

https://dspace.org/

Turnover intentions of information technology employees within South African firms: the role of cognitive engagement, job satisfaction and job performance

Storm, Christiaan Philippus

2015

http://hdl.handle.net/10539/18812

Downloaded from a DSpace repository. https://dspace.org/



Turnover Intentions of Information Technology Employees within South African Firms: The Role of Cognitive Engagement, Job Satisfaction and Job Performance.

Research Report

Submitted in partial fulfilment of the requirements for the degree of

Master of Commerce in the field of Information Systems

School of Economic and Business Sciences

Faculty of Commerce, Law and Management

University of the Witwatersrand, Johannesburg

Student:	Christiaan Storm
Student no:	745963
Supervisor:	Professor Jason Cohen
Date:	Feb 2015

Declaration

I declare that this research report is my own unaided work, except to the extent indicated in the text, acknowledgements and reference matter. It is being submitted for the 50% research component of a Masters of Commerce degree (by Research and Coursework) at the University of the Witwatersrand, Johannesburg.

It has not been submitted before for any other degree or examination in this or any other institution.

Christiaan Storm

Feb 2015

Acknowledgements

I would like to express my sincerest gratitude to my supervisor, Prof Jason Cohen. With his passion and enthusiasm he guided and encouraged me through this process with significant knowledge about the IS domain, never doubting me, and showing me how to think critically. Also, thank you to Jean-Marie Bancilhon for being a linguist by heart and giving valuable feedback on the wording and format of the questionnaire.

I would also like to thank the respondents for completing my survey and allowing me to complete my research report.

Finally, thank you to Maria Katumba who made a ton of phone calls on my behalf, and also Angelene Kuppusamy who made good arguments. I am indebted to you all.

Dedication

Thank you to my brother Dr Michael Storm and my parents. I am lucky that you are a part of my life.

Abstract

The decision of an information technology (IT) employee to leave their organisation introduces challenges for organisations and IT software project success. Since 1980 MIS managers have been concerning themselves in keeping resignation rates low. However IT employee turnover is still a problem experienced in practice today. Thus the turnover of information technology employees represent a key IT management issue. To improve our understanding of IT employee turnover, this research study draws on the constructs of job satisfaction, job performance and cognitive engagement.

More specifically, this research study developed and tested a model of how the understudied construct of cognitive engagement amongst IT employees influences their job satisfaction and job performance and ultimately their turnover intention. Two dimensions of cognitive engagement were considered. These were attention, defined as the amount of cognitive resources that a person can allocate to think about work, and absorption, defined as intensity of immersion and focus that one experiences when working. These two dimensions of cognitive engagement were hypothesized to influence two important intermediary variables that prior research has shown to be important in the turnover intention of employees, namely job satisfaction and job performance. Job characteristics, namely skill variety, task identity, task significance, job feedback, and autonomy were also considered to be important to both job satisfaction and turnover intentions of IT employees. Other factors such as job rewards were also considered.

A survey methodology was used to test the research model. This required that a questionnaire instrument be developed to collect data from IT professionals in South Africa. The study's variables were operationalised from the literature and multi-item scales were employed. First, the IT employees of randomly selected companies from the McGregor's Who Owns Whom directory were invited to participate in the study by completing the questionnaire. This was later supplemented by a non-probability snowball sampling approach. Data was collected over three months, and a total of 105 useable responses from IT professionals in South Africa were collected.

After removing incomplete responses, handling missing data, and checking for outliers, the data was checked for reliability and validity. First, an exploratory factor analysis was carried out to ensure the unidimensionality, convergent and discriminant validity of the constructs. Then scale reliability was confirmed using Cronbach's alpha. Composite scores for all multi-item variables were then calculated and relationships examined using Pearson's correlation analysis. Finally hypothesized relationships were tested using multiple regression.

The final results supported job satisfaction as a determinant of turnover intention. Also, job satisfaction completely mediated the effect of attention, as a dimension of cognitive engagement, on turnover intention. Attention also showed a correlation with job performance and fully mediates the effect of task significance, as a job characteristic, on job satisfaction.

The employee turnover phenomenon is important to both IT management practice and research. This study addressed this key IT management issue by determining the extent to which job

satisfaction, job performance, and cognitive engagement are important to the turnover intentions of South African IT employees. Results have useful implications for practice.

Contents

Declaration ..... **ii**
Acknowledgements ..... **iii**
Dedication ..... **iv**
Abstract ..... **v**
Chapter 1- Introduction **1**
1.1 The Research Problem and Overall Objectives 2
1.1.1 Research Problem 2
1.1.2 Contribution to the body of knowledge 3
1.2 Structure of the Report 4
Chapter 2 – Literature Review **5**
2.1 Introduction 5
2.2 Employee Turnover 6
2.3 Job Satisfaction 8
2.3.1 Job satisfaction and IT employees 10
2.4 Job Performance 12
2.5 Cognitive Engagement 13
2.6 Contributions and Shortcomings of Past Work 14
2.7 Conceptual Framework and Research Model 14
2.7.1 The Link between Job satisfaction and Turnover Intention 15
2.7.2 The Link between Cognitive Engagement and Job Satisfaction 16
2.7.3 The Links between Cognitive Engagement, Job Performance and Turnover Intention 16
2.7.4 Control Variables 18
2.8 Summary 18
Chapter 3 - Research Design **19**
3.1 Introduction 19
3.2 Research Paradigm 19
3.3 Research Methodology 20
3.4 Data Collection 22
3.4.1 Population 22
3.4.2 Sampling and Administration 22
3.5 Research Instrument 24
3.5.1 Operationalisation of variables 24
3.5.2 Job Characteristics and Other Controls 26
3.5.3 Pretesting 28

3.5.4 Piloting 28
3.6 Ethical Considerations 29
3.7 Data Analysis 30
3.7.1 Reliability and Validity 30
3.7.2 Hypotheses Testing 30
3.8 Limitations 31
3.9 Summary 31
Chapter 4: Results 32
4.1 Introduction 32
4.2 Data screening, missing value and outliers 32
4.2.1 Reverse Scoring 33
4.2.2 Missing values 33
4.2.3 Outliers 37
4.3 Respondent Profile 37
4.4 Validity and Reliability 41
4.4.1 Principal Component Factor Analysis 41
4.4.2 Reliability Test 44
4.4.3 ANOVA 47
4.5 Hypothesis Testing 47
4.5.1 Hypotheses H1 and H3 47
4.5.2 Hypotheses H2a, H2b and H4 50
4.5.3 Hypotheses H5a and H5b 52
4.5.4 Other relationships with Cognitive Engagement 54
4.6 Summary 57
Chapter 5: Discussions and Interpretations 58
5.1 Introduction 58
5.2 Job Satisfaction, Job Performance and Turnover Intentions 58
5.3 Job Satisfaction, Job Performance and Cognitive Engagement 59
5.4 The Role of Job Characteristics 61
5.5 Control Variables 62
5.5.1 Rewards 62
5.5.2 Other Controls 62
5.6 Summary 62
Chapter 6 64

6.1 Summary of the study 64
6.2 Managerial Guidelines 65
6.3 Limitations of the study 65
6.4 Recommendations for future research 66
6.5 Conclusion 67
References 68
Appendices 78
Appendix A- Emails 78
Appendix B- Ethics Clearance Certificate 80
Appendix C- Questions 81
Appendix D- t-Test 90
Appendix E- Assumptions 101
Appendix F- ANOVA 103

Chapter 1- Introduction

Employee turnover is defined as an individual employee's intention to stay or quit (Joseph, Ng, Koh, Ang, 2007). The turnover of Information technology (IT) employees represents an important IT management issue. This is because the amount of time and money invested in hiring and training an IT individual is lost if the individual leaves the organisation. In the early 1980's, Ives and Olson (1981) and Rockart (1982) found that some of the most challenging problems faced by IT managers include the hiring and training of IT employees. Recently, Luftman and Zadeh (2011) showed that IT employee turnover rates were as high as 6% and that "considerations of IT human resources" ranked 13th on the top IT management concerns around the globe in 2010. Thus IT employee turnover is still a problem in practice today and so deserves academic attention.

Table 1 below is a summary of IT employee turnover related articles.

Table 1: Employee turnover related articles

Reference	Key issue
Adams, Clark, Goldman, Jester, Lee, Noseworthy, Soejarto, Cantara, and Thompson (2006)	IT turnover remains a chronic problem.
Joseph et al. (2007)	IT turnover remains one of the most persistent challenges facing organisations.
Kim (2012)	IT employee turnover is costly.
Davidson, Timo, and Wang (2010)	Retaining skilled talent in Information Technology is critical for organisation success.
Mawson (2015)	There is still a shortage of skills within the ICT sector.
Van Heerden (2015)	HR departments need to reorient themselves to improve IT employee satisfaction and retention.

The determinants of the turnover of employees in the broader workplace has received much attention from researchers. For instance, factors such as job satisfaction (Richer, Blanchard, and Vallerand, 2002; Chiu and Francisco, 2003; Jawahar and Hemmasi, 2006; Siong, Mellor, Moore and Firth, 2006; van Breukelen, van der Vlist and Steensma, 2004), and emotive, cognitive and physiological stress symptoms (Avey, Luthans, and Jensen, 2009; Chau, Dahling, Levy, and Diefendorff, 2009) have been documented as determinants of turnover behaviour. Job satisfaction has been linked closely with other phenomena such as burnout, job performance and organisational commitment, making it a key phenomenon to examine in the study of employee turnover (Martin and Bennett, 1996; Darden, Hampton and Howell, 1989).

More recently, some studies have shown that cognitive engagement in the workplace can also influence job performance and turnover intention (Berry, 2010; Ho, Wong and Lee, 2011). Cognitive

engagement, which is defined as one's focus or psychological presence on role activities, may offer an improved explanation for IT employee turnover. Studies show that just 26% of IT employees report full engagement with their jobs and 22% report outright disengagement with their jobs (Pittenger, Perelli, and Somers, 2012; Treadwell and Alexander, 2000). The importance of cognitive engagement as an explanation for the turnover of IT employees has not however been sufficiently explored. Specifically, the links between job satisfaction, job performance and cognitive engagement and their effects on IT employee turnover may offer useful insights into the IT employee turnover problem and are deserving of continued empirical attention.

This research will therefore explore the relationship between cognitive engagement and these other important IT employee turnover constructs. To do so, the literature on cognitive engagement and job satisfaction is examined and measurable variables derived from past conceptualizations of cognitive engagement and job performance. A research model and hypotheses are developed and a survey methodology is used as the means to collect data from a sample of IT employees[1] across South Africa. The hypotheses are then tested using correlation and regression techniques.

1.1 The Research Problem and Overall Objectives

1.1.1 Research Problem

The IT skill shortage is an enduring IS management issues, especially for developing countries (Guest, 2005). Mohlala, Goldman and Goosen (2012) showed that turnover contributes greatly to skills shortages within organisational IT departments. Employing the most talented people available is key for an organisation to remain competitive. This means that attracting and retaining talented employees directly affects the organisation's success (Kaye and Vultaggio, 2004). Acquiring skilled IT resources is problematic enough but retaining these IT individuals in a market that has a shortage of skills is even more paramount (Guest, 2005). In trying to understand why people resign, scholars have mostly focused on job satisfaction. For example, a study by Joseph et al. (2007) clarified illustrated that turnover of IT personnel was negatively correlated with job satisfaction and they concluded that managing job satisfaction deserves significant attention.

To better understand determinants of job satisfaction, factors such as work exhaustion, role conflict, role ambiguity have been considered in the IT employee context (Rutner, Hardgrave, and McKnight, 2008; Moore, 2000). However, emerging constructs such as cognitive engagement have been subject to insufficient empirical research in the IT context (Rutner, Hardgrave, and McKnight, 2008; Moore, 2000). Studies of employees in other professions suggest that cognitive engagement could offer a promising explanation for turnover intention (Sonnentag, 2003; Schaufeli and Bakker, 2004).

[1] IT employees include: programmer, information system professional, developer, systems analyst, systems designer, MIS engineer, software engineer, software architect, and data processing professional (Maudgalya, Wallace, Daraiseh, and Salem, 2006)

Thus the following questions arise:

1. To what extent do the dimensions of cognitive engagement influence job satisfaction amongst IT employees?
2. To what extent do the dimensions of cognitive engagement influence job performance amongst IT employees?
3. To what extent do the dimensions of cognitive engagement, job satisfaction, and job performance explain variation in the turnover intentions of IT employees?

To answer these questions the following objectives were set:

1. Review the literature on turnover intention, job satisfaction, job performance and cognitive engagement.
2. Build a conceptual model with testable hypotheses.
3. Operationalize hypotheses into measurable variables.
4. Collect data from IT employees using an online survey questionnaire.
5. Ensure the validity and reliability of data collected using exploratory factor analysis and Cronbach's alpha.
6. Test the hypothesized relationships using multiple regression testing.

1.1.2 Contribution to the body of knowledge

Answering the above questions is of both academic and practical significance.

Understanding IT employee turnover can assist organisational decision-makers to proactively intervene so as to retain their skilled employees and profit from their investments into staff training. The study by Hall, Beecham, Verner, and Wilson (2008) shows a clear relationship between software project success and staff turnover. Minimising employee turnover is important to software project success. By identifying factors important to IT employees, results from this study can help IT manager's better design jobs to ensure that jobs deliver the requisite levels of engagement, and other characteristics such as variety or autonomy, that could be important to IT employee performance and satisfaction. Results of this study will thus contribute to addressing the turnover problem by showing that cognitive engaged employees have higher job satisfaction and are less likely to have turnover intention.

This study could also add value for IT employees themselves. Findings could help employees, by identifying factors important to their satisfaction, which they can then communicate to managers. Results can help employees better design their jobs to ensure that jobs deliver the requisite levels of engagement and other job characteristics that are important to their performance and satisfaction.

From an academic perspective, previous research shows that some of the dimensions of cognitive engagement can predict employee turnover (Berry, 2010; Avey et al., 2009; Chau et al., 2009). However the concept of cognitive engagement in the IT employee literature has not been previously examined. This research will introduce the concept of cognitive engagement and examine employee turnover intentions through this theory. This study's research model brings together a number of

understudied constructs in the IT employee context, namely turnover intention, job satisfaction, job performance, job characteristics and cognitive engagement. By examining the inter-relationships amongst these constructs and the effects of a broad set of cognitive engagement dimensions on job satisfaction, this study makes a contribution to the literature pertaining to IT employee turnover.

1.2 Structure of the Report

Chapter 1 - Introduction

This chapter presented the reader with an introduction to the research problem of turnover intentions of information technology employees. In addition, it outlined the objectives and importance of the research being undertaken.

Chapter 2 – Literature Review

Prior research on turnover, job satisfaction and cognitive engagement and its impact on turnover intentions will be discussed. By describing the contributions and shortcomings of prior research, the chapter will also demonstrate that research being undertaken addresses a research gap. The research model and its associated hypotheses will then be developed.

Chapter 3 – Research Methodology

This chapter will articulate and justify the research methodology adopted to test the hypothesized research model in the South African IT employee context. The questionnaire, procedure for data collection, and the sampling methods will be discussed.

Chapter 4 –Results Analysis

This chapter will present the profile of participants in the study. Results of tests of validity and reliability of the data collected are also presented. Finally, results of tests of the formulated hypotheses using multiple regression analysis are presented. Key insights will be brought to the reader's attention.

Chapter 5 –The Research Findings

The research results will be interpreted in this chapter and the significance of the findings will be discussed. Outcomes related to each of the hypothesis tested will also be discussed.

Chapter 6 –Conclusion

A summary of the research report will be provided as well as generating conclusions based on the research findings. Limitations of the study and recommendations for future studies will also be discussed.

Chapter 2 – Literature Review

2.1 Introduction

This chapter presents a review of existing literature on employee turnover, job satisfaction and cognitive engagement. The review focuses on the theoretical underpinnings, definitions, and models of the above constructs. Based on the reviewed literature, a conceptual model is then developed. The relationships between the constructs in the model form the basis of the hypotheses to be tested.

In order to gather literature for the purposes of this review, the following process was adopted. First, the data sources to be searched were selected. These included online academic databases that would provide access to peer reviewed literature such as journal articles. Table 2.1.1 presents the data sources that were used to search for relevant articles.

Next, a search string was developed in order to retrieve appropriate literature. The PIOS framework was used to derive the search string definitions for the preliminary search (Hawkes and Ugur, 2012). This framework guides the construction of a search string around the themes of P for the study population/participants of interest (IT employees in this study), I for the intervention of interest (e.g. job satisfaction, job performance and cognitive engagement in this study), O for the outcomes of interest (turnover in this study context), and S for study designs (e.g. empirical studies). Using this framework search strings that were used included “turnover intentions”, “job satisfaction”, and “cognitive engagement”, see Table 2.1.2. These strings were also used in combination with IT professional, IT employee, and information systems. To develop an understanding of key concepts, mainly papers with high citation counts were relied upon. Finally, to supplement the search, articles citing the identified papers as well as articles identified from the reference lists of key papers were also selectively reviewed.

Table 2.1.1: Databases used for Literature Review

Database
ACM
APA PsycNET
Computer Abstracts International Database
EBSCO Host
EdITLib
IEEE Xplore
JSTOR
ProQuest Central
ScienceDirect
Web of Science

Table 2.1.2: PIOS: Framework for building search

Population	Intervention	Outcome	Study Design
Any One of: organisation firm company	*Any One of:* cognitive engagement job satisfaction job performance job engagement	*Any One of:* employee turnover staff turnover turnover intention	*Any One of:* measure correlation construct association cause

The literature derived from this search and contributions and shortcomings of the reviewed work is presented next.

2.2 Employee Turnover

Employee turnover in the workplace has received much attention from researchers. Within these studies, employee turnover is defined as the number of employees who leave employment of an organisation (DeNisi and Griffin, 2008). Turnover intention is defined as an individual employee's intention to stay or quit (Joseph et al., 2007). These intentions are often used as proxies for studying actual employee turnover because of the difficulties involved in a longitudinal study (Jessor and Jessor, 1975).

Numerous theories have been drawn upon in past work in an attempt to explain the turnover phenomenon. These include the met expectations model (Porter and Steers, 1973); the theory of organisational equilibrium (March and Simon, 1958); the unfolding model of turnover (Lee and Mitchell, 1994; Lee, Mitchell, Holtom, McDaneil, and Hill, 1999; Lee, Mitchell, Wise, and Fireman, 1996); the job embeddedness theory of turnover (Mitchell and Lee, 2001); and the linkage model (Mobley 1977; Mobley, Horner, and Hollingsworth, 1978).These theories are summarized in Table 2.2 below.

Table 2.2: Employee turnover theories

Theory	Description	Key constructs	Example of Study
Met expectations model	March and Simon argue that turnover occurs when individuals perceive the incentives they receive are less than their contributions to an organisation.	• Desire to move • Job satisfaction • Ease of movement • Employability	Irving and Meyer (1994)
The theory of organisational equilibrium	Porter and Steers (1973) posit that "the discrepancy between what a person encounters on the job in the way of positive and negative experiences and what he expected to encounter" is a key determinant in turnover decisions.	• Job dissatisfaction • Rewards • Advancement • Relations with peers. • Relations with supervisors	Subramony, Krause, Norton, and Burns (2008)
Unfolding model of turnover	Turnover decisions are adopted a in a more naturalistic approach.	• Shock • Script	Morrell, Loan-Clarke, Arnold, and Wilkinson (2008)
Job embeddedness theory of turnover	Individuals stay with their organisations because they are prevented from quitting their jobs due to being enmeshed in a web that prevents them.	• Strong links with people • Strong links with activities • Fit with their jobs • Fit with their communities • Greater sacrifices	Ghafourian SharifHeravi, Shahidi, and Nik Mahmood (2010).
The linkage model	Series of withdrawal cognitions (e.g., thoughts of quitting, job search intentions, and job search utility evaluations) are triggered due to job dissatisfaction that result in job search behaviour.	• Job dissatisfaction • Thoughts of quitting • Job search • Job search intention	Hom, Caranikas-Walker, Prussia, and Griffeth (1992)

Common to all the theories above is the importance of job satisfaction to turnover (Hom et al., 1992; Mobley, 1977; Smith, and Speight, 2006). Therefore, job satisfaction is identified as a central construct in the prediction of turnover and turnover intentions.

2.3 Job Satisfaction

The concept of job satisfaction has been around a long time, probably since 1976 (Hackman and Oldham, 1976). Ironson, Smith, Brannick, Gibson, and Paul found about 3350 articles related to job satisfaction up to 1989. This number is still rising today. After reviewing 32 studies, Hoppock (1935) created a widely accepted definition of job satisfaction. “Job satisfaction is defined as any combinations of psychological, physiological and environmental circumstances that cause a person truthfully to say, “I am satisfied with my job””. (Hoppock, 1935). Kalleberg and Sørensen (1973) and Ivancevich and Donnelly (1968) described job satisfaction as the emotional state of the individual towards their work roles. Employees weigh up dissatisfactions and satisfactions of their own accord to calculate job satisfaction in its entirety.

Hackman and Oldham developed the Job Characteristics Model (JCM) in 1975. Their model attempts to create an approach to work redesign that is comprehensive, and they include the job itself as part of the entire compensation factor (Mondy, 2010). The model was based on previous works on the satisfaction theory and motivation theory. Hackman and Oldham (1975) conducted a series of research studies to try to determine the relationship between employees’ reactions to their jobs and the characteristics of their jobs. Thus, this model can be used to reveal job characteristics, including skill variety; task identity; task significance; job feedback; and autonomy, which may significantly affect job satisfaction and employee motivation. The model illustrates a three-stage process, which begins with the effect of a set of job characteristics on a number of psychological states, which then leads to certain outcomes in the work environment (Nakhata, 2010). Using the JCM, job satisfaction has been associated with a number of constructs such as self-esteem, motivation and turnover (Beecham, Baddoo, Hall, Robinson, and Sharp, 2008; Bartol and Martin, 1982; Pierce and Gardner, 2004). Many researchers have tried to identify why people are satisfied through the use of the JCM, which makes it important to control for the factors in the JCM model when studying job satisfaction.

Given the importance of job satisfaction, it is not surprising that a number of other studies have considered the factors that influence job satisfaction and its correlates. Table 2.3 below summarizes some of these studies. Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964), argued that job satisfaction is reduced by role conflict and role ambiguity, which may increase turnover intention (Jackson and Schuler 1985). Workload may also increase turnover intention, by decreasing job satisfaction due to work-family conflict (Greenhaus, Collins, Singh, and Parasuraman, 1997). Other factors such as involvement and autonomy should decrease turnover intention, by enhancing intrinsic motivation and therefore increasing job satisfaction (Jackson and Schuler, 1985).

Table 2.3: General research on Job Satisfaction

Author (s)	Article Title	Methodology	Approach	Findings
Greenhaus et al. (1997)	Work and Family Influences on Departure from Public Accounting	Quantitative techniques	428 members of American Institute of Certified Public Accountants (AICPA) completed the questionnaire.	Excessive work load ultimately strengthens public accountants' intentions to leave the field.
Hackman and Oldham (1975)	Development of the job diagnostic survey	Quantitative and qualitative techniques	Developed a model and tested it with 658 employees working on 62 different jobs in 7 organisations.	Effects of a set of job characteristics on a number of psychological states, which then leads to certain outcomes.
Jackson and Schuler (1985)	A Meta-Analysis and Conceptual Critique of Research on Role Ambiguity and Role Conflict in Work Settings	Systematic literature review	A total of 200 empirical research on the causes and consequences of role ambiguity and role conflict as they occur in work-related contexts.	Role conflict and role ambiguity reduces job satisfaction.
Kahn et al. (1964)	Organizational Stress: Studies in Role Conflict and Ambiguity	Quantitative and qualitative techniques	53 focal persons at various supervisory and executive levels in several industrial locations followed by national survey of 725 working adults.	Role ambiguity and role conflict could come at a cost of low job satisfaction.

Pierce and Gardner (2004)	Self-Esteem Within the Work and Organizational Context: A Review of the Organization-Based Self-Esteem Literature	Systematic literature review.	A review of a decade of research on organisation-based conceptualisation of self-esteem.	Self-esteem, both global as well as organization-based play a central role in the direction and motivation of human behaviour.

2.3.1 Job satisfaction and IT employees

In the study of job satisfaction among IT employees, research has focused on three categories of job related factors: role behaviours, role stressors and job characteristics, see Table 2.4. The effects of these factors have been examined as both indirect and direct determinants of turnover intention, which is mediated by job satisfaction. Examples of studies are that of Moore (2000), who illustrated that work exhaustion has a positive direct effect on IT turnover intention. Lee (2000) found job satisfaction to be a mediating variable on the effect of the motivating potential of a job, role conflict and role ambiguity on IT turnover intention. Guimaraes and Igbaria (1992) found that turnover intention is indirectly affected by boundary spanning activities, via organisational commitment and job satisfaction. Jobs that require individuals to cross organisational or departmental boundaries in performing their job duties are referred to as boundary spanning activities (Guimaraes and Igbaria, 1992).

Table 2.4: IS research on Job Satisfaction

Author (s)	Article Title	Methodology	Approach	Findings
Bartol and Martin (1982)	Managing information systems personnel: a review of the literature and managerial implications	Systematic literature review	Authors reviewed materials from 1970 that researched managing human resources in the information systems.	Research data indicates that information systems personnel who are satisfied with their jobs are less likely to leave their job and managers should engage with human resource to mitigate these risks.
Beecham et al. (2008)	Motivation in Software Engineering: A systematic literature review	Systematic literature review	Reviewed a final list of 92 research papers that studied characteristics of Software Engineers.	Software Engineers are likely to be motivated according to their 'characteristics', internal 'controls' and external 'moderators'.
Guimaraes and Igbaria (1992)	Determinants of Turnover Intentions: Comparing IC and IS Personnel	Quantitative techniques	209 information systems employees at Thirty-eight different companies with operations in the state of Ohio partook in the study.	Role stressors and boundary spanning activities were found to have an indirect effect on overall job satisfaction and organisational commitment which affects turnover intentions.
Lee (2000)	Turnover of Information Technology Professionals: A Contextual Model	Quantitative techniques	420 responses from Computerworld (Singapore edition) readers.	Motivating potential score of a job and role ambiguity affect turnover intentions through job satisfaction.

Moore (2000)	An examination of work exhaustion in technology professionals	Quantitative and qualitative techniques	Two-phased (antecedents to work exhaustion; turnover intention and fairness of rewards) survey with a total of 270 IT responses.	Technology professionals experiencing higher levels of exhaustion reported greater intentions to leave the job.

The job satisfaction literature mostly focuses on negative antecedents of job satisfaction like work exhaustion and role ambiguity. This study will add to this existing literature by focusing on an alternative perspective of job performance and cognitive engagement.

2.4 Job Performance

John P. Campbell (1990) describes job performance as whether a person performs their job well, an individual level variable, or something a single person does. This differentiates it from more encompassing constructs such as organisational performance or national performance which are higher level variables. The job performance construct has been conceptualized as the individual's performance along specific dimensions, such as quality and quantity of work or overall performance/task proficiency (Steers, 1977; Meyer, Paunonen, Gellatly, IGoffin, and Jackson, 1989). Perceptions of individual performance or subjective ratings are commonly used by when researchers want to measure an individual's overall job performance (Meyer, Allen and Smith, 1993). These subjective ratings can be based on past performance, peer rating, supervisor ratings, or self-appraisals (Steers, 1977; Meyer et al., 1989).

The relationship between job performance, job satisfaction and turnover intention has received a lot of attention. Job performance has been shown to have a negative relationship with turnover intention through enhanced job satisfaction (Martin, Price, and Mueller, 1981; Dreher 1982). Joseph et al. (2007) showed that job performance had a negative direct relationship with IT employee's turnover intention and a positive relationship with job satisfaction. However, because of the distal relationship between behaviours and attitudes the link between job performance and job satisfaction link is typically a weak one (Wilson, Dunn, Bybee, Hyman, and Rotondo, 1984; Judge, Thoresen, Bono, and Patton, 2001). Research in cognitive psychology suggests that cognitive states would be a good proximal job performance indicator, compared to general attitudes (job satisfaction) (Ackerman and Beier, 2003). An example of a cognitive state is cognitive engagement, which has been shown to have a relationship with job performance (Rich, Lepine, and Crawford, 2010; Ho et al., 2011; Hunter, 1986).

Job performance has been linked to turnover intentions, job satisfaction and cognitive engagement, which makes it an important construct to consider in the study of turnover intentions.

2.5 Cognitive Engagement

Cognitive engagement is rooted in psychological theories for example the theory of flow (Csikszentmihalyi, 1990) and cognitive engagement theory (Webster and Ho, 1997). Cognitive engagement comprises two dimensions - attention and absorption (Rothbard, 2001). Attention refers to the amount of cognitive resources, including psychic energy and concentration that an individual can allocate in different ways to thinking about work (Gardner, Dunham, Cummings, and Pierce, 1989; Kahneman, 1973; Csikszentmihalyi, 1978). On the other hand, absorption refers to the intensity of immersion and focus that one experiences when working. Individuals who are absorbed/ deeply engrossed in an activity would not be easily distracted by other activities. Attention thus pertains to the quantity of cognitive efforts expended, whereas absorption refers to the quality of cognitive investments and effort in work (Rothbard, 2001). There are several empirical research studies which used Rothbard's (2001) conceptualization of cognitive engagement and found it has a significant mediating relationship with job satisfaction (Ho et al., 2011; Saks, 2006). Figure 1 depicts Saks' (2006) illustration of the importance of engagement to employee attitudes and behaviours. The model depicts job engagement (a similar concept to cognitive engagement) as resulting from various job characteristics and predicting constructs such as satisfaction and turnover.

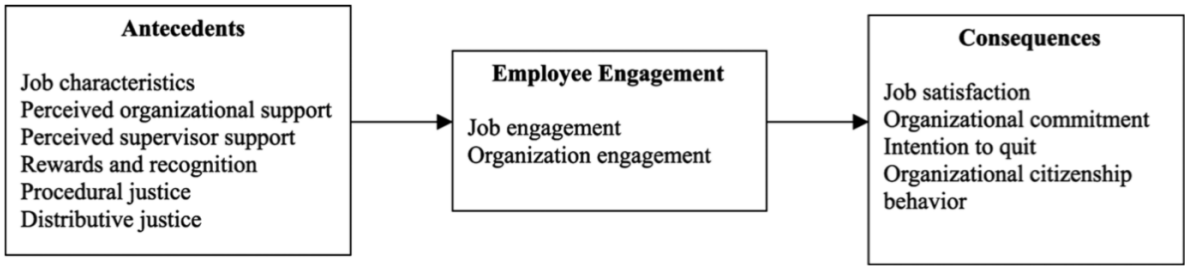


Figure 1: Employee engagement (Saks, 2006)

There are also several perspectives from the role investment theory and the enrichment perspective that suggest that employees who are cognitively engaged in their jobs would have greater job satisfaction. Firstly, employees will invest their time and cognitive attention in a role that provides them with an opportunity for self-actualization and self-esteem, according to the role investment theory (Kanungo, 1979; Lobel, 1991; Rothbard and Edwards, 2003). Secondly the enrichment perspective suggests that role involvement may lead to benefits like greater self-esteem, gratification, and a positive emotional response to the role (Verbrugge, 1986; Gove and Zeiss, 1987).

Although no studies were found that looked at the correlation between cognitive engagement and job satisfaction in an IS context, the concept of cognitive engagement has been considered before in past IS research where it has been shown to influence beliefs behaviours of IT users. For example, Agarwal and Karahanna (2000) and Saade and Bahil (2005) both found that cognitive engagement had indirect effects on IT usage behaviours as a result of their effects on salient beliefs regarding the IT system. Another study found cognitive engagement has a significant influence on satisfaction with e-learning (Roca, Chiu, and Martinez, 2006). Thus the potential for cognitive engagement to influence outcomes in the IT workplace requires further attention.

2.6 Contributions and Shortcomings of Past Work

The review of the literature on the relationship between turnover intentions, job satisfaction, job performance and cognitive engagement illustrates some of the major issues that researchers have explored. For instance, the review of past work has revealed that job satisfaction and job characteristics are important in understanding employee turnover intentions. Also, job performance might be important in understanding employee turnover intentions. They deserve continued attention.

There are a small amount of studies that consider the joint impacts of cognitive engagement, job satisfaction and job performance on turnover intentions, but none are specific to employees in an IT context. Because IT employee retention rates are low, understanding IT employee turnover and job satisfaction has been an important area of enquiry. Cognitive engagement may add to explanations of job satisfaction and the turnover intentions of IT employees.

Through the development and testing of a research model, this study intends to address this gap in research and furnish useful guidelines to IS managers. The next section describes the theoretical underpinnings of the research model and the development of the model's hypotheses.

2.7 Conceptual Framework and Research Model

Figure 2 presents the study's research model. The model is underpinned by the Hackman and Oldham Job Characteristics Model (JCM) and existing research on cognitive engagement. This research suggests that cognitive engagement constructs have a relationship with job satisfaction and job performance and that the latter two constructs are important to turnover intentions (Ho et al., 2011; Saks, 2006; Hom et al., 1992; Mobley, 1977; Smith, and Speight, 2006). The dependent variable turnover intention is defined as an individual employee's intention to stay or quit (Joseph et al., 2007). It depicts the relationships between the two dimensions of cognitive engagement namely attention and absorption, job performance, job satisfaction and turnover intention. Job characteristics and other control variables are also included. Intention is expected to lead to actual turnover but examination of actual turnover is excluded from the study. The arrows in the model denote hypothesized relationships that are derived next.

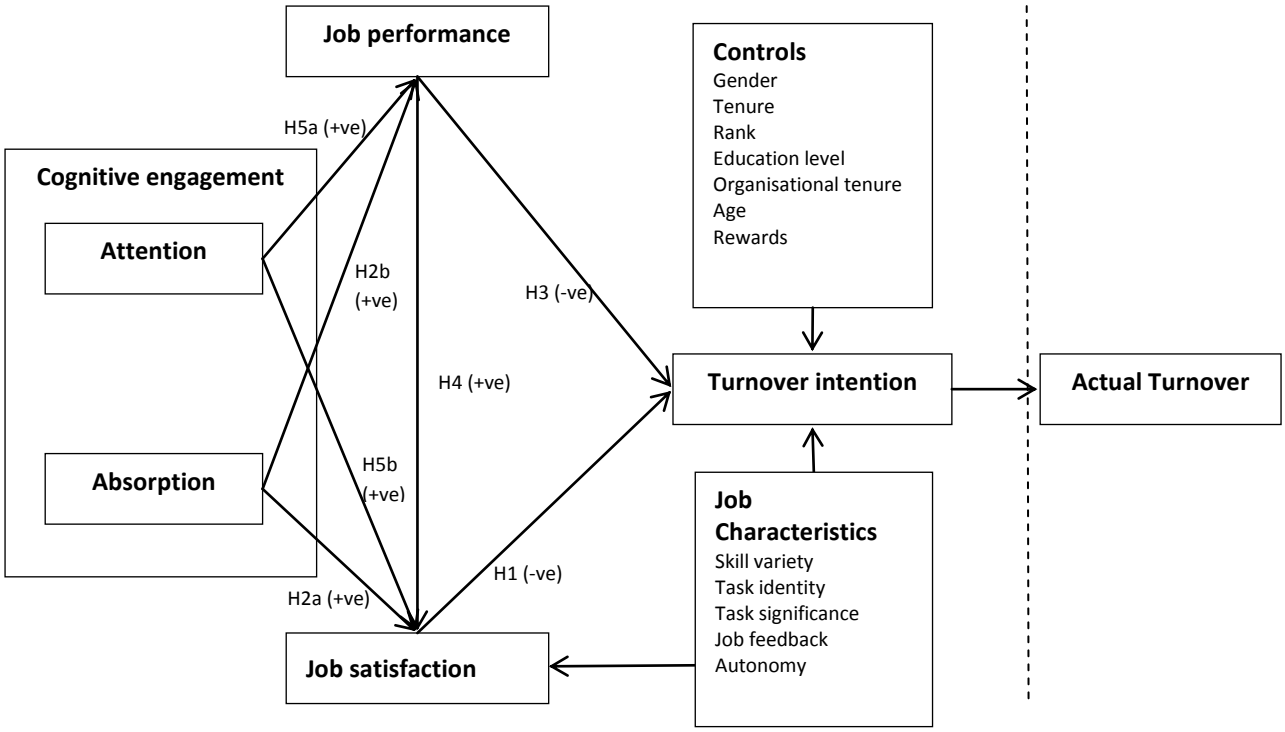


Figure 2: Conceptual model

2.7.1 The Link between Job satisfaction and Turnover Intention

Job satisfaction is important to an employee because it gives the employee a positive emotional state or pleasure (Locke, 1976). The general perspective that job satisfaction ultimately drives turnover intention is a common one, as seen demonstrated in theories such as the Linkage Model (Mobley, 1977) and the Organisational Equilibrium Theory (March and Simon, 1958). Numerous conceptual and empirical studies have supported that job satisfaction has an indirect effect on employee turnover, via employee turnover intentions (Chiu and Francisco, 2003; Jawahar and Hemmasi, 2006; Joseph et al. 2007; Siong et al., 2006; van Breukelen et al., 2004). Psychological states of exhaustion, role conflict, the motivating potential of a job, and ambiguity were all mediated through job satisfaction on IT turnover intention (Lee, 2000; Moore, 2000). Satisfaction is important to turnover because it mediates both indirect and direct antecedents of turnover intention.

Hence:

Hypothesis H1: The individual IT employee's job satisfaction is negatively associated with turnover intention.

2.7.2 The Link between Cognitive Engagement and Job Satisfaction

Cognitive engagement consists of two dimensions, attention and absorption (Rothbard, 2001). Attention focuses on the cognitive challenge of the job while absorption focuses on immersion in the job. A job that provides for cognitive engagement i.e. provides an opportunity for both cognitive challenge and immersion is theorized to be more satisfying (Verbrugge, 1986; Gove and Zeiss, 1987; Kanungo, 1979; Lobel, 1991; Rothbard and Edwards, 2003).

Both attention and absorption have been shown to have a relationship with job satisfaction. This is because cognitively engaged employees experience a positive, fulfilling work-related experience and state of mind (Sonnentag, 2003; Schaufeli and Bakker, 2004), which has been found to be related to positive work affect and good health (Sonnentag, 2003). These positive emotions and experiences are likely to result in positive work outcomes like job satisfaction. Also, a study done by Gardner et al. (1989) suggest that IT employees who have higher attention could have higher job satisfaction. This is because when employees seek to satisfy higher order psychological needs (like the need for satisfaction) on the job then they are likely to be more focused on that job, and not on events that will not satisfy those needs (Gardner et al., 1989). Prior empirical research in the job satisfaction literature supports a link between attention, absorption and job satisfaction (Ho et al., 2011; Saks, 2006).

Hence:

Hypothesis H2a: The greater the degree of an individual IT employee's attention while working, the greater will be their job satisfaction

Hypothesis H2b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job satisfaction.

2.7.3 The Links between Cognitive Engagement, Job Performance and Turnover Intention

Job performance has been shown to have a negative relationship with turnover intention through enhanced job satisfaction. This is because high performers should be more satisfied with the job as they tend to receive greater rewards (Martin et al., 1981; Dreher 1982), and hence should be less likely to resign. Employees might also have turnover intention if they perceive a threat of dismissal because of low job performance, as low performance is a risk factor for dismissal (Jackofsky, 1984; Wanous, Stumpf, and Bedrosian, 1979). Also, employees who are performing well will likely be intrinsically motivated and therefore experience higher job satisfaction (Lawler and Hall, 1970; Brown and Peterson, 1994). Joseph et al. (2007) showed that job performance had a negative direct relationship with IT employee's turnover intention and a positive relationship with job satisfaction.

Hence:

Hypothesis H3: The individual IT employee's job performance will be negatively associated with turnover intention.

Hypothesis H4: The individual IT employee's job performance will be positively associated with job satisfaction.

Attention and absorption have been shown to have a relationship with job performance. Ho et al. (2011) suggested that employees who are expending greater intensity and quantities of cognitive energy on their work are likely to have higher job performance. This is because they are able to overcome obstacles easier through their intense concentration and focus on the job and should thus be more effective and successful. Prior empirical research in the job performance literature supports a link between attention, absorption and job performance (Ho et al., 2011).

Hence:

Hypothesis H5a: The greater the degree of an individual IT employee's attention while working, the greater will their job performance.

Hypothesis H5b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job performance.

Job Characteristics

Other job characteristics not captured within cognitive engagement will also be controlled (Hackman and Oldham, 1976). The following job characteristics are included:

Skill variety: The degree to which different talents and skills are required by the job for an individual to carry out different activities related to the work.

Task identity: The degree to which the job has identifiable pieces that form part of a visible outcome of the work from beginning to end.

Task significance: The degree to which the work or lives of other people in the external environment or immediate organisation are impacted by the job.

Job feedback: The degree to which an individual obtains clear and direct information about the effectiveness of her or his performance when carrying out the work activities.

Autonomy: The degree to which an individual experience substantial independence, discretion, and freedom in determining the procedures to be used in doing the job and scheduling the work.

Numerous studies have suggested that job characteristics are relevant to IT employee's job satisfaction and turnover (Igbaria, Meredith, and Smith, 1994; Thatcher, Liu, Stepina, Goodman, and Treadway, 2006; Thatcher, Stepina, and Boyle, 2002).

Therefore, job characteristics are illustrated in Figure 2 as likely to influence job satisfaction and turnover intention.

2.7.4 Control Variables

Prior research identifies a number of factors that should be controlled for because of their influence on job satisfaction, job performance, and turnover intention. By controlling for these factors, the direct effects of cognitive engagement can be better isolated.

First job tenure, and educational level are included as control variables, based on the suggestions of previous research that these variables can be related to job satisfaction (Tsui and O'Reilly, 1989, Rusbult and Farrell, 1983).

Then the management literature also suggests that turnover intention correlates with three additional demographic factors. Organisational tenure, age and gender have shown an association with turnover intention (Porter and Steers 1973; Mobley, Griffeth, Hand, and Meglino, 1979; Price, 1977). Accordingly, gender, age and organisational tenure are included as additional control variables.

Finally, Igbaria and Siegel (1992) suggests that IT employees are concerned about organisational and job based rewards. These rewards should be negatively correlated with intention to leave and are added as a control variable.

2.8 Summary

This chapter reviewed existing literature on employee turnover, job satisfaction and cognitive engagement and developed a conceptual model. The following hypotheses were derived:

Hypothesis H1: The individual IT employee's job satisfaction is negatively associated with turnover intention.

Hypothesis H2a: The greater the degree of an individual IT employee's attention while working, the greater will be their job satisfaction

Hypothesis H2b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job satisfaction.

Hypothesis H3: The individual IT employee's job performance will be negatively associated with turnover intention.

Hypothesis H4: The individual IT employee's job performance will be positively associated with job satisfaction.

Hypothesis H5a: The greater the degree of an individual IT employee's attention while working, the greater will their job performance.

Hypothesis H5b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job performance.

The research methods that are used to test these hypotheses will be articulated in the next chapter.

Chapter 3 - Research Design

3.1 Introduction

The previous chapter reviewed existing literature on employee turnover, job satisfaction and cognitive engagement and developed a research model that forms the basis for the hypotheses to be tested.

The purpose of this chapter is to discuss the research methodology, approach for data collection and methods for hypothesis testing. The initial part of this chapter examines research paradigms. This is followed by research methodologies used in information systems research and discusses the survey methodology approach that was followed by this research paper. Then the research instrument will be discussed, which is a structured questionnaire. The target sample, sampling approach and the administration of the instrument are then described. The final part of the chapter discusses ethical considerations, approach to hypothesis testing and limitations.

3.2 Research Paradigm

There are broadly two research paradigms namely the positivist and interpretive paradigm. Positivists assume that reality can be described by measurable properties and is objective (Bhattacherjee, 2012). These properties are independent of the researcher and the research instruments. Positivist studies generally attempt to increase predictability of a phenomenon by testing theories. Orlikowski and Baroudi (1991) classified positivist research as studies which use a sample and showed formal propositions, hypothesis testing, quantifiable measures of variables, and drawing inferences about a phenomenon. Interpretive researchers assume that only through social constructions can we access reality. Only through meanings, that people assign to phenomena, can the phenomena be studied. Walsham (1993) classified interpretive methods as aiming to produce "an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context". Interpretive research thus focuses on the human sense making of a phenomena, rather than predefining independent and dependent variables (Kaplan and Maxwell, 1994).

A positivist paradigm informs this study. This is because this study has drawn from existing theory on turnover intention, job satisfaction and cognitive engagement to state formal propositions and relationships between a pre-defined set of variables. Also, the propositions and relationships are tested using quantifiable measures of the variables.

3.3 Research Methodology

A research methodology is defined as “the general approach the researcher takes in carrying out the research project” (Leedy and Ormrod, 2005). The two broad research methods or methodological paradigms that have dominated recent social research are qualitative and quantitative research. The qualitative approach is usually linked to interpretivism and quantitative approach to positivism (Mouton and Babbie, 2001, Orlikowski and Baroudi, 1991).

The quantitative methodology followed in this research report implies that the researcher’s role is impersonal and will yield objective results (Hussey and Hussey, 1997). A quantitative approach is typically characterized by collection of structured data, measures of variables, and the subsequent use of inferential statistics to test the hypothesized interrelationships (Figure 2) amongst the pre-specified study variables (Neuman, 1997).

This study follows a relational study design. Relational research usually studies the weak causal relationship among variables by observing the size and directions of the association (Shadish, Cook, and Campbell, 2002). To carry out the relational study, a survey methodology was adopted. The survey was cross-sectional and used a structured questionnaire to allow for the use of quantitative methods to test the hypotheses and for generalisations to be made about the population based on sampled observations (Neuman, 1997). The survey methodology is also advantageous when time and money constraints need to be considered (Bhattacherjee, 2012).

Survey methods are ideal for quantitative studies as they allow for data collection from large number of respondents, particularly with limited resources. Analytical and descriptive are the two main types of surveys (Hussey and Hussey, 1997). Analytical surveys determine if a relationship exists between constructs (variables) and descriptive surveys are used when counting and identifying variable frequencies in a population. To allow for this, surveys draw subjects from a population called a sample, and uses statistical techniques to demonstrate that the sample contains characteristics that can also be found in the population. Survey question responses can be obtained through questionnaires or telephonic, or face-face interviews (Bhattacherjee, 2012). See Table 3.3.1 below for Advantages and Disadvantages of Survey research.

Table 3.3.1: Advantages and Disadvantages of Survey research

Advantages	Disadvantages
• Economical in terms of effort, researcher time and cost • Excellent method for recording a great variety of data that cannot be observed • Gives respondents the ability to respond at a convenient time portraying the method as unobtrusive in nature • A population that is difficult to observe directly because of its size can be collected remotely. • Certain population groups can only be reached in this way • Population subgroup may also be analysed comparatively	• The sample of respondents may be unrepresentative of the intended population (Sampling bias) • Low response rates are generally notorious with survey research (Non-response bias) • Responses may be inexact due to difficulties with memory recall (Recall bias) • Lower validity of response may be obtained as respondents portray themselves in a socially desirable manner (Social desirability bias)

** Derived from Bhattacherjee (2012)*

The survey instrument that was used in this research is a web-based questionnaire (Appendix C). This provided an opportunity to analyse data from a wide audience with minimal cost (Saunders, Lewis, and Thornhill, 1997). It should be noted that non-response bias is a disadvantage to using electronic questionnaires as some IT employees might not have been interested in responding to the survey.

3.4 Data Collection

3.4.1 Population

A population, also referred to as unit of analysis, may be a person, group, organisation, country, object, or any other entity that a researcher wishes to study (Bhattacherjee, 2012). For this study, the unit of analysis is South African (SA) IT employees. For the purpose of this study, IT employees are defined as an individual that has any of the following roles: programmer, information system professional, developer, systems analyst, systems designer, MIS engineer, software engineer, software architect, and data processing professional (Maudgalya et al., 2006).

3.4.2 Sampling and Administration

Given that the population stated above is too broad to study, a sample is needed. A sample is a subset of the unit of analysis, effectively a generalisable sample that is representative of the greater population. There are many options for sampling for example selecting members from selected professional IT bodies. But the problem is that these members may not be generalizable to the greater IT employee population. So initially, a decision was taken to target IT employees working across a random sample of SA firms. To that end, a sampling frame was constructed by drawing a random list of 350 companies from the McGregor's Who Owns Whom Directory of SA companies. More specifically, the sampling frame was drawn using proportional stratified sampling based on industry. The IT employees from these 350 randomly selected firms were invited to participate (see Table 3.4 for stratum).

Table 3.4: Stratum of sectors

Sector	Number Selected
Education	10
Transport	37
Entertainment	28
Wholesale	23
Manufacturers	104
Government	4
Mining	11
Telecommunications	14
Agriculture	14
Real Estate	15
Finance	24
Retail	14
Warehousing	3
Service	50

The procedure was as follows. First, a random list of 350 companies from the McGregor's Who Owns Whom Directory of SA companies was selected. Then an individual having responsibility for IT within the organisation was identified and their email address was discerned either by searching the organisations website or calling the company directly. In the cases where there was no IT department, e.g. the IT related operations were outsourced, or if the company advised that they did not wish to participate then the company was dropped from the sample. Using this approach, 124 companies were invited to participate by sending an email to the identified contact person (refer to this in the Appendix-A-Request email). This responsible person needed to distribute the invitation internally to the relevant IT employees (refer to Appendix-A-Invitation). The invitation email contained a link to the online questionnaire which gave IT employees the option to partake in the study. After 4 weeks the response rate was low and a follow up email was sent.

After 8 weeks, the response rate was still very low. From the 124 firms that were sent an invitation only 45 IT employees had responded. This was possibly due to the initial contact person acting as a gatekeeper and not distributing the questionnaire as intended. It was also possible that the potential respondents saw the questionnaire as coming from management and were thus less likely to respond to questions on turnover and job satisfaction.

It was therefore decided to supplement the sample by using a non-probability sampling method More specifically snowball sampling was adopted. Although there are consequences for the external validity and generalizability of findings resulting from a non-probability sample (Bhattacherjee, 2012), the non-response from the probability based method presented a similar limitation. It was therefore considered appropriate to increase the number of responses and thereby provide for more useful tests of hypotheses whilst cautioning against the generalizability of findings.

Snowball sampling is a non-probability method where the researcher starts with identifying possible respondents and then asking them to partake and recommend to others in their social networks who might also meet the selection criteria to partake (Bhattacherjee, 2012). The invitation (Appendix A-Invitation) requesting IT professionals to partake in the survey was posted on social networks by the researcher and emailed to various IT related mailing lists to which the researcher had access. At the end of a total three month period, 119 responses had been collected

3.5 Research Instrument

3.5.1 Operationalisation of variables

All research variables were measured using existing multi-item scales. By drawing items from previous literature, greater content validity is assured (Lallmahamood, 2007; Kim, Park, and Jeong, 2004). Content validity assesses how adequately a set of items matches the content of the construct that it is attempting to measure (Bhattacherjee, 2012).

For most measures, this study will use a 7-point scale as it will optimise reliability by preventing neutral responses and will allow for more variation in data (Colman, Norris and Preston 1997).

See a list of items in Table 3.5.1.

Turnover intention

Turnover intention is the study's dependent variable. It is defined as an individual employee's intention to stay or quit (Joseph et al., 2007). It was measured using an existing four-item scale from Rutner et al. (2008).

- I will be with this company five years from now.
- How likely is it that you will be working with this company this time next year?
- I will probably look for a job at a different company in the next year.
- How likely is it that you will take steps during the next year to secure a job at a different company?

Turnover intention was measured on a 7-point Liker scale ranging from

1: Very unlikely 2: Unlikely 3: Somewhat likely 4: Neither likely nor unlikely 5: Somewhat likely 6: Likely 7: Very likely

Job satisfaction

Job satisfaction which is defined as a combinations of any environmental, psychological, and physiological circumstances that cause a person to say, "I am satisfied with my job". (Hoppock, 1935). Job satisfaction was measured using an existing three-item scale retrieved from Rutner et al. (2008).

- Generally speaking, I feel satisfied with this job.
- Overall, I feel satisfied with the kind of work I do in this job.
- In general, I feel satisfied with my job.

Job satisfaction was measured on a 7-point Likert scale from:

1: Strongly Disagree 2: Disagree 3: Disagree Somewhat 4: Neither Agree nor Disagree 5: Agree Somewhat 6: Agree 7: Strongly Agree

Job performance

Job performance was measured using an existing four-item scale, which is in a form of self-evaluation questions regarding the respondent's own productivity and performance, as well as their colleague's performance compared with their own. The items were retrieved from Yousef (2000), which had been used successfully before.

- Quality of your performance.
- Your productivity on the job.
- How do you evaluate the performance of your peers at their jobs compared with yourself doing the same kind of work?
- How do you evaluate the performance of yourself at your job compared with your peers doing the same kind of work?

Job performance was measured on a 10-point scale ranging from

1: Very low to 10: Very high

Cognitive engagement

The cognitive engagement construct has two dimensions, namely attention, and absorption. Attention is defined as the amount of cognitive resources that a person can allocate to think about work. Absorption is defined as the intensity of immersion and focus that one experiences when working. Based on the literature review four attention items and five absorption items were identified for the measurement of cognitive engagement (Rothbard, 2001).

Measures of Attention

- I spend a lot of time thinking about my work.
- I focus a great deal of attention on my work.
- I concentrate a lot on my work.
- I pay a lot of attention to my work.

Measures of Absorption

- When I am working, I often lose track of time.
- I often get carried away by what I am working on.
- When I am working, I am completely engrossed by my work.
- When I am working, I am totally absorbed by it.
- Nothing can distract me when I am working.

Attention and absorption were both measured on 7-point Likert scales from:

1: Strongly Disagree 2: Disagree 3: Disagree Somewhat 4: Neither Agree nor Disagree 5: Agree Somewhat 6: Agree 7: Strongly Agree

The measurement items are summarized in Table 3.5.1 below.

Table 3.5.1: Measurement Items

Conceptual definition	Source of Measure	Item
Attention	Rothbard (2001)	AT1. I spend a lot of time thinking about my work. AT2. I focus a great deal of attention on my work. AT3. I concentrate a lot on my work. AT4. I pay a lot of attention to my work.
Absorption	Rothbard (2001)	AB1. When I am working, I often lose track of time. AB2. I often get carried away by what I am working on. AB3. When I am working, I am completely engrossed (absorb) by my work. AB4. When I am working, I am totally absorbed by it. AB5. Nothing can distract me when I am working.
Job satisfaction	Rutner et al. (2008)	JS1. Generally speaking, I feel satisfied with this job. JS2. Overall, I feel satisfied with the kind of work I do in this job. JS3. In general, I feel satisfied with my job.
	New Item	JS4. I feel positive about my job.
Turnover intention	Rutner et al. (2008)	TI1. I will be with this company five years from now. (R) TI2. How likely is it that you will be working with this company this time next year? (R) TI3. I will probably look for a job at a different company in the next year. TI4. How likely is it that you will take steps during the next year to secure a job at a different company?
Job Performance	Yousef (2000)	JP1. Quality of your performance. JP2. Your productivity on the job JP3. How do you evaluate the performance of your peers at their jobs compared with yourself doing the same kind of work? JP4. How do you evaluate the performance of yourself at your job compared with your peers doing the same kind of work?

3.5.2 Job Characteristics and Other Controls

Gender was measured with a numerical scale (0 = male; 1 = female; 3 = Prefer not to say), and education on a scale ranging from 9 (PhD) to 1 (Less than high school). Job level was measured based on the respondent's position in the organisational hierarchy, and tenure was measured as the number of years the respondent had been in the IT profession. Organisational tenure was measured as the amount of time (in years) an individual has spent working at the current organisation. Age was measured in years. Rewards was measured based on an existing scale retrieved from Igbaria and Siegel (1992). Items to measure job characteristics (skill variety, task identity, task significance, job feedback, and autonomy) were incorporated into the instrument based on Morris and Venkatesh (2010). Job characteristics were measured on a 7-point Likert scale.

The measures are summarized in Table 3.5.2 below.

Table 3.5.2: Control Items

Conceptual definition	Item
Gender	G1. Scale (0 = male; 1 = female; 3 = Prefer not to say)?
Educational level	EL1. Scale ranging from 9 (PhD) to 1 (Less than high school). EL2. Other, please specify.
Age	A1. What will your age be at the end of 2014?
Job Level	JL1. What is your current job level? Scale (One Level below the CEO; Two Levels below the CEO; Three Levels below the CEO; Four Or more levels below the CEO)
Organisational tenure	OT1. Approximately, how long have you been working in your current organisational (i.e. in years)?
Tenure	T1. Approximately, how long have you been working in the IT profession (i.e. in years)?
Industry type	O1. Industry your organisation operates in?
Role	R1. What is your IT Role? Scale (Information system professional; Developer; Systems analyst; Systems designer; MIS engineer; Software engineer; Software architect; Data processing professional). R2. Other, please specify.
Skill variety	SV1. My job requires me to use a number of different skills and talents. SV2. My job is complex and nonrepetitive.
Task identity	TD1. My job provides me a chance to completely finish the pieces of work I begin. TD2. My job is arranged so that I can do an entire piece of work from beginning to end.
Task significance	TS1. My job is one where a lot of other people can be affected by how well my work gets done. TS2. My job is very significant and important in the broader scheme of things.
Job feedback	JF1. Just doing the work required by my job provides many chances for me to figure out how well I am doing. JF2. After I finish a piece of work, I know whether I performed well.
Autonomy	JA1. My job gives me considerable opportunity for independence and freedom in how I do my work. JA2. My job gives me a chance to use my personal initiative and judgment in carrying out my work.
Rewards	RW1. Build a professional reputation. RW2. Work on professionally important projects. RW3. Receive substantial annual salary increases. RW4. Receive a promotion within the next year or two.

3.5.3 Pretesting

The use of scales adopted from the literature helps to provide for greater content validity of the measurement items (Bhattacherjee, 2012). However, to further ensure content validity, a pre-test was carried out with eight academic experts. They reviewed the adequacy of the scales for measuring the intended variables of interest. Only a few minor issues were found and changed accordingly. The changes include:

- Grammar issues
- "Prefer not to say" option added to the gender scale
- "Other, please specify?" option added to education and IT Role scale.

3.5.4 Piloting

In order to ensure face validity a pilot test was carried out (Bhattacherjee, 2012). Face validity is important and ensures that items are reasonable and meaningfully measure the underlying construct from the perspective of the intended respondents (Bhattacherjee, 2012). This involved administering the questionnaire to a convenient sample of 15 IT employees to comment on their understanding of the questionnaire and the clarity of instructions provided. The data collected from the pilot test was also assessed with statistical tests for reliability, and the distribution of responses. Some minor changes were made. These were:

- Due to a lack of variation, job performance was changed from its original 7 point scale to be measured on a 10 point scale so as to introduce more variation.
- Drawing on Morris and Venkatesh (2010), SV1 was originally specified as "My job requires me to use a number of complex or high-level skills". However, it appeared this item tapped into the complexity of the job rather than the variety of skills required by the job. The item was therefore changed to the Hackman and Oldham (1975) item "My job requires me to use a number of different skills and talents".
- For item AB3 measuring absorption, a synonym for engrossed was added as some respondents didn't understand the meaning.
- Because JS1 and JS3 seem so similar, another item (JS4) measuring job satisfaction was added.
- A Qualitative question was added "Any comments you wish to make" at the end.

3.6 Ethical Considerations

There are various ethical considerations to a research study that need to be accounted for (Bhattacherjee, 2012). Prior to data collection ethics clearance was obtained. The data collection protocol ensured that all responses remained anonymous, that respondents could withdraw at any time, and that their participation in the study was voluntary. Informed consent is a necessity for research according to Faden, Beauchamp, and King (1986). Respondents were invited to partake in the study by completing the questionnaire. In this invitation respondents were informed that their participation is both anonymous and voluntary. The questionnaire did not request that respondents provide any personal details such as their identity number or name, thus ensuring that their anonymity was being maintained. Results are also aggregated and individual responses will not be reported. Moreover, data collected from responding individuals is not shared with any third parties and thus confidentiality is maintained. The final results will only be reported in published journals or the research report. The ethics clearance certificate protocol number CINFO/1055 was issued on 18TH June 2014 by the ethics committee of the School of Economics and Business Sciences of the University of the Witwatersrand (see Appendix B).

3.7 Data Analysis

3.7.1 Reliability and Validity

Testing reliability and validity is important to research as it provides support that data truly measurers reality (validity) and the results can be reproduced (reliability) so that the body of knowledge can be extended with functional measures (Bhattacherjee, 2012). Validity in this study is assessed through convergent and discriminant validity. Convergent validity refers to the proximity with which a construct and its specified measures relate. Discriminant validity refers to the degree to which a measure discriminates from other constructs that it is not meant to measure (Bhattacherjee, 2012).

An exploratory factor analysis was conducted using principal components as the means of extraction and Varimax as the method of orthogonal rotation to define the underlying structure among variables in the analysis. Principal Component Analysis (PCA) is used to ensure both convergent and discriminant validity. By extracting item loadings and ensuring that the extracted item loadings are above 0.6 will demonstrate convergent validity. Low cross-loadings (0.3 and below) will demonstrate discriminant validity. Furthermore, the average variance extracted (AVE) for each construct should be above 0.50 (convergent validity) and should be larger than the variance shared between constructs (discriminant validity) (Hair, Black, Babin, Anderson, and Tatham, 2010).

The degree to which the measure of a construct is dependable and consistent is called reliability. Internal consistency reliability is estimated using Cronbach's alpha. According to Nunnally and Bernstein (1994) the reliability coefficient should be above the suggested threshold of 0.70 (Bhattacherjee, 2012).

3.7.2 Hypotheses Testing

Multiple regression is used to test the Hypotheses. Multiple regression is a technique that allows the combined effects of a set of independent variables on a dependent variable to be estimated. The hypotheses is confirmed if the beta co-efficient (representing the comparable effect each independent variable has upon the dependent variable) for a variable is statistically significant at the $p < 0.05$ value or lower. Near significant levels of $p < 0.10$ will also be considered as done by previous research (Niederman, Brancheau, and Wetherbe, 1991). The following multiple regression equations will be analysed in order to test the study's hypotheses[2]:

TI= ƒ JS + JP	----------	H1,H3
JS= ƒ AT + AB + JP	----------	H2a, H2b, H4
JP= ƒ AT + AB	----------	H5a, H5b

[2]TI-Turnover Intention, JS-Job Satisfaction, JP-Job Performance, AT-Attention, AB-Absorption
Controls : Gender-G, Age-A, Educational Level-EL, Job Level-JL, Organisational Tenure-OT, Tenure-T, Industry Type-IT, Role-R, Skill Variety-SV, Task Identity-TD, Task Significance-TS, Job Feedback-JF, Autonomy-JA, Rewards-RW

To test H1 and H3, the dependent variable Turnover Intention (TI) will be regressed on the independent variables Job Satisfaction (JS) and Job Performance (JP). To test H2a, H2b and H4, the dependent variable of Job Satisfaction (JS) will be regressed on the independent variables Absorption (AB), Attention (AT), Job Performance (JP). To test H5a and H5b, the dependent variable of Job Performance (JP) will be regressed on the independent variables Absorption (AB) and Attention (AT). In all analyses, the effects of job characteristics, gender, educational level, age, job level, organisational tenure, employee tenure, industry type, and role will be controlled.

3.8 Limitations

This study acknowledges the following limitations:

- Generalisability: Using non-probability sampling minimizes external validity (generalisability). But due to time and monetary constraints there was no alternative (Bhattacherjee, 2012).
- Non-response bias: There is a possibility that some IT employees might not be interested in responding to the survey and results may therefore be less generalizable (Bhattacherjee, 2012).
- Common-method bias: is said to be present as data about the dependent and independent variables are provided by a single respondent (Hair et al., 2010).
- Other methods bias could limit the validity of the results e.g. social desirability bias may lead respondents to provide false information (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003).
- Internal validity / causality: The study is cross-sectional and therefore temporal precedence cannot be established.
- Other threats to internal validity arise due to the difficulty of controlling for all confounding variables, the potential for reciprocal causality, and the problem of using correlation evidence (Hair et al., 2010). Despite these problems, the use of theory, aids in the inference of causality from the evidence.
- The study focuses on turnover intentions and not actual turnover behaviour.

3.9 Summary

This chapter examined research paradigms and methodologies use in information systems research and discussed the quantitative, survey-based approach that was followed by this research. The instrument measures were detailed and the target population was described followed by the sampling approach, and procedures for data collection. The final part of the chapter discussed ethical considerations, the approach to hypothesis testing and limitations.

The next chapter analyses the data collected and presents results of the study.

Chapter 4: Results

4.1 Introduction

The research methodology, instrument and approach used for data collection were discussed in the previous chapter. The results of data analysis are presented in this chapter. First, the chapter discusses preparation of the data for analysis, including reverse scoring, handling missing data and checking for outliers. Next, respondent profiles will be presented before presenting the results of the tests for reliability and validity, correlations and the results of hypothesis testing using multiple regression.

4.2 Data screening, missing value and outliers

Following the data collection strategy described in the previous chapter, 119 questionnaires were obtained from respondents. An initial scan of the responses showed 10 responses were obtained from individuals not meeting this study's definition of an "IT employee" and were eliminated.

As indicated in Chapter 3, sampling was initially based on McGregor's Who Owns Whom Directory of SA companies. However, as response rates were fairly low, it was subsequently decided to adopt a snowball sampling approach. The number of responses obtained from each sampling strategy are illustrated below.

Table 4.2: Responses per sample

	Number of respondents
McGregor's Who Own Whom Sample	45
Snowball Sample	64
Total	109

Independent sample t-tests were used to compare responses across all questionnaire items of the McGregor's sample and the snowball sample (Appendix D). Differences for the following items: A1, OT1, T1, TI1, TI2, TI3, JP1, JP2, JP4, and SV1 were significant.

It thus appeared that both turnover intention (TI items) and job performance (JP items) were consistently different across respondents from the two sub-samples. This suggests that the differences in turnover intention (TI) and job performance (JP) are not due to chance. It appeared that the turnover intentions were significantly lower and self-evaluated job performance significantly higher in the McGregor's sample. This could be because of the perception that the questionnaire was being distributed through management and thus responses were more likely subject to bias. It was therefore decided to add a control for the differences when testing the hypotheses by including a dummy variable representing the sample into the regression analyses.

In preparing for data analysis, the next step was to reverse score certain items and then missing values in the data was checked, lastly, data was examined for outliers.

4.2.1 Reverse Scoring

This is the process of reversing the scores of an item phrased in the negative while retaining its distribution characteristics (Hair et al., 2010), to align their correlations with other items measuring the same variable. Because TI1 and TI2 were measuring intention to stay rather than turnover intention, these items needed to be reverse scored. The two items listed below were reverse scored:

- TI1 - I will be with this company five years from now.
- TI2 - How likely is it that you will be working with this company this time next year?

4.2.2 Missing values

The most direct means of assessing the extent of missing data was determining the number of missing questionnaire responses for each case, and the number of missing case responses for each questionnaire item (Hair et al., 2010).

4.2.2.1 Cases with missing data

Table 4.2.2.1 shows that 29 (27%) of the cases had missing item responses, 21 (19%) had one missing item, and 6 (4%) had two missing items and one case was missing three responses. Hair et al. (2010) suggested as a rule of thumb that cases missing 10% of required data may be retained and cases missing 15% or more of the data are candidates for deletion. Cases 90 and 66 which are missing 88% of item responses were thus deleted and not used for further analysis.

Table 4.2.2.1: Cases with missing values

Case	# Missing	% Missing
2	1	2.3
19	1	2.3
81	1	2.3
8	2	4.7
52	1	2.3
108	2	4.7
33	1	2.3
30	1	2.3
31	2	4.7
70	1	2.3
51	1	2.3
105	1	2.3
58	1	2.3
59	1	2.3
48	1	2.3
75	1	2.3
46	1	2.3
24	1	2.3
84	1	2.3
100	1	2.3
102	1	2.3
104	1	2.3
96	2	4.7
64	2	4.7
36	1	2.3
106	1	2.3
87	3	7
90	38	88.4
66	38	88.4

- indicates an extreme low value, while + indicates an extreme high value. The range used is (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

4.2.2.2 Questionnaire items with missing data

One respondent did not wish to provide gender, two did not provide tenure details, and three did not provide job levels (Table 4.2.2.2.1). Table 4.2.2.2.2 shows missing data on the questionnaire items. Since no questionnaire item was missing from more than 5% of the cases, no items were eliminated. All missing items were replaced with the series mean of the item, except in the case of gender and organisational level.

Table 4.2.2.2.1 : Missing values - Demographics

		Missing	
	N	Count	Percent
Gender	106	1	.9
Education level	107	0	.0
Age	107	0	.0
Job level	104	3	2.8
Organisational tenure	107	0	.0
Tenure	107	0	.0
Role	107	0	.0
Industry type	105	2	1.9

Table 4.2.2.2.2 : Missing values and descriptive statistics

	N	Mean	Std. Deviation	Missing Count	Missing Percent	No. of Extremes[a,b] Low	No. of Extremes[a,b] High
AT1	107	5.82	1.089	0	.0	3	0
AT2	104	6.13	.925	3	2.8	4	0
AT3	106	6.08	.953	1	.9	5	0
AT4	103	6.09	.940	4	3.7	4	0
AB1	106	5.65	1.147	1	.9	5	0
AB2	106	5.40	1.262	1	.9	7	0
AB3	107	5.34	1.213	0	.0	7	0
AB4	106	5.20	1.206	1	.9	10	0
AB5	107	3.72	1.426	0	.0	0	0
JS1	106	5.05	1.558	1	.9	1	0
JS2	107	5.14	1.501	0	.0	1	0
JS4	106	5.12	1.497	1	.9	2	0
JS3	107	5.06	1.522	0	.0	2	0
TI1	107	3.7850	2.09234	0	.0	0	0
TI2	107	2.8037	1.86547	0	.0	0	0
TI3	107	3.73	2.090	0	.0	0	0
TI4	106	3.75	2.057	1	.9	0	0
JP1	106	7.78	1.287	1	.9	1	0
JP2	107	7.61	1.503	0	.0	0	0
JP3	107	6.74	1.829	0	.0	7	0
JP4	104	7.52	1.475	3	2.8	3	0
SV1	105	6.15	.886	2	1.9	4	0
SV2	107	5.17	1.328	0	.0	2	0
TD1	107	4.80	1.457	0	.0	3	0
TD2	107	4.25	1.700	0	.0	0	0
TS1	105	6.13	.921	2	1.9	5	0
TS2	107	5.86	1.145	0	.0	3	0
JF1	106	5.34	1.059	1	.9	5	0
JF2	107	5.57	1.166	0	.0	7	0
JA1	107	5.37	1.438	0	.0	13	0
JA2	106	5.58	1.421	1	.9	10	0
RW1	107	5.18	1.478	0	.0	2	0
RW2	105	5.18	1.530	2	1.9	17	0
RW3	107	3.67	1.583	0	.0	0	0
RW4	105	3.33	1.822	2	1.9	0	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

b. indicates that the inter-quartile range (IQR) is zero.

4.2.3 Outliers

Responses with characteristics identifiable as distinctly different from the other observations are outliers (Hair et al., 2010). Univariate outlier detection will examine if cases had observations at the outer ranges of the distribution. For sample sizes larger than 80, the threshold value of standardised score is 4.0 (Hair et al., 2010). This study has a sample size of over 100 and thus this threshold was adopted.

Two cases had standard scores above 4 for a number of their responses and were thus excluded in further analysis. The final sample used was therefore 105 cases.

4.3 Respondent Profile

The profile of the 105 useable respondents on demographics such as education, gender, age, tenure and IT job roles are presented next.

30.5% of the respondents had a bachelor's degree and 15.2% had a technical degree (Table 4.3.1).

Table 4.3.1: Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's degree	32	30.5	30.5	30.5
	High school	5	4.8	4.8	35.2
	Master's degree	11	10.5	10.5	45.7
	Other	10	9.5	9.5	55.2
	Post-master's courses	2	1.9	1.9	57.1
	Some college	16	15.2	15.2	72.4
	Some graduate courses	13	12.4	12.4	84.8
	Technical degree	16	15.2	15.2	100.0
	Total	105	100.0	100.0	

82.5% of the respondents were male (Table 4.3.2). This is not surprising given that information technology has been stereotyped as male dominated profession.

Table 4.3.2: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	14	13.3	13.5	13.5
	Male	89	84.8	85.6	99.0
	Prefer not to say	1	1.0	1.0	100.0
	Total	104	99.0	100.0	
Missing		1	1.0		
Total		105	100.0		

24.8% of employees were between the ages of 36 and 40 years, while IT employees in the age categories of 23 to 30 and 31 to 35 constituted 23.8% and 24.8% of total respondents respectively. Only 7% of employees were above the age of 50 (Table 4.3.3).

Table 4.3.3: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23 to 30	25	23.8	23.8	23.8
	31 to 35	26	24.8	24.8	48.6
	36 to 40	26	24.8	24.8	73.3
	41 to 50	21	20.0	20.0	93.3
	51+	7	6.7	6.7	100.0
	Total	105	100.0	100.0	

54.3% of the respondents had between 6 to 15 years' experience. A significant number of IT employees (13.3%) had experience that exceeded 20 years (Table 4.3.4).

Table 4.3.4: Tenure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 to 1	2	1.9	1.9	1.9
	1 to 5	14	13.3	13.3	15.2
	6 to 10	29	27.6	27.6	42.9
	11 to 15	28	26.7	26.7	69.5
	16 to 20	18	17.1	17.1	86.7
	20+	14	13.3	13.3	100.0
	Total	105	100.0	100.0	

Approximately 47.7% of respondents had more than 5 years working experience at their respective organisations, with 14.3% of the employees working for a period ranging between 11 to 15 years, and only 3.8% for more than 20 years (Table 4.3.5).

Table 4.3.5: Organisational Tenure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 to 1	16	15.2	15.2	15.2
	1 to 5	39	37.1	37.1	52.4
	6 to 10	26	24.8	24.8	77.1
	11 to 15	15	14.3	14.3	91.4
	16 to 20	5	4.8	4.8	96.2
	20+	4	3.8	3.8	100.0
	Total	105	100.0	100.0	

41% of the employees were four or more levels below the CEO, but there were a fair number of respondents from lower to more senior levels (Table 4.3.6).

Table 4.3.6: Job Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Four or more levels below the CEO	43	41.0	42.2	42.2
	One level below the CEO	12	11.4	11.8	53.9
	Three levels below the CEO	25	23.8	24.5	78.4
	Two levels below the CEO	22	21.0	21.6	100.0
	Total	102	97.1	100.0	
Missing		3	2.9		
Total		105	100.0		

Most IT employees thought as themselves as either an information system professional or developer. While 28.6% indicated 'other' (Table 4.3.7).

Table 4.3.7: Role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Data processing professional	1	1.0	1.0	1.0
	Developer	20	19.0	19.0	20.0
	Information system professional	21	20.0	20.0	40.0
	MIS engineer	6	5.7	5.7	45.7
	Other	30	28.6	28.6	74.3
	Programmer	5	4.8	4.8	79.0
	Software architect	5	4.8	4.8	83.8
	Software engineer	6	5.7	5.7	89.5
	Systems analyst	8	7.6	7.6	97.1
	Systems designer	3	2.9	2.9	100.0
	Total	105	100.0	100.0	

Table 4.3.8 describe some of the other option the respondents entered manually as their role (Table 4.3.8). The list confirmed that the responses were from IT employees.

Table 4.3.8: Role Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business Analyst	2	1.9	6.7	6.7
	Business Intelligence	2	1.9	6.7	13.3
	CIO	3	2.9	10.0	23.3
	CTO	1	1.0	3.3	26.7
	Digital Marketer	2	1.9	6.7	33.3
	IT Administrator	4	3.8	13.3	46.7
	IT Manager	10	9.5	33.3	80.0
	System Support	3	2.9	10.0	90.0
	Test Analyst	2	1.9	6.7	96.7
	Web Master	1	1.0	3.3	100.0
	Total	30	28.6	100.0	

Most IT employees were from the Finance industry, while 24.8% said their organisation operated in an IT services industry (Table 4.3.8).

Table 4.3.8: Industry type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agriculture	5	4.8	4.9	4.9
	Algorithms	1	1.0	1.0	5.8
	All	1	1.0	1.0	6.8
	Engineering	1	1.0	1.0	7.8
	Finance	29	27.6	28.2	35.9
	Government	2	1.9	1.9	37.9
	IT Services	26	24.8	25.2	63.1
	Legal	5	4.8	4.9	68.0
	Logistics	1	1.0	1.0	68.9
	Manufacturing	12	11.4	11.7	80.6
	Media	2	1.9	1.9	82.5
	Mining	7	6.7	6.8	89.3
	Public Sector	1	1.0	1.0	90.3
	Retail	1	1.0	1.0	91.3
	Security	2	1.9	1.9	93.2
	Services	1	1.0	1.0	94.2
	Tourism	2	1.9	1.9	96.1
	Travel	3	2.9	2.9	99.0
	Various	1	1.0	1.0	100.0
	Total	103	98.1	100.0	
Missing	20	2	1.9		
Total		105	100.0		

4.4 Validity and Reliability

Due to the adaptations made to previously validated scales, the constructs of the research model were assessed for validity through principal components factor analysis (PCA) and for reliability, using Cronbach's alpha coefficient.

4.4.1 Principal Component Factor Analysis

An exploratory factor analysis was conducted using principal components as the means of extraction and Varimax as the method of orthogonal rotation. Factor analysis provided the tools for analysing correlations among a large number of items and by defining sets of items (factors) that were highly correlated (Hair et al., 2010), while orthogonal rotation was used to simplify the rows and columns of a factor matrix to facilitate interpretation. The Varimax orthogonal rotational method has proven successful as an analytic approach in obtaining a rotation of factors (Hair et al., 2010).

Prior to conducting the principal components analysis, a correlation matrix of all 43 questionnaire items Q1 to Q43 (see questionnaire in appendix C) was examined to assess if they were suitable for factor analysis. No items were removed due to most item correlations being above 0.3.

The first PCA was run on the items measuring the variables of Attention, Absorption, Job Satisfaction, Job Performance and Turnover Intention. An initial PCA found that AB1 and JP3 items loaded with other items on factors they were not intended to measure and were subsequently dropped.

After dropping those items, a stable solution emerged. Results of the final PCA are reflected below. The KMO and Barlett's test (Table 4.4.1) showed that the KMO measure shows that the use of PCA is appropriate and the items are factorable.

Table 4.4.1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.816
Bartlett's Test of Sphericity	Approx. Chi-Square	1675.718
	df	153
	Sig.	.000

All items loaded onto their respective constructs. No items loaded on other factors they were not expected to measure after the orthogonal rotation, as shown in Table 4-4.2.

Table 4.4.2: Rotated Component Matrix[a]

	Component				
	Turnover Intention	Job Satisfaction	Attention	Job Performance	Absorption
AT1			.771		
AT2			.851		
AT3			.849		
AT4			.774		
AB2					.826
AB3					.915
AB4					.860
JS1	-.441	.801			
JS2		.789			
JS3		.867			
JS4		.855			
TI1	.792				
TI2	.816				
TI3	.835				
TI4	.915				
JP1				.925	
JP2				.872	
JP4				.877	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

A second PCA was conducted on the items measuring job rewards and those measuring the job characteristics. Job feedback, skill variety items and two reward items (RW1, RW2) were removed because the items have loadings of more than 0.40 on constructs they were not intended to measure. Thus, their discriminant validity could not be confirmed. After dropping these items, a stable solution emerged for the remaining items measuring task identity, task significance, job autonomy and rewards. The KMO and Barlett's test (see Table 4.4.3) showed that the KMO measure indicated that the use of PCA was appropriate and the items were factorable. All non-significant loadings of less than 0.4 were suppressed (see Table 4-4.4).

Table 4.4.3: KMO and Bartlett's Test- Job characteristics

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.615
Bartlett's Test of Sphericity	Approx. Chi-Square	261.054
	df	28
	Sig.	.000

Table 4.4.3: Rotated Component Matrix[a]

	Component			
	Job Autonomy	Rewards	Task Identity	Task Significance
TD1			.885	
TD2			.901	
TS1				.893
TS2				.777
JA1	.900			
JA2	.871			
RW3		.903		
RW4		.907		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The variables measures thus demonstrated adequate convergent validity with loadings on theoretically expected constructs > 0.60 and good discriminant validity, but demonstrating low-loadings on constructs they were not intended to measure.

4.4.2 Reliability Test

The scale reliability tests were carried out using Cronbach Alpha. A cut-off of 0.70 suggested by Nunnally and Bernstein (1994) was adopted as evidence of adequate scale reliability. The task significance construct did not meet this criterion, however, it was above 0.60, which has been considered elsewhere (Hair et al., 2010) as acceptable reliability in more exploratory studies. Consequently the variable was retained. All other constructs had evidence of scale reliability $\alpha > 0.70$ as shown in Table 4.4.4.

Table 4.4.4: Descriptive Statistics for the Composite Variables

	Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Cronbach's Alpha
Attention	6.0948	3.75	7.00	3.25	3.25	0.460	0.853
Absorption	5.3765	2.33	7.00	4.67	1.00247	1.005	0.869
Job satisfaction	5.1123	1.75	7.00	5.25	1.40412	1.972	0.956
Turnover Intention	3.4708	1.00	7.00	6.00	1.81798	3.305	0.932
Job performance	7.6233	4.00	10.00	6.00	1.27240	1.619	0.889
Task identity	4.5762	1.00	7.00	6.00	1.39674	1.951	0.774
Task significance	6.0203	3.00	7.00	4.00	0.84009	0.706	0.616
Autonomy	5.5313	1.00	7.00	6.00	1.22550	1.502	0.827
Rewards	3.4984	1.00	7.00	6.00	1.56270	2.442	0.827

Satisfied as to the reliability and validity of the measures, composite scores for the study's variables were then calculated. Only items surviving PCA analyses were included and composites were calculated as the mean of relevant items weighted equally.

Correlations between the composite scores were then examined using Pearson's correlation analysis. Attention correlated with absorption, job satisfaction and job performance at $p < 0.01$, suggesting that H2a and H5a may be supported. Job satisfaction correlated with turnover intention, autonomy, task identity and rewards at $p < 0.01$ suggesting that H1 may be supported (Table 4.4.2.1). Next the regression analysis will proceed.

Table 4.4.2.1: Correlations

		Attention	Absorption	Job satisfaction	Turnover intention	Job Performance	Task identity	Task significance	Autonomy	Rewards
Attention	Pearson Correlation	1	.397**	.267**	-.109	.282**	.037	.282**	.110	.014
	Sig. (2-tailed)		.000	.006	.269	.004	.711	.004	.263	.889
	N	105	105	105	105	105	105	105	105	105
Absorption	Pearson Correlation	.397**	1	.124	-.115	.183	.041	.128	.024	.168
	Sig. (2-tailed)	.000		.209	.243	.062	.677	.192	.807	.087
	N	105	105	105	105	105	105	105	105	105
Job satisfaction	Pearson Correlation	.267**	.124	1	-.699**	.175	.367**	.284**	.589**	.339**
	Sig. (2-tailed)	.006	.209		.000	.074	.000	.003	.000	.000
	N	105	105	105	105	105	105	105	105	105
Turnover intention	Pearson Correlation	-.109	-.115	-.699**	1	-.159	-.305**	-.189	-.394**	-.308**
	Sig. (2-tailed)	.269	.243	.000		.104	.002	.054	.000	.001
	N	105	105	105	105	105	105	105	105	105
Job Performance	Pearson Correlation	.282**	.183	.175	-.159	1	.070	.188	.170	.038
	Sig. (2-tailed)	.004	.062	.074	.104		.480	.054	.083	.697
	N	105	105	105	105	105	105	105	105	105
Task identity	Pearson Correlation	.037	.041	.367**	-.305**	.070	1	.151	.237*	.205*
	Sig. (2-tailed)	.711	.677	.000	.002	.480		.125	.015	.036
	N	105	105	105	105	105	105	105	105	105
Task significance	Pearson Correlation	.282**	.128	.284**	-.189	.188	.151	1	.267**	.027
	Sig. (2-tailed)	.004	.192	.003	.054	.054	.125		.006	.783
	N	105	105	105	105	105	105	105	105	105
Autonomy	Pearson Correlation	.110	.024	.589**	-.394**	.170	.237*	.267**	1	.341**
	Sig. (2-tailed)	.263	.807	.000	.000	.083	.015	.006		.000
	N	105	105	105	105	105	105	105	105	105
Rewards	Pearson Correlation	.014	.168	.339**	-.308**	.038	.205*	.027	.341**	1
	Sig. (2-tailed)	.889	.087	.000	.001	.697	.036	.783	.000	
	N	105	105	105	105	105	105	105	105	105

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.4.3 ANOVA

Because role and industry type were ordinal variables, it was decided to carry out an one-way ANOVA to check if the categorical variables (industry type, role) differ across attention, absorption, satisfaction, performance, intention. Industry type was coded into a new variable as non-services (0); services (1). Role was coded into technical (0); non-technical (1) and non-managerial (0); managerial (1) (see Appendix F for detailed analysis).

The ANOVA's showed that the categorical variables (industry type, role) did differ significantly across the dependent and independent variables. The results suggested that IT employees in non-technical IT roles were reporting significantly higher attention ($p < 0.05$) and job satisfaction ($p < 0.05$) than their technical counterparts; and although not statistically significant they had lower turnover intentions. Also, people in managerial roles reported statistically significantly higher attention ($p < 0.05$) and job satisfaction ($p < 0.05$) than counterparts in non-management. Lastly, people in the service industry reported higher turnover intention ($p < 0.05$) and lower job performance ($p < 0.05$) than non-service industries. Because of these differences across the dependent and independent variables, it was necessary to add a control for these effects by using the industry type and role variables as dummy variables in the regression analyses reported next.

4.5 Hypothesis Testing

Multiple regression analysis was carried out to determine the effects of the model's independent variables on the dependent variables. Results are reported next.

4.5.1 Hypotheses H1 and H3

Hypothesis H1: The individual IT employee's job satisfaction is negatively associated with turnover intention.

Hypothesis H3: The individual IT employee's job performance will be negatively associated with turnover intention

$TI = ƒ\ JS + JP$[3]

First, only the controls were entered. This model (model 1) explained 37% of the variance with *job autonomy* significantly ($p < 0.05$) lowering turnover intention, also *task identity* and *rewards* had near significant levels of $p < 0.1$. Next, the main effects variables of job satisfaction and job performance were entered (model 2). The R^2 of model 2 explained 55.6% of the variance in turnover intention (Table 4.5.1.1). This was significant at the $p < 0.001$ level. There was an 18.5% increase in R^2 over model 1, which was significant at the $p < 0.001$ level. *Job satisfaction* was shown to have a statistically significant effect on turnover intention. Job satisfaction has the largest significant effect

[3] Tests of assumptions for $TI = ƒ\ JS + JP$ are provided in appendix-E along with the plots to check for homoscedasticity, and the normality of the residuals.

on turnover intention with a standardised beta coefficient of -0.584, which was significant at p < 0.001 level (Table 4.5.1.2*)*. *Job performance* however had no significant effect. The results suggested support for hypothesis H3 and rejection of H1.

Table 4.5.1.1: Turnover Intention Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.609[a]	.370	.263	1.56300	.370	3.444	14	82	.000
2	.745[b]	.556	.467	1.32923	.185	16.689	2	80	.000

a. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure

b. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure, Job Performance, Job satisfaction

c. Dependent Variable: Turnover intention

Table 4.5.1.2: Turnover Intention Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.734	2.340		3.306	.001
	Gender	.480	.412	.116	1.165	.247
	Educational level	-.046	.086	-.053	-.535	.594
	Age	-.001	.042	-.004	-.022	.983
	Job Level	.068	.183	.038	.371	.711
	Organisational tenure	.004	.035	.014	.123	.902
	Tenure	-.069	.051	-.261	-1.350	.181
	Sample	.339	.387	.092	.875	.384
	Task identity	-.219	.126	-.172	-1.731	.087
	Task significance	-.070	.225	-.033	-.312	.756
	Autonomy	-.338	.149	-.233	-2.269	.026
	Rewards	-.220	.113	-.193	-1.944	.055
	Tech/ Non-Tech	-.207	.459	-.054	-.450	.654
	Non-Managerial/ Managerial	.493	.650	.093	.758	.450
	Non-Services/ Services	.692	.442	.165	1.566	.121
2	(Constant)	7.726	2.116		3.651	.000
	Gender	.532	.351	.129	1.517	.133
	Educational level	-.032	.073	-.036	-.431	.668
	Age	-.012	.036	-.053	-.334	.740
	Job Level	-.047	.157	-.027	-.300	.765
	Organisational tenure	.005	.030	.017	.178	.859
	Tenure	-.042	.044	-.159	-.962	.339
	Sample	.297	.349	.081	.849	.398
	Task identity	-.029	.112	-.023	-.256	.799
	Task significance	-.013	.193	-.006	-.068	.946
	Autonomy	-.007	.142	-.005	-.049	.961
	Rewards	-.134	.097	-.117	-1.372	.174
	Tech/ Non-Tech	.060	.394	.016	.153	.879
	Non-Managerial/ Managerial	.315	.553	.059	.570	.570
	Non-Services/ Services	.514	.379	.122	1.354	.179
	Job Performance	.120	.128	.086	.943	.348
	Job satisfaction	-.757	.134	-.584	-5.637	.000

a. Dependent Variable: Turnover intention

Results showed that, amongst the variables considered, job satisfaction was the primary determinant of turnover intentions of IT employees. On average, IT employees that had a higher emotional state towards their job work roles were less likely to have turnover intentions. The next section therefore focuses on the determinants of JS.

4.5.2 Hypotheses H2a, H2b and H4

Hypothesis H2a: The greater the degree of an individual IT employee's attention while working, the greater will be their job satisfaction

Hypothesis H2b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job satisfaction.

Hypothesis H4: The individual IT employee's job performance will be positively associated with job satisfaction.

JS= ƒ AT + AB + JP

First, only the controls were entered. This model (model 1) explained 48.1% of the variance with *job autonomy* and *task identity* significant for job satisfaction. Next, the main effects variables of attention, absorption and job performance were entered (model 2). The R^2 in model 2 explains 51.6% of the variance in job satisfaction (Table 4.5.2). There was a 3.5% increase in R^2 over model 1, but this was not significant. The standardised beta coefficient for the independent variable *attention* was 0.206, which was significant at $p < 0.05$ level (Table 4.5.3). The results suggested some support for hypothesis H2a, and also suggested that *job autonomy* and *task identity* retained significant effects on the dependent variable.

Table 4.5.2: Job Satisfaction Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.693[a]	.481	.392	1.09497	.481	5.422	14	82	.000
2	.718[b]	.516	.412	1.07722	.035	1.908	3	79	.135

a. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure

b. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure, Absorption, Attention, Job Performance

c. Dependent Variable: Job satisfaction

Table 4.5.3: Job Satisfaction Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.866	1.639		.528	.599
	Gender	.079	.289	.025	.273	.785
	Educational level	.013	.060	.019	.210	.834
	Age	-.012	.029	-.068	-.406	.686
	Job Level	-.128	.128	-.094	-.999	.321
	Organisational tenure	.003	.025	.011	.103	.918
	Tenure	.038	.036	.187	1.069	.288
	Sample	-.196	.271	-.069	-.721	.473
	Task identity	.247	.089	.252	2.792	.007
	Task significance	.105	.158	.064	.664	.509
	Autonomy	.456	.104	.408	4.366	.000
	Rewards	.115	.079	.131	1.455	.149
	Tech/ Non-Tech	.374	.322	.127	1.164	.248
	Non-Managerial/ Managerial	-.225	.455	-.055	-.494	.623
	Non-Services/ Services	-.279	.309	-.086	-.902	.370
2	(Constant)	-.830	1.914		-.434	.666
	Gender	.011	.286	.003	.038	.970
	Educational level	.000	.060	-.001	-.008	.994
	Age	.004	.030	.021	.125	.901
	Job Level	-.140	.127	-.103	-1.099	.275
	Organisational tenure	.005	.024	.022	.215	.831
	Tenure	.024	.036	.120	.683	.497
	Sample	-.308	.283	-.109	-1.088	.280
	Task identity	.230	.087	.235	2.636	.010
	Task significance	.055	.159	.034	.349	.728
	Autonomy	.454	.104	.406	4.351	.000
	Rewards	.125	.080	.142	1.557	.123
	Tech/ Non-Tech	.307	.320	.104	.960	.340
	Non-Managerial/ Managerial	-.351	.451	-.086	-.778	.439
	Non-Services/ Services	-.243	.308	-.075	-.787	.433
	Attention	.434	.205	.206	2.116	.038
	Absorption	.008	.128	.006	.062	.951
	Job Performance	-.113	.106	-.104	-1.061	.292

a. Dependent Variable: Job satisfaction

Results showed that job characteristics of task identity and autonomy were important to the job satisfaction of IT employees. However, results here also confirmed that attention, as a dimension of cognitive engagement, was important to their job satisfaction. On average, IT employees that put more cognitive resources into their work were more satisfied in their jobs, and therefore less likely to have turnover intentions. Attention was the more important of the cognitive engagement constructs to job satisfaction. Moreover, job performance was not significant to job satisfaction in the presence of all other controls and job characteristics.

4.5.3 Hypotheses H5a and H5b

Hypothesis H5a: The greater the degree of an individual IT employee's attention while working, the greater will their job performance.

Hypothesis H5b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job performance.

JP= ƒ AT + AB

First, only the controls were entered. This model (model 1) explained 32.9% of the variance with the dummy variable reflecting the sample (McGregor's versus snowball) accounting significantly for the observed differences in self-reported job performance. Next, the main effects variables of *attention* and *absorption* were entered (model 2). The R^2 in model 2 explained 36.8% of the variance in job performance (Table 4.5.3.1). There was only a 3.9% increase in R^2 over model 1, and was near significant as $p < 0.10$ level. The standardised beta coefficient for independent variable attention was 0.193, which was near significant at $p < 0.1$ level (Table 4.5.3.2). The results suggested some support for hypothesis H5a, and also suggested that the only control that had a significant effect on the dependent variable was the sample.

Table 4.5.3.1: Job Performance Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.574[a]	.329	.215	1.15178	.329	2.877	14	82	.001
2	.607[b]	.368	.242	1.13161	.039	2.474	2	80	.091

a. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure

b. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure, Absorption, Attention

c. Dependent Variable: Job Performance

Table 4.5.3.2: Job Performance Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.516	1.724		3.199	.002
	Gender	.063	.304	.021	.209	.835
	Educational level	-.040	.064	-.065	-.635	.527
	Age	.016	.031	.101	.529	.598
	Job Level	.151	.135	.120	1.122	.265
	Organisational tenure	.008	.026	.035	.294	.769
	Tenure	.018	.038	.095	.475	.636
	Sample	-.879	.285	-.336	-3.079	.003
	Task identity	-.024	.093	-.026	-.257	.798
	Task significance	.185	.166	.122	1.116	.268
	Autonomy	.114	.110	.110	1.039	.302
	Rewards	.009	.083	.011	.107	.915
	Tech/ Non-Tech	.138	.338	.050	.407	.685
	Non-Managerial/ Managerial	.058	.479	.015	.122	.903
	Non-Services/ Services	-.275	.325	-.092	-.846	.400
2	(Constant)	3.336	1.976		1.688	.095
	Gender	-.001	.301	.000	-.003	.997
	Educational level	-.048	.063	-.077	-.770	.443
	Age	.027	.031	.169	.873	.385
	Job Level	.123	.133	.098	.928	.356
	Organisational tenure	.009	.026	.040	.339	.735
	Tenure	.004	.038	.020	.103	.918
	Sample	-.892	.280	-.341	-3.179	.002
	Task identity	-.036	.092	-.039	-.390	.698
	Task significance	.112	.166	.074	.676	.501
	Autonomy	.105	.109	.101	.963	.339
	Rewards	.009	.084	.011	.108	.915
	Tech/ Non-Tech	.074	.336	.027	.220	.827
	Non-Managerial/ Managerial	-.070	.474	-.018	-.147	.883
	Non-Services/ Services	-.225	.323	-.075	-.698	.487
	Attention	.375	.211	.193	1.777	.079
	Absorption	.063	.134	.049	.474	.637

a. Dependent Variable: Job Performance

Attention was the primary determinant of job performance in the presence of all other controls. On average, IT employees that put more cognitive resources into their work had a higher perceived job performance.

4.5.4 Other relationships with Cognitive Engagement

4.5.4.1 Job Characteristics

To determine if job characteristics (autonomy, task identity, or task significance) had an indirect effect through the more important dimension of cognitive engagement constructs (attentions) on job satisfaction, the following regression analyses was carried out.

AT (Attention) = ƒ AT + TD + TS

Only job characteristics where entered. The R^2 in model 1 explains 8.1% of the variance in attention (Table 4.5.4.1.1) which was significant. The standardised beta coefficient for *task significance* was 0.273, which was significant at $p < 0.05$ level (Table 4.5.4.1.2). The results suggested that task significance had a direct effect on attention.

Table 4.5.4.1.1: Attention Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.284[a]	.081	.053	.65990	.081	2.958	3	101	.036

a. Predictors: (Constant), Autonomy, Task identity, Task significance

Table 4.5.4.1.2: Attention Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.676	.512		9.139	.000
	Task identity	-.007	.048	-.014	-.144	.885
	Task significance	.220	.080	.273	2.744	.007
	Autonomy	.023	.056	.041	.402	.688

a. Dependent Variable: Attention

Results of hypothesis tests showed that task significance was the only job characteristic having an independent effect on attention. It was shown earlier, Table 4.5.3, that task significance did not have a direct effect on job satisfaction in the presence of attention, and that attention was related to job satisfaction. Table 4.5.4.1.2 has now established that task significance has a direct effect on attention. Thus, according to the requirements for mediation as specified by Baron and Kenny (1986), it could be concluded that the effects of task significance on job satisfaction were fully mediated by attention. Results thus showed that while task identity and autonomy were direct

predictors of job satisfaction, task significance had an indirect effect on job satisfaction through attention.

4.5.4.2 Turnover Intention

To determine whether the two cognitive engagement constructs (attentions and absorption) were additional direct predictors of turnover intention, a further regression analysis was carried out.

TI= ƒ AT + AB

The R^2 in model 2 explains 0.1% of the variance in job performance and is not significant (Table 4.5.4.2.1). The standardised beta coefficients for attention and absorption were not significant (Table 4.5.4.2.2). They were thus not independent predictors of turnover intention. Results confirmed that job satisfaction fully mediates the effects of attention on turnover. Attention had an effect on turnover intention through job satisfaction. The influence of absorption as a dimension of cognitive engagement on the satisfaction and turnover of IT employees could not be confirmed and requires further study.

Table 4.5.4.2.1: Attention and Absorption Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.609[a]	.370	.263	1.56300	.370	3.444	14	82	.000
2	.610[b]	.372	.246	1.58053	.001	.095	2	80	.909

a. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure

b. Predictors: (Constant), Non-Services/Services, Rewards, Gender, Educational level, Technical/No Technical, Job Level, Organisational tenure, Task identity, Task significance, Autonomy, Sample, Age, Non-Managerial/Managerial, Tenure, Absorption, Attention

c. Dependent Variable: Turnover intention

Table 4.5.4.2.2: Attention and Absorption Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.734	2.340		3.306	.001
	Gender	.480	.412	.116	1.165	.247
	Educational level	-.046	.086	-.053	-.535	.594
	Age	-.001	.042	-.004	-.022	.983
	Job Level	.068	.183	.038	.371	.711
	Organisational tenure	.004	.035	.014	.123	.902
	Tenure	-.069	.051	-.261	-1.350	.181
	Sample	.339	.387	.092	.875	.384
	Task identity	-.219	.126	-.172	-1.731	.087
	Task significance	-.070	.225	-.033	-.312	.756
	Autonomy	-.338	.149	-.233	-2.269	.026
	Rewards	-.220	.113	-.193	-1.944	.055
	Tech/ Non-Tech	-.207	.459	-.054	-.450	.654
	Non-Managerial/ Managerial	.493	.650	.093	.758	.450
	Non-Services/ Services	.692	.442	.165	1.566	.121
2	(Constant)	8.105	2.760		2.937	.004
	Gender	.485	.420	.118	1.155	.251
	Educational level	-.045	.087	-.051	-.516	.608
	Age	-.001	.044	-.004	-.023	.982
	Job Level	.073	.186	.041	.394	.695
	Organisational tenure	.005	.036	.016	.134	.894
	Tenure	-.067	.053	-.255	-1.279	.205
	Sample	.341	.392	.093	.872	.386
	Task identity	-.218	.128	-.171	-1.700	.093
	Task significance	-.052	.232	-.024	-.222	.825
	Autonomy	-.341	.152	-.236	-2.245	.028
	Rewards	-.213	.117	-.187	-1.812	.074
	Tech/ Non-Tech	-.209	.470	-.055	-.445	.658
	Non-Managerial/ Managerial	.518	.662	.097	.782	.437
	Non-Services/ Services	.695	.451	.166	1.542	.127
	Attention	-.034	.295	-.012	-.115	.909
	Absorption	-.063	.187	-.035	-.335	.738

a. Dependent Variable: Turnover intention

4.6 Summary

After presenting the sample profile and determining acceptable reliability and validity of the study's measures, hypotheses were tested to assess the effect of the independent variables on the dependent variables. This chapter tested hypotheses by use of multiple regression analysis.

As illustrated by Table 4.6.1.1, some hypotheses were supported, specifically job satisfaction predicted turnover intention, and attention was the more important of the cognitive engagement constructs for job satisfaction and job performance.

Table 4.6.1.1: Table of Hypotheses and study Outcomes

Hypotheses		Outcome
Hypothesis H1:	The individual IT employee's job satisfaction is negatively associated with turnover intention.	Supported
Hypothesis H2a:	The greater the degree of an individual IT employee's attention while working, the greater will be their job satisfaction	Supported
Hypothesis H2b:	The greater the degree of an individual IT employee's absorption while working, the greater will be their job satisfaction.	Rejected
Hypothesis H3:	The individual IT employee's job performance will be negatively associated with turnover intention	Rejected
Hypothesis H4:	The individual IT employee's job performance will be positively associated with job satisfaction.	Rejected
Hypothesis H5a:	The greater the degree of an individual IT employee's attention while working, the greater will their job performance.	Supported
Hypothesis H5b:	The greater the degree of an individual IT employee's absorption while working, the greater will be their job performance.	Rejected

Additional analyses suggested that job satisfaction was more important to managerial and non-technical roles. Also, that job characteristics of task identity and autonomy were direct predictors of job satisfaction, task significance has an indirect effect on job satisfaction through attention.

Using the literature in chapter 2 these results will be discussed in the next chapter.

Chapter 5: Discussions and Interpretations

5.1 Introduction

The previous chapter presented results of the data collected in order to answer the following research questions posed for the study:

1. To what extent do the dimensions of cognitive engagement influence job satisfaction amongst IT employees?
2. To what extent do the dimensions of cognitive engagement influence job performance amongst IT employees?
3. To what extent do the dimensions of cognitive engagement, job satisfaction, and job performance explain variation in the turnover intentions of IT employees?

To answer these questions, the study conceptualized two dimensions of cognitive engagement, namely attention and absorption. Then, seven hypotheses were developed to examine the interrelationships amongst the variables of cognitive engagement, job satisfaction, job performance, and turnover intentions. Results of hypothesis tests shows that, on average, IT employees who put more cognitive resources into their work (attention) are more satisfied and are higher performers in their jobs. Attention is the more important of the cognitive engagement constructs to job satisfaction and job performance. In addition, the extent to which IT employees had autonomy and task identity influenced job satisfaction. Finally, job satisfaction is the primary determinant of turnover intentions of IT employees. The effect of cognitive engagement on turnover was found to be indirect and mediated by job satisfaction.

Results for each of the hypothesis tested in the research model are discussed next:

5.2 Job Satisfaction, Job Performance and Turnover Intentions

This study drew on the literature (Chapter 2) and identified two factors shown by past work to be highly important to turnover intention, namely job satisfaction and job performance. The following was postulated**:**

Hypothesis H1: The individual IT employee's job satisfaction is negatively associated with turnover intention.

Hypothesis H3: The individual IT employee's job performance will be negatively associated with turnover intention.

Hypothesis 1a was supported. Job satisfaction is the emotional response of an individual towards their job (Kalleberg and Sørensen, 1973; Ivancevich and Donnelly, 1968). According to Joseph et al.

(2007) several studies have indicated that turnover intention is higher when job satisfaction is lower. This study confirmed this important link as IT employees who reported a higher job satisfaction had less intention to leave their organisations. Job satisfaction is important to an employee because it gives the employee a positive emotional state or pleasure (Locke, 1976). Job satisfaction's ability to predict turnover intention in the context of information technology has been confirmed thus providing further support to this relationship.

Hypothesis 3 was not supported. Job performance refers to the quality of one's work and their productivity on the job (Yousef, 2000). It was initially expected that high performers would be less likely to resign. This hypothesis was not however supported. Job performance was not correlated with either job satisfaction or turnover intention. This was an unexpected finding as numerous studies have suggested that high performers get more rewards and are thus more satisfied ultimately having less turnover intention (Dreher 1982; Martin et al., 1981). Also, low performers may perceive a threat of dismissal and have turnover intentions as low performance is a risk factor for dismissal (Jackofsky, 1984; Wanous, Stumpf, and Bedrosian, 1979). It may also be possible that IT employees are less satisfied by the outcomes of their performance (i.e. rewards) because their jobs provide satisfaction by offering task identity and autonomy. These factors appear more important to IT employees than the experience of job performance. It could also be that IT employees in South Africa are less rewarded than their colleagues in other countries, this could mean that job performance is less correlated with rewards and job satisfaction in a South African context. It should also be noted that a self-evaluation of job performance was used in this study and results may also be biased by the possibility that self-ratings of performance were inflated, notwithstanding that some researchers suggest that self-ratings of job performance do not necessarily lead to systematic bias (Churchill Jr, Ford, Hartley, and Walker, 1985; Fox and Dinur, 1988).

5.3 Job Satisfaction, Job Performance and Cognitive Engagement

By drawing on the literature in Chapter 2 this study also found evidence to support links between job satisfaction and job performance and cognitive engagement constructs. The following were postulated:

Hypothesis H2a: The greater the degree of an individual IT employee's attention while working, the greater will be their job satisfaction.

Hypothesis H2b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job satisfaction.

Hypothesis H4: The individual IT employee's job performance will be positively associated with job satisfaction.

Hypothesis H5a: The greater the degree of an individual IT employee's attention while working, the greater will their job performance.

Hypothesis H5b: The greater the degree of an individual IT employee's absorption while working, the greater will be their job performance.

Hypothesis 2a was supported. Attention is a dimension of cognitive engagement and is defined as the amount of cognitive resources, including psychic energy and concentration that an individual allocates to their work (Gardner et al., 1989; Csikszentmihalyi, 1978). Attention is thus observed when someone spends a lot of time thinking about their work, focuses a great deal of attention on their work, and concentrates a lot on work. According to Saks (2006) job satisfaction should be higher when attention is higher. Results of this study confirmed this link. It was found that IT employees who reported higher levels of attention had higher job satisfaction. This may be because an employee who seeks to satisfy higher order psychological needs, such as the need for job satisfaction, will be more focused on that job, and not on activities that will not satisfy those needs (Gardner et al., 1989). Attention's ability to predict job satisfaction in the context of information technology has been confirmed thus providing support for a previously under-explored relationship in the IT employee context.

Hypothesis 2b was not supported. Absorption is a dimension of cognitive engagement and is defined as the intensity of immersion and focus that one experiences when working (Rothbard, 2001). Absorption in the job would be observed if an employee is not easily distracted by other activities while deeply engrossed in the job activity. Absorption was hypothesised to be important to job satisfaction because absorption is linked to intrinsically motivated interest which could lead to positive emotions (Rothbard, 2001). The hypothesis was not however supported. Giallonardo, Wong, and Iwasiw (2010) also found that this relationship between absorption and job satisfaction was not significant. Absorption may not always be positive. If you consider the indicators of absorption i.e. being completely engrossed by one's work, totally absorbed by it and often getting carried away, there is a sense that this could be a function of a stressful work environment, a high workload, and could lead to burnout. In other words absorption may be a dysfunctional/obsessive behaviour. Thus in the IT employee context, if absorption reflects an unhealthy immersion in work then it may not coincide with job satisfaction or performance. This dimension should be explored in future research.

Hypothesis 5a was supported. Prior empirical research in the job performance literature also supports a link between attention and job performance (Ho et al., 2011). Ho et al. (2011) suggested that employees who are expending greater intensity and quantities of cognitive energy into their work exhibit higher job performance. This is likely because they are able to overcome obstacles easier by their intense concentration and focus, which could help them be more effective and successful. Attention's ability to predict job satisfaction in the context of information technology has been confirmed thus providing further support to this relationship.

Hypothesis 5b was not supported. Absorption did not significantly relate to job performance, suggesting that higher job performers don't exhibit greater immersion and focus in the job. The lack of a relationship between absorption and job performance could be because absorption may also result from negative aspects such as increased job complexity and demands (Gardner et al., 1989). Specifically, IT employees who have problems in coping with job demands and doing their work may be more absorbed in the work to overcome these demands or difficulties (Bakker, 2008). At the

same time, excessive demands and complexities could impair job performance, thereby not producing a correlation between absorption and job performance.

Hypothesis 4 was not supported. Previous research has shown that job satisfaction and job performance correlate weakly (Iaffaldano and Muchinsky, 1985, Brayfield and Crockett, 1955). This could be because different meanings are giving to job performance by those rating performance (e.g. self-appraisal, supervisors or managers) (Organ, 1977). For example, when evaluating job performance managers appear to include formal work performance and extra-role performance. Extra-role performance in a self-appraisal would not necessarily be measured because the behaviour exceeds the normal fulfilment of the task (Motowidlo and Van Scotter, 1994). Judge et al. (2001) suggest that the job performance, job satisfaction correlation has not yet been proven or disproven. Further examination of the role of job performance and job satisfaction in the IT employee context is needed. For example, job performance may be less important to satisfaction and turnover in a context where skills shortages exist, and employees perceives themselves to be highly mobile and able to pursue multiple opportunities in the job market. Also, a real challenge appears to be that there is no standard definition of the very subjective construct of job performance, which leads to inconsistent finding in the literature based on who did the research and what they were measuring.

5.4 The Role of Job Characteristics

This study drew on Hackman and Oldham to identify various dimensions of job characteristics that may interact with other factors in the study to influence turnover. These dimensions were skill variety, task identity, task significance, job feedback, and autonomy. Skill variety and job feedback were not found to have been measured reliably and were dropped and only three, namely task significance, task identity and autonomy were retained.

The data was examined to check whether task characteristics influence cognitive engagement (attention), and it was found that task significance did. Thus when people perceive task significance i.e. that their job is very significant and important in the broader scheme of things and a lot of other people can be affected by how it is done, then they are likely to expend more cognitive resources in the work, focus their attention and concentrate their effort. This is consistent with suggestions elsewhere that employees will concentrate more on significant than less significant tasks (Wong, and Campion, 1991; Taber, and Alliger, 1995). Thus, jobs should be designed to provide employees with significance if they are to maintain cognitive engagement and be satisfied.

Job autonomy appears to be the most influential factor for job satisfaction. Joseph et al. (2007) also suggested that job autonomy correlates with job satisfaction. Autonomy provides IT employee's opportunity to not unduly increase work exhaustion and stress because of the flexibility and freedom to manage their own workloads. This ultimately leads to enhanced job satisfaction because of enhanced intrinsic motivation (Jackson and Schuler 1985). Jobs that comprise of more IT components naturally have more job autonomy because information technology affords employees the freedom to adapt technologies to fit their lives and manage schedules to respond to task demands (Ahuja and Thatcher, 2005).

Task Identity exists when a job provides an employee the chance to completely finish a piece of work (from beginning to end). Results show this is important for the job satisfaction of IT employees. Past literature also support this correlation as it has been shown that IT employees who experience greater task identity have higher levels of job satisfaction. This is consistent with findings elsewhere that IT employees will perceive their work as more interesting and important which leads to higher satisfaction (Thatcher et al., 2006; Couger and Zawacki, 1980). If an IT employee such as a programmer is not provided an opportunity to completely finish their work, e.g. if there are frequent handovers, and if the outcomes of a job are not observable to the programmer then they may perceive themselves as only contributing a small piece, their contribution to the larger outcome is obscured and they are therefore less likely to be satisfied.

5.5 Control Variables

5.5.1 Rewards

This study also considered external rewards (promotion and salary increases) as having a potentially important influence on job satisfaction and turnover. Anecdotal evidence suggests that employees may be manipulated by rewards such as salary and offers of promotion. Results showed that rewards are not important to IT employees, they have no additionally significant effect on their satisfaction and do not increase their turnover intention. However, this study offers additional insights. More specifically, that job design factors such as autonomy, task identity and as well as cognitive attention as a dimension of engagement are more important to predicting turnover and job satisfaction than the provision of external rewards. IT employees cannot be manipulated only by external rewards and require intrinsic motivation brought about by job characteristics. This is an important finding of the study that deserves attention by practitioners.

5.5.2 Other Controls

Other controls included gender, educational level, age, job level, organisational tenure, and job tenure. These control variables had no significant effect on the turnover intentions, job satisfaction, job performance and cognitive engagement constructs. The variable which was added to control for the sample did have a significant effect on job performance but this could be because of the perception that the questionnaire was being distributed through management and thus responses in the one sample may have been subject to response bias.

5.6 Summary

The research results of the previous chapter were discussed and interpreted in this chapter. The results of each hypothesis that was tested were discussed with reference to the literature.

Findings, including those relating to controls, suggest that attention is more important than absorption, that attention, together with autonomy and task identity, is important to satisfaction. Attention was found to mediate the effect of task significance on job satisfaction. Job satisfaction is a primary predictor of turnover intention but job performance did not explain any significant variation in turnover intentions of IT employees surveyed.

This next chapter is a summary of the study and highlights the practical and academic contribution. Limitations of the study and recommendations for future research are also discussed.

Chapter 6

6.1 Summary of the study

This study drew on the job satisfaction, job performance and cognitive engagement constructs to develop a research model aimed at explaining why IT employees in South Africa resign. Data from 105 respondents was collected using an online questionnaire that was administered to IT employees in South Africa using a combination of random and snow-ball sampling. Findings from this study were that job satisfaction, together with one dimension of cognitive engagement (attention), autonomy, and task identity had either direct or indirect positive effects on turnover intentions.

The model that emerged from the analysis is shown in Figure 3. The findings support the Job Characteristics Model (JCM) by providing evidence that job characteristics affect an employee's psychological state which then leads to an outcome in the work environment. The findings also support that job satisfaction is the primary mediator of turnover intentions.

The recommendations for practice, limitations of this study, and suggestions for future research are presented next.

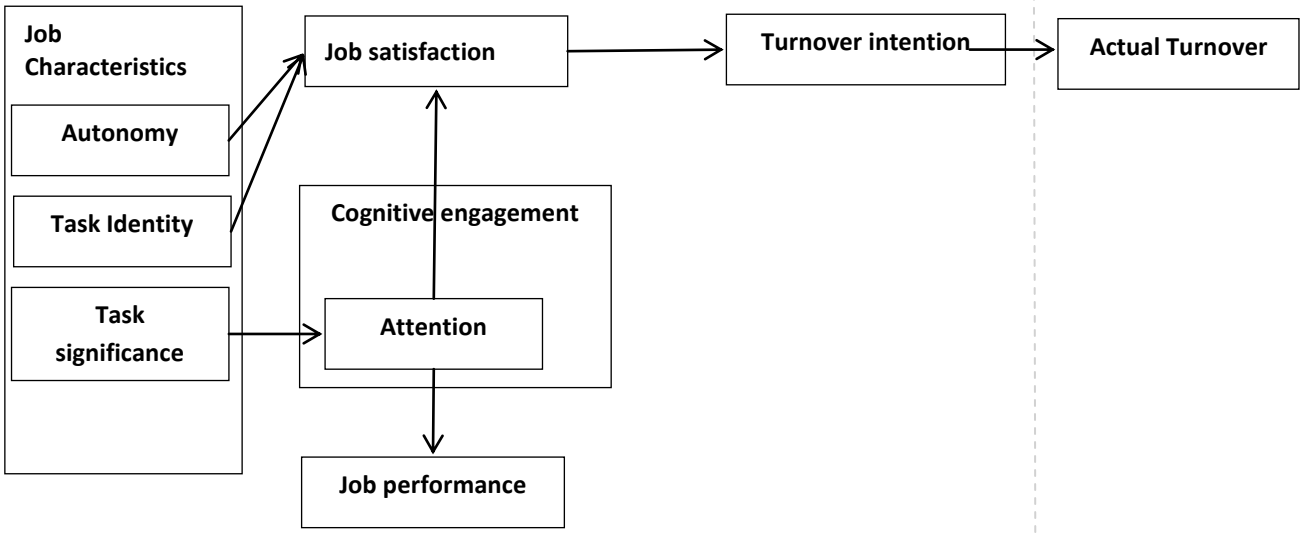


Figure 3: Revised Conceptual model of IT Employee Satisfaction and Turnover

6.2 Managerial Guidelines

Many IT managers seek to understand why IT employees resign. Some practical guidelines are offered on the basis of empirical results. Firstly, IT managers need to keep their IT employees satisfied within the work environment in order to decrease their turnover intentions. The findings from this survey indicate that employees who are cognitively engaged with their work have higher job satisfaction, regardless of job rewards, and that this has direct benefit for employee turnover intentions. Specifically the attention dimension of cognitive engagement could be acquired by implementing cognitive engagement initiatives, for example by reducing the noise level in the work place, noise level has been shown to correlate with job satisfaction (Sundstrom, Town, Rice, Osborn, and Brill, 1994). Secondly, when IT employees have certain job characteristic like autonomy and task identity they were more satisfied with the job. IT managers should give their employees an experience of substantial independence, discretion, and freedom in determining the procedures to be used in doing the job and scheduling the work; designing identifiable pieces that form part of a visible outcome of the work from beginning to end. Thirdly, the results suggest that IT management should be especially weary of their IT employee's job satisfaction in the service sector and those working with more technical and non-managerial level IT employees, as those IT employees exhibited less job satisfaction on average. Lastly, this study found that task significance had an indirect effect through attention on job satisfaction. This suggests that if an IT employee feels that the job is more significant the employee is likely to spend more cognitive resources on the job and then be more satisfied. IT managers should reengineer the job design so that the impact of the IT employee's tasks on the work or lives of others is more visible to the employee. If an employee is not made aware of or cannot see the significance of their work on others then they are less likely to devote more cognitive resources, and ultimately satisfaction may decline.

6.3 Limitations of the study

Limitations of this research need be acknowledge in considering the implications of the study. Firstly, a self-appraisal approach was used to measure job performance. Although the use of a subjective instead of an objective measure is not preferable, it was necessary due to time and money constraints.

A second limitation is the problem of common method bias in using only self-reported survey data. Common method bias refers to potential error that could affect different measures in a similar way, rather than a substantive relationship between two measures i.e. a correlation is found to exist due to the fact that data for all variables came from the same respondent using the same survey instrument. Because this model focuses on IT employee's perceptions of their job satisfaction, job performance, and cognitive engaged, responses from the individuals themselves were needed. Furthermore, Spector (1987) suggested that common method bias is more of a problem with poorly designed or single-item scales and less of a problem with well-designed multi-item scales. This concern is diminished as this study used only multi-item scales with high reliabilities.

Finally, a snowball sampling approach was used to supplement the preferred random sampling method. As a result, when generalizing to the larger population some caution is required.

6.4 Recommendations for future research

The following suggestions are made for future research. Firstly, the findings reported above demonstrate the importance of the cognitive engagement construct. Specifically, the dimension of attention, or the amount of cognitive resources and concentration that an individual allocates to their work, is important in predicting the satisfaction and turnover of IT employees. The study of cognitive engagement and job characteristics should thus be extended to include other variables not examined here. For example, other job characteristics (e.g. role conflict) might have a significant relationship with cognitive engagement. Experimental research on cognitive engagement suggests that when people are highly engaged in one task and experience frustration as a result of that task, they are less engaged in a subsequent task (Rothbard, Galinsky, and Medvec, 2000). Do IT employees who experience role conflict on one project experience less cognitive engagement on another project? Also, because engagement (attention) can lead to high job performance, it is therefore important to manage engagement so that higher returns might result. Future research should explore how the work place can be designed so that employees are more likely to remain cognitively engaged. This could also further explain Ramirez, Kraemer, and Lawler (2001) claim that higher IT returns are received when employees are more cognitively engaged in their work.

Secondly, future research may wish to better explore interrelationships amongst the cognitive engagement constructs. For example, Agarwal and Karahanna (2000) operationalize the cognitive engagement construct with 4 dimensions, namely: temporal dissociation, focused immersion, heightened enjoyment, and control. Perhaps their operationalization of the cognitive engagement construct could be more psychometrically superior and shed more light on the inner workings of cognitive engagement.

Thirdly, studying actual turnover, rather than turnover intention is encouraged. Although research suggest the strongest precursor of turnover is turnover intention (e.g. Lee and Mowday 1987, Tett and Meyer, 1993), did a meta-analytic review and found that 27% of turnover variance is explained by turnover intention. Hence, actual turnover should not be confused with turnover intention and employees may have opportunities to intervene if the connection between job characteristics, satisfaction, engagement, performance and actual turnover are better understood.

Lastly, future research should explore whether job opportunities due to skills gaps and the high perceived mobility of IT employees may moderate the effects of factors such as job performance on outcomes such as turnover.

6.5 Conclusion

This study recognized the problem of turnover of IT employees within South Africa. To address this problem, a research model was developed to further our understanding of turnover intention of IT employees. The joint and independent effects of cognitive engagement, job performance, and job satisfaction were demonstrated through reliable and valid data having been collected from IT employees in South Africa. Results supported the significant effects of job satisfaction on turnover intention, cognitive engagement on job satisfaction, and the importance of task significance to cognitive engagement. Findings may be especially helpful to IT management in service sectors and those working with more technical and non-managerial level IT employees who exhibit less job satisfaction on average. As a result, this study has provided much needed empirical evidence to the growing body of knowledge on turnover intentions of IT employees and provided new insights into what drives the turnover of IT employees in South Africa.

References

Ackerman, P. L., and Beier, M. E. (2003). Intelligence, personality, and interests in the career choice process. *Journal of Career Assessment, 11*(2), 205-218.

Adams, C., Clark, L. M., Goldman, M., Jester, R., Lee, M., Noseworthy, D., Soejarto, A., Cantara, M., and Thompson, E. (2006). Skills shortages are emerging in the CSI service market. *Publication G00140837, Gartner Inc., Stamford, CT*.

Ahuja, M. K., and Thatcher, J. B. (2005). Moving beyond intentions and toward the theory of trying: effects of work environment and gender on post-adoption information technology use. *MIS quarterly, 29*(3), 427-459.

Agarwal, R., and Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*, *24*(4), 665-694.

Avey, J. B., Luthans, F., and Jensen, S. (2009). Psychological capital: A positive resource for combating stress and turnover. *Human Resource Management, 48*, 677–693.

Bakker, A. B. (2008). The work-related flow inventory: Construction and initial validation of the WOLF. *Journal of vocational behavior*, *72*(3), 400-414.

Baron, R. M., and Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173.

Bartol, K. M., and Martin, D. C. (1982). Managing information systems personnel: a review of the literature and managerial implications. *MIS Quarterly*, *6*(SI), 49-70.

Beecham, S., Baddoo, N., Hall, T., Robinson, H., and Sharp, H. (2008). Motivation in Software Engineering: A systematic literature review. *Information and Software Technology*, *50*(9), 860-878.

Berry, M. L. (2010). Predicting Turnover Intent: Examining the Effects of Employee Engagement, Compensation Fairness, Job Satisfaction, and Age. Unpublished Report, University of Tennessee.

Bhattacherjee, A. 2012. *Measurement Validation*. Course Material. University of South Florida, Tampa, USA

Brayfield, A. H., and Crockett, W. H. (1955). Employee attitudes and employee performance. *Psychological Bulletin, 52*, 396–424.

Brown, S. P., and Peterson, R. A. (1994). The effect of effort on sales performance and job satisfaction. *The Journal of Marketing*, *58*(2), 70-80.

Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 1, pp. 687–732). Palo Alto, CA: Consulting Psychologists Press.

Chau, S. L., Dahling, J. J., Levy, P. E., and Diefendorff, J. M. (2009). A predictive study of emotional labor and turnover. *Journal of Organizational Behavior, 30*(8), 1151−1163.

Chiu, R.K. and Francesco, A.M. (2003). Dispositional traits and turnover intention: examining the mediating role of job satisfaction and affective commitment. *International Journal of Manpower. 24*(3), 284-298.

Colman, A.M., Norris, C.E., and Preston, C.C. (1997). Comparing rating scales of different lengths: Equivalence of scores from 5-point and 7-point scales. *Psychological Reports, 80*, 355-362.

Couger, J. D., and Zawacki, R. A. (1980). *Motivating and managing computer personnel*. Wiley.

Csikszentmihalyi, M. (1978). Attention and the holistic approach to behavior. In K. S. Pope & J. L. Singer (Eds.), *The Stream of Consciousness* (pp. 335–358). New York: Plenum.

Csikszentmihalyi, M. (1990). *Flow, the Psychology of Optimal Experience*. New York: Harper Collins.

Churchill Jr, G. A., Ford, N. M., Hartley, S. W., and Walker Jr, O. C. (1985). The determinants of salesperson performance: A meta-analysis. *Journal of marketing research, 22*(2), 103-118.

Darden, W. R., Hampton, R., & Howell, R. D. (1989). Career Versus Organizational Commitment: Antecedents And Con. *Journal of Retailing, 65*(1), 80-106.

Davidson, M. C., Timo, N., and Wang, Y. (2010). How much does labour turnover cost? A case study of Australian four-and five-star hotels. *International Journal of Contemporary Hospitality Management, 22*(4), 451-466.

DeNisi, A.S., and Griffin, R.W. (2008). *Human resource management (3rd edition)*. Boston, MA: Houghton Mifflin.

Dreher, G. F. (1982). The role of performance in the turnover process. *Academy of Management Journal*, *25*(1), 137-147.

Faden, R. R., Beauchamp, T. L., and King, N. M. (1986). *A history and theory of informed consent*. New York: Oxford University Press.

Fox, S., and Dinur, Y. (1988). Validity of self-assessment: A field evaluation. *Personnel psychology, 41*(3), 581-592.

Gardner, D. G., Dunham, R. B., Cummings, L. L., and Pierce, J. L. (1989). Focus of attention at work: construct definition and empirical validation. *Journal of Occupational Psychology*, *62*(1), 61-77.

Goldstein, D. K., and Rockart, J. F. (1984). An examination of work-related correlates of job satisfaction in programmer/analysts. *MIS Quarterly, 8*(2) 103-115.

Ghafourian SharifHeravi, M., Shahidi, S. E., and Nik Mahmood, N. H. (2010). Investigating the relationships between leadership style and personnel turnover intention in it companies in Iran. *In Proceedings of the 2010 Special Interest Group on Management Information System's 48th annual conference on Computer personnel research on Computer personnel research* (pp. 48-54). ACM.

Giallonardo, L. M., Wong, C. A., and Iwasiw, C. L. (2010). Authentic leadership of preceptors: predictor of new graduate nurses' work engagement and job satisfaction. *Journal of nursing management, 18*(8), 993-1003.

Gove, W. R., and Zeiss, C. (1987). Multiple roles and happiness. *In F. Crosby (ed.), Spouse, Parent, Worker: On Gender and Multiple Roles. New Haven*. CT: Yale University Press. 125-137

Greenhaus, J. H., Collins, K. M., Singh, R., and Parasuraman, S. (1997). Work and Family Influences on Departure from Public Accounting. *Journal of Vocational Behavior, 50*(2), 249-270.

Guest, K. (2005). Talent Trouble. http://www.iweek.co.za/On-the-cover/Talent-trouble/. (Last checked 11 February 2015).

Guimaraes, T., and Igbaria, M. (1992). Determinants of Turnover Intentions: Comparing IC and IS Personnel. *Information Systems Research, 3*(3), 273-303.

Hackman, J. R., and Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied psychology*, *60*(2), 159-170.

Hackman, J.R., and Oldham, G.R. (1976). Development Motivation through the design of work: test of a theory. *Organizational Behavior and Human Performance, 16*(2), 250-279.

Hall, T., Beecham, S., Verner , J. , and Wilson, D. (2008). Impact of staff turnover on software projects: The importance of understanding what makes software practitioner's tick. *Proc. ACM SIGMIS CPR Conf. Comput. Personnel Doctoral Consortium Res., Charlottesville, VA, USA, 2008*.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (2010). Multivariate data analysis (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall.

Hawkes, D., and Ugur, M. (2012). *Evidence on the relationship between education, skills and economic growth in low-income countries*. Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre).

Ho, V. T., Wong, S. S., and Lee, C. H. (2011). A tale of passion: linking job passion and cognitive engagement to employee work performance. *Journal of Management Studies*, *48*(1), 26-47.

Hom, P. W., Caranikas-Walker, F., Prussia, G. E., and Griffeth, R.W. (1992). A Meta-Analytical Structural Equations Analysis of a Model of Employee Turnover. *Journal of Applied Psychology, 77*(6), 890-909

Hoppock, R. (1935). *Job satisfaction*. New York: Harper and Brothers.

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of vocational behavior, 29*(3), 340-362.

Hussey, J., Hussey, R., (1997). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. London: Macmillan Press.

Iaffaldano, M. T., and Muchinsky, P. M. (1985). Job satisfaction and job performance: A meta-analysis. *Psychological bulletin, 97*(2), 251.

Igbaria, M., Meredith, G., and Smith, D. C. (1994). Predictors of intention of IS professionals to stay with the organization in South Africa. *Information & Management, 26*(5), 245-256.

Igbaria, M., and Siegel, S. R. (1992). The reasons for turnover of information systems personnel. *Information & Management, 23*(6), 321-330.

Irving, P. G., and Meyer, J. P. (1994). Reexamination of the met-expectations hypothesis: A longitudinal analysis. *Journal of Applied Psychology, 79*(6), 937.

Ironson, G. H., Smith, P. C., Brannick, M.T., Gibson, W. M., and Paul K. B. (1989). Construction of a Job in General Scale: A Comparison of Global, Composite, and Specific Measures. *Journal of Applied Psychology, 74*(2), 193-200.

Ivancevich, J., and Donnelly, J. (1968). Job Satisfaction Research: A Management Guide for Practitioners. *Personnel Journal, 47*, 172-177.

Ives, B. and Olson, M.H. (1981). Manager or Technician? The Nature of the Information Systems Managers' Job, *MIS Quarterly, 5*(4), 49-63.

Jackofsky, E. F. (1984). Turnover and job performance: An integrated process model. *Academy of Management Review, 9*(1), 74-83.

Jackson, S. E., and Schuler, R. (1985). A Meta-Analysis and Conceptual Critique of Research on Role Ambiguity and Role Conflict in Work Settings. *Organizational Behavior and Human Decision Processes, 36*(1), 16-78.

Jawahar, I.M. and Hemmasi, P. (2006). Perceived organizational support for women's advancement and turnover intentions: the mediating role of job and employer satisfaction. *Women in Management Review*, *21*(8), 643-61.

Joseph, D., Ng, K. Y., Koh, C., and Ang, S. (2007). Turnover of information technology professionals: a narrative review, meta-analytic structural equation modeling, and model development. *MIS Quarterly*, *31*(3), 547-577.

Jessor, R., and Jessor, S. L. (1975). Adolescent development and the onset of drinking; a longitudinal study. *Journal of Studies on Alcohol and Drugs*, *36*(1), 27-51.

Judge, T. A., Thoresen, C. J., Bono, J. E., and Patton, G. K. (2001). The job satisfaction–job performance relationship: A qualitative and quantitative review. *Psychological bulletin, 127*(3), 376-407.

Kalleberg, A. L., and Sørensen, A. B. (1973). The Measurement of the Effects of Overtraining On Job Attitudes. *Sociological Methods Research, 2*(2), 215-238.

Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D., and Rosenthal, R. S. (1964). *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: John Wiley & Sons.

Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice-Hall.

Kanungo, R. N. (1979). The concepts of alienation and involvement revisited. *Journal of Applied Psychology, 67*, 341–9.

Kaplan, B. and Maxwell, J.A. (1994). Qualitative Research Methods for Evaluating Computer Information Systems. In J.G. Anderson, C.E. Aydin & S.J. Jay (Eds.), *Evaluating Health Care Information Systems: Methods and Applications (pp.* 45-68*)*. Springer: New York.

Kaye, B., and Vultaggio, P. (2004). *The development minded manager*. http://www.hr.com/en/communities/staffing_and_recruitment/the-development-minded-manager_ead179wf.html. (Last checked 18 July 2013).

Kim, S. (2012). The impact of human re source management on state government IT employee turnover intentions. *Public Personnel Management, 41*, 257-279.

Kim, M.K., Park, M.C., and Jeong, D.H. (2004). The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services. *Telecommunications Policy*, *28*(2), 145-159.

Lallmahamood, M. (2007). *An Examination of Individual's Perceived Security and Privacy of the Internet in Malaysia and the Influence of this on their Intention to Use E-commerce: Using an Extension of the Technology Acceptance Model* (Doctoral dissertation, Malaysian Institute of Management).

Lawler, E. E., and Hall, D. T. (1970). Relationship of job characteristics to job involvement, satisfaction, and intrinsic motivation. *Journal of Applied psychology, 54*(4), 305-312.

Lee, P. C. B. (2000). Turnover of Information Technology Professionals: A Contextual Model. *Accounting, Management & Information Technology, 10*(2), 101-124.

Lee, T. W., and Mitchell, T. R. (1994). An alternative approach: The unfolding model of voluntary employee turnover. *Academy of Management Review*, *19*(1), 51-89.

Lee, T. W., and Mowday, R. T. (1987). Voluntarily leaving an organization: An empirical investigation of Steers and Mowday's model of turnover. *Academy of Management journal, 30*(4), 721-743.

Lee, T. W., Mitchell, T. R., Holtom, B. C., McDaneil, L. S., and Hill, J. W. (1999). The unfolding model of voluntary turnover: A replication and extension. *Academy of Management Journal*, *42*(4), 450-462.

Lee, T. W., Mitchell, T. R., Wise, L., and Fireman, S. (1996). An unfolding model of voluntary employee turnover. *Academy of Management journal*, *39*(1), 5-36.

Leedy, P. D., and Ormrod, J. E. (2005). Practical research. *Planning and* design *(9th Edition).* New York: Pearson.

Lobel, S. A. (1991). Allocation of investment in work and family roles: alternative theories and implications for research. *Academy of Management Review, 16*, 507–21.

Locke, E. A. (1976). The nature and causes of job satisfaction. *Handbook of industrial and organizational psychology, 1*, 1297-1343.

Luftman, J. and H. S. Zadeh (2011). Key Information Technology and Management Issues 2010–11: An International Study. *Journal of Information Technology, 3*(26), 193-204.

March, J. G., and Simon, H. A. (1958). *Organizations*. Oxford, England: Wiley.

Martin, C. L., and Bennett, N. (1996). The role of justice judgments in explaining the relationship between job satisfaction and organizational commitment. *Group & Organization Management*, *21*(1), 84-104.

Martin, T. N., Price, J. L., and Mueller, C. W. (1981). Job performance and turnover. *Journal of Applied Psychology, 66*(1), 116.

Maudgalya, T., Wallace, S., Daraiseh, N., and Salem, S. (2006). Workplace stress factors and 'burnout'among information technology professionals: A systematic review. *Theoretical Issues in Ergonomics Science*, *7*(3), 285-297.

Mawson, N,. (2015). *R3.6bn 'wasted' skills development pool*. http://www.itweb.co.za/index.php?option=com_content&view=article&id=141003:R3-6bn-wasted-skills-development-pool&catid=69. (Last checked 11 February 2015).

Meyer, J. P., Allen, N. J., and Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of applied psychology, 78*(4), 538.

Meyer, J. P., Paunonen, S. V., Gellatly, I. R., Goffin, R. D., and Jackson, D. N. (1989). Organizational commitment and job performance: It's the nature of the commitment that counts. *Journal of applied Psychology, 74*(1), 152.

Mitchell, T. R., and Lee, T. W. (2001). 5. The unfolding model of voluntary turnover and job embeddedness: Foundations for a comprehensive theory of attachment. *Research in organizational behavior*, *23*, 189-246.

Mobley, W. H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover. *Journal of applied psychology*, *62*(2), 237.

Mobley, W.H., Griffeth, R.W., Hand, H.H., and Meglino, B.M. (1979). Review and conceptual analysis of the employee turnover process. *Psychological Bulletin, 36*, 493-522.

Mobley, W. H., Horner, S. O., and Hollingsworth, A. T. (1978). An evaluation of precursors of hospital employee turnover. *Journal of Applied psychology*, *63*(4), 408-414.

Mohlala, J., Goldman, G. A., and Goosen, X. (2012). Employee retention within the Information Technology Division of a South African Bank: original research. *SA Journal of Human Resource Management, 10*(2), 1-11.

Mondy, R. W. (2010). *Human resource management (11th edition)*. Upper Saddle River, New York: Prentice Hall.

Moore, J. E. (2000). One road to turnover: An examination of work exhaustion in technology professionals. *MIS Quarterly, 24*(1) 141-168.

Morrell, K., Loan-Clarke, J., Arnold, J., and Wilkinson, A. (2008). Mapping the decision to quit: a refinement and test of the unfolding model of voluntary turnover. *Applied Psychology, 57*(1), 128-150.

Morris, M. G., and Venkatesh, V. (2010). Job Characteristics and Job Satisfaction: Understanding the Role of Enterprise Resource Planning System. *MIS Quarterly*, *34*(1), 143-162.

Motowidlo, S. J., and Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied Psychology, 79*, 475–480.

Babbie, E., and Mouton, J. (2001). *The practice of social science research*. Belmont, CA: Wadsworth.

Nakhata, C. (2010). The Relationship between Job Dimensions and Job Satisfaction of SME Entrepreneurs in Thailand. *Journal of American Academy of Business, Cambridge, 15*(2), 220-227.

Neuman, W.L. 1997. *Social research methods: Qualitative and quantitative approaches*. 3rd edition, London: Allyn and Bacon.

Niederman, F., Brancheau, J. C., and Wetherbe, J. C. (1991). Information systems management issues for the 1990s. *MIS quarterly*, *15*(4), 475-500.

Nunnally, J. C., and I. H. Bernstein. (1994). *Psychometric Theory (3rd Edition)*. New York: McGraw-Hill.

Orlikowski, W.J. and Baroudi, J.J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research, 2*, 1-28.

Organ, D. W. (1977). A reappraisal and reinterpretation of the satisfaction-causes-performance hypothesis. *Academy of Management Review, 2*, 46–53.

Pierce, J. L., and Gardner, D. G. (2004). Self-esteem within the work and organizational context: A review of the organization-based self-esteem literature. *Journal of Management*, *30*(5), 591-622.

Pittenger, L. M., Perelli, S., and Somers, T. (2012). IT professionals: Maximizing engagement in the rapidly changing business environment. *In Technology Management Conference (ITMC), 2012 IEEE International (pp. 248-256). IEEE*.

Porter, L. W., and Steers, R. M. (1973). Organizational, work, and personal factors in employee turnover and absenteeism. *Psychological bulletin*, *80*(2), 151.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88*(5), 879-903.

Price, J. L. (1977). *The study of turnover*. Ames, IA: Iowa State University Press.

Ramirez, R., Kraemer, K. L., and Lawler, E. (2001). The contribution of information technology investments to firm performance: Influence of management practices. *Center for Research on Information Technology and Organizations, University of California, Irvine.*

Rich, B. L., Lepine, J. A., and Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of management journal, 53*(3), 617-635.

Richer, S. F, Blanchard, C., and Vallerand, R. J. (2002). A motivational model of work turnover. *Journal of Applied Social Psychology*, *32*, 2089-2113.

Roca, J. C., Chiu, C-M., and Martinez, F. J. (2006). Understanding E-Learning Continuance Intention: An Extension of the Technology Acceptance Model. *International Journal of Human–Computer Studies, 64*, 683-696.

Rockart, J.F. (1982). The Changing Role of the Information Systems Executive: A Critical Success Factors Perspective. *Sloan Management Review, 24*(1), 3-13.

Rothbard, N. P. (2001). Enriching or depleting? The dynamics of engagement in work and family roles. *Administrative Science Quarterly, 46*, 655–84.

Rothbard, N. P. and Edwards, J. R. (2003). Investment in work and family roles: a test of identity and utilitarian motives. *Personnel Psychology*, *56*, 699–730.

Rothbard, N. P., Galinsky, A., and Medvec, V. H. (2000). Frustration and satisfaction at work: emotion and engagement in multiple tasks. In *National Meeting of the Academy of Management, Toronto*.

Rusbult, C. E., and Farrell, D. (1983). A longitudinal test of the investment model: The impact on job satisfaction, job commitment, and turnover of variations in rewards, costs, alternatives, and investments. *Journal of applied psychology*, *68*(3), 429-438.

Rutner, P. S., Hardgrave, B. C., and McKnight, D. H. (2008). Emotional dissonance and the information technology professional. *MIS Quarterly*, *32*(3), 635-652.

Saade, R., and Bahli, B. (2005). The Impact of Cognitive Absorption on Perceived Usefulness and Perceived Ease of Use in On-Line Learning: An Extension of the Technology Acceptance Model. *Information & Management, 42*, 317-327.

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*, *21*(7), 600-619.

Saunders, M., Lewis, P. and Thornhill, A. (1997). *Research methods for business research*. London: Pitman Publishing.

Schaufeli, W. B., and Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of organizational Behavior*, *25*(3), 293-315.

Shadish, W. R., Cook, T. D., and Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.

Siong, Z.M.B., Mellor, D., Moore, K.A., and Firth, L. (2006). Predicting intention to quit in the call centre industry: Does the retail model fit? *Journal of Managerial Psychology*, *21*(3), 231–243.

Smith, D. C., and Speight, H. L. (2006, April). Antecedents of turnover intention and actual turnover among information systems personnel in South Africa. *In Proceedings of the 2006 ACM SIGMIS CPR conference on computer personnel research: Forty four years of computer personnel research: achievements, challenges & the future (pp. 123-129).* ACM.

Spector, P. E. (1987). Method variance as an artifact in self-reported affect and perceptions at work: Myth or significant problem?. *Journal of Applied Psychology, 72*(3), 438.

Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: a new look at the interface between nonwork and work. *Journal of Applied Psychology*, *88*(3), 518.

Steers, R. M. (1977). Antecedents and outcomes of organizational commitment. *Administrative science quarterly, 22*(1), 46-56.

Subramony, M., Krause, N., Norton, J., and Burns, G. N. (2008). The relationship between human resource investments and organizational performance: a firm-level examination of equilibrium theory. *Journal of Applied Psychology, 93*(4), 778.

Sundstrom, E., Town, J. P., Rice, R. W., Osborn, D. P., and Brill, M. (1994). Office noise, satisfaction, and performance. *Environment and Behavior, 26*(2), 195-222.

Taber, T. D., and Alliger, G. M. (1995). A task-level assessment of job satisfaction. *Journal of Organizational Behavior, 16*(2), 101-121.

Tett, R. P., and Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Personnel psychology, 46*(2), 259-293.

Thatcher, J. B., Liu, Y., Stepina, L. P., Goodman, J. M., and Treadway, D. C. (2006). IT worker turnover: an empirical examination of intrinsic motivation. *ACM SIGMIS Database, 37*(2-3), 133-146.

Thatcher, J. B., Stepina, L. P., and Boyle, R. J. (2002). Turnover of information technology workers: Examining empirically the influence of attitudes, job characteristics, and external markets. *Journal of Management Information Systems, 19*(3), 231-261.

Treadwell, D., and Alexander, P. (2000). *Money Isn't All that Matters: Strategies for Attracting & Retaining Technical Professionals*. New York: Blessing/White.

Tsui, A. S. and O'Reilly, C. A., III (1989). Beyond simple demographic effects: the importance of relational demography in superior-subordinate dyads. *Academy of Management Journal, 32*, 402–23.

Tsui, A. S., and O'reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. *Academy of management journal, 32*(2), 402-423.

Van Breukelen, W., Van der Vlist, R., and Steensma, H. (2004). Voluntary employee turnover: Combining variables from the 'traditional'turnover literature with the theory of planned behavior. *Journal of Organizational Behavior, 25*(7), 893-914.

Van Heerden, A,. (2015). *Three strategic imperatives for HR in 2015*. http://www.itweb.co.za/index.php?option=com_content&view=article&id=140693:Three-strategic-imperatives-for-HR-in-2015&catid=355. (Last checked 11 February 2015).

Verbrugge, L. M. (1986). Role burdens and physical health of women and men. *Women & Health*, *11*(1), 47-77.

Walsham, G. (1993). *Interpreting Information Systems in Organizations (1st edition).* John Wiley & Sons. New York: USA.

Wanous, J. P., Stumpf, S. A., and Bedrosian, H. (1979). Job survival of new employees. *Personnel Psychology, 32*(4), 651-662.

Webster, J., and Ho, H. (1997). Audience Engagement in Multimedia Presentations. *The DATA BASE for Advances in Information Systems, 28*(2), 63-77.

Wilson, T. D., Dunn, D. S., Bybee, J. A., Hyman, D. B. and Rotondo, J. A. (1984). Effects of analyzing reasons on attitude-behavior consistency. *Journal of Personality and Social Psychology, 47*, 5–16.

Wilson, C. (2006). Why stay in nursing? Caroline Wilson presents the findings of a small study in which a group of nurses were asked to explain why they stay in nursing. Their responses suggest that enjoyment of the job, allied closely to levels of job satisfaction, is the main reason for doing so. *Nursing Management*, *12*(9), 24-32.

Wong, C. S., and Campion, M. A. (1991). Development and test of a task level model of motivational job design. *Journal of Applied Psychology, 76*(6), 825-837.

Yousef, D. A. (2000). Organizational commitment: a mediator of the relationships of leadership behavior with job satisfaction and performance in a non-western country. *Journal of Managerial Psychology, 15*(1), 6-24.

Appendices

Appendix A- Emails

Request email

Good Day

My name is Christiaan Storm and I am a Masters student in the School of Economic and Business Sciences at the University of the Witwatersrand, Johannesburg. I am conducting research to evaluate job characteristics and job satisfaction among South African IT professionals. The research forms part of my requirements for a Master of Commerce. My supervisor is Prof Jason Cohen.

Understanding the job characteristics and satisfaction of IT employees is important because it can lead to employee turnover. This study may help organisational decision-makers into proactively controlling this behaviour.

I would like to invite IT employees within your organisation to participate in the study. As a contact from the McGregor's Who Owns Whom Directory of SA companies may I kindly ask you to forward the attached invitation to participate to the IT employees in your organisation before the 1st of October 2014.

Participation will involve completing an online questionnaire. Participation is entirely voluntary and involves no risks or penalties whether or not the employee chooses to participate. All responses are anonymous and all data collected will be treated strictly confidential, and will not be shared or made available to any 3rd parties. All data will be aggregated and used solely for completion of the research report. A copy of the report will be made available on request.

Should you have any questions, please do not hesitate to contact myself, Christiaan Storm, or my supervisor, Prof Jason Cohen Jason.cohen@wits.ac.za should you have any queries.

Thank you for participating.

Kind regards
Christiaan Storm
0794958067
Christiaan.Storm@students.wits.ac.za
Masters Student: Division of Information Systems
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

Invitation

Date: 21 January 2014
Good-day

My name is Christiaan Storm and I am a Masters student in the School of Economic and Business Sciences at the University of the Witwatersrand, Johannesburg. I am conducting research to evaluate job characteristics and job satisfaction among South African IT employees. The research forms part of my requirements for a Master of Commerce. My supervisor is Prof Jason Cohen.

As an IT employee you are invited to take part in this study by completing the following questionnaire : http://www.surveygizmo.com/s3/1720439/Turnover-Intentions-of-Information-Technology-Employees-within-South-African-Firms-The-Role-of-Cognitive-Engagement-Job-Satisfaction-and-Job-Performance.
Please note that your participation is anonymous and all responses will be strictly confidential. You will not be asked to provide your name or any other identifying information. Only aggregate results will be presented in the research report and data will not be accessible nor made available to any 3rd parties. Your completion of the survey will be considered as your consent taken part in this study. You may discontinue participation at any time without loss or penalty.

The survey consists of 43 questions and will take approximately 15 minutes to complete. There is no right or wrong answer. Should you agree to participate please click the next button below to take the survey and complete the questions. Kindly complete and share the survey before Monday 1 December 2014. A copy of the report will be made available on request.

Thank you for participating.

Kind regards
Christiaan Storm
0794958067
Christiaani.Storm@wits.ac.za
Masters Student: Division of Information Systems
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

Supervisor:
Professor Jason Cohen
Jason.Cohen@wits.ac.za

Appendix B- Ethics Clearance Certificate

Faculty of Commerce, Law and Management
University of the Witwatersrand, Johannesburg

School of Economic and Business Sciences
Private Bag X3, WITS, 2050, South Africa • Telephone: +27 11 717 8004 •
email: Siyabonga.Twala@wits.ac.za

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: CINFO/1055**

PROJECT: **The relationships between cognitive engagement, job satisfaction, and IT employee turnover intention within South African firms.**

INVESTIGATOR: Christiaan Storm

STUDENT NUMBER: **745963**

SCHOOL: SEBS

DATE CONSIDERED: 18 June 2014

DECISION OF THE ETHICS COMMITTEE: Approved

NOTE

Unless otherwise specified this ethics clearance is valid for 1 year and may be renewed upon application.
Please remember to include the protocol number above to your participation letter.

DATE: 20/06//2014 **CHAIRPERSON: Jean-Marie Bancilhon**

cc: Supervisor:

Prof Jason Cohen

SCHOOL OF ECONOMIC & BUSINESS SCIENCES

Appendix C- Questions

Please provide the following information about yourself.

Shortname / Alias: G1

1) Please indicate your gender

( ) Male

( ) Female

( ) Prefer not to say

Shortname / Alias: EL1

2) Educational level

( ) Less than high school

( ) High school

( ) Some college

( ) Technical degree

( ) Bachelor's degree

( ) Some graduate courses

( ) Master's degree

( ) Post-master's courses

( ) Doctoral degree

( ) Other, please specify:: _____

Shortname / Alias: A1

3) What will your age be at the end of 2014?

_____

Shortname / Alias: JL1

4) What is your current job level

( ) One level below the CEO

( ) Two levels below the CEO

( ) Three levels below the CEO

( ) Four or more levels below the CEO

Shortname / Alias: OT1

5) Approximately, how long have you been working in your current organisation (i.e in years)?

_____

Shortname / Alias: T1

6) Approximately, how long have you been working in the IT profession (i.e in years)?

_____

Shortname / Alias: O1

7) Industry your organisation operates in?

_____

Shortname / Alias: R1

8) What is your IT Role

( ) Programmer

( ) Information system professional

( ) Developer

( ) Systems analyst

( ) Systems designer

( ) MIS engineer

( ) Software engineer

( ) Software architect

( ) Data processing professional

( ) Other, please specify:: _____

Please indicate the extent to which you agree with each of the following statements relating to your engagement in your job.

Shortname / Alias: AT1

9) I spend a lot of time thinking about my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AT2

10) I focus a great deal of attention on my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AT3

11) I concentrate a lot on my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AT4

12) I pay a lot of attention to my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AB1

13) When I am working, I often lose track of time.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AB2

14) I often get carried away by what I am working on.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AB3

15) When I am working, I am completely engrossed (absorb) by my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AB4

16) When I am working, I am totally absorbed by it.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: AB5

17) Nothing can distract me when I am working.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Please indicate the extent to which you agree with each of the following statements relating to how you feel about your job.

Shortname / Alias: JS1

18) Generally speaking, I feel satisfied with this job.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JS2

19) Overall, I feel satisfied with the kind of work I do in this job.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JS4

20) I feel positive about my job.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JS3

21) In general, I feel satisfied with my job.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Please indicate your intentions with regard to your current job and employer.

Shortname / Alias: TI1

22) I will be with this company five years from now.

( ) Very unlikely ( ) Unlikely ( ) Somewhat unlikely ( ) Neither unlikely nor likely ( ) Somewhat likely ( ) Likely ( ) Very likely

Shortname / Alias: TI2

23) How likely is it that you will be working with this company this time next year?

( ) Very unlikely ( ) Unlikely ( ) Somewhat unlikely ( ) Neither unlikely nor likely ( ) Somewhat likely ( ) Likely ( ) Very likely

Shortname / Alias: TI3

24) I will probably look for a job at a different company in the next year.

( ) Very unlikely ( ) Unlikely ( ) Somewhat unlikely ( ) Neither unlikely nor likely ( ) Somewhat likely ( ) Likely ( ) Very likely

Shortname / Alias: TI4

25) How likely is it that you will take steps during the next year to secure a job at a different company?

( ) Very unlikely ( ) Unlikely ( ) Somewhat unlikely ( ) Neither unlikely nor likely ( ) Somewhat likely ( ) Likely ( ) Very likely

Please indicate how you evaluate your own job performance.

Shortname / Alias: JP1

26) Quality of your performance.

( ) 1=Very low ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) 8 ( ) 9 ( ) 10=Very high

Shortname / Alias: JP2

27) Your productivity on the job.

( ) 1=Very low ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) 8 ( ) 9 ( ) 10=Very high

Shortname / Alias: JP3

28) How do you evaluate the performance of your peers at their jobs compared with yourself doing the same kind of work?

( ) 1=Very low ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) 8 ( ) 9 ( ) 10=Very high

Shortname / Alias: JP4

29) How do you evaluate the performance of yourself at your job compared with your peers doing the same kind of work?

( ) 1=Very low ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) 8 ( ) 9 ( ) 10=Very high

Please indicate the extent to which you agree with each of the following statements relating to your job.

Shortname / Alias: SV1

30) My job requires me to use a number of different skills and talents.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: SV2

31) My job is complex and non-repetitive.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: TD1

32) My job provides me a chance to completely finish the pieces of work I begin.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: TD2

33) My job is arranged so that I can do an entire piece of work from beginning to end.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: TS1

34) My job is one where a lot of other people can be affected by how well my work gets done.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: TS2

35) My job is very significant and important in the broader scheme of things.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JF1

36) Just doing the work required by my job provides many chances for me to figure out how well I am doing.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JF2

37) After I finish a piece of work, I know whether I performed well.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JA1

38) My job gives me considerable opportunity for independence and freedom in how I do my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Shortname / Alias: JA2

39) My job gives me a chance to use my personal initiative and judgment in carrying out my work.

( ) Strongly Disagree ( ) Disagree ( ) Disagree Somewhat ( ) Neither Agree nor Disagree ( ) Agree Somewhat ( ) Agree ( ) Strongly Agree

Please indicate the extent to which your current job provide you an opportunity to:

Shortname / Alias: RW1

40) Build a professional reputation.

( ) Not at all ( ) Few ( ) Somewhat few ( ) Undecided ( ) Somewhat many ( ) Many ( ) A great extent

Shortname / Alias: RW2

41) Work on professionally important projects.

( ) Not at all ( ) Few ( ) Somewhat few ( ) Undecided ( ) Somewhat many ( ) Many ( ) A great extent

Shortname / Alias: RW3

42) Receive substantial annual salary increases.

( ) Not at all ( ) Few ( ) Somewhat few ( ) Undecided ( ) Somewhat many ( ) Many ( ) A great extent

Shortname / Alias: RW4

43) Receive a promotion within the next year or two.

( ) Not at all ( ) Few ( ) Somewhat few ( ) Undecided ( ) Somewhat many ( ) Many ( ) A great extent

Your feedback

44) Any comments you wish to make

Appendix D- t-Test

Group Statistics

	Sample Name	N	Mean	Std. Deviation	Std. Error Mean
EL1	McGegror	45	5.13	2.341	.349
	Snowball	64	5.34	1.962	.245
A1	McGegror	45	38.56	8.706	1.298
	Snowball	64	35.14	7.053	.882
JL1	McGegror	42	3.10	1.008	.155
	Snowball	64	2.88	1.076	.135
OT1	McGegror	45	9.022	6.5557	.9773
	Snowball	64	4.950	4.7224	.5903
T1	McGegror	45	14.400	7.9784	1.1893
	Snowball	62	11.452	5.5793	.7086
AT1	McGegror	45	5.80	1.236	.184
	Snowball	62	5.84	.978	.124
AT2	McGegror	43	6.28	.591	.090
	Snowball	61	6.03	1.095	.140
AT3	McGegror	45	6.20	.588	.088
	Snowball	61	5.98	1.147	.147
AT4	McGegror	44	6.25	.576	.087
	Snowball	59	5.97	1.129	.147
AB1	McGegror	45	5.82	1.051	.157
	Snowball	61	5.52	1.206	.154
AB2	McGegror	45	5.51	1.218	.182
	Snowball	61	5.31	1.298	.166
AB3	McGegror	45	5.44	1.198	.179
	Snowball	62	5.26	1.227	.156
AB4	McGegror	45	5.31	1.041	.155
	Snowball	61	5.11	1.318	.169
AB5	McGegror	45	3.87	1.198	.179
	Snowball	62	3.61	1.572	.200
JS1	McGegror	45	5.33	1.414	.211
	Snowball	61	4.84	1.635	.209
JS2	McGegror	45	5.36	1.448	.216
	Snowball	62	4.98	1.531	.194
JS4	McGegror	45	5.44	1.271	.190

	Snowball	61	4.89	1.613	.207
JS3	McGegror	45	5.38	1.336	.199
	Snowball	62	4.82	1.615	.205
TI1	McGegror	45	4.98	1.960	.292
	Snowball	62	3.66	2.024	.257
TI2	McGegror	45	5.64	1.773	.264
	Snowball	62	4.87	1.877	.238
TI3	McGegror	45	3.22	1.999	.298
	Snowball	62	4.10	2.094	.266
TI4	McGegror	45	3.36	1.990	.297
	Snowball	61	4.03	2.073	.265
JP1	McGegror	45	8.31	1.104	.165
	Snowball	61	7.39	1.282	.164
JP2	McGegror	45	8.24	1.190	.177
	Snowball	62	7.15	1.545	.196
JP3	McGegror	45	6.87	1.949	.291
	Snowball	62	6.65	1.747	.222
JP4	McGegror	45	8.09	1.145	.171
	Snowball	59	7.08	1.557	.203
SV1	McGegror	44	6.43	.661	.100
	Snowball	61	5.95	.973	.125
SV2	McGegror	45	5.29	1.199	.179
	Snowball	62	5.08	1.418	.180
TD1	McGegror	45	4.76	1.384	.206
	Snowball	62	4.84	1.517	.193
TD2	McGegror	45	4.42	1.685	.251
	Snowball	62	4.13	1.713	.218
TS1	McGegror	45	6.09	1.083	.162
	Snowball	60	6.17	.785	.101
TS2	McGegror	45	6.00	1.087	.162
	Snowball	62	5.76	1.183	.150
JF1	McGegror	45	5.49	.895	.133
	Snowball	61	5.23	1.160	.149
JF2	McGegror	45	5.78	1.126	.168
	Snowball	62	5.42	1.181	.150
JA1	McGegror	45	5.53	1.325	.197
	Snowball	62	5.26	1.514	.192
JA2	McGegror	45	5.78	1.166	.174
	Snowball	61	5.43	1.575	.202
RW1	McGegror	45	5.24	1.525	.227

	Snowball	62	5.13	1.454	.185
RW2	McGegror	44	5.16	1.493	.225
	Snowball	61	5.20	1.569	.201
RW3	McGegror	45	3.51	1.547	.231
	Snowball	62	3.79	1.611	.205
RW4	McGegror	44	3.39	1.755	.265
	Snowball	61	3.30	1.883	.241

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
EL1	Equal variances assumed	3.108	.080	-.022	117	.982	-.009	.403	-.807	.789
	Equal variances not assumed			-.021	85	.983	-.009	.417	-.838	.820
A1	Equal variances assumed	.976	.325	1.873	117	.064	2.934	1.566	-.168	6.036
	Equal variances not assumed			1.844	90	.068	2.934	1.591	-.226	6.093
JL1	Equal variances assumed	1.269	.262	1.616	114	.109	.335	.208	-.076	.747
	Equal variances not assumed			1.663	96	.100	.335	.202	-.065	.736
OT1	Equal variances assumed	7.987	.006	3.794	117	.000	3.8783	1.0223	1.8536	5.9029
	Equal variances not assumed			3.524	73	.001	3.8783	1.1006	1.6852	6.0714

T1	Equal variances assumed	3.035	.084	1.994	115	.049	2.6412	1.3244	.0177	5.2646
	Equal variances not assumed			1.899	80	.061	2.6412	1.3906	-.1259	5.4082
AT1	Equal variances assumed	.631	.428	-.221	115	.825	-.048	.219	-.482	.385
	Equal variances not assumed			-.216	89	.829	-.048	.224	-.493	.396
AT2	Equal variances assumed	1.437	.233	1.030	112	.305	.179	.173	-.165	.522
	Equal variances not assumed			1.152	111	.252	.179	.155	-.129	.486
AT3	Equal variances assumed	2.127	.147	.923	114	.358	.166	.180	-.191	.524
	Equal variances not assumed			1.017	113	.312	.166	.164	-.158	.491
AT4	Equal variances assumed	.972	.326	1.272	111	.206	.222	.175	-.124	.568
	Equal variances not assumed			1.415	108	.160	.222	.157	-.089	.533
AB1	Equal variances assumed	.911	.342	1.255	114	.212	.276	.220	-.159	.711

	Equal variances not assumed			1.297	106	.197	.276	.213	-.146	.697
AB2	Equal variances assumed	.140	.709	.626	114	.533	.150	.239	-.324	.623
	Equal variances not assumed			.632	99	.529	.150	.237	-.320	.620
AB3	Equal variances assumed	.378	.540	.459	115	.647	.103	.225	-.342	.549
	Equal variances not assumed			.457	94	.649	.103	.226	-.345	.552
AB4	Equal variances assumed	.356	.552	.557	114	.579	.125	.225	-.321	.572
	Equal variances not assumed			.580	108	.563	.125	.216	-.304	.555
AB5	Equal variances assumed	8.360	.005	.770	115	.443	.208	.269	-.326	.741
	Equal variances not assumed			.816	111	.416	.208	.254	-.296	.712
JS1	Equal variances assumed	1.079	.301	1.232	114	.220	.368	.299	-.224	.961
	Equal variances not assumed			1.268	105	.207	.368	.290	-.207	.944

JS2	Equal variances assumed	.002	.968	.786	115	.434	.220	.280	-.334	.774
	Equal variances not assumed			.787	96	.433	.220	.279	-.335	.775
JS4	Equal variances assumed	1.697	.195	1.593	114	.114	.442	.277	-.107	.991
	Equal variances not assumed			1.663	108	.099	.442	.266	-.085	.968
JS3	Equal variances assumed	1.658	.200	1.566	115	.120	.440	.281	-.116	.996
	Equal variances not assumed			1.627	107	.107	.440	.270	-.096	.976
TI1	Equal variances assumed	1.048	.308	2.985	115	.003	1.152	.386	.388	1.917
	Equal variances not assumed			3.012	99	.003	1.152	.383	.393	1.912
TI2	Equal variances assumed	.680	.411	1.643	115	.103	.573	.349	-.118	1.263
	Equal variances not assumed			1.658	99	.101	.573	.346	-.113	1.259
TI3	Equal variances assumed	.002	.960	-1.811	115	.073	-.703	.388	-1.473	.066

	Equal variances not assumed			-1.821	98	.072	-.703	.386	-1.470	.063
TI4	Equal variances assumed	.030	.863	-1.271	114	.206	-.494	.389	-1.264	.276
	Equal variances not assumed			-1.272	96	.206	-.494	.388	-1.264	.277
JP1	Equal variances assumed	1.111	.294	3.617	114	.000	.840	.232	.380	1.300
	Equal variances not assumed			3.733	106	.000	.840	.225	.394	1.286
JP2	Equal variances assumed	3.916	.050	3.560	115	.001	.964	.271	.428	1.500
	Equal variances not assumed			3.771	111	.000	.964	.256	.457	1.470
JP3	Equal variances assumed	.411	.523	.548	115	.585	.186	.339	-.486	.858
	Equal variances not assumed			.533	87	.596	.186	.349	-.508	.879
JP4	Equal variances assumed	3.697	.057	3.213	112	.002	.867	.270	.332	1.402
	Equal variances not assumed			3.389	110	.001	.867	.256	.360	1.374

SV1	Equal variances assumed	.054	.817	2.754	113	.007	.451	.164	.127	.775
	Equal variances not assumed			2.984	112	.003	.451	.151	.151	.750
SV2	Equal variances assumed	.006	.938	.719	115	.473	.178	.247	-.311	.667
	Equal variances not assumed			.742	105	.460	.178	.239	-.297	.652
TD1	Equal variances assumed	.213	.645	-.428	114	.670	-.117	.274	-.661	.426
	Equal variances not assumed			-.435	101	.665	-.117	.270	-.653	.419
TD2	Equal variances assumed	.005	.943	.249	115	.804	.080	.323	-.559	.719
	Equal variances not assumed			.247	93	.806	.080	.325	-.565	.726
TS1	Equal variances assumed	1.457	.230	-.287	113	.775	-.051	.177	-.401	.300
	Equal variances not assumed			-.271	78	.787	-.051	.187	-.423	.322
TS2	Equal variances assumed	.999	.320	.933	115	.353	.197	.211	-.221	.616

	Equal variances not assumed			.946	100	.347	.197	.209	-.216	.611
JF1	Equal variances assumed	.992	.321	.532	114	.596	.107	.201	-.291	.505
	Equal variances not assumed			.561	111	.576	.107	.190	-.270	.484
JF2	Equal variances assumed	.119	.730	1.247	115	.215	.268	.215	-.158	.693
	Equal variances not assumed			1.253	97	.213	.268	.214	-.156	.692
JA1	Equal variances assumed	3.532	.063	.758	115	.450	.212	.279	-.342	.765
	Equal variances not assumed			.788	107	.432	.212	.269	-.321	.745
JA2	Equal variances assumed	3.901	.051	.799	114	.426	.211	.264	-.312	.735
	Equal variances not assumed			.846	111	.399	.211	.250	-.283	.706
RW1	Equal variances assumed	.395	.531	-.381	115	.704	-.108	.283	-.668	.453
	Equal variances not assumed			-.373	89	.710	-.108	.289	-.682	.466

RW2	Equal variances assumed	.337	.563	-.883	113	.379	-.262	.297	-.849	.326
	Equal variances not assumed			-.873	90	.385	-.262	.300	-.858	.334
RW3	Equal variances assumed	.000	.991	-1.751	115	.083	-.543	.310	-1.158	.071
	Equal variances not assumed			-1.776	100	.079	-.543	.306	-1.151	.064
RW4	Equal variances assumed	1.249	.266	-.385	113	.701	-.138	.358	-.848	.572
	Equal variances not assumed			-.393	100	.695	-.138	.351	-.835	.559

Appendix E- Assumptions

TI= ƒ JS + JP

Homoscedasticity

Table E.1 shows that the tolerance values are close to 1 and VIFs are below 5. This satisfies that the collinearity of the independent variables job satisfaction and job performance is not problematic.

Table E.1 : Homoscedasticity

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Job satisfaction	-.603[b]	-5.836	.000	-.537	.524	1.908	.223
	Job Performance	.084[b]	.783	.436	.085	.680	1.471	.227

a. Dependent Variable: Turnover intention

b. Predictors in the Model: (Constant), Rewards, Tenure, Gender, Industry type, Role, Task identity, Task significance, Job Level, Educational level, Sample, Autonomy, Organisational tenure, Age

Normality of the residuals.

Figure 4 shows that the residuals are approximately normally distributed. Figure 5 shows that the points follow no obviose pattern and assumes that no violation of assumption has occurred, including linearity and heteroscedasticity.

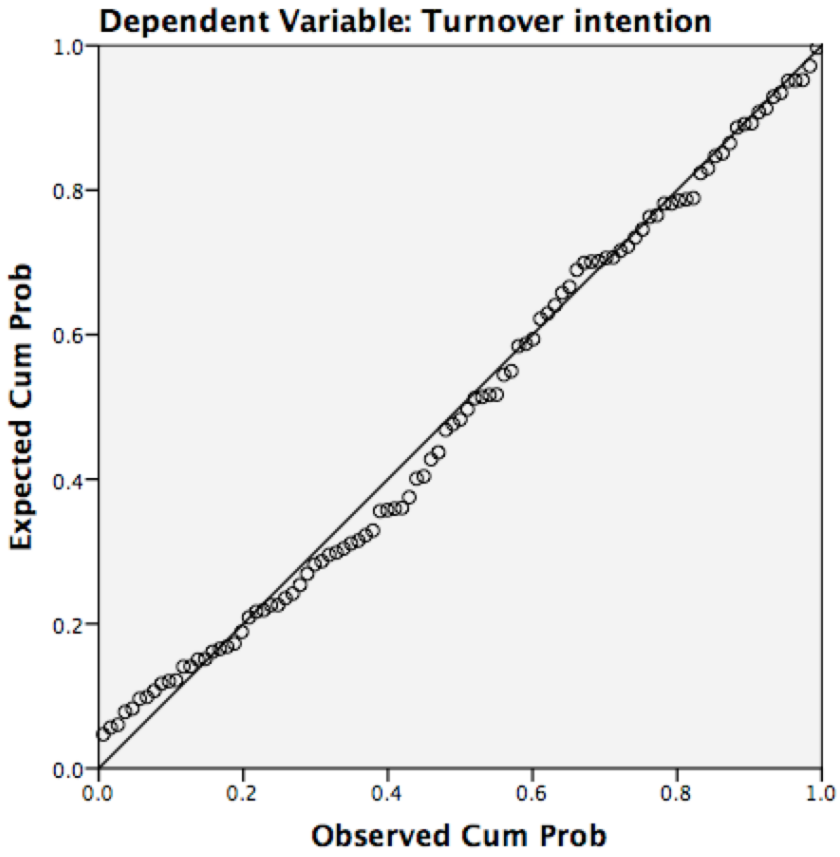


Figure 4: Normal P-P Plot of Regression Standardized Residual

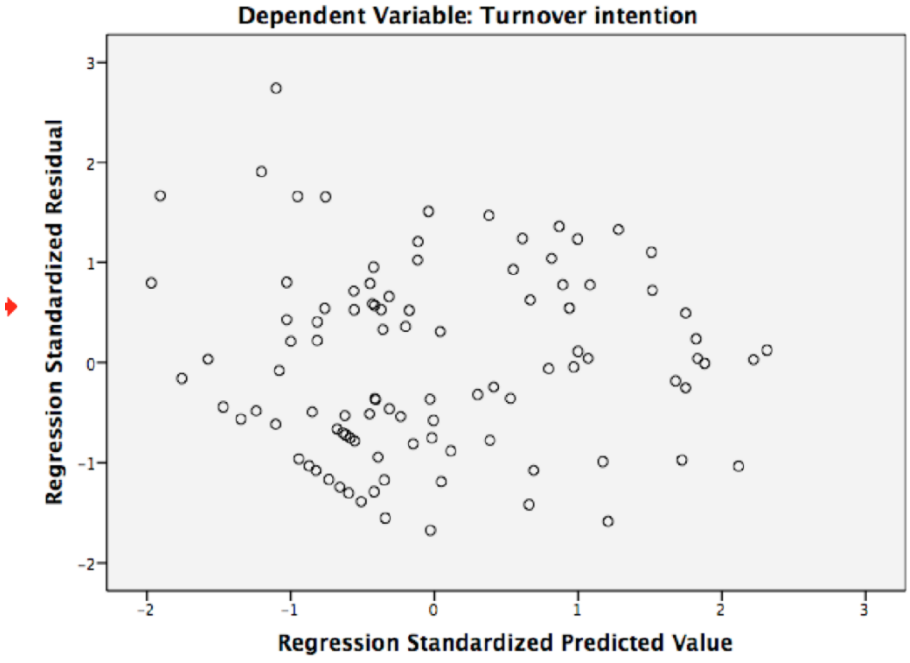


Figure 5: Scatterplot

Appendix F- ANOVA

Technical/No Technical

Tech_NonTech dummy variable was coded on the below groups. See Table F.1 and Table F.2 for the descriptives and ANOVA.

Technical roles (0)

- Business Analyst
- Business Intelligence
- Data processing professional
- Developer
- Information system professional
- MIS engineer
- Programmer
- Software architect
- Software engineer

No-technical roles (1)

- CIO
- CTO
- Digital Marketer
- IT Manager
- Systems analyst
- Systems designer
- Test Analyst
- Web Master
- System Support
- IT Administrator

Table F.1 : Descriptives - Technical/Non-Technical

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Attention	.00	68	5.9880	.72080	.08741	5.8135	6.1625	3.75	7.00
	1.00	37	6.2911	.54860	.09019	6.1082	6.4740	4.75	7.00
	Total	105	6.0948	.67828	.06619	5.9636	6.2261	3.75	7.00
Absorption	.00	68	5.3490	1.03767	.12584	5.0978	5.6002	2.33	7.00
	1.00	37	5.4270	.94612	.15554	5.1115	5.7424	3.33	7.00
	Total	105	5.3765	1.00247	.09783	5.1825	5.5705	2.33	7.00
Job satisfaction	.00	68	4.8536	1.45502	.17645	4.5014	5.2058	1.75	7.00
	1.00	37	5.5878	1.18177	.19428	5.1938	5.9819	2.25	7.00
	Total	105	5.1123	1.40412	.13703	4.8406	5.3840	1.75	7.00
Turnover intention	.00	68	3.5983	1.85970	.22552	3.1482	4.0485	1.00	7.00
	1.00	37	3.2365	1.73900	.28589	2.6567	3.8163	1.00	6.75
	Total	105	3.4708	1.81798	.17742	3.1190	3.8226	1.00	7.00
Job Performance	.00	68	7.5285	1.31648	.15965	7.2099	7.8472	4.00	10.00
	1.00	37	7.7975	1.18468	.19476	7.4025	8.1925	5.33	9.67
	Total	105	7.6233	1.27240	.12417	7.3771	7.8695	4.00	10.00

Table F.2 : ANOVA - Technical/Non-Technical

		Sum of Squares	df	Mean Square	F	Sig.
Attention	Between Groups	2.202	1	2.202	4.968	.028
	Within Groups	45.645	103	.443		
	Total	47.846	104			
Absorption	Between Groups	.146	1	.146	.144	.705
	Within Groups	104.368	103	1.013		
	Total	104.514	104			
Job satisfaction	Between Groups	12.919	1	12.919	6.926	.010
	Within Groups	192.122	103	1.865		
	Total	205.041	104			
Turnover intention	Between Groups	3.137	1	3.137	.949	.332
	Within Groups	340.586	103	3.307		
	Total	343.724	104			
Job Performance	Between Groups	1.733	1	1.733	1.071	.303
	Within Groups	166.644	103	1.618		
	Total	168.378	104			

Non-Managerial/Managerial

NonManag_Manag dummy variable was coded on the below groups. See Table F.3 and Table F.4 for the descriptives and ANOVA.

Non-Managerial roles (0)

- Business Analyst
- Business Intelligence
- Data processing professional
- Developer
- Digital Marketer
- Information system professional
- IT Administrator
- MIS engineer
- Programmer
- Software architect
- Software engineer
- System Support
- Systems analyst
- Systems designer
- Test Analyst

Managerial roles (1)

- CIO
- CTO
- IT Manager
- Web Master

Table F.3 : Descriptives - Non-Managerial/Managerial

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Attention	.00	90	6.0382	.69510	.07327	5.8926	6.1838	3.75	7.00
	1.00	15	6.4348	.44902	.11594	6.1861	6.6834	5.75	7.00
	Total	105	6.0948	.67828	.06619	5.9636	6.2261	3.75	7.00
Absorption	.00	90	5.3378	1.01390	.10687	5.1254	5.5501	2.33	7.00
	1.00	15	5.6088	.92884	.23982	5.0944	6.1232	4.33	7.00
	Total	105	5.3765	1.00247	.09783	5.1825	5.5705	2.33	7.00
Job satisfaction	.00	90	4.9977	1.41665	.14933	4.7010	5.2944	1.75	7.00
	1.00	15	5.8000	1.13861	.29399	5.1695	6.4305	3.00	7.00
	Total	105	5.1123	1.40412	.13703	4.8406	5.3840	1.75	7.00
Turnover intention	.00	90	3.5576	1.84117	.19408	3.1720	3.9433	1.00	7.00
	1.00	15	2.9500	1.63172	.42131	2.0464	3.8536	1.00	6.25
	Total	105	3.4708	1.81798	.17742	3.1190	3.8226	1.00	7.00
Job Performance	.00	90	7.5827	1.30325	.13737	7.3098	7.8557	4.00	10.00
	1.00	15	7.8667	1.07497	.27756	7.2714	8.4620	6.00	9.67
	Total	105	7.6233	1.27240	.12417	7.3771	7.8695	4.00	10.00

Table F.4 : ANOVA - Non-Managerial/Managerial

		Sum of Squares	df	Mean Square	F	Sig.
Attention	Between Groups	2.023	1	2.023	4.546	.035
	Within Groups	45.824	103	.445		
	Total	47.846	104			
Absorption	Between Groups	.944	1	.944	.939	.335
	Within Groups	103.569	103	1.006		
	Total	104.514	104			
Job satisfaction	Between Groups	8.276	1	8.276	4.332	.040
	Within Groups	196.765	103	1.910		
	Total	205.041	104			
Turnover intention	Between Groups	4.747	1	4.747	1.442	.233
	Within Groups	338.977	103	3.291		
	Total	343.724	104			
Job Performance	Between Groups	1.036	1	1.036	.638	.426
	Within Groups	167.341	103	1.625		
	Total	168.378	104			

Non-Services/Services

NonServ_Serv dummy variable was coded on the below groups. See Table F.5 and Table F.6 for the descriptives and ANOVA.

Non-Managerial roles (0)

- Agriculture
- Engineering
- Manufacturing
- Mining

Managerial roles (1)

- Algorithms
- Finance
- IT Services
- Legal
- Security
- Services
- Tourism
- Travel
- Government
- Retail

- Media
- Logistics

Table F.5 : Descriptives - Non-Services/Services

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Attention	.00	25	6.2600	.54715	.10943	6.0341	6.4859	5.00	7.00
	1.00	76	6.0488	.70873	.08130	5.8868	6.2107	3.75	7.00
	Total	101	6.1011	.67599	.06726	5.9676	6.2345	3.75	7.00
Absorption	.00	25	5.4267	.94536	.18907	5.0364	5.8169	3.33	7.00
	1.00	76	5.4017	1.00457	.11523	5.1722	5.6313	2.33	7.00
	Total	101	5.4079	.98564	.09807	5.2133	5.6025	2.33	7.00
Job satisfaction	.00	25	5.4700	1.27132	.25426	4.9452	5.9948	2.75	7.00
	1.00	76	4.9644	1.45782	.16722	4.6312	5.2975	1.75	7.00
	Total	101	5.0895	1.42476	.14177	4.8083	5.3708	1.75	7.00
Turnover intention	.00	25	2.6500	1.34436	.26887	2.0951	3.2049	1.00	5.25
	1.00	76	3.7853	1.89671	.21757	3.3519	4.2188	1.00	7.00
	Total	101	3.5043	1.83694	.18278	3.1417	3.8670	1.00	7.00
Job Performance	.00	25	8.3304	1.06142	.21228	7.8923	8.7686	6.00	10.00
	1.00	76	7.3884	1.26943	.14561	7.0983	7.6785	4.00	9.67
	Total	101	7.6216	1.28293	.12766	7.3683	7.8749	4.00	10.00

Table F.6 : ANOVA - Non-Services/Services

		Sum of Squares	df	Mean Square	F	Sig.
Attention	Between Groups	.839	1	.839	1.852	.177
	Within Groups	44.857	99	.453		
	Total	45.697	100			
Absorption	Between Groups	.012	1	.012	.012	.913
	Within Groups	97.136	99	.981		
	Total	97.148	100			
Job satisfaction	Between Groups	4.809	1	4.809	2.402	.124
	Within Groups	198.184	99	2.002		
	Total	202.993	100			
Turnover intention	Between Groups	24.249	1	24.249	7.665	.007
	Within Groups	313.187	99	3.164		
	Total	337.436	100			
Job Performance	Between Groups	16.694	1	16.694	11.175	.001
	Within Groups	147.898	99	1.494		
	Total	164.592	100			