately and to take longer to make decisions". This means that the younger an executive is, the more difficult it would be to make informed decisions. The authors observed that career experiences somewhat shape the lenses through which strategic opportunities are viewed. In essence, executives with career experience are better equipped to influence and drive organisational strategies.

The above assertions infer that the age and IT career experience matter for female IT professionals to progress to IT Executive positions. Based on the age ranges of the female

IT Executives in the study, the majority of them are in their 40s (*cf.* Section 5.2.1). Looking at the period they have been fulfilling the IT Executive role, it is noted that they actually became IT Executives while they were in their 30s. This is corroborated by a survey conducted by Ernest and Young, which found that on average a 43-year-old IT Executive has typically been in the position for five years (Ernest & Young, 2012).

The study found that the IT Executives attributed their success to years of work experience in the IT field. Work experience of several years gives an individual an added advantage towards progression to high-level positions (Ahuja, 2002). For female IT professionals to successfully achieve IT leadership levels, it means they need to have several years of IT work experience. According to Joseph, Ang and Slaughter (2005), by gaining work experiences over time, an individual is essentially following a particular career sequence. A career sequence is defined by a series of occupations in an individual's work history (Joseph *et al.*, 2012). This implies that to gain IT work experience an individual must work in a series of IT occupations.

The female IT professional's career path towards an IT Executive position involves fulfilling IT Support, Middle IT management, and Senior IT management occupations (*cf.* Section 5.3.1.1). For support and middle management occupations, the results showed exposure to analyst-type occupations and project management to be common among the majority of the participants (see Table 5-20). To ensure success in achieving the IT Executive positions, female IT professionals have to fulfil IT Support, Middle IT management, and Senior IT management occupations in a sequential manner over several years. According to Castaño and Webster (2011), following a linear career path whereby sequential career stages are completed will result in a positive outcome.

Joseph *et al.* (2012) note that experience and career sequences contribute to career success. However, to successfully advance to senior positions in IT, an individual must persist and not drop out of the IT field. Neither the demographic data of the IT Executives nor aspects related to the role of an IT Executive showed a pattern of influence on IT career persistence. Nevertheless, it is suggested that managing one's career by fulfilling various IT occupations to gain experience will promote female IT professionals' persistence in the IT field.

A female IT professional of the right age and adequate experience will not succeed in an IT Executive position if she does not possess adequate skills for the job. Yukl (2010: 44) states that the right skills give one an ability to do something effectively. For an IT Executive to be successful, Smith (2013) points out that technical and soft skills are important. From the study, it was found that in striking a balance between the soft skills and technical skills, the female IT Executives were better equipped to apply the right skills for the right situations. After all, having the right skills increases the chances of a leader being successful (Bozkurt, 2011: 32).

To summarise, an individual’s age, IT work experience, and IT leadership skills serve as sources for progression to IT Executive roles, as illustrated in Figure 6-4 (greyed out portion of the model is outside the scope of this study). These three factors describe the identity of a female IT Executive.

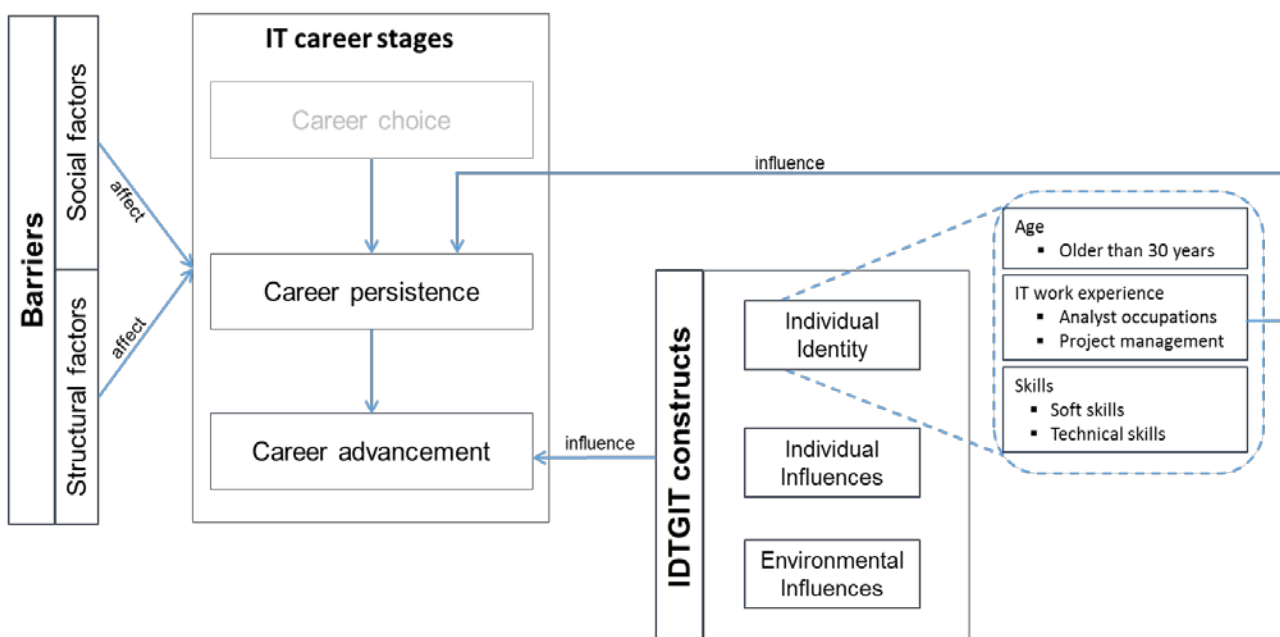


Figure 6-4: Individual identity factors for female IT professionals' career progression

### 6.2.1.2 Individual influences

As a male-dominated field, the IT field presents various barriers that affect female IT professionals' progression to leadership positions. One such key challenge is gender prejudice (Northouse, 2016: 399). The results of the study showed that gender played a role in how women were treated by their male counterparts as they occupied management



positions. Because of the masculine nature of the IT field, there are preconceived opinions that women will not deliver when it comes to management positions. As Koenig *et al.* (2011) indicate, “men are seen as more similar to the leader stereotype than women are”. Therefore, the IT Executive role is stereotypically a male role. Gender-stereotyping leadership positions create a bias against women when making leadership selection, placement, promotion, and training decisions (Powell, 2012: 126). This implies that the female IT professionals appear less qualified to fulfil IT Executive roles by virtue of their gender.

Gender also defines how people should behave (Wharton, 2009: 9). In essence, expected behaviours of men and women would vary. Rosette and Tost (2010) note that stereotypes for men are in line with traditional expectations of leadership behaviours, while the stereotypes for women tend to diverge from traditional expectations of leadership behaviours. As a result, the notion of “think manager – think male” (Powell, 2012: 126) means female IT Executives behave like men. After all, if women conform to the female gender role, they are deemed not suitable for leadership roles because they do not meet the expected leadership requirements (Powell, 2012: 125). The persistence of the IT Executives was found to be associated with their personality traits. All the participants acknowledged that masculine personality traits made them successful in their pursuit for IT Executive roles. These traits matched typical traits of a leader (*cf.* Table 3-8).

Supplementary to adequate skills for effective leadership, it is crucial for one to have leadership traits. Cutler (2014) highlights that people having leadership traits are considered to be suitable for positions of authority. As such, female IT professionals will be deemed suitable for IT Executive positions if they possess leadership traits. Typical leadership traits are said to be mostly found in men (Rosette & Tost, 2010). This makes men better suited for IT leadership positions than women. However, effective leadership requires leadership traits associated with both men (agentic traits) and women (communal traits) (Rosette & Tost, 2010). The study indicates that IT Executives in the study possessed both agentic and communal leadership traits (*cf.* Section 5.3.2.2 (b)). Women naturally exude communal traits (Rosette & Tost, 2010). None of the participants muted their femininity in order to advance to IT leadership roles. Instead, they adopted agentic traits that fostered their chances of success in a male-dominated field. “Adaptation is used to improve the fit between a person and the work environment with identity changing over time as difficulties and demands of

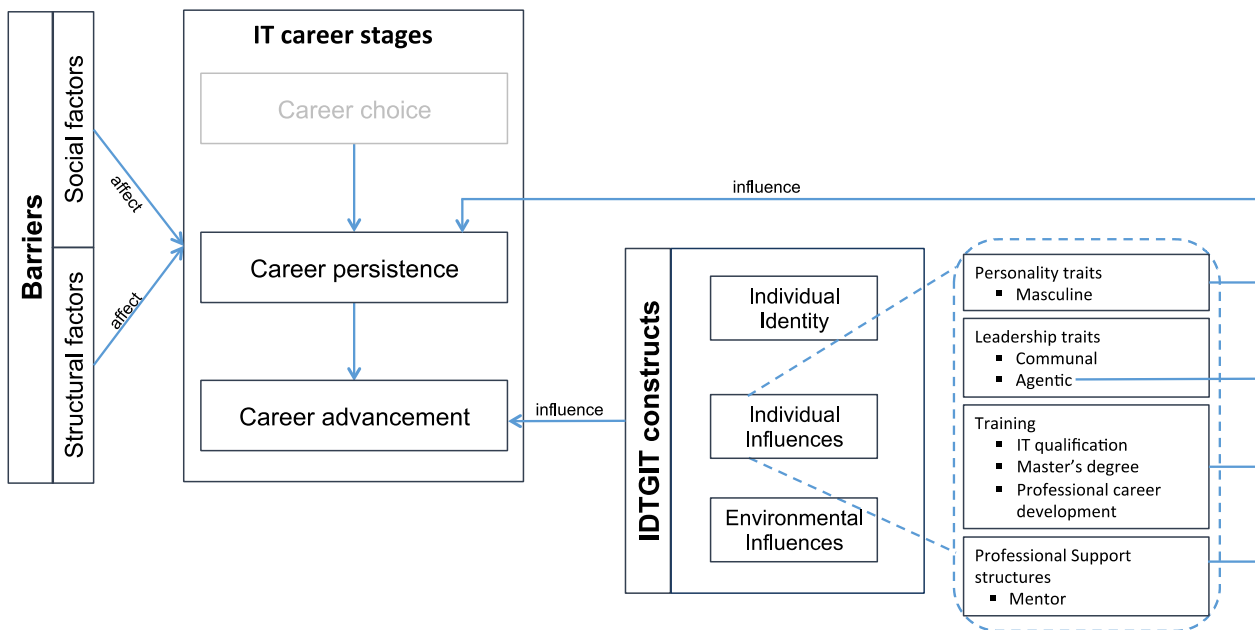
roles impact one's notion of identity" (Buse, Bilimoria & Perelli, 2013). Female IT professionals would therefore need to adapt to the IT field by adopting agentic traits in order to persist in the IT field and subsequently advance to IT Executive positions.

As per the findings from the study, the educational background of the IT Executives had a positive effect on their career progression. Cano *et al.* (2012) state that a good academic education is considered one of the requirements of becoming an IT Executive. Even though there are no uniform mandated qualifications for the IT Executive (Aiken & Gorman, 2013), a formal IT qualification is common among female IT Executives. The majority of the female IT Executives also possess postgraduate degrees at a master's level. Research shows that women enrol in higher education in pursuit of careers in management (Appelbaum *et al.*, 2011). In addition, Cano *et al.* (2012) posit that a master's level qualification in an IT-related discipline is the main requirement for someone in an IT Executive position. However, the study also found that some of the IT Executives have master's level qualifications in general management. Considering that soft skills are critical to the success of a female IT Executive (*cf.* Section 2.2.1), female IT professionals need to acquire and enhance such skills. This can be done by pursuing personal development training (*cf.* Section 5.3.2.2 (c)). Investing in career development efforts will give female IT professionals the motive to persist in the IT field.

Over and above the required competencies of a female IT Executive as discussed above, female IT professionals need to surround themselves with career support structures. The results show that having support had a positive influence in some of the women's persistence and advancement to IT leadership positions (*cf.* Section 5.3.2.2 (d)). A career support structure enhances women's career advancement (Allen *et al.*, 2004). A valuable tool for female IT professionals' advancement to IT Executive positions is mentoring. By having mentors, individuals are better positioned to achieve career success (Allen *et al.*, 2004). It was observed that the female IT Executives in the study who had mentors were able to successfully navigate through the barriers in the IT field.

In summary, factors that shape and influence the progression of female IT professionals to IT leadership levels include having personality traits similar to that of leaders, an IT qualification, a master's level qualification, professional development training, and a mentor. These factors will give an added advantage to female IT professionals' career advancement

opportunities. Figure 6-5 indicates these factors as components of the proposed framework (greyed out portion of the model is outside the scope of this study).



**Figure 6-5: Individual influence of female IT professionals' career progression**

### 6.2.1.3 Environmental influences

Cultural factors play a key role in the participation of women in IT (Ahuja, 2002). According to Hofstede *et al.* (2010: 6), culture is not embedded in genes, but it rather stems from the social environment that one interacts with. Therefore, culture is adaptive and is based on the human capacity to change (Luthans & Doh, 2012: 108). Since female IT Executives interact with both the social and IT industry environments, it means the cultures embedded in these environments can be changed.

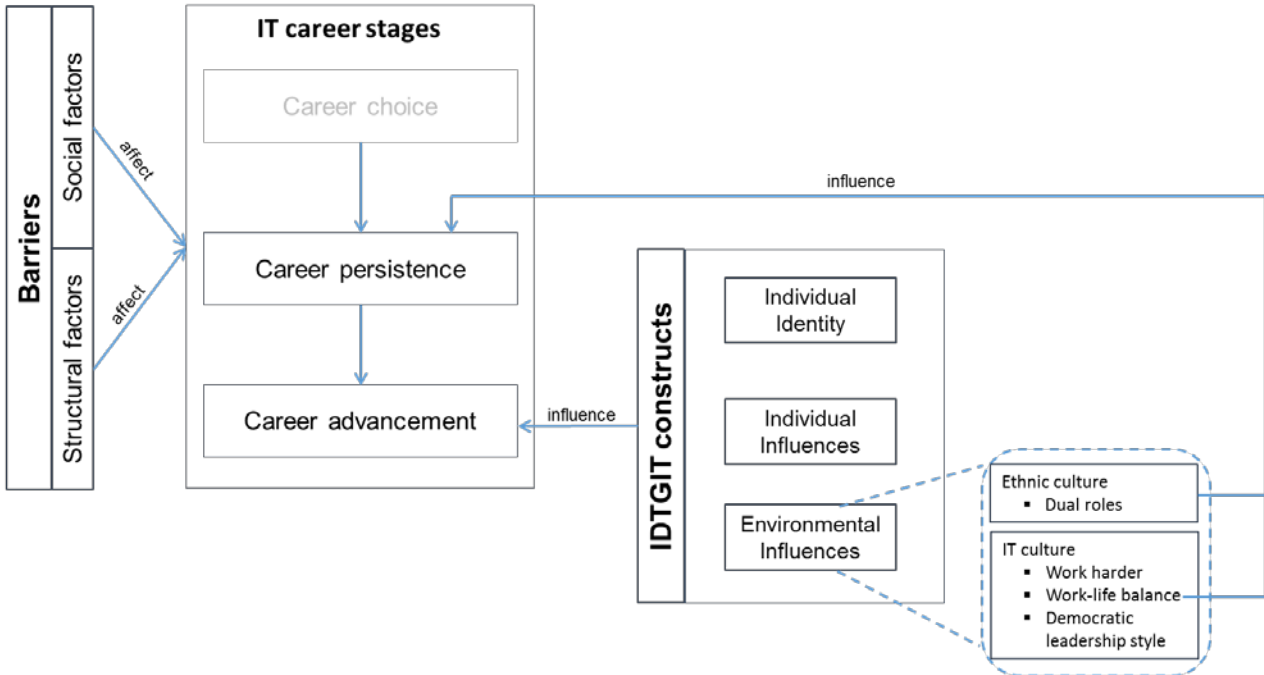
Culture also describes the expected roles that must be fulfilled by both men and women (Alesina *et al.*, 2013). As members of particular ethnic groups and members of the IT field, females are expected to fulfil specific roles in the respective cultures.

From an ethnic culture perspective, the results show that female IT Executives are expected to look after the household while they are also working (*cf.* Section 5.3.3.2 (a)). Family responsibilities are part of the ethnic cultures of South Africans. This implies that female IT Executives occupy both feminine and masculine roles. The study did not highlight family

responsibilities as a hindrance to achieving IT leadership positions. The ability for the IT Executives to fulfil dual roles enabled them to persist in their IT careers. This means that female IT professionals would need to maintain a work-life balance as they progress towards IT Executive positions. Maintaining a work-life balance is instrumental in increasing their chances of career progression as they compete with male colleagues. To ensure that there is no work-life conflict, the results show that female IT Executives have to work harder in order to achieve the same career progress as their male counterparts.

In the context of the IT field, the female IT Executive is the head of the IT department. As such, women experience situations that collide with patriarchal IT culture (Bierema, 2016: 120). Since female IT Executives occupy a role that was traditionally occupied by men, the manner in which they use power to lead the IT departments is important. According to Eagly and Carli (2007), men and women have different leadership styles. To ensure that they are trusted by their male counterparts and their subordinates, female IT Executives have to exhibit the correct leadership style. The findings from the study show that the IT Executives display a democratic leadership style.

Being a female IT Executive is a violation of the feminine gender norm, since a woman in this role would be occupying a masculine role. This is an indication of a cultural norm that women are not equipped to be leaders, let alone be leaders in a male-dominated field. For female IT professionals, the ability to maintain a work-life balance, to fulfil dual roles (feminine and masculine roles), work hard to compete with male counterparts, and to exhibit a democratic leadership style will shape their IT career advancement success as indicated in Figure 6-6 (greyed out portion of the model is outside the scope of this study).



**Figure 6-6: Environmental influences of female IT professionals' career progression**

Figure 6-7 presents an integrated view of the proposed theoretical framework.

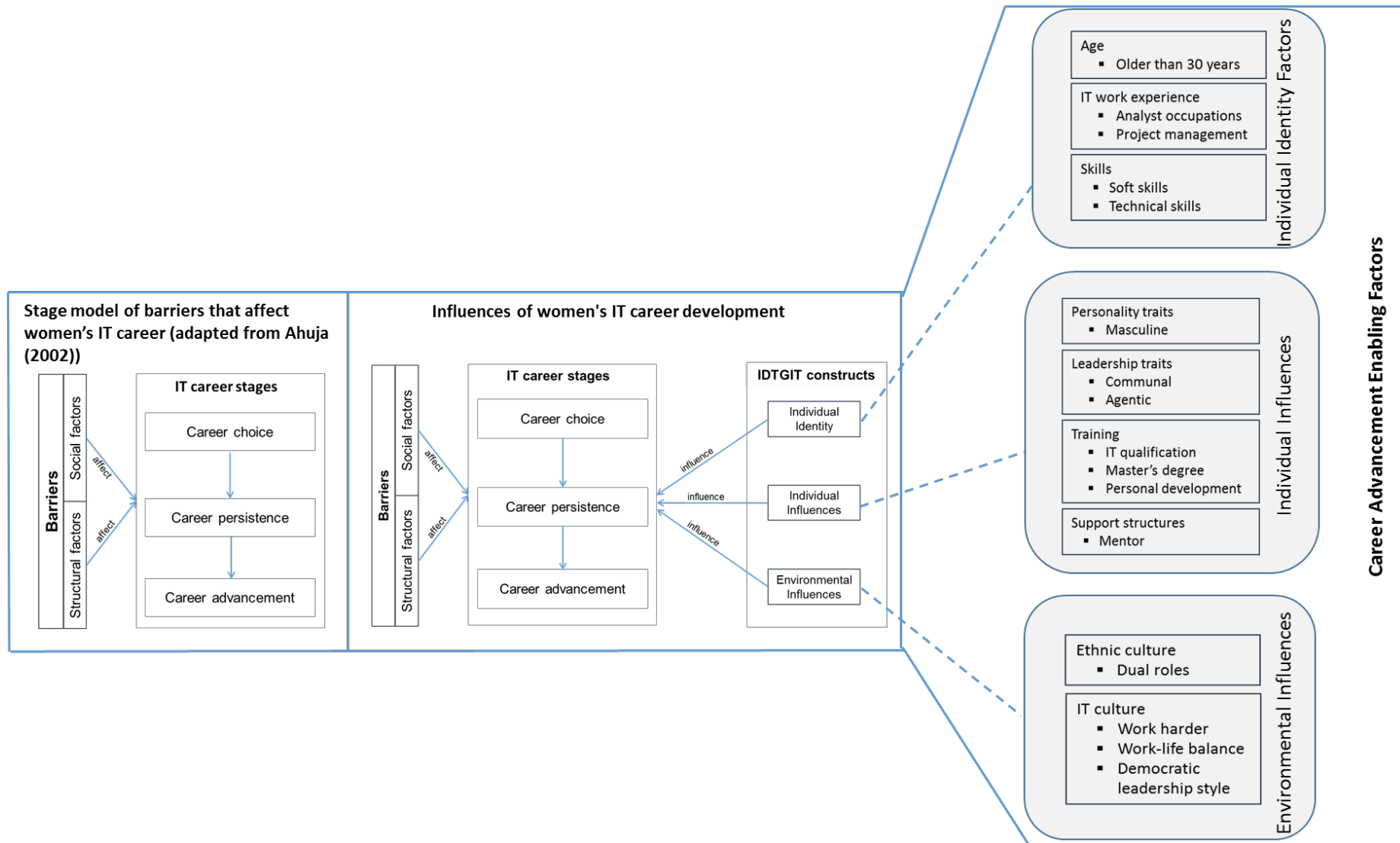


Figure 6-7: A theoretical framework for female IT Professional's advancement to IT Executive positions

### 6.3 CONCLUSION

In this chapter, the findings from the study were used to develop a theoretical framework that will enable the advancement of female IT professionals to IT Executive positions. The theoretical framework uses the concepts of the stage model of barriers that affect women's IT careers (Ahuja, 2002) and the IDTGIT (Trauth, 2002).

Ahuja's model formed the basis upon which the proposed framework was constructed. It was then refined to include the individual differences (IDTGIT) that influenced the IT Executives' career development process. From each of the IDTGIT construct, the following factors were identified as enablers of female IT professionals' advancement to IT Executive positions:

- *Individual identity*: A female IT professional is likely to advance to an IT Executive position if she is above the age of 30 years, has demonstrated IT work experience that is gained by occupying different roles, and has skills balance of both soft and technical skills.
- *Individual influences*: The study showed that masculine personality traits of female IT Executives contributed to their persistence and career advancement, as these resembled traits of a leader. For IT leadership positions, a combination of both communal and agentic leadership traits are required. Over and above the individual characteristics, an IT qualification, a master's level qualification, and professional development training were also noted to be influencers of women's IT career persistence and advancement. Accessibility to a mentor was one of the key factors identified as a contributor to the female IT Executives' success to overcoming the challenges in the IT field.
- *Environmental influences*: Given that female IT Executives engage in both the family and work environments, the ability to fulfil dual roles of looking after the family and bringing income, compete with male counterparts by working hard, maintain a work-life balance, and exhibit a democratic leadership style were noted to influence career persistence and advancement.

The study did not identify one predominant factor that can contribute to the advancement of female IT professionals. The findings instead suggest that a broad range of factors are responsible for the progression of the female IT professionals to IT Executive positions. These factors are mainly personal rather than organisational or industry related. By taking into consideration these elements of the proposed theoretical framework, female IT professionals in South Africa may successfully advance to IT leadership positions. This will subsequently improve the presentation of female IT Executives in South Africa.

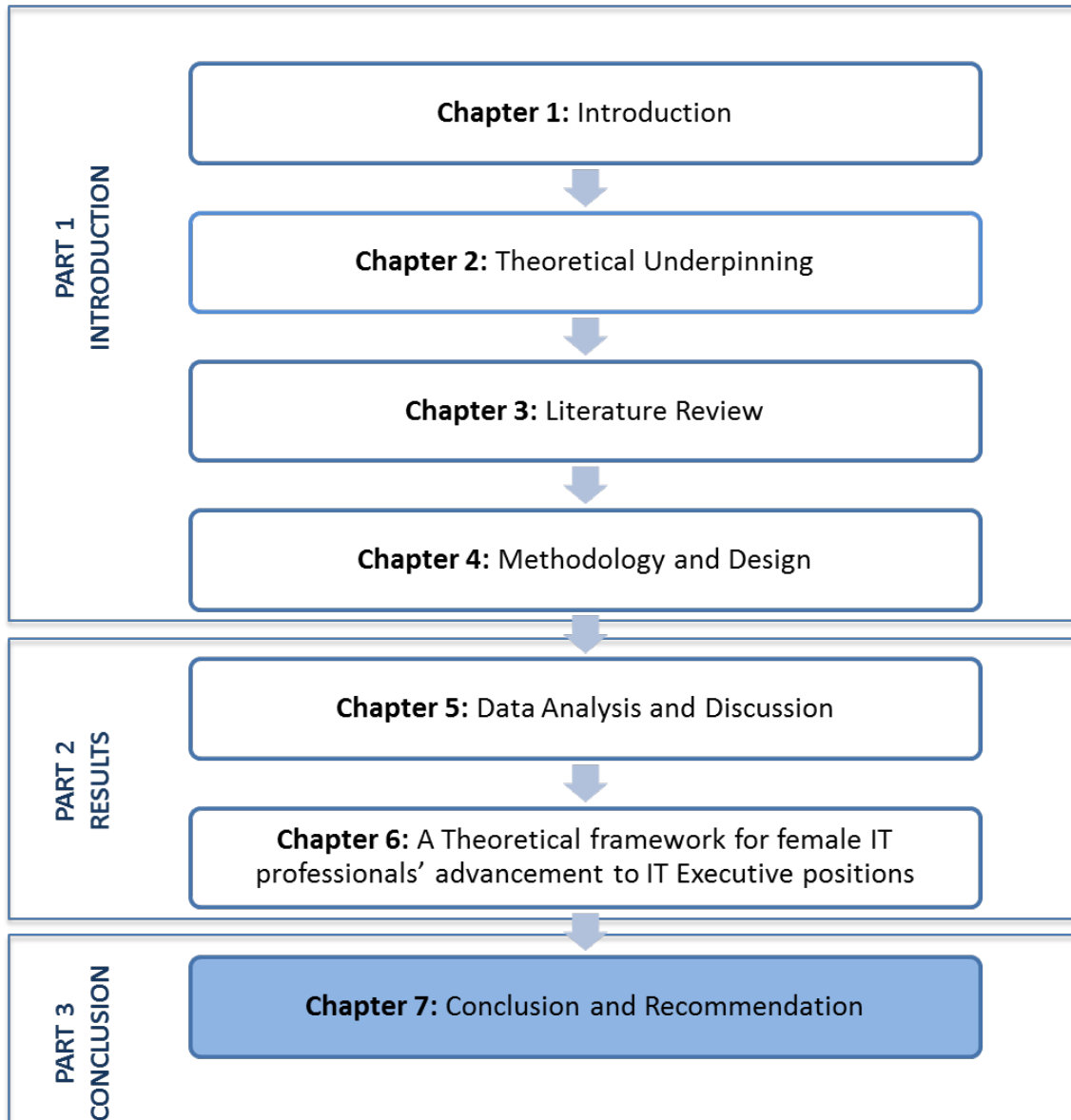
The next and final chapter concludes the study. It provides contributions of the study and recommendations for future research.



# **PART 3**

# **CONCLUSION**

## 7 CONCLUSION AND RECOMMENDATIONS



## 7.1 INTRODUCTION

The aim of this study was to determine how South African female IT professionals could advance to IT Executive positions. This was achieved by developing a theoretical framework to guide female IT professionals' advancement to IT Executive positions. By adopting the proposed theoretical framework, it is envisaged that female IT professionals in South Africa will succeed in achieving IT leadership roles, thereby improving the representation of female IT Executives in the country.

To develop the theoretical framework, an interpretive research approach was adopted and was underpinned by the IDTGIT as a theoretical framework. The IDTGIT aims to explain the underrepresentation of women in the IT field by identifying the influencing factors and also accounts for women who have overcome the barriers in IT (Trauth *et al.*, 2016). Interviews with 15 female IT Executives were conducted to understand how they have overcome barriers in IT to successfully progress to IT leadership positions. The career advancement influencing factors of the research participants along with Ahuja's (2002) stage model of barriers that affect women's entry and performance in the IT field were used to construct the theoretical framework.

To arrive at the theoretical framework as discussed in the penultimate chapter, the study sought to answer the research questions that were asked in Chapter 1 (*cf.* Section 1.5). As a result, the chapter starts by answering these research questions. It continues by evaluating contributions of the study to the body of knowledge. Then implications of the study are presented. The chapter concludes by making recommendations for future studies.

## 7.2 ANSWERS TO RESEARCH QUESTIONS

In Chapter 1, a number of questions were asked to determine how female IT professionals can successfully advance to IT Executive roles amid a labyrinth of barriers in the IT field. These questions are revisited and answered based on the results obtained from the study. The secondary research questions are answered first, followed by the primary research question.

### 7.2.1 Addressing the secondary research questions

*Secondary Research Question 1: Which competencies are required for one to be a successful female IT Executive?*

Literature shows that IT Executives who have the right set of competencies are able to perform their tasks effectively. It is further noted that given the dynamic nature of the IT Executive role, some competencies become redundant in time. However, an IT Executive is expected to possess core competencies that increase his or her chances of success. Competencies of an IT Executive are defined in terms of skills and knowledge. Skills are classified in terms of soft and technical skills, whereas knowledge is described with respect to educational background (*cf.* Section 3.4.2.2).

The strategic nature of the IT Executive role requires female IT Executives to have a combination of both soft and technical skills. Soft skills are required for the effective management of the IT department and engagement with other executives who are part of the TMT. Technical skills enable the female IT Executive to adequately drive the technological direction of the organisation. On that account, it is imperative for the female IT Executive to strike a balance between soft and technical skills (*cf.* Section 5.3.1.2 (b)).

As far as the educational background of the female IT Executive is concerned, the success of the female IT Executive is influenced by a formal qualification. Although a female IT Executive can still achieve IT leadership levels, it emerged from the study that an IT formal qualification was advantageous, as it provides a foundation in the IT field. It was also established from the study that having a master's degree propelled the participants into IT Executive positions (*cf.* Section 5.3.2.2 (c)).

*Secondary Research Question 2: What are the strategies for overcoming barriers to progressing to IT Executive positions?*

The IT Executive role is traditionally known to be a male-specific role. This is because, first, the leadership role is presumably suitable for men while women are considered to be suitable for support roles. Secondly, the IT field is a male-dominated field dominated by masculine values. Because of these reasons, women are confronted with a variety of obstacles that hinder them from progressing to IT leadership levels. There are three

empirical strategies that the female IT Executives in the study employed in their pursuit of leadership positions. Table 7-1 outlines these approaches as identified from the study.

IT career advancement strategy	Description
<p><b>Adoption of leadership traits</b></p>	<p>The masculine values dominating the IT field have created an environment that does not recognise women as capable IT leaders. These values influence how people should behave. With the IT field consisting mostly of males, there is a high likelihood that a female IT Executive will have more males reporting to her than females. To ensure that her authority is not undermined, a female IT Executive needs to adopt leadership traits that are mostly found in men, namely, agentic leadership. Such traits are associated with effective leaders. The research findings and literature show that agentic leadership traits alone are not sufficient for female IT Executives. To be an effective IT Executive, female IT professionals are expected to possess both agentic and communal leadership traits. Consequently, female IT professionals who have strong communal leadership traits need to develop and adopt agentic leadership traits in order to succeed in their roles. Similarly, those with strong agentic leadership traits need to learn and apply communal leadership traits (<i>cf.</i> Section 5.3.2.2, Table 5-26).</p>
<p><b>Professional career development</b></p>	<p>It emerged from the research findings that a formal qualification alone was not adequate for the progression to IT leadership positions. IT-specific qualifications were noted to equip one with technical skills. In answering secondary research</p>

IT career advancement strategy	Description
	<p>question 2 (<i>cf.</i> Section 7.2.1), the importance of soft skills in the role of female IT Executives was highlighted. The soft skills mentioned herein are typically acquired through professional development training courses (<i>cf.</i> Section 5.3.2.2, Table 5-28).</p>
<p><b>Access to mentors</b></p>	<p>To guide the female IT Executives in navigating the IT leadership labyrinth, the research highlighted the importance of having support structures. Support structures in the form of mentors were identified as beneficial throughout the career development of female IT professionals. Bearing in mind that mentorship is provided by a more experienced individual in the field to a less experienced individual, such relationships can be established internal to the female IT professionals' organisation or within the IT field as a whole. The gender of the mentor was noted to be immaterial.</p>

**Table 7-1: Female IT professionals' strategies for overcoming barriers in IT**

*Secondary Research Question 3.1: What are the job expectations of female IT Executives?*

The job expectations of female IT Executives differ according to the strategic objectives of the organisations they work for. The female IT Executive engages with various stakeholders such as the members of the TMT, service providers, internal and external customers, and the staff reporting to her. As a result, each stakeholder would have certain expectations from the female IT Executive. This makes the role of the female IT Executive complex and dynamic. It was noted from the study that there were commonalities among the participants with regard to the responsibilities that they undertake as female IT Executives (*cf.* Section

5.3.1.2, Figure 5-7). Based on these responsibilities, the job expectations of female IT Executives are summed up as follows:

- A visionary who will advise the TMT on the strategic direction that the organisation must take based on technological trends.
- A leader to give direction and support her staff in delivering IT services to the organisation.
- A problem-solver who is able to identify business problems and implement solutions to address these problems, thereby bridging the gap between IT and the business.
- A relationship manager who will facilitate communication between IT service providers, staff, and the organisation at large.
- To support business operations by overseeing IT operations and ensuring that organisational costs are minimised.

From the expectations listed above, it is noted that they do not point to the female gender, but rather general expectations from any individual occupying the IT Executive position regardless of their gender. This infers that the expectations of female IT Executives are similar to their male counterparts.

The job expectations of an IT Executive role are typically outlined in a job description. They provide base criteria of who gets appointed to fulfil the IT Executive role. The job descriptions differ from organisation to organisation because their strategic objectives are different. Be that as it may, the job descriptions are similar in terms of the general responsibilities of an IT Executive. This means there is no way of telling if the job would be suitable for a man or woman by a simple analysis of the IT Executive job description. In a nutshell, the IT leadership role cannot be classified according to gender.

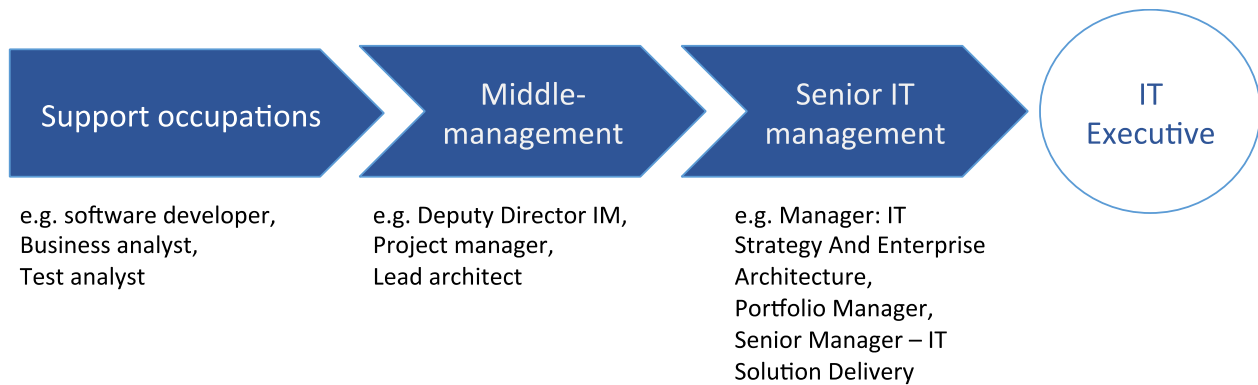
*Secondary Research Question 3.2: What is the career path followed by female IT professionals towards the fulfilment of the IT Executive role?*

Advancement of female IT professionals to IT Executive positions involves following a particular career sequence. The study shows that there is no uniform career sequence for female IT Executive positions. For example, some female IT professionals may start their IT careers as system developers while others may start as IT technicians, but they both end up in IT Executive positions. Although the career sequence for female IT Executives is not uniform, the results show that the career path is linear.

The linear career path of female IT Executives includes occupying a series of positions within the three key categories, namely, Support, Middle management, and Senior management positions. Support-level positions introduce one to work in the IT field. The results show that analysis experience is beneficial to the career progression of female IT professionals. This is because analyst-type occupations provide a platform for one to interact with the business.

Having work experience in the IT field paves the way for advancement to management-level positions, starting with middle management roles. Middle management positions expose one to management responsibilities, though at a smaller scale. It is at this level that female IT professionals manage smaller teams by managing IT projects. The experience acquired from middle management roles presents the female IT professional with the opportunity to advance to senior IT management positions. At senior management levels, a female IT professional is responsible for managing bigger teams than at middle management levels. It was also found that in some cases, some of the people reporting to the senior IT manager are middle managers. Senior IT management occupations are a step away from advancing to IT leadership positions. The career path of a female IT Executive is depicted in Figure 7-1.





**Figure 7-1: Female IT Executive career path**

IT management experience is pivotal to female IT professionals' advancement to IT Executive level. This means one cannot move from being in a support occupation straight into an IT Executive position. As a result, it is imperative that female IT professionals go through the necessary preparatory steps that will enable them to advance to IT Executive positions.

*Secondary Research Question 4: How does culture influence the progression of South African female IT professionals to IT Executive positions?*

Each female IT professional belongs to both an ethnic group and the IT group. In each group, there are inherent cultural values and perceptions about women. From an ethnic, cultural perspective, females are generally not expected to fulfil masculine roles, but rather nurturing roles. The IT Executive role is in itself a masculine role by virtue of it being a leadership role in a male-dominated field. The cultural norm is that women should take care of the home and work in elementary occupations, whereas men are the heads of the family. As such, being a female IT Executive means occupying both feminine and masculine roles.

In the context of the IT field, the IT Executive role is "the head" of the IT department. This implies that as female IT Executives, women in this position are therefore the heads of the IT department. With the understanding that the IT field is male-dominated, having a female IT Executive essentially means that the female IT Executive will have dominance and control over men. Consequently, this would be in contrast to ethnic, cultural beliefs. Since societal, cultural values filter through to the IT work environment, female IT Executives subsequently tend to be treated differently compared to male IT Executives.

The perceptions that women are not meant for leadership positions in general has resulted in female IT Executives being subjected to hostility and prejudice within the male-dominated IT field. This is regardless of African female IT Executives having the required competencies to fulfil the role of the IT Executive. The prejudices experienced by female IT Executives often results in the role of female IT Executives being undermined and their appointments being challenged and questioned. To mitigate the issues around how female IT Executives are treated, they are then forced to behave like men and work twice as hard in order to be as valued and respected as their male counterparts.

The study highlights cultural beliefs as a potential hindrance to women's progression to IT Executive roles. Although there is acceptance of female IT Executives in South Africa's IT field, it is incumbent on the female IT Executives to still maintain the work-life balance. The ability of female IT Executives maintaining a work-life balance is instrumental in increasing their chances of career progression as they compete with male colleagues.

### **7.2.2 Addressing the primary research question**

The main aim of the study is to establish factors that will enable South African female IT professionals to advance to IT Executive positions. This research objective is converted to the following primary research question:

***What are the factors that will enable female IT professionals in South Africa advancing to IT Executive positions?***

The theoretical framework proposed in Chapter 6 serves as a tool for answering the primary research question. It applies the stage model of barriers that affect women's IT careers along with the IDTGIT constructs to explain factors that can contribute to the progression of female IT professionals to IT Executive positions. The framework was developed based on the interviews conducted with female IT Executives. The participants were from different cultural backgrounds with varying experience in the IT field and in the IT Executive role (*cf.* Chapter 5). The study was guided by Eileen Trauth's IDTGIT, whereby the individual experiences of the female IT Executives as they progressed to IT Executive roles were explained using the constructs of the theory. For each IDTGIT construct, factors that explain how female IT professionals can advance to IT leadership positions were identified. These were informed by the experiences of the female IT Executives in the study.

From the individual identity construct, it was revealed that the identity of a female IT Executive can be described by means of her age, IT work experience, and IT leadership skills. Female IT professionals of ages over 30 and have IT management experience are considered suitable for IT leadership positions. It is at this age that individuals are perceived as better equipped to influence the organisation's strategy. Furthermore, it was noted that responsibilities of the female IT Executive require competencies that are acquired through education and experience.

The individual influence construct identified leadership traits, training, and mentorship as factors that influence the women's persistence in the IT field and the progression to the IT Executive position. These individual influencing factors were employed as female IT Executives' strategies for career progression.

Through the environmental influences assessment, the study revealed that both the ethnic, cultural and IT industry cultural beliefs have an influence on the women's IT career progression. To circumvent cultural beliefs in both domains, female IT Executives change some of their behaviours so as to be accommodated. Despite the cultural perceptions of women, the IT Executive expectations are however not gender-specific.

### **7.3 EVALUATION OF CONTRIBUTION TO THE BODY OF KNOWLEDGE**

This section outlines the contribution of this study to the existing body of IS knowledge. Dinham and Scott (2001) assert that an expectation of a doctoral research is to make significant contribution to the discipline in which the research was conducted. Moreover, such research work is presented in terms of an overall conceptual framework (Moses, 1985 cited in Gregor, 2002). The outcome of the research will advance knowledge from theoretical, methodological, and practical perspectives.

The first part of this section describes the criteria used to evaluate the research contribution to IS knowledge. The last section then applies these criteria to discuss the contribution made by this study.

### 7.3.1 Criteria for evaluating contribution to knowledge in Information Systems research

According to Gregor (2002: 1), the expectation from leading journals is for papers that are accepted for publication to make theoretical contributions and add to knowledge. Thus, it is essential to clearly understand the nature of theory in IS (Gregor, 2006: 613). Nonetheless, not much is known in the IS discipline respecting what constitutes theory in IS and what form contributions to knowledge can take (Gregor, 2006: 611). Much of it is attributed to the fact that the IS discipline has a number of referent disciplines such as mathematics, philosophy, sociology, and management, from which theoretical bases are drawn (Gregor, 2002: 2). Each discipline has an influence on the nature of its theory (Gregor, 2006: 613); as such, there is no clear-cut stance on what constitutes theory in IS.

Gregor (2006: 613) posits that IS in general can be better understood through a theory “that links the natural world, the social world, and the artificial world of human constructions”. Gregor further contends that the practicality of theories allows a body of knowledge to be accumulated systematically such that the world can be understood, explained, and predicted.

To solve a particular research problem, Gregor (2006: 619) recommends that a theory that is developed should achieve the following goals:

- Analysis and Description – “The theory provides a description of the phenomena of interest, analysis of relationships among those constructs, the degree of generalisability in constructs and relationships and the boundaries within which relationships and observations hold”.
- Explanation – “The theory provides an explanation of how, why and when things happened, relying on varying views of causality and methods for argumentation”.
- Prediction – “The theory states what will happen in the future if certain preconditions hold”.
- Prescription – “The theory provides a description of the method or structure or both for the construction of an artifact”.

Combining the foregoing goals, Gregor (2006: 620) has therefore identified five types of theories in IS research in Table 7-2 that are used to evaluate the body of knowledge from a particular study.

Type of Theory	Description
<b>Analysis</b>	<p>Says what is.</p> <p>The theory does not extend beyond analysis and description. No causal relationships among phenomena are specified, and no predictions are made.</p>
<b>Explanation</b>	<p>Says what is, how, why, when, and where.</p> <p>The theory provides explanations but does not aim to predict with any precision. There are testable propositions.</p>
<b>Prediction</b>	<p>Says what is and what will be.</p> <p>The theory provides predictions and has testable propositions but does not have well-developed justificatory causal explanations.</p>
<b>Explanation and Prediction (EP)</b>	<p>Says what is, how, why, when, where, and what will be.</p> <p>Provides predictions and has both testable propositions and causal explanations.</p>
<b>Design and Action</b>	<p>Says how to do something.</p> <p>The theory gives explicit prescriptions (e.g. methods, techniques, principles of form and function) for constructing an artifact.</p>

**Table 7-2: Types of theories in IS research**

Source: Gregor (2006: 620)

## 7.4 CONTRIBUTIONS OF THE STUDY

This study will contribute to the field of IS at a theoretical, methodological, and practical level.

- **Theoretical contribution** – The theoretical contribution is twofold. First, Eileen Trauth's Individual Differences Theory of Gender and Information Technology theory was used to understand how the IT career challenges faced by South African female IT professionals could be overcome in order to achieve IT Executive positions. Secondly, due to the poor representation of female IT Executives, a theoretical framework was developed to guide the improvement of the representation of female IT Executives in South Africa.
- **Methodological contribution** – The methodological contribution is through the use of multiple case studies underpinned by an interpretive philosophical paradigm. The adoption of interpretive methods was used to define a theoretical framework that aims to resolve the problem of the underrepresentation of female IT Executives in South Africa.
- **Practical contribution** – Gaining insights into how the female IT Executives in South Africa successfully broke the glass ceiling will enlighten the ICT industry as a whole on the practical reasons women do not progress to executive ICT leadership roles as much as their male counterparts. These insights formed the basis of a theoretical framework that can be applied to improve the status of female IT Executives in South Africa. This theoretical framework can potentially influence the organisational cultures, skills development policies, and possibly the country's legislation on affirmative action. As Trauth (2002) brings out, with understanding comes greater awareness, which, in turn, results in proactive responses by governments and employers to curb the underrepresentation of women in the IT field.

## 7.5 RECOMMENDATIONS FOR FURTHER RESEARCH

The study contributes to the body of knowledge that relates to women in IT. It provides a foundation for further studies in women's IT career advancement in South Africa. Accordingly, recommendations for further research are as follows:

- The study provides insights into the experiences of female IT Executives based in the Gauteng province, South Africa. Further studies could broaden the sample and widen the area covered in the study by including female IT Executives in other provinces.
- Since the sample of ethnic groups in the study was based on South Africa's population composition of each ethnic group, a study could be conducted to explore the career progression of the female IT professionals from different ethnic groups.
- Throughout the study, none of the female IT Executives attributed their ability to break the glass ceiling to the government legislation that aims to promote participation of women in South Africa's labour force. They all devised their own strategies for career advancement. An exploration of the effectiveness of pieces of legislation such as the Employment Equity Act is therefore warranted.
- In this study, comparisons with male IT Executives were not made. Therefore, the possibility that male IT Executives may have different individual factors that influence their career advancement cannot be ruled out. Further studies could be conducted to investigate men's progression to IT leadership positions upon which comparisons can be made.
- It was noted in the study that female IT Executives progressed to leadership positions despite their reasons for pursuing a career in IT. As such, an insightful future study could examine the influence of female IT career anchors on their persistence in the IT field.
- Considering that the proposed theoretical framework has not been tested, it is recommended that it be tested and refined as further research.

## 7.6 CONCLUDING REMARKS

The poor representation of female IT Executives is a revealing symptom of lack of transformation in South Africa's IT field. Having women saturated in senior IT management positions with no organisational and government support for progression beyond this level will not resolve the underrepresentation of female IT Executives in the country. The factors identified in the study may be helpful in enabling female IT professionals who seek to advance to IT Executive positions, thereby improving the representation of female IT Executives in South Africa. Of all the factors mentioned in the study, mentoring was considered one of the critical factors that can assist in overcoming the barriers in the IT field.

Although there are various factors that contribute to the underrepresentation of female IT Executives, the study revealed that cultural stereotypes might have a substantial contribution. As long as current cultural beliefs about the role of women continue to be entrenched in the IT field, the number of female IT Executives in South Africa is likely to be maintained. However, if the status quo is challenged, then over time more women will be seen to fulfil IT Executive positions in both public and private sectors.

In summary, the overall aim of the study was addressed by developing a framework that will enable female IT professionals in South Africa to advance to IT Executive positions as discussed in this chapter. Looking through the lens of female IT Executives' experiences provided a better understanding of how they navigated through the labyrinth of the IT field and succeeded in breaking the glass ceiling.

---

***“Nothing is a waste of time if you use the experience wisely.”***

***(Auguste Rudin)***



## REFERENCES

- ACKER, J. 2006. Inequality regimes gender, class, and race in organisations. *Gender & Society*, vol. 20, no. 4, p. 441-464.
- ACKER, J. 2009. From glass ceiling to inequality regimes. *Sociologie Du Travail*, vol. 51, no. 2, p. 199-217.
- ADAM, A., HOWCROFT, D. & RICHARDSON, H. 2004. A decade of neglect: reflecting on gender and IS. *New Technology, Work and Employment*, vol. 19, no. 3, p. 222-240.
- ADAM, A. & RICHARDSON, H. 2001. Feminist philosophy and information systems. *Information Systems Frontiers*, vol. 3, no. 2, p. 143-154.
- ADAMS, B.G., VAN DE VIJVER, F.J. & DE BRUIN, G.P. 2012. Identity in South Africa: examining self-descriptions across ethnic groups. *International Journal of Intercultural Relations*, vol. 36, no. 3, p. 377-388.
- ADYA, M.P. 2008. Women at work: differences in IT career experiences and perceptions between South Asian and American women. *Human Resource Management*, vol. 47, no. 3, p. 601-635.
- ADYA, M. & KAISER, K.M. 2005. Early determinants of women in the IT workforce: a model of girls' career choices. *Information Technology & People*, vol. 18, no. 3, p. 230-259.
- AHUJA, M.K. 2002. Women in the information technology profession: a literature review, synthesis and research agenda. *European Journal of Information Systems*, vol. 11, no. 1, p. 20-34.
- AIKEN, P. & GORMAN, M.M. 2013. *The case for the chief data officer*. USA: Morgan Kaufmann, Elsevier.
- ALESINA, A., GIULIANO, P. & NUNN, N. 2013. On the origins of gender roles : women and the plough. *The Quarterly Journal of Economics*, vol. 128, no. 2, p. 469-530.

ALEXANDER, T., SCHOEMAN, M., DE KOCK, E., ALEXANDER, B. & PIDERIT, R. 2011. The influence of gender and age on choosing computing courses at South African universities. In *Proceedings of the South African Institute of Computer Scientists and Information Technologists Conference on Knowledge, Innovation and Leadership in a Diverse, Multidisciplinary Environment*, p. 1-10.

ALLEN, T.D., POTEET, M.L., EBY, L.T., LENTZ, E. & LIMA, L. 2004. Career benefits associated with mentoring for protégés: a meta-analysis. *Journal of Applied Psychology*, vol. 89, no. 1, p. 127-136.

ALLISON, D.H. 2010. The future CIO: critical skills and competencies. *ECAR Research Bulletin*, no. 15, p. 1- 14.

APPELBAUM, S.H., ASHAM, N. & ARGHEYD, K. 2011. Is the glass ceiling cracked in information technology? A qualitative analysis: part 1. *Industrial and Commercial Training*, vol. 43, no. 6, p. 354-361.

APPIANING, J. & VAN ECK, R.N. 2015. Gender differences in college students' perceptions of technology-related jobs in computer science. *International Journal of Gender, Science and Technology*, vol. 7, no. 1, p. 28-56.

APRIL, K., DREYER, S. & BLASS, E. 2007. Gender impediments to the South African Executive Boardroom. *South African Journal of Labour Relations*, vol. 31, no. 2, p. 51-67.

ARUN, S. & ARUN, T. 2002. ICTs, gender and development: women in software production in Kerala. *Journal of International Development*, vol. 14, no. 1, p. 39-50.

ASHCRAFT, C. & BLITHE, C. 2010. *Women in IT: The Facts*, National Center for Women & Information Technology. [Online]. Available: [http://ncwit.org/pdf/NCWIT\\_TheFacts\\_rev2010.pdf](http://ncwit.org/pdf/NCWIT_TheFacts_rev2010.pdf) [Cited 30 September 2015].

ASHCRAFT, C., MCLAIN, B. & EGER, E. 2016. *Women in tech: the facts 2016 UPDATE See what's changed and what hasn't*. [Online]. Available: [https://www.ncwit.org/sites/default/files/resources/ncwit\\_women-in-it\\_2016-full-report\\_final-web06012016.pdf](https://www.ncwit.org/sites/default/files/resources/ncwit_women-in-it_2016-full-report_final-web06012016.pdf) [Cited 30 January 2017].

AUH, S. & MENGUC, B. 2005. Top management team diversity and innovativeness: the moderating role of interfunctional coordination. *Industrial Marketing Management*, vol. 34, no. 3, p. 249-261.

AYMAN, R., KORABIK, K. & MORRIS, S. 2009. Is transformational leadership always perceived as effective? Male subordinates' devaluation of female transformational leaders. *Journal of Applied Social Psychology*, vol. 39, no. 4, p. 852-879.

BANKER, R.D., HALL, S. & HU, N. 2008. CIO reporting structure, strategic positioning and firm performance: to whom should the CIO report? *MIS Quarterly*, vol. 35, no. 2, p. 487-504.

BASCHAB, J. & PIOT, J. 2007. *The executive's guide to information technology*. New Jersey: John Wiley & Sons.

BASKERVILLE, R.F. 2003. Hofstede never studied culture. *Accounting, Organisations and Society*, vol. 28, no. 1, p. 1-14.

BASKERVILLE-MORLEY, R.F. 2005. A research note: the unfinished business of culture. *Accounting, Organisations and Society*, vol. 30, no. 4, p. 389-391.

BECERRA-FERNANDEZ, I. & SABHERWAL, R. 2010. *Knowledge management: systems and processes*. New York: M.E. Sharpe.

BENDL, R. & SCHMIDT, A. 2010. From "Glass ceilings" to "Firewalls"-Different metaphors for describing discrimination. *Gender, Work and Organisation*, vol. 17, no. 5, p. 612-634.

BHATTACHARYYA, D.K. 2011. *Performance management systems and strategies*. India: Pearson Education.

BIEREMA, L.L. 2016. Women's leadership: troubling notions of the "ideal"(male) leader. *Advances in Developing Human Resources*, vol. 18, no. 2, p. 119-136.

BLICKENSTAFF, J.C. 2005. Women and science careers: leaky pipeline or gender filter? *Gender and Education*, vol. 17, no. 4, p. 369-386.

BUDLENDER, D. & LUND, F. 2011. South Africa: a legacy of family disruption. *Development and Change*, vol. 42, no. 4, p. 925-946.

BUSE, K., BILIMORIA, D. & PERELLI, S. 2013. Why they stay: women persisting in US engineering careers. *Career Development International*, vol. 18, no. 2, p. 139-154.

BOSAK, J. & SCZESNY, S. 2008. Am I the right candidate? Self-ascribed fit of women and men to a leadership position. *Springer Science and Business Media*, vol. 58, p. 682-688.

BOYATZIS, R.E. 2008. Competencies in the 21st century. *Journal of Management Development*, vol. 27, no. 1, p. 5-12.

BOZKURT, T. 2011. *Management by competencies*. Istanbul.

BRANSON, L., CHEN, L. & REDENBAUGH, K. 2013. The presence of women in top executive positions in non-profit organisations and Fortune 500 companies. *International Journal of Business & Public Administration*, vol. 10, no. 2, p. 15-29.

BREYTENBACH, J. & DE VILLIERS, C. 2012. Supply elasticity within the South African ICT labour market. *Proceedings Annual Workshop of the AIS Special Interest Group for ICT in Global Development*, p. 1-28.

BREYTENBACH, J., DE VILLIERS, C.D. & HEARN, G. 2013. Directing the South African ICT labour force towards growth sectors: A case for non-institutional scarce skills transition and reskilling courses. *AIS Special Interest Group for Education: International Academy for Information Management-AIS SIG-ED IAIM 2013 International Conference on Informatics Education and Research Conference*.

BUDDHAPRIYA, S. 2009. Work-family challenges and their impact on career decisions: a study of Indian women professionals. *Vikalpa*, vol. 34, no. 1, p. 31-45.

Business Women's Association of South Africa (BWASA). 2015. Annual South African women in leadership census.

Business Women's Association of South Africa (BWASA). 2017. Annual South African women in leadership census.

BUYL, T., BOONE, C. & HENDRIKS, W. 2014. Top management team members' decision influence and cooperative behaviour: an empirical study in the information technology industry. *British Journal of Management*, vol. 25, no. 2, p. 285-304.

CAIN, C.C. & TRAUTH, E.M. 2013. The underrepresentation of Black males in IT higher education: a conceptual framework for understanding individual differences. *Proceedings of the Nineteenth Americas Conference on Information Systems*, p. 1-8.

CALITZ, A., EVERT, C. & CULLEN, M. 2015. Promoting ICT careers using a South African ICT career portal. *African Journal of Information Systems*, vol. 7, no. 2, p. 40-61.

CANO, C., FERNANDEZ-SANZ, L. & MISRA, S. 2012. Characterising the position of CIO. *Information Systems and Technologies*, 2012, 7<sup>th</sup> Iberian Conference, p. 1-5.

CASTAÑO, C. & WEBSTER, J. 2011. Understanding women's presence in ICT: the life course perspective. *International Journal of Gender, Science and Technology*, vol. 3, no. 2, p. 364-386.

Catalyst. 2005. *South African women in corporate leadership: Census 2005*. [Online]. Available: <http://www.catalyst.org/system/files/2005SouthAfricanCensus.pdf> [Cited 27 May 2015].

Chartered Management Institute. 2013. *Women in management tackling the talent pipeline*. [Online]. Available: <http://www.managers.org.uk/~media/Angela%20Media%20Library/pdfs/CMI%20Talent%20Pipeline%20White%20Paper.pdf> [Cited 08 October 2015].

CHEN, D.Q. & PRESTON, D.S. 2007. Understanding CIO role effectiveness: the antecedents and consequents. *Proceedings of the Annual Hawaii International Conference on System Sciences*, p. 1-7.

CHEN, D.Q., PRESTON, D.S. & XIA, W. 2010. Antecedents and effects of CIO supply-side and demand-side leadership: a staged maturity model. *Journal of Management Information Systems*, vol. 27, no. 1, p. 231-272.

CHEN, Y. & WU, J. 2011. Information & management IT management capability and its impact on the performance of a CIO. *Information & Management*, vol. 48, no. 4, p. 145-156.

CHESTER, T.M. 2011. Technical skills no longer matter. *Educause Review*, January/February, p. 62-63.

Centre for Higher Education Trust (CHET). 2017. *Enrolments by CESM and major field of study*. [Online]. Available: <http://www.chet.org.za/data/sahe-open-data> [Cited 22 December 2017].

CHEUNG, F.M. & HALPERN, D.F. 2010. Women at the top: powerful leaders define success as work + family in a culture of gender. *The American Psychologist*, vol. 65, no. 3, p. 182-193.

CHHOKAR, J.S., BRODBECK, F.C. & HOUSE, R.J. (Eds.). 2008. *Culture and leadership across the world: The GLOBE book of in-depth studies of 25 societies*. New York, NY: Taylor & Francis Group, LLC.

CHIANG, F. 2005. A critical examination of Hofstede's thesis and its application to international reward management. *The International Journal of Human Resource Management*, vol. 16, no. 9, p. 1545-1563.

CHUN, M. & MOONEY, J. 2009. CIO roles and responsibilities: twenty-five years of evolution and change. *Information & Management*, vol. 46, no. 6, p. 323-334.

CLARK, E. 2012. Women CIOs in higher education highlights framing the study. *EDUCASE*, p. 1-10.

CLARKE, V. & BRAUN, V. 2013. Teaching thematic analysis: overcoming challenges and developing strategies for effective learning. *The Psychologist*, vol. 26, no. 2, 120-123.

CLAUS, V.A., CALLAHAN, J. & SANDLIN, J.R. 2013. Culture and leadership: women in nonprofit and for-profit leadership positions within the European Union. *Human Resource Development International*, vol. 16, no. 3, p. 330-345.

COETZEE, M. & SCHREUDER, A.M.G. 2014. Career anchors as a meta-capacity in career development. In *Psycho-social career meta-capacities: dynamics of contemporary career development*. Edited by M. Coetzee. Springer International Publishing. p. 139-154.

COHEN, A.B. 2009. Many forms of culture. *The American Psychologist*, vol. 64, no. 3, p. 194-204.

COHEN, D. 2012. *The IT skills gap is everyone's business (Part 1)*. [Online]. Available: <http://www.idgconnect.com/blog-abstract/429/douglas-cohen-south-africa-the-it-skills-gap-everyone-business-part> [Cited 22 December 2017].

COSTELLO, T. 2011. IT tech and strategy trends. *IT Pro*, January/February, p. 61-64.

CREAMER, E.G., LEE, S. & MESZAROS, P.S. 2006. Factors associated with women's interest in computing fields. *Research paper presented at the Association for the Study of Engineering Education (ASEE)*, 20th June, Chicago, Illinois.

CRESWELL, J.W. 2007. *Qualitative inquiry & research design: choosing among five approaches, 2<sup>nd</sup> ed.* California: Sage Publications, Inc.

CUADRADO, I., NAVAS, M., MOLERO, F., FERRER, E. & MORALES, J. 2012. Gender differences in leadership styles as a function of leader and subordinates' sex and type of organisation. *Journal of Applied Social Psychology*, vol. 42, no. 12, p. 3083-3113.

CUNNINGHAM, S.J. & MACRAE, C.N. 2011. The colour of gender stereotyping. *British Journal of Psychology*, vol. 102, no. 3, p. 598-614.

CUTLER, A. 2014. *Leadership psychology*. London, UK: Kogan Page Limited.

DANDAPAT, A.K. & SENGUPTA, D. 2012. Women and gender stereotyping in higher education: a case study of Vidyasagar University post-graduates. *International Journal of Research Studies in Education*, vol. 2, no. 1, p. 76-90.

DAVIDSON, M.J. & BURKE, R.J. (Eds.) 2011. *Women in management worldwide: Progress and prospects, 2<sup>nd</sup> ed.* Farnham, England: Gower Publishing Limited.

DAWSON, G.S. & KAUFFMAN, R.J. 2010. Are CIO's any different? Analyzing the job tenures of C-suite executives in the public sector. *Proceedings of the Annual Hawaii International Conference on System Sciences*, p. 1-10.

DE VILLIERS, M.R. 2005. Three approaches as pillars for interpretive information systems research: development research, action research and grounded theory. In *Proceedings of the 2005 annual research conference of the South African Institute of Computer Scientists and Information Technologists on IT research in developing countries, July 2005*, p. 111-120.

DE VILLIERS, C., JOHNSON, R. & CREMER, P. 2012. South African ICT skills deficiency. *AMCIS 2012 Proceedings*, p. 1-12.

DENIS, J.L., LANGLEY, A. & ROULEAU, L. 2010. The practice of leadership in the messy world of organisations. *Leadership*, vol. 6, no. 1, p. 67-88.

DIEKMAN, A.B., BROWN, E.R., JOHNSTON, A.M. & CLARK, E.K. 2010. Seeking congruity between goals and roles. *A New Look At Why Women Opt Out of Science, Technology, Engineering, and Mathematics Careers*, vol. 21, no. 8, p. 1051-1057.

DINHAM, S. & SCOTT, C. 2001. The experience of disseminating the results of doctoral research. *Journal of Further and Higher Education*, vol. 25, no. 1, p. 45-55.

DRURY, M. 2011. Women technology leaders: Gender issues in higher education information technology. *NASPA Journal About Women in Higher Education*, vol. 4, no. 1, p. 96-123.

DUEHR, E.E. & BONO, J.E. 2006. Men, women, and managers: Are stereotypes finally changing? *Personnel Psychology*, vol. 59, no. 4, p. 815-846.

DURAI, P. 2010. *Human Resource Management*. Dorling Kindersley (India) Pvt.

EAGLY, A.H. & CARLI, L.L. 2007. Women and the Labyrinth of Leadership. *Harvard business review*, vol. 85, no. 9, p. 63-71.

EAGLY, A. & JOHANNESSEN-SCHMIDT, M. 2001. The leadership styles of women and men. *Journal of Social Issues*, vol. 57, no. 4, p. 781-797.



EARLEY, P.C. 2009. So what kind of atheist are you? Exploring cultural universals and differences. In *Beyond Hofstede: Culture frameworks for global marketing and management*. Edited by C. Nakata. UK, England: Palgrave Macmillan.

ENNS, H.G., MCFARLIN, D.B. & HUFF, S.L. 2007. How CIOs can effectively use influence behaviours. *MIS Quarterly Executive*, vol. 6, no. 1.

Ernest & Young. 2012. The DNA of the CIO: Opening the door to the C-suite. [Online]. Available: [www.ey.com/Publication/vwLUAssets/DNA\\_of\\_the\\_CIO/\\$FILE/DNA\\_of\\_theCIO.pdf](http://www.ey.com/Publication/vwLUAssets/DNA_of_the_CIO/$FILE/DNA_of_theCIO.pdf) [Cited 18 May 2016].

EVANS, C. 2012. Recruitment initiatives aimed at increasing the gender diversity within ITEC employment: not so “gender neutral”? *Equality, Diversity and Inclusion: An International Journal*, vol. 31, no. 8, p. 741-752.

EVANS, N. 2006. Leading information technology in South Africa: a unique challenge. In *Proceedings of the 2006 ACM SIGMIS CPR conference on computer personnel research: Forty-four years of computer personnel research: achievements, challenges & the future*, April 2006, p. 90-96.

FANG, T. 2006. From “onion” to “ocean”: paradox and change in national cultures. *International Studies of Management & Organisation*, vol. 35, no. 4, p. 71-90.

FERNANDEZ, R. 2007. Culture as learning: the evolution of female labor force participation over a Century. NBER Working Paper, 13373.

FISCHER, R. 2009. Where is culture in cross cultural research?: an outline of a multilevel research process for measuring culture as a shared meaning system. *International Journal of Cross Cultural Management*, vol. 9, no. 1, p. 25-49.

FISHER, C.D. & NEIHOUSER, C.M. 2013. Women’s equality in the workplace. *International Journal of Scientific & Engineering Research*, vol. 4, no. 4, p. 17-53.

FORD, D.P., CONELLY, C.E. & MEISTER, D.B. 2003. Information systems research and Hofstede’s cultures consequences: an uneasy and incomplete partnership. *Engineering Management*, vol. 50, p. 8-24.

FORTINO, A. 2008. Whither the CIO? Evolution from keeper of the infrastructure to firm innovator. *PICMET 2008 Proceedings*, 27-31 July, Cape Town, South Africa, p. 1878-1886.

GEROW, J.E. 2012. What should firms Look for in a CIO? In *Proceedings of the Southern Association for Information Systems Conference, Atlanta, GA, USA March*, p. 23-24.

GILLWALD, A., MOYO, M. & STORK, C. 2012. *Understanding what is happening in ICT in South Africa: a supply- and demand- side analysis of the ICT sector*. [Online]. Available:  
[http://www.researchictafrica.net/publications/Evidence\\_for\\_ICT\\_Policy\\_Action/Policy\\_Paper\\_7\\_-\\_Understanding\\_what\\_is\\_happening\\_in\\_ICT\\_in\\_South\\_Africa.pdf](http://www.researchictafrica.net/publications/Evidence_for_ICT_Policy_Action/Policy_Paper_7_-_Understanding_what_is_happening_in_ICT_in_South_Africa.pdf) [Cited 13 February 2016].

GINIGE, K., AMARATUNGA, D. & HAIGH, R. 2007. Gender stereotypes: a barrier for career development of women in construction.

GISCOMBE, K. 2007. Women in corporate leadership: status and prospects. In *Women and leadership: the state of play and strategies for change*. Edited by B. Kellerman & D.L. Rhode. Jossey-Bass.

GOLDKUHL, G. 2012. Pragmatism vs interpretivism in qualitative information systems research. *European Journal of Information Systems*, vol. 21, no. 2, p. 135-146.

Google Scholar. 2016. [Online]. Available: <https://0-scholar.google.co.za/innopac.up.ac.za/> [Cited 30 May 2015].

GORDON, J.R. & WHELAN-BERRY, K.S. 2005. Contributions to family and household activities by the husbands of midlife professional women. *Journal of Family Issues*, vol. 26, p. 899-923.

GREGOR, S. 2002. A theory of theories in information systems. In S. Gregor and D. Hart (Eds.), *Information Systems Foundations: Building the Theoretical Base*. Canberra: Australian National University.

GREGOR, S. 2006. The nature of theory in information systems. *MIS Quarterly*, September 2006, vol. 30, no. 3, p. 611-642.

GRIFFITHS, M. & MOORE, K. 2010. Disappearing women: a study of women who left the UK ICT sector. *Journal of Technology Management and Innovation*, vol. 5, no. 1, p. 95-107.

GUADALUPE, M., LI, H. & WULF, J. 2014. Who lives in the c-suite organisational structure and the division of labor in top management. *Management Science*, vol. 60, no. 4, p. 824-844.

GUPTA, N. 2015. Rethinking the relationship between gender and technology: a study of the Indian example. *Work, Employment and Society*, vol. 29, no. 4, p. 661-672.

GUPTA, S.D., RAYCHAUDHURI, A. & HALDAR, S.K. 2015. Information technology sector in India and gender inclusivity. *Gender in Management: An International Journal*, vol. 30, no. 2, p. 94-108.

HAMBRICK, D.C. & MASON, P.A., 1984. Upper echelons: the organization as a reflection of its top managers. *Academy of management review*, vol. 9, no. 2, p.193-206.

HANCOCK, D.R. & ALGOZZINE, B. 2006. *Doing case study research: a practical guide for beginning researchers*. Amsterdam Avenue, New York: Teachers College Press.

Harvey Nash, 2012. *Harvey Nash CIO Survey 2012: In search of growth*. [Online]. Available: [http://media.harveynash.com/uk/mediacentre/CIO\\_survey2012US\\_LR.pdf](http://media.harveynash.com/uk/mediacentre/CIO_survey2012US_LR.pdf). [Cited 05 June 2015].

Harvey Nash, 2014. *Harvey Nash CIO Survey* [Online]. Available: [http://www.harveynash.com/group/mediacentre/2014%20CIO\\_survey.pdf](http://www.harveynash.com/group/mediacentre/2014%20CIO_survey.pdf) [Cited 05 June 2015].

Harvey Nash, 2015. *Harvey Nash CIO Survey* [Online]. Available: [https://www.harveynash.com/group/mediacentre/Harvey\\_Nash\\_CIO\\_Survey\\_2015.pdf](https://www.harveynash.com/group/mediacentre/Harvey_Nash_CIO_Survey_2015.pdf) [Cited 05 June 2015].

HASHIM, J. 2008. Competencies acquisition through self-directed learning among Malaysian managers. *Journal of Workplace Learning*, vol. 20, no. 4, p. 259-271.

HASLAM, S.A. & RYAN, M.K. 2008. The road to the glass cliff: differences in the perceived suitability of men and women for leadership positions in succeeding and failing organisations. *Leadership Quarterly*, vol. 19, no. 5, p. 530-546.

HEILMAN, M.E. 2012. Gender stereotypes and workplace bias. *Research in Organisational Behaviour*, vol. 32, p. 113-135.

HODGSON, L. & LANE, M.S. 2010. What are the key job functions and critical competencies required for the role of the CIO in achieving superior organisational performance? *Issues in Informing Science and Information Technology*, vol. 7, p. 257-266.

HOFSTEDE, G., HOFSTEDE, G.J. & MINKOV, M. 2010. *Cultures and organisations: software of the mind, 3<sup>rd</sup> ed.* McGraw-Hill Companies.

HOFSTEE, E. 2006. *Constructing a good dissertation.* South Africa, Johannesburg: Blue Weaver Marketing.

HOYT, C.L. 2010. Women, men, and leadership: exploring the gender gap at the top. *Social and Personality Psychology Compass*, vol. 4, p. 484-498.

HUNTER, G. 2010. The chief information officer: a review of the role. *Journal of Information, Information Technology, and Organisations*, vol. 5, no. 1, p. 125-143.

INGLIS, F. & AERS, L. 2008. *Key concepts in education.* London: SAGE Publications Ltd.

ICT Empowerment Charter Working Group. 2004. *The ICT Charter.* [Online]. Available: <http://www.workinfo.com/BEE/ICTBEECharterNov04.pdf> [Cited 30 May 2015].

Independent Communications Authority of South Africa (ICASA). 2016. Report on the state of the ICT sector in South Africa.

ITIM International Culture and Management Consultants. 2015. Culture GPS Lite.

ITWeb. 2011. *CIO Directory, 2<sup>nd</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2012. *CIO Directory, 3<sup>rd</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2013. *CIO Directory, 4<sup>th</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2014. *CIO Directory, 5<sup>th</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2015. *CIO Directory, 6<sup>th</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2016. *CIO Directory, 7<sup>th</sup> ed.* Rivonia, South Africa: ITWeb Limited.

ITWeb. 2010. JCSE-ITWeb Skills Survey Summary of Main Findings. [Online]. Available: [http://www.mict.org.za/downloads/2010\\_Skills\\_Survey\\_Report\\_v2\\_1.pdf](http://www.mict.org.za/downloads/2010_Skills_Survey_Report_v2_1.pdf) [Cited 14 April 2018].

JOHARI, J. 2009. Interpretivism in Information System (IS) Research. *Integration & Dissemination*, vol. 4, p. 25-27.

JONES, M.L. 2007. Hofstede-culturally questionable? *Oxford Business & Economics Conference*, p. 24-26.

JOSEPH, D., ANG, S. & SLAUGHTER, S. 2005. Identifying the prototypical career paths of IT professionals: a sequence and cluster analysis. In *Proceedings of the 2005 ACM SIGMIS CPR conference on Computer personnel research*, p. 94-96.

JOSEPH, D., BOH, W.F., ANG, S. & SLAUGHTER, S.A. 2012. The career paths less (or more) traveled: a sequence analysis of IT career histories, mobility patterns, and career success. *MIS Quarterly*, p. 427-452.

JOSHI, K.D., KVASNY, L., MCPHERSON, S., TRAUTH, E., KULTUREL-KONAK, S. & MAHAR, J. 2010. Choosing IT as a career: exploring the role of self-efficacy and perceived importance of IT skills. *ICIS 2010 Proceedings*.

JOUBISH, M.F., KHURRAM, M.A., AHMED, A., FATIMA, S.T. & HAIDER, K. 2011. Paradigms and characteristics of a good qualitative research. *World Applied Sciences Journal*, vol. 12, no. 11, p. 2082-2087.

JUDGE, T.A., BONO, J.E., ILIES, R. & GERHARDT, M.W. 2002. Personality and

leadership: a qualitative and quantitative review. *Journal of Applied Psychology*, vol. 87, no. 4, p. 765-780.

KAHN, B. & BLAIR, B. 2009. *Information nation: seven keys to information management compliance, 2<sup>nd</sup> ed.* Indianapolis: Wiley Publishing Inc.

KAO, K.Y., ROGERS, A., SPITZMUELLER, C., LIN, M.T. & LIN, C.H., 2014. Who should serve as my mentor? The effects of mentor's gender and supervisory status on resilience in mentoring relationships. *Journal of Vocational Behavior*, vol. 85, no. 2, p.191-203.

KARAHANNA, E. & WATSON, R.T. 2006. Information systems leadership. *IEEE Transactions on Engineering Management*, vol. 53, no. 2, p. 171.

KARANJA, E. & ZAVERI, J. 2012. IT leaders: who are they and where do they come from? *Journal of Information Systems Education*, vol. 23, no. 2, p. 143-164.

KEEGAN, S. 2009. *Qualitative research: good decision making through understanding people, cultures and markets.* London: Kogan Page Publishers.

KHALLAF, A. & SKANTZ, T. 2011. Does long term performance improve following the appointment of a CIO? *International Journal of Accounting Information Systems*, vol. 12, p. 57-78.

KINDSIKO, E. & TÜRK, K. 2016. Detecting major misconceptions about employment in ICT: a study of the myths about ICT work among females. *World Academy of Science, Engineering and Technology, International Journal of Social, Behavioural, Educational, Economic, Business and Industrial Engineering*, vol. 11, no. 1, p. 107-114.

KIRKPATRICK, S.A. & LOCKE, E.A. 1991. Leadership: do traits matter? *Academy of Management Executive*, vol. 5, no. 2, p. 48-60.

KIRLIDOG, M., VAN DER VYVER, C., ZEEMAN, M. & COETZEE, W. 2016. Unfulfilled need: reasons for insufficient ICT skills In South Africa. *Information Development*, vol. 34, no. 1, p. 5-19.

KOENIG, A.M., EAGLY, A.H., MITCHELL, A.A. & RISTIKARI, T. 2011. Are leader stereotypes masculine? A meta-analysis of three research paradigms. *Psychological Bulletin*, vol. 137, no. 4, p. 616-642.

KOHUN, F.G., BURCIK, V. & SKOVIRA, R.J. 2012. Research into Hofstede' thesis. *Management, Knowledge and Learning*, p. 989-997.

LAMB, R. & KLING, R. 2003. Reconceptualizing users as social actors in Information Systems research. *MIS Quarterly*, vol. 27, no. 2, p. 197-235.

LANG, C. 2007. Twenty-first century Australian women and IT: exercising the power of choice. *Computer Science Education*, vol. 17, no. 3, p. 215-226.

LEE, P., STEWART, D. & CALUGAR-POP, C. 2016. *Technology, media, & telecommunications predictions*. [Online]. Available: <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/gx-tmt-prediction-2016-full-report.pdf> [Cited 14 April 2018].

LEIDNER, D.E. & KAYWORTH, T. 2006. Review: a review of culture in Information Systems research: toward a theory of information technology culture conflict. *MIS Quarterly*, vol. 30, no. 2, p. 357-399.

LEUNG, K. & VAN DE VIJVER, F.J.R. 2008. Strategies for strengthening causal inferences in cross cultural research: the consilience approach. *International Journal of Cross Cultural Management*, vol. 8, no. 2, p. 145-169.

LI, Y. & TAN, C.H. 2009. Aligning CIO characteristics to business strategy: an empirical investigation. In *System Sciences, 42<sup>nd</sup> Hawaii International Conference*, p. 1-10.

LIM, J., STRATOPOULOS, T.C. & WIRJANTO, T.S. 2012. Role of IT executives in the firm's ability to achieve competitive advantage through IT capability. *International Journal of Accounting Information Systems*, vol. 13, vol. 1, p. 21-40.

LITTRELL, R.F. & NKOMO, S.M. 2010. Gender and race differences in leader behaviour preferences in South Africa. *Women in Management Review*, vol. 20, no. 8, p. 562-580.

LOTRIET, H.H., MATTHEE, M.C. & ALEXANDER, P.M. 2010. Challenges in ascertaining ICT skills requirements in South Africa. *South African Computer Journal*, vol. 46, p. 38-48.

LUMLEY, E.J., COETZEE, M., TLADINYANE, R. & FERREIRA, N. 2011. Exploring the job satisfaction and organisational commitment of employees in the information technology environment. *Southern African Business Review*, vol. 15, no. 1, p. 100-118.

LUTHANS, F. & DOH, J.P. 2012. *International management: culture, strategy, and behaviour*, 8<sup>th</sup> ed. New York, NY: McGraw-Hill Irwin.

MAJOR, D.A., DAVIS, D.D., SANCHEZ-HUCLES, J., DOWNEY, H.J. & GERMANO, L.M. 2007. Myths and realities in the IT workplace: gender differences and similarities in climate perceptions. In *Women and minorities in science, technology, engineering, and mathematics: upping the numbers*. Edited by R.J. Burke & M.C. Mattis. Edward Elgar Publishing.

MATHE, K., MICHIE, S. & NELSON, D.L. 2011. Women in management in the USA. In *Women in management worldwide: progress and prospects*, 2<sup>nd</sup> ed. Edited by M.J. Davidson & R.J. Burke. Farnham, England: Gower Publishing Limited.

MATHUR-HELM, B. 2005. Equal opportunity and affirmative action for South African women: a benefit or barrier? *Women in Management Review*, vol. 20, no. 1, p. 56-71.

MATHUR-HELM, B. 2011. Women in management in South Africa. In *Women in management worldwide: progress and prospects*, 2<sup>nd</sup> ed. Edited by M.J. Davidson & R.J. Burke. Farnham, England: Gower Publishing Limited.

MATTESON, M.L., ANDERSON, L. & BOYDEN, C. 2016. "Soft skills": a phrase in search of meaning. *Libraries and the Academy*, vol. 16, no. 1, p. 71-88.

MCGEE, K. 2008. Meet your next CIO. *Gartner Research*, Stamford.

MCKINNEY, B.V.R., WILSON, D.D., BROOKS, N., LEARY-KELLY, A.O. & HARDGRAVE, B. 2008. Women and men in the IT profession. *Communications of the ACM*, vol. 51, no. 2, p. 81-84.



Media, Information and Communication Technologies Sector Education and Training Authority (MICT SETA). 2015. Sector skills plan 2016 to 2021.

MIHALČOVÁ, B., PRUŽINSKÝ, M. & GONTKOVIČOVÁ, B. 2015. The consequences of gender stereotypes in the work of managers. *Procedia Economics and Finance*, vol. 23, October 2014, p. 1260-1265.

MIKKOLA, A. & MILES, C.A. 2007. Development and gender equality: consequences, causes, challenges and cures. In *UNU-WIDER Project Meeting on "Gender and Food Security"*, May, p. 17-19.

MINTZBERG, H. 2013. *Simply managing: what managers do—and can do better*. San Francisco: Berrett-Koehler Publishers.

MKHIZE, H. 2015. *Uniting women to move South Africa into a digital economy*. 18 August 2015, uMfolozi FET College-eSikhawini Campus. [Online]. Available: [https://www.dtps.gov.za/index.php?option=com\\_content&view=article&id=520:commemoration-of-women's-month&catid=10&Itemid=137](https://www.dtps.gov.za/index.php?option=com_content&view=article&id=520:commemoration-of-women's-month&catid=10&Itemid=137) [Cited 03 March 2016].

MOGHADDAM, G.G. 2010. Information technology and gender gap: toward a global view. *The Electronic Library*, vol. 28, no. 5, p. 722-733.

MOORE, T.S., LAPAN, S.D. & QUARTAROLI, M.T. 2011. Case study research. In *Qualitative research: an introduction to methods and designs*. Edited by S.D. Lapan, M.T. Quartaroli & F.J. Riemer. vol. 37. John Wiley & Sons.

MYERS, M.D. 2013. *Qualitative research in business & management, 2<sup>nd</sup> ed*. London: Sage Publications.

NELSON, K. & VELTRI, N. 2011. Women in information technology careers: a person-process-context-time framework. In *Proceedings of ECIS*.

NEWMAN, J. 2005. *Gender and cultural change*. In *Gender, culture and organisational change: Putting theory into practice*. Edited by C. Itzin & C. Newman. New York, NY: Routledge.

NJOKI, M.M., WABWOBA, F. & MICHENI E.M. 2016. ICT definition implication on ICT career choice and exclusion among women. *I.J. Information Technology and Computer Science*, vol. 5, p. 62-71.

NOBLE, C. & MOORE, S. 2006. Advancing women and leadership in this post feminist, post EEO era: a discussion of the issues. *Women In Management Review*, vol. 21, no. 7, p. 598-603.

NORTHOUSE, P.G. 2016. *Leadership: theory and practice, 7<sup>th</sup> ed.* London, UK: SAGE Publications, Inc.

NUNNO, T., EDWARDS, J. & LEE, P. 2015. CIO Agenda 2015: A gender perspective. 13 April, Gartner.

O'BRIEN, K.E., BIGA, A., KESSLER, S.R. & ALLEN, T.D. 2010. A meta-analytic investigation of gender differences in mentoring. *Journal of Management*, vol. 36, no. 2, p. 537-554.

O'DELL, C. & HUBERT, C. 2011. *The new edge in knowledge: how knowledge management is changing the way we do business.* New Jersey: John Wiley & Sons, Inc.

O'NEIL, D.A., HOPKINS, M.M. & BILIMORIA, D. 2008. Women's careers at the start of the 21<sup>st</sup> century: patterns and paradoxes. *Journal of Business Ethics*, vol. 80, p. 727-743.

OATES, B.J. 2006. *Researching Information Systems and computing.* London: SAGE Publications Ltd.

OLIVIER, M.S. 2009. *Information technology research: a practical guide for computer science and informatics, 3<sup>rd</sup> ed.* Pretoria, South Africa: Van Schaik Publishers.

OWEN, J. 2012. *The leadership skills handbook: 50 essential skills you need to be a leader, 2<sup>nd</sup> ed.* London, United Kingdom: Kogan Page Limited.

PEPPARD, J. 2010. Unlocking the performance of the chief information officer (CIO). *California Management Review*, vol. 52, no. 4, p. 73-100.

PEPPARD, J., EDWARDS, C. & LAMBERT, R. 2011. Clarifying the ambiguous role of the CIO. *MIS Quarterly Executive*, vol. 10, no. 1, p. 31-44.

PERRONE, K.M., WRIGHT, S.L. & JACKSON, Z.V. 2009. Traditional and nontraditional gender roles and work-family interface for men and women. *Journal of Career Development*, vol. 36, no. 1, p. 8-24.

POWELL, G.N. 2012. Six ways of seeing the elephant: the intersection of sex, gender, and leadership. *Gender in Management: An International Journal*, vol. 27, no. 2, p. 119-141.

POWELL, C. & CHANG, A.M., 2016. Women in Tech as a driver for growth in emerging economies. *Council on Foreign Relations*.

PRESTON, D.S., CHEN, D. & LEIDNER, D.E. 2008. Examining the antecedents and consequences of CIO strategic decision-making authority: an empirical study. *Decision Sciences*, vol. 39, no. 4, p. 605-642.

PRESTON, D.S., KARAHANNA, E. & ROWE, F. 2006. Development of shared understanding between the chief information officer and top management team in U.S. and French organisations: A cross-cultural comparison. *IEEE Transactions On Engineering Management*, vol. 53, no. 2, p. 191-206.

PRETORIUS, H.W., MAWELA, T., STRYDOM, I., DE VILLIERS, C. & JOHNSON, R.D. 2015. Continuing the discourse of women in information technology: a South African perspective. *Gender, Technology and Development*, vol. 19, no. 3, p. 346-369.

QUESENBERRY, J.L. 2007. *Career values and motivations: a study of women in the information technology workforce*. Pennsylvania, USA: The Pennsylvania State University, State College. (PhD thesis.)

QUESENBERRY, J.L. & TRAUTH, E.M. 2007. What do women want?: an investigation of career anchors among women in the IT workforce. In *Proceedings of the 2007 ACM SIGMIS CPR conference on Computer personnel research: The global information technology workforce, April 2007*, p. 122-127.

QUESENBERRY, J.L. & TRAUTH, E.M. 2012. The (dis)placement of women in the

IT workforce: an investigation of individual career values and organisational interventions. *Information Systems Journal*, vol. 22, no. 6, p. 457-473.

RAGHURAM, P., HERMAN, C., RUIZ-BEN, E. & SONDHI, G. 2017. *Women and IT scorecard – India*. [Online]. Available: [http://gsm-it.com/userassets/Publications/GSM-IT\\_SCORECARD-INDIA\\_Spring\\_2017\\_web.pdf](http://gsm-it.com/userassets/Publications/GSM-IT_SCORECARD-INDIA_Spring_2017_web.pdf) [Cited 28 April 2018].

RAMÍREZ, E. & RUBEN, R. 2015. Gender systems and women's labor force participation in the salmon industry in Chiloé, Chile. *World Development*, vol. 73, p. 96-104.

RANGANATHAN, C. & JHA, S. 2008. Do CIOs matter? Assessing the value of CIO presence in top management teams. In *Proceedings of Twenty Ninth International Conference on Information Systems*, p. 1- 11.

REID, M.F., ALLEN, M.W., ARMSTRONG, D.J. & RIEMENSCHNEIDER, C.K. 2010. Perspectives on challenges facing women in IS: the cognitive gender gap. *European Journal of Information Systems*, vol. 19, no. 5, p. 526-539.

RHODE, D.L. & KELLERMAN, B. 2007. The underrepresentation of women in leadership roles. In *Women and leadership: the state of play and strategies for change*. Edited by B. Kellerman & D.L. Rhode. Jossey-Bass.

RIDGEWAY, C.L. 2011. *Framed by gender: how gender inequality persists in the modern world*. Oxford, New York: Oxford University Press, Inc.

RIDGEWAY, C.L. & KRICHELI-KATZ, T. 2013. Intersecting cultural beliefs in gender, race and class binds and freedoms. *Gender & Society*, vol. 27, no. 3, p. 294-318.

RODRIGUES, R., GUEST, D. & BUDJANOVCANIN, A. 2013. From anchors to orientations: towards a contemporary theory of career preferences. *Journal of Vocational Behaviour*, vol. 83, no. 2, p. 142-152.

ROGERS, V.L.N., 2015. Women in IT: The Endangered Gender. In *Proceedings of the 2015 ACM Annual Conference on SIGUCCS*, p. 95-98.

ROHLANDER, D. 2014. *Idiot's guides: management skills*. USA: Penguin Group Inc.

ROODT, J. & PATERSON, A. 2008. ICT skills in the labour market: an occupational-level analysis focusing on computer professionals and associate professionals, 1996-2005. *Scarce and critical skills research project for the Department of Labour in South Africa*. [Online]. Available: [http://www.labour.gov.za/downloads/documents/research-documents/ICT%20skills\\_DoL\\_Report.pdf](http://www.labour.gov.za/downloads/documents/research-documents/ICT%20skills_DoL_Report.pdf) [Cited 22 December 2017].

ROSETTE, A.S. & TOST, L.P. 2010. Agentic women and communal leadership: how role prescriptions confer advantage to top women leaders. *The Journal of Applied Psychology*, vol. 95, no. 2, p. 221-235.

RYAN, M.K. & HASLAM, S.A. 2007. The glass cliff: exploring the dynamics surrounding the appointment of women to precarious leadership positions. *Academy of Management Review*, vol. 32, no. 2, p. 549-572.

RUST, B. 2012. Five soft skills for technology leaders in K-12 education. *Gartner Research*, Stamford.

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. *Research methods for business student, 5<sup>th</sup> ed*. London: Financial Times-Prentice Hall.

SCHEIN, V.E. 2007. Women in management: reflections and projections. *Women in Management Review*, vol. 22, no. 1, p. 6-18.

SCHERMERHORN, J.R. 2013. *Management, 12<sup>th</sup> ed*. New Jersey: John Wiley & Sons, Inc.

SHANMUGAM, M.M. 2017. Impact of parenthood on women's careers in the IT sector – a study in the Indian context. *Gender in Management: An International Journal*, vol. 32, no. 5, p. 352-368.

SIVAKUMAR, N. & TAMILSELVAN, P.R.J. 2014. Women in IT. *Journal Impact Factor*, vol. 3, no. 1, p. 19-25.

SMALTZ, D.H., SAMBAMURTHY, V. & AGARWAL, R. 2006. The antecedents of CIO role effectiveness in organisations: an empirical study in the healthcare sector. *IEEE Transactions on Engineering Management*, vol. 53, no. 2, p. 207-222.

SMITH, G.S. 2013. *Straight to the top: CIO leadership in mobile, social and cloud-based world*, 2<sup>nd</sup> ed. New Jersey: John Wiley & Sons, Inc.

SOE, L. & YAKURA, E.K. 2008. What's wrong with the pipeline? Assumptions about gender and culture in IT work. *Women's Studies*, vol. 37, no. 3, p. 176-201.

The Employment Equity Act of South Africa, Act No. 55 of 1998. 1998.

Department of Labour. 2006. *Women in the South African Labour Market 1995-2005*. [Online]. Available: <http://www.labour.gov.za/DOL/downloads/documents/useful-documents/labour-market-research-and-statistics/Labour%20Market%20Research%20-%20Women%20in%20the%20South%20African%20Labour%20Market%201995%20-%202005.pdf> [Cited 30 May 2015].

Department of Telecommunications and Postal Services. 2014. *11 ICT policy review-supplementary insights-information technology*. [Online]. Available: [https://www.dtps.gov.za/index.php?option=com\\_phocadownload&view=category&id=23:executive-summary-ict-policy-review-feb-2014&Itemid=143](https://www.dtps.gov.za/index.php?option=com_phocadownload&view=category&id=23:executive-summary-ict-policy-review-feb-2014&Itemid=143) [Cited 19 December 2017].

Department of Women. 2015a. *Programme 2: Social transformation and economic empowerment*. [Online]. Available: <http://www.women.gov.za/index.php/about-us/programmes> [Cited 22 December 2017].

Department of Women. 2015b. *The status of women in the South African economy*. [Online]. Available: <http://www.women.gov.za/index.php/documents/92-south-africa-s-status-of-women-report-2015> [Cited 13 December 2017].

SouthAfrica.info. 2015. *Gauteng province, South Africa*. [Online]. Available: <http://www.southafrica.info/about/geography/gauteng.htm#.VtHKrFY9I0Q> [Cited 27 February 2016].

STAINBACK, K., KLEINER, S. & SKAGGS, S. 2015. Women in power: undoing or redoing the gendered organisation? *Gender & Society*, vol. 30, no. 1, p. 109-135.

Statistics South Africa (STATSSA). 2011. *Census 2011*. [Online]. Available: <http://www.statssa.gov.za/publications/P03014/P030142011.pdf> [Cited 3 June 2015].

Statistics South Africa (STATSSA). 2016. *General household survey*. [Online]. Available: <http://www.statssa.gov.za/publications/P0318/P03182016.pdf> [Cited 13 April 2018].

Statistics South Africa (STATSSA). 2017a. *Information and Communication Technology satellite account for South Africa*. [Online]. Available: <http://www.statssa.gov.za/publications/Report-04-07-01/Report-04-07-012014.pdf> [Cited 13 April 2018].

Statistics South Africa (STATSSA). 2017b. *Quarterly labour force survey, Quarter 4 2017*. [Online]. Available: <http://www.statssa.gov.za/publications/P0211/P02114thQuarter2017.pdf> [Cited 13 April 2018].

STEVENSON, D.H. & STARKWEATHER, J.A. 2010. PM critical competency index: IT execs prefer soft skills. *International Journal of Project Management*, vol. 28, no. 7, p. 663-671.

STRAUB, D., LOCH, K., EVARISTO, R., KARAHANNA, E. & SRITE, M. 2002. Toward a theory-based measurement of culture. *Human Factors in Information Systems*, vol. 10, no. 1, p. 61-65.

SURIYA, M. 2008. Women in the IT profession in India – the millennium scenario. *Women in Engineering ProActive Network*.

TARAS, V. & STEEL, P. 2009. Beyond Hofstede: challenging the ten commandments of cross-cultural research. In *Beyond Hofstede: culture frameworks for global marketing and management*. Edited by C. Nakata. UK, England: Palgrave Macmillan.

The Guardian. 2014a. *Women in technology: no progress on inequality for 10 years*. [Online]. Available: <http://www.theguardian.com/technology/2014/may/14/women-technology-inequality-10-years-female> [Cited 06 October 2015].

The Guardian. 2014b. *The tech industry gender gap: what we can learn from Europe*. [Online]. Available: <http://www.theguardian.com/women-in-leadership/2014/jul/02/tech-industry-gender-gap-europe> [Cited 08 October 2015].

THORNTON, G. 2013. Women in senior management: setting the stage for growth. *Grant Thornton International Business Report*, p. 1-12.

THORNTON, G. 2015. Women in business: the path to leadership. *Grant Thornton International Business Report*.

THUDUGALA, K. & WEERAWARANA, S.M. 2013. Requisite competencies for government chief information officer in Sri Lanka. *Global Business and Economics Research Journal*, vol. 2, no. 7, p. 1-11.

TINLINE, G. & COOPER, C. 2016. *The outstanding middle manager: how to be a healthy, happy, high-performing mid-level manager*. London, United Kingdom: Kogan Page Publishers.

TRAUTH, E.M. 2002. Odd girl out: an individual differences perspective on women in the IT profession. *Information Technology & People*, vol. 15, no. 2, p. 98-118.

TRAUTH, E.M. 2006. Theorising gender and information technology research. *Human Computer Interaction: Concepts, Methodologies, Tools, and Applications*, p. 1154-1159.

TRAUTH, E.M. 2013. The role of theory in gender and Information Systems research. *Information and Organisation*, vol. 23, no. 4, p. 277-293.

TRAUTH, E.M., CAIN, C.C., JOSHI, K.D., KVASNY, L. & BOOTH, K.M. 2016. The influence of gender-ethnic intersectionality on gender stereotypes about IT skills and knowledge. *Database for Advances in Information Systems*, vol. 47, no. 3, p. 9-39.

TRAUTH, E. & QUESENBERRY, J. 2006. Are women an underserved community in the information technology profession? *ICIS 2006 Proceedings*, December 2006, p. 1757-1770.



TRAUTH, E.M., QUESENBERRY, J.L. & HUANG, H. 2006. Cross-cultural influences on women in the IT workforce. In *Proceedings of the 2006 ACM SIGMIS CPR conference on computer personnel research: Forty-four years of computer personnel research: achievements, challenges & the future*, p. 12-19.

TRAUTH, E.M., QUESENBERRY, J.L. & HUANG, H., 2008a. A multicultural analysis of factors influencing career choice for women in the information technology workforce. *Journal of Global Information Management*, vol. 16, no. 4, p.1.

TRAUTH, E.M., QUESENBERRY, J.L. & MORGAN, A.J. 2004. Understanding the under representation of women in IT: toward a theory of individual differences. *Proceedings of the 2004 SIGMIS Conference on Computer Personnel Research: Careers, Culture, and Ethics in a Networked Environment*, p. 114-119.

TRAUTH, E.M., QUESENBERRY, J.L. & YEO, B., 2008b. Environmental influences on gender in the IT workforce. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, vol. 39, no.1, p. 8-32.

United States of America. Department of Labor. 2014a. *Labor force participation rates*. [Online]. Available: [http://www.dol.gov/wb/stats/latest\\_annual\\_data.htm#labor](http://www.dol.gov/wb/stats/latest_annual_data.htm#labor) [Cited 30 September 2015].

United States of America. Department of Labor. 2014b. *Women's Bureau. Computer and Information Technology occupations*. [Online]. Available: [http://www.dol.gov/wb/stats/Computer\\_information\\_technology\\_2014.htm](http://www.dol.gov/wb/stats/Computer_information_technology_2014.htm) [Cited 30 September 2015].

United States of America. Department of Labor. 2014c. *Women in the labor force: a data book*. [Online]. Available: <http://www.bls.gov/opub/reports/cps/women-in-the-labor-force-a-databook-2014.pdf> [Cited 30 September 2015].

VINKENBURG, C.J., VAN ENGEN, M.L., EAGLY, A.H. & JOHANNESSEN-SCHMIDT, M.C. 2011. An exploration of stereotypical beliefs about leadership styles: is transformational leadership a route to women's promotion? *Leadership Quarterly*, vol. 22, no. 1, 10-21.

VITORES, A. & GIL-JUÁREZ, A. 2015. The trouble with “women in computing”: a critical examination of the deployment of research on the gender gap in computer science. *Journal of Gender Studies*, vol. 25, no. 6, p. 666-680.

WARREN, J., YOUNG, D. & WILLIAMS, K. 2012. Personality, gender and careers in information technology. *AMCIS*.

WELMAN, C., KRUGER, F. & MITCHELL, B. 2005. *Research methodology, 3<sup>rd</sup> ed.* South Africa: Oxford University Press.

WENTLING, R.M. & THOMAS, S. 2009. Workplace culture that hinders and assists the career development of women in information technology. *Information Technology, Learning, and Performance Journal*, vol. 25, no. 1, p. 25-42.

WHARTON, A.S. 2009. *The sociology of gender: an introduction to theory and research.* USA: Blackwell Publishing Ltd.

WILLCOCKS, L.P. & FEENY, D. 2006. IT outsourcing and core IS capabilities: challenges and lessons at Dupont. *Information Systems Management*, vol. 23, no. 1, p. 49.

WILS, L., WILS, T. & TREMBLAY, M. 2010. Toward a career anchor structure: an empirical investigation of engineers. *Relations Industrielles*, vol. 65, no. 2, p. 236-256.

WILSON, F.M. 2011. Women in management in the UK. In *Women in management worldwide: progress and prospects, 2<sup>nd</sup> ed.* Edited by M.J. DAVIDSON & R.J. BURKE. Farnham, England: Gower Publishing Limited.

XIAO, J. 2006. Survey ranking of job competencies by perceived employee importance: comparing China's three regions. *Human Resource Development Quarterly*, vol. 17, no. 4, p. 371-402.

YANG, B.C., WU, B.E., SHU, P.G. & YANG, M.H. 2006. On establishing the core competency identifying model: a value-activity and process oriented approach. *Industrial Management & Data Systems*, vol. 106, no. 1, p. 60-80.

YIN, R.K. 2011. *Qualitative research from start to finish.* New York: Guilford Press.

YIN, R.K. 2014. *Case study research: designs and methods*, 5<sup>th</sup> ed. California, United States of America: SAGE Publications, Inc.

YUKL, G.A. 2010. *Leadership in organisations*. New Jersey: Pearson Education Inc.

ZACCARO, S.J. 2007. Trait-based perspectives of leadership. *American Psychologist*, vol. 62, no. 1, p. 6-16.

ZENG, Z. 2011. The myth of the glass ceiling: evidence from a stock-flow analysis. *Social Science Research*, vol. 40, no. 1, p. 312-325.

## APPENDIX A – PARTICIPANT DEMOGRAPHICS FORM

Name and Surname (Optional)		
Age	<input type="checkbox"/> 20-30	<input type="checkbox"/> 41-50  <input type="checkbox"/> 51-60  <input type="checkbox"/> ≥ 61
Racial Group	<input type="checkbox"/> Black African	
	<input type="checkbox"/> Tswana	<input type="checkbox"/> Swati
	<input type="checkbox"/> Tsonga	<input type="checkbox"/> Xhosa
	<input type="checkbox"/> Pedi	<input type="checkbox"/> Zulu
	<input type="checkbox"/> Venda	<input type="checkbox"/> Ndebele
	<input type="checkbox"/> Sotho	
	<input type="checkbox"/> White	
<input type="checkbox"/> English	<input type="checkbox"/> Afrikaans	
<input type="checkbox"/> Indian		
<input type="checkbox"/> Coloured		
Marital Status	<input type="checkbox"/> Single	<input type="checkbox"/> Divorced  <input type="checkbox"/> Widowed
	<input type="checkbox"/> Married	
Kids	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Designation	Business Relationship Manager	
Period in position	<input type="checkbox"/> < 1yr	<input type="checkbox"/> 5yrs<=>10yr

	<input type="checkbox"/> 1yr<>5yrs	<input type="checkbox"/> > 10
Highest level of education	<input type="checkbox"/> Matric	<input type="checkbox"/> Postgrad
	<input type="checkbox"/> Diploma/Degree	

## APPENDIX B – INTERVIEW QUESTIONS

- 1) What motivated you to pursue a career in IT?

*\*The aim is to understand that factors that contribute to women embarking on a career in a male-dominated field.*

- 2) On your path towards the IT Executive role, what challenges did you experience as a woman? How did you overcome these challenges to reach the position you are in?

*\*Exploring challenges faced by female IT professionals as they advance towards IT leadership roles and how to overcome them.*

- 3) Explain the functions of your job, i.e. what does your job entail?

*\*This question aims to understand the role of the IT Executive as fulfilled by women and the responsibilities thereof.*

- 4) What are the typical skills (in general) required for an IT Executive position? Which skills do you exercise in your role as an IT Executive?

*\*The question seeks to understand the skills required for one to be an IT Executive. Additionally, it aims to identify typical skills of female IT Executives.*

- 5) What is your educational IT background, i.e. formal qualifications?

*\*The question seeks to determine the type of IT-related learning that supports female IT leaders.*

- 6) Explain your career path into an IT Executive role.

*\*The question aims to determine the paths women take to achieve IT leadership roles, i.e. how they got here in terms of work experience.*

- 7) Did you receive any professional development training that assisted with your career progression? If so, how did it/they assist with your career progression?

*\*The question seeks to determine if there is any other training intervention over and above IT that female IT professionals need to advance to IT leadership roles.*

- 8) Which leadership traits do you think are more appropriate for an IT Executive role?

*\*The aim is to establish typical leadership traits of an IT Executive.*

- 9) What personality traits do you believe may have helped you to succeed in achieving the IT Executive role?

*\*The question aims to identify personality traits that female IT professionals need to succeed in getting the IT Executive position.*



10) Explain the typical gender stereotypes from the perspective of your culture, i.e. what is the perceived role of a woman?

*\*The question aims to establish the expectations of a woman in society.*

11) Please explain the culture of an IT field based on your observation/experience.

*\*The aim is to solicit the views of female IT Executives on the IT culture.*

12) What is it like to be a woman in an IT executive role? How are women in IT leadership positions perceived by society, both at the workplace and socially?

*\*The aim here is to understand how society treats women in IT leadership positions, i.e. attitudes towards female IT Executives.*