INDIVIDUAL-RELATED FACTORS INFLUENCING KNOWLEDGE-SHARING INTENTION IN KNOWLEDGE-INTENSIVE BUSINESSES

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INDIVIDUAL-RELATED FACTORS INFLUENCING KNOWLEDGE-SHARING INTENTION IN KNOWLEDGE-INTENSIVE BUSINESSES

BY

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DEDICATION

This thesis is dedicated to my late father who was always very proud of my accomplishments in life.

As I have said many times before, his example is my challenge and most respected memory. My father gave me an education and upbringing to be proud of, but more importantly, he believed in me.

I wish he was here to share in this important milestone, because without him it would not have been possible to pursue this journey.

“My father gave me the greatest gift anyone could give another person:
***He believed in me**.”*

--- Jim Valvano ---

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DECLARATION

I hereby declare that this thesis submitted is my own independent work and has not been previously submitted by me for a degree at any other university.

Conrad van Greunen

Port Elizabeth
July 2016

ABSTRACT

It has become generally accepted to refer to today's global economy as a knowledge-based economy, since knowledge has increasingly become *the* resource, instead of *a* resource for wealth creation. The ability of businesses to harness the potential of intangible assets such as knowledge has become far more decisive than their ability to manage physical assets. In the implementation of knowledge management activities, knowledge sharing is recognised as an integral task and key enabler of knowledge management. Although knowledge sharing is regarded as one of the most crucial factors in the effective management of knowledge, in knowledge-intensive businesses in particular, it has also been established that most employees are reluctant to share knowledge.

Research further confirms that the factors that promote or discourage knowledge-sharing behaviour in businesses are poorly understood and that knowledge management systems fail as a result of the misunderstanding of individual characteristics that could influence knowledge sharing. Moreover, the focus of knowledge-sharing literature, in terms of the unit of analysis, is rarely at an individual/micro level, although the role of individuals in the knowledge-sharing process is critical as tacit knowledge resides within the individual and knowledge sharing starts with individuals.

Given the importance of understanding knowledge sharing of individuals in knowledge-intensive businesses – but noting the lack of existing systematic, integrated research that focuses on individual-related factors influencing knowledge sharing – the purpose of this study was to fill the gap in the current literature. As such, the primary objective of this research was to identify and empirically investigate the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses.

The literature review revealed twelve constructs, namely *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*,

Relationship conflict, Task conflict, *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness* and *Conscientiousness* that could influence the dependent variable *Knowledge-sharing intention* in knowledge-intensive businesses. Various moderating relationships between the dependent and independent variables were also proposed, while seven demographic variables (*Age*, *Gender*, *Language*, *Highest qualification*, *Ethnic background*, *Organisational tenure* and *Job tenure* of the respondent) were identified as potential control variables.

Each construct in the hypothesised model of individual-related factors influencing *Knowledge-sharing intention* was defined and operationalised using items sourced from validated measuring instruments in previous studies. Several self-generated items based on secondary sources were also formulated. A structured questionnaire was made available to respondents identified by means of the convenience sampling technique, and the data collected from 597 usable questionnaires was subjected to various statistical analyses.

An exploratory factor analysis (EFA) was conducted which confirmed the unique factors present in the data, and Cronbach-alpha coefficients were calculated to confirm the reliability of the measuring instrument. Structural equation modelling (SEM) was the main statistical procedure used to test the significance of the relationships hypothesised between the various independent and dependent variables. A subset of SEM, namely general linear modelling (GLM) was used to determine the influence of selected demographic variables on *Knowledge-sharing intention* and to assess various moderating relationships as proposed in the hypothesised model.

The main findings of this study were that personality traits are strong predictors of individual employees' willingness to share knowledge, and that the maturity of individuals, in terms of realising the significance and value of sharing their knowledge with others, and in recognising the intrinsic benefits of sharing, influence *Knowledge-sharing intention.*

The main limitations of the study were the use of a convenience sampling technique to collect the data, as well as the dependence of self-report by respondents, which could lead to response bias.

This study has added to the body of knowledge management research, in particular knowledge-sharing research, by investigating selected individual-related factors influencing the *Knowledge-sharing intention* of individuals in a particular subset of businesses, namely knowledge-intensive businesses, and focusing on a particular type of knowledge, namely tacit knowledge. From a business's perspective, this study offers recommendations and suggestions for managing these individual-related factors in such a way as to increase knowledge sharing among employees, and as a result, the effectiveness and competitive advantage of knowledge-intensive businesses.

Keywords: Knowledge-intensive businesses, Knowledge-sharing intention, Individual-related factors, Tacit knowledge

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LIST OF ACRONYMS

AVE	**Average variance extracted**
CFA	**Confirmatory factor analysis**
CFI	**Comparative fit index**
EFA	**Exploratory factor analysis**
GLM	**General linear modelling**
MI	**Modification index**
NMMU	**Nelson Mandela Metropolitan University**
PGFI	**Parsimony goodness-of-fit index**
RMSEA	**Root mean squared error of approximation**
SEM	**Structural equation modelling**
TLI	**Tucker-Lewis index**

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“An investment in knowledge always pays the best interest”

Benjamin Franklin 1706–1790
(one of the Founding Fathers of the United States)

CHAPTER 1
INTRODUCTION, PROBLEM STATEMENT AND DEMARCATION OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE RESEARCH

It has become generally accepted to refer to today's global economy as a knowledge-based economy, since knowledge has increasingly become *the* resource, instead of *a* resource for wealth creation (Ghelichkhani & Khaiami, 2015:1). The sharing of know-how and exchanging of ideas results in the creation of new knowledge. The application of new knowledge to common problems has resulted in numerous innovations during the past few centuries. The previous two decades in particular were characterised by technological advancements that rapidly changed the way in which production was being organised, trade occurred and value that was delivered to consumers. In this respect, the fundamental rules of the economy have not changed. However, the structure and drivers of the economy have changed, and knowledge is progressively being accepted as a strategic resource. When managers started to shift their attention from physical resources to the more intangible resources, namely knowledge, the term "knowledge management" was coined (Cruywagen, 2010:1).

Knowledge management can be described as the act of finding, selecting and sharing information and expertise crucial for business activities (Okyere-Kwakye & Nor, 2011:66). Knowledge management affects businesses both directly (increasing return on investment) and indirectly (increasing employee satisfaction and learning). Hence, managing business knowledge has been identified as one of the key strengths of a business's activities. Knowledge management has enabled many businesses like De Beers, Siemens, General Motors, Xerox, Shell and Microsoft to sustain a competitive advantage and to acquire a favourable market position (Milton, 2013; Okyere-Kwakye & Nor, 2011:66). In fact, by managing knowledge, a business can greatly improve its chances of success. Therefore, the ability of businesses to harness the potential of intangible assets such as knowledge has become far more decisive than their ability to manage physical assets (Kamruddin & Akram, 2016:652).

In the implementation of knowledge management activities, knowledge sharing is recognised as the most important task (Ismail & Yusof, 2010:1; Jiacheng, Lu & Francesco, 2010:221; Abdullah, Hassim & Chik, 2009:115) and will form the focus point of the present study. Knowledge sharing can be defined as "a process which begins by capturing and organising knowledge and experience gained from others and proceeds to make this knowledge accessible to a wider audience" (Okyere-Kwakye & Nor, 2011:66-68). Knowledge sharing is a key enabler of knowledge management and many businesses agree that knowledge sharing is vital to utilise core competencies and to achieve a sustained competitive advantage (Nordin, Daud & Osman, 2012:696; Argote & Ingram, 2000:155).

Knowledge transfer has been used to describe the movement of knowledge between different units, divisions or organisations rather than between individuals (Wang & Noe, 2010:117; Szulanski, Cappetta & Jensen, 2004:608). Similarly, Paulin and Suneson (2012:87) state that the common dividing line between knowledge sharing and knowledge transfer is related to the levels of analysis. In this respect, the term "knowledge sharing" is used more often by authors focusing on the individual level, whereas "knowledge transfer" is used more frequently when groups, departments, organisations or even businesses are the focus point. However, knowledge transfer is sometimes used interchangeably with knowledge sharing (Paulin & Suneson, 2012:81) and therefore, when knowledge sharing is investigated, knowledge transfer should not be ignored.

A lack of knowledge sharing leads to a decreased intellectual capacity of a business and its productivity. In fact, a business can even elect to invest all its resources into knowledge management, but when employees are not willing to share knowledge within the business, the business's knowledge management efforts are likely to fail and the benefits of knowledge management will not be realised (Okyere-Kwakye & Nor, 2011:66-68).

Although knowledge sharing is important in all businesses, Swart and Kinnie (2003:60) conclude that it is crucial in knowledge-intensive businesses, if these businesses are to gain the most from their intellectual capital as well as to

compete effectively. Knowledge-intensive businesses include those businesses where most work is said to be of an intellectual nature, such as law and accounting businesses; management, engineering and computer consultancy businesses; advertising agencies; research and development units and high-technology businesses. Well-educated, qualified employees form the major part of the workforce of these businesses to create market value through the effective application of knowledge in their service provision to clients (Swart & Kinnie, 2003:60-61). Deng (2008:177) therefore asserts that cultivating a knowledge-sharing culture could be regarded as the most important and challenging task for effective knowledge management, especially in these knowledge-intensive businesses. Similarly Abdullah *et al*. (2009:115) assert that the key challenge faced by knowledge-intensive businesses is to facilitate the sharing of knowledge among employees. The potential loss of key personnel, who acquired and developed knowledge, could result in the business losing its competitive advantage. Per se, knowledge acquisition, storing, retrieving and sharing knowledge should be seen as critical by knowledge-intensive businesses (Nunes, Annansingh, Eaglestone & Wakefield, 2006:107).

1.2 PROBLEM STATEMENT

According to Blumberg, Cooper and Schindler (2011:55-56) any excellent research starts with a clearly defined research problem statement. These authors note that the researcher needs to confirm whether some theoretical considerations are available to address the research problem and whether the problem makes a valuable contribution to the field of study. The problem statement of the present study conforms to all the criteria of a good research problem as suggested above by Blumberg *et al*. (2011:55-56). First, the problem is narrowly defined and remains focused. Second, there are numerous theories that address the research problem (as explained in section 2.3.3 of Chapter 2). Finally, the research problem is relevant and, if addressed properly, the outcome holds various advantages for the relevant parties. A brief synopsis of the background leading to the problem statement, and evidence that the problem statement meets the criteria of a good research problem, is outlined below.

As much as knowledge sharing is regarded as one of the most crucial factors in the effective management of knowledge in knowledge-intensive businesses, it has also been established that most employees are reluctant to share knowledge. This unwillingness to share knowledge is therefore considered to be the most intractable problem facing knowledge management (Abdullah *et al*., 2009:117). The lack of knowledge sharing represents a formidable challenge for most managers, as sharing knowledge with other employees is contrary to human's nature. Pilsmo (2010:2) reports that, for a knowledge-intensive business, the most problematic and difficult aspect to overcome is the individual's survival instinct. Some individuals believe that one might benefit more from withholding information than by sharing information with others, while other employees believe that giving away knowledge is ceding power (Dunford, 2000:298). Furthermore, knowledge sharing has the potential to induce feelings of conflict of interest among individuals (Matzler, Renzl, Mooradian, Von Krogh & Mueller, 2011:297).

Individuals holding specific knowledge could enjoy special benefits and unique positions. As such, the issue of knowledge sharing could involve a social dilemma (Rad, Alizadeh, Miandashti & Fami, 2011:492). Many businesses have invested considerable time and money in knowledge-management initiatives. Regardless of these investments, it is estimated that billions of dollars are lost annually by Fortune 500 companies as a result of the failure to share knowledge (Zubair, 2013; French, 2010:2). An important reason for this failure to share knowledge is the lack of consideration of how the organisational and interpersonal contexts, as well as individual characteristics, influence knowledge sharing (Wang & Noe, 2010:115-116). In this respect, an important question that arises is: Which factors influence knowledge-sharing behaviour among employees?

Although many factors affecting knowledge-sharing behaviour have been reported in academic journals, it is not possible to draw a comprehensive picture of these factors, as few studies have summarised and analysed their results systematically (Hung & Chuang, 2009:1). Previous research confirms that the factors that promote or discourage knowledge-sharing behaviour in businesses are poorly understood (Chennamaneni, 2006:5; Bock, Zmud, Kim & Lee, 2005:87; Connelly & Kelloway, 2003:294). In this respect, research (Wang & Noe, 2010:116-117;

Ismail & Yusof, 2010:1; Hung & Chuang, 2009:1-2) highlights the lack of systematic, integrative research that includes individual perspectives on knowledge-sharing behaviour.

In addition, most past research has concentrated on organisational or technological perspectives to prove that there are several factors influencing knowledge-sharing behaviour (Ismail & Yusof, 2010:1; Bechina & Bommen, 2006:110). French (2010:2) states that one of the reasons why knowledge management systems fail is the misunderstanding of individual characteristics that could influence knowledge sharing. A limited number of studies have been conducted that highlight the influence of individual perspectives on knowledge-sharing behaviour (Ismail & Yusof, 2010:1-2; Samieh & Wahba, 2007:1). Matzler *et al*. (2011:297) observe that, even though personality psychology has undergone dramatic evolution over the past two decades, only a limited amount of research has considered the influence of enduring individual differences (personality traits) on knowledge sharing. Similarly, Wang and Noe (2010:125) suggest that research is needed to examine how personality traits could influence individuals' responses to work practices designed to encourage knowledge-sharing behaviour.

Matzler *et al*. (2011:296-297) further posit that previous research (see Ones, Viswesvaran & Dilchert, 2005:389; Barrick, Mount & Judge, 2001:9) indicates that personality traits have been claimed to be a strong predictor of behaviour and performance in the workplace. Chennamaneni (2006:5) asserts that minimal empirical research exists concerning the underlying individual issues that influence individuals' beliefs, attitudes, intentions, and behaviour in terms of knowledge sharing. In the same way, Hassan, Ariffin and Rehman (2011:135) stress that there is a lack of research that attempts to understand individuals' motivation for knowledge sharing. Such research however could provide a better understanding of individuals' knowledge-sharing motivation from intrinsic as well as extrinsic motivational perspectives, as well as individual differences in knowledge-sharing behaviour. Aamir (2010:1) reports that, apart from a lack of research on individuals' extrinsic and intrinsic motivation to share knowledge, literary work on individual differences and knowledge sharing is also considered scarce, although this is one of the most challenging problems that managers face. In this regard,

Ismail and Yusof (2010:2) suggest that it is time for researchers to shift their focus by concentrating on individual perspectives that may relate to knowledge-sharing behaviour. Identifying individual-related factors is important because the sharing of knowledge starts with the individual himself/herself. Similarly, Anadachee (2012:71) claims that despite studies suggesting that individuals are inclined to certain work attitudes and behaviours, little research exists which has empirically examined the role of individual personality or dispositions in knowledge-sharing. Research focussing on other individual-related factors such as demography also remains scarce (Mogotsi, Boon & Fletcher, 2011:2; Kharabsheh, 2007:424).

Anadachee (2012:71) also notes that the focus of knowledge-sharing literature, in terms of the unit of analysis, is rarely at an individual (micro) level. The role of the individual in the knowledge-sharing process is critical as tacit knowledge resides within the individual (Koskinen, 2013:87), and knowledge sharing starts with individuals (Ismail & Yusof, 2010:2). In fact, Wang and Noe (2010:116) claim that no systematic review has been conducted pertaining to individual-level knowledge sharing, noting that prior reviews have focused on knowledge transfer across units, organisations, or within inter-organisational networks. Likewise, research by Foss, Michailova and Husted (2010:455) confirmed that the knowledge-sharing literature is preoccupied with constructs, processes, and phenomena defined at a macro (collective, organisational) level and pay relatively little attention to constructs at a micro (individual) level.

A micro-level analysis is however important because macro-level interventions are often made at lower levels (Foss *et al*., 2010:467-475). For example, building specific organisational-level capabilities may require that certain employees with particular educational backgrounds, experiences and characteristics are hired, socialised and remunerated in specific ways. These interventions evidently require substantial knowledge about what goes on at a micro level. In the same way, it is important to note that the relationship between knowledge sharing and organisational outcomes also involves the individuals and their interaction. In this instance, an increase in organisation-level problem-solving capacity – which may result from knowledge sharing – happens because of a higher individual problem-solving capacity that knowledge sharing may foster (Foss *et al*., 2010:475). Finally,

Wang, Noe and Wang (2011:2) point out that research has paid inadequate attention to knowledge sharing between employees, instead concentrating on knowledge creation and transfer at the level of team, unit or organisation. This presents a serious shortcoming in knowledge-sharing research as most researchers (Abdullah *et al*., 2009:115; Chow & Chan, 2008:458) recognise that accumulation of organisational knowledge rest on knowledge sharing between employees.

1.3 PURPOSE OF THE STUDY

Given the importance of understanding knowledge sharing between individuals, but noting the lack of existing systematic, integrated research that focuses on individual-related factors influencing knowledge sharing, the purpose of this study is to fill the gap in the current literature. As such, this study aims to contribute to a better understanding of the individual-related factors influencing the *Knowledge-sharing intention* of individuals in knowledge-intensive businesses.

To give effect to this purpose and to address the research gaps in current literature, the researcher will develop and empirically test a hypothesised model of individual-related factors that influence *Knowledge-sharing intention* in knowledge-intensive businesses. To the best knowledge of the researcher, no similar study could be found that uses a similar design and approach to shed light on the problem with respect to knowledge sharing as proposed in the preceding and following paragraphs.

1.4 RESEARCH OBJECTIVES

After the problem has been defined, the research objectives are developed. Research objectives are the goals to be achieved during the research study (Zikmund, Babin, Carr & Griffin, 2013:60).

1.4.1 Primary research objective

The primary research objective of this research is to identify and empirically investigate the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses. The identification of such factors, empirical testing and subsequent understanding and management thereof, could contribute to an increase in knowledge sharing among employees, which could enhance the effectiveness and competitive advantage of knowledge-intensive businesses.

1.4.2 Secondary objectives

To achieve the primary objective, a number of secondary objectives are formulated, namely:

SO^1 To investigate the relationship between individuals' awareness of the importance of knowledge sharing and their *Knowledge-sharing intention*.

SO^2 To investigate the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.

SO^3 To investigate the relationship between psychological contract breach and *Knowledge-sharing intention*.

SO^4 To investigate the relationship between conflict and *Knowledge-sharing intention*.

SO^5 To investigate the relationship between personality traits and *Knowledge-sharing intention*.

SO^6 To investigate the moderating influence of personality traits on the relationship between psychological contract breach and *Knowledge-sharing intention*.

SO^7 To investigate the moderating influence of personality traits on the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.

SO^8 To investigate the moderating influence of individuals' motivation to share knowledge on the relationship between conflict and *Knowledge-sharing intention*.

SO^9 To investigate the relationship between selected demographic variables and *Knowledge-sharing intention*.

1.4.3 Methodological objectives

In order to address the abovementioned primary and secondary objectives, the following methodological objectives have been identified:

MO^1 To undertake a comprehensive theoretical investigation into the nature and importance of knowledge sharing, and possible factors that could influence knowledge sharing among individuals.

MO^2 To develop a hypothesised model of individual-related factors that could influence the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses, and to suggest appropriate hypotheses pertaining to the relationships depicted in the hypothesised model.

MO^3 To determine an appropriate research design that would be most suitable for this study to facilitate the answering of all the research questions.

MO^4 To develop a measuring instrument to empirically test the relationships as described in the hypothesised model.

MO^5 To conduct an empirical investigation and empirically test the relationships

proposed in the hypothesised model on a sample of employees working in knowledge-intensive businesses.

MO[6] To report research findings, interpret data, compare findings to previous research and address potential relationships that emanate from the data analysis.

MO[7] To interpret the research findings and provide guidelines and recommendations to knowledge-intensive businesses on how to manage the individual-related factors influencing *Knowledge-sharing intention* of individual employees. This could lead to more knowledge sharing among employees and consequently render a competitive advantage for the business.

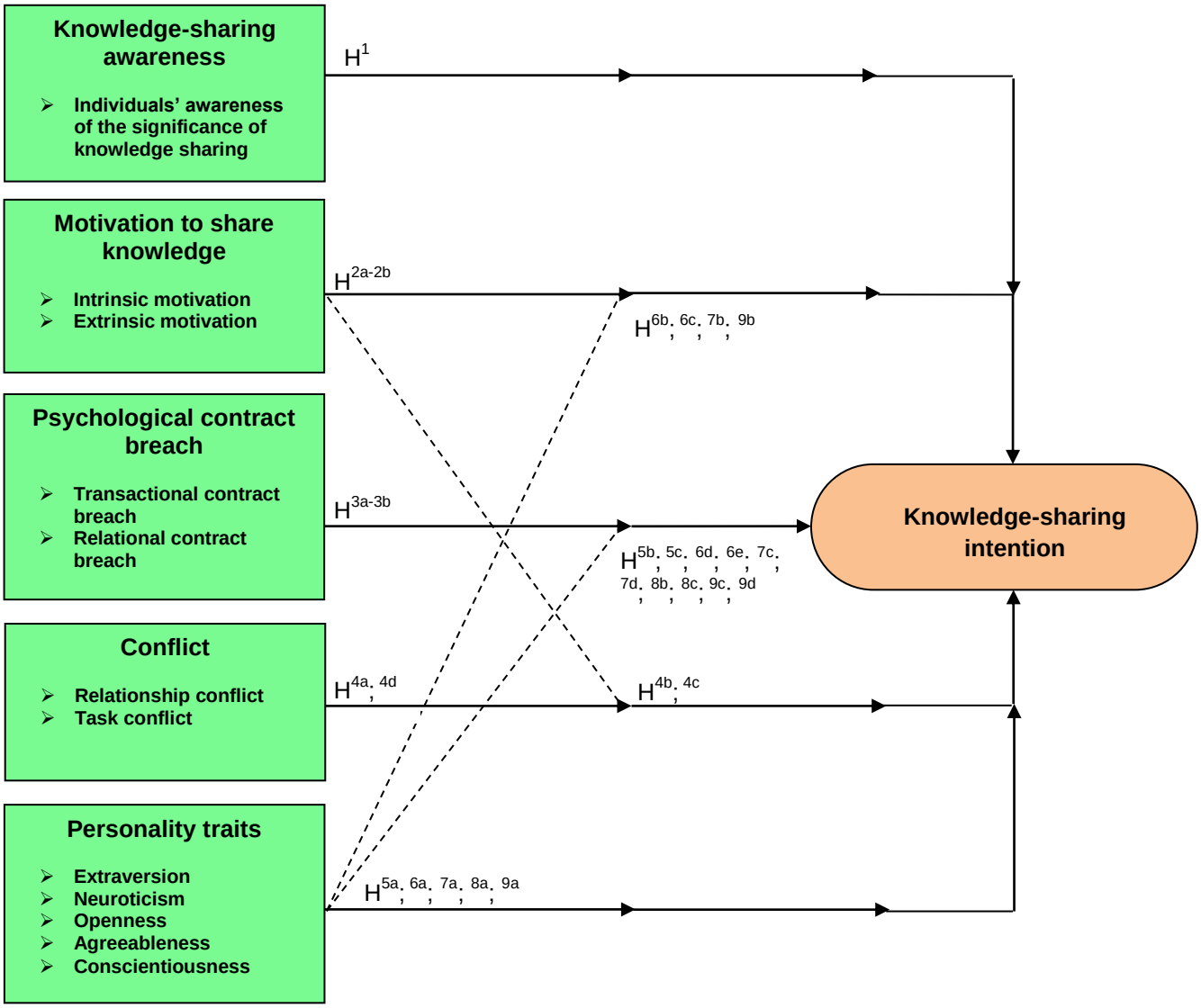
1.5 PROPOSED HYPOTHESISED MODEL, RESEARCH QUESTIONS AND HYPOTHESES

For the purpose of this study, *Knowledge-sharing intention* refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise. As the primary research objective of this study is to identify and empirically investigate the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses, a hypothesised model is constructed of individual-related factors that may influence employees' willingness to share knowledge. Although many factors could influence employees' willingness to share knowledge with co-workers, this study focuses on individual-related factors, given their importance with respect to knowledge sharing and the lack of research focusing on these factors.

The researcher investigates individuals' knowledge sharing by testing direct relationships between various individual-related factors (independent variables) and *Knowledge-sharing intention* (dependent variable), as well as various moderating relationships as presented in the proposed hypothesised model (Figure 1.1). These factors and proposed relationships are identified in a

comprehensive literature review (Chapters 2, 3 and 4) as important influencing factors with respect to knowledge sharing. The inclusion of each factor in the model is justified in more detail in Chapter 4.

Figure 1.1: Proposed hypothesised model of individual-related factors influencing knowledge-sharing intention



Source: Researcher's own construction

Based on the proposed hypothesised model and research objectives, the following research questions and hypotheses were formulated.

1.5.1 Research questions

- What is the relationship between individuals' awareness of the importance of knowledge sharing and their *Knowledge-sharing intention*?
- What is the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*?
- What is the relationship between psychological contract breach and *Knowledge-sharing intention*?
- What is the relationship between conflict and *Knowledge-sharing intention*?
- What is the relationship between personality traits and *Knowledge-sharing intention*?
- What is the moderating influence of personality traits on the relationship between psychological contract breach and *Knowledge-sharing intention*?
- What is the moderating influence of personality traits on the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*?
- What is the moderating influence of individuals' motivation to share knowledge on the relationship between conflict and *Knowledge-sharing intention*?
- What is the relationship between selected demographic variables and *Knowledge-sharing intention*?

1.5.2 Research hypotheses

A number of research hypotheses are formulated to summarise the various relationships depicted in the proposed hypothesised model (Figure 1.1).

H^{1}: There is a positive relationship between *Individuals' awareness* and *Knowledge-sharing intention*.

H^{2a}: There is a positive relationship between *Intrinsic motivation* and *Knowledge-sharing intention*.

H^{2b}: There is a positive relationship between *Extrinsic motivation* and *Knowledge-sharing intention.*

H^{3a}: There is a negative relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{3b}: There is a negative relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

H^{4a}: There is a negative relationship between *Relationship conflict* and *Knowledge-sharing intention*.

H^{4b}: *Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.

H^{4c}: *Intrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.

H^{4d}: There is a positive relationship between *Task conflict* and *Knowledge-sharing intention*.

H^{5a}: There is a positive relationship between *Extraversion* and *Knowledge-sharing intention*.

H^{5b}: *Extraversion* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{5c}: *Extraversion* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

H^{6a}: There is a negative relationship between *Neuroticism* and *Knowledge-sharing intention*.

H^{6b}: *Neuroticism* moderates the relationship between *Extrinsic motivation* and

Knowledge-sharing intention.

H^{6c}: *Neuroticism* moderates the relationship between *Intrinsic motivation* and *Knowledge-sharing intention*.

H^{6d}: *Neuroticism* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{6e}: *Neuroticism* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

H^{7a}: There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*.

H^{7b}: *Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

H^{7c}: *Openness to experience* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{7d}: *Openness to experience* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

H^{8a}: There is a positive relationship between *Agreeableness* and *Knowledge-sharing intention*.

H^{8b}: *Agreeableness* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{8c}: *Agreeableness* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

H^{9a}: There is a positive relationship between *Conscientiousness* and *Knowledge-sharing intention*.

H^{9b}: *Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

H^{9c}: *Conscientiousness* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{9d}: *Conscientiousness* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

A detailed discussion related to the hypotheses above is presented in Chapter 4. To establish whether selected demographic characteristics influence individuals' willingness to share knowledge, an additional hypothesis (H^{10}) is developed to determine the influence of selected demographic variables (gender, tenure, education, age and race) on *Knowledge-sharing intention*.

H^{10}: There is a relationship between selected *Demographic variables and Knowledge-sharing intention.*

1.6 RESEARCH DESIGN

The research paradigm adopted in this study to test the various hypotheses and to achieve the research objectives of the study will first be described. This is followed by a discussion of the literature review and empirical investigation, as determined by the adopted research paradigm.

1.6.1 Research paradigm

In light of the study's problem statement and the subsequent research objectives, a positivistic paradigm was deemed most appropriate to measure the perceptions of respondents concerning the individual-related factors influencing *Knowledge-sharing intention*. A positivistic approach is associated with quantitative research and therefore with the study of numbers and statistics (Quinlan, 2011:13). Quantitative research is undertaken to examine questions about relationships between variables, as in the case of the present study (Saunders, Lewis & Thornhill, 2016:166). Moreover, quantitative research addresses research objectives by means of empirical investigations that involve numerical analyses and measurement (Zikmund *et al*., 2013:134).

In order to identify the various individual-related factors that could influence *Knowledge-sharing intention*, a comprehensive literature review was conducted, as explained in the following section.

1.6.2 Literature review

The purpose of the literature review was to identify individual-related factors that could influence the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses. From this detailed literature review the proposed hypothesised model was derived.

The identification of such variables, empirical testing and subsequently the understanding and management thereof, may have various advantages for knowledge-intensive businesses. Chapter 2 covers the nature and importance of knowledge sharing among individuals.

Chapter 3 focuses on the various factors that could influence knowledge sharing among individuals. Even though the purpose of this study is to investigate the individual-related factors influencing *Knowledge-sharing intention*, for completeness' sake the organisation-related factors influencing knowledge sharing are also discussed in Chapter 3. The organisational and individual-related factors are often related to each other, with several examples highlighted in Chapter 3. In addition, despite the fact that this study focuses on *Knowledge-sharing intention*, to obtain a holistic representation of factors that could influence the willingness of individuals to share knowledge, secondary sources to various behavioural concepts of knowledge sharing (such as attitude towards knowledge sharing, intention towards knowledge sharing and actual knowledge-sharing behaviour) were consulted. These secondary sources included academic journal articles, research published in books, dissertations, working papers, as well as conference papers, to identify empirical models, frameworks, reviews and behavioural theories related to knowledge sharing. In this regard, the databases primarily used in this study included EBSCOhost, Emerald, IEEE, JSTOR, Sabinet, SAGE, ScienceDirect and SpringerLink, while internet search engines such as Google, Google Scholar and Yahoo were used. It is acknowledged that the abovementioned databases are not the only sources of information on knowledge sharing; however, these formed the foundation of the literature review.

Chapter 3 provides the basis for selecting the independent variables of this study, which are the individual-related factors that influence *Knowledge-sharing intention* (dependent variable). In Chapter 4 the proposed hypothesised model of individual-related factors that could influence knowledge-sharing intention is presented. The independent, dependent and control variables included in this model are justified and discussed in Chapter 4, and the resulting hypothesised relationships to be empirically tested are presented.

1.6.3 Empirical investigation

The population, sample, data collection methods and primary data analysis technique are subjects briefly discussed in the following sections.

1.6.3.1 Data collection

The population in the present study included all employees in knowledge-intensive businesses that are based in South Africa. Although knowledge-intensive businesses are widely distributed all over the country, a complete database of such businesses was not available. As such, a convenience sampling technique was used and respondents working in knowledge-intensive businesses who were available and willing to participate in the research constituted the sample in the present study.

A measuring instrument in the form of a questionnaire was compiled to assess the dependent, independent and control variables. Each construct identified in the literature survey was defined and operationalised. Operationalisation was done by using reliable and valid items obtained from existing measuring instruments used in previous studies, as well as a few self-generated items based on the literature review. The items in the questionnaire were presented to respondents using a Likert-type scale. An electronic link to the final questionnaire was emailed to respondents identified through the convenience sampling technique.

Chapter 5 presents a detailed explanation of the sampling frame, primary data collection methods, operationalisation of the constructs and construction of the

measuring instrument, together with the process followed concerning the administering of the measuring instrument.

1.6.3.2 Data analysis

An exploratory factor analysis (EFA) was conducted to identify the unique factors present in the data, confirming the discriminant validity of the measuring instrument used. Bartlett's Test of Sphericity was performed to determine the factor-analysability of the data. Principal Component Extraction with Varimax Raw Rotation was specified as the extraction and rotation method. The percentage of variance explained and the individual factor loadings were considered to identify the factors to extract for the model. For the purpose of this study, only items with a factor loading of 0.6 or higher that loaded onto one factor were considered significant. In addition, no restriction on the number of factors was specified and Kaiser's rule was used to establish the number of factors (Eigen values greater than one) (Ledesma & Valero-Mora, 2007:2). The software program Statistica (Dell Statistica Version 13) was used for the purpose of the EFA. In addition to an EFA to assess the discriminant validity of the measuring instrument, the average variance extracted (AVE) value was calculated for each latent variable in the measurement model to confirm the convergent validity. Chapter 6 provides more details about this method (section 6.5.1).

Cronbach-alpha coefficients were calculated to confirm the reliability of the measuring instrument. Satisfactory Cronbach-alpha coefficients were reported for all the constructs identified during the EFA, confirming the reliability of the measuring instrument.

Structural equation modelling (SEM) analyses were undertaken to determine the influence of the independent variables on the dependent variable *Knowledge-sharing intention* as proposed in the hypothesised model. The goodness-of-fit of the model was evaluated using various fit indices such as the normed Chi-square, RMSEA (root mean squared error of approximation), CFI (comparative fit index), TLI (Tucker-Lewis index) and PGFI (parsimony goodness-of-fit index). Finally, a subset of SEM, namely general linear modelling (GLM) was used to determine the

influence of selected demographic variables on *Knowledge-sharing intention* and to assess various moderating relationships as proposed in the hypothesised model. The present study made use of the software program, SPSS AMOS (Version 23), for the purpose of the SEM analyses.

A detailed discussion of the data analyses is presented in Chapter 6.

1.7 SCOPE AND LIMITATIONS OF THE RESEARCH

Leedy and Ormrod (2013:43), as well as Fox and Bayat (2012:140), suggest that it is important to know what the researcher does *not* intend to do during the research. Research problems usually emerge from larger contexts and problem areas, and as such, the researcher can easily be enticed and drawn off course by addressing irrelevant research questions and obtaining data that lies beyond the limits of the problem being investigated. The present study will focus on identifying the individual-related factors that could influence the *Knowledge-sharing intention* of individual employees employed in knowledge-intensive businesses.

Although the sample of the quantitative study is thought to be a good representation of the population as a whole, the extent to which a convenience sample (non-probability sample) represents the population can be questioned (Leedy & Ormrod, 2013:214). Nonetheless, the researcher feels that the findings of the study can be generalised to some extent as the empirical analysis of the data was based on a relatively large sample as will be described in Chapter 6.

Another limitation of the study was that the quantitative data presented in the present study was subject to self-report of respondents. This could lead to response bias. Nonetheless, various procedural and statistical remedies were employed to control common method bias as dicussed in Chapter 6 (section 6.12).

1.8 CONTRIBUTION OF THE STUDY

Employees are often reluctant to share knowledge with one another, even though knowledge sharing is central in the knowledge management process and has

been recognised as a positive force that contributes to the survival of a business. Furthermore, large amounts of money are lost every year owing to a lack of knowledge sharing among employees, while research has confirmed that the individual-related factors that promote or discourage knowledge sharing in organisations are poorly understood (French, 2010:2; Abdullah *et al*., 2009:117; Chennamaneni, 2006:5).

This study adds to the body of knowledge management research, in particular knowledge-sharing research, by investigating selected individual-related factors influencing the *Knowledge-sharing intention* of individuals in a particular subset of businesses, namely knowledge-intensive businesses, and focusing on a particular type of knowledge, namely tacit knowledge. The inclusion of each individual-related factor in the hypothesised model was appropriately justified by underlining the lack of research pertaining to the respective factor and knowledge sharing, therefore addressing various gaps in knowledge-sharing literature. As a result, a further contribution of this study is the development of a reliable instrument that measures individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses.

Another valuable contribution of the study is that it focuses on knowledge-sharing of individual employees. It therefore adopts an individual unit of analysis, and addresses the gap in knowledge-sharing research where inadequate attention has been paid to knowledge sharing of individual employees. Instead, past research mainly concentrated on knowledge transfer at team, unit or organisational level (Wang *et al*., 2011:2).

Furthermore, from an empirical perspective, the use of an advanced statistical technique such as SEM to analyse various direct and moderating relationships as proposed in the hypothesised model, makes a valuable contribution to the body of knowledge-sharing literature. The empirical investigation (EFA) further revealed a new factor that has an influence on *Knowledge-sharing intention* that has not been previously identified in knowledge-sharing literature (refer to Chapter 6).

From a business's perspective, understanding and managing the individual-related

factors influencing *Knowledge-sharing intention* could contribute to an increase in knowledge sharing among employees. As a result, the effectiveness and competitive advantage of knowledge-intensive businesses could be enhanced. More specifically, to mention only a few examples, knowledge sharing has been associated with generating new business ideas and opportunities, developing organisational learning, enhanced business effectiveness and productivity, improved work quality and problem-solving (refer to Chapter 2 section 2.4). The recommendations put forward in section 7.3 therefore make a valuable contribution to knowledge-intensive businesses.

1.9 DEFINITION OF KEY CONCEPTS

A few key concepts that will be extensively used in this study are clarified below.

1.9.1 Knowledge management

Knowledge management is a process that involves creating, generating, capturing storing, sharing and using knowledge to support and improve individual performance (Ismail & Yusof, 2010:2).

1.9.2 Knowledge-sharing intention

In this study, *Knowledge-sharing intention* refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise.

1.9.3 Knowledge-intensive business

A knowledge-intensive business is characterised by well-educated and skilled employees who create market value by means of the effective application of knowledge to provide a service to its clients (Swart & Kinnie, 2003:62).

1.9.4 Individual-related factors

In contrast to factors that relate to issues or situations in the business (organisation-related factors) that can facilitate or impede knowledge sharing between individuals, individual-related factors are those that are directly linked to individuals and could influence individuals' willingness to share knowledge with others.

1.10 STRUCTURE OF THE STUDY

Chapter 1 presents an introduction and background to the research, followed by the problem statement, purpose of the study and research objectives. This leads to the presentation of a proposed hypothesised model and associated research questions and hypotheses. The research design is proposed, which introduces the adopted research paradigm, as well as the literature review and empirical investigation. In addition, the scope and limitations of the research are described and its contributions highlighted. The chapter concludes with definitions of important concepts used and an outline of the structure of the study.

Chapter 2 focuses on the nature and importance of knowledge sharing. The different types of knowledge are discussed and knowledge sharing is contextualised. The chapter proceeds with a discussion of the importance of knowledge sharing and concludes by examining the various methods of knowledge sharing.

Chapter 3 deals with the factors that influence knowledge sharing. In particular, various organisational factors as well as individual-related factors that could influence knowledge sharing are identified and discussed to obtain a holistic representation of possible factors that could influence knowledge sharing among individuals.

Chapter 4 presents a model of selected individual-related factors that are hypothesised to influence individuals' *Knowledge-sharing intention*. The independent, dependent and control variables included in this model are justified

and discussed, as well as the resulting hypothesised relationships to be empirically tested.

Chapter 5 provides a description of the preliminary assessment of the proposed hypothesised model. This is followed by a discussion of the study population, sampling unit, sampling method and the method of data collection. The dependent and independent variables of the study are operationalised and a detailed explanation of how the measuring instrument was developed and administered is put forward. Following this, the sample size requirements and statistical analysis techniques that were used to assess the validity and reliability of the results are discussed. The chapter concludes with a description of the SEM technique, which was used to test the relationships in the hypothesised model.

Chapter 6 reports on the results of the reliability and validity assessments of the measuring instrument used in this study. The results of the empirical testing of the relationships between the independent and dependent variables are presented and compared with findings of previous research studies. The results of the empirical testing of various moderating relationships are also discussed, as well as the influence of selected demographic variables on the dependent variable *Knowledge-sharing intention*.

Chapter 7 offers a summary, conclusions and recommendations of the research. More specifically, the chapter presents a brief overview of the research, and a discussion of the main empirical findings and recommendations pertaining to the individual-related factors influencing *Knowledge-sharing intention* in knowledge-intensive businesses. The empirical findings of the study are interpreted and their implications for knowledge-intensive businesses are discussed. The contributions of the study are also highlighted and the chapter concludes with a discussion of the limitations of the study and recommendations for future research.

CHAPTER 2
THE NATURE AND IMPORTANCE OF KNOWLEDGE SHARING

2.1 INTRODUCTION

Nowadays knowledge is regarded as a crucial factor for a business's competitiveness. Together with land, labour and capital, knowledge is also regarded as a factor of production that drives today's knowledge economy (Wickramasinghe & Von Lubitz, 2007:188). In order to be valuable and useful, knowledge must be shared among individuals within a business. The process of knowledge sharing in a business is not only central to the success of the business, but also to the employees who benefit by it (Szabo & Csepregi, 2011:41-42; Kruger, 2008:70).

This chapter will address part of the first methodological research objective, namely to undertake a comprehensive theoretical investigation into the nature and importance of knowledge sharing. The chapter commences by discussing the different types of knowledge and thereafter contextualises knowledge sharing. This is followed by a discussion of the importance of knowledge sharing. The chapter concludes by examining the various methods of knowledge sharing.

2.2 TYPES OF KNOWLEDGE

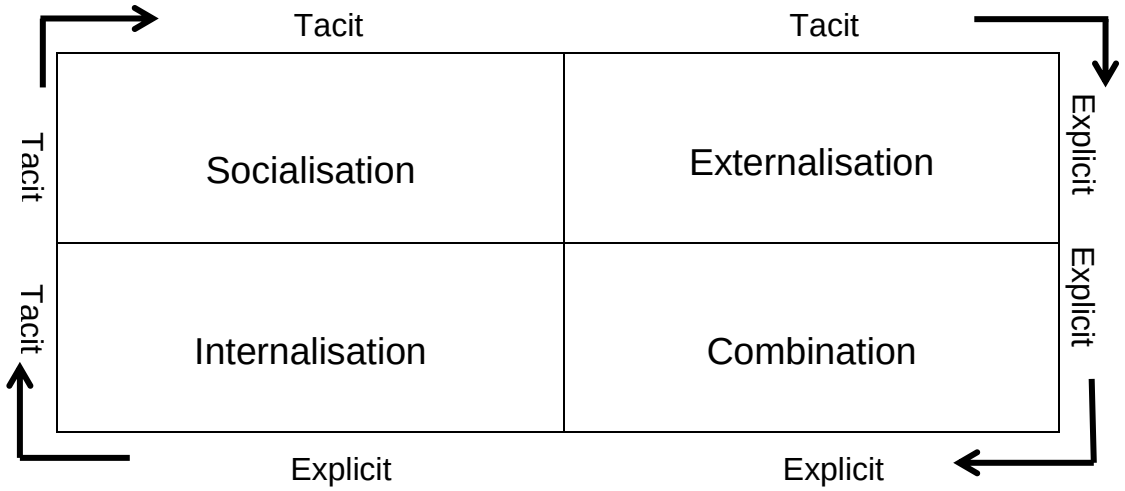
Knowledge can be categorised into two types, namely explicit and tacit knowledge. Both tacit and explicit knowledge are transferred between the individuals in a business to create a collective knowledge pool, which forms an important building block in creating both a competitive advantage and value (Nonaka, 1994:15). Coetzee, Beek and Buys (2012:622) note that explicit knowledge can be expressed in words and numbers, and shared in the form of data, manuals and universal principles. Explicit knowledge (such as manuals, databases, plans, business documents, guidelines, process models) can be captured, manipulated, formalised, documented and archived. As such, explicit knowledge can easily be communicated and transferred between people in a formal and systematic manner (Okyere-Kwakye & Nor, 2011:67; Chennamaneni, 2006:11). In addition, this type

of knowledge has a universal character, can function across contexts and is recognisable in conscious acts (Nonaka & Von Krogh, 2009:636; Cavusgil, Calantone & Zhoa, 2003:8).

By contrast, tacit knowledge (which will be the focus point of this study) is personal and difficult to formalise and cannot be shared as easily as explicit, codifiable knowledge (knowledge that can be documented) (Matzler *et al*., 2011:298). Tacit knowledge is acquired through personal experience, and includes aspects such as subjective insights and intuitions (Eucker, 2007:12; Desouza, 2003:85-86). Chennamaneni (2006:11-12) asserts that tacit knowledge is deeply rooted in an individual's values, actions, experiences and ideals. This type of knowledge is further related to the concept of skills and it is difficult to express or verbalise tacit knowledge.

An important aspect of knowledge sharing is to facilitate the flow of both tacit and explicit knowledge. The interaction between tacit and explicit knowledge is of strong organisational significance as the two knowledge types influence one another (Pienaar, 2007:38-44). Nonaka and Takeuchi (1995:62) developed the well-known SECI model (see Figure 2.1 below) to illustrate the interactions between tacit and explicit knowledge, and hence the significant implications of knowledge sharing for a business.

Figure 2.1: SECI Model



Source: Nonaka and Takeuchi (1995:62)

In Figure 2.1, "socialisation" refers to tacit knowledge being added to existing tacit knowledge through such things as on-the-job training, sharing experiences, observation, brainstorming, imitation and practice. Socialisation is typical during apprenticeships where tacit knowledge is gained through face-to-face, hands-on experience, instead of from written manuals. "Externalisation" takes place when tacit knowledge is converted into explicit knowledge by using metaphors, models or analogies. The knowledge created through the externalisation process is called "conceptual knowledge". For example, when individuals are trying to conceptualise an image (convert tacit knowledge to explicit knowledge), they express its essence typically in imaginative rhetorical language such as metaphors and analogies (Yoshimichi, 2011:21-28; Pienaar, 2007:40-42; Nonaka & Takeuchi, 1995:62-70). Figure 2.2 below provides examples of the externalisation process.

Figure 2.2: Externalisation: Metaphor and analogy for concept creation in product development

Product (Company)	**Metaphor/Analogy**	**Influence on Concept**
City (Honda)	Automobile evolution (metaphor) The sphere (analogy)	Hint of maximising passenger space as ultimate auto development, 'Man-maximum, machine-minimum' concept created Hint of achieving maximum passenger space through minimising surface area, 'Tall and short car (Tall Boy)' concept created
Mini-Copier (Canon)	Aluminum beer can (analogy)	Hint of similarities between inexpensive aluminum beer can and photosensitive drum manufacture, 'Low-cost manufacturing process' concept created
Home Bakery (Matsushita)	Hotel bread (metaphor) Osaka International Hotel head baker (analogy)	Hint of more delicious bread, 'Twist dough' concept created

Source: Nonaka and Takeuchi (1995:66)

Although the examples above relate to concept creation in product development, the researcher is of the opinion that externalisation (metaphor and analogy) can also be applied to the present study and hence, knowledge sharing in a service-orientated business. For example, an employee working in a service-orientated business could articulate his or her tacit knowledge (ideas or images in words, metaphors and analogies) into explicit knowledge that can be used by colleagues for the benefit of the business. Also, customers' tacit ideas or needs can be translated into a readily understandable form through the use of metaphors, images or analogies.

As depicted in Figure 2.1, the third process in the SECI model, namely "combination", relates to explicit knowledge being added to other explicit knowledge by means of a variety of sources such as databases and memorandums. Alternatively, the conversion process entails the assembling of new or existing explicit knowledge held by individuals in a knowledge system.

Finally, “internalisation” is a process whereby explicit knowledge is converted to tacit knowledge. Documentation, manuals and other kinds of explicit knowledge such as text, sound, video formats, or oral stories can facilitate the internalisation process. The processes mentioned above have significant implications for a business, and illustrate the importance of interaction between tacit and explicit knowledge and ultimately the importance of knowledge sharing in a business (Yoshimichi, 2011:21-28; Pienaar, 2007:40-42; Nonaka & Takeuchi, 1995:62-70).

It is important that the right knowledge, or knowledge resources (such as people), are available to the right people at the right time. Therefore, knowledge-management processes must be implemented in a business, and knowledge sharing is possibly the most important aspect of the knowledge management process, as knowledge management initiatives depend upon knowledge sharing (Frost, 2013). In the next section, knowledge sharing is contextualised.

2.3 CONTEXTUALISING KNOWLEDGE SHARING

In this section, a distinction is made between knowledge management and knowledge sharing. Knowledge sharing is also defined and the various theories on knowledge sharing are discussed.

2.3.1 Knowledge management and knowledge sharing

Knowledge management is a process of identifying, organising and managing knowledge resources. The process of knowledge management involves creating, generating, capturing, storing, sharing and using knowledge in order to support and improve individual and business performance (Ismail & Yusof, 2010:2). During the emergence of knowledge management as a concept, the initial emphasis was on technology and information tools, but the focus has now shifted to human factors (people-centred knowledge management) because human beings are the primary source of tacit knowledge in businesses. Knowledge management is not only about managing technology, but also about the management of individuals’ knowledge sharing (Antonova & Gurova, 2006:1-2). Nassuora (2011:32) states that the operational objective of knowledge management is to ensure that the right

knowledge is available to the right processors, in the right representations and at the right times. In this respect, knowledge sharing is an important method of ensuring that knowledge is available and delivered at the right time. Knowledge sharing has a central role in the knowledge management process, and effective knowledge management strategies must emphasise the role of knowledge sharing in order to attain maximum results for the business (Nassuora, 2011:29; Abdullah *et al*., 2009:115).

2.3.2 Defining knowledge sharing

There are many definitions by numerous authors of knowledge sharing. A review of knowledge-sharing literature indicates that there is no universal definition of the concept. Many researchers have defined it from their own point of view and have considered knowledge flows, knowledge sharing and knowledge transfer as exchangeable terms (Chennamaneni, 2006:15-16). For instance, Alavi and Leidner (2001:119-120) relate knowledge sharing to knowledge transfer, and define it as the process of disseminating knowledge throughout the organisation. In this respect, the spreading of knowledge can take place between individuals, groups or organisations.

Lin, Lee and Wang (2009:26) define knowledge sharing as “a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organisation.” In the same manner, Harder (2008:5) defines knowledge sharing as “the voluntary and social process to transfer, absorb and re-use the existing knowledge in order to serve an organisational end.” Cheng, Ho and Lau (2009:314) explain knowledge sharing as the communication of knowledge between a minimum of two individuals, to a multiple of individuals such as colleagues in a workplace. In addition, Cheng *et al*. (2009:314) suggest that individuals share what they have learned with those who have a collective interest, as well as with those who will find the knowledge useful. The knowledge-sharing process encompasses the collecting, organising and conversing of knowledge from one to another (Cheng *et al*., 2009:314).

On the other hand, Paulin and Suneson (2012:87) state that there is a common dividing line between knowledge sharing and knowledge transfer. For example, knowledge sharing is used more often by authors focusing on the individual level, while knowledge transfer is used more frequently when groups, departments, organisations or businesses are the focus point.

While investigating knowledge sharing in the present study, knowledge transfer will not be ignored as these terms are often used interchangeably. Knowledge sharing, in this study, is defined as the sharing of tacit knowledge between individuals, which includes personal insights, know-how, experience and expertise. Individuals' role in the knowledge-sharing process is critical as knowledge resides within the individual, and knowledge sharing starts with individuals. Next, the various theories that provide insight into the knowledge-sharing process are presented.

2.3.3 Theories on knowledge sharing

The Resource-Based Theory, Social/Economic Exchange Theory, Theory of Reasoned Action, Theory of Planned Behaviour; Social Cognitive Theory, Knowledge-Based Theory and Social Capital Theory are popular theories that have often been used by researchers to understand knowledge-sharing behaviour. In the present study, these theories were the most popular theories which were identified frequently throughout the literature review. This view is also consistent with that of Wang and Noe (2010:122) who identify the Theory of Reasoned Action, Social Exchange Theory and Social Capital Theory as the most commonly used theoretical perspectives to study knowledge-sharing behaviour. These authors reviewed empirical knowledge-sharing literature that dated back as early as 1994 to the most recent in 2008. Similarly, Hung and Chuang (2009:5) found that the Theory of Reasoned Action, Theory of Planned Behaviour, Social Exchange Theory and the Social Capital Theory were prevalent in knowledge-sharing literature that dated back from 2000 to the most recent in 2009.

In addition, the literature review on the various knowledge sharing theories reveal that there is a lack of recent theories to explain knowledge-sharing behaviour. In

this instance, older well documented theories (as mentioned above) are used to build upon existing knowledge-sharing models.

2.3.3.1 Penrose's Resource-Based Theory (1959)

The Resource-Based Theory views a business as a collection of resources. Traditionally these resources have been defined in terms of materiality or capital. However, in today's knowledge society they increasingly appear in an intangible form as intellectual capital (Styhre, 2012:162-163; Penrose, 1959:77). The Resource- Based Theory proposes that a business's competitive advantage and performance depends on unique resources and capabilities that are costly to copy by other competitors. The basis of the Resource-Based Theory is that a business's competitiveness relies on the development of distinctive and unique capabilities and that the essence of a business's strategy should be defined by these unique resources and capabilities (Theriou, Aggelidis & Theriou, 2009:178-179).

The development of internal skills and unique capabilities to remain competitive require businesses to not only preserve knowledge but also to share knowledge between individuals and functional groups as it fulfils an essential role to share new ideas or solutions (Islam, Ahmed, Hasan & Ahmed, 2011:5901). Collecting information and knowledge from a variety of sources in a firm's internal and especially external environment is central to innovation. In this regard, businesses can improve their knowledge and innovative capabilities by leveraging the skills of others through knowledge sharing both within and across businesses boundaries (Evans, Bosua & Sawyer, 2013).

2.3.3.2 Blau's Social/Economic Exchange Theory (1964)

This Social Exchange Theory is concerned with individuals' behaviour, outcomes/benefits, the environment and interpersonal network between individuals. More specifically, the Social Exchange Theory concerns relationships or exchanges as a cost-benefit activity. This theory postulates that individuals will not get involved in certain activities unless they perceive the outcomes as being

positive. Individuals' knowledge-sharing behaviour is therefore based on their future expectations, and as a result, they will be reluctant to share knowledge when they perceive activities as a mere cost. The Social Exchange Theory can also be linked to the concept of trust. In this instance, when individuals perceive others as untrustworthy, they will not exchange or cooperate with them as there could be a possibility of harm to themselves. Individuals develop trust for one another when they are certain that their relations with another individual will not harm them (Okyere-Kwakye & Nor, 2011:69; Blau, 1964:6).

The Social Exchange Theory is similar to the Economic Exchange Theory. Both theories assume that an exchange takes place when the benefit an individual gains is greater than the cost. The difference is that the Social Exchange Theory examines intangible costs (such as convenience) and benefits (such as enjoyment in helping others), while the Economic Exchange Theory involves tangible benefits and costs (Allam, 2013:95; Hung & Chuang, 2009:1). With social exchanges, individuals do others a favour with no definite expectation of an exact future return. For example, individuals may do favours for each other, not because they anticipate direct and immediate future economic benefit, but rather for a long-term intangible return (Allam, 2013:103; Kankanhalli, Tan & Wei, 2005:115; Blau, 1964:315).

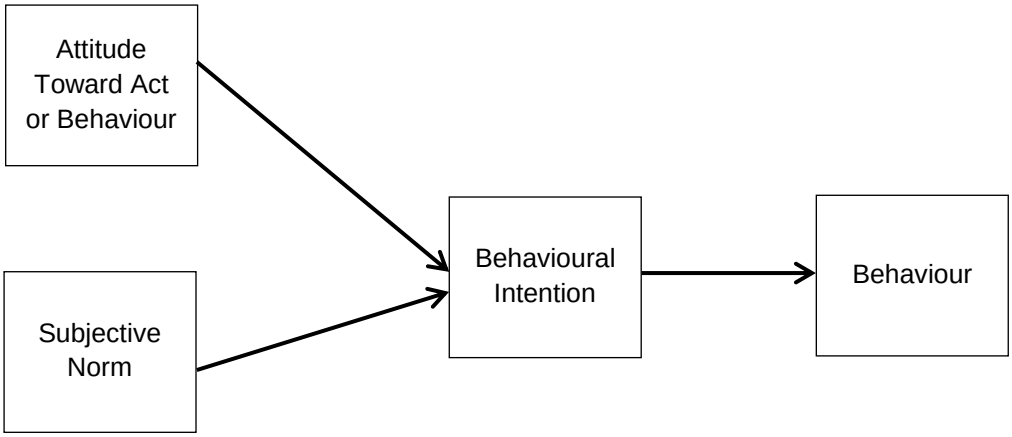
2.3.3.3 Fishbein and Ajzen's Theory of Reasoned Action (1975)

According to the Theory of Reasoned Action, the intention to engage in a specific behaviour is determined by the attitudes towards that behaviour along with the perceptions of social norms. Attitudes are determined by beliefs about the outcomes of the behaviour as well as the evaluation of these outcomes, while subjective norms relate to beliefs about the existence of social expectations of behaviour (Cabrera & Cabrera, 2005:721).

With respect to knowledge sharing, this theory suggests that to influence intentions to share knowledge, the factors that affect individuals' attitudes towards knowledge sharing must first be identified, along with their perceptions of norms for knowledge sharing. The Theory of Reasoned Action predicts a link between the

attitudes and subjective norms related to knowledge sharing, intentions to share knowledge, and actual sharing of knowledge. For example, the more favourable the attitude of a person towards a specific behaviour and the greater the subjective norm, the stronger will be the person's intention to engage in the behaviour. In turn, the stronger the intention to engage in a behaviour, the more likely the person will be to perform it (Chow & Chan, 2008:459; Cabrera & Cabrera, 2005:721). Figure 2.3 below depicts the Theory of Reasoned Action.

Figure 2.3: Components of the Theory of Reasoned Action



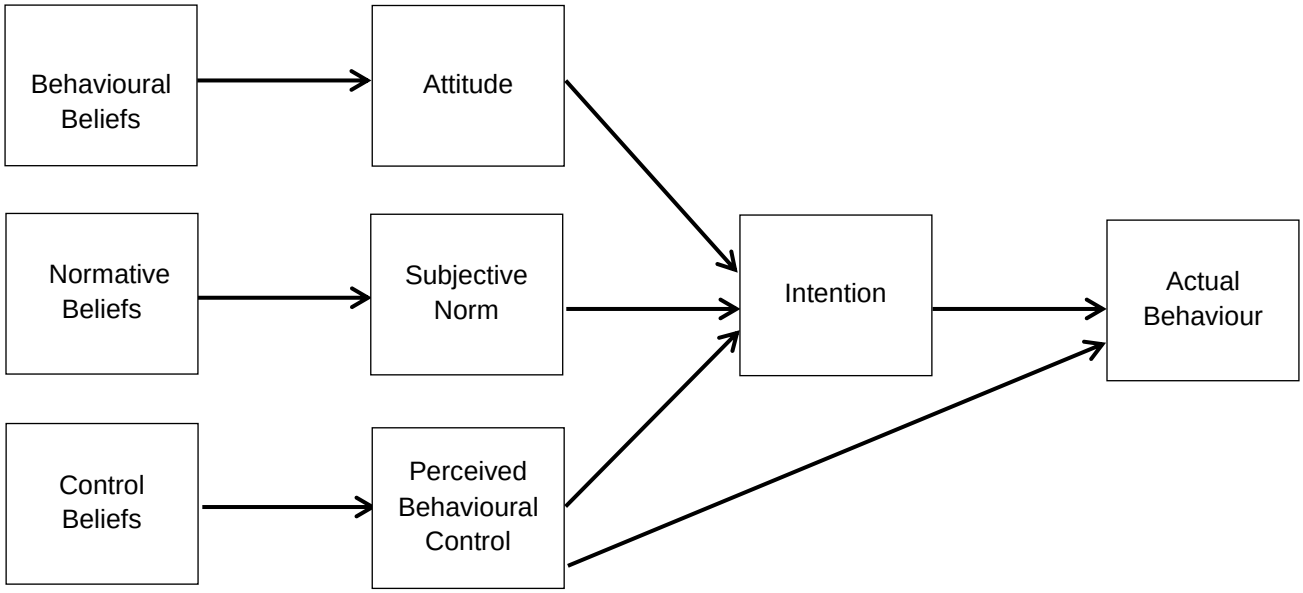
Source: Allam (2013:89)

2.3.3.4 Ajzen's Theory of Planned Behaviour (1985)

The Theory of Planned Behaviour is an extension of Fishbein and Ajzen's (1975) Theory of Reasoned Action, as explained in the previous section. The extension was the result of a finding that behaviour seemed to be not fully voluntary and under control. This resulted in the introduction of a new determinant, namely perceived behavioural control. According to this theory, key determinants of an individual's behavioural action are intention and perceived behavioural control. Intention is a sign of readiness to engage in a behaviour, while intention is a function of an individual's attitude towards a behaviour, subjective norm and perceived behavioural control (each element is weighted for its significance with respect to the behaviour and population in question) (Hung & Chuang, 2009:1; Chennamaneni, 2006:25).

As was mentioned in the Theory of Reasoned Action, an attitude towards a behaviour is based on behavioural beliefs (beliefs about the expected consequences of a specific behaviour as well as the evaluation of these outcomes). Subjective norms relates to normative beliefs (beliefs about the perceived social pressure from important referent groups to engage or not to engage in a specified behaviour). Normative beliefs, in conjunction with the motivation to conform to referent groups' expectations, determine subjective norm (Chennamaneni, 2006:26). The last key determinant of intention, namely perceived behavioural control, is based on control beliefs (beliefs about the perceived presence or lack of factors that could assist or impede the performance of the behaviour). Control beliefs in conjunction with the perceived power of each factor determine perceived behavioural control (Chennamaneni, 2006:26). In this respect, perceived behavioural control improves intention, as individuals are not encouraged to undertake tasks at which they are likely to fail. Perceived behavioural control is expected to influence actual behaviour, particularly when there is an agreement between individuals' perceived behavioural control and the actual control. In this instance, the greater an individual's belief that he or she possesses resources and opportunities, the fewer obstacles are anticipated, and as such there is greater perceived control over a behaviour (Chennamaneni, 2006:26-27). Figure 2.4 below illustrates the components of the Theory of Planned Behaviour.

Figure 2.4: Components of the Theory of Planned Behaviour



Source: Chennamaneni (2006:27)

The construct perceived behavioural control includes factors like time, resources, ability and opportunities to perform the behaviour concerned. With respect to determining knowledge-sharing behaviour, enabling conditions such as time, ability, resources and opportunities are essential. The Theory of Planned Behaviour has been successfully used to explain various human behaviours such as knowledge sharing (Chennamaneni, 2006:27-28).

2.3.3.5 Bandura's Social Cognitive Theory (1986)

Social Cognitive Theory has its foundations in the Social Learning Theory and contends that individual learning is influenced by the environment in which that individual operates. With respect to a business, this environment denotes other individuals and artefacts within the business in which an individual operates. In this instance, Social Cognitive Theory highlights the idea that human learning takes place in a social environment and that by observing others, individuals acquire knowledge of rules, skills, strategies, beliefs and attitudes. According to this theory, a person's mind is an active tool which guides the steps towards formulating expectations, abilities and outcomes (Okyere-Kwakye & Nor, 2011:68).

In the context of knowledge sharing, the Social Cognitive Theory explains that when individuals are unsure of their capabilities, as well as the outcome of the knowledge that they are supposed to share, they may be reluctant to share it. Nevertheless, when the expectations of the outcome of knowledge sharing are high, they may share their knowledge. The Social Cognitive Theory can be linked to people's self-efficacy (judgement of one's capability to perform certain tasks), which in turn is based on the environment, goals and social network in which they find themselves. Individuals may develop higher self-efficacy and be more willing to exchange knowledge when there is cooperation within their environment and their social network (Okyere-Kwakye & Nor, 2011:68; Bandura, 1986:206).

2.3.3.6 Grant's Knowledge-Based Theory (1996)

The Knowledge-Based Theory builds upon and is an extension of the Resource-Based Theory (initially promoted by Penrose in 1959) where the concept of resources is extended to include intangible assets and specifically, knowledge-based resources (Kruger, 2008:22; Eisenhardt & Santos, 2001:1; Grant, 1996:120-121). While the Resource-Based Theory recognises the importance of knowledge in businesses with a competitive advantage, proponents of the Knowledge-Based Theory contend that the resource-based view does not go far enough to regard knowledge as having special characteristics within a business. More specifically, the Resource-Based Theory treats knowledge as a generic resource (Theriou *et al*., 2009:180).

According to the Knowledge-Based Theory, knowledge is regarded as the most strategically important resource in a business. The theory argues that because knowledge-based resources are generally difficult to imitate, heterogeneous knowledge bases and capabilities among businesses are the major determinants of sustained competitive advantage and business performance (Kruger, 2008:22; Grant, 1996:117). The knowledge-based perspective suggests that the services rendered by tangible resources depend on how they are combined and applied, which in turn is a function of the business's know-how (knowledge). This knowledge is rooted and carried through multiple entities such as the

organisational culture, policies, routines, documents, systems and employees (Ngaruiya, 2013:12; Alavi & Leidner, 2001:108).

The Knowledge-Based Theory affirms that the coordination of knowledge within the business is crucial in order to realise a competitive advantage. Businesses can coordinate knowledge through organisational practices by which they operate. In this respect, knowledge sharing is a central aspect of the Knowledge-Based Theory as it claims that the main reason for the existence of a business is its exceptional ability to transfer and incorporate various knowledge streams and to apply existing knowledge to tasks (Ryan, Windsor, Ibragimova & Prybutok, 2010:139; Grant, 1996:113). More specifically, factors such as the role of management and organisational structure/design, and its relationship with knowledge sharing play an important role in this theory, which will be discussed in more detail in Chapter 3.

2.3.3.7 Nahapiet and Ghoshal's Social Capital Theory (1998)

Even though the Social Capital Theory was developed in 1998, it is still frequently used to examine knowledge-sharing behaviour in an organisational context. This theory claims that social capital provides an essential condition to facilitate knowledge exchange (Allam, 2013:96-97; Hung & Chuang, 2009:2). Social capital refers to the resources and value that individuals can acquire from human networks and relationships. There are three crucial aspects of social capital that can explain the context for knowledge exchange, namely trust, norms and identification (Allam, 2013:96; Nahapiet & Ghoshal, 1998:255-256).

Trust refers to the belief that the intended action of others will be suitable from one's own point of view, while a norm signifies a degree of agreement in the social system. Identification refers to a condition where the interests of individuals unite with the interests of the organisation (for instance, in similarity of values). This subsequently results in the creation of an identity grounded on those interests. Identification provides a setting within which communication and knowledge exchange can take place between organisational members. These three aspects

are considered key organisational resources or assets embedded in social relationships (Kankanhalli *et al*., 2005:116-117).

The abovementioned theories shed valuable light on knowledge sharing as they highlight various factors that could influence individuals to engage in knowledge sharing. From a management perspective, these theories must be considered, as knowledge sharing has significant impacts and importance for a business. Next, the importance of knowledge sharing is explained.

2.4 IMPORTANCE OF KNOWLEDGE SHARING

The knowledge base of a business is becoming a strategic focus for many knowledge-intensive businesses owing to the unique nature of knowledge resources (Usoro, Sharratt, Tsui & Shekhar, 2007:200). Most other resources (such as capital) tend to diminish with use, but the potential for growth in knowledge resources increases with use, because shared knowledge stays with the giver, while it enriches the receiver (Szabo & Csepregi, 2011:42; Usoro *et al*., 2007:200). As such, the understanding of knowledge management and specifically knowledge sharing in businesses is important.

Leaders of a business should be aware that the old paradigm “knowledge is power” cannot exist in this era anymore, and they should rather encourage colleagues to achieve a new standard of “sharing knowledge is power” (Szabo & Csepregi, 2011:42). Employees need to realise that knowledge sharing can support them in keeping their jobs, doing their work more effectively, and helping their personal development. In fact, a good deal of the key knowledge inside a business is held by employees, and knowledge sharing is an important feature in that knowledge stays in the business long after the employees leave it (Szabo & Csepregi, 2011:42).

From a business perspective, businesses need to exploit, develop, collect and share organisational knowledge to maintain their market position and develop new products or technologies in today’s knowledge economy (Szabo & Csepregi, 2011:42). Lin (2007a:135) stresses that knowledge sharing is essential in

knowledge management processes, and fundamental for generating new ideas and developing new business opportunities. In this regard, Pienaar (2007:46) explains that products, services, decisions and actions with unique qualities offers value for a customer that cannot be found elsewhere, and these unique qualities depend on knowledge and the willingness of individuals to share knowledge. Therefore, by developing knowledge and sharing knowledge, the competitive advantage of a business is improved.

Yang (2007:83) believes that knowledge sharing supports the transformation of collective individual knowledge into organisational knowledge. In turn this would result in the development of organisational learning and ultimately the enhancement of business effectiveness. Gholami, Asli, Shirkouhi and Noruzy (2013:206) similarly state that knowledge management encompasses valuable processes (such as knowledge sharing) which can influence the productivity, financial performance, staff performance, innovation, work relationships, customer satisfaction and finally organisational performance.

If managed properly, knowledge sharing can greatly improve work quality, decision-making skills, problem-solving efficiency and competency (Ismail, 2012:21). Likewise, Mohammed and Jalal (2011:218) note that knowledge sharing enables the exchange of experiences that leads to a sustained competitive advantage. Furthermore, Mohammed and Jalal (2011:226) have found that knowledge sharing enhances decision-making in a business. In this regard, knowledge sharing reduces cost and speeds up the time to take decisions. Concerning productivity, Dyer and Nobeoka (2000:345) report that the ability to effectively create and manage knowledge-sharing processes could lead to improved productivity. French (2010:2) shares the sentiments of these researchers in that effective knowledge sharing among individuals contributes to innovation and competitive advantage of an organisation. In fact, knowledge sharing could improve the overall performance of a business across a number of areas, which include sales volumes, product development and overall team performance.

Cohen and Levinthal (1990:133) consider that the interaction among individuals who have different knowledge increases a business’s ability to innovate, while

Seidler-de Alwis and Hartmann (2008:135) observe that businesses that support knowledge-sharing processes are more successful at innovation. Collins and Smith (2006:547-548) conclude that the collective ability of employees to exchange and combine knowledge is the foundation of knowledge creation and innovation success. Furthermore, knowledge sharing is a great indicator of business performance. In this instance, "performance" refers to revenue from new products and services (Collins & Smith, 2006:554-555).

Pham (2008:1) is of the opinion that although knowledge-sharing researchers view knowledge sharing as a key determinant of a business's competitive advantage, the effect of knowledge sharing on business performance has not been fully studied or attracted adequate empirical testing (Pham, 2008:1). In this instance, Foss *et al*. (2010:475) assert that research into knowledge sharing should pay more attention to the relationship between knowledge sharing and business performance. Managers need more knowledge about this relationship in order to make sense of the behaviour of the employees they try to shape and govern inside the business. Unfortunately, a proper measurement of the business benefits associated with knowledge is rather challenging as it deals with something intangible. It should also be noted that prior research regarding this matter mostly focuses on measuring the relationship between knowledge management (not specifically knowledge sharing) and business performance (Rasula, Vuksic & Stemberger, 2012:147; Daud & Yusoff, 2010:135).

In order to encourage knowledge sharing and consequently realise the benefits associated with knowledge sharing as explained above, management can employ various formal and informal knowledge-sharing methods. These methods are explained in the following section.

2.5 KNOWLEDGE-SHARING METHODS

Knowledge-sharing methods can be classified as either formal or informal. Formal methods are those methods that a business can explicitly manage and implement, while informal knowledge-sharing methods are voluntary, and management can only manipulate or support these (Pienaar, 2007:50-51).

It is important to note that three components, namely people (root of knowledge), processes (referring to organisation culture, climate, methods and channels of knowledge sharing) and technologies (alluding to information technology as a tool to share knowledge) are essential for knowledge sharing to take place. These components must be considered when choosing the appropriate knowledge-sharing method. Different businesses will use different methods as they operate in different contexts and have unique needs. The only way to attain the full value of knowledge sharing is by means of the interplay between the organisational culture and the correct knowledge-sharing methods for that business (Pienaar, 2007:51).

2.5.1 Formal knowledge-sharing methods

Formal knowledge-sharing methods include intranets, extranets, peer assists, after-action reviews, retrospects, knowledge fairs, coaching, knowledge networks and group-based knowledge sharing.

2.5.1.1 Intranets and extranets

An intranet is a private secure website that enables users to share documents, calendars and other information within the business, while an extranet can be viewed a part of a business's intranet that is extended to external stakeholders (customers, partners and clients related to the business) to allow them access to a business's information through passwords or user identification numbers. An intranet can also facilitate working in groups and provides a secure forum for discussion and commentary among internal employees. Not only can a business use an intranet to keep its employees up to date with developments within the business, but it also makes employees feel part of a business and hence creates an organisational culture of knowledge sharing. The collaborative nature of intra and extranets plays an important role in knowledge sharing (Pienaar, 2007:50-53).

2.5.1.2 Peer assist

Pienaar (2007:53) explains that a peer assist is a meeting that brings together a group of peers in order to get feedback on a specific problem, activity or project. The aim of the meeting is to learn from the knowledge and experience of the participating members with specific reference to the problem, activity or project. A peer assist meeting can aid in the planning process (before a project commences) as well as help steer the direction of a project while it is underway.

In addition, a peer assist focuses on problem solving and guides product and service development. Peer assists provide an opportunity to create and share innovative ideas so that the best possible product or service is developed. Through the variety of ideas, employees can also learn from each other. In this regard, employees must be informed that their ideas are being valued (Pienaar, 2007:53). Dixon (2009) notes that peer assist is a great relationship-building process and an opportunity to obtain tacit knowledge from experts who have experience in a specific project being undertaken.

2.5.1.3 After-action reviews

An after-action review is a meeting that takes place immediately after an event or project is finished, with the purpose of stating the lessons learned, rather than solving problems or criticising. As such, an after-action review is only a summary of a project or event, and knowledge is shared with respect to what went right or wrong during an activity. Participants in an after-action review have the opportunity to learn from one another and a business can therefore get different perspectives on a specific activity (Young, 2010:20; Pienaar, 2007:53-54).

2.5.1.4 Retrospects

In contrast to after-action reviews which only state the lessons learned from an event, retrospects involve an in-depth discussion after an event to capture the lessons learned during the course of an event. A retrospect is more comprehensive than an after-action review in that a retrospect helps participants to

reflect upon and learn from what happened, understand why it happened, what went well, what needs improvement and what lessons can be learned from the experience. An after-action review is merely concerned with lessons learned and problems encountered, while a retrospect looks to solve these problems and fill gaps to improve on future projects (Pienaar, 2007:53-54).

2.5.1.5 Knowledge fairs

The purpose of a knowledge fair is to present information on a specific theme by a variety of means such as kiosks, presentations, showcases, panels, scale models and demonstrations. Through knowledge fairs, a business can invite external professionals to share knowledge on a specific topic. The use of knowledge fairs does not imply that internal knowledge sharing is less important, but external knowledge sharing provides fresh perspectives that may have been overlooked previously. Knowledge fairs are flexible, and individuals can see what others are doing while interacting with each other (Pienaar, 2007:54; Denning, 2000).

2.5.1.6 Coaching

The objective of this method of knowledge sharing is to improve the tacit business knowledge of an employee. Coaching is explicitly geared towards the development of new skills, qualifications and abilities of an employee in order to contribute to a business's goals (Pienaar, 2007:54). It should be noted that coaching is not mentoring. Mentoring refers to senior, experienced employees guiding other less experienced employees by "taking them under their wing". Coaching, on the other hand, relates to developing new skills and qualifications in an employee. Coaching aims at improving an employee's learning and job performance in order to reach organisational goals. The coach does not express his or her personal vision to the employee but rather focuses on the employee's predefined needs that relate directly to his or her job. As such, coaching aims at developing abilities among employees so as to meet target goals in a work situation (Hunt, 2009).

2.5.1.7 Structured knowledge networks

A knowledge network is a formal and structured team that concentrates on domains of knowledge that are crucial for a business. Knowledge networks have clear accountabilities, roles as part of their regular job, performance contracts with the business and action-orientated collaboration to attain measurable results. The goal of a knowledge network is to determine what knowledge a business needs and how this knowledge can be captured and exploited (Denner, 2012:15; Pienaar, 2007:55).

A formal knowledge network can for instance be part of the hierarchy of a specific organisation as the official channels put in place by management to strategically lead knowledge creation and sharing within the business. The knowledge created can be used to create new products, strategies and policies. Another example of a type of formal knowledge network is a task force that is created to complete a specific task or project. The purpose of such a task force is to create knowledge in order to complete a specific task in the business. Furthermore, participation in this type of network is by invitation and depends on the individual or organisation's expertise, skills and attitudes (Denner, 2012:16; Apostolou, Papailiou & Mentzas, 2007:334).

2.5.1.8 Formal group-based knowledge sharing

Group-based knowledge sharing methods such as small meetings, discussion groups and large forums, can render an opportunity for knowledge sharing. With group-based knowledge sharing, the focus is on building relationships between employees. These micro-relationships can develop workplace dynamics as well as contributing to knowledge sharing and learning. For example, a person who is able to work well with other employees inside the business is vital for a business that wishes to promote an innovative, open culture. The more interaction an employee has with his or her colleagues and peers, the more that level of interaction will increase. This could result in better interaction with external stakeholders such as customers and suppliers (Pienaar, 2007:55).

2.5.2 Informal knowledge-sharing methods

Informal knowledge-sharing methods to be discussed in this section include weblogs, mentoring, storytelling, chat shows, communities of practice and unstructured knowledge networks.

2.5.2.1 Weblogs

A weblog is a frequently updated website comprising dated entries that are arranged so that the most recent entries appear first. The process of writing blog entries is one of the easiest ways of sharing knowledge and individuals as well as teams can capture and share information about specific topics. As an individual's participation in a weblog is voluntary, it is an informal way of sharing knowledge. A weblog is a personal web space where one can see how individuals think, and it provides an opportunity for employees to share ideas, opinions and knowledge. Another benefit of a weblog is that information is captured and knowledge is already codified for a business to use (Young, 2010:50-51; Pienaar, 2007:56).

On the other hand, if a weblog is left unsupervised, a business's sensitive information or secrets can be leaked intentionally or by accident. As such, a business's reputation can suffer, and it is a good idea to incorporate a weblog into a business's intranet and extranet to have some degree of regulation. A good incentive to encourage the use of web logging is to award a prize to the "Weblog of the month" or "Most innovative weblog of the month" (Pienaar, 2007:56).

2.5.2.2 Mentoring

Mentoring can be explained as a learning relationship between two employees with the mentor being an experienced employee sharing knowledge with a less experienced employee (Pienaar, 2007:56). Mentoring is similar to coaching, but coaching is more formal and focuses on the business's goals, while mentoring is more informal and focuses on the individual. It is important to note that an individual's willingness to share knowledge may be stronger if he or she feels that personal needs come before the needs of the business. Tacit knowledge

development will also occur more easily to the advantage of the business (Hunt, 2009; Pienaar, 2007:56).

2.5.2.3 Storytelling

Storytelling is one of the oldest ways to share knowledge, and entails the communication or sharing of complicated ideas, lessons learned or important messages (Pienaar, 2007:56). Storytelling is an informal method of sharing knowledge and can take place during tea-time breaks or business functions, for example. It is important that employees feel that they are part of a family in order for knowledge sharing to reach its full potential. Storytelling instils this sense of community among employees (Young, 2010:22; Pienaar, 2007:57).

2.5.2.4 Chat shows

A chat show is a fun, informal way of sharing knowledge. It has a similar format to a television chat show in that a host and three to four guests are appointed with an audience of co-workers watching and participating. The host asks the guests a variety of questions related to specific topics, which acts not only as a way of sharing knowledge, but also as a method for colleagues to get to know one another. A chat show should remain informal and enjoyable and therefore not focus on serious topics. The main idea of a chat show is to encourage teambuilding and development of interaction (Pienaar, 2007:57; Hewlitt, Barnard & Fisher, 2005).

2.5.2.5 Communities of practice

A community of practice is one of the most important informal methods of knowledge sharing and problem solving available to a business (Pienaar, 2007:56). Formal knowledge-sharing methods focus on the business with employees reaping additional benefits, while informal methods such as communities of practice focus on the individual with the business reaping additional rewards (Pienaar, 2007:56). A community of practice refers to a group of individuals who share a common concern or passion for something they do, and

by interacting on a regular basis, they learn to do it better. Alternatively, communities of practice can be described as groups of people who are in the same line of work, who get together (online or in person) to assist each other by sharing tips, hints, ideas and best practices (Pienaar, 2007:56). These groups can consist of professionals in a business or in several businesses, or they can basically form a non-work-related community. Although the professionals participating in a community of practice may not all know each other, they get a sense of community as they face similar challenges and have similar interests. Like all the other knowledge-sharing methods, communities of practice rely on employees' willingness to work with others (Young, 2010:35; Pienaar, 2007:58).

2.5.2.6 Unstructured knowledge networks

Informal, unstructured knowledge networks are formed mostly by accident and are personal in nature and sometimes based on friendship (Denner, 2012:17). Members normally join informal networks to gain knowledge, expertise, experiences and skills. Some individuals further identify different types of informal networks, for example, learning networks, advice networks and market networks. Individuals in these networks share specific characteristics such as interests, expertise and backgrounds. Moreover, participation in these networks is voluntary and therefore these networks are not very stable and usually have a short life expectancy. When the network dissolves, some of its participants may continue sharing and creating knowledge, thus creating a new knowledge network. If the degree of affiliation to the knowledge network is great, the stability of the network could increase, resulting in the network continuing beyond its original purpose of forming (Denner, 2012:17-18; Johnson, 2009:66).

Unlike a community of practice, networks do not have a specific problem to solve or an explicit task to achieve. Informal knowledge networks are based primarily on sets of relationships and have member relationships in constant flux of change. In fact, members of networks may never even know, or know of, or come across one another; however, they are able to share knowledge (Juhasz, 2005:5). In the same manner, Erwee (2005:4-5) points out that members of a community of practice participate as they personally identify with the topic and enterprise of the

community, while the focus in informal knowledge networks is on building or expanding relationships continuously, so that such networks could have a short-term existence with the purpose to collect and share information.

Informal networks do not from part of a hierarchy and the rank of a person has little to no relevance to informal knowledge networks. The focus is on sharing and creating knowledge for the achievement of a common goal. Managers should not try to manage these types of knowledge networks but instead create an environment that is essential for these types of networks to form and grow (Denner, 2012:17-18).

Although management can employ various knowledge-sharing methods to encourage employees to engage in knowledge sharing, the role of the individual in the knowledge sharing process must not be overlooked.

2.6 SUMMARY AND CONCLUSIONS

This chapter dealt with the nature and importance of knowledge sharing in the knowledge management process. The difference between tacit and explicit knowledge was highlighted and the chapter considered the difference between knowledge management and knowledge sharing, various definitions of knowledge sharing, as well as the theories that provide insight into the knowledge-sharing process. This was followed by a discussion of the importance of knowledge sharing, and the various methods that management can employ to encourage knowledge sharing between individuals.

The next chapter presents a comprehensive discussion of the factors that could influence knowledge sharing. Chapter 3 will therefore provide a basis for choosing the independent variables of the study.

CHAPTER 3
FACTORS THAT INFLUENCE KNOWLEDGE SHARING

3.1 INTRODUCTION

The purpose of this chapter is to identify and discuss the factors that influence knowledge sharing. While the previous chapter focused on knowledge sharing in general, this chapter forms an integral part in selecting the independent variables of this study, which are the factors that influence individuals' willingness to share knowledge.

Secondary sources relating to various behavioural concepts of knowledge sharing (such as attitude towards knowledge sharing, intention towards knowledge sharing and actual knowledge-sharing behaviour) will be consulted in order to obtain a holistic representation of both individual and organisation-related factors that could influence knowledge sharing. These secondary sources include academic journal articles, research published in books, dissertations, working papers, as well as conference papers, to identify empirical models, frameworks, reviews and behavioural theories related to knowledge sharing.

This chapter will address part of the first methodological research objective, namely to undertake a comprehensive theoretical investigation into possible factors influencing knowledge sharing. In particular, various organisational factors as well as individual-related factors that could influence knowledge sharing will be identified and discussed.

3.2 FACTORS THAT INFLUENCE KNOWLEDGE SHARING

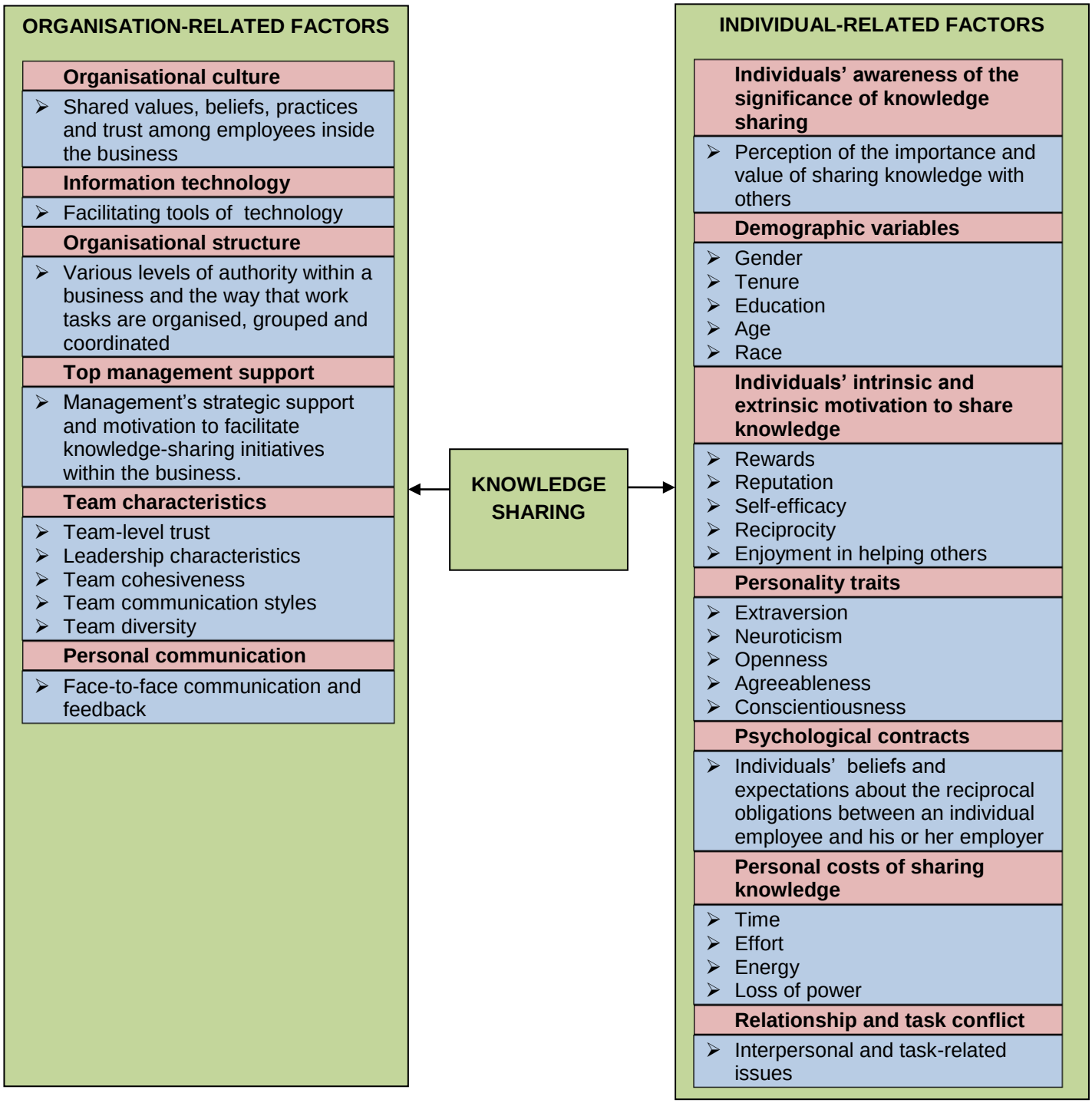
As was mentioned in Chapter 1, past research has emphasised the lack of a systematic, integrative framework of factors influencing knowledge sharing (Hung & Chuang, 2009:1). More specifically, the individual-related factors that influence knowledge sharing are poorly understood and limited empirical research exists in this regard (Ismail & Yusof, 2010:1; Chennamaneni, 2006:5). Following a preliminary theoretical investigation into knowledge sharing, Figure 3.1 below was

constructed depicting possible organisational and individual-related factors influencing knowledge sharing among employees. Although this framework and the discussion in Chapter 3 includes both organisation and individual-related factors that could influence knowledge sharing, only selected individual-related factors will be identified in Chapter 4 and empirically tested.

A number of overlapping factors that could influence knowledge sharing were identified in the literature review, therefore similar factors were combined and an appropriate name assigned to them. For example, reputation, rewards, reciprocity and enjoyment in helping others are all motivational factors for individuals to share knowledge. As such these factors were combined under intrinsic and extrinsic motivation to share knowledge (refer to Figure 3.1). Another example is that of team-level trust, leadership characteristics of the team, team cohesiveness, team communication styles and team diversity, which were combined under team characteristics that can influence knowledge sharing (see Figure 3.1). In the opinion of the researcher, this is a more practical approach and allows for the development of a comprehensive integrated model of factors influencing knowledge sharing.

In previous studies, more than 40 factors were identified that could influence knowledge sharing. However, after combining similar factors (as described above), 13 main factors were identified that could influence knowledge sharing. For the sake of simplicity, the researcher further grouped all the identified factors into two main categories, namely organisation-related and individual-related factors (refer to Figure 3.1). Interrelationships between several organisation-related and individual-related factors were also identified, and are discussed in the sections to follow.

Figure 3.1: An integrative theoretical framework of factors influencing knowledge sharing



Source: Researcher's own construction

The factors identified in Figure 3.1 are also listed in Table 3.1 along with a brief description and supporting references for each factor.

Table 3.1: Summary of the factors influencing knowledge sharing

ORGANISATION-RELATED FACTOR	DESCRIPTION	SUPPORTING REFERENCES
Organisational culture	Organisational culture embraces the organisation's behaviours, beliefs and values and also relates to the shared assumptions inside a business.	• Wang and Noe (2010) • French (2010) • Brijball (2010) • Hsieh, Lin and Lin (2009) • Van den Hoof and Huysman (2009) • Alam, Abdullah, Ishak and Zain (2009) • Lin (2008) • Moloto (2008) • Renzl (2008) • Chow and Chan (2008) • Schepers and Van den Berg (2007) • Al-Alawi, Al-Marzoogi and Mohammad (2007) • Usoro *et al*. (2007) • Kumar, Jha and Vaidya (2007) • Du Plessis (2006) • Mooradian, Renzl and Matzler (2006) • Kankanhalli *et al*. (2005) • Malhotra (2004) • Van den Brink (2003) • Connelly and Kelloway (2003) Sveiby and Simons (2002) • Lee and Al-Hawamdeh (2002) • Disterer (2001) • Jarvenpaa and Staples (2001) • De Long and Fahey (2000) • Connelly (2000) Davenport and Prusak (1998)
Information technology	Information technology relates to the availability of facilitating tools of technology that could influence knowledge- sharing behaviour among employees.	• Amiri and Sotoudeh (2014) • French (2010) • Chee (2009) • Rhodes, Hung, Lok, Wu and Lien (2008) • Ismail and Yusof (2008) • Kharabsheh (2007) • Wasko and Faraj (2005) • Connelly (2000)
Organisational structure	Organisational structure refers to the various levels of authority within a business and the way that work tasks are organised, grouped and coordinated.	• Wang and Noe (2010) • French (2010) • Rhodes *et al*. (2008) • Ismail and Yusof (2008) • Pham (2008) • Lin (2008) • Yang and Chen (2007) • Tobin and Franze (2005) • Kubo, Saka and Pan (2001) • Disterer (2001)
Top management support	Top management support refers to management as the key decision-maker and	• Peihua (2011) • Wang and Noe (2010)

	strategic planner of a business to support and motivate knowledge sharing initiatives within the business.	• Abdullah *et al*. (2009) • Chee (2009) • Keyes (2008) • Connolly (2007) • Kulkarni, Ravindran and Freeze (2007) • Lin (2007b) • Lee, Kim and Kim (2006) • Chennamaneni (2006) • Hsu (2006) • Chua (2003) • Connelly and Kelloway (2003) • Disterer (2001) • Connelly (2000) • Liebowitz (1999)
Team characteristics	Team characteristics include characteristics such as team-level trust, leadership characteristics of the team, team cohesiveness, team communication styles and team diversity that could have an influence on knowledge sharing.	• Xue, Bradley and Liang (2011) • Wang and Noe (2010) • Keyes (2008) • De Vries, Van den Hooff and De Ridder (2006) • Srivastava, Bartol and Locke (2006) • Bakker, Leenders, Gabbay, Kratzer and Van Engelen (2006) • Foos, Schum and Rothenberg (2006) • Sun and Scott (2005)
Personal communication	Personal communication refers to face-to-face communication and feedback in order to facilitate knowledge sharing.	• Wang and Noe (2010) • Holste and Fields (2010) • Salis and Williams (2008) • Kharabsheh (2007) • Riege (2005) • Connelly and Kelloway (2003) • Sharratt and Usoro (2003)
INDIVIDUAL-RELATED FACTORS	**DESCRIPTION**	**SUPPORTING REFERENCES**
Individuals' awareness of the significance of knowledge sharing	Individuals' awareness of the significance of knowledge sharing relates to the ability of employees to realise the importance and value of sharing their knowledge with others.	• Nkuna (2012) • Noor and Salim (2011) • Rahab, Sulistyandari and Sudjono (2011) • Van Vliet (2010) • Ismail and Yusof (2010) • Ismail and Yusif (2008) • Riege (2005) • Van den Hooff and Van Weenen (2004)
Demographic variables	Demographic variables refer to characteristics of employees such as their gender, tenure, education, age and race that have an influence on knowledge sharing.	• Dube and Ngulube (2012) • Oye, Mazleena and Noorminshah (2011) • Mogotsi *et al*. (2011) • Amayah (2011) • Wang and Noe (2010) • Ismail and Yusof (2009) • Pangil and Nasurdin (2008) • Kharabsheh (2007) • Bordia, Irmer and Abusah (2006)

		• Sawng, Kim and Han (2006) • Finestone and Snyman (2005) • Ojha (2005) • Riege (2005) • Ford and Chan (2003) • Chow, Deng and Ho (2000) • Chow, Harrison, McKinnon and Wu (1999)
Individuals' intrinsic and extrinsic motivation to share knowledge	Individuals' intrinsic and extrinsic motivation to share knowledge relates to the intrinsic and extrinsic benefits that employees consider as motivation to engage in knowledge sharing.	• Chen (2011) • Okyere-Kwakye and Nor (2011) • Tan, Lye, Ng and Lim (2010) • Wang and Noe (2010) • Zhang, Chen, Vogel and Guo • (2009) • Abdullah *et al*. (2009) • He and Wei (2009) • Hung and Chuang (2009) • Hsu and Lin (2008) • Gammelgaard (2007) • Lee and Ahn (2007) • Yao, Kam and Chan (2007) • Siemsen, Balasubramanian and Roth (2007) • Kulkarni *et al*. (2007) • Lin (2007a) • Lin (2007b) • Hew and Hara (2007) • Lucas (2006) • Chennamaneni (2006) • Hsu (2006) • Nelson, Sabatier and Nelson (2006) • Chiu, Hsu and Wang (2006) • Bock *et al*. (2005) • Kankanhalli *et al*. (2005) • Wasko and Faraj (2005) • Osterloh and Frey (2000) • O'Dell and Grayson (1998)
Personality traits	Personality traits include extraversion, neuroticism, openness to experience, agreeableness and conscientiousness that have an influence on knowledge sharing.	• Teh, Yong, Chong and Yew (2011) • Matzler *et al*. (2011) • Ismail and Yusof (2010) • Wang and Noe (2010) • Matzler, Renzl, Muller, Herting and Mooradian (2008) • Awad and Ghaziri (2007)
Psychological contract breach	Psychological contract breach relates to individuals' perceptions that the business has failed to meet one or more obligations of one's psychological contract.	• Cheng, Wang, Song and Huang (2013) • Gupta, Agarwal, Samaria, Sarda and Bucha (2012) • Abdullah, Hamzah, Arshad, Isa and Ghani (2011) • Bal, Chiaburu and Diaz (2011) • Anvari, Amin, Ismail, Ahmad and Seliman (2011) • O'Neill and Adya (2007)

Personal costs of sharing knowledge	Personal costs of sharing knowledge refer to the time, energy, effort or loss of power associated with knowledge sharing among employees.	• Connelly, Ford, Turel, Gallupe and Zweig (2013) • Thomas, Fugate and Koukova (2011) • Hew and Hara (2007) • Minbaeva (2007) • Riege (2005) • Kankanhalli *et al*. (2005) • Davenport and Prusak (1998) • Goodman and Darr (1998)
Relationship and task conflict	Relationship and task conflict refer to interpersonal incompatibilities among individuals as well as discrepant views, ideas or opinions among individuals with regard to the content of a task being performed.	• Pekdemir, Kocoglu and Gurkan (2013) • Chen (2011) • Lu, Zhou and Leung (2011) • Chen, Zhang and Vogel (2011) • Shih, Farn and Ho (2008) • Panteli and Sockalingam (2005)

Source: Researcher's own construction

3.2.1 Organisation-related factors influencing knowledge sharing

Even though the purpose of this study is to investigate the individual-related factors influencing knowledge-sharing intention, for completeness' sake it is important to refer to the organisation-related factors influencing knowledge sharing. The organisational and individual-related factors are often related to each other, with several examples highlighted in the text. The following section therefore briefly explains the organisation-related factors that could influence knowledge sharing as illustrated in Table 3.1.

3.2.1.1 Organisational culture

Organisational culture embraces the organisation's behaviours, beliefs and values (Moloto, 2008:9) and also relates to the shared assumptions inside a business that are applied by individuals when solving problems (Brijball, 2010:16). O'Neill, Beauvais and Scholl (2001:137) define organisational culture as a "consensual schema shared among employees in an organisation, resulting in and from a pattern of basic assumptions and norms enhancing individual and organisational stability, manifested in shared meanings, communicated by stories, myths, and practices, and resulting in certain behaviour patterns which are unique to the

organisation".

Every business is unique in that it has its own distinctive culture which develops over time to reflect the business's identity. A business's culture is reflected in its espoused values, philosophy, mission, and the unspoken values that guide employees' behaviour and perceptions inside the business. It is vital for businesses to capture the thoughts, minds and behaviour of its employees because knowledge sharing requires a culture that enables employees to engage in knowledge sharing as part of their daily work. Businesses must generate a desire to share knowledge as a guiding principle for the businesses' survival (Ling, 2011:330; Brijball, 2010:16).

While organisational culture is difficult to define, certain dimensions can be identified that shape behaviour and hence organisational culture. These dimensions include management style, reward orientation, disposition towards change, locus of authority (organisational structure) and employee participation (Jacobs & Roodt, 2011:2). In the present study, the researcher takes cognisance of the fact that these dimensions are linked to organisational culture; however, due to the significance of each of these factors in its own capacity with respect to knowledge sharing, they are identified and explained as separate factors. For example, reward orientation is explained later in this chapter as an individual-related factor that influences individuals' motivation to engage in knowledge sharing, whereas the organisational structure and top management support will be discussed separately as organisation-related factors.

Trust is another important concept that is linked to organisational culture and is one of the most crucial success factors for creating an organisational culture that facilitates knowledge sharing (Tan, Lim & Ng, 2009:137). The culture of trust in the workplace has a strong influence that acts as a central force behind knowledge sharing (Ling, 2011:330). French (2010:13) asserts that as a cultural element, trust has received the most attention in knowledge-sharing literature (Wang & Noe, 2010:118). Kankanhalli *et al*. (2005:117) claim that a culture which emphasises trust relieves the negative effect of perceived costs on knowledge sharing. Although in this section trust is generally explained as an organisation-related

factor as it is an important element of organisational culture, trust can also be viewed in terms of being an individual-related factor. In this instance, Chow and Chan (2008:459) suggest that trust among employees facilitates interaction which, in turn, is favourable for employees to share their knowledge. Trust can be viewed as an expression of confidence between parties (refer to section 2.3.3.2). When parties engage in an exchange situation, trust can be viewed as an expression of confidence between the parties that the exchange will not bring bad results to either party (Ismail & Yusof, 2010:4; Jones & George, 1998:531).

With regard to businesses that are process-orientated, Ajmal, Kekale and Koskinen (2009:363-364) note that cultures which are to a certain extent process-orientated may have conservative approaches towards change, preferring the use of existing or recognised methods. In an organisational culture that is more process-orientated, individuals may regard knowledge sharing as a threat because they are likely to feel that they have lost possession of their knowledge and therefore power within the business. In contrast, results-orientated businesses take risks, and encourage the use of innovative techniques for the survival and growth of the business (Ajmal *et al*., 2009:363). Such businesses that promote innovation and are willing to try new approaches with their employees, are more likely to have success with respect to knowledge sharing among employees (Ajmal *et al*., 2009:363-364).

3.2.1.2 Information technology

Information technology relates to the availability of facilitating tools of technology that could influence knowledge sharing among employees (Amiri & Sotoudeh, 2014:239). Traditionally, the knowledge management field was related to the field of information technology and technology-driven perspectives, but over time a great deal of attention has been given to the role of individuals in the knowledge management process (Manaf, 2012:43).

Information technology and its specific role with respect to knowledge sharing has been a centre of debate. Some researchers (McDermott & O'Dell, 2001:83) are of the opinion that knowledge management initiatives could be effective without the

use of information technology tools, while other researchers (Papoutsakis, 2007:231) have identified information technology as an important pillar of knowledge management (Mohamed, Stankosky & Murray, 2006:103). Rehman, Mahmood, Salleh and Amin (2011:223), however, assert that there is a misbelief that technology is the most important facilitator of knowledge sharing in large organisations. These authors suggest that knowledge sharing is predominantly people-orientated, and apart from technology, there are other important factors (as will be explained throughout this chapter) which also influence knowledge sharing.

Although it is argued that information technology is not the most important facilitator of knowledge sharing, the sharing of knowledge across space and time raises issues with respect to the accessibility of mechanisms to access local knowledge (Hassandoust & Kazerouni, 2011:43). The key requirements for supporting collaboration and communication among employees with diverse backgrounds and expertise are an individual's capability to create a sense of mutuality and a shared frame of reference. This requires knowledge sharing among individuals, and with the development of new technologies, new forms of interaction and collaboration have evolved. Examples include the World Wide Web that allows teams to share knowledge and work remotely on various projects, e-collaboration tools such as videoconferencing, group support systems, distance education tools, and email that has advanced radically (Hassandoust & Kazerouni, 2011:43-44).

Davison, Ou and Martinsons (2013:96) underline the benefits of information technology tools and how they facilitate knowledge sharing. They suggest that the key to most information technology tools is that they support interactivity. Tools that were originally developed as social applications are nowadays used as legitimate work-related tools that promote unscheduled, informal and frequent interactive and social communication. Information technology tools such as Instant Messenger and Weblog for example enable interlocutors to communicate synchronously or asynchronously in almost real time. Interactive information technology tools allow the right knowledge to be available to the right people at the right time (Davison *et al*., 2013:96).

Against this background that highlights the importance of information technology in supporting individuals' knowledge sharing, Krishnaveni and Sujatha (2012:37) state that even where technology is very helpful in a business where individuals rely on knowledge, such individuals require conversation, experimentation and shared experiences with others about who does what and what they do. In similar vein, Chennamaneni (2006:4) claims that technology alone cannot guarantee that knowledge will be shared among individual, and there are various other factors to consider. For example, individuals consider the perceived costs (such as time and energy) before engaging in knowledge sharing. Therefore it is crucial to reduce the perceived cost of sharing knowledge by implementing well-designed, user-friendly technological tools that simplify the task and reduce the time needed for sharing knowledge (refer to the Social Exchange Theory as discussed in Chapter 2). Training in the use of technological tools can assist employees to use the systems more efficiently and consequently reduce the perceptions of cost.

3.2.1.3 Organisational structure

Organisational structure refers to the various levels of authority within a business (Ismail & Yusof, 2008:167) and the way that work tasks are organised, grouped and coordinated (Pham, 2008:43). The organisational structure and operational processes should be designed in such a way as to encourage knowledge sharing between employees (Momeni, Zohoori, Musram & Hosseinipour, 2013:521). These operational processes are derived from work division and the responsibilities and tasks in both vertical and horizontal form. The extent to which employees have authority and freedom for participating in making decisions to solve issues defines the level of empowerment of employees. In turn, the extent to which employees have enough freedom to take a part in work increases their effort to share knowledge and learn. By empowering employees, authority is given to employees to make important decisions and to be held accountable for the results. Both decentralised and centralised decision-making occur in a business. With respect to centralised decision-making, top management makes all of the important decisions, whereas in a decentralised business, all of the employees participate in decision-making (Momeni *et al*., 2013:521-522).

According to Willem and Buelens (2009:151), studying effective inter-unit knowledge sharing in businesses calls for insight into the impact of organisational structure on the cooperative events in which knowledge sharing takes place. To obtain this insight, it is important to assess the impact of various organisational structure dimensions (coordination, centralisation, formalisation and specialisation) on inter-unit knowledge sharing. Coordination is the process of informing each as to the planned behaviours of the others, while centralisation refers to the extent to which decision-making power is concentrated at the top management level in the organisation. Formalisation specifies the extent to which the rights and duties of the individuals in the business are determined, and the extent to which these are written down in rules, procedures and instructions. Specialisation relates to the extent to which the organisational tasks are divided into subtasks, and individuals are allocated to execute only one of these subtasks (Willem & Buelens, 2009:152-153). These classic organisational structure dimensions underpin the differentiation and integration balance within a business. For example, coordination, centralisation and formalisation are tuning and integrating units' tasks and behaviour, while specialisation is causing differentiation among units (Willem & Buelens, 2009:151). The link between these structural dimensions and knowledge sharing is highlighted in the following discussion.

Willem and Buelens (2009:152) state that the impact of coordination on knowledge sharing is closely linked to the other structure dimensions, namely centralisation, formalisation and specialisation. Coordination mechanisms based on centralisation and formalisation are less suitable to facilitate knowledge sharing than mechanisms that are based on decentralisation and low formalisation (Chen & Huang, 2007:104).

Centralised and formal coordination are found in formal hierarchical coordination as well as formal systems which include plans, procedures, standards and goals. These types of coordination formally define which and how much information and knowledge should be exchanged. Although such coordination is thought to have a low cost, it holds limited opportunities for increasing knowledge sharing in a flexible way (Grant, 1996:114-115). In addition, effective decisions with respect to the sharing of specialised knowledge can only be realised if the centralised

decision-maker knows which knowledge is held individually. As such, decision-making power regarding knowledge issues is best delegated to the owner of the relevant knowledge. Centralisation, and especially hierarchy, in terms of top-down directives, can create an environment of fear, distrust and internal competition which reduces collaboration and integrative actions. In the same way, formalisation has disadvantages regarding centralisation for knowledge sharing, in that it creates an environment of control and decreases flexibility in knowledge sharing. Consequently, formalisation is ineffective in obtaining integration from a knowledge-sharing perspective (Willem & Buelens, 2009:151-154; Chen & Huang, 2007:106-107). Wang and Noe (2010:119) similarly state that functionally segmented structures tend to reduce knowledge-sharing practices among different functions or departments.

Less formal and decentralised coordination is more flexible in terms of task execution, and can deal with ad hoc communication and information needs. Horizontal coordination, such as teams, allows high levels of integration and liaisons, and coordinators can also play the role of knowledge brokers. In this instance, teams can be formed every time a need for knowledge sharing arises. For instance, communities of practice (as explained in section 2.5.2.5 in Chapter 2) are examples of teams or project groups reaching high levels of knowledge sharing. Although some authors (Willem & Scarbrough, 2006:1358) indicate drawbacks of informal coordination for knowledge sharing, especially in cases where informal networking is a source of power, the informal nature of informal coordination in general has a positive influence on knowledge sharing (Willem & Buelens, 2009:152). Lin (2008:1508) is also of the opinion that less formalised structures facilitate knowledge sharing among departments, whereas more complex structures are less helpful in sharing knowledge among departments (Ali, 2013:29).

Specialisation results in the development of specific knowledge that is uniquely held by an individual or group (Grant, 1996:112-113). Lichtenstein and Brain (2006:4) note that, owing to the competitive nature of knowledge workers, deeper knowledge is required by individuals, leading to specialisation and sometimes to a specialist culture within a business where there is a separation of concerns, and

reduced inter-group knowledge sharing. In specialised structures, employees are likely to seek only knowledge applicable to their work, and consequently reducing opportunities to share and learn across units. Lichtenstein and Brain (2006:4) further point out that when authority is vested in a senior level (centralisation) within a business characterised by specialisation, it can lead to reduced knowledge sharing across groups. As authority is not distributed among many managers in a centralised structure, inter-group knowledge sharing is more difficult, while intra-group knowledge sharing is more likely.

In summary, researchers (Momeni *et al*., 2013:522; Van den Hoof & Huysman, 2009:6-7) agree that organisational structure influences knowledge sharing, and empirical results pertaining to studies on knowledge sharing and organisational structure suggest that organisations should create opportunities for employee interaction. Aspects such as employees' rank, position in the organisational hierarchy, and seniority, should be given less prominence to encourage knowledge sharing (Wang & Noe, 2010:119).

3.2.1.4 Top management support

Top management support refers to management as the key decision-maker and strategic planner of a business to support and motivate knowledge-sharing initiatives within the business (Peihua, 2011:105). Wee (2012:658) suggests that in order to attain the strategic goals of a business, top management must ensure that communication with other decision-makers inside the business is clear and complete, because the success of instilling a conducive knowledge-sharing culture in a business depends on the support and commitment of top management. In this respect, employees' behaviour is influenced by the direction of the top management. Top management plays a significant role in creating effective knowledge-sharing routines, and the active participation of top management increases the knowledge-sharing routines. The willingness of the employees to donate and collect information is influenced by the support from top management (Wee, 2012:658).

Similarly, Chee (2009:40) notes that the responsibility lies with top management to

set goals and objectives, allocate resources, prepare budgeting, provide training, create knowledge roles, design organisational and technical infrastructure, measure performance and consider needs and priorities to support knowledge sharing within a business. In fact, top management has the ability to influence critical success factors and eliminate constraints to knowledge sharing in order to show their support of knowledge management activities (Chong, 2006:247). More specifically, the perception of top management's encouragement of knowledge sharing is essential for creating and maintaining a positive knowledge-sharing culture in a business (Lin, 2007b:319). Other employees cannot be expected to share knowledge when top management hoards knowledge; therefore top management support is vital in the execution of a knowledge-related policy that will change the organisational culture towards a culture that shares knowledge. In this instance, senior managers and knowledge managers providing structure, facilitation, and support can create and sustain a knowledge-sharing culture (Chee, 2009:40-41).

Inconsistent behaviour from top management regarding knowledge sharing can be frustrating to employees and discourage knowledge sharing. Employees look to leaders for guidance on what is acceptable and preferred behaviour, therefore, top management's support for knowledge sharing must be consistent and resilient in the face of resistance (Barreto, 2003:104-105).

With respect to resources, top management must provide resources to acquire and maintain the required technology and processes to enhance knowledge sharing. Top management should further recognise that acquiring and maintaining resources alone is not adequate, and it is also important to create a social environment to support and facilitate knowledge sharing. For example, top management plays an important role in facilitating a social environment that includes the design of office and relaxation areas, learning centres, retreat centres, and bringing together communities with common interests (Barreto, 2003:105-106). In addition, top management can encourage knowledge sharing and emphasise its significance by sending practical signals to employees, that include recognition and rewards (see section 3.2.2.3 discussion on motivation in Chapter 3) for sharing knowledge (Peihua, 2011:31).

Another influential aspect of knowledge sharing is management's efforts regarding training and development, and hence management's efforts to encourage formal, organised and structured learning and knowledge sharing among employees (Hsu, 2006:326). To increase knowledge sharing, businesses must continue or intensify structured learning through the effective training and development of their staff. Effective training and development provide a formal organised situation where people can learn from each other (Abdullah *et al*., 2009:116). In this case, top management must provide access to resources to enable learning to take place. Without top management's commitment, training and development activities will lack importance in the organisational structure (Abdullah *et al*., 2009:116-117).

3.2.1.5 Team characteristics

Team characteristics include characteristics such as team-level trust, leadership characteristics of the team, team cohesiveness, team communication styles and the diversity of the team that could have an influence on knowledge sharing (Xue *et al*., 2011:301; Wang & Noe, 2010:119; De Vries *et al*., 2006:116). According to Wang and Noe (2010:119) who extensively reviewed the literature on knowledge sharing, limited studies have investigated team characteristics and processes with regard to knowledge sharing.

As a social behaviour, an individual's knowledge sharing is without doubt susceptible to social influences arising from other individuals. In this respect, team climate refers to an implicit frame that shapes individual perceptions, attitudes and behaviours within a group context. For individuals, the immediate social environment is an important source of information to construct reality and formulate perceptions, attitudes and behaviours. Stronger social influence takes place in work teams because individuals are likely to relate most closely with their work team and consequently they are more willing to conform to team norms. A desirable team climate can create an environment that encourages knowledge sharing. A team climate characterised by cohesion is likely to enhance individuals' willingness to care for one another and therefore increase knowledge sharing between individuals (Xue *et al*., 2011:301).

According to Xue *et al*. (2011:301), cohesion refers to the perception of a sense of togetherness among members and can be considered as a psychological force that binds individuals together. Wang and Noe (2010:119) note that the longer a team has been formed and the higher the level of team cohesiveness, the more likely the team members are to share knowledge. Another dimension relating to team climate is trust. Trust, in a team environment, is defined as a member's willingness to accept vulnerability based on a confident expectation of teammates' competence, integrity and benevolence. In an environment in which trust and commitment are dominant, effective communication is possible and hence knowledge sharing is more likely (Xue *et al*., 2011:301).

Regarding the relationship between leadership characteristics of a team and knowledge sharing, Xue *et al*. (2011:302) have found that a team's leader plays a crucial role in making knowledge sharing possible in the team. An empowering organisational structure enables leaders to increase team members' self-efficacy and control over their work environment. In turn, when team members are empowered to make job-related decisions on their own, they require relevant information to make sure that their decisions are reasonable and justifiable. Consequently, they are more likely to share knowledge with one another before and during the decision process. Empowering leadership therefore encourages and nurtures the occurrence of knowledge sharing (Xue *et al*., 2011:302; Srivastava *et al*., 2006:1239).

With respect to the influence of team communication styles on knowledge sharing, De Vries *et al*. (2006:127-128) claim that if team members are agreeable and extravert (also see section 3.2.2.4 in Chapter 3 for discussion on personality traits), they are likely to share their knowledge with other members. Agreeableness creates trust in information receivers and increases their willingness to share knowledge in return. In the same way, extravert individuals have a talkative and enthusiastic nature and are therefore likely to stimulate motivation and effort among members to share their own knowledge (Petrauskaite, 2011:32-33).

Relating to team demography, in particular marital status and gender of team members, Ojha (2005:67) is of the opinion that married individuals (when the

majority of team members are single) and women in a group consisting mostly of men, are less likely to share knowledge. A possible explanation for such behaviour is that these individuals participate less in non-work-related activities and therefore have fewer bonds with team members. According to Thomas-Hunt, Ogden and Neale (2003:473), socially isolated team members do contribute to discussions, although they focus more on their own specific knowledge than on others' knowledge because they want to increase other members' perception of their usefulness (Petrauskaite, 2011:32-33).

The diversity of a team is another factor that influences knowledge sharing. When employees consider themselves a minority based on gender, marital status or education, they are likely to share less knowledge than employees who consider themselves a majority. Knowledge is more likely to be shared between individuals with similar training and background (Scholing, 2011:23; Wang & Noe, 2010:119; Ohja, 2005:67). On the other hand, heterogeneous teams are likely to be more successful than homogeneous teams because the heterogeneous teams can draw on broader task-relevant knowledge and perspectives. As such, informational diversity gives diverse teams an expanded pool of resources that lead to the exchange and processing of diverse information and perspectives (Noh, 2013:25-26; Kearney & Gebert, 2009:78). In light of the above, the link between team characteristics and demographic variables (as explained later in this chapter in section 3.2.2.2) becomes apparent.

3.2.1.6 Personal communication

Personal communication such as face-to-face communication and feedback can facilitate knowledge sharing among individuals. In this respect, Wang and Noe (2010:125) note that, with the exception of Bordia *et al*.'*s* (2006:262) study, few researchers have examined the differences between knowledge sharing by means of knowledge management systems and face-to-face interaction. Such research is however important because the factors influencing the decision to share knowledge face-to-face versus technology-aided interaction may be different. This factor (personal communication) is linked to personality traits (see discussion in section 3.2.2.4) as both factors could influence knowledge sharing. Employees

who are highly extravert may be more likely to share knowledge on a face-to-face basis. Introvert personality types, on the other hand, may prefer an electronic context to share knowledge because knowledge exchange is mostly relationship-based (Wang & Noe, 2010:125). Cabrera and Cabrera (2005:729) report that although technology is useful with regard to the exchange of information, it should not replace face-to-face interaction. These authors note that the frequency of interaction among workers, and therefore knowledge sharing, can be enhanced by bringing employees together under the same roof.

Interaction among employees is supported by social networks within a business and relates to trust between individuals. As interaction and therefore communication between individuals signifies trust between individuals (see previous discussion in section 3.2.1.1 on trust), communication and regular interaction between employees can contribute to knowledge sharing with each other (Islam *et al*., 2011:5902). Businesses that promote knowledge sharing can encourage debate and dialogue to support contributions from individuals at multiple levels in the business. Such participation among employees is facilitated by practices that consist of people collecting data from various sources, making their judgement to transform data into information and then getting involved in intense interaction to produce new knowledge that can be used in the business (Islam *et al*., 2011:5902; Cheng, Yeh & Tu, 2008:283).

Personal communication in terms of feedback from managers regarding knowledge sharing in the business (or feedback on how the knowledge shared has assisted colleagues) could increase knowledge sharing self-efficacy (Wang & Noe, 2010:124). Feedback is regarded as information that is provided in response to some actions that are valuable, and encourage the employees to share and learn knowledge when it repeats what has taken place and therefore makes a valuable statement. Feedback is important with regard to efficient sharing and learning (Asgharian, Zohoori, Malakouti & Attarnezhad, 2013:713). Feedback (performance management) on learning behaviour indicates to employees that their performance is being observed, and it also communicates the value of sharing knowledge beyond the usual encouragements. In addition, when the feedback is provided by significant others such as managers, commitment will be reinforced (Abdullah *et*

al., 2009:119; Hsu, 2006:332).

Feedback from management regarding knowledge sharing is linked to other factors such as top management support (see section 3.2.1.4) as well as individuals' intrinsic and extrinsic motivation (refer to section 3.2.2.3). In this respect, Wang and Noe (2010:124) suggest that receiving organisational recognition (positive feedback) with regard to the sharing of knowledge, or feedback on how the knowledge shared has helped other employees, may facilitate knowledge-sharing self-efficacy. When others recognise the value of one person's knowledge, they may gain an improved self-perception of competency, credibility and confidence. This in turn increases the likelihood that they will share their knowledge with others. Abdullah *et al*. (2009:116) report that managers may expect knowledge sharing among their staff, but there is uncertainty when it comes to communicating this imperative. Periodic feedback on the learning performance of staff members is important to effectively manage the learning and sharing behaviour of the staff. By giving feedback to staff, management communicates their seriousness and commitment to the importance of this attribute (Abdullah *et al*., 2009:115-116).

The sections above briefly outlined the influence of the most important organisation-related factors on knowledge sharing. In the following sections, the individual-related factors that could influence knowledge sharing are discussed.

3.2.2 Individual-related factors influencing knowledge sharing

According to Okyere-Kwakye and Nor (2011:68), individuals play a pivotal role in the knowledge-sharing process. Without the involvement of individuals, knowledge sharing will not be successful in a business. In the knowledge-sharing process, individuals act as both knowledge generator and knowledge receptor (Okyere-Kwakye & Nor, 2011:68). Through socialisation, individuals exchange ideas and experiences, and therefore generate knowledge. As a knowledge receptor, individuals search for knowledge and interpret it before transferring it to any repository. The individual has to start the process, and a conscious effort is necessary to share or keep knowledge. For example, when Employee A finds out

that a colleague, Employee B, is facing a work-related problem for which Employee A has the solution, Employee A's decision to share or not to share knowledge with Employee B may be influenced by his or her personal beliefs on knowledge sharing (Okyere-Kwakye & Nor, 2011:68).

As the prime source of knowledge in a business, individuals are an integral part of creating, capturing and sharing knowledge (Kharabsheh, 2007:419). Their knowledge sharing can also contribute to further knowledge creation at an organisational level. Kharabsheh (2007:419) further notes that organisational knowledge is created as a result of the combination and exchange of existing knowledge among employees. In the same manner, Ismail and Yusof (2010:2) maintain that knowledge can be exchanged when individuals share knowledge that may lead to the creation of new knowledge. However, knowledge sharing can only occur when an individual is actually interested in helping others to develop a new capability for action. Similarly, Krishnaveni and Sujatha (2012:30) note that the success of tacit knowledge (see section 2.2 in Chapter 2) sharing depends on the willingness, as well as the capacity of individuals, to share what they know.

Kharabsheh (2007:419) contends that too much faith is placed in technology, and that knowledge management initiatives fail largely because the individuals' role in knowledge sharing is ignored. Although technology is an important tool for knowledge management implementation, technology alone may not effectively encourage knowledge-sharing activities (Cheng *et al*., 2009:315). In the same way Liu, Cheng, Chao and Tseng (2012:408-409) point out that information technology has traditionally dominated the knowledge management field, but there is a growing recognition of the role of the individual in the knowledge management process. Knowledge resides within individuals, and businesses rely on employees' knowledge sharing to increase their competitive advantage and value.

Given the above importance of individuals' knowledge sharing within a business, knowledge sharing among employees must be encouraged. Because knowledge is objective, dynamic and volatile, the value of specific knowledge will differ from person to person. The value of knowledge sharing therefore depends on the situation and context within which it is shared, as well as the actual knowledge,

knowledge producer and user (Pienaar, 2007:38). Table 3.1 depicts several individual-related factors that could influence knowledge sharing among employees, which are discussed in the following sections.

3.2.2.1 Individuals' awareness of the significance of knowledge sharing

Noor and Salim (2011:111) note that awareness among individuals about the importance of sharing knowledge represents an important phase of the knowledge-sharing process in a business. Awareness of the significance of knowledge sharing is an attitude that every employee, including top management, should have. Shaari, Rahman and Rajab (2014:39) emphasise that knowledge sharing resides within individuals, and it is therefore important to convince individuals about the importance and contribution of knowledge sharing in a business. Knowledge-sharing awareness must be cultivated among employees to ensure that its significance and influence are understood and supported by employees (Shaari *et al*., 2014:39).

Shaari *et al*. (2014:40) underline the fact that it is not sensible to force individuals to share knowledge, but it is important to encourage them to understand the importance of sharing knowledge so that they will act accordingly. These authors highlight the importance of attitude or behaviour change in order to realise knowledge sharing among individuals. Rahab *et al*. (2011:118) maintain that the improvement of individuals' awareness of the importance of sharing their knowledge is important to enhance self-confidence to share knowledge. Individuals must consequently be aware that their knowledge is useful for others inside the business.

Keyes (2008:28) points out that in some businesses, there is little realisation of the value and benefit of knowledge among employees. A person's realisation of knowledge needs within a business however influences the extent to which he or she is prepared to share and receive knowledge. For example, knowing what others need to know is expected to positively influence the willingness to share knowledge (Van den Hooff & Van Weenen, 2004:22). When employees are aware of the benefits and value associated with knowledge sharing, they will be more

open to engage in knowledge sharing. Nkuna (2012:23) stresses that when people understand that their knowledge sharing could help them do their job more effectively, could help them to retain their job, assist them in personal development, and provide them with more personal recognition, then knowledge sharing is likely to become a reality.

Ross (2006:32) further underlines the importance of attending to ignorance concerning knowledge sharing inside a business. Ross (2006:32) explains that people need to be trained in knowledge management skills because they often do not know how to share knowledge, or they do not realise the value of what they know. Training people in knowledge management skills can get a better understanding of what is expected from them with respect to knowledge sharing. Ignorance can also come from a higher organisational level, such as top management ignoring the importance of knowledge sharing and therefore not giving support in that regard (Van Vliet, 2010:32). The fact that ignorance (lack of knowledge/awareness of the value of knowledge) influences knowledge sharing is further emphasised by Van Vliet (2010:31), who points out that a lack of absorptive capacity in individuals impedes their ability to value, assimilate and apply new knowledge. The concept of absorptive capacity was introduced by Cohen and Levinthal (1990:128) who explain it as the ability to recognise the value of new knowledge, to assimilate it and apply it to commercial ends. Such individuals with larger absorptive capacity are likely to experience higher knowledge-sharing effectiveness and are inclined to have more favourable attitudes toward knowledge sharing (Kwok & Gao, 2006:46).

Tjakraatmadja and Martini (2011:363) point out that the knowledge-sharing process has two sides, namely the sender and the receiver. Both have a certain level of absorptive capacity and desire to participate in knowledge sharing. The sender (the individual who delivers the knowledge) needs to have absorptive capacity to relate the topic he or she delivers in the context that the receiver will be more likely to understand. The sender also needs a certain level of desire to engage in knowledge sharing and before actually sharing that knowledge with a recipient. On the other side, the receiver of knowledge also needs to have a certain absorptive capacity to know how the new knowledge received during the

knowledge-sharing process can be beneficial and related to prior knowledge in order to solve a specific problem. Employees may be uncertain about the value to others of the knowledge they possess. More specifically, neither the knowledge source nor the recipient is sure who requires knowledge or who possesses it. This ignorance in both the knowledge source and the receiver is one of the biggest barriers to sharing knowledge (Riege, 2005:25).

In conclusion, some employees are not aware that the knowledge they have could be useful to support the business if they share it. As such, management needs to improve the awareness of their employees and inform them that the knowledge they have is regarded as an asset for the business, and is very important for its success (Rahab *et al*., 2011:118; Jain, Sandhu & Sidhu, 2007:28). To create a knowledge-sharing culture, both employees and top management should be aware of the importance of knowledge sharing as there is a significant relationship between awareness and knowledge sharing (Ismail & Yusof, 2010:1). A lack of awareness is a potential factor that hinders individuals from communicating information (Riege, 2005:23), while knowledge about the importance of one's own knowledge for other employees is a major factor that improves the quality and quantity of contributions to a shared database. Individuals not only consider their own payoff for contributing knowledge, but also the usefulness of their knowledge to the whole collective (Cyr & Choo, 2010:828; Cress, Barquero, Schwan & Hesse, 2007:434). Consequently, top management should consider seminars, training programmes or a "knowledge-sharing awareness week" as methods to improve awareness among their employees regarding the value of their knowledge to others (Said Ali, 2009:209).

3.2.2.2 Demographic variables

Demographic variables include characteristics of employees, such as their gender, tenure, education, age and race that have an influence on knowledge sharing. Dube and Ngulube (2012:68) contend that diversity and heterogeneity in terms of individuals' demographical characteristics may pose a challenge when it comes to knowledge sharing.

Limited research has been conducted regarding the impact of demographic factors on knowledge sharing (Nagamani & Katyayani, 2013:114; Lauring & Selmer, 2012:90; Kharabsheh, 2007:424) and the available studies on this topic provide inconclusive and inconsistent results (Pangil & Nasurdin, 2008:2). Therefore, new findings could afford valuable guidelines to human resources managers who find themselves in today's increasing number of diverse knowledge-intensive businesses (Lauring & Selmer, 2012:90).

Gender appears to influence knowledge sharing that occurs directly between individuals, or sharing that takes place through contributions to an electronic knowledge management system. According to Bordia *et al*. (2006:276), women have more perceptions about the benefits of knowledge sharing than men, which suggests that gender could have an impact on knowledge sharing. Moreover, Lin (2006:236) suggests that gender could also moderate the effect of ties on knowledge sharing. More specifically, the relationship between instrumental ties (transactional in nature and entails co-operation in order to achieve some immediate goal or to accomplish task) and knowledge sharing is stronger for women, while the relationship between expressive ties (commitment to another individual arising out of kinship) and knowledge sharing is stronger for men. As such, females may be more likely than males to engage in knowledge sharing when influenced by instrumental ties. Conversely, the opposite applies with respect to expressive ties and knowledge sharing (Lin, 2006:236-238).

Besides gender, organisational tenure is another demographic variable that influences knowledge sharing. The stage where a relationship develops between an individual and his or her organisation can be viewed as the individual's organisational tenure. From a social exchange viewpoint, there is a relationship between organisational tenure and social exchange (Watson & Hewett, 2006:150). As organisational tenure increases, and as an employee frequently engages in successful exchanges with the organisation, there is a steady building of trust and commitment between the individual and the organisation. Organisational tenure can be considered a predictor of a person's commitment to the exchange of knowledge, because as the person's tenure with the organisation increases, he or she is regularly involved in exchanges of benefits with the organisation (Pangil &

Nasurdin, 2008:2; Watson & Hewett, 2006:150).

In a similar way, Bakker *et al*. (2006:601) conclude that tenure has an influence on knowledge sharing. These authors find that the longer team members have been together, the more likely they are to share knowledge among themselves. On the other hand, organisational tenure can have a negative effect on knowledge sharing. In this instance, there are several motives for the fear of sharing knowledge, for example, long-term employees may feel threatened by those they consider to be possible replacements for their position. In addition, individuals may feel a level of discomfort in dealing with newer, and often younger, employees (Keyes, 2008:26).

Education is another demographical factor that influences knowledge sharing. In particular, the higher the educational level, the more likely it is that the person will share knowledge, and at a lower educational level, the less likely someone may be to share knowledge as they fear that they could lose the only thing that made them valuable to the business (Keyes, 2008:45).

With respect to age, Riege (2005:23) suggests that age is a major barrier to knowledge sharing. Older employees who are more mature in years may feel threatened by younger workers and therefore do not share knowledge with them (Keyes, 2008:46). Individuals might be more likely to share knowledge with individuals of their own age group than with significantly younger or older colleagues (Mogotsi *et al*., 2011:3).

Ethnicity is another factor related to knowledge sharing and Keyes (2008:46) notes that it can be barrier to knowledge sharing. In this regard, trust, comfort and respect are important elements to support knowledge sharing. Evans (2012:47) proposes that race homophily (the preference of associating with individuals of the same racial background) can be an important driver for knowledge sharing.

Henderson (2005:79) concludes that language diversity also affects knowledge sharing through interpretation, which eventually influences overall team performance. Language diversity refers not only to the fact that individuals speak a

variety of mother tongues, but also to the fact that they hear in a variety of different ways as they tend to use different interpretive mechanisms because of their diverse backgrounds. This latter point is often overlooked, as individuals are usually unaware that they are not sharing the same interpretation of a particular message, and therefore do not always hear the same thing, even when they work through a shared language (Henderson, 2005:69-70).

Chiu *et al*. (2006:1883) suggest that shared language has a positive influence on the quality of knowledge shared. "Shared language" refers to having the same mother tongue or fluency in a common language. Shared language promotes interaction by enabling easier communication, shared meanings and shared systems of signification. In addition, shared language facilitates strong informal connections while it encourages certain nationalities to communicate more with one another than with other nationalities, highlighting the significance of the same mother tongue (Makela, Kalla & Piekkari, 2007:9). Shared language is an essential avenue through which individuals understand one another and hence build shared vocabulary in their domains. As such, shared language promotes the sharing of ideas as well as enhancing the efficiency of communication between people with a related background or practical experience. Therefore shared language can motivate individuals to be actively involved in knowledge-sharing activities (Chiu *et al*., 2006:1878)

3.2.2.3 Individuals' intrinsic and extrinsic motivation to share knowledge

It is important to understand how to motivate individuals to share their valuable knowledge (Amin, Hassan & Ariffin, 2010:1429). Individuals' motivation relates to the intrinsic and extrinsic benefits that employees consider as motivation to engage in knowledge sharing. Chang, Chiu, Keng and Chou (2008:885) and Kankanhalli *et al*. (2005:113) observe that knowledge sharing is influenced by intrinsic benefits (self-efficacy and enjoyment in helping others) and extrinsic benefits (reputation, reciprocity, organisational rewards and image).

a) Individuals' intrinsic motivation to share knowledge

As explained in the Social Exchange Theory (refer to section 2.3.3.2 in Chapter 2), individuals engage in a specific behaviour based on the intrinsic reward that they expect from such behaviour. Intrinsic benefits from social association should consequently be considered to influence the sharing of knowledge. Moreover, some individuals share knowledge as it satisfies their immediate needs. Such individuals are ideally motivated by achieving their self-defined goals and fulfilling tasks. These intrinsically motivated individuals engage in an activity for its own sake, out of interest, or for the pleasure and satisfaction derived from the experience (Susanty & Wood, 2011:160). Lam and Lambermont-Ford (2009:53) point out that intrinsic motivation gives immediate need satisfaction and facilitates the generation and transfer of tacit knowledge.

Another theory linked to intrinsic motivation and knowledge sharing is the Social Cognitive Theory as was discussed in Chapter 2. This theory claims that individuals' attitude and behaviour are influenced by self-efficacy. Self-efficacy is defined as individuals' judgement of their ability to perform an activity. In turn, self-efficacy is influenced by the environment, goals and social network in which people find themselves (Okyere-Kwakye & Nor, 2011:67-68). Individuals may develop higher self-efficacy (confidence) and be more willing to exchange knowledge when there is cooperation within their environment and their social network (Okyere-Kwakye & Nor, 2011:68; Susanty & Wood, 2011:160).

Lin (2007a:139) observes that employees who believe that they can contribute to business performance by sharing their knowledge, will develop more positive attitudes and intentions with respect to knowledge sharing. This view is in congruence with another theory, namely the Theory of Reasoned Action (see section 2.3.3.3 in Chapter 2) which states that the intention to engage in a specific behaviour is determined by the attitudes towards that behaviour (Chow & Chan, 2008:459). Lin (2007a:135) also asserts that individuals who derive enjoyment from helping others when sharing knowledge may be more inclined to share knowledge. Similarly, Olatokun and Nwafor (2012:228-229) put forward the notion that self-efficacy and enjoyment in helping others (altruism) are related to

individuals' attitudes and knowledge-sharing intentions. Likewise, other authors (Hung & Chuang, 2009:5; He & Wei, 2009:836; Hsu & Lin, 2008:65; Wasko & Faraj, 2005:53) contend that people gain satisfaction and intrinsic joy when they help others, and therefore it is positively related to knowledge sharing. When employees share expertise that is useful to the business, it is an opportunity to enhance their sense of self-worth.

b) Individuals' extrinsic motivation to share knowledge

With respect to extrinsic benefits, Susanty and Wood (2011:160) assert that people will engage in an activity when they expect to gain economic benefits such as increased pay, bonuses, job security, or career advancement. In the same manner, Olatokun and Nwafor (2012:217) posit that extrinsic motivation relates to motivation that emanates from outside an individual, and in the form of rewards, promotion, coercion or punishment. From an extrinsic motivational perspective, an individual's behaviour is motivated by the perceived values and benefits of the action. On the other hand, Lam and Lambermont-Ford (2009:52-53) suggest that extrinsic motivation allows individuals to satisfy their needs indirectly by gaining additional resources (financial and non-financial). Extrinsic motivation may support the sharing of measurable explicit knowledge; however, it often fails to support the sharing of tacit knowledge owing to its intangible nature that is difficult to measure. As such, the use of extrinsic motivation to share knowledge often places an individual in a transactional, instead of interactive, position with respect to the business (Lam & Lambermont-Ford, 2009:52-53). This perspective is in line with the Economic Exchange Theory as explained in section 2.3.3.2 of Chapter 2. According to this theory, individuals' behaviour is based on rational self-interest. Extrinsic motivation emphasises goal-driven motives such as benefits earned when engaging in a specific behaviour (Olatokun & Nwafor, 2012:217; Susanty & Wood, 2011:160). In addition, Lam and Lambermont-Ford (2009:53-54) suggest that providing external incentives for certain behaviour and thus quantifying efforts and competence, could imply that an individual's competence or efforts are not appreciated. This could result in a changed position with respect to certain behaviour, such as from an internally-driven relational stance to a reward-driven transactional one. For example, in an organisational setting, an employee could

make just enough contributions to a knowledge base in order to gain a payoff (Lam & Lambermont-Ford, 2009:53).

Lin (2007a:137) maintains that employees engage in knowledge exchange based on a cost-benefit analysis. In this regard, employees compare the rewards (benefits) expected from a specific exchange with the effort (costs) involved in that exchange.

From a socio-economic outlook, if the perceived benefits equal or exceed the costs, then the exchange process will carry on. Concerning knowledge sharing, the costs include factors relating to efforts such as time taken and mental effort, while the potential gains include receiving organisational rewards.

Hung and Chuang (2009:4) consider that a favourable image and status (extrinsic benefits) are important for individuals to achieve and/or maintain in the business. In this respect, Hung and Chuang (2009:4) propose that the enhancement of reputation is a critical factor for people to engage in knowledge sharing (Hsu & Lin, 2008:72; Kulkarni *et al*., 2007:321). With regard to organisational rewards, research indicates that knowledge sharing occurs when there are appropriate rewards or incentive mechanisms in place (such as a bonus or career advancement) that will motivate employees to share their knowledge (Wang & Noe, 2010:118; Kulkarni *et al*., 2007:341).

In light of the above, intrinsic motivation is more difficult to change, with more uncertain outcomes compared to extrinsic motivation. These integral shortcomings of intrinsic rewards often call for extrinsic incentives to motivate individuals' knowledge sharing (Osterloh & Frey, 2000:540). Lee and Ahn (2007:940) observe that little research effort has been made with regard to the design of an incentive system for effective knowledge sharing. Lin (2007a:136) further asserts that there is no significant body of empirical research that assesses the effect of the difference between extrinsic and intrinsic motivation factors on employee knowledge-sharing behaviours.

3.2.2.4 Personality traits

Awad and Ghaziri (2007:119) have identified personality as a key factor that influences knowledge sharing. For example, extrovert, self-confident and secure individuals are more likely to share knowledge than those who are introvert, self-centred or security-conscious. Wang and Noe (2010:120) stress however that only a few studies have empirically examined the role of individual personality traits or dispositions in knowledge sharing. Although numerous personality traits can describe individuals as noted in the example above, personality traits are often grouped into five main categories, otherwise known as the "Big Five Personality" model (Wei, 2010:14).

The Big Five Personality factors, namely extraversion, neuroticism, openness to experience, agreeableness and conscientiousness, account for the various personality traits observed within and across organisational communities. These personality traits have become a robust taxonomy of personality, and may shed valuable light on knowledge sharing (Teh *et al*., 2011:48; Wei, 2010:14).

a) Extraversion

Extraversion refers to an individual's tendency to be sociable. Individuals high in extraversion are inclined to be more sociable, enthusiastic, energetic and optimistic (Teh *et al*., 2011:49). Furthermore, Lin and Wang (2012:355) note that individuals who score high on extraversion are inclined to be more confident, active, friendly, outgoing, easygoing, and possesses strong interpersonal skills. Wang *et al*. (2011:7) stress that a major characteristic of extraversion is dominance as well as sensitivity to rewards. In addition, extraversion has been associated with a desire for power, recognition, and status (Bendersky & Shah, 2013:389; Anwar, Shahzad & Rehman, 2012:3727; Barrick, Stewart & Piotrowski, 2002:45). Individuals high in extraversion like to work with others and engage in group discussions. Research suggests that extroverts are positively affective, and as such are likely to have positive emotions and contribute to greater team satisfaction. Because extroverts are likely to be emotionally positive and content when working with teams, they are likely to share knowledge among group

members in order to guarantee the viability of the team (Teh *et al*., 2011:49). On the other hand, Gupta (2008:145) asserts that individuals who score low on extraversion are inclined to be quiet, private and may feel too nervous to get involved in a problem-solving conversation with other individuals. Employees low in extraversion may be less responsive to recognition and incentives of knowledge sharing (Wang *et al*., 2011:7). In similar vein, Ismail and Yusof (2010:5) put forward the suggestion that introvert individuals have more problems interacting with other individuals, and the ability of employees to share knowledge depends on their verbal and written communication skills. As introvert individuals may engage in fewer group activities and are less sociable, such individuals tend to share less knowledge (Rehman, Mahmood, Salleh & Amin, 2014:852).

b) Neuroticism

Teh *et al*. (2011:49) suggest that neuroticism relates to different negative moods such as anxiety, sadness and nervous tension. In the same manner, Lin and Wang (2012:355) posit that neuroticism is a measure of emotional stability and individuals who score high on this trait are emotionally sensitive and vulnerable to stress. These individuals easily feel upset, frustrated, afraid, guilty, and agitated. Hutasuhut (2007:7) considers that individuals who score high on neuroticism are less likely to develop positive attitudes towards their work, whereas Lin and Wang (2012:355) state that if a team has a high average level of neuroticism among its members, its members can be inclined to become emotionally unstable and portray negative emotions, diminishing the likelihood of cooperation within the team and reducing the quality of communication. In addition, since individuals who score high on neuroticism tend to have a lack of trust in people, they are linked with a negative attitude towards knowledge sharing (Hutasuhut, 2007:7). Such individuals with negative feelings like anger, anxiety and stress are too busy attending to their internal and mental problems, causing them not to meet the expectations of their work environment, such as sharing knowledge with colleagues (Gharanjik & Azma, 2014:82-83). Also, for a neurotic individual, trust is more important to consider in their decision to share or withhold knowledge, compared to an individual who is less neurotic and therefore more emotionally secure and confident (Natalegawa, 2013:31).

c) Openness to experience

The third personality trait is openness to experience and includes a broad range of characteristics, for example, being curious, open-minded and artistic. Openness to experience relates to an individual's independent, liberal, and daring behaviour (Teh *et al*., 2011:50). Lin and Wang (2012:355) are of the opinion that individuals who score high on openness to experience have high imagination, curiosity, and a strong preference for diversity, unusual ideas and changes. These individuals are more likely to accept different opinions and new experiences. In the same way, Wei (2010:19) asserts that openness to experience is linked to a positive attitude towards learning new things and the willingness of individuals to share knowledge (Gharanjik & Azma, 2014:83; Wei, 2010:19; Matzler *et al*., 2008:306).

d) Agreeableness

The trait of agreeableness describes a person's tendency to be pleasant. People who are high in agreeableness tend to be good-natured, forgiving, courteous, helpful, generous, cheerful, cooperative, altruistic and sympathetic (Teh *et al*., 2011:49; Hutasuhut, 2007:6). Because knowledge sharing symbolises an individual's helpfulness, cooperation and collaboration, individuals high in agreeableness are likely to engage in knowledge sharing (Teh *et al*., 2011:49; Hutasuhut, 2007:6). Individuals with a higher level of agreeableness normally dislike offending others, and view interpersonal agreement as a behavioural norm. In contrast, Wang *et al*. (2011:8) suggest that employees high in agreeableness are more modest, and are therefore less likely to become competitive with others. Therefore, they are less likely to be motivated by evaluation or rewards to share knowledge.

e) Conscientiousness

With respect to conscientiousness, Lin and Wang (2012:355) point out that this relates to the quality of being concentrated and focused in pursuit of goals. Individuals with a high level of conscientiousness are inclined to be more careful, self-disciplined, responsible, and also more goal-orientated. Such individuals strive

to reduce uncertainties and negative incidents. For highly conscientious individuals, the achievement of goals is viewed as a uniform standard for all behaviour. According to Teh *et al*. (2011:49), conscientiousness includes personality traits associated with achievement orientation and perseverance. Individuals with high conscientiousness are likely to be dutiful, dependable, reliable, organised and hardworking. A highly conscientious individual is more cooperative with others (than those who have a lower level of conscientiousness), especially in circumstances where interdependence and good interpersonal relationships are important success factors for knowledge sharing (Teh *et al*., 2011:49). Conscience individuals believe that they can share their knowledge and skills to benefit the organisation, and are therefore more willing to engage in knowledge sharing (Gharanjik & Azma, 2014:82).

3.2.2.5 Psychological contract breach

According to Abdullah *et al*. (2011:233), psychological contracts refer to an individual's beliefs and expectations about the reciprocal obligations between an individual employee and his or her employer. These beliefs are based on the employee's perceptions about the business's obligations to him or her, as well as his or her own obligations to the business. The individual's belief represents a perceived promise that comprises several aspects such as expectations of future return and obligation, as well as expected contribution (Abdullah *et al*., 2011:233). Rousseau (1989:123), who developed the psychological contract concept, asserts that it is the individual's belief in an obligation of reciprocity that establishes the psychological contract. As such, the psychological contract is formed when an individual perceives that the contributions he or she makes require the organisation to reciprocity (or vice versa). This belief is unilateral, held by a particular individual, and does not compel those of any other parties to the relationship. The conceptualisation of the psychological contract is based on the employee's experience and hence, individuals have psychological contracts, while the business provides the context for the creation of a psychological contract, but cannot in turn have a psychological contract with its members (Winter & Jackson, 2006:423; Rousseau, 1989:124-126).

On the other hand, Guest (2004:545-546) argues that the psychological contract can be considered a two-way exchange process and therefore includes the perceptions of both parties (employee and organisation) to the employment relationship, in terms of reciprocal promises and obligations (Cullinane & Dundon, 2006:118). In this regard, Gupta *et al*. (2012:740) state that the psychological contract entails "unwritten and implied beliefs held by the employee and organisation about what each should offer, and what each is obligated to provide, in the exchange relations that operate between them".

Although in some studies there are different views on who experiences psychological contracts (for instance, the employee or employer), in this study, psychological contracts refer to an individual's beliefs and expectations (unilateral) about the reciprocal obligations between an individual employee and his or her employer.

There are two underlying theories that can be linked to the psychological contract concept, namely the Norm of Reciprocity (Gouldner, 1960) and Social Exchange Theory (Blau, 1964), as discussed earlier in Chapter 2 of this study. These two theories highlight the dynamic element of the exchange relationship and offer a useful perspective to examine the motivational mechanisms underlying the sharing of knowledge in a business. Reciprocity is significant with respect to maintaining stability and commitment within a social system, as reciprocity creates mutual enduring relations where both parties have concurrent obligations and rights. Then again, Social Exchange Theory suggests that when an individual willingly affords a benefit to another, this action will raise an obligation of the other party to respond by means of providing something in return (Abdullah *et al*., 2011:233).

A number of different types of psychological contracts have been proposed in literature. The present study explains the most popular types, namely the transactional and relational psychological contracts (Cable, 2008:18-19). These psychological contracts differ in two ways, these being the promised duration of the relationship between the parties, and the performance requirements (O'Neill & Adya, 2007:414; Rousseau, 1995:97-98). Firstly, transactional psychological contracts emphasise economic and monetary terms, and are short term with

explicit performance criteria. Characteristics of a transactional contract are job opportunities with very narrow duties and/or positions with a limited or short-term period. Employees recognising this type of psychological contract may seek other employment opportunities as soon as specific terms fail, or are not perceived to be sufficiently fulfilled (O'Neill & Adya, 2007:414). In this type of psychological contract, Rousseau (1995:98) expects low ambiguity, low member commitment, easy exit (high turnover), freedom to enter new contracts, and little learning, which are typical of seasonal type work (Abdullah *et al*., 2011:233; Atkinson, 2007:507-508; Rousseau, 2004:122-123; Rousseau, 1995:98). Furthermore, Rao (2010:82) posits that when individuals are unhappy with their psychological contract they might choose to hoard knowledge and refuse to share knowledge within the business. As such, understanding the nuances of psychological contracts may shed valuable light on knowledge sharing between individuals.

A second type of psychological contract, namely the relational psychological contract, deals with the exchange of personal, socio-emotional, value-based considerations as well as monetary elements. Relational elements involve trust, loyalty and mutuality, which develop over time (Abdullah *et al*., 2011:233; Atkinson, 2007:508). Relational contracts are typically found when a long-term arrangement is perceived to exist without specific performance-reward likelihoods (ambiguous). Relational contracts exist in situations where there is loyalty between the employer and the employee, and both parties believe in an open-ended commitment to the future. Employees engaged in such a relational approach consider interdependence and mutuality, and are more concerned about their careers and less concerned about a particular job (O'Neill & Adya, 2007:414; Rousseau, 1995:98). Employees with relational psychological contracts are extremely upset when the terms of their psychological contract are not fulfilled, and tend to seek remedies that maintain their relationship with the employer. Only when these employees cannot find a remedy in a situation where the terms of their psychological contract was breached, do they reduce their contributions or consider leaving the business (Gupta *et al*., 2012:740; O'Neill & Adya, 2007:414-415). The way employees perceive the relational psychological contract will have an influence on their future attitudes and behaviour towards the business, for instance in the sharing of knowledge (Abdullah *et al*., 2011:233).

Against this background, businesses must formulate psychological contracts with the intention to institute trust between the parties concerned, as well as promoting employee responsibilities to share knowledge (O'Neill & Adya, 2007:413). Gupta *et al*. (2012:745) propose that the most successful businesses are capable of attracting and retaining talented employees by entering into psychological contracts with their employees that encourage them to generate and share knowledge in return for nurturing and nourishing their professional skills. O'Neill and Adya (2007:413) assert that most knowledge workers are motivated by either institutional or communitarian loyalty. "Institutional loyalty" refers to cultures, norms and stories that may create institutional loyalty, while "communitarian loyalty" refers to perceived common interests and social identification with a certain group. Both types of loyalty are important in motivating and retaining knowledge workers. In addition to loyalty, trust also pays off when knowledge about another's motives, interests or personal background is unknown. Because occupational commitment may be stronger than organisational commitment among knowledge workers, any perceived breach of their psychological contract can be translated as a breach of trust (O'Neill & Adya, 2007:413).

Gupta *et al*. (2012:744-745) suggest that in order to improve knowledge sharing, businesses must build an environment in which employees perceive that there is little cost involved in sharing knowledge. This occurs when employees share a psychological contract which entails perceived responsibilities that are emotional and intrinsic in nature, for an unspecified period (Gupta *et al*., 2012:744-745). The aspect of cost and its influence on knowledge sharing has been identified as a separate factor that can motivate knowledge sharing, as will be explained later in section 3.2.2.6 of this chapter.

Min, He and Gan (2010:1638) believe that although motivation measures are important with respect to the psychological contract and knowledge sharing, a once- off incentive activity cannot guarantee continuous knowledge sharing. Only a positive state of the psychological contract can ensure that knowledge sharing is carried out in the long term. People will construct their psychological contract taking task and incentives into account in conjunction with their ability. Individual expectations are not identical, and individuals will compare their spiritual and

material rewards with initial expectations after knowledge sharing. If the outcome is in line with the expectation, or even exceeds it, the individual will be satisfied and there will be an increased sense of identity with the business. As a result, a healthy psychological contract can be maintained to promote knowledge sharing activities (Min *et al*., 2010:1638-1639).

Based on the employee's continuous assessment of the employment relationship, a conclusion is made whether the business is honouring its promises as perceived by the employee. According to these perceptions, a psychological contract is said to be breached or fulfilled. The violation of the psychological contract involves the emotional response that could accompany instances of contract breach. Violation may include emotional ramifications, and the intensity might range from disappointment, frustration and distress to anger, resentment, bitterness and indignation. Individuals may become cynical, and believe that the business lacks integrity. Consequently, employees may have negative emotions towards the business and violation can also be associated with certain negative behavioural outcomes towards the business (Khan, 2009:41; Pate, Martin & Mcgoldrick, 2003:558-560). For example, when someone finishes a task though the business fails to provide timeous feedback, or the response does not meet his or her expectations, the trust between the two parties will be destroyed. This could result in negative behaviours from employees such as a decline in their quality of work and undertaking less responsibility to assist colleagues. Employees could even get involved in antisocial behaviours such as revenge, theft or destruction. As soon as the psychological contract breaks down, enthusiasm for knowledge sharing declines, and results in resentment of knowledge sharing (Min *et al*., 2010:1638-1639).

While a breach of a psychological contract will damage ongoing attitudes and behaviours, a fulfilment of a psychological contract is likely to maintain rather than enhance behaviours and attitudes. Negative events have a bigger influence than positive events on individuals' moods. Individuals therefore respond more strongly to negative events such as a breach of psychological contract (Conway, Guest & Trenberth, 2011:268). In this regard, the researcher is of the opinion that individuals will react more strongly to psychological contract breach in terms of

decreased knowledge sharing. On the other hand, individuals might only maintain but not enhance their knowledge sharing as a result of psychological contract fulfilment. In addition, Sonnenberg (2006:23) is of the opinion that it is better to investigate breach and violation, instead of fulfilment, as psychological contracts are best understood when they are violated.

In light of the above and line with most prior research (Jafri, 2014; Ghitan, 2009; Raja, Johns & Ntalianis, 2004; Robinson & Morrison, 2000), the present study will also focus on perceived breach of the psychological contract, rather than on its fulfilment.

3.2.2.6 Personal costs of sharing knowledge

Personal cost of sharing knowledge can be linked to the Social Exchange Theory as explained in section 2.3.3.2 in Chapter 2. Social Exchange Theory offers the notion that individuals review and weigh their relationships in terms of costs and rewards. Cost includes elements such as stress, time and energy that have a negative value to a person (Kumar *et al*., 2007:3). The perceived cost of losing power when sharing knowledge can also have a negative influence on individuals' knowledge sharing (Gupta, Joshi & Agarwal, 2012:12) and an individual must be convinced that the benefit of sharing knowledge outweighs the cost of losing power (Srikantaiah, Koenig & Hawamdeh, 2010:11). Liu, Ding, Huang and Huang (2014:2) assert that the cost of sharing knowledge, such as the loss of knowledge power, may prevent employees from sharing knowledge with each other. Wang and Noe (2010:124) posit that even though employees' unique knowledge often results in positive evaluations (such as performance appraisal, bonuses, promotions, protection from layoffs), these evaluations could also create a disincentive for knowledge sharing. By sharing knowledge, individuals could lose their distinctiveness from others (Wang & Noe, 2010:124). Kankanhalli *et al*. (2005:116) in a similar manner suggest that knowledge contributors may experience a loss of power and unique value within the business. People may be afraid that their peers might misinterpret the shared knowledge and consequently cause bad work experiences (Al-Busaidi, Olfman, Ryan & Leroy, 2010:3).

Kankanhalli *et al*. (2005:116) suggest that it takes time and effort to codify knowledge, therefore, such time is an opportunity cost that prevents knowledge contributors from performing alternative tasks. When the codification process is complex, people are less likely to share their knowledge (Hung & Chuang, 2009). Hew and Hara (2007:2312) indicate that a lack of time is one of the most frequently cited reasons for not sharing knowledge, while Cyr and Choo (2010:838) note that the perceived cost of knowledge sharing will be negatively related to propensity to share knowledge. Similarly, Kankanhalli *et al*. (2005:120) conclude that the more time and effort employees deem necessary to codify knowledge in order to share it, the less likely they will be to share it. Cheng *et al*. (2009:315) also maintain that the sharing of knowledge is a costly activity, and unless the perceived benefits exceed the costs of sharing, the sharing process will remain difficult to realise. Personal cost can in this instance be related to motivation (rewards/benefits) for knowledge sharing. For instance, Al-Busaidi *et al*. (2010:9) suggest that a reward policy is critical in motivating individuals to freely spend time and effort in sharing their knowledge.

3.2.2.7 Relationship and task conflict

In general, conflict relates to perception of differences, discrepancies and incompatible needs among individuals (Pekdemir *et al*., 2013:133). A distinction is normally made between relationship and task conflict, which will be discussed in the subsections below.

a) Relationship conflict

Relationship conflict relates to the tension caused by interpersonal differences, as well as mutual dislike and annoyance between colleagues (Pekdemir *et al*., 2013:134). Pekdemir *et al*. (2013:134) add that relationship conflict is also known as interpersonal conflict, affective conflict or emotional conflict.

Glinow, Shapiro and Brett (2004:578) point out that emotional conflict is likely to arise in heterogeneous teams, as there may be barriers to interpretation emanating from individuals different values, beliefs, language systems and

experiences. Shih *et al*. (2008:3) assert that relationship conflict arises when there are interpersonal incompatibilities among group members, resulting in tension, animosity and annoyance within a group. Group members with interpersonal issues and who are annoyed with each other work less effectively at the expense of a business's product quality.

The threat and anxiety caused by relationship conflict are inclined to prevent individuals' cognitive functioning and therefore hinder individual performance. Relationship conflict may prevent the sharing of information among team members as well as lower the commitment of team members towards each other (Shih *et al*., 2008:3). Lu *et al*. (2011:132) note that the majority of research with regard to relationship conflict focuses on the group (teams) level of analysis. There is still uncertainty regarding how relationship conflict may influence diverse workplace behaviours at the individual level, which is the focus point of the present study. Relationship conflict can also be linked to a previous factor explained in this chapter, namely personality traits. Personality differences may result in relationship conflict and hence discourage knowledge sharing between individuals (Chen, 2011:1388).

b) Task conflict

Task conflict relates to different perspectives between individuals and occurs when individuals have disagreements over how to complete a task (Lu *et al*., 2011:132). Jehn (1995:258) posits that task conflict exists when there are disagreements about the content of a task being performed. While relationship conflict is believed to hinder performance because it leads to distraction, negative emotions and decreased knowledge sharing, task-related conflict may improve performance because it encourages open expression and evaluation of assumptions and alternatives. Consequently, task conflict may increase the possibility of generating better solutions in a business because task conflict stimulates task-related interpersonal interaction (Lu *et al*., 2011:132-135). For example, disagreements among individuals related to task conflict could encourage the sharing of expertise and knowledge among such individuals in order to justify their views and opinions. Subsequently, perceptions of disagreements among individuals over task issues

could increase knowledge sharing (Lu *et al*., 2011:135). Similarly, Shih *et al*. (2008:2) highlight the potential benefit associated with task conflict in term of knowledge sharing. These authors point out that individuals involved in controversies can be motivated to understand one another's positions and to be appreciative of them through collaborative knowledge sharing.

3.3 SUMMARY AND CONCLUSIONS

After discussing the nature and importance of knowledge sharing in Chapter 2 and the introduction of several models dealing with knowledge sharing, this chapter highlighted organisational and individual-based factors that could influence knowledge sharing among employees. From numerous previous models and literature consulted, more than 40 factors were identified. This necessitated the grouping of factors into simpler categories, namely organisational and individual-related factors. Organisation-related factors relate to issues or situations in the business that can facilitate or impede knowledge sharing between individuals, while individual-related factors are linked to individuals who engage in knowledge sharing. As mentioned in Chapter 1, the focus point of this study will be on individual-related factors. Although these factors are divided into organisational and individual-related factors, they are often related to each other, with several examples highlighted in the text.

The next chapter will identify and discuss the most significant individual-related factors to be empirically tested, as it is not feasible to test all the individual-related factors identified in this chapter. Consequently, the hypothesised model to be empirically tested will be introduced.

CHAPTER 4
A PROPOSED HYPOTHESISED MODEL OF INDIVIDUAL-RELATED FACTORS THAT INFLUENCE KNOWLEDGE-SHARING INTENTION

4.1 INTRODUCTION

Various organisational and individual-based factors influence knowledge sharing, most of which were identified and discussed in Chapter 3. These factors were identified as those that relate to issues or situations in the business (organisation-related factors) that can facilitate or impede knowledge sharing between individuals, and those factors that are directly linked to individuals (individual-related factors) who engage in knowledge sharing.

Given the importance and lack on research of the individual-related factors influencing knowledge sharing (Matzler *et al*., 2011:297; Ismail & Yusof, 2009:1) this chapter will present a model of selected individual-related factors that are hypothesised to influence individuals' willingness to share knowledge. The independent, dependent and control variables included in this model will be justified and discussed in the sections to follow, after which the resulting hypothesised relationships will be presented to be empirically tested. This chapter will therefore address the second methodological research objective.

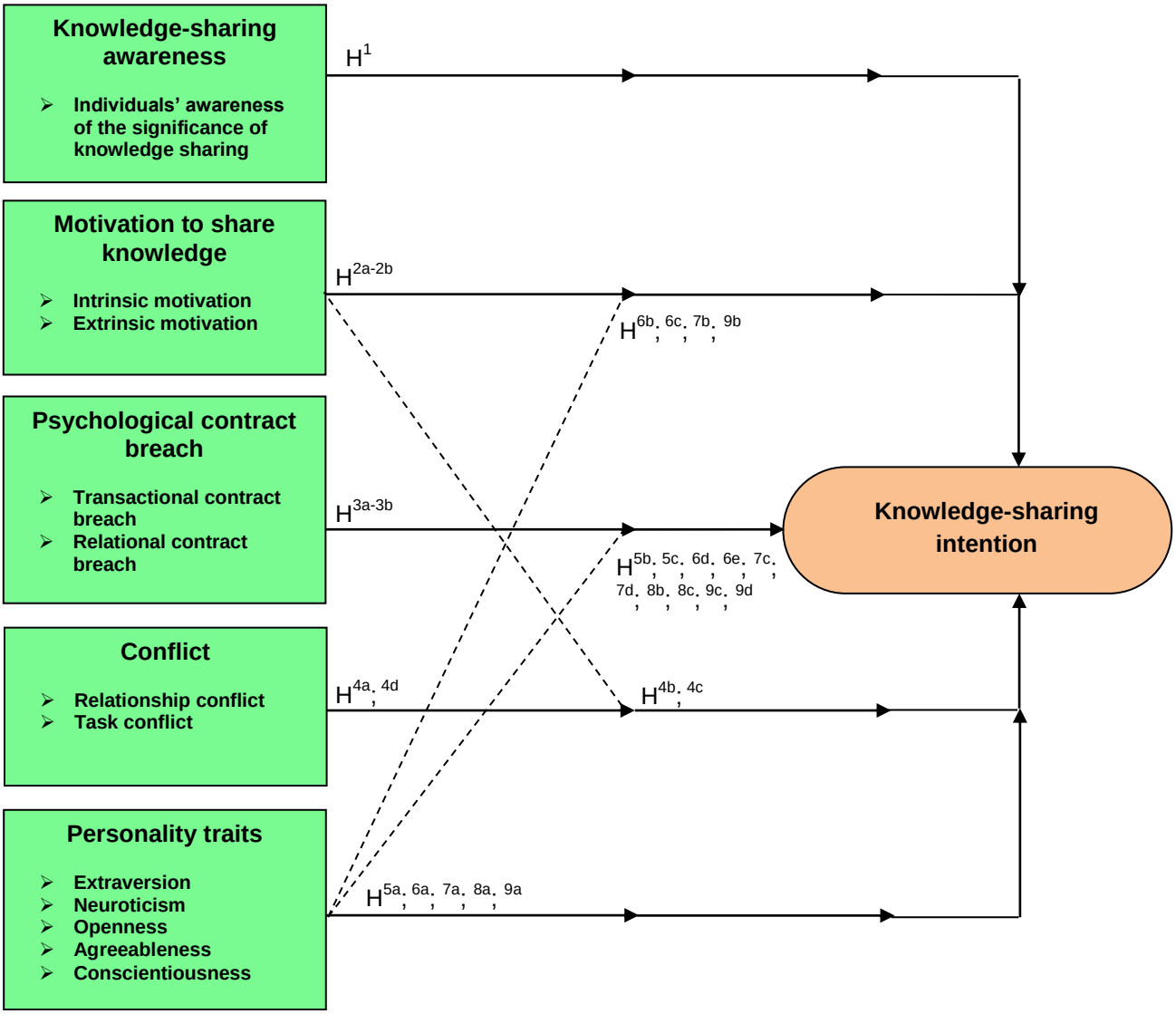
4.2 THE PROPOSED HYPOTHESISED MODEL

The proposed hypothesised model in this study, as depicted in Figure 4.1 below, includes selected individual-related factors that influence knowledge-sharing intention. These individual-related factors are included as the independent variables of this study to be empirically tested, namely *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*, *Relationship conflict, Task conflict*, *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness* and *Conscientiousness*. These independent variables were identified from the knowledge-sharing literature discussed in Chapter 3 as requiring more research with respect to their relationship with knowledge sharing. Only one of the

individual-related factors (personal costs) that were identified in Chapter 3 is excluded for empirical analysis in the present study owing to the large amount of existing research on its relationship with knowledge sharing. The researcher identified ample research regarding the relationship between personal cost and knowledge sharing (see Jamaliah & Sarinah, 2013; Gupta *et al*., 2012; Peihua, 2011; Cyr & Choo, 2010; Draaijer, 2008). Wang and Noe (2010:121), who extensively reviewed past knowledge-sharing literature, also assert that perceived costs/benefits have been one of the most studied antecedents of knowledge sharing.

This study will address the gaps in current knowledge-sharing literature and empirical research. More specifically, the researcher will investigate individuals' knowledge-sharing by testing direct relationships between the identified individual-related factors (independent variables) and *Knowledge-sharing intention* (dependent variable), as well as various moderating relationships. In addition, demographic variables (gender, tenure, education, age and race) are included in the hypothesised model in the form of control variables. This will be a pioneering study since, to the best knowledge of the researcher, there is no evidence of similar studies to what is proposed in the present study. Following the discussion above, Figure 4.1 below illustrates the proposed hypothesised model of individual-related factors influencing knowledge-sharing intention.

Figure 4.1: Proposed hypothesised model of factors influencing knowledge-sharing intention



Source: Researcher's own construction

The selected individual-related factors illustrated in Figure 4.1, and their influence on *Knowledge-sharing intention*, are explained in the sections below and the resulting hypothesised relationships are presented. The inclusion of the respective variables and relationships in the proposed model are also justified in the subsequent sections.

4.2.1 Dependent variable: Knowledge-sharing intention

Following on the discussion in Chapter 2 about the nature and importance of knowledge sharing, for the purpose of this study, *Knowledge sharing intention* refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise. Empirical evidence of the influence of individual-related factors on the intention or willingness to share knowledge have been found by Lin (2007a), Tsai and Chen (2012), Susanty and Wood (2011), Hau, Kim, Lee and Kim (2013) and Olapegba, Balogun and Idemudia (2013).

Although previous studies also measured knowledge sharing in terms of individuals' attitudes toward knowledge sharing (Isfahani, Nilipour, Aghababapour & Tanhaei, 2013; Olatokun & Elueze, 2012) and self-reports of historical (actual) knowledge-sharing behaviour (Yu, Lu & Liu, 2010; Chatzoglou & Vraimaki, 2009), in general knowledge-sharing literature focuses on individuals' willingness or intention to share knowledge (Hau *et al*., 2013; Susanty & Wood, 2011; Lin, 2007a). In fact, Wang and Noe (2010:126) in their review of knowledge-sharing literature, point out that knowledge-sharing studies commonly measured knowledge sharing in terms of willingness or intention to share knowledge. Furthermore, researchers tend to measure the extent to which an individual shares different types of knowledge such as personal experience, expertise and ideas (Wang & Noe, 2010:126). For example, the intentions to share experience, expertise and ideas have been verified as being important measures of individuals' knowledge sharing in empirical studies conducted by Chow and Chan (2008), Bock *et al*. (2005), Chennamaneni (2006), Evans (2012) and Gu and Wang (2013).

Against this background, this study focuses on *Knowledge-sharing intention* of individuals. It is believed that this approach would be appropriate in understanding knowledge sharing among individuals in knowledge-intensive businesses, as knowledge-sharing intention has often been used as an alternative to indicate or measure actual knowledge-sharing behaviour. In this regard, and as discussed in Chapter 2 (see Theory of Reasoned Action in section 2.3.3.3), actual behaviour is

a function of attitude and intention towards a specific behaviour. There is therefore a link between the attitudes related to knowledge sharing, intentions to share knowledge, and actual sharing of knowledge. For example, the more favourable the attitude of a person towards a specific behaviour, the stronger the person's intention is likely to be to engage in the behaviour. In turn, the stronger the intention to engage in a behaviour, the more likely the person will be to perform it (Ghelichkhani & Khaiami, 2015:3; Chow & Chan, 2008:459). In addition, Evans (2012:75) notes that there is no practical way of directly measuring actual employee behaviour, and therefore actual knowledge-sharing behaviour is difficult to capture (Evans, 2012:75).

In the next section, the various relationships of the independent variables with the dependent variable will be justified and discussed.

4.2.2 Independent variables

The following independent variables influencing *Knowledge-sharing intention*, namely *Individuals' awareness, Intrinsic motivation, Extrinsic motivation, Transactional psychological contract breach, Relational psychological contract breach, Relationship conflict, Task conflict, Extraversion, Neuroticism, Openness to experience, Agreeableness and Conscientiousness* are discussed and their inclusion in the hypothesised model is justified, in the following sections.

4.2.2.1 Individuals' awareness of the significance of knowledge sharing

In this study, *Individuals' awareness* refers to the ability of individuals to realise the importance and value of sharing their knowledge with others. Individuals not only consider their own payoff for sharing knowledge, but also the usefulness of their knowledge to others. Being aware of the knowledge needs of other individuals is therefore also encompassed in this variable.

Van den Hooff and De Ridder (2004:127) suggest that future research needs to be conducted on this variable of awareness, as knowing what others need to know can influence the willingness to share knowledge. Similarly, Shaari *et al*. (2014:40)

note that it is important to investigate individuals' awareness toward knowledge sharing and how a positive attitude can be gained for sharing knowledge. The researcher's view is in congruence with the view of these researchers, in that more research is required on individuals' awareness within a business. More specifically, throughout the literature review the researcher noted that limited attention has been given to empirical research regarding the relationship between awareness and knowledge sharing. As such, the present study will empirically test the relationship between *Individuals' awareness* and *Knowledge-sharing intention*.

Cress *et al*. (2007:434) suggest that the awareness of the value of one's knowledge increases the likelihood of making better contributions in term of sharing knowledge. Other anecdotal evidence (see Nkuna, 2012:23; Rahab *et al*., 2011:118; Noor & Salim, 2011:111) also points towards the positive influence of individuals' awareness on knowledge sharing. On the other hand, Riege (2005:23) identifies a low awareness and realisation of the value and benefit of knowledge as a barrier to knowledge sharing.

Although limited, existing empirical research indicates that awareness is positively related to knowledge sharing. Ali (2012:92) investigated the determinants of knowledge sharing among professional service workers. The findings revealed that awareness is significantly related to knowledge-sharing quality. In the same manner, Ismail and Yusof (2010:8) investigated the impact of individual factors on knowledge-sharing quality at Malaysian public agencies. Their results also showed that awareness is significantly related to knowledge-sharing quality. In another study investigating the factors affecting knowledge-sharing behaviour among stakeholders in Jordanian hospitals, Alhalhouli, Hassan and Der (2014:926) found that awareness influence knowledge-sharing behaviour.

Based on the anecdotal and empirical evidence presented above, the following hypothesis is formulated:

H^1: There is a positive relationship between *Individuals' awareness* and *Knowledge-sharing intention*.

4.2.2.2 Individuals' intrinsic and extrinsic motivation to share knowledge

Individuals' *Intrinsic and Extrinsic motivation* to share knowledge in this study refers to the intrinsic benefits (such as self-efficacy and enjoyment in helping others) and extrinsic benefits (such as organisational rewards and reciprocity) that employees consider as motivation to share knowledge.

Various authors (Liu, Liang, Sambamurthy, Rajagopalan & Wu, 2011:23; Wang & Noe, 2010:125) have emphasised the need for more research on the influence of motivation on knowledge sharing, because current research findings are inconsistent (for example Kim & Lee, 2006 & Lin, 2007a).

Concerning individuals' motivation to share knowledge, Waheed, Masood, Khan and Tahir (2013:545) note that there are more practices that can be implemented to increase knowledge sharing among employees. Therefore, to expand the study of knowledge sharing, practices such as the reward system (performance appraisal system, monetary rewards and financial and non-financial benefits) of the business for motivating employees who engage in knowledge-sharing practices, must be studied further (Waheed *et al*., 2013:545). Olatokun and Nwafor (2012:217) similarly propose that limited attention has been given in research to the influence of motivational factors on knowledge-sharing behaviour. Lin (2007a:136) suggests that there is a limited body of empirical research that assesses the influence of the difference between extrinsic and intrinsic motivation factors on individuals' knowledge-sharing behaviour. Lin (2007a:136) further stresses that little is known about the fundamental factors that influence extrinsic and intrinsic motivation, and hence, the key determinants of knowledge-sharing behaviours.

In the sections below, existing anecdotal and empirical evidence regarding the relationship between intrinsic and extrinsic motivation and knowledge sharing is discussed.

a) Individuals' intrinsic motivation to share knowledge

Individuals' *Intrinsic motivation* to share knowledge in this study refers to the intrinsic benefits such as enjoyment in helping others, satisfaction and self-efficacy that employees consider as motivation to share knowledge. In their meta-analyses on the different factors that affect knowledge-sharing behaviour, Liu *et al*. (2011:23) note that individuals may share knowledge because they experience intrinsic rewards, such as realising one's complete personal and professional potential, and the feeling of pride when others use one's ideas. Osterloh and Frey (2000:546) investigated how different kinds of motivation (extrinsic and intrinsic) are crucial for generating and transferring the two forms of knowledge, namely tacit and explicit knowledge. These authors found that intrinsic rewards are the most effective in facilitating tacit knowledge sharing. Liu *et al*. (2011:36) add that managers can increase individuals' intrinsic motivation through establishing their knowledge self-efficacy (confidence in their ability to provide knowledge that is useful to the business), ensuring more job autonomy, and encouraging their intention to help others.

Olatokun and Nwafor (2012:216) investigated the effect of extrinsic and intrinsic motivation on knowledge-sharing intentions among civil servants in Ebonyi State in south-eastern Nigeria, and the findings reveal that self-efficacy and enjoyment in helping others are significant, and point towards a strong role in employee attitudes and knowledge-sharing intentions. Kankanhalli *et al*. (2005:113), in their empirical study on knowledge contribution to electronic knowledge repositories among senior knowledge management executives and practitioners from public organisations in Singapore, conclude that self-efficacy significantly influences knowledge sharing in the form of contributions to an electronic knowledge repository. In the same manner, in their empirical study among academics in public universities, Shaari *et al*. (2014:41) found that self-efficacy influence the likelihood of knowledge sharing.

Using a case of training institutes of an oil and gas company in Malaysia to empirically investigate a framework of extrinsic and intrinsic motivators of knowledge sharing, Amin *et al*. (2010:1428) found that intrinsic motivation is a

strong predictor of knowledge-sharing behaviour. Rahab *et al*.'s (2011:118) empirical research on the influence of individual and organisational factors on knowledge sharing among employees in small and medium-sezed enterprises reveal that the enjoyment of helping others significantly influences knowledge sharing. Empirical confirmation from Ko, Kirsch and King (2005:75) indicates that intrinsic motivation is important for sharing knowledge (King & Marks, 2008:134). The findings of Ko *et al*. (2005:75) are also consistent with the findings of Osterloh and Frey (2000:546) who argue that intrinsically motivated employees are required when the knowledge being shared is primarily tacit in nature. Lin (2007a:135) empirically examined the effects of extrinsic and intrinsic motivation on knowledge-sharing intentions among employees in large Taiwanese organisations. In agreement with previous findings (Rahab *et al*., 2011:118), Lin (2007a:135) found that intrinsic motivational factors such as knowledge self-efficacy and enjoyment in helping others are significantly related to employee knowledge-sharing attitudes and intentions. With regard to the relationship between enjoyment in helping others and knowledge sharing as presented in the paragraphs above, Chennamaneni (2006:37) posits that similar findings have been observed in other studies (see Wasko & Faraj, 2000:53; Constant, Sproull & Kiesler, 1996:130).

Based on the discussion presented above, the following relationship is hypothesised:

H^{2a}: There is a positive relationship between *Intrinsic motivation* and *Knowledge-sharing intention*.

b) Individuals' extrinsic motivation to share knowledge

Individuals' *Extrinsic motivation* to share knowledge in this study refers to the extrinsic benefits such as promotion, organisational rewards, acknowledgement, job security and reciprocity that employees consider as motivation to share knowledge. Wang and Noe (2010:118) as well as Connolly (2007:30), note that despite the expected positive influence of incentives on knowledge sharing, the findings from various empirical studies investigating the influence of extrinsic rewards on knowledge sharing have revealed mixed results. Based on both Social

Exchange and Social Capital Theories (refer to section 2.3.3 of Chapter 2), extrinsic rewards (such as promotion, bonus, and higher salary) have been shown to be positively related to knowledge sharing (Kankanhalli *et al*., 2005:133-135). In their empirical study of the impact of organisational context and information technology on knowledge-sharing capabilities among employees in private and public-sector organisations in South Korea, Kim and Lee (2006:380) found that a performance-based pay system in a business contributed to knowledge sharing. The empirical findings of Said Ali's (2009:184) study of cultural influences on knowledge sharing among academics in a Kuwaiti Higher Education Institution confirm the views found in other empirical research (Chow *et al*., 2000:90; Davenport & Prusak, 1998:97) that extrinsic rewards (such as financial incentives and promotion) motivate individuals to share knowledge.

The results of Said Ali (2009:185) also reveal that extrinsic rewards (for instance financial rewards) should be combined with internal rewards (such as recognition) and therefore should be customised to fit different individual needs in order to motivate knowledge sharing. Some individuals may be more motivated by recognition than financial rewards to share knowledge.

However, contrary to the anticipated positive effect of extrinsic rewards, some researchers (Bock *et al*., 2005:88; Bock & Kim, 2002:14) found that extrinsic rewards have a negative effect on attitudes towards knowledge sharing. A number of other studies (Lin, 2007a:135; Kwok & Gao, 2006:45) showed no relationship between extrinsic motivation and knowledge-sharing intentions or attitudes toward knowledge sharing. Chang, Yeh and Yeh (2007:276) also found no relationship between rewards and knowledge sharing. Olatokun and Nwafor's (2012:216) findings in the same way reveal that expected organisational rewards as well as reciprocal benefits have not been significantly related to employee attitudes and knowledge-sharing intentions.

Because of the mixed results found pertaining to the relationship between extrinsic rewards and knowledge sharing, the positive influence of extrinsic rewards on knowledge sharing should therefore be subjected to further testing. The following relationship is consequently hypothesised:

H^{2b}: There is a positive relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

4.2.2.3 Psychological contract breach

For the purpose of this study, *Transactional psychological contract breach* refers to an individual's perception that the business has failed to meet one or more expectations about the extrinsic or monetary obligations between an individual employee and his or her employer in the short term. On the other hand, *Relational psychological contract breach* refers to an individual's perception that the business has failed to meet one or more expectations related to long-term arrangements (for example career development or continuous training) between an employee and his or her employer.

Regarding psychological contracts and knowledge sharing, Abdullah *et al*. (2011:232) point out that in knowledge-intensive businesses, the sharing of knowledge is especially important, but the understanding of the factors that contribute to employees' tendency to share knowledge may lag. For instance, although there is an increasing amount of research on factors that influence the knowledge sharing of employees, not enough interest is directed towards the potentially promising link between the psychological aspect of employment (psychological contract) and knowledge sharing. Knowledge sharing requires a positive environment in the form of an intact psychological contract, which provides an opportunity to evaluate the central aspects in the exchange relationship between employees and employers. Rehman *et al*. (2011:225-226) point out that although research has been done on the factors influencing knowledge sharing, little research is done on employee-related issues, which include psychological contracts and their impact on knowledge sharing. The majority of studies on psychological contracts focus on management, students or graduates, therefore limiting the possibility of generalising research results (Lepoiev, 2011:42). The present study will focus on knowledge workers across various departments, in order to address this gap in research, and to provide insight into mixed research results with respect to psychological contracts and knowledge sharing.

Rayton and Yalabik (2014:2385) further suggest that while psychological contract breach and fulfilment are part of a continuum, the effects they create on employee attitudes may be asymmetrical; therefore, researchers should evaluate the effects of breach and fulfilment separately. As discussed and justified in Chapter 3 (section 3.2.2.5), the present study focuses on psychological contract breach, instead of fulfilment. In addition, research does not always distinguish between specific psychological contracts, breaches, and their influence on knowledge sharing. In this regard, Gupta *et al*. (2012:744) suggest that further studies are required to investigate the type of psychological contract breach (for example relational and transactional) on knowledge-sharing behaviour, as will be the case in the present study. Depending on the nature of the psychological contract, the reaction to breach may vary, with breaches of relational obligations being more likely to have a stronger influence on individuals' behaviour than breaches of transactional obligations.

Psychological contracts have a significant influence on individuals' work attitudes, which also have an influence on knowledge sharing (Kexiang & Pu, 2013:174). Lin, Lin, Joe and Hung (2012:5) suggest that a lack of psychological contract fulfilment (breach) in a workplace can result in a lack of collaboration and ultimately knowledge sharing effectiveness. Besides performing their daily tasks, employees engage in proactive behaviour (knowledge sharing), which includes speaking up with ideas for improvement, or sharing information with their colleagues. Proactive behaviours can be regarded by employees as part of their daily work and related to rewards, therefore, when employees perceive their psychological contract to be breached, they are likely to reduce their proactive behaviours (Bal *et al*., 2011:722;726).

Rayton and Yalabik (2014:2394) assert that the management and delivery of employees' expectations is one way to avoid a decrease in work satisfaction linked to psychological contract breach. However, when a breach occurs, organisations must manage the implications for job satisfaction, which might result in a decrease in knowledge sharing by employees. Unselt, Gleich and Russo (2006:10) posit that the violation of trust related to a psychological contract breach is an important

factor for cooperation, as well as for the amount and quality of communication, which is central to successful knowledge sharing.

Empirical research has also found that a perceived breach of the psychological contract is positively related to the intention to quit (Suazo, 2009:145; Turnley & Feldman, 2000:31) and to the neglect of in-role duties (Turnley & Feldman, 2000:33). Suazo (2009:148-152) in his empirical research on psychological contract breach and violation among service-orientated employees working in the United States, found that contract breach diminished employees' initiative in terms of contributing ideas, providing constructive suggestions, and presenting creative solutions. Not receiving enough in return for contributions to the business can be regarded negatively by employees, and in line with the Social Exchange Theory (see section 2.3.3.2 in Chapter 2), contract breach represents an imbalance in exchanges and can therefore influence employee contributions (Bal *et al*., 2011:727).

Bal *et al*. (2011:736), in their empirical study on psychological contract breach among employees from multiple organisations in the Unites States, found that psychological contract breach is negatively related with knowledge sharing. These authors subsequently found that employees who perceive psychological contract breach are less likely to share their knowledge with colleagues, and are therefore likely to withhold important information from supervisors and peers (Bal *et al*., 2011:737-738).

Gupta *et al*. (2012:737) empirically investigated the influence of organisational commitment and psychological contracts on knowledge sharing among employees in different organisations from various industries such as IT (Information technology), automobiles and FMCG (fast-moving consumer goods). These authors found that psychological contract breach did not have a significant influence on knowledge-sharing behaviour (Gupta *et al*., 2012:737).

In summary, anecdotal evidence suggests that psychological contract breach is associated with a lack of collaboration and knowledge sharing (Rayton & Yalabik, (2014:2394; Lin *et al*., 2012:4-5). Limited existing empirical research regarding

psychological contract breach and knowledge sharing reports mixed findings, revealing that psychological contract breach is either not related to knowledge sharing (Gupta *et al*., 2012:737), or suggesting that psychological contract breach is related to a number of downward adjustments (such as decrease in employees' initiative in terms of contributing ideas, providing constructive suggestions, presenting creative solutions and sharing knowledge) in employees' attitudes and behaviours (Bal *et al*., 2011:736; Suazo, 2009:148-152). These limited empirical findings call for further research into the relationship between psychological contract breach and knowledge sharing. Therefore, the following relationships are hypothesised:

H^{3a}: There is a negative relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{3b}: There is a negative relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

4.2.2.4 Relationship and task conflict

Conflict, in this study, refers to how often individuals experience arguments, tension, friction, emotional conflict and personality conflict at work (*Relationship conflict*), as well as discrepant views, ideas or opinions with regard to the content of a task being performed (*Task conflict)*. With reference to conflict as a factor influencing knowledge sharing, Chen (2011:1389) states that empirical research has rarely been conducted to test the direct effect of relationship conflict on knowledge sharing. Shih *et al*. (2008:3) also claim that only limited direct empirical evidence exists to show that relationship conflict leads to a low level of knowledge sharing. Lu *et al*. (2011:132) postulate that, with respect to relationship and task conflict, most research focuses on the group level of analysis, and the question of how task and relationship conflicts influence diverse workplace behaviours (for instance knowledge sharing) at the individual level remains unanswered. The present study will fill this gap in research, as the focus of the empirical investigation is at an individual level of analysis.

a) Relationship conflict

Relationship conflict, in this study, refers to how often individuals experience arguments, tension, friction, emotional conflict and personality conflict at work. The effects of relationship conflict are worth noticing for managers in order to promote knowledge sharing (Chen, 2011:1393). Relationship conflict influences knowledge sharing as it is relationship-orientated, and interpersonal relationships influence employees to share knowledge with each other (Chen, 2011:1388). Prior empirical research (Medina, Munduate, Dorado, Martinez & Guerra, 2005:227; Jehn, 1995:270-271) have revealed that relationship conflict has direct and negative effects on various outcomes such as interpersonal liking, intent to stay in the organisation, employees' satisfaction and task performance. Moreover, relationship conflict triggers negative moods among individuals which weaken collaboration and cause individuals in relationship conflict to not be willing to accept ideas from each other, as well as to decrease information exchange between individuals (Chen, 2011:1388-1389).

With specific reference to the relationship between relationship conflict and knowledge sharing, Chen *et al*. (2011:1005) empirically explored the underlying processes between conflict and knowledge sharing among employees in software development companies in China. These authors confirmed that relationship conflict has a negative, indirect effect on knowledge sharing. In an empirical study of IT project teams from 45 different organisation throughout the United States, results revealed that relationship conflict has a significant and negative effect on knowledge sharing (Hewitt, 2008:157). Chen (2011:1387), who investigated the interactive effects of relationship conflict, reward, and reputation on knowledge sharing among full-time employees in various organisations in China, found a negative relationship between relationship conflict and knowledge sharing. Likewise, Lu *et al.'s* (2011:139) empirical findings show that knowledge-sharing behaviour is negatively related to relationship conflict when they explored the effects of task and relationship conflicts on individual work behaviours among part-time MBA students in China. The empirical results of Gu and Wang (2013:84), who investigated how conflicts may impact on knowledge sharing among college students in the United States, revealed a negative significant relationship between

interpersonal conflicts (disagreement, personal issues, mutual dislike) and the attitude towards knowledge sharing. An empirical investigation among senior students of an information management department in Taiwan indicated that knowledge sharing is negatively associated with relationship conflict (Shih *et al*., 2008:6).

In light of the anecdotal and empirical evidence presented above, the following relationship is hypothesised:

H^{4a}: There is a negative relationship between *Relationship conflict* and *Knowledge-sharing intention*.

Chen's (2011:1387) empirical research further indicate that rewards and reputation decrease the negative effect of relationship conflict on knowledge sharing, and consequently have a moderating effect on the relationship between knowledge sharing and relationship conflict. Chen (2011:1390) argues that employees in relationship conflict feel anger, annoyance and distrust towards their colleagues, and are therefore not willing to engage in knowledge sharing. However, when rewards (such as increased pay or bonuses) for sharing knowledge are high, the economic benefits of sharing knowledge prevail over negative moods or distrust triggered by relationship conflict. Posthuma (2011:110), in a similar manner, states that different reward systems may be required to neutralise the negative effects of relationship conflicts, and that more research is required to connect conflict management to other performance outcomes. In contrast, Chen (2011:1390) finds that when rewards for knowledge sharing are low, employees in relationship conflict who hold negative feelings toward colleagues will have even less motivation to share knowledge. In addition, when reputation for sharing knowledge is high, employees perceive that knowledge contribution could bring them a better image or prestige (Chen, 2011:1390). The social benefit of sharing knowledge in this instance outweighs the negative moods or responses triggered by relationship conflict. On the other hand, when reputation for sharing knowledge is low, employees in relationship conflict will have less motivation to engage in knowledge sharing with those they dislike (Chen, 2011:1390).

Apart from the moderating effect of extrinsic benefits (rewards and reputation) on the relationship between relationship conflict and knowledge sharing, Chen (2011:1393) further notes that future research should focus on conflict by testing whether benefits such as intrinsic motivation (self-efficacy and taking pleasure in helping others) moderate the relationship between conflict and knowledge sharing. Although no previous research could be found in this regard, the researcher's view is in congruence with that of Chen (2011:1393) as previous empirical research (Rahab *et al*., 2011:118; Lin, 2007a:135) found that intrinsic benefits such as self-efficacy and enjoyment in helping others benefit knowledge sharing. As such, the researcher is of the opinion that it is worth investigating whether the negative effect of relationship conflict on knowledge sharing can be decreased by intrinsic benefits, as is the case with extrinsic benefits.

Based on the evidence presented above, the following hypotheses are formulated:

H^{4b}: *Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.

H^{4c}: *Intrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.

b) Task conflict

Task conflict, for the purpose of this study, refers to how often individuals experience discrepant views, ideas or opinions among colleagues with regard to the content of a task being performed. According to Stock (2004:286), both positive and negative effects have been found for task-related conflicts and work outcomes. The potential benefit of task conflict is easily disregarded. In a business's setting where conflicting views are openly discussed, task conflict can make a positive contribution to decision-making (Shih *et al*., 2008:2). According to Huttermann and Boerner (2011:838), task conflict promotes the exchange of different knowledge and ideas, which in turn contributes to innovation within a business. More specifically, task conflict promotes a better understanding of task

issues, and an exchange of information that facilitates problem solving and decision making as well as the generation of ideas.

Lu *et al*. (2011:144) report that their empirical results support their hypothesis that task conflict is positively related to both innovative and knowledge-sharing behaviours. In an empirical study investigating the influence of conflict on team innovation, and conducted in collaboration with an international postal service functioning in the Netherlands, De Dreu (2006:90) found that moderate task conflict is associated with increased information sharing. In a similar way, Van Woerkom and Sanders (2010:146) conclude that, with respect to knowledge sharing and task conflict, only when there are neither too many nor too few differing views, will individuals be open to new ideas and will start questioning assumptions and generating new insights. In another empirical study investigating the effect of team conflict and task type on knowledge sharing among 386 employees in 76 teams from six Chinese enterprises, Chen and Leung (2010:1) also report that task conflict has positive effects on knowledge sharing.

In contrast, Lin, Ye and Bi's (2014:98) empirical findings revealed no significant correlation between task conflict and knowledge-sharing behaviour, while Gu and Wang (2013:84) also report no significant relationship between task conflicts and the attitude towards knowledge sharing. The empirical findings of Lee, Lee, Chen, Hsieh, Yeh and Lin (2014:427-428) are inconsistent with well-documented older studies (Amason, 1996:141-144; Jehn, 1995:275-278) which suggest that task conflict allows individuals to express different opinions, clarify concepts, reach a consensus, accept decision making and share knowledge. Correspondingly, the results of Hsu, Chou, Hwang and Chou (2008:75) as well as the results of Saes (2008:2) reported that task conflict were not significant in explaining knowledge sharing. Hewitt’s empirical research (2008:132) also found that task conflict did not affect knowledge sharing.

Although conflicting results on the relationship between task conflict and knowledge sharing exist, there is strong evidence to believe that task conflict can have a positive influence on knowledge sharing. The following relationship is consequently hypothesised:

H^{4d}: There is a positive relationship between *Task conflict* and *Knowledge-sharing intention*.

4.2.2.5 Personality traits

The following personality traits, namely *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness*, and *Conscientiousness* are included as independent variables in this study to empirically test their relationship with *Knowledge-sharing intention*. Knowledge-sharing literature suggests that, apart from the direct relationship of these traits with knowledge sharing, these traits can moderate the relationships between the independent and dependent variables identified in this study, although it is also well documented that only limited research has been conducted in this regard.

More specifically, Matzler *et al*. (2011:297) observe that limited research has considered the influence of personality traits on knowledge sharing, even though personality psychology has undergone dramatic development over the past two decades. In a similar manner, Hutasuhut (2007:3-4) notes that although studies on the relationship between personality traits and managerial and organisational factors exist, there is a lack of empirical studies in the area of knowledge management that focuses on individuals. Only limited studies examine aspects such as personal characteristics (for example personality traits) and attitude towards knowledge sharing.

Wang and Noe (2010:120) in a similar manner propose that although individuals are inclined to certain work attitudes and behaviours, limited studies have empirically examined the role of individual personality or dispositions in knowledge sharing. Amayah (2011:4) posits that mixed results on the influence of specific personality traits such as agreeableness and conscientiousness on knowledge sharing should be further investigated, as practitioners could benefit greatly from further research in this area. Understanding which of the personality traits are likely to lead to positive or negative attitudes towards knowledge sharing can enhance knowledge management practices.

Apart from the limited research pertaining to the direct influence of personality traits on knowledge sharing, Wang and Noe (2010:125) point out that it is useful, from an interactional psychology perspective, to examine how personality may interact with situational factors to influence knowledge sharing as few studies examine their interaction. Manaf (2012:73-85) adds that there is limited research into knowledge sharing in relation to personality or temperament, and points out that personality can be a moderating factor with respect to knowledge sharing. With reference to the present study, the interaction of personality traits with other factors (rewards, psychological contracts) that influence knowledge sharing will be investigated.

There is a strong possibility that the effectiveness of extrinsic rewards for motivating knowledge sharing (see section 4.2.2.2) may be influenced by other factors, such as individuals' personality traits. Likewise, Wei (2010:6) suggests that, to better understand knowledge sharing, there is an urgent need to integrate individual heterogeneity and reward schemes. In this respect, the moderating effect of individual personality traits has been mostly ignored in the current knowledge management literature, and personal characteristics can be expected to influence knowledge sharing under different reward schemes.

Similarly Gupta *et al*. (2012:745) suggest that research should be conducted where the moderating effect of personality can be examined with respect to psychological contracts and knowledge sharing. Zhao, Wayne, Glibkowski and Bravo (2007:673) researched the relationship between breach of psychological contract and outcomes. These authors also advise that future research should be conducted to investigate the role of individual differences, such as personality, with respect to psychological contract breach and its subsequent outcomes, as personality may influence employee detection and reaction to psychological breach of contract. Chen, Tsui and Zhong (2008:528) are also of the opinion that the moderating effect of individual differences in the reactions to psychological contract breach are relatively unexplored, and that it is unlikely that all individuals would have similar reactions to psychological contract breach. Orvis, Cortina and Dudley (2008:1183) similarly note that the moderating role of personality has received little attention in the psychological contract literature.

Against this background, the subsequent sections will, in conjunction with available empirical research, draw from anecdotal evidence to propose various hypothesised relationships relating to the influence of various personality traits (*Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness*, and *Conscientiousness*) on *Knowledge-sharing intention*, as well as the moderating effect of these personality traits on the relationships between selected independent and dependent variables of this study.

a) Extraversion

In this study, *Extraversion* refers to the tendency of an individual to be outgoing, enthusiastic, active, assertive and talkative. Extroverts are likely to be emotionally positive and content when working with teams, they are therefore likely to share knowledge among group members (Teh *et al*., 2011:49). Hutasuhut (2007:3) empirically studied the relationship between personality traits and the attitude to share knowledge among lecturers in a Malaysian university. The results showed that extraversion is positively related to attitude towards knowledge sharing. In another empirical study, Teh *et al*. (2011:47) investigated the Big Five Personality factors supporting or inhibiting knowledge-sharing behaviours among students at two Malaysian universities. The results showed that extraversion is positively related to the attitude towards knowledge sharing. Amayah (2011:2) did a review of empirical studies on knowledge sharing and personality and diversity. The studies included in Amayah's (2011) review were identified using the ProQuest database. A search was conducted using relevant keywords relating to knowledge sharing and the Big Five Personality traits. A total of 23 qualitative and quantitative studies published between 2006 and 2011 were identified and the results of the review indicated that extraversion has a positive influence on knowledge sharing (Amayah, 2011:3).

In their empirical study on knowledge-sharing attitudes and behaviours using 424 members of different work-related teams, De Vries *et al*. (2006:124) found that extraversion is positively and significantly related to both the eagerness and willingness to share knowledge. In another empirical study among 100 employees from a Chinese software company, investigating how individual characteristics and

organisational work practices influence knowledge sharing, Wang *et al.'s* (2011:17) results showed that extraversion had a positive significant effect on knowledge sharing. In a similar manner, Wei (2010:25) empirically investigated the effect of personality traits on knowledge sharing among IT professionals from large IT consulting firms in Netherlands. The findings revealed that extraversion was positively related to the willingness to share knowledge (Wei, 2010:33).

In light of the discussion presented above, the following relationship is hypothesised:

H^{5a}: There is a positive relationship between *Extraversion* and *Knowledge-sharing intention*.

Wei's (2010:34) empirical results further indicate that extraversion did not moderate the relationship between individuals' extrinsic motivation (rewards) and knowledge sharing, as they originally proposed. The empirical findings of Wang *et al*. (2011:17-18) also revealed that extraversion did not have a moderating effect on the relationship between evaluation/rewards and knowledge sharing. It is possible, because extraversion is associated with a desire to attain status (Barrick, Parks & Mount, 2005:761), and regularly exchanging useful knowledge with other employees enhances individuals' status among colleagues in a knowledge-sharing community. Therefore, management practices that evaluate and reward knowledge sharing are not required to activate the trait (Wang *et al*., 2011:21-22). Consequently, the moderating effect of extraversion on the relationship between rewards and knowledge sharing will not be empirically tested in this study.

With respect to the moderating effect of extraversion on the relationship between psychological contract breach and knowledge sharing, Lepoiev (2011:1) investigated the relationship between psychological contract breach and violation (outcome of breach) and employees' work-related outcomes. The study was conducted among employees from Europe, The United States and China and the results showed that extroverted individuals would express their disappointment when the promises made to them (psychological contract) were not fulfilled. However the results also showed that extroverts were likely to consider other

employment alternatives rather than taking destructive actions toward their business when their psychological contract is breached (Lepoiev, 2011:37). In another well-documented empirical study among seven well-established private and public organisations in Pakistan, Raja, Johns and Bilgrami (2011:403) successfully hypothesised that when the detected breach of psychological contract arouses feelings of violation among extraverted individuals, such individuals are likely to show strong reactions and are subsequently more likely to show a decrease in job satisfaction and performance and increasing the likelihood of them leaving the organisation (Raja *et al*., 2011:409). Knowledge is anchored in individual's minds and can get lost if they choose to leave the organisation (Bessick & Naicker, 2013:2; Rasula *et al*., 2012:147). As such, given the evidence presented above, the following relationships are hypothesised:

H^{5b}: *Extraversion* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{5c}: *Extraversion* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

b) Neuroticism

Neuroticism, for the purpose of this study, refers to an individual's propensity to easily get upset and to worry a lot, as well as to experience negative feelings such as nervousness and tension. Neurotic individuals are inclined to have a lack of trust in people and therefore have negative attitudes towards knowledge sharing. Hutasuhut's (2007:3) empirical findings revealed that this trait is negatively related to attitude towards knowledge sharing. In another empirical study on the relationship between personality traits and the willingness to share knowledge among employees in an Iranian university, Gharanjik and Azma (2014:81) found that neuroticism had a negative relation with the willingness to share knowledge. Consistent with the empirical findings presented above, Yoo and Gretzel (2011:618) also found a negative linkage between neuroticism and knowledge-sharing intention in their empirical study of how personality traits predict behaviour. This study was conducted among members of a commercial online research panel

residing in the United States (Yoo & Gretzel, 2011:613). Wang and Yang (2007:1431), in their empirical study on knowledge- sharing intention among scientists in a research and development laboratory in Taiwan, found that neuroticism is not significantly related to knowledge-sharing intentions. Based on the discussion presented above, the following hypothesis is formulated:

H^{6a}: There is a negative relationship between *Neuroticism* and *Knowledge-sharing intention*.

Concerning the moderating influence of neuroticism, and consistent with their prediction, Wang *et al*. (2011:19) found that the relationship between evaluation/rewards (accountability and incentive) and knowledge sharing was stronger for employees high in neuroticism compared with employees low in neuroticism. Consistent with Bordia *et al*. (2006:262), Wang *et al*.'*s* (2011:21) findings suggest that management practices that provide both evaluation and incentives for knowledge sharing could help overcome the negative effect of evaluation apprehension. A potential explanation for this result is that highly neurotic individuals are more sensitive to negative evaluation and value rewards. Consequently, with the availability of rewards (extrinsic motivation), such individuals spend more time and effort sharing more knowledge, to ensure that the shared knowledge is correct and valuable to other individuals, in order to reduce the chance of being evaluated negatively, and in order to gain rewards (Wang *et al*., 2011:21). The following hypothesis is subsequently formulated:

H^{6b}: *Neuroticism* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

In an empirical study that set out to examine the influence of motives and individual factors on the intention to share knowledge on a knowledge community platform, as well as taking into account the impact of moderating factors such as personality, Perik (2014:47) found that personality is a moderating factor on the relationship between self-efficacy (intrinsic motivation) and knowledge-sharing intention. Self-efficacy was found to be a significant positive influence on the intention to share knowledge among individuals with high scores on neuroticism,

while self-efficacy did not have a significant influence on the intention to share knowledge for individuals with low scores on neuroticism. On the contrary, Wei (2010:34) did not find empirical support for their hypothesis that neuroticism will moderate the relationship between rewards and knowledge sharing. Therefore, the following hypothesis is formulated:

H^{6c}: *Neuroticism* moderates the relationship between *Intrinsic motivation* and *Knowledge-sharing intention*.

Contrary to expectations, Lepoiev's (2011:32) findings showed that neuroticism did not moderate the relationship between psychological contract breach and counterproductive behaviours. The study did, however, reveal that neuroticism might moderate the relationship between psychological contract breach and turnover intentions (probability that an individual will leave his or her organisation) in such a way that the effect will be stronger for neurotic people than for emotionally stable ones (Lepoiev, 2011:30). In general, other research (Tallman & Bruning, 2008:691; Raja *et al*., 2004:351) indicate that individuals high in neuroticism have negative attitudes towards their organisation, such as job performance, career success and motivation. Also, neurotic individuals avoid long-term commitment, social skills, trust and taking initiative. Ho, Weingart and Rousseau (2004:288), who empirically investigated the effects of personality traits on broken promises among undergraduate students, also found that individuals who are high in neuroticism tend to experience more negative emotions pursuant to a psychological contract breach. Consequently, in this research, it would be expected that individuals high in neuroticism will have a stronger negative reaction to psychological contract breach than less neurotic individuals. Therefore, the following relationships are hypothesised:

H^{6d}: *Neuroticism* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{6e}: *Neuroticism* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

c) Openness to experience

In this study, *Openness to experience* refers to the extent that an individual is being original, open-minded, imaginative, inventive and a deep thinker. Open individuals tend to accept different opinions and new experiences and are linked to a positive attitude towards learning new things and the willingness to share knowledge (Lin & Wang, 2012:355; Wei, 2010:19). According to Hutasuhut's (2007:3) empirical findings, openness to experience is positively related to attitude towards knowledge sharing. Amayah (2011:3), in their review of empirical studies on knowledge sharing and personality, also note that openness to experience has been shown consistently to be positively related with knowledge-sharing intention. In an empirical study investigating individual differences on knowledge sharing, Matzler *et al*. (2011:306) suggest that openness to experience might be related to the adoption and use of new tools or technologies that facilitate knowledge sharing. In another empirical study exploring the determinants of individual engagement in knowledge sharing among employees from a large multinational company, research by Cabrera, Collins and Salgado (2006:260) revealed that openness to experience is related to knowledge sharing as well as to other important work outcomes such as the capacity to manage change within a business. Consistent with the findings above, Wang and Yang's (2007:1431) empirical research found that openness is significantly related to the intention to share knowledge. From the evidence presented, the following hypothesis is formulated:

H^{7a}: There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*.

Wang *et al*. (2011:19) report that the relationship between evaluation/rewards and knowledge sharing was stronger for employees low in openness to experience. Therefore, under an evaluation/reward condition, employees with low levels of openness engaged in significantly greater levels of knowledge sharing than employees with high levels. A possible explanation for this result is that individuals high in openness are more likely to seek, but not necessarily share knowledge, as a result of their natural curiosity (Wang *et al*., 2011:22). In this instance, Cabrera *et*

al. (2006:248) point out that openness to experience, as a reflection of an individual's curiosity and originality, could be a predictor of seeking insights from other individuals. Wei (2010:34), to the contrary, found no relationship between "open" individuals and the impact of rewards on knowledge sharing. Although scant, given the evidence on the possible moderating effect of openness to experience on the relationship between rewards and knowledge sharing, the following hypothesis is formulated:

H^{7b}: *Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

According to Raja *et al*. (2004:351), openness to experience has a limited research history, showing controversial structure and weak relevance for organisational behaviour. These authors consequently did not include openness to experience in their well-documented study on psychological contracts and personality. Berger (2009:20) also omitted openness to experience in their study on personality, psychological contract breach and work-related attitudes. Raja *et al*. (2011:404) in the same way state that the openness to experience trait is relatively less investigated compared to the other Big Five Personality traits, and it is therefore difficult to develop strong arguments for this trait. These authors argue that feelings of anger, distrust and frustration upon realisation of breach of promise would lead to a strong reaction. Open individuals might see a broken promise as a hurdle to their creative behaviour and self-expression, therefore showing a stronger reaction to breach (Raja *et al*., 2011:404). Consequently, these authors hypothesised and successfully tested that violation associated with negative outcomes (individuals' satisfaction and performance) arising from a breach of psychological contract, will be stronger for individuals high on openness to experience (Raja *et al*., 2011:404).

Individuals high in openness are unlikely to feel they must be subservient to the organisation. These people are likely to be risk takers and expect to be personally supported by the organisation (Tallman & Bruning, 2008:693). Lepoiev (2011:39), on the other hand, found no evidence of openness as a moderator of the relationship between psychological contract breach and work-related attitudes. In

conclusion, the researcher is of the opinion that the limited research history (Berger, 2009:20; Raja *et al*., 2004:351) of openness to experience calls for further investigation into the moderating influence of openness to experience on the relationship between psychological contract breach and knowledge sharing. Evidence (Raja *et al*., 2011:404) points towards the moderating effect of this trait on the relationship between psychological contract breach and work-related outcomes. The following relationships are therefore hypothesised:

H^{7c}: *Openness to experience* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{7d}: *Openness to experience* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

d) Agreeableness

Agreeableness, in this study, refers to the extent to which an individual gets along with others, as well as the degree to which an individual is being cooperative, considerate, forgiving and helpful to others. As knowledge sharing signifies an individual's helpfulness, cooperation and collaboration, agreeable individuals are likely to engage in knowledge sharing (Teh *et al*., 2011:49). With regard to the relationship between agreeableness and knowledge sharing, Hutasuhut (2007:3) reports that agreeableness is positively related to attitude towards knowledge sharing. According to De Vries *et al*. (2006:124), people who score high on the agreeableness scale are more likely to share knowledge than people with low scores. Matzler *et al*. (2008:309) in their empirical investigation of personality traits and knowledge sharing among employees in an internationally operating engineering company similarly report that agreeableness is positively related to knowledge sharing. The empirical findings of Wang and Yang (2007:1431) reveal that agreeableness is significantly related to the intention to share knowledge, while Teh *et al*. (2011:55) in their empirical study on the influence of personality traits on knowledge sharing found that agreeableness is significantly related to the attitude towards knowledge sharing. Generally, empirical studies show that

agreeableness is likely to have a positive relationship with knowledge sharing (Amayah, 2011:3) and the following hypothesis is therefore formulated:

H^{8a}: There is a positive relationship between *Agreeableness* and *Knowledge-sharing intention*.

Pertaining to the moderating effect of agreeableness, Wei's (2010:34) findings did not show support that the more agreeable a person is, the stronger the positive impact of extrinsic reward on knowledge sharing will be. Consequently, agreeableness did not show a moderating effect on the relationship between rewards and knowledge sharing. Likewise, Wang *et al*. (2011:19) empirical results did not support their hypothesis that the relationship between evaluation/reward and knowledge sharing is weaker for employees high in agreeableness than for those low in agreeableness. No evidence was therefore found for the moderating influence of agreeableness. As such, for the purpose of this study, the moderating effect of agreeableness on the relationship between rewards and knowledge sharing will not be empirically tested.

Furthermore, findings of Ho *et al*. (2004:285) reveal that higher levels of agreeableness relate to weaker negative emotive responses to broken promises. Agreeable individuals tend to experience fewer negative emotions when a breach occurs, but their trust in the other party diminishes. Agreeable individuals value their interpersonal relationships and are therefore interested in maintaining positive relations with the others (Ho *et al*., 2004:288). Consistent with these views, Lepoiev's (2011:31) results reveal that agreeableness was found to moderate the relationship between psychological contract breach and counterproductive behaviour. In other words, individuals with lower levels of agreeableness are more likely to react against their psychological contract being breached than people with higher levels of agreeableness. Agreeable people are more likely to maintain long-term and pleasant relationship with others that might influence the way they perceive their psychological contract. Agreeable people might therefore be more tolerant and forgiving to a perceived breach of psychological contract and feel fewer negative emotional reactions to breach than less agreeable people (Lepoiev, 2011:15). Berger’s (2009:53) empirical findings

also show that employees who perceived themselves as less agreeable seemed to react more strongly to perceived psychological contract breach than agreeable employees. Considering the discussion above, the following hypotheses are formulated:

H^{8b}: *Agreeableness* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{8c}: *Agreeableness* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

e) Conscientiousness

For the purpose of this study, *Conscientiousness* refers to the tendency of an individual to be attentive, reliable, efficient, persevering and to follow through with plans. Conscientious individuals believe that they can share their knowledge and skills to benefit the organisation. Such individuals are therefore likely to engage in knowledge sharing (Gharanjik & Azma, 2014:82). The results of Hutasuhut (2007:3) showed that conscientiousness is positively related to attitude towards knowledge sharing. The empirical results of Matzler *et al*. (2008:309) similarly show that conscientiousness influence knowledge sharing, whereas Gupta (2008:147) in his empirical investigation on the role of personality in knowledge sharing and acquisition reported that individuals high in conscientiousness are more involved in both knowledge sharing and knowledge acquisition activities. Other empirical findings (Gharanjik & Azma, 2014:81; Wang & Yang, 2007:1434) are consistent with the finding presented above, indicating that conscientiousness is positively related to knowledge sharing. On the contrary, findings from Cabrera *et al*. (2006:260), as well as Teh *et al*. (2011:55) did not reveal a significant relationship between conscientiousness and knowledge sharing. However, the majority of evidence points towards a positive relationship between conscientiousness and knowledge sharing. The following relationship is therefore hypothesised:

H^{9a}: There is a positive relationship between *Conscientiousness* and *Knowledge-sharing intention*.

Wang and Noe (2010:125) reported that because conscientious employees tend to have less concern for economic rewards, less conscientious employees would probably respond more favourably to work practices that are aimed at rewarding knowledge sharing. In addition, Wang *et al*'*s* (2011:19) empirical results showed that the relationship between evaluation/rewards and knowledge sharing was stronger for employees low in conscientiousness, compared with employees high in conscientiousness. This means that when individuals shared knowledge based on rewards and accountability, individuals who were low in conscientiousness shared significantly more knowledge than did employees high in conscientiousness. Rewards are probably less effective for highly conscientious individuals because these people are dutiful and less influenced by external incentives (Fong & Tosi, 2007:172). With respect to conscientious individuals, Wei (2010:34) did not find support for their hypothesis that there is a stronger positive impact of extrinsic rewards on knowledge sharing, the more conscientious an individual is. The following hypothesis is subsequently formulated:

H^{9b}: *Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.

Moreover, Lepoiev (2011:30-31) reports that conscientiousness was found to moderate the relationship between psychological contract breach and counterproductive behaviour (stronger for individuals with lower levels of conscientiousness). This finding is in line with Orvis *et al*. (2008:1188), who tested the hypothesis that conscientiousness moderates the relationship between psychological contract breach and work outcomes. Their empirical findings showed that when there is a breach of psychological contract, negative actions towards the organisation (decreased organisational loyalty, lower job satisfaction and higher turnover intentions) increase. In this regard, employees with low conscientiousness react more strongly to a breach of psychological contract than do employees with high conscientiousness. Raja *et al*. (2004:362) also found that there is a relationship between conscientiousness and psychological contract

breach. Individuals with higher levels of conscientiousness perceived lower levels of psychological contract breach than individuals with lower levels of conscientiousness. Consequently, the following hypotheses are formulated and tested:

H^{9c}: *Conscientiousness* moderates the relationship between *Transactional psychological contract breach* and *Knowledge-sharing intention*.

H^{9d}: *Conscientiousness* moderates the relationship between *Relational psychological contract breach* and *Knowledge-sharing intention*.

In summary, it is evident that there is a direct relationship between the various personality types and knowledge sharing. In addition, the relationship between individuals' motivation (such as receiving rewards), psychological contracts and knowledge sharing can be moderated by different personality types. However, the limited research in this regard calls for further investigation as proposed in the discussion and hypotheses presented above. The next section will deal with demographic variables as the control variables in the current study.

4.2.3 Control variables: demographic variables

Control variables are also known as attribute variables and refer to those variables that are characteristics of the respondent, instead of things the respondent does (Saunders, Lewis & Thornhill, 2009:368). In this study, demographic variables refer to characteristics of employees such as their gender, tenure, education, age, race, and language, which have an influence on knowledge-sharing behaviour. Dube and Ngulube (2012:68) contend that diversity and heterogeneity in terms of individuals' demographical characteristics may pose a challenge when it comes to knowledge sharing.

Mogotsi *et al*. (2011:2) claim that empirical literature that focuses on the role of demographic variables and knowledge sharing remains scarce. Nagamani and Katyayani (2013:114) similarly point out that there is a lack of literature that focuses on the role of demographic variables and knowledge sharing, while

Lauring and Selmer (2012:90-91) posit that few attempts have yet been made to link different types of diversity (for example gender, age or race) to knowledge sharing. These views are supported by Kharabsheh (2007:424) who suggests that little work has been done on the relationship between demographic variables and knowledge sharing. Limited research has been conducted regarding the impact of demographic factors on knowledge sharing, and the available studies on this topic provide inconclusive and inconsistent results (Pangil & Nasurdin, 2008:2).

Bordia *et al*. (2006:276) empirically investigated the influence of gender on knowledge sharing. They took two contexts into consideration, namely when sharing occurs directly between individuals, and when sharing takes place through contributions to an electronic knowledge management system. Their findings showed that females had higher perceptions about the benefits of knowledge sharing than their male counterparts. This finding suggests that gender could have an effect on knowledge-sharing behaviour. Chennamaneni (2006:19) indicated that, in contrast to their male counterparts, females need a more positive social interaction culture before they will recognise a knowledge-sharing culture as positive. In another empirical study on knowledge sharing from a perspective of social network ties, Lin (2006:236) found that gender moderated the effect of ties on knowledge sharing. More specifically, the relationship between instrumental ties and knowledge sharing was stronger for females, whereas the relationship between expressive ties and knowledge sharing was stronger for males. As such, females may be more likely than males to engage in knowledge sharing when influenced by instrumental ties. The opposite applies with respect to expressive ties and knowledge sharing (Lin, 2006:237-238). Pangil and Nasurdin's (2008:5) empirical findings show that men share more tacit knowledge than women, while the empirical findings of both Nagamani and Katyayani's (2013:120) and Mogotsi *et al*. (2011:5) found that gender had no significant influence on knowledge sharing.

Tenure is another demographic variable that influences knowledge sharing. According to Keyes' (2008:45) empirical findings, tenure within the business or industry has no effect on knowledge sharing. Conversely Bakker *et al*. (2006:602) reported a positive relationship between tenure and knowledge sharing. These

authors claimed that the longer team members had been together, the more likely they were to share knowledge among themselves. Similarly, Bordia *et al*. (2006:270) empirically found organisational tenure to be a good predictor of interpersonal knowledge sharing. Watson and Hewitt (2006:150) argued that as organisational tenure increases, trust and commitment to the business also improve; therefore, tenure would be positively related to knowledge sharing. Mogotsi *et al*. (2011:3) suggest that these claims made by Watson and Hewitt (2006:150) are sensible, as both trust (Chowdhury, 2005:321) and commitment (Van den Hooff & De Ridder, 2004:117) have been found to be positively related to knowledge-sharing behaviour. The empirical findings of Watson and Hewitt (2006:159) also confirmed their hypothesis. In line with the empirical findings presented above, Pangil and Nasurdin (2008:2) put forward that organisational tenure could be important to encourage knowledge-sharing behaviour because the longer an individual works for a certain business, the more knowledge he or she acquires and therefore feels more indebted towards the business with respect to sharing knowledge in the business. Apart from organisational tenure, job tenure is also regarded as significant in knowledge sharing. The longer an individual has been working in a specific position, the more comfortable that individual is regarding the knowledge he or she possesses relating to that specific job. Therefore, the individual will be more able to share knowledge with colleagues (Pangil & Nasurdin, 2008:2).

Referring to education as a demographical factor, Keyes' (2008:45) research demonstrated that education, to some degree, had an impact on knowledge sharing. The majority of respondents in Keyes' (2008:45) study believed that education did not have an effect on knowledge sharing, but some of the participants were of the opinion that the higher the educational level, the more likely it was that the person would share knowledge. As a result, the lower the educational level, the less likely individuals would be to share knowledge. In addition, the empirical findings of Nagamani and Katyayani (2013:121) indicate that respondents with a doctoral qualification contributed more to behaviour than others with postgraduate qualifications. Individuals with doctorates might have acquired more knowledge through more advanced education and research activities compared to individuals with lower qualifications, therefore making them

more willing to get involved in knowledge sharing activities (Nagamani & Katyayani, 2013:121). This finding is in line with the results of another empirical study (Lou, Yang, Shih & Tseng, 2007:146) on the knowledge-sharing behaviour of information management instructors at technological universities in Taiwan that also revealed that instructors with doctorates may be more willing to share their knowledge with others than instructors with masters degrees. On the contrary, Abili, Thani, Mokhtarian and Rashidi (2011:1705) found that educational level does not have an effect on knowledge sharing. Similarly MacCurtain, Flood, Ramamoorthy, West and Dawson (2010:219) indicated that educational level of the top management did not have any direct effect on knowledge sharing.

Keyes (2008:46) implied that age also has a relationship with knowledge-sharing behaviour. More specifically, senior workers who are more mature in years may feel threatened by younger workers and therefore do not share knowledge with them. A further interesting finding of Keyes' (2008:46) empirical study was that younger people also might be more technologically skilled than older employees, who preferred face-to-face and email communication to share knowledge. In line with this sentiment, Lou *et al*.'*s* (2007:148) empirical results indicate that respondents aged 30-39 tended to be more willing to share knowledge than respondents who were aged 40-49. In Nagamani and Katyayani's (2013:121) research, the respondents in the 25-30 age group showed less knowledge-sharing behaviour than respondents in higher age groups. Mogotsi *et al*.'*s* (2011:5) empirical findings showed that age was not statistically significantly related to knowledge-sharing behaviour.

Regarding race/ethnicity, Keyes (2008:42) found that ethnicity influence knowledge sharing. The ability to understand what is being communicated as well as cultural mores relating to the way different groups communicated plays an important role in knowledge sharing. Ethnic minorities are also more likely to seek advice and support from their heterogeneous counterparts than from the ethnic majority (Evans, 2012:39). In another empirical study (Ziaei, Walczak & Nor, 2014:246) investigating the impact of ethnic diversity on short-term knowledge sharing, results showed that knowledge sharing within groups as a whole suffers as ethnic diversity increases. In their exploratory research on knowledge sharing in

a multicultural environment, Dube and Ngulube (2012:71) found that respondents were not motivated to share knowledge on the basis of race. However, it should be noted that differences in demographic characteristics (such as race) could function as barriers to interaction and decrease social interaction due to inherent differences, especially in a country like South Africa that is characterised by its racial, cultural, ethnic and national diversity (Dube & Ngulube, 2012:71). Pangil and Nasurdin's (2008:4) empirical findings indicate that race has an influence on knowledge sharing. These authors investigated the influence of demographic factors on knowledge-sharing behaviour among research and development employees.

Furthermore, Chiu *et al*. (2006:1883) investigated knowledge sharing in virtual communities and found that shared language has a significant positive effect on the quality of knowledge shared. In another empirical (Amin & Shahid, 2013:38) study investigating the influence of language on knowledge sharing in five selected multinational companies located in Sweden, findings revealed that a shared (common) corporate language facilitate more knowledge sharing in an environment where a variety of individuals with different cultural backgrounds and native languages work together. In congruence with the findings above, the empirical findings of Isa, Abdullah and Senik (2010:82) who investigated the dimensions and items of social capital in fostering tacit knowledge sharing among team members, revealed that shared language fosters the sharing of tacit knowledge. These authors further indicate that when team members communicate to share specialised technical knowledge with one another, the words that they use might sometimes mean different things to different people. A shared language may provide a common tool for better understanding others (Isa *et al*., 2010:83). Similarly, Evans (2012:198) empirically found that shared language has a positive influence on trust. As such, respondents could have more meaningful outcomes from the interactions with colleagues they share language with. As a result of the positive working relationships, respondents could be encouraged to interact more frequently. Also, by avoiding possible misunderstandings in during communications, more opportunities exist to exchange ideas (Evans, 2012:198).

Against this background, the present study incorporates some demographic issues related to individuals' knowledge-sharing behaviour such as gender, tenure, education, age, ethnic background, and language. Demographic variables are consequently used as a control variable in this study and the following hypothesis is formulated:

H^{10}: There is a relationship between selected *Demographic variables* and *Knowledge-sharing intention*.

4.3 SUMMARY AND CONCLUSIONS

This chapter presented a hypothesised model of individual-related factors that influence *Knowledge-sharing intention*. This model was based on an extensive review of knowledge-sharing literature that highlighted various gaps with respect to the selected factors and knowledge sharing as presented in the hypothesised model. In this study, the relationships between *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*, *Relationship conflict, Task conflict*, *Extraversion*, *Neuroticism*, *Openness*, *Agreeableness*, *Conscientiousness* and *Knowledge-sharing intention*, will be empirically tested, as suggested by the hypothesised relationships presented in this chapter and subsequent proposed hypothesised model. Several anecdotal and empirical sources identified and justified the inclusion of these factors in the hypothesised model, as knowledge-sharing research has revealed a significant gap with respect to these specific individual-related factors and their relationship with knowledge sharing.

In the next chapter, the research design, chosen research methodology, data collection and analysis techniques to be employed in this study will be discussed.

CHAPTER 5
RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

The previous chapter presented the proposed hypothesised model of individual-related factors that influence knowledge-sharing intention. The focus in this chapter is on the research design and methodology that was employed to empirically test the relationships between the independent and dependent variables. As such, this chapter will address the third and fourth methodological research objectives, namely to to determine an appropriate research design that would be most suitable for this study to facilitate the answering of all the research questions, and to develop a measuring instrument to empirically test the relationships as described in the hypothesised model.

This chapter provides a brief description of the preliminary assessment of the proposed hypothesised model. This is followed by a discussion of the study population, sampling unit, sampling method and the method of data collection. Thereafter, the dependent and independent variables of the study are operationalised and a detailed explanation of how the measuring instrument was developed and administered is put forward. Following this, the sample size requirements and statistical analysis techniques that were used to assess the validity and reliability of the results are discussed. The chapter concludes with a description of the SEM technique, which was used to test the relationships in the hypothesised model.

5.2 PRELIMINARY ASSESSMENT OF THE HYPOTHESISED MODEL

Based on a literature review in Chapters 2 and 3, a model of individual-related factors hypothesised to influence knowledge-sharing intention was proposed in Chapter 4 (Figure 4.1). The model was presented at a doctoral colloquium at the Nelson Mandela Metropolitan University (NMMU) and opinions were solicited from a number of academics specialising in the field of knowledge management to identify potential shortcomings of the model, the face validity of the hypothesised

model, measuring instruments to measure the constructs, and potential difficulties inherent in the research methodology and statistical analysis techniques used.

Following the preliminary assessment of the model, minor changes were made to the hypothesised model.

5.3 QUANTITATIVE TESTING AND ANALYSES

5.3.1 Population studied

A population is the total collection of elements (units of study) about which a researcher wants to make some conclusions (Cooper & Schindler, 2011:364) and from which a sample is taken (Leedy & Ormrod, 2013:206). Given the background and importance of knowledge sharing in knowledge-intensive businesses, the population of this study was limited to employees working in knowledge-intensive businesses. If these businesses are to gain the most from their intellectual capital, as well as to compete effectively in the marketplace, their highly educated and skilful employees need to share knowledge with each other. Consequently, the population in this study includes all employees in knowledge-intensive businesses based in South Africa. Although knowledge-intensive businesses are widely distributed across the country, a complete database of such businesses is not available.

5.3.2 Sample unit and sampling method

In many research studies it is often impossible to include every person of the population in the sample. According to Cooper and Schindler (2007:717), and Leedy and Ormrod (2013:206-207), a sample is a subset of the population that is carefully selected to represent the population. As no database exists of employees working in knowledge-intensive businesses in South Africa, it was impossible to select the whole population to participate in the study and therefore a sample had to be drawn.

The sampling unit or unit of analysis refers to a single element (or group of elements) subject to selection in the sample to which the variables under study and the research problem refers, and about which data is collected and analysed (Collis & Hussey, 2009:128; Welman, Kruger & Mitchell, 2005:57). While individuals remain popular units of analyses, research problems can also be solved through examining other units of analysis such as groups/teams in an organisation (Fox & Bayat, 2012:32). For the purpose of this study, the unit of analysis was individual employees working in knowledge-intensive businesses. Previous research has paid inadequate attention to knowledge sharing between employees, in that it rather concentrates on knowledge creation and transfer at a team, unit or organisational level. This presents a serious shortcoming in knowledge-sharing research as the accumulation of team and organisational knowledge rests on knowledge sharing between employees (Wang *et al*., 2011:2).

Regarding sampling techniques, two types exist, namely probability or representative sampling and non-probability or judgement sampling (Saunders *et al*., 2009:213). In probability sampling the probability that any element or member of the population will be included in the sample can be determined (Welman *et al*., 2005:56), whereas with non-probability sampling, the probability cannot be determined (Saunders *et al*., 2009:213). In the present study, a form of non-probability sampling, namely convenience sampling, was used for the data collection as data was collected from members of the population who are conveniently available to participate in the study. Sekaran and Bougie (2010:276) note that convenience sampling is particularly used during the exploratory stage of a research project and is conceivably the best way of obtaining information quickly and efficiently.

Against this background, the researcher used convenience sampling and requested three knowledge-intensive businesses representative of the population to participate in the study. One company declined the request owing to confidentiality concerns. Another business, after agreeing to participate in the study, withdrew a few days before the data collection process was scheduled to start because a competitor had acquired this company. This necessitated the researcher to commence with the data collection process with only one

knowledge-intensive business signifying the population and agreeing to participate in the study. In this respect, the researcher contacted a company director who verified that most work in this business is of an intellectual nature, and that well-educated, qualified employees form the major part of the workforce, as is typical of a knowledge-intensive business (Swart & Kinnie, 2003:60-61). The subsequent paragraphs describe the selected business.

The business selected for this research study is a leading South African consulting company. A fictional name is assigned to the selected company, namely "GlobalCon Solutions", in order to protect its anonymity. GlobalCon Solutions has a devoted team of highly trained and educated consultants throughout South Africa who use their skills to provide other businesses with integrated business solutions, which include professional legal advice, incapacity management, risk management, compliance management, gap analysis and formulation of strategies. In fact, all GlobalCon's consulting staff are graduated professionals who have endured rigorous training and examinations before being appointed on a permanent basis. In addition to their knowledge-intensive qualified staff, the company has strategic business partners to ensure that it gives its clients the best possible solutions available.

GlobalCon Solutions has an outstanding reputation in South Africa and has provided its services to leading financial, engineering and manufacturing businesses, to mention only a few. Given the knowledge-intensive nature of the company as is evident from the description above, the researcher is of the opinion that the company's employees and especially managers were suitable respondents for the present study as they are representative of the population. In total, 320 employees in GlobalCon were requested to participate in the data collection process.

As discussed, because of the untimely withdrawal of the businesses that initially agreed to participate in the data collection process, the researcher was obliged to continue the data collection with only one company (GlobalCon Solutions). Anticipating that an unrealistically high response rate would have been required from this company to generate a sufficient number of responses for statistical

analyses (refer to section 5.3.8 on sample size requirements), convenience sampling was used to generate additional respondents. In this regard, the researcher was fortunate to obtain an alumni list from a leading higher education institution with contact details of professional individuals working in knowledge-intensive businesses. Through the human resources director of this higher education institution, the researcher verified that the alumni list contained contact details of well-educated and qualified individuals, and that these individuals work in businesses where the main focus of their job is of an intellectual nature, which is a characteristic of a knowledge-intensive business. To generate potential respondents from this alumni list, a total of 4500 professional individuals who were available to participate in the research study were requested to partake in the data collection process. The approximate distribution percentage of these individuals per industry is indicated in brackets as follows: finance and business services (35%), information and communication technology (ICT) (15%) and government services (50%).

The researcher is of the opinion that the sample described above is representative of the population and would give effect to the purpose of this study, which is to identify and empirically test the individual-related factors influencing *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses. Chapter 6 (section 6.2) provides more detail regarding the sample and response rate of the present study. In summary, the study sample includes respondents from the list described above, as well as respondents from GlobalCon Solutions.

5.3.3 Method of data collection

Surveys are the most popular and common method of generating primary data in the field of business and management research. According to Quinlan (2011:322) structured questionnaires are widely used in survey research, primarily in quantitative research, with the purpose of generating quantitative data, which indicates a positivistic perspective in research. Leedy and Ormrod (2013:189) explain that survey research allows for the collection of information (such as characteristics, opinions, attitudes or experiences) about respondents by asking them questions and summarising their responses with a variety of statistics. In

studies where individual people are the units of analysis (as is the case in the present study), surveys are mainly used and regarded as the most efficient method available to collect original data from a large population (Babbie & Mouton, 2001:232). Surveys are flexible, and when properly conducted, provide valuable information about behaviour within a business (Zikmund *et al*., 2013:185-186). The strength of the survey (as a primary data collection approach) lies in its versatility. With well-developed questions, information can be collected faster and with less effort than when gathered by observation (Cooper & Schindler, 2011:243).

In the present study, primary data on the individual-related factors that potentially influence knowledge-sharing intention in knowledge-intensive businesses was collected by means of the survey technique. The questions included in the questionnaire form an integral part of the success of a survey (Cooper & Schindler, 2011:328; Saunders *et al*., 2009:361). This is discussed in the following section on the development of the measuring instrument.

5.3.4 Development of the measuring instrument

In order to produce a precise and simple data-collecting instrument, the researcher needs to study previous examples of instruments and scales in literature and consider the data requirements of the research project. The content, presentation, order and length of the questionnaire are key issues to consider when designing the instrument (Quinlin, 2011:326-337).

The measuring instrument developed in this study (see Annexure A) includes a cover letter and four sections. The cover letter formed part of an email sent to the respondents and provided details concerning the purpose of the study and the type of information being solicited. Confirmation was also given from the NMMU that the study was conducted under the support of the Unit for Applied Management Sciences for doctoral research purposes. In addition, ethical clearance was obtained for the research, the ethical clearance number being H-15-BES-BMa-008. The respondents were assured of their confidentiality and that names of individuals will not appear in the research report. In this regard, respondents were informed that only aggregate data and summary statistics would

be reported. Moreover, respondents were given clear instructions on how to respond to the statements and how to submit the completed questionnaire electronically. The cover letter was printed on the official letterhead of the Unit for Applied Management Sciences of the NMMU and included names of the research supervisors and the ethical clearance number obtained from NMMU.

Sections 1 and 2 consisted of statements (items) relating to the dependent (*Knowledge-sharing intention*) and independent variables (individual-related factors influencing *Knowledge-sharing intention*) in this study. With regard to each statement, respondents were asked to indicate their extent of agreement using a Likert-type scale. The items were designed based on previous studies to assess the factors influencing *Knowledge-sharing intention* in knowledge-intensive businesses. A seven-point Likert-type interval scale was used in section 1 and interpreted as 1 = Strongly disagree and 7 = Strongly agree, while in section 2 a five-point Likert-type scale was used and anchored by descriptors ranging from 0 = Never to 4 = Always. Using an interval scale for the measuring instrument allows the required inferential statistical data analysis to be undertaken (Cooper & Schindler, 2011:277; Saunders *et al*., 2009:414). Interval rating scales possess sufficient numeric properties for the purpose of statistical analyses, and a wide range of statistical techniques such as t-tests, F-tests, and product moment correlation tests can be applied to data collected in this format (Wegner, 2012:12; Cooper & Schindler, 2011:277).

Section 3 contained questions pertaining to the demographic information of the respondents. This section specifically requested information on the respondents' age, gender, language, education, ethnic background and tenure, which have an influence on knowledge-sharing intention. In section 4, respondents were given an opportunity to participate in a lucky draw after completing the online survey. The researcher acknowledges the impact of a lucky draw with respect to potential biases in completing the questionnaire; however, no significant influence of response bias could be established in the present study. The development of the scales for the dependent and independent variables, as well as their operationalisation, is given in the next section.

5.3.5 Scale development and operationalisation of variables

In research, certain concepts and constructs must be measured, which call for more rigorous definitions than, for example, those found in a dictionary. These definitions are known as operational definitions and are stated in terms of specific criteria for testing or measurement. These definitions must state the characteristics that can be counted or measured, and how they are to be observed. Confusion about the meaning of concepts can destroy the value of a research study. Therefore specifications and procedures must be clear enough for any competent person using them to understand the object in the same way. Operational definitions may vary, depending on the purpose of the study (Cooper & Schindler, 2011:57).

Bryman and Bell (2011:154) explain that in order to provide an operational definition of a concept, it is necessary to identify indicators that will stand for the concept. Such indicators can be devised through questions that are part of a questionnaire concerning respondents' attitudes and behaviour. An indicator is therefore something that is devised or already exists and that is employed as though it was a measure of a concept. In fact, variables are often operationalised when researchers ask questions to get data for analysis and interpretation (Babbie & Mouton, 2001:233). In this study, in order to operationalise the latent variables, a combination of knowledge-sharing literature (as discussed in previous chapters), and EFA was used.

In the present study, it was essential to define the variables of the proposed hypothesised model accurately and clearly to ensure the validity and reliability of the measuring instrument for valid conclusions to be drawn. According to Quinlan (2011:336), the questionnaire and scale designed by the researcher must be a valid measure of the phenomenon being studied. The items used in the questionnaire must be relevant and essential so as to provide the data required for the research study. Replicating or building on measuring instruments developed by previous researchers helps to improve validity and reliability. Where possible, items from existing measuring instruments that have proved to be reliable and valid in previous research studies were used in the present study. In instances

where sufficient items were not available, the researcher formulated additional questions based on a rigorous analysis of secondary sources. This was done to make sure that most variables in the measuring instrument were represented by at least five items. It is appropriate to revise and update existing questionnaires and scales to meet the needs of a new study (Hair, Celsi, Money, Samouel & Page, 2011:95-96).

The operational definitions of the dependent and independent variables will be presented below. They are based on an interpretation of secondary sources and on existing empirical studies. The development of the scales to measure the different variables will also be discussed. Table 6.3 in Chapter 6 provides more detail regarding the items relevant to the scales for each construct used in the research instrument.

5.3.5.1 Dependent variable: Knowledge-sharing intention

While reference has been made in previous chapters to knowledge-sharing attitudes (an individual's positive feelings about sharing his or her knowledge) and knowledge-sharing behaviour (degree to which an individual actually shares knowledge with others), it was also explained (see section 4.2.1 in Chapter 4) that the dependent variable of this study is knowledge-sharing intention (willingness of an individual to engage in knowledge sharing).

Hau *et al*. (2013:357), in their study on employees' tacit and explicit knowledge-sharing intention, define knowledge-sharing intention as the degree to which one believes that one will engage in a tacit or explicit knowledge-sharing act. In another study investigating the role of trust and altruism in knowledge sharing, Chen, Fan and Tsai (2014:169) refer to knowledge-sharing intention as the willingness of individuals within an organisation to share their knowledge with others they know. In a similar manner, Olapegba *et al*. (2013:34) in their study on personality and knowledge sharing, refer to knowledge-sharing intention as the extent to which an employee is willing to share useful skills and expertise with colleagues in an organisation.

Based on these results, and for the purpose of this study, *Knowledge-sharing intention* refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise. Tacit knowledge includes aspects such as subjective insights and intuitions that are deeply rooted in an individual's values, actions, experiences and ideals, and which are personal and difficult to formalise and cannot be shared as easily as explicit knowledge (Matzler *et al*., 2011:298; Eucker, 2007:12; Chennamaneni, 2006:11). In developing the scale to measure knowledge-sharing intention in knowledge-intensive businesses, this study will draw from previous literature on knowledge sharing to develop a reliable scale to use for the empirical investigation.

A number of researchers have developed scales to measure the degree of knowledge sharing within a business. Chow and Chan (2008:461) developed two five-item scales to measure attitudes toward knowledge sharing and intention to share knowledge. The scales returned high Cronbach-alpha coefficients of 0.91 and 0.89 respectively. These values are both higher than the acceptable value of 0.60 (Zikmund *et al*., 2013:302). The nine-item scale on knowledge sharing developed by Usoro *et al*. (2007:206) reported a Cronbach-alpha coefficient of 0.95. Lee (2001:330) developed a three-item measurement for implicit knowledge sharing. Each item was measured on a five-point Likert scale ranging from "strongly disagree" to "strongly agree" and reported a Cronbach-alpha of 0.76.

In her study on the determinants of knowledge-sharing behaviours, Chennamaneni (2006:41) used multiple items (including reverse items) based on a Likert-type scale to measure constructs and to improve the reliability and validity of the measuring scale. Chennamaneni (2006:41) developed a seven-item scale (reliability = 0.94) to assess knowledge-sharing behaviour. These items used to measure knowledge-sharing behaviour were developed based upon the studies of Lee (2001), Teigland and Wasko (2003) and Bock *et al*. (2005), which all relate to knowledge sharing. Bock *et al*. (2005:109) studied individuals' intention to share knowledge using a five-item scale and reported high Cronbach-alpha coefficients of 0.92 for the scale measuring intention to share explicit knowledge and 0.93 for the scale measuring intention to share implicit knowledge. Bock *et al.'s* (2005:108) five-item scale to measure attitudes towards knowledge sharing also revealed a

high internal reliability of 0.92. Teigland and Wasko (2003:273) developed eight items to measure the trading or sharing of information that span both intra-organisational and extra-organisational boundaries. The individual survey items that made up a theoretical construct were assessed for internal reliability using the internal composite reliability (ICR). The ICR is calculated by squaring the sum of the component loadings to an indicator, then dividing by the sum of squared loadings plus the sum of the error terms. The ICR is interpreted in the same way as a Cronbach's coefficient. Values of 0.91 and 0.94 were reported for the items measuring internal and external information trading respectively, indicating adequate reliability (Teigland & Wasko, 2003:275-276).

De Vries *et al*. (2006:122) used two four-item scales developed by Van den Hooff and Hendrix (2004:9) to measure both knowledge collecting and knowledge donating (sharing). In previous studies, the reliabilities of the knowledge collecting and donating scales were respectively 0.72 and 0.68. However, in De Vries *et al.'s* (2006:122) study, the Cronbach-alpha coefficient of knowledge collecting was 0.75 and the reliability of knowledge donating 0.84. In Evans's (2012:76) study on knowledge sharing and the role of trust and other social-cognitive factors in an organisational setting, a five-item Likert-type scale was used to measure the willingness of knowledge sharing. The scale reported acceptable Cronbach-alpha values. Evans's (2012) items are similar to those used in Holste's (2003:75) study. Holste (2003:75) measured the sharing of explicit knowledge and tacit knowledge. Holste (2003:75) created four items to measure explicit knowledge sharing and another four items to measure tacit knowledge sharing, based on the examples of explicit and tacit knowledge identified in his literature review. Cronbach-alpha values of 0.90 and 0.85 were reported for explicit and tacit knowledge sharing respectively.

In his study on the effects of extrinsic and intrinsic motivation on employee knowledge-sharing intention, Lin (2007a:140) used two four-item scales to measure attitudes and intention toward knowledge sharing. The study used composite reliability measures to indicate the reliability of the scales. A popular alternative to Cronbach-alpha coefficient is composite reliability and this is normally calculated in combination with SEM (Peterson & Kim, 2013:194). The

composite reliability values for attitude and intention toward knowledge sharing were 0.87 and 0.85 respectively, which exceeded the benchmark of 0.70 recommended by Nunnally and Bernstein (1994).

Gu and Wang (2013:82) investigated how conflicts may affect intention to share knowledge in a virtual team. These authors also calculated composite reliabilities to assess the reliability of their scales that measure attitude and intention to share knowledge. Both the scales measuring attitude (0.81) and intention (0.73) to share knowledge consisted of five items and reported composite reliability values greater than 0.70. Lin *et al*. (2014:93) used a five-item Likert scale to measure knowledge-sharing behaviour. Their study involved a longitudinal and multilevel investigation on factors influencing knowledge-sharing behaviour. The Cronbach-alpha for the scale was 0.84. Van Woerkom and Sanders (2010:143) used similar scales to those of the researchers mentioned above. These authors used a five-item scale to measure knowledge sharing that reported a sufficient reliability (α = 0.71). In a similar way, Olatokun and Nwafor (2012:223) used two three-item scales to measure the attitude towards knowledge sharing and knowledge-sharing intention. Cronbach-alpha values of 0.67 and 0.63 were reported for attitudes and intention to share knowledge respectively. Finally, Chatzoglou and Vraimaki (2009:253-254) measured knowledge-sharing behaviour (five-item scale), knowledge-sharing intention (five-item scale) and attitudes toward knowledge sharing (five-item scale) among bank employees in Greece using a Likert-type scale. Sufficient composite reliability values of 0.83, 0.89 and 0.85 were reported respectively (Chatzoglou & Vraimaki, 2009:265).

In this study, a six-item scale was developed to measure the factor *Knowledge-sharing intention*. The scale was based on the scales of previous empirical studies that returned reliable and valid results (Gu & Wang, 2013:85; Evans, 2012:288; Olatokun & Nwafor, 2012:231; Chatzoglou & Vraimaki, 2009:265; Chow & Chan, 2008:464; Lin, 2007a:142; Chennamaneni, 2006:114; Lee, 2001:330) as well as on the knowledge-sharing literature presented in Chapters 2, 3 and 4 of this study. As the previous scales also tested other behavioural concepts of knowledge sharing (such as the attitudes toward knowledge sharing, and actual knowledge-sharing behaviour), the wording of the items in such scales was slightly adjusted to

make the items more suitable for the present study testing *Knowledge-sharing intention*.

5.3.5.2 Independent variables

In Chapter 4 a number of individual-related factors that influence knowledge-sharing intention were identified and depicted in the hypothesised model (Figure 4.1). The individual-related factors included in this model, and which subsequently serves as the independent variables in this study, were: *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*, *Relationship conflict, Task conflict*, *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness* and *Conscientiousness*.

Based on the interpretation of both secondary sources and a number of previous empirical studies, the independent variables were operationalised and are presented below. For each independent variable, an explanation is presented of how the scale was developed and the items selected to measure the variable.

a) Individuals' awareness (of the significance of knowledge sharing)

In the present study, *Individuals' awareness* refers to the ability of individuals to realise the importance and value of sharing their knowledge with others. Individuals not only consider their own payoff for sharing knowledge, but also the usefulness of their knowledge to others. Being aware of the knowledge needs of other individuals is therefore also encompassed in this variable.

Ismail and Yusof (2010:7), in their study on knowledge sharing quality, refer to awareness as the degree to which an individual believes that the understanding of knowledge management and appreciation of the importance and benefits of knowledge sharing will influence knowledge-sharing quality. These authors used a three-item Likert-type scale to measure individuals' awareness. The scale reported a sufficient Cronbach-alpha value of 0.78. In their study on the determinants of knowledge sharing, Ali (2012:137) used a four-item Likert-type scale to measure

individuals' awareness. No Cronbach-alpha value was reported for the scale measuring individuals' awareness, however an overall Cronbach-alpha (0.95) for their measuring instrument revealed sufficient reliability. In another study on the factors affecting knowledge-sharing behaviour, Alhalhouli *et al*. (2014:923) describe awareness as an understanding or realisation of the significance of knowledge, whereby knowledge sharing significantly improves with heightened awareness. The scale used to measure awareness reported a high reliability (Cronbach-alpha of 0.84). The authors did however not reveal the items used in the scale that measured awareness in their study.

Several self-generated items based on secondary sources (such as Rahab *et al*., 2012:118; Cress *et al*., 2007:434; Van den Hooff & Van Weenen, 2004:22) were developed, in addition to using items from existing studies (Ali, 2012:137; Ismail & Yusof, 2010:7) to develop a five-item scale to measure *Individuals' awareness* of the significance of knowledge sharing in this study. Minor adjustments were made to the wording in the items used from previous studies to make the scales more suitable for the present study.

b) Individuals' intrinsic motivation to share knowledge

Individuals' *Intrinsic motivation* to share knowledge in this study refers to the intrinsic benefits such as enjoyment in helping others, satisfaction and self-efficacy that employees consider as motivation to share knowledge. Ehtamo (2013:58), in his study on individuals' knowledge sharing, defines intrinsic motivation as an employee's motivation to share knowledge because he or she finds knowledge sharing interesting, enjoys doing it, and feels inherent satisfaction to share knowledge. Ehtamo (2013:64) used a five-item scale to measure intrinsic motivation (Cronbach-alpha of 0.83) and indicated sufficient reliability (Ehtamo, 2013:76).

In their study, Minbaeva, Makela and Rabbiosi (2012:394-395) measured intrinsic motivation with a three-item scale and reported a sufficient Cronbach-alpha value of 0.91. In Lin's (2007a:139-142) study, intrinsic motivation was measured on two four-item scales. One scale measured knowledge self-efficacy (composite

reliability of 0.86) as intrinsic motivation factor and the other scale measured enjoyment in helping others as intrinsic motivation factor (composite reliability of 0.86). Both scales revealed sufficient reliability.

In Olatokun and Nwafor's (2012:222-223) study, knowledge self-efficacy (three-item scale) and enjoyment in helping others (two-item scale) were measured as intrinsic motivation factors to share knowledge and reported sufficient Cronbach-alpha values of 0.73 and 0.75 respectively. In Olatokun and Nwafor's (2012:220) study, knowledge self-efficacy referred to employees' judgements of their capability to share knowledge that is valuable to the organisation, while enjoyment in helping others focused on employee perceptions of pleasure gained through knowledge sharing.

In Kankanhalli *et al.'s* (2005:127) study, intrinsic benefits for knowledge sharing were measured on two four-item scales. As was the case in previous research (Olatokun & Nwafor, 2012; Lin, 2007a) one scale related to knowledge self-efficacy, while the other scale related to enjoyment in helping others. Both scales reported a high Cronbach-alpha value of 0.96.

In congruence with the scales of Ehtamo (2013:145), Olatokun and Nwafor (2012:230-231), Lin (2007a:142) and Kankanhalli *et al*. (2005:141-142), and the literature on knowledge sharing as discussed in previous chapters, a five-item scale was developed to measure *Intrinsic motivation* to share knowledge in this study. Minor adjustments to the wording in previous scales were made to make the items more suitable for the present study.

c) Individuals' extrinsic motivation to share knowledge

Individuals' *Extrinsic motivation* to share knowledge refers, in this study, to the extrinsic benefits such as promotion, organisational rewards, acknowledgement, job security and reciprocity that employees consider as motivation to share knowledge. Chen (2011:1391) in his study on the effects of relationship conflict, reward, and reputation on knowledge sharing, measured extrinsic motivation (such as reward and reputation) on a four-item and five-item Likert scale respectively.

The reliability statistics for rewards show a Cronbach-alpha of 0.92, while a Cronbach-alpha of 0.90 is reported for reputation indicating sufficient reliability for these scales. In Ehtamo's (2013:58) study, extrinsic motivation is defined as the motivation of an employee to share knowledge to satisfy an external demand or reward contingency (extrinsic) or to maintain and enhance his or her feelings of worth and acceptance in his or her organisation. Ehtamo (2013:64) used a six-item scale to measure extrinsic motivation (Cronbach-alpha of 0.89) and showed sufficient reliability (Ehtamo, 2013:76).

Minbaeva *et al*. (2012:394-395) operationalised the variable extrinsic motivation as individual-level responsiveness to incentives to behave in a certain way (for instance, sharing knowledge) and in their study was measured on a four-item scale that revealed a high Cronbach-alpha value of 0.90. In a similar way, Lin (2007a:139-142) measured extrinsic motivation on two four-item scales. One of the scales measured expected organisation rewards as an extrinsic motivational factor, while the other scale was used to measure reciprocal benefits as an extrinsic motivational factor. Both scales revealed sufficient composite reliability (0.75 for expected organisational rewards; 0.81 for reciprocal benefits), which exceeded the benchmark of 0.70 recommended by Nunnally and Bernstein (1994).

As in the case of the study of Lin (2007a:139-142), Olatokun and Nwafor (2012:223) also developed a scale related to expected organisational rewards (four-item scale) and reciprocal benefits (four-item scale) to measure extrinsic motivation to share knowledge. These authors defined organisational rewards as the degree to which employees believe they will receive extrinsic incentives (salary, bonuses, promotion or job security) through knowledge sharing. Reciprocal benefits, in their study, focused on employees' belief that current knowledge sharing would lead to future requests for knowledge being met. Both scales reported high Cronbach-alpha coefficients of 0.76 (expected organisational rewards) and 0.82 (reciprocal benefits).

Similar to previous researchers such as Olatokun and Nwafor (2012:223) and Lin (2007a:139-42), Kankanhalli *et al*. (2005:127) measured extrinsic benefits for

knowledge sharing on different scales. A scale was developed to measure organisational rewards (four-item scale), image (four-item scale) and reciprocity (three-item scale) and reported sufficient Cronbach-alpha coefficients of 0.96, 0.89 and 0.85 respectively.

Based on the scales of Minbaeva *et al*. (2012:395), Olatokun and Nwafor (2012:230-231), Lin (2007a:142) and Kankanhalli *et al*. (2005:141-142), and on the literature on knowledge sharing (as discussed in previous chapters), a five-item scale was developed to measure *Extrinsic motivation* to share knowledge in this study. Minor adjustments to the wording in previous scales were made to make the items more suitable for the present study.

d) Psychological contract breach

In this study, *Transactional psychological contract breach* refers to an individual's perception that the business has failed to meet one or more expectations about the extrinsic or monetary obligations between an individual employee and his or her employer in the short term, while *Relational psychological contract breach* refers to an individual's perception that the business has failed to meet one or more expectations related to long-term arrangements (for example career development and continuous training) between an employee and his or her employer.

Most previous research (Jafri, 2014; Le, 2012; Ghitan, 2009; Robinson & Morrison, 2000) used a global measure to assess psychological contract breach as a construct, and therefore did not include specific dimensions for transactional and relational contract breach. Knoppe (2012:27) explains that the global measure does not request respondents to rate the breach of specific components (such as pay, job, security, training). Instead, it questions respondents about their overall view on the fulfilment of obligations at the business. For example, Robinson and Morrison (2000:534) developed one of the most widely used scales to measure psychological contract breach. Their global measure (overall evaluation of how well one's contract has been fulfilled by one's employer) of perceived contract breach contains five items on a Likert-type scale, which measures employees'

perceptions of how well their psychological contracts are being fulfilled by their organisation. The scale reported a high Cronbach-alpha value of 0.92.

Similarly, Jafri (2014:171) used the global measure (five-item scale) developed by Robinson and Morrison (2000:534) to measure psychological contract breach in their study on the influence of personality on perceptions of pychological contract breach. The Cronbach-alpha coefficient of the scale in their study was 0.82, indicating sufficient reliability. Le (2012:41) also used the five-item scale developed by Robinson and Morrison (2000:534) and reported a sufficient reliability with a Cronbach-alpha value of 0.82. In the same way, Ghitan (2009:20), Castellano (2010:62) and Rayton and Yalabik (2014:2389) used a five-item scale adopted from Robinson and Morrison (2000:534) to measure psychological contract breach. The scales reported Cronbach-alpha coefficients of 0.94, 0.96 and 0.93 respectively, which are close to Robinson and Morrison's (2000:534) reported reliability of 0.92.

Whereas the global measure as explained above does not request respondents to rate the breach of specific components (such as pay, job, security, training), the composite measure approach to assessing psychological contract breach assumes that the psychological contract can be measured on several components (e.g. pay, job security, training, etc.). In this composite approach, breach is measured by asking respondents to what extent the business has fulfilled its obligations of each component (Knoppe, 2012:27). The components that are used in the composite measure can be classified into transactional and relational components. Transactional content relates to monetary exchanges over a limited period of time (for example obligations about pay and merit pay), while relational content denotes long-term exchanges relate to the employee-employer relationship (for example obligations about personal support) (Zhao *et al*., 2007:657).

Relating to composite measures, Kickul, Lester and Finkl (2002:476) requested respondents to indicate the degree to which certain promises made to them were fulfilled by the organisation. Respondents used a five-point Likert scale (1 = not at all fulfilled; 5 = very fulfilled) to rate four items related to extrinsic promises

(competitive salaries, rewards, and flexibility in scheduling) and seven items related to intrinsic promises (such as employee freedom, participation, and increased responsibilities). The Cronbach-alpha coefficients for the two factors measuring psychological contract breach (extrinsic and intrinsic contract outcomes) were 0.90 and 0.89 respectively.

For the purpose of the present study, several self-generated items based on secondary sources (see Rayton & Yalabik, 2014:2382-2386; Knoppe, 2012:62) were used to develop a composite measure of psychological contract breach, as this study seeks to explain the relationship between specific psychological contract breach (transaction and relational) and knowledge sharing. As such, *Transactional psychological contract breach* and *Relational psychological contract breach* will be measured as two separate constructs in the present study. Given the lack of knowledge-sharing research using composite measures, researchers (Gupta *et al*., 2012:744) suggest further studies to investigate the specific type of psychological contract breach on knowledge-sharing behaviour. Depending on the nature of the psychological contract (transactional or relational), the reaction to breach may vary, with breaches of relational obligations being more likely to have a stronger influence on individuals' behaviour than breaches of transactional obligations. Consequently, a four-item Likert scale was developed to measure *Transactional* psychological contract breach, while a seven-item scale measured *Relational psychological contract breach*.

e) Relationship conflict

There are generally two types of conflict, namely relationship and task conflict (Lu *et al*., 2011:132). As in previous research, these types of conflict are measured as two separate constructs in the present study. This will be discussed in the sections to follow.

Relationship conflict, in this study, refers to how often individuals experience arguments, tension, friction, emotional conflict and personality conflict at work. Jehn (1995:258), in her study on the benefits and detriments of intragroup conflict, explains relationship conflict as interpersonal incompatibilities which typically

consist of tension, animosity and annoyance among individuals. Jehn (1995:264) developed a Likert-type scale consisting of four items (Jehn, 1995:268) to measure the presence of relationship conflict. The coefficient alpha for the scale measuring relationship conflict was 0.92.

Jehn's (1995:268) scale is well documented in knowledge-sharing literature; various other authors have adopted this scale in their studies on knowledge sharing. For example, in Shih *et al*.'s (2008:4) study on conflict and knowledge sharing, the items measuring relationship conflict were adopted from Jehn (1995:268). The scale showed sufficient internal consistency by reporting a composite reliability value of 0.84 (Shih *et al*., 2008:5). In addition, in Chen's (2011:1391) knowledge-sharing study, relationship conflict was measured using four items from Jehn (1995:268), with responses rated on a five-point scale. The Cronbach-alpha coefficient was found to be 0.88.

Anwar *et al*. (2012:3729) developed a four-item scale to measure interpersonal conflict, which returned a Cronbach-alpha coefficient of 0.82 for internal consistency. These items were taken from the four-item Interpersonal Conflict at Work Scale (Cronbach-alpha of 0.74) developed by Spector and Jex (1998:361). In order to measure relationship conflict, Lee *et al*. (2014:423) developed a three-item scale that showed internal consistency with a composite reliability value of 0.93 reported.

For the purpose of the present study, a six-item scale was developed to measure the factor *Relationship conflict*. Five response choices were given, ranging from 0 = Never to 4 = Always. Items were based on previous scales (Spector & Jex, 1998:356; Jehn, 1995:268) with slight adjustments to the wording to make the items more appropriate for the present study.

f) Task conflict

Task conflict, for the purpose of this study, refers to how often individuals experience discrepant views, ideas or opinions among colleagues with regard to the content of a task being performed. In her study, Jehn (1995:258) describes

task conflict as the disagreement between individuals concerning the content of a task being performed. These disagreements include differences in viewpoints, ideas and opinions. Jehn (1995:264) measured task conflict on a Likert-type scale consisting of four items (Jehn, 1995:268) relating to the amount of task conflict in work units. The coefficient alpha for the scale was reliable with a value of 0.87 reported. Shih *et al*. (2008:4-5) adopted the items measuring task conflict from Jehn's (1995:268) study and reported a composite reliability value of 0.84.

Likewise, Hsu *et al*. (2008:73) adapted three items from Jehn (1995:268) to measure task conflict. In this instance, a Cronbach-alpha of 0.81 was reported. As was the case with previous research (Hsu *et al*., 2008), Lin *et al*. (2014:93) also used a three-item measure based on a Likert-type scale to measure task conflict. The Cronbach-alpha coefficient was found to be 0.87. Similarly, Lee *et al*. (2014:421) developed a three-item Likert-type scale to measure task conflict. The composite reliability was found to be 0.90, suggesting sufficient internal consistency (Lee *et al*., 2014:422-423).

In order to measure the factor *Task conflict* in the present study, a four-item scale was developed. Five response choices were given, ranging from 0 = Never to 4 = Always. These items were derived from those used in Jehn's (1995:268) study, as well as the literature on knowledge sharing as discussed in previous chapters. The wording of these items was adjusted to make the items more suitable to the present study.

g) Personality traits

The following personality traits, namely *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness*, and *Conscientiousness* are included and measured as independent variables in this study.

In this study, *Extraversion* refers to the tendency of an individual to be outgoing, enthusiastic, active, assertive and talkative, while *Neuroticism,* for the purpose of this study, refers to an individual's propensity to easily get upset and to worry a lot, as well as to experience negative feelings such as nervousness and tension.

Openness to experience refers to the extent that an individual is being original, open-minded, imaginative, inventive and a deep thinker, whereas *Agreeableness*, in this study, refers to the extent to which an individual gets along with others, as well as the degree to which an individual is being cooperative, considerate, forgiving and helpful to others. Finally, *Conscientiousness,* for the purpose of this study, refers to the tendency of an individual to be attentive, reliable, efficient, persevering and to follow through with plans.

The NEO scales developed by Costa and McCrae's (1992) are the most widely used to measure the Big Five Personality factors. The NEO-Personality Inventory Revised (NEO-PI-R) instrument consists of 240 items that measure the five domains. In addition, it measures 30 specific subordinate dimensions (six subordinate dimensions/facets of each personality factor). The 60-item NEO Five-Factor Inventory (NEO-FFI) also measures the five domains with 12 items each (NEO-FFI) and is a shortened version of the NEO-PI-R (Matzler *et al*., 2011:301).

Matzler *et al*. (2011:302) in their knowledge-sharing study involving personality dimensions, measured personality traits with the relevant 12-item subscales (NEO-FFI) using five-point Likert-type scales ranging from "strongly agree" to "strongly disagree." These authors only measured personality traits of agreeableness and openness to experience. No Cronbach-alpha coefficients were reported.

In his study involving personality traits and workplace outcomes, Wittgenstein (2013:33-34) assessed four of the Big Five Personality factors in their study using the NEO-FFI instrument. Using a five-point Likert scale, respondents were asked to indicate their level of agreement about how each item signified them. A rating of 1 indicated that the respondent strongly disagreed with the item, while a rating of 5 revealed that the respondent strongly agreed with the statement. Cronbach-alpha coefficients of 0.69 (extraversion), 0.78 (neuroticism), 0.82 (conscientiousness), and 0.74 (agreeableness) were reported (Wittgenstein, 2013:33-34).

In line with previous studies (e.g. Wittgenstein, 2013; Matzler *et al*., 2011), Gupta (2008:146) also used the NEO-FFI personality assessment in his study relating to

the role of personality in knowledge sharing. Therefore, each of the five personality factors was measured using 12 items (total of 60 items) on a five-point Likert scale. No Cronbach-alpha coefficients were reported in this study.

Cho, Li and Su (2007:7-8) measured personality traits (conscientiousness and agreeableness) using five-point Likert-type scales anchored from 1 = Very inaccurate to 5 = Very accurate. Six items were developed to measure each personality trait by adapting measures that had been validated by other researchers and by converting operational definitions of constructs into a questionnaire format. Owing to low factor loading, two and four items were dropped from the agreeableness and conscientiousness constructs respectively. Cronbach-alpha coefficients of 0.62 (agreeableness) and 0.69 (conscientiousness) were reported (Cho *et al*., 2007:9).

In their study on the influence of the Big Five Personality factors on knowledge sharing, Teh *et al*. (2011) measured the different personality traits as follows: seven items to measure extraversion; seven items to measure neuroticism; seven items to measure openness to experience; eight items to measure agreeableness, and nine items to measure conscientiousness (Teh *et al*., 2011:62). Cronbach-alpha coefficients of 0.70 (extraversion), 0.64 (neuroticism), 0.79 (openness to experience), 0.66 (agreeableness) and 0.61 (conscientiousness) were reported (Teh *et al*., 2011:54).

In another empirical study by Manaf (2012:129) involving personality and knowledge sharing, personality traits were measured using the Big Five Inventory (BFI) assessment by John, Naumann and Soto (2008), which is a copy of the original version of the BFI by John, Donahue and Kentle (1991). The BFI assessment consists of 44 items related to the Big Five Personality factors, although Manaf (2012:129) only used 28 of these items to measure the traits of agreeableness (Cronbach-alpha 0.74), openness to experience (Cronbach-alpha 0.85) and conscientiousness (Cronbach-alpha 0.71) (Manaf, 2012:172). More specifically, nine items were used to measure agreeableness, ten items to measure openness to experience and nine items to measure conscientiousness (Manaf, 2012:334). In general, previous research confirms that the domain scales

of the BFI personality assessment have high reliability, clear factor structure and strong convergence with the Big Five Personality measures (Manaf, 2012:129; Benet-Martinez & John, 1998:737).

For the purpose of the present study, a five-item scale was developed to measure each of the Big Five Personality factors, namely *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness*, and *Conscientiousness*. Based on its accessibility and reliability, the items were based on the BFI personality assessment. The wording of selected items was slightly adjusted to make the items more suitable to the present study. The BFI tool has proved to be an effective tool across many cultures and languages. Because of the length of the questionnaire, the BFI assessment is commonly used in research settings where respondents' time is at a premium (Morse, 2009:15).

For each of the factors investigated in this study, the number of items used, the sources of these items, sample items as well as the operationalisation thereof can be found in Table 5.1. Annexure A provides a full list of items used in the present study.

Table 5.1: Operationalisation of the dependent and independent variables

Dependent variable	Operationalisation of dependent variable	Sample items	Sources	Number of items
Knowledge-sharing intention	Refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise	I would willingly share work experiences with my co-workers I would share work know-how with my co-workers	Gu and Wang, 2013; Evans, 2012; Olatokun and Nwafor, 2012; Chatzoglou and Vraimaki, 2009; Chow and Chan, 2008; Lin, 2007a; Chennamaneni, 2006; Lee, 2001	**6**
Independent variables	**Operationalisation of independent variables**	**Sample items**	**Sources**	**Number of items**
Individuals' awareness	Refers to the ability of individuals to realise the importance and value of sharing their knowledge with others	If I share my knowledge with co-workers it could help them in doing their jobs better Sharing my knowledge is beneficial for the business	Ali, 2012; Ismail and Yusof, 2010; Self-generated items (Rahab *et al*., 2011; Cress *et al*., 2007; Van den Hooff and Van Weenen, 2004)	**5**
Intrinsic motivation	Refers to the intrinsic benefits such as enjoyment in helping others, satisfaction and self-efficacy that employees consider as motivation to share knowledge	It would give me pleasure to share my experience with co-workers It would feel good to help co-workers by sharing my expertise	Ehtamo, 2013; Olatokun and Nwafor, 2012; Lin, 2007; Kankanhalli *et al*. 2005	**5**
Extrinsic motivation	Refers to the extrinsic benefits such as promotion, organisational rewards, acknowledgement, job security and reciprocity that employees consider as motivation to share knowledge	I would share my expertise with co-workers if I knew I would be promoted I would share my expertise with co-workers if I knew it would improve my job security	Minbaeva *et al*. 2012; Olatokun and Nwafor, 2012; Lin, 2007a; Kankanhalli *et al*. 2005	**5**
Transactional psychological contract breach	Refers to an individual's perception that the business has failed to meet one or more expectations about the extrinsic or monetary obligations between an individual employee and his or her employer in the short term	My expectation of my employer to pay my salary on time has been kept My expectation of my employer to provide a clear job description has been kept	Self-generated items (Rayton and Yalabik, 2014; Knoppe, 2012)	**4**
Relational psychological contract breach	Refers to an individual's perception that the business has failed to meet one or more expectations related to long-term arrangements (for example career development and continuous training) between an employee and his or her employer	My expectation of my employer to provide me with opportunities to develop my career has been kept My expectation of my employer to provide continuous	Self-generated items (Rayton and Yalabik, 2014; Knoppe, 2012)	**7**

		training that will increase my work-related expertise has been kept		
Relationship conflict	Refers to how often individuals experience arguments, tension, friction, emotional conflict and personality conflict at work	How often do you experience personality conflict at work? How often do you experience tension with other co-workers at work?	Spector and Jex, 1998; Jehn, 1995	**6**
Task conflict	Refers to how often individuals experience discrepant views, ideas or opinions among colleagues with regard to the content of a task being performed	How often do you have a different opinion from your colleagues on how to complete a task/job in your work unit? How often do you have a different opinion from your colleagues concerning the content of a tasks/job being performed?	Jehn, 1995	**4**
Extraversion	Refers to the tendency of an individual to be outgoing, enthusiastic, active, assertive and talkative	I am someone who is outgoing and sociable I am someone who has an assertive personality	BFI personality assessment – John *et al*. 1991	**5**
Neuroticism	Refers to an individual's propensity to easily get upset and to worry a lot, as well as to experience negative feelings such as nervousness and tension	I am someone who gets nervous easily I am someone who can be tense	BFI personality assessment – John *et al*. 1991	**5**
Openness to experience	Refers to the extent that an individual is being original, open-minded, imaginative, inventive and a deep thinker	I am someone who is original, comes up with new ideas I am someone who is a deep thinker	BFI personality assessment – John *et al*. 1991	**5**
Agreeableness	Refers to the extent to which an individual gets along with others, as well as the degree to which an individual is being cooperative, considerate, forgiving and helpful to others	I am someone who is considerate and kind to most people I am someone who has a forgiving nature	BFI personality assessment – John *et al*. 1991	**5**
Conscientiousness	Refers to the tendency of an individual to be attentive, reliable, efficient, persevering and to follow through with plans	I am someone who perseveres until the job is finished I am someone who does things efficiently	BFI personality assessment – John *et al*. 1991	**5**

5.3.5.3 Control variables: demographic variables

Section 4.2.3 highlighted many demographic variables such as gender, tenure, education, age, race, and language, which could have an influence on knowledge sharing. Based on previous research (see Evans, 2012; Keyes, 2008; Chennamaneni, 2006), each demographic variable was partitioned into unique categories. These items are included in section 3 of the questionnaire.

5.3.6 Pilot testing of measuring instrument

To detect any problems in the questionnaire's instructions or design before it was sent to the respondents in the sample, the questionnaire was subjected to a pilot test. Preliminary tests or pilot tests are test runs with a group of actual respondents, for the purpose of detecting problems in the questionnaire's instructions or design (Cooper & Schindler, 2011:89). Preliminary testing could also involve screening the questionnaire with other professionals such as colleagues and respondent surrogates, in order to provide feedback and to possibly refine the instrument (Cooper & Schindler, 2011:89).

As such, the questionnaire in this study was subjected to a pilot study with 30 respondents representative of the sample to certify ease of understanding, the relevance of the items (including the ease with which questions could be answered), and the time required for completing the questionnaire.

In addition, to assess the content validity (face validity) of the measuring scales, experts in the field of research methodology, knowledge management and statistical modelling were requested to inspect the questionnaire. These individuals were given the construct definitions of the different factors and requested to review the relevance and meaningfulness of the items in the measuring instrument and whether the items were formulated correctly. The use of experts to ensure that the measurement instrument has content validity is an acceptable practice (Leedy & Ormrod, 2013:91). Based on these preliminary reliability estimates and on the feedback received, minor changes and corrections to the original constructed questionnaire were made before it was finalised. The

final items were then randomly sequenced, after which the actual respondents of this study were requested to complete the online survey.

5.3.7 Administration of questionnaire

A cover letter and an electronic link to a self-administered structured questionnaire (refer to Annexure A) were emailed to potential respondents. This provided them an opportunity to complete an online survey on the individual-related factors that influence knowledge-sharing intention. To increase the credibility of the study and the likelihood that the respondents would complete the questionnaires, all communication with respondents was done on the official stationery of the Unit of Applied Management Sciences at the NMMU. Apart from explaining the purpose of the study, the cover letter also specified that ethical clearance had been obtained for the research and included the ethical clearance number. Also, respondents were assured of the confidentiality of their responses.

As discussed in section 5.3.2, the initial data collection process commenced within a knowledge-intensive business representative of the population. In line with the process described above, questionnaires were made available to 320 potential respondents in this business via the business's human resources officer. In addition, questionnaires were also made available to a further 4500 potential respondents obtained from the alumni list as was discussed in section 5.3.2. More information concerning the effective population is provided in the next chapter.

5.3.8 Sample size requirements

SEM requires a large sample as statistical estimates might not be accurate when small samples are used. Several factors affect the required sample size in SEM, for example, the complexity of the model being analysed. The analyses of a complex model generally require more cases compared to a simpler model as there are more parameters in complex models. Models with more parameters involve more estimates, therefore larger samples are needed for the results to be stable (Kline, 2011:11-12).

While Hair, Black, Babin, Anderson and Tatham (2006:740) suggest a generally accepted ratio of 15 respondents for each parameter estimated in the model, Kline (2011:12) notes that an ideal sample size-to-parameters ratio would be 20:1. For instance, in a model that requires 10 parameter estimates, an ideal minimum sample size would be 200 cases. It is also useful to think about sample size in more absolute terms. In this instance, a typical sample size would be 200 cases. This number is in accordance with the approximate median sample size in surveys of published articles wherein SEM results are reported. These include a review by Shah and Goldstein (2006:153) of 93 articles in management science journals, as well as an older but well documented review by Breckler (1990:265) of 72 articles in personality and social psychology journals (Kline, 2011:12).

Bijleveld, Van der Kamp, Mooijaart, Van der Kloot, Van der Leeden and Van der Burg (1998:226) posit that samples under 100 cases are too small for SEM and sample sizes towards 400 and above are more desirable. Sample sizes in-between these two numbers are in a grey area and the required sample size depends on the complexity of the problem being analysed. Hoe (2008:77) proposes that, as a rule of thumb, any number above 200 cases is believed to provide adequate statistical power for data analysis. Iacobucci (2010:91) asserts that in SEM, if the variables are reliable and the model not too complex, smaller samples will be sufficient. As such, it is of some comfort that SEM can perform well even when the sample size is small (for example 50 to 100). The vague, folklore rule of thumb regarding required sample size ($n > 200$) can be conservative and simplistic (Iacobucci, 2010:92). In the same way, Hair, Black, Babin and Anderson (2014:574) suggest that less complex models containing five or fewer constructs, each with more than three items and with high item communalities require a minimum sample size of 100 respondents. On the other hand, models with large numbers of constructs, some with lower communalities, and/or having fewer than three measured items (observed variables) require a minimum sample size of 500 respondents.

In their empirical study on the sample size requirements for SEM, Wolf, Harrington, Clark and Miller's (2013:913) revealed a range of sample size requirements (from 30 to 460 cases), and underlined the limitations of generally cited rules of thumb.

Generally, models with fewer indicators require a larger sample relative to models with more indicators, while models with stronger factor loadings also need dramatically smaller samples compared to models with weaker factor loadings (Wolf *et al*., 2013:923). These researchers (Wolf *et al*., 2013:925) consequently demonstrated the broad variability in sample size requirements for latent variable models and revealed how the sample size estimates vary significantly from model to model.

The model investigated in this study is based on a sound theoretical basis as the elements of the model had been previously researched in the fields of knowledge management and specifically knowledge sharing. Farrington (2009:363) asserts that if a model is based on a sound theoretical basis, the possibility of mis-specification owing to omission of variables is reduced. Therefore, there is no need to increase the sample size to more than what is normally recommended in the theory of SEM (specifically from 200 to 500 cases depending on the complexity of the model being tested).

5.3.9 Missing data

The questionnaire in the present study had been structured to prevent incomplete surveys from being submitted. No missing data was subsequently experienced.

5.3.10 Methods of data analysis

A good measurement tool has three important criteria, namely reliability, validity and practicality. While reliability is concerned with the accuracy and precision of the measurement procedure, validity refers to the extent to which a test measures what it is supposed to measure. Practicality relates to a wide range of factors such as economy, convenience and interpretability (Cooper & Schindler, 2011:280). The reliability and the validity of the measuring instrument needs to be assessed before one attempts to measure the strength of the relationships in a hypothesised model (Van den Heever, 2014:174). The statistical techniques used in the present study to assess the validity and reliability of the results are discussed in the sections below. An overview of the SEM method employed to determine the

influence of the control and independent variables on *Knowledge-sharing intention* will also be described.

5.3.10.1 Reliability of the measuring instrument

Reliability contributes to validity but is not a sufficient condition for validity. Reliability is concerned with estimates of the degree to which measurements are free of random or unstable error. Instruments that are reliable work well at different times under different conditions (Cooper & Schindler, 2011:283).

Internal consistency is a frequently used measure of reliability, which relates to the consistency among the variables in a summated scale. The rationale for internal consistency is concerned with the requirement that individual items of a scale should all measure the same construct and be inter-correlated (Cooper & Schindler, 2007:323).

Internal consistency can be assessed by calculating a type of reliability estimate known as the Cronbach-alpha coefficient. This estimate is based on the average correlation of variables within a specific set of items measuring a construct (Cooper & Schindler, 2007:322). Generally, a lower limit for the Cronbach-alpha coefficient of 0.70 is acceptable (Bryman & Bell, 2014:38; Nunnally, 1978:226). In exploratory research, the lower limit may be reduced to 0.60 (Hair *et al*., 2014:123).

Cronbach-alpha coefficients were used in the present study to measure the degree of reliability of the measuring instrument, and therefore to determine which items to include as measures of specific constructs. The software program Statistica (Dell Statistica Version 13) was used to establish the Cronbach-alpha coefficients.

5.3.10.2 Validity of the measuring instrument

The validity of a measurement instrument relates to whether or not a measure of a concept actually measures the concept it is supposed to measure (Bryman & Bell,

2014:38). In the present study, validity was established by considering construct validity. Construct validity relates to the degree to which a measure assesses the fundamental theoretical construct it is purported to measure. Construct validation involves the gathering of multiple sources of evidence. In this instance, construct validation requires evidence that the test measures what it intends to measure, as well as evidence that the test does not measure irrelevant attributes. In this respect, if a scale has both convergent and discriminant validity, a measuring instrument is considered to have construct validity (Bryman & Bell, 2014:39; Farrington, 2008:368).

Convergent validity refers to the extent to which scores on one scale correlate with scores on other scales that were designed to measure the same construct. On the other hand, the degree to which scores on one scale do not correlate with scores from other scales designed to assess different construct, is known as discriminant validity (Cooper & Schindler, 2011:282). In the present study, the measuring instrument was designed by using constructs identified in theory and by assessing the convergent and discriminant validity.

EFA is a common multivariate technique used to assess discriminant validity (Van den Heever, 2014:177; Dwivedi, Lal, Williams, Schneberger & Wade, 2009:88). This was also applied in the present study to assess the discriminant validity of the research instrument by using the software program Statistica (Dell Statistica Version 13). In addition, the AVE value was calculated for each latent variable in the measurement model to determine the convergent validity. Chapter 6 provides more details about this method (section 6.5.1).

Besides discriminant and convergent validity, it is also important to establish face validity. Face validity is established when the measured items are conceptually in line with a construct definition (Hair *et al*., 2014:637), as is the case in the present study. This form of validity subjectively evaluates the similarity between the individual items and the concept through assessments by experts or pretests, with the aim of ensuring that the selection of items extends beyond just empirical issues and also takes into account theoretical and practical considerations (Hair *et al*., 2014:123). To enhance face validity in the present study, experts in the field of

research methodology, knowledge management and statistical modelling were requested to scrutinise and adjust the questionnaire before it was distributed to final respondents. A pilot study was also carried out to detect any problems in the questionnaire's instructions or design before it was sent to the respondents in the sample (refer to section 5.3.6).

5.3.10.3 Effect of demographic (control) variables

In the hypothesised model, it was hypothesised that certain individual-related factors would influence the dependent variable specified as *Knowledge-sharing intention.* It was also hypothesised that selected demographic variables would influence *Knowledge-sharing intention* (see section 4.2.3 of Chapter 4).

SEM analyses were undertaken to determine the influence of selected demographic variables, as well as the independent variables, on the dependent variable *Knowledge-sharing intention*. More specifically, a subset of SEM, namely GLM is used to determine the influence of demographic variables on *Knowledge-sharing intention* and to assess various moderating relationships as proposed in the hypothesised model. In the following section, a description of the SEM technique is presented.

5.3.10.4 Structural equation modelling (SEM)

SEM is a multivariable, multi-equation statistical method to model the linear relationships between variables. While the data from which relationships are modelled and estimated are observed, models may include unobserved variables, referred to as latent variables. Subsequently, SEM has been referred to as latent variable modelling. Structural equation models are also commonly referred to as linear structural relations models (Hoyle, 2014:3-4; Cooper & Schindler, 2011:539).

According to Hair *et al*. (2014:546), SEM may be perceived as a combination of factor analysis and multiple regression analysis. In addition, SEM is suited to theory-testing instead of theory development as it provides a transition from exploratory to confirmatory analysis (Hair *et al*., 2014:553-554).

Against this background, SEM has two major advantages compared to other multivariate techniques. First, SEM has the ability to simultaneously estimate multiple and interrelated dependence relationships. Second, in these relationships, SEM can represent latent variables (unobserved concepts) and account for measurement error in the estimation process (Cooper & Schindler, 2011:539).

Two important issues in SEM are statistical identification and sample size. Statistical identification is concerned with whether enough information exists to identify a solution to a set of structural equations. Many difficulties in confirmatory factor analysis (CFA) and SEM relate to insufficient sample size and lack of indicator variables per construct. Based on the specific model, an adequate sample must be used, and each construct must be measured by at least three items, as is the case in the present study (Van den Heever, 2014:178; Hair *et al*., 2014:582) (See sections 5.3.5 and 5.3.8 on scale development and sample size).

a) Requirements for the application of SEM

A sound theoretical basis for the model being investigated, and the development of an appropriate modelling strategy, are two basic conditions for the successful application of SEM (Hair *et al*., 2014:554-558).

Through extensive review of the literature relating to the area under investigation, a sound theoretical foundation can be realised. SEM is regarded a confirmatory technique that is useful for testing and potentially confirming theory. As such, theory provides the basis for almost all aspects of SEM and is necessary to identify relationships in both the measurement and the structural models (Hair *et al*., 2014:554).

In addition, a sound theoretical model must guide modifications to an estimated model and thus forms the foundation for the inclusion or omission of any relationship in the model. As a confirmatory method, structural equation analysis is guided more by theory than empirical results; the theoretical justification of the model under investigation is therefore the basis that underpins the method of

structural equation analysis (Hair *et al*., 2014:554).

The desire to include all variables in a theory-based model must be balanced against the practical limitations of SEM. However, it is important not to omit one or more vital predictive variables. This is also known as a specification error. There is no theoretical limit on the number of variables that can be included in models, but interpretation becomes increasingly difficult when a model includes a large number of concepts (more than 20) (Hair, Anderson, Tatham & Black, 1998:594).

Concerning the second condition for the successful application of SEM, Hair *et al*. (2014:558) distinguish between three modelling strategies in the application of SEM, namely the confirmatory modelling strategy, the competing models strategy and the model development strategy. There is no single correct method. To realise the objectives in the present study, confirmatory modelling strategy was adopted in the application of SEM. The objective of this study is to apply SEM to test and potentially confirm the factors identified as influencing individuals' *Knowledge-sharing intention*.

b) SEM and confirmatory modelling strategy

Confirmatory modelling strategy is the most direct application of SEM where a single model is specified and SEM is employed to assess how well the model fits the data. With this strategy, the theoretical relationships are strictly specified and SEM is used to evaluate the significance of the modelled relationships (Hair *et al*., 2014:558). It is essential that the model is accurately specified based on the type of analysis that the modeller is attempting to confirm, as SEM is a confirmatory technique.

In order to determine if the pattern of variances and covariance in the data are consistent with a structural model specified by the researcher, goodness-of-fit tests are performed. Acceptable levels of fit for the measurement model, the structural equation model, and the overall model do not guarantee that the best model has been identified, nor does it prove the proposed model. Acceptable levels of fit will only confirm that it is one of several possible acceptable models (Hair *et al*.,

2014:558; 589).

c) Steps in SEM

The SEM process focuses on two main steps, namely validating the measurement model through confirmatory factor analysis, and fitting the structural model through primarily path analysis with latent variables. In reality a conventional model in SEM comprises two models, namely the measurement model and the structural model (Hair *et al*., 2014:565). While the measurement model signifies how measured variables come together to represent constructs, the structural model represents how constructs are associated with each other (Hair *et al*., 2014:585).

Various researchers have proposed different processes of testing a SEM model. Cooper and Schindler (2011:539) recommend five basic steps in the implementation of SEM. Similarly, Hair *et al*. (2006:734 and 2014:565) propose a six-stage decision process in the implementation of SEM, while these authors propose in their 1998 study (1998:592-616) that seven consecutive steps be followed. A comparison of the three processes is illustrated in Table 5.2.

Table 5.2: Steps in structural equation modelling (SEM)

Steps	**Cooper and Schindler (2011:539-540)**
1.	Model specification
2.	Estimation
3.	Evaluation of fit
4.	Respecification of the model
5.	Interpretation and communication
Stages	**Hair *et al*. (2006:734) / Hair *et al*. (2014:565)**
1.	Defining individual constructs
2.	Developing and specifying the measurement model
3.	Designing a study to produce empirical results
4.	Assessing the measurement model validity
5.	Specifying the structural model
6.	Assessing structural model validity
Steps	**Hair *et al*. (1998:592-616)**
1.	Developing a theoretical model
2.	Constructing a path diagram of causal relationships
3.	Converting the path diagram into a set of structural equations and measurement models
4.	Choosing the input matrix type (correlation matrix or covariance matrix) and estimating the proposed model
5.	Assessing the identification of model equations
6.	Evaluating the results for goodness-of-fit
7.	Making the indicated modifications to the model, if theoretically justified

Source: Researcher's own construction

Farrington (2009:375) points out that, although the suggested processes of Hair *et al*. (2006:734 and 1998:592-616) overlap, Hair *et al's* (2006:734) process includes broader aspects of the research design (Stage 3) and measurement development (Stage 1). In the present study, Stage 1 and to a certain degree, Stage 3 of Hair *et al's* (2006:734) six-stage decision process, have already been addressed in the discussions on research design in Chapter 5. The dependent variable (*Knowledge-sharing intention*) as well as the independent variables were defined in sections 5.3.5.1 and 5.3.5.2. The scale development and operationalisation of each of these variables were also described (aspects of Stage 1). In addition, the issues of sample size and missing data (aspects of Stage 3) have been addressed in sections 5.3.8 and 5.3.9 respectively.

Farrington (2009:375) further suggests that the other stages (Stages 2, 4, 5 and 6) in the six-stage (Hair *et al*., 2006:734) decision process overlap with the seven

steps originally suggested by Hair *et al*. (1998:592-616). These remaining stages are also addressed in a more detailed and sequential manner in the seven-step procedure.

The researcher's view regarding the two processes suggested above is in congruence with Farrington (2009:375). In addition, the researcher is of the opinion that the five-step process proposed by Cooper and Schindler (2011:539-540) also overlaps with the processes described above. For the purpose of the present study, the stages proposed by Hair *et al*. (2014:565) are explained next.

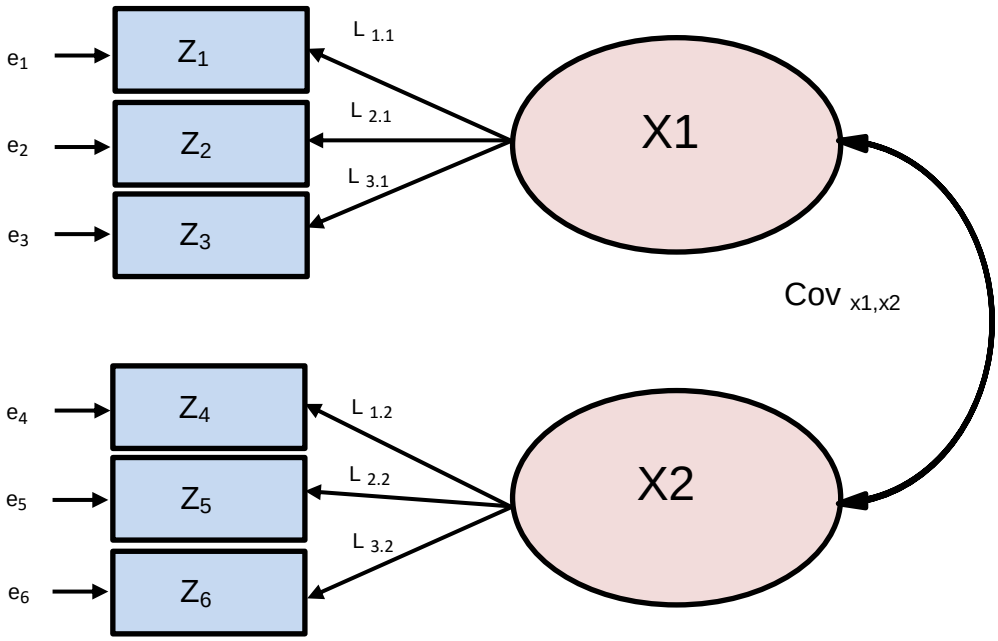
Stage 1: Defining individual constructs

The first stage in the SEM process is to define the individual constructs. In this regard, a thorough analysis of theory is vital as was done in this study in Chapters 2 to 4. Theoretical constructs could be operationalised using scales from previous research or by developing new scales. Hair *et al*. (2014:567) assert that the hypotheses tests relating to the structural relationships among constructs will be no more reliable or valid than is the measurement model that explains how these constructs are constructed. The dependent variable in the present study was identified *as Knowledge-sharing intention*. The individual-related factors influencing *Knowledge-sharing intention*, and which subsequently serve as the independent variables in this study, were identified as: *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*, *Relationship conflict, Task conflict*, *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness* and *Conscientiousness*. In addition, the demographic factors of gender, tenure, education, age, race and language were identified as control variables in the present study. Based on the interpretation of both secondary sources and scale items from previous empirical studies, the dependent and independent variables were operationalised in the present study.

Stage 2: Developing and specifying the measurement model

With the scale items specified, the next step in the SEM process involves specifying the measurement model. As such, each latent construct included in the model is identified and the items (measured indicator variables) are assigned to the latent constructs (Hair *et al*., 2014:567). In Chapter 4 a number of individual-related factors (independent variables) that influence *Knowledge-sharing intention* (dependent variable) were identified and depicted in the hypothesised model (Figure 4.1). The identification and assignment of the measurement model can be represented by equations; however, it is simpler to illustrate this process with a diagram as shown in Figure 5.1.

Figure 5.1: Measurement model



Source: Adapted from Hair *et al*. (2014:568)

Stage 3: Designing a study to produce empirical results

Once the measurement model is specified with reference to the constructs and indicators (measured variables), it is important to design a study to produce empirical results. In particular, the researcher must turn attention to the research design and estimation. The research design process calls for decisions on the type of data to be analysed, remedies for missing data and impact of sample size (Hair *et al*., 2014:569). These issues related to the research design were covered earlier in this chapter.

Concerning the model estimation, researchers must choose the estimation method that will be employed to identify estimates for each parameter (Hair *et al*., 2014:575). In this instance, when data shows evidence of non-normality, alternative analytical procedures can be used to estimate parameters. For example, it has been argued that instead of the commonly used maximum likelihood method in SEM, alternative methods such as the robust maximum likelihood procedure or asymptotic distribution free estimation (Byrne, 2010:105) can be used as they compensate for non-normality of the data. Unfortunately, it is widely known that unless sample sizes are extremely large (1000 to 5000 cases), the asymptotic distribution free estimator can generate severely distorted estimations and standard errors. Subsequently the results of this method cannot be trusted in the present study (Byrne, 2010:105). On the other hand, the Satorra-Bentler robust method works well with smaller samples, as is the case in the present study, to compensate for non-normality of data. Although evidence of non-normality was found in the data in the present study while assessing for univariate and multivariate normality by means of the software program AMOS, the robust maximum likelihood method could not be applied as this method is not available in the software program used in the present study (Byrne, 2010:105).

For the purpose of this study, it was decided to use the default maximum likelihood method to estimate the parameters in SEM due to the large sample size requirements of the asymptotic distribution free estimation method, and as the robust maximum likelihood estimation was not available in the software program used in the present study. This decision is consistent with conclusions made by

Byrne (2010:127) who was also unable to use the robust method for technical reasons, as explained above, while attempting to address the issue of non-normality of data. Subsequently, Byrne (2010:105) employed the default maximum likelihood estimation. At a later stage, Byrne (2010:127) decided for instructive purposes, to compare model fit statistics based on maximum likelihood (using AMOS program) and robust maximum likelihood estimation (using EQS program) to investigate the extent to which results deviate between the two estimation methods. Byrne (2010:127) found that although standard errors underwent correction to take non-normality into account when using different methods, the final conclusion concerning the statistical significance of the estimated parameters remained the same. Byrne (2010:127) concluded that although the uncorrected maximum likelihood approach may have a tendency to overestimate the degree to which estimates are statistically significant, overall conclusions were consistent across CFA estimation approaches. The decision to use maximum likelihood estimation in the present study is further supported by Hair *et al*. (2014:575) who posit that maximum likelihood estimation continues to be the most widely used approach, and that many researchers (Savalei, 2008; Olsson, Foss & Breivik, 2004; Olsson, Foss, Troye & Howell, 2000) have found that maximum likelihood estimation is fairly robust to violations of the normality assumption.

In the present study, the software program AMOS was used for these estimations.

Stage 4: Assessing the measurement model validity

With the measurement model specified, the necessary data collected, and the decision with regard to the estimation techniques made, the next step is to assess the measurement model validity. In this regard, multiple fit indices play an important role in providing evidence of model fit and construct validity. Goodness-of-fit tests establish how well the theory fits reality as indicated by the data (Hair *et al*., 2014:576). The specific goodness-of-indices that were employed in the present study is discussed in Chapter 6, section 6.9.1.

Stage 5: Specifying the structural model

While specifying the measurement model (stage 2) involves assigning indicator variables to the constructs they should represent, the specification of the structural model entails assigning relationships from one construct to another based on the proposed theoretical model (Hair *et al*., 2014:585). Structural model specification represents structural hypotheses of the researcher's model. In this regard, each hypothesis signifies a specific relationship that must be specified (Hair *et al*., 2014:585). In Chapter 4 (Figure 4.1) a hypothesised model of factors influencing *Knowledge-sharing intention* was presented and various hypotheses pertaining to the relationships depicted in the hypothesised model were suggested. This model and associated hypotheses therefore plays an important role in specifying the structural model.

Stage 6: Assessing structural model validity

The final stage in the SEM process involves assessing the structural model validity and its associated hypothesised relationships. A proposed structural model cannot only be supported by a good fit, as the individual parameter estimates that represent each hypothesis must also be examined (Hair *et al*., 2014:587-589). Additional rounds of assessment of fit were performed in the present study in order to provide more information on the overall fit and the individual parameter estimates for the structural paths (refer to section 6.9 in Chapter 6).

5.4 SUMMARY

This chapter provided a description of the activities undertaken to conduct a preliminary assessment of the hypothesised model. The population studied, sampling unit, and the sampling technique were described. Clear and concise definitions were provided to operationalise the different variables, while the scales and items included in the measuring instrument were also described. The administration of the measuring instrument, including the method of data collection, was addressed. The statistical analysis performed to ensure the validity and reliability of the results was explained, and this was followed by a discussion

of the SEM technique used to validate the proposed conceptual structural model.

The results obtained from the measuring instrument and the various statistical analyses performed will be presented and discussed in Chapter 6.

CHAPTER 6
EMPIRICAL RESULTS

6.1 INTRODUCTION

Chapter 5 provided an overview of the research design and methodology used to investigate the individual-related factors influencing *Knowledge-sharing intention*. Data collection and analyses proceeded in accordance with the methodology described in Chapter 5.

In this chapter the sample size, response rate and demographic profile of the respondents is presented, followed by a discussion of the results of the EFA. The validity and reliability of the factors identified during the EFA are confirmed and a revised hypothesised model is presented, followed by a discussion on the descriptive statistics of the sample data. This revised model forms an integral part of the SEM analyses, which is the core statistical technique used in this study to analyse the data.

The chapter concludes with a summary of the hypothesised relationships and a discussion of common method variance and how it was addressed in the present study.

In light of the above, this chapter will address the fifth and sixth methodological research objectives, namely to conduct an empirical investigation and empirically test the relationships proposed in the hypothesised model on a sample of employees working in knowledge-intensive businesses, and to report research findings, interpret data, compare findings to previous research and address potential relationships that emanate from the data analysis.

6.2 SAMPLE SIZE AND RESPONSE RATE

In total, 597 usable questionnaires were received from respondents, which is acceptable when judged according to the guidelines described in section 5.3.8. Also, as highlighted in section 5.3.9, the questionnaire in the present study was structured in such a way that the submission of incomplete surveys was prevented. Subsequently, no missing data was experienced. Table 6.1 provides a summary of the number of questionnaires sent out, the number of usable responses received and the response rate.

Table 6.1: Response rate

	Respondents
Questionnaires mailed	4820
Return-to-sender	445
Partially complete	0
Removed during cleanup	0
Effective population	4375
Usable questionnaires received	597
Response rate	13.65%

6.3 DEMOGRAPHIC PROFILE OF RESPONDENTS

Section 3 of the questionnaire included various questions regarding the demographic details of the respondents. The demographic profile of the respondents is summarised in Table 6.2.

Table 6.2: Demographic profile of respondents

Age	**18-24 Years**	**25-30 Years**	**31-40 Years**	**41-50 Years**	**51-60 Years**	**61-70 Years**	**Older than 70 years**	
	11.7%	29.5%	34.7%	17.4%	6.0%	0.7%	0.0%	
Gender	**Male**	**Female**						
	48.9%	51.1%						
Home language	**Afrikaans**	**English**	**Xhosa**	**Zulu**	**Sotho**	**Other**		
	30.7%	36.0%	4.4%	8.2%	7.2%	13.5%		
Highest academic qualification	**Grade 11 and lower**	**Grade 12 or equivalent qualifica-tion**	**Higher Certificate**	**Diploma**	**Bachelors degree**	**Honours degree**	**Masters degree/ MBA or higher**	**Other**
	0.3%	12.7%	10.9%	14.4%	19.9%	23.6%	14.9%	3.3%
Ethnic background	**White**	**Black**	**Asian**	**Coloured**	**Other**			
	44.9%	38.9%	7.2%	6.9%	2.1%			
Organisational tenure	**Less than a year**	**1-2 Years**	**3-5 Years**	**6-10 Years**	**11-15 Years**	**16-20 Years**	**More than 20 years**	
	12.2%	19.6%	27.1%	24.1%	9.0%	2.0%	6.0%	
Job tenure	**Less than a year**	**1-2 Years**	**3-5 Years**	**6-10 Years**	**11-15 Years**	**16-20 Years**	**More than 20 years**	
	17.1%	30.0%	31.2%	15.2%	3.7%	1.0%	1.8%	

For the purpose of this study some of the originally proposed categories in the questionnaire were regrouped as follows:

- The age of respondents was regrouped into five categories, namely 18-24 years, 25-30 years, 31-40 years, 41-50 years and older than 50 years. The greatest number of the respondents (34.7%) indicated that they were between 31 and 40 years of age, while 29.5% indicated that they were between 25 and 30 years of age. A further 17.4% of respondents specified that they were between 41 and 50 years of age and 11.7% indicated that they were between 18 and 24 years of age. Only 6.7% of respondents specified that they were older than 50 years of age.
- The gender of the respondents was more or less evenly divided between males (48.9%) and females (51.1%).
- The home language of the respondents was grouped into three categories, namely Afrikaans, English and other. The majority of the respondents were English-speaking (36.0%), while 30.7% of the respondents reported their home language as Afrikaans. The remainder of the respondents fell into the other category (33.3%), which constitutes other South African languages. The

other major languages included Xhosa, Zulu, Sotho, Shona, Setswana, Tsonga, Sepedi, Ndebele and Venda.

- The education level of respondents was grouped into four categories, namely matric or lower, higher certificate or diploma, bachelors or honours degree and masters degree or higher. The results revealed that the majority of the respondents (43.5%) held a bachelors or honours degree, while 25.3% of the respondents held a higher certificate or diploma and 18.2% held a masters degree or higher qualification. The minority of the respondents (13.0%) held a matric certificate (or lower education). These results are typical of a knowledge-intensive sample where most of the respondents are well-educated, qualified employees (Swart & Kinnie, 2003:60-61).
- With respect to ethnic background, respondents were grouped into three categories, namely White, Black and other. The majority of the respondents (44.9%) were White, with the next largest group being Black (38.9%). The remainder of the respondents (16.2%) fell into the other category which included Asian, Coloured and Indian respondents.
- The organisational tenure of the respondents was grouped into five categories, namely less than a year, 1-2 years, 3-5 years, 6-10 years and more than 10 years. The majority of respondents (27.1%) had worked in their organisation between 3 and 5 years, while 24.1% of the respondents had worked in their organisation between 6 and 10 years. A further 19.6% of the respondents' organisational tenure was between 1 and 2 years and 17.0% more than 10 years. Only 12.2% of the respondents had worked in their organisation for less than a year.
- As was the case with organisational tenure, the job tenure of the respondents was also grouped into five categories, namely less than a year, 1-2 years, 3-5 years, 6-10 years and more than 10 years. The results revealed that the majority of the respondents (31.2%) worked in their current position/role between 3 and 5 years, followed by 30.0% of the respondents whose job tenure was between 1 and 2 years. A small percentage of the respondents worked in their current position between 6 and 10 years (15.2%) and for less than a year (17.1%), while only 6.5% of the respondents' job tenure was more than 10 years.

6.4 EXPLORATORY FACTOR ANALYSIS (EFA)

An EFA was conducted to determine the validity of the measuring instrument. The abbreviations and new reference numbers for the items in the questionnaire are discussed in the next section, followed by a discussion of the factors identified during the EFA.

6.4.1 Abbreviations and item numbers used in EFA

Various constructs were identified in Chapter 3 that were included in the hypothesised model in Chapter 4. In order to simplify the interpretation of the empirical analysis, a summary of the constructs is presented in Table 6.3, together with the item numbers used in the questionnaire to measure the constructs. The table also includes abbreviations and reference numbers for the various items.

Table 6.3: Summary of abbreviations and reference numbers for items in the questionnaire

Construct	Item numbers in questionnaire	Abbreviation	Reference number
Knowledge-sharing intention	1.18; 1.29; 1.34; 1.38; 1.46; 1.55	KI	KI1 - KI6
Individuals' awareness	1.7; 1.13; 1.15; 1.43; 1.56	AW	AW1 - AW5
Intrinsic motivation	1.3; 1.21; 1.22; 1.28; 1.51	IM	IM1 - IM5
Extrinsic motivation	1.8; 1.17; 1.26; 1.37; 1.41	EM	EM1 - EM5
Transactional psychological contract breach	1.4; 1.25; 1.42; 1.45	TB	TB1 - TB4
Relational psychological contract breach	1.12; 1.24; 1.30; 1.31; 1.40; 1.44; 1.52	RB	RB1 - RB7
Relationship conflict	2.1; 2.2; 2.4; 2.6; 2.8; 2.10	RC	RC1 - RC6
Task conflict	2.3; 2.5; 2.7; 2.9	TC	TC1 - TC4
Extraversion	1.9; 1.20; 1.23; 1.50; 1.53	EX	EX1 - EX5
Neuroticism	1.1; 1.6; 1.19; 1.35; 1.36	NE	NE1 - NE5
Openness to experience	1.2; 1.5; 1.33; 1.48; 1.54	OP	OP1 - OP5
Agreeableness	1.14; 1.16; 1.27; 1.47; 1.49	AG	AG1 - AG5
Conscientiousness	1.10; 1.11; 1.32; 1.39; 1.57	CO	CO1 - CO5

6.4.2 EFA and factor structures

After the EFA was completed, all items with loadings of lower than 0.6 were removed from the results, which is in line with recommendations by Hair *et al*. (2014:115-116). In fact, Hair *et al*. (2014:115-116) assert that factor loadings of approximately 0.3 to 0.4 are minimally acceptable with regard to statistical significance, while values greater than 0.5 are usually considered necessary for practical significance. Consequently, only items with a factor loading of 0.6 or higher were retained in the factor loading analysis results as depicted in the following tables, therefore indicating statistical (0.05 significance level) and practical significance.

Table 6.4: Factor structure: Dependent variable

Item	Factor
	Dependent variable
	KI
KI1	-0.7895
KI2	-0.8624
KI3	-0.8546
KI4	-0.8382
KI5	-0.8930
KI6	-0.7085
Expl.Var	4.0991
Prp.Totl	0.6832

Table 6.5: Factor structure: Independent variables

Item	Factor						
	Independent variables						
	MC	EM	PB	EX	NE	OP	CO
AW1	**0.6674**	0.0930	0.0635	0.0550	0.0566	0.0486	0.1315
AW2	**0.6234**	0.0398	0.1364	0.0243	0.0546	0.1548	0.2516
AW3	**0.7512**	0.0321	0.1473	0.0003	0.1081	0.0558	0.2291
AW4	**0.7018**	-0.0294	0.1878	-0.0098	0.0398	0.1666	0.2493
AW5	**0.7466**	0.0282	0.1283	0.0076	0.0695	0.1763	0.2754
IM1	**0.6086**	0.0789	-0.0007	0.1052	-0.0571	0.1415	-0.0124
IM2	**0.7925**	0.0727	0.1310	0.2592	0.0610	0.0501	0.0063
IM3	**0.7916**	0.0882	0.1411	0.2338	0.0576	0.0841	-0.0271
IM4	**0.7317**	0.0659	0.1699	0.2146	0.0200	0.0950	0.0623
IM5	**0.6329**	0.0280	0.1108	0.2142	0.1262	0.3153	0.2716
AG1	**0.6051**	0.0187	0.1040	0.2310	0.0465	0.0657	0.2149
EM1	-0.0903	**-0.8557**	-0.0028	0.0057	-0.0608	-0.0630	0.0181
EM2	-0.1328	**-0.8747**	0.0305	0.0032	-0.0945	-0.0630	-0.0486
EM3	0.0354	**-0.7920**	0.0787	-0.0865	-0.0950	0.0310	-0.0116
EM4	-0.0462	**-0.8504**	0.0956	-0.0118	-0.0960	-0.0438	-0.0553
EM5	0.0027	**-0.7925**	0.0933	-0.0021	-0.0829	-0.0003	-0.0139
TB2	0.1075	-0.0835	**0.7645**	0.0185	-0.0446	0.0037	0.0228
TB3	0.0639	-0.1084	**0.8204**	-0.0045	0.0327	0.0455	0.0211
TB4	0.1306	0.0270	**0.7768**	0.0335	-0.0019	0.0568	0.0875
RB1	0.0723	0.0142	**0.8307**	-0.0064	0.0148	0.0043	0.0440
RB2	0.0520	-0.0228	**0.8098**	0.0944	-0.0157	-0.0478	-0.0300
RB3	0.1109	-0.0076	**0.8169**	0.0463	0.0056	-0.0186	0.1009
RB4	0.1286	0.0010	**0.6889**	0.0290	-0.0109	0.0453	0.1460
RB5	0.0665	-0.0577	**0.8415**	0.0771	0.0418	0.0109	0.0102
RB6	0.1332	-0.0986	**0.7961**	0.0299	-0.0094	0.0922	0.0679
RB7	0.1546	-0.0277	**0.7632**	0.0654	-0.0237	0.0746	0.0123
EX1	0.1567	-0.0643	0.0742	**0.7817**	0.0993	-0.0047	0.0960
EX2	0.2511	0.1161	0.1119	**0.6353**	0.0942	0.2400	0.2063
EX3	0.2501	0.0633	0.0552	**0.6264**	0.1899	0.2953	0.2565
EX5	0.3518	0.0304	0.1271	**0.6313**	0.0466	0.1957	0.1295
NE1	-0.0572	-0.0979	-0.0188	-0.1247	**-0.6377**	-0.1823	-0.0475
NE2	-0.0276	-0.0575	0.0074	-0.1256	**-0.7592**	-0.0252	0.0372
NE3	-0.0673	-0.0914	0.0009	-0.1286	**-0.7931**	-0.0135	0.0049
NE4	-0.1106	-0.1769	-0.0089	-0.0068	**-0.7810**	-0.0179	-0.0512
NE5	-0.1056	-0.1452	0.0188	0.0189	**-0.7531**	-0.0431	-0.0766
OP1	0.1487	0.0870	0.0018	0.2551	0.1453	**0.6246**	0.0975
OP3	0.1840	0.0552	0.0100	0.2184	0.0276	**0.6604**	0.1451
OP4	0.2343	0.0343	0.0898	0.1979	0.1359	**0.7082**	0.0613
OP5	0.2190	0.0812	0.0617	-0.0959	-0.0569	**0.6448**	0.2257
CO1	0.2324	0.1115	0.1071	0.1667	0.0916	0.0644	**0.6500**
CO2	0.2326	0.0107	0.1610	0.2136	0.0536	0.0807	**0.6978**
CO5	0.3601	0.0082	0.0573	0.1849	0.0663	0.2149	**0.6519**
Expl.Var	7.2220	3.7002	6.6924	3.0036	3.0834	2.9972	2.9794
Prp.Totl	0.1416	0.0726	0.1312	0.0589	0.0605	0.0588	0.0584

The independent variables, namely task conflict and relationship conflict, were measured on a different scale to the other variables. Therefore, for the purpose of

this study, an independent factor analysis, was conducted on these variables as illustrated in Table 6.6.

Table 6.6: Factor structure: Independent variables

Item	Factor	
	Independent variables	
	RC	TC
RC1	**0.7189**	0.1888
RC2	**0.6031**	0.3520
RC3	**0.7174**	0.2072
RC4	**0.6746**	0.2921
RC5	**0.7654**	0.0812
RC6	**0.7978**	0.1825
TC2	0.1091	**0.8769**
TC3	0.1967	**0.8187**
Expl.Var	3.6956	2.1686
Prp.Totl	0.3696	0.2169

The factors that were identified during the EFA (Tables 6.4 to 6.6) are discussed in the next section.

6.4.3 Factors identified during the EFA

In total, nine factors were identified from the EFA of the data. These factors are:

- Knowledge-sharing intention (KI)
- Mature cooperation (MC)
- Extrinsic motivation (EM)
- Psychological contract breach (PB)
- Relationship conflict (RC)
- Extraversion (EX)
- Neuroticism (NE)
- Openness to experience (OP)
- Conscientiousness (CO)

Abbreviated names, as indicated in brackets above, will be assigned to each factor to enhance the readability of the rest of this chapter.

6.4.3.1 Knowledge-sharing intention (KI)

The dependent variable of this study as proposed in the hypothesised model is *Knowledge-sharing intention*. Six items (KI1-KI6) were formulated to measure individuals' knowledge-sharing intention in knowledge-intensive businesses. The EFA revealed that all six items loaded together as expected onto one factor.

Knowledge-sharing intention explains 68.32% of the variance in the data and the factor loadings ranged from 0.71 to 0.89 (Table 6.4). Sufficient evidence of discriminant validity is therefore provided for this construct. The Cronbach-alpha coefficient of 0.90 for *Knowledge-sharing intention* suggests that the scale used to measure this construct is reliable.

Table 6.7: Knowledge-sharing intention (KI)

% of Variance: 68.32%		**Cronbach-alpha: 0.90**
Item	**Question**	**Factor loading**
KI5	I would willingly share my work expertise with my co-workers	-0.8930
KI2	I would share work know-how with my co-workers	-0.8624
KI3	I would willingly share insights that I have learned from work with my co-workers	-0.8546
KI4	I would willingly share business knowledge with my co-workers	-0.8382
KI1	I would willingly share work experiences with my co-workers	-0.7895
KI6	I would intentionally share my knowledge with my co-workers if they ask	-0.7085

(*) 0 items were deleted for this factor

As expected, all six items that measured *Knowledge-sharing intention* loaded onto one factor and as a result the operationalisation of this construct as per Chapter 5, remained unchanged. For the purpose of this study, *Knowledge-sharing intention* therefore refers to individuals' willingness/intentions to share tacit knowledge, which includes personal insights, know-how, experience and expertise.

6.4.3.2 Mature cooperation (MC)

As illustrated in Table 6.3, the constructs *Individuals' awareness*, *Intrinsic motivation* and *Agreeableness* were each measured with five items in the final questionnaire. Of these 15 items, all the items under *Individuals' awareness* and *Intrinsic motivation,* plus one item under *Agreeableness* loaded together onto one factor. The items AG2, AG3, AG4 and AG5 did not load as expected and were excluded from further analysis. The 11 items that loaded together refer to an individual's maturity to recognise the significance that cooperating, in terms of sharing knowledge, has for the business and co-workers, as well as the maturity of an individual to realise intangible, intrinsic benefits, for sharing knowledge. Subsequently, this new construct that emerged was named *Mature cooperation*.

Table 6.8: Mature cooperation (MC)

% of Variance: 14.16%		**Cronbach-alpha: 0.92**
Item	**Question**	**Factor loading**
IM2	It would give me pleasure to share my experience with co-workers	0.7925
IM3	I would enjoy sharing my expertise with co-workers	0.7916
AW3	It is important for the business that I share my knowledge with co-workers	0.7512
AW5	Sharing my knowledge is beneficial for the business	0.7466
IM4	It would feel good to help co-workers by sharing my expertise	0.7317
AW4	If I share my knowledge with co-workers it could help them in doing their jobs better	0.7018
AW1	The importance of sharing my knowledge with co-workers is clear to me	0.6674
IM5	I have the confidence to provide knowledge that co-workers might consider valuable	0.6329
AW2	I know being aware of co-workers knowledge needs is important for the business	0.6234
IM1	I would find it personally satisfying to share my expertise with co-workers	0.6086
AG1	I am someone who likes to cooperate with others	0.6051

(*) 4 items were deleted for this factor

Mature cooperation explains 14.16% of the variance in the data and the factor loadings ranged from 0.61 to 0.79. Satisfactory evidence of discriminant validly is therefore provided for this new construct. The Cronbach-alpha coefficient for this construct is of 0.92, suggesting that the instrument used to measure this construct can be considered reliable. For the purpose of this study the construct *Mature cooperation* refers to the maturity of individuals, both in realising the significance and value of sharing their knowledge with others, and in recognising the intrinsic benefits of sharing as a motivation to share knowledge.

6.4.3.3 Extrinsic motivation (EM)

Five items were included in the final questionnaire to measure the construct *Extrinsic motivation.* All five items loaded together onto one factor with all factor loadings exceeding a value of 0.79. Sufficient evidence of discriminant validy is thus provided for this construct. *Extrinsic motivation* explains 7.26% of the variance in the data and the Cronbach-alpha coefficient for this construct is 0.90, suggesting that the instrument used to measure this construct can be considered reliable.

Table 6.9: Extrinsic motivation (EM)

% of Variance: 7.26%		**Cronbach-alpha: 0.90**
Item	**Question**	**Factor loading**
EM2	I would share my expertise with co-workers if I knew I would get a salary raise and/or bonus	-0.8747
EM1	I would share my expertise with co-workers if I knew I would be promoted	-0.8557
EM4	I would share my expertise with co-workers if I knew it would improve my job security	-0.8504
EM5	I would share ideas with co-workers if I knew my colleagues would in turn share their expertise with me	-0.7925
EM3	I would share my expertise with co-workers if I knew I would get their acknowledgement	-0.7920

(*) 0 items were deleted for this factor

As all the items loaded together onto *Extrinsic motivation* as expected, the operationalisation of *Extrinsic motivation* (see Chapter 5) remained unchanged.

Individuals' *Extrinsic motivation* to share knowledge in this study refers to the extrinsic benefits such as promotion, organisational rewards, acknowledgement, job security and reciprocity that employees consider as motivation to share knowledge.

6.4.3.4 Psychological contract breach (PB)

The final scale to measure *Transactional psychological contract breach* included four items and seven items to measure *Relational psychological contract breach*. All seven items intended to measure *Relational psychological contract breach* plus three items intended to measure *Transactional psychological contract breach* loaded onto one factor. The item TB1 did not load as expected and was excluded from further analysis. The new construct that emerged was named *Psychological contract breach.* Therefore, for the purpose of this study a distinction will not be made between relational and transactional breach as originally proposed.

As discussed in Chapters 4 and 5, researchers (Gupta *et al*., 2012:744) suggest that further studies are required to investigate the specific type of psychological contract breach on knowledge-sharing behaviour. Depending on the nature of the psychological contract (transactional or relational), the reaction to breach may vary, with breaches of relational obligations being more likely to have a stronger influence on individuals' behaviour than breaches of transactional obligations. Although the present study addressed this lack of research as suggested above by developing two different measures (transactional and relational) of psychological contract breach, the empirical results strongly propose that a global measure of psychological contract breach might be more appropriate, as individuals in this study did not distinguish between transactional and relational psychological contract breach. This finding is in line with other research (Phuong, 2013:32; Zhao *et al.,* 2007:670) that suggests the appropriateness of a global measure of breach for predicting workplace outcomes.

Table 6.10: Psychological contract breach (PB)

% of Variance: 13.12%		Cronbach-alpha: 0.94
Item	**Question**	**Factor loading**
RB5	My expectation of my employer to provide continuous training that will increase my work-related expertise has been kept	0.8415
RB1	My expectation of my employer to provide me with opportunities to develop my career has been kept	0.8307
TB3	My expectation of my employer to reward me for work well done has been kept	0.8204
RB3	My expectation of my employer to be honest with me concerning job-related aspects/issues has been kept	0.8169
RB2	My expectation of my employer to provide me with training that will facilitate my personal development has been kept	0.8098
RB6	My expectation of my employer to be trustworthy has been kept	0.7961
TB4	My expectation of my employer to provide a clear job description has been kept	0.7768
TB2	My expectation of my employer to reward me with a fair salary in exchange for my expertise has been kept	0.7645
RB7	My expectation of my employer to provide me with continued feedback on my performance has been kept	0.7632
RB4	My expectation of my employer to provide me with job security has been kept	0.6889

(*) 1 item was deleted for this factor

Psychological contract breach explains 13.12% of the variance in the data and all factor loadings exceeded a value of 0.68. Sufficient evidence of discriminant validity of the construct is thus provided. A Cronbach-alpha coefficient of 0.94 for *Psychological contract breach* is reported in Table 6.10, which suggests that the instrument used to measure this construct is reliable. In this study, *Psychological contract breach* refers to an individual's perception that the business has failed to meet one or more of his or her expectations concerning the extrinsic or monetary obligations expected from his or her employer in the short term, as well as an individual's perception that the business has failed to meet one or more expectations related to long-term arrangements such as career development, continuous training, and job security.

6.4.3.5 Relationship conflict (RC)

All six items included in the final questionnaire to measure the construct *Relationship conflict* loaded as expected onto one factor, while only two of the four items included in the final questionnaire to measure *Task conflict* loaded as expected. As a result, the construct *Task conflict* was excluded for further analysis. *Relationship conflict* explains 36.96% of the variance in the data and factor loadings between 0.60 and 0.80 were reported for this construct in Table 6.11. The Cronbach-alpha coefficient for *Relationship conflict* is 0.85, suggesting that the instrument used to measure this construct is reliable.

Table 6.11: Relationship conflict (RC)

% of Variance: 36.96%		**Cronbach-alpha: 0.85**
Item	**Question**	**Factor loading**
RC6	How often do you experience tension with other co-workers at work?	0.7978
RC5	How often are colleagues rude to you at work?	0.7654
RC1	How often do you experience friction from co-workers within the workplace?	0.7189
RC3	How often do you experience emotional conflict at work?	0.7174
RC4	How often do you experience personality conflict at work?	0.6746
RC2	How often are there arguments at work between yourself and co-workers?	0.6031

(*) 0 items were deleted for this factor

Because all six items loaded onto *Relationship conflict* as expected, the operationalisation of *Relationship conflict* as per Chapter 5 remains unchanged. *Relationship conflict*, in this study, refers to how often individuals experience arguments, tension, friction, emotional conflict and personality conflict at work.

6.4.3.6 Extraversion (EX)

Of the original five items proposed to measure the construct *Extraversion*, four items loaded together onto one factor. Item EX4 did not load as expected and was consequently excluded from further analysis. *Extraversion* explains 5.89% of the variance in the data and factor loadings varied between 0.63 and 0.78. Sufficient evidence of discriminant validity is thus provided for this construct. The Cronbach-alpha coefficient of 0.80 reported for *Extraversion* suggests that the instrument used to measure this construct is reliable.

Table 6.12: Extraversion (EX)

% of Variance: 5.89%		**Cronbach-alpha: 0.80**
Item	**Question**	**Factor loading**
EX1	I am someone who is outgoing and sociable	0.7817
EX2	I am an enthusiastic person	0.6353
EX5	I easily engage in conversation with others	0.6313
EX3	I am someone who is active/lively	0.6264

(*) 1 item was deleted for this factor

Because the item EX4 did not load onto *Extraversion* as expected, the operationalisation of *Extraversion*, as per Chapter 5, was slightly amended. Therefore, for the purpose of this study, *Extraversion* refers to the tendency of an individual to be outgoing, enthusiastic, active and talkative.

6.4.3.7 Neuroticism (NE)

Five items were included in the final questionnaire to measure the construct *Neuroticism*. All five items loaded onto one factor as expected. *Neuroticism* explains 6.05% of the variance in the data and all factor loadings exceeded a value of 0.63. Sufficient evidence of discriminant validity of this construct is therefore provided. A Cronbach-alpha coefficient of 0.83 is reported for this construct, suggesting that the instrument used to measure *Neuroticism* is reliable.

Table 6.13: Neuroticism (NE)

% of Variance: 6.05%		Cronbach-alpha: 0.83
Item	**Question**	**Factor loading**
NE3	I am someone who worries a lot	-0.7931
NE4	I am someone who easily gets upset	-0.7810
NE2	I am someone who can be tense	-0.7592
NE5	I am someone who can be moody	-0.7531
NE1	I am someone who gets nervous easily	-0.6377

(*) 0 items were deleted for this factor

Given that all five items loaded onto *Neuroticism* as expected, the operationalisation of *Neuroticism* as per Chapter 5 remained unchanged. *Neuroticism,* for the purpose of this study, refers to an individual's propensity to easily get upset and to worry a lot, as well as to experience negative feelings such as nervousness and tension.

6.4.3.8 Openness to experience (OP)

Four of the original five items developed to measure the construct *Openness to experience* loaded together onto one factor. Only the item OP2 did not load as expected and was excluded from further analysis. *Openness to experience* explains 5.88% of the variance in the data and factor loadings varied between 0.62 and 0.71. Sufficient evidence of discriminant validity is thus provided for this construct. The Cronbach-alpha coefficient of 0.74 reported in Table 6.14 suggests that the instrument used to measure *Openness to experience* is reliable.

Table 6.14: Openness to experience (OP)

% of Variance: 5.88%		Cronbach-alpha: 0.74
Item	**Question**	**Factor loading**
OP4	I am someone who is inventive	0.7082
OP3	I am someone who has an active imagination	0.6604
OP5	I am someone who is a deep thinker	0.6448
OP1	I am someone who is original, comes up with new ideas	0.6246

(*) 1 item was deleted for this factor

The exclusion of the item OP2 did not necessitate a change in the operationalisation of the construct *Openness to experience*, as per Chapter 5. *Openness to experience* refers to the extent that an individual is being original, open-minded, imaginative, inventive and a deep thinker.

6.4.3.9 Conscientiousness (CO)

Three of the original five items included in the final questionnaire to measure the construct *Conscientiousness* loaded together onto one factor. The items CO3 and CO4 did not load as expected, and was excluded from further analysis. *Conscientiousness* explains 5.84% of the variance in the data and the factor loadings ranged between the values of 0.65 and 0.70. Sufficient evidence of discriminant validity is thus provided for this construct. The Cronbach-alpha coefficient of 0.77 reported for this construct suggests that the instrument used to measure *Conscientiousness* is reliable.

Table 6.15: Conscientiousness (CO)

% of Variance: 5.84%		Cronbach-alpha: 0.77
Item	**Question**	**Factor loading**
CO2	I am someone who makes plans and follows through with them	0.6978
CO5	I am someone who does things efficiently	0.6519
CO1	I am someone who perseveres until the job is finished	0.6500

(*) 2 items were deleted for this factor

Because the two items CO3 and CO4 did not load as expected onto the construct Conscientiousness, the operationalisation of this construct was slightly amended. *Conscientiousness,* therefore in this study, refers to the degree to which an individual is efficient and to which an individual perseveres and follows through with plans.

6.5 VALIDITY OF THE MEASURING INSTRUMENT

EFA was used to assess the validity of the measuring instrument. The construct validity of the measuring instrument comprises of, amongst others, convergent, discriminant and face validity as discussed in the following sections.

6.5.1 Convergent validity

Convergent validity considers the extent to which two measures of the same concept are correlated (Hair *et al*., 2014:124). To estimate the amount of convergent validity among item measures one should consider the size of the factor loadings, with high loadings on a factor suggesting convergence on a common point. At a minimum, factor loadings should be statistically significant. However, a significant loading can still be weak in strength. Therefore, standardised loading estimates should preferably be 0.5 or higher (Hair *et al*., 2014:618). After the factor analysis was conducted in the present study, only significant loading of 0.6 or higher was retained in the factor analysis results, while items loading together onto one factor were grouped as discussed in section 6.4.

Another method employed in this study to estimate the relative amount of convergent validity among item measures was to calculate the AVE. Using standardised loadings, the AVE value can be calculated as follows:

$$AVE = \frac{\sum_{i=1}^{n} L_i^2}{n}$$

The L_i denotes the standardised factor loadings and i is the number of items. Therefore, for n items, AVE is calculated as the total of all squared standardised factor loadings divided by the number of items. An AVE value should be calculated for each latent variable in a measurement model. A measure of 0.5 or higher as a rule of thumb implies adequate convergence (Hair *et al*., 2014:619).

The computation of the AVE measure for the factor *Knowledge-sharing intention* (KI) is shown below, while Table 6.16 illustrated the AVE values for the other latent constructs that were calculated in similar fashion.

$$AVE = \frac{\sum_{i=1}^{n} L_i^2}{n}$$

$$= \frac{(-0.7895)^2 + (-0.8624)^2 + (-0.8546)^2 + (-0.8382)^2 + (-0.8930)^2 + (-0.7085)^2}{6}$$

$$= \frac{4.0994}{6}$$

$$= 0.683$$

Table 6.16: AVE of all factors

Factor	AVE
Knowledge-sharing intention (KI)	0.683
Mature cooperation (MC)	0.489
Extrinsic motivation (EM)	0.695
Psychological contract breach (PB)	0.627
Relationship conflict (RC)	0.512
Extraversion (EX)	0.451
Neuroticism (NE)	0.558
Openness to experience (OP)	0.436
Conscientiousness (CO)	0.445

With the exception of *Mature cooperation*, *Extraversion*, *Openness to experience* and *Conscientiousness* that produced AVE values that were marginally below the broad guideline of 0.5, all other AVE values were in excess of 0.5. In general, satisfactory evidence of convergent validity is thus provided. The theoretical foundations in this thesis (Chapters 2, 3 and 4) substantiate that the factors for which an AVE value of less than 0.5 were reported, play an important role concerning *Knowledge-sharing intention*. The fact that the AVE measures for these factors are marginally below the general approximation, and not the strict rule of 0.5, and due to their theoretical prominence, these factors should not be rejected as invalid factors based only on the AVE results.

An additional indicator of convergent validity is reliability (Hair *et al*., 2014:619). The reliability of the measuring instrument, which lends further support to the convergent validity of the measuring instrument in this study, is discussed in section 6.6.

6.5.2 Discriminant validity

Discriminant validity refers to the extent to which two conceptually similar concepts are distinct (Hair *et al*., 2014:124). To determine the discriminant validity of the measuring instrument in the present study, an EFA was conducted. Principal component extraction with varimax raw rotation was specified as the extraction and rotation method. The percentage of variance explained and the individual factor loadings were considered to identify the factors to extract for the model. For the purpose of this study, only items with a factor loading of 0.6 or higher that loaded onto one factor were considered significant (Hair *et al*., 2014:115-116). This therefore provides evidence of construct and discriminant validity for the measuring instrument (refer to section 6.4).

In conjunction with using an EFA to assess the discriminant validity of the measuring instrument, the AVE value for any two factors was compared with the correlation estimates between the two factors as an additional method to evaluate the discriminant validity. In this instance, the square root of every AVE value of each latent construct should be larger than any correlation (absolute value) among any pair of latent constructs in order to confirm the discriminant validity of the measuring instrument. Fundamentally, AVE measures the explained variance of a construct. A comparison of the AVE value of a construct to an inter-construct correlation estimate, establishes whether the items of the construct explain more variance than the items of the other constructs (Zait & Bertia, 2011:218; Bhuvan, 2008:309). Table 6.17 presents the results of the discriminant validity of this study. The factor names are displayed in column 1, followed by the square root of the AVE values for each factor in column 2. Table 6.17 also illustrates the correlation estimates between a factor in column 1 and each one of the other factors in columns 3 to 10.

Table 6.17: AVE versus correlation estimates

1	2	3	4	5	6	7	8	9	10
Factor	$\sqrt{\mathbf{AVE}}$	**MC**	**EM**	**PB**	**RC**	**EX**	**NE**	**OP**	**CO**
MC	0.699	-	-0.128	0.299	-0.148	0.540	-0.192	0.488	0.573
EM	0.834	-0.128	-	0.101	0.041	-0.090	0.253	-0.144	-0.099
PB	0.792	0.299	0.101	-	-0.283	0.212	-0.011	0.135	0.241
RC	0.716	-0.148	0.041	-0.283	-	-0.161	0.245	-0.060	-0.133
EX	0.672	0.540	-0.090	0.212	-0.161	-	-0.259	0.492	0.512
NE	0.747	-0.192	0.253	-0.011	0.245	-0.259	-	-0.205	-0.161
OP	0.660	0.488	-0.144	0.135	-0.060	0.492	-0.205	-	0.456
CO	0.667	0.573	-0.099	0.241	-0.133	0.512	-0.161	0.456	-

All of the squared AVE values of the constructs (refer to column 1) were much larger than the absolute value of the correlation estimate of the given construct with any other construct. It can therefore be concluded that the measuring instrument in this study has satisfactory discriminant validity. In addition to the AVE analysis, the EFA as explained earlier further supports the discriminant validity of the measuring instrument used in the present study.

6.5.3 Face validity

Face validity is the most important validity test and must be established before any theoretical testing takes place. Without understanding every item's content or meaning, it is impossible to express and accurately specify a measurement model (Hair *et al*., 2014:620). As is the case in the present study, face validity is established when the measured items are conceptually in line with a construct definition (Hair *et al*., 2014:637). To further enhance face validity, experts in the field of research methodology, knowledge management and statistical modelling were requested to scrutinise and adjust the questionnaire before it was distributed to final respondents. Moreover, a pilot study was conducted to detect any

problems in the questionnaire's instructions or design before it was sent to the respondents in the sample (refer to section 5.3.10.2).

Given the results and conclusions on convergent, discriminant and face validity as discussed in section 6.5, the measuring instrument used in this study can be considered valid.

6.6 RELIABILITY OF THE MEASURING INSTRUMENT

The widely accepted Cronbach-alpha coefficient was used in this study as a reliability estimate of internal consistency. Cronbach-alpha coefficients of less than 0.5 are not considered to be acceptable, while those between 0.50 and 0.60 are deemed questionable, and those above 0.70 are acceptable. Good reliability coefficients are those greater than 0.80. It is generally accepted that the lower limit for the Cronbach-alpha coefficient is 0.70 (Nunnally, 1978). Table 6.18 depicts the Cronbach-alpha coefficients of the different constructs.

Table 6.18: Cronbach-alpha coefficients of the different constructs

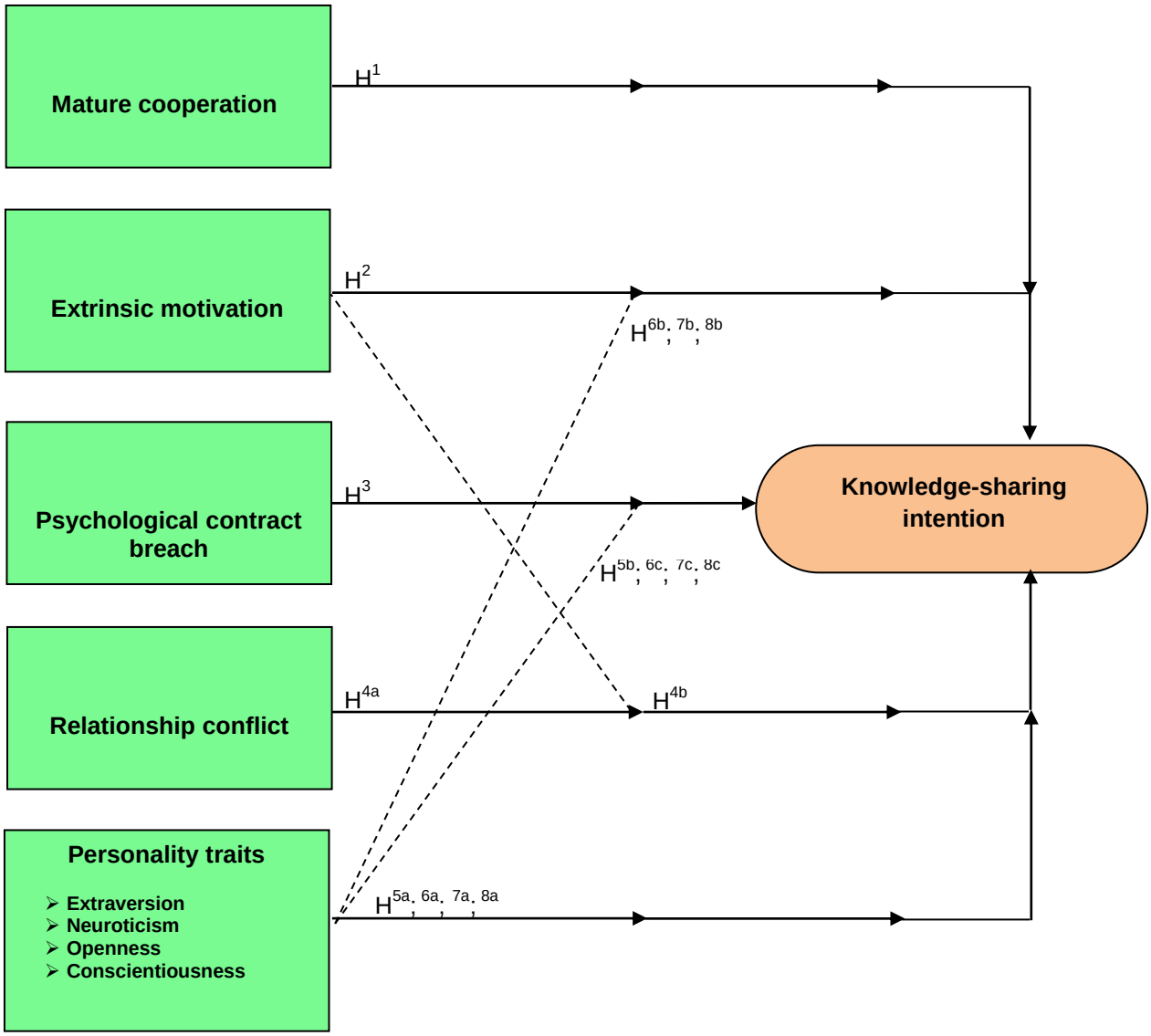
Factor	Cronbach-alpha coefficient
Knowledge-sharing intention (KI)	0.90
Mature cooperation (MC)	0.92
Extrinsic motivation (EM)	0.90
Psychological contract breach (PB)	0.94
Relationship conflict (RC)	0.85
Extraversion (EX)	0.80
Neuroticism (NE)	0.83
Openness to experience (OP)	0.74
Conscientiousness (CO)	0.77

As indicated in Table 6.18, all the coefficients were in excess of the suggested cut-off point of 0.70, indicating scale reliability. In fact, the items measuring the different constructs can be regarded as good measures of the various constructs given that most of the values are above 0.80 and in some cases even in excess of 0.90. In addition, it should be noted that reliability is an indicator of convergent validity. Therefore, the findings concerning convergent validity in section 6.5.1 can be confirmed given that the reliability of the measuring instrument has been established above. Based on the discussions in sections 6.5 and 6.6 the overall validity and reliability of the measuring instrument are considered satisfactory.

6.7 REVISED HYPOTHESISED MODEL AND HYPOTHESES

Based on the factor analysis results, the original hypothesised model and associated hypotheses (refer to Chapter 4) were revised. The various relationships illustrated in the revised hypothesised model (Figure 6.1), and the reformulated hypotheses as depicted below, are subjected to further empirical testing.

Figure 6.1: Revised hypothesised model of factors influencing knowledge-sharing intention



From the revised hypothesised model, the following alternative hypotheses are formulated for further empirical testing. Specific hypotheses relating to demographic variables such as age, gender, home language, highest academic qualification, ethnic background organisational tenure and job tenure of the respondents are also included in Table 6.19. In all hypotheses, the null hypotheses (H_o) states that there is no relationship between the variables tested.

Table 6.19: Summary of revised hypotheses

Hypothesis Number	Hypothesis
H^{1}:	There is a positive relationship between *Mature cooperation* and *Knowledge-sharing intention*.
H^{2}:	There is a positive relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{3}:	There is a negative relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{4a}:	There is a negative relationship between *Relationship conflict* and *Knowledge-sharing intention*.
H^{4b}:	*Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.
H^{5a}:	There is a positive relationship between *Extraversion* and *Knowledge-sharing intention*.
H^{5b}:	*Extraversion* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{6a}:	There is a negative relationship between *Neuroticism* and *Knowledge-sharing intention*.
H^{6b}:	*Neuroticism* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{6c}:	*Neuroticism* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{7a}:	There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*.
H^{7b}:	*Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{7c}:	*Openness to experience* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{8a}:	There is a positive relationship between *Conscientiousness* and *Knowledge-sharing intention*.
H^{8b}:	*Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{8c}:	*Conscientiousness* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{9a}:	There is a relationship between *Age* and *Knowledge-sharing intention*.
H^{9b}:	There is a relationship between *Gender* and *Knowledge-sharing intention*.
H^{9c}:	There is a relationship between *Home language* and *Knowledge-sharing intention*.
H^{9d}:	There is a relationship between *Highest academic qualification* and *Knowledge-sharing intention*.

H^{9e}:	There is a relationship between *Ethnic background* and *Knowledge-sharing intention*.
H^{9f}:	There is a relationship between *Organisational tenure* and *Knowledge-sharing intention*.
H^{9g}:	There is a relationship between *Job tenure* and *Knowledge-sharing intention*.

6.8 DESCRIPTIVE STATISTICS AND CORRELATIONS

The following sections examine the descriptive statistics by discussing the descriptive statistics of the sample data and the correlations between the factors identified during the EFA.

6.8.1 Descriptive statistics of sample data

Descriptive statistics (mean, standard deviation and frequency distributions) were calculated from the sample data and are summarised in Table 6.20. For the purpose of this research and for the sake of brevity, the mean scores for the factors resulting from the factor analysis (excluding the factor *Relationship conflict*) were categorised as Disagree [1 - 3), Neutral [3 - 5) and Agree [5 - 7]. Given the nature of the scale used to measure the factor *Relationship conflict* (refer to section 5.3.5), the mean scores relating to this factor were categorised as Disagree [0 – 1.33), Neutral [1.33 - 2.66) and Agree [2.66 - 4].

Table 6.20: Descriptive statistics of the dependent and independent variables (N = 597)

Factor	Mean	Std. Dev.	Disagree %	Neutral %	Agree %
Knowledge-sharing intention (KI)	6.16	0.85	0.50	7.87	91.63
Extrinsic motivation (EM)	4.33	1.72	22.95	34.84	42.21
Psychological contract breach (PB)	5.13	1.36	8.54	27.97	63.49
Relationship conflict (RC)	1.28	0.67	52.43	43.72	3.85
Mature cooperation (MC)	6.12	0.79	0.50	7.87	91.63
Extraversion (EX)	5.61	1.04	1.34	20.27	78.39
Neuroticism (NE)	3.59	1.34	32.66	48.58	18.76
Openness to experience (OP)	5.64	0.92	0.67	17.59	81.74
Conscientiousness (CO)	6.17	0.80	0.50	5.19	94.31

Except for the variables *Relationship conflict* and *Neuroticism,* most of the respondents agreed with the statements measuring the different variables. This agreement varied between 42.21% for *Extrinsic motivation* to 94.31% for *Conscientiousness*. The lowest and highest mean scores were that of *Relationship conflict* (1.28) and *Conscientiousness* (6.17) respectively. Given the categories used to classify the mean responses relating to *Relationship conflict*, it is not surprising that this variable reported the lowest mean score.

6.8.2 Pearson's product moment correlations

The Pearson's product moment correlation test was carried out to assess whether there is a relationship between two or more variables. There are no guidelines concerning the levels of correlation as they depend on the type of study conducted and sample size (Van den Heever, 2014:219). For the purpose of the present study, the following guidelines were used to evaluate the correlations:

- < 0.2 Weak relationship;
- [0.2 - 0.3] Moderate relationship; and
- > 0.3 Strong relationship.

As illustrated in Table 6.21, the majority of factors have correlations with each other that vary from weak to moderate relationships. In selected cases strong relationships are reported between factors. For example, *Extraversion* has strong correlations with *Knowledge-sharing intention* and *Mature Cooperation*. All reported correlation estimates are significant at $p < 0.05$.

Table 6.21: Pearson's moment correlation coefficients

Factor	KI	MC	EM	PB	RC	EX	NE	OP	CO
KI	1.000								
MC	0.826	1.000							
EM	-0.118	-0.128	1.000						
PB	0.285	0.299	0.101	1.000					
RC	-0.147	-0.148	0.041	-0.283	1.000				
EX	0.418	0.540	-0.090	0.212	-0.161	1.000			
NE	-0.146	-0.192	0.253	-0.011	0.245	-0.259	1.000		
OP	0.434	0.488	-0.144	0.135	-0.060	0.492	-0.205	1.000	
CO	0.449	0.573	-0.099	0.241	-0.133	0.512	-0.161	0.456	1.000

Based on these descriptive statistics it is reasonable to expect a limited linear relationship between the variables with low correlations.

6.9 STRUCTURAL EQUATION MODELLING (SEM)

In the present study, SEM was the major statistical technique used during the empirical investigation. SEM is typically used to examine the overall fit of the revised hypothesised model and to analyse the direct relationships between independent and dependent variables. Moreover, as a subset of SEM, GLM is

used to determine the influence of demographic variables on *Knowledge-sharing intention*. Once the analyses are concluded, the results are interpreted and the revised hypothesised relationships are either supported or not supported.

For referencing purposes, the following abbreviations are used in the tables and figures to follow:

- Knowledge-sharing intention → KI
- Mature cooperation → MC
- Extrinsic motivation → EM
- Psychological contract breach → PB
- Relationship conflict → RC
- Extraversion → EX
- Neuroticism → NE
- Openness → OP
- Conscientiousness → CO

6.9.1 SEM analyses to determine best model fit

To determine the best fit model, the complete model (Model 1) was first analysed. Based on the analysis, adjustments were made to Model 1 and the resulting Model 2 (Adapted model) was subjected to further analysis. Further adjustments were made to Model 2, and finally, Model 3 (Proposed model) was evaluated.

Various indices are useful to measure model goodness-of-fit. For example, the ratio of the Chi-square to the degrees of freedom is useful for interpretation. This term forms part of the goodness-of-fit indices in this study and is known as the normed Chi-square (x^2/df). It is recommended that this value should be in the order of 3 or less. Even if a value of 3 or less is reported, it should be read in conjunction with other goodness-of-fit indices as illustrated in Table 6.22 (Hooper, Coughlan & Mullen, 2008:53-60).

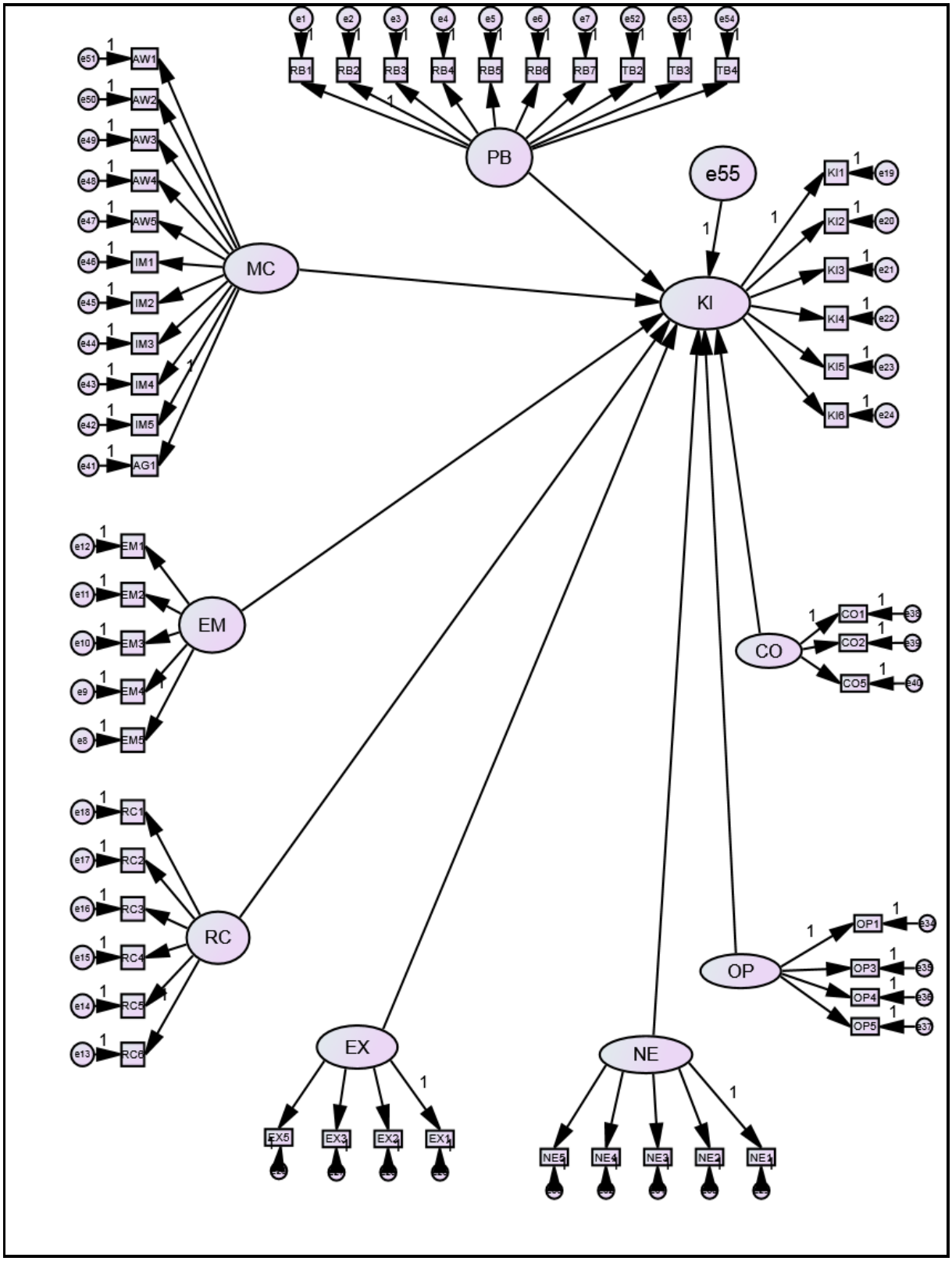
Table 6.22: Goodness-of-fit indices

CMin/df (x^2/df)	Normed Chi-square: it is recommended that this value should be in the order of 3 or less
RMSEA	Root mean squared error of approximation: preferably this measure should be smaller than 0.07
CFI	Comparative fit index: ideally the CFI should obtain a value above 0.9
TLI	Tucker-Lewis index: this index should preferably show a value above 0.9
PGFI	Parsimony goodness-of-fit index: this index is used to compare models, and the better model will have the higher PGFI

6.9.1.1 Model 1 (Complete model)

The SEM process was conducted to identify the goodness-of-fit of the hypothesised model as illustrated in Figure 6.1. Figure 6.2 denotes Model 1, which estimates 144 distinct parameters, with 1485 distinct sample moments and 1341 (1 485 – 144) degrees of freedom.

Figure 6.2: Model 1 (Complete model)



The SEM results from Model 1 show a normed Chi-square of 2.954, which indicates a good fit, but should be read in conjunction with other goodness-of-fit indices as illustrated in Table 6.23.

Table 6.23: Model 1 goodness-of-fit indices

Index	Norm	Results for Model 1
CMin/df (x^2/df)	Less than 3.0	2.954
RMSEA	Smaller than 0.07	0.057
CFI	Above 0.90	0.867
TLI	Above 0.90	0.859
PGFI	The higher the better	0.712

From the results in Table 6.23 it is evident that the fit of Model 1 could be better as the CFI and TLI indices are marginally below the norm value of 0.90. Therefore, the researcher proceeded to improve the model fit by defining Model 2 (adapted model) where insignificant variables with p-values > 0.05 were omitted and significant relationships (p < 0.05) were retained. Table 6.24 shows the parameter estimates, standard errors, test statistic value (CR) and p-values of Model 1 that were used to define Model 2.

Table 6.24: Model 1 parameter estimates and p-values

			Estimate	SE	CR	P
KI	<---	PB	0.012	0.014	0.854	0.393
KI	<---	EM	-0.020	0.014	-1.370	0.171
KI	<---	RC	-0.029	0.031	-0.933	0.351
KI	<---	EX	-0.128	0.039	-3.293	***
KI	<---	NE	0.008	0.022	0.350	0.727
KI	<---	CO	-0.122	0.052	-2.370	0.018
KI	<---	OP	0.110	0.040	2.772	0.006
KI	<---	MC	1.119	0.077	14.470	***

*** p < 0.001

In light of Table 6.24, the following relationships were removed for further analysis:

KI	<---	PB	(p = 0.393)
KI	<---	EM	(p = 0.171)
KI	<---	RC	(p = 0.351)
KI	<---	NE	(p = 0.727)

Psychological contract breach is not significantly related (0.012, p = 0.393) to *Knowledge-sharing intention* and therefore hypothesis H^3 cannot be supported. This finding suggests that *Psychological contract breach* did not influence the *Knowledge-sharing intention* of respondents in the present study. This finding is in congruence with the findings of Gupta *et al*. (2012:737) who also found that *Psychological contract breach* did not have a significant influence on knowledge-sharing behaviour. This finding is, however, contrary to the findings of other researchers (Bal *et al*., 2011:736) who found that *Psychological contract breach* is negatively related to knowledge sharing. As suggested in section 6.4.3.4, the present study used a composite measure of psychological contract breach, while a global (overall) measure of psychological contract breach might be more accurate to evaluate how well an employee's contract has been fulfilled by an employer. A composite measure of psychological contract breach may be more applicable when the purpose is to identify which items (for example training or job security) are being fulfilled and which are not. Also, it is possible that the composite measure of breach used in the present study did not include relevant obligation items that were applicable to all respondents. For instance, if an item (obligation) of high importance was not included in the questionnaire and the employer is not fulfilling the obligation, some respondents may interpret this as an overall breach and as a result respond negatively for all other items (Phuong, 2013:37).

In contrast with studies (see section 4.2.2.2 in Chapter 4) that did find a relationship between individuals extrinsic motivation and knowledge sharing, this study revealed no significant relationship between *Extrinsic motivation* and *Knowledge-sharing intention* (-0.020, p = 0.171). Hypothesis H^2 can therefore not be supported. This finding corresponds with the findings of a number of other studies (Lin, 2007a:135; Kwok & Gao, 2006:45) that also revealed no relationship

between extrinsic motivation and knowledge-sharing intentions or attitudes toward knowledge sharing. Chang *et al*. (2007:276) also found no relationship between rewards and knowledge sharing. Olatokun and Nwafor's (2012:216) findings in the same way reveal that expected organisational rewards and reciprocal benefits have not been significantly related to employee attitudes and knowledge-sharing intentions. A possible explanation for this result may be that respondents in this study have minimal rewards or incentives offered in their organisation for sharing knowledge. In addition, the respondents may value intrinsic (intangible) benefits more with respect to knowledge sharing. In this instance, Olatokun and Nwafor (2012:228) suggest that with intrinsically motivated employees, the creation and sharing of tacit knowledge is more important than with extrinsically motivated employees. Hence, this could explain why no significant relationship was found between extrinsic motivation and the sharing of tacit knowledge in the present study.

Table 6.24 confirms that *Relationship conflict* is not significantly related to *Knowledge-sharing intention* (-0.029, p = 0.351). Consequently, hypothesis H^{4a} cannot be supported. A possible explanation for this finding is that, as a result of personality differences, some respondents may still be willing to share their tacit knowledge with co-workers although they experience relationship conflict. From Chapter 4 (section 4.2.2.4) it is evident that the majority of research on relationship conflict and knowledge sharing reports a negative relationship between these constructs. More specifically, the result in the present study is incongruent with the findings of Chen *et al*. (2011:1005), Lu *et al*. (2011:139) and Hewitt (2008:157) who did find a negative relationship between relationship conflict and knowledge sharing.

Finally, no significant relationship between *Neuroticism* and *Knowledge-sharing intention* (0.008, p = 0.727) was established (hypothesis H^{6a} cannot be supported). In their study on the determinants of individual engagement in knowledge sharing, Cabrera *et al*. (2006:248) inferred on the basis of secondary research, that this trait is not related to the intention to share knowledge. Accordingly, these authors did not include this personality trait in their study for empirical testing. Similarly, Matzler *et al.* (2011:299-300) did not include neuroticism in their empirical study on

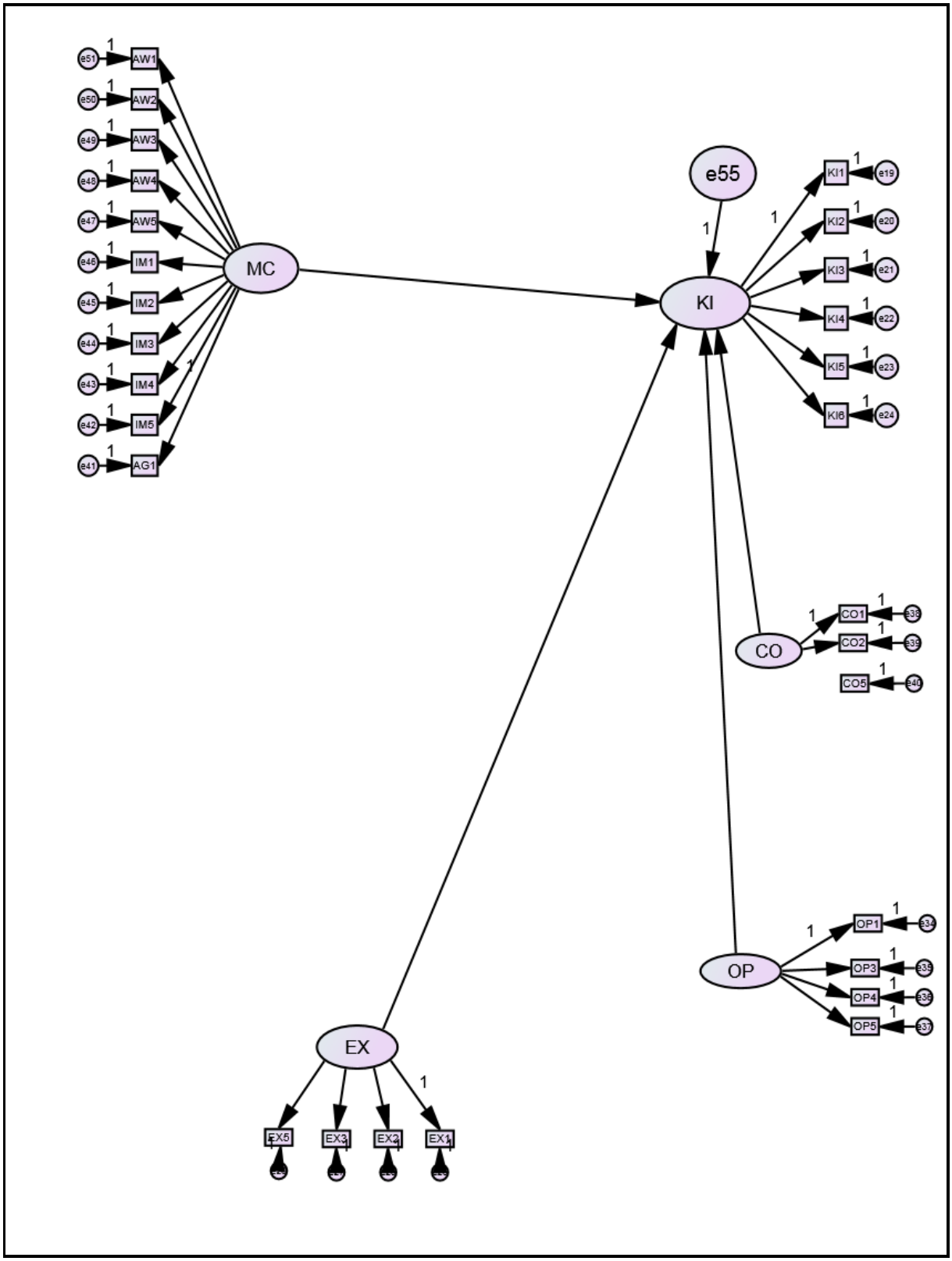
personality traits and knowledge sharing. As such, these researchers provided no empirical evidence to support their argument regarding the lack of relationship between neuroticism and knowledge-sharing intention. The empirical findings in the present study, which reported no significant relationship between neuroticism and knowledge-sharing intention, therefore confirm the conclusions of Cabrera *et al*. (2006:248) and Matzler *et al.* (2011:299-300). Likewise, the findings of Wang and Yang (2007:1431-1434) indicate that neuroticism is not significantly related to knowledge-sharing intention. On the other hand, other research (see Gharanjik & Azma, 2014:81; Yoo & Gretzel, 2011:618) reports a negative relationship between neuroticism and knowledge-sharing intention. The researcher is accordingly of the opinion that future research is required on the relationship between these constructs given the mixed findings in this respect.

In order to obtain the most parsimonious model, the researcher proceeded to improve the model fit (refer to Table 6.23) by defining Model 2 (Adapted model), where the insignificant variables as discussed in the preceding paragraphs were omitted.

6.9.1.2 Model 2 (Adapted model)

Figure 6.3 illustrates Model 2 where only the significant relationships were included.

Figure 6.3: Model 2 (Adapted model)



Model 2 estimates 81 distinct parameters, with 561 distinct sample moments and 480 (561 – 81) degrees of freedom. In order to compare the fit of Model 2 with the

fit of Model 1, the goodness-of-fit indices were calculated again. These are presented in Table 6.25.

Table 6.25: Model 2 goodness-of-fit indices

Index	Norm	Results for Model 2
CMin/df (x^2/df)	Less than 3.0	4.643
RMSEA	Smaller than 0.07	0.078
CFI	Above 0.90	0.879
TLI	Above 0.90	0.865
PGFI	The higher the better	0.689

Table 6.26 provides a summary of the parameter estimates, standard errors, test statistic value (CR) and p-values of Model 2.

Table 6.26: Model 2 parameter estimates and p-values

			Estimate	SE	CR	P
KI	<---	EX	-0.126	0.038	-3.317	***
KI	<---	CO	-0.118	0.052	-2.273	0.023
KI	<---	OP	0.110	0.039	2.786	0.005
KI	<---	MC	1.132	0.078	14.579	***

*** $p < 0.001$

Although Table 6.26 shows that all the relationships in Model 2 were found to be significant ($p < 0.05$), Table 6.25 illustrates that the fit of Model 2 could be improved. The normed Chi-square value of Model 2 is considerably higher than the recommended norm of 3.0, while the CFI and TLI are slightly lower than the norm value of 0.90. In addition, the RMSEA is marginally above the recommended value of 0.070. As a result an attempt was made to improve the model fit by identifying cross-correlations between factors. In this regard, the modification index (MI) was used and set at the conservative level of 20. The cross-correlations above 20 are shown in Table 6.27.

Table 6.27: Cross-correlations and MI results

Correlation			M.I.	Par Change
e45	<-->	e47*	20.016	-0.075
e28	<-->	e42*	20.566	0.156
e37	<-->	Extra*	21.520	-0.152
e42	<-->	AwareMot*	21.865	-0.078
e25	<-->	e37*	24.496	-0.266
e42	<-->	e47*	25.153	0.109
e43	<-->	e44*	25.624	0.075
e44	<-->	e48*	26.462	-0.101
e44	<-->	e50*	27.666	-0.105
e43	<-->	e47*	29.559	-0.090
e45	<-->	e50*	30.422	-0.111
e42	<-->	e48*	31.813	0.143
e40	<-->	e47*	32.262	0.109
e43	<-->	e55*	36.992	0.060
e42	<-->	e43	39.678	-0.122
e47	<-->	e49	39.893	0.117
e46	<-->	e51	41.072	0.231
e20	<-->	e43	46.697	0.094
e44	<-->	e47	54.051	-0.123
e47	<-->	e48	62.291	0.173
e44	<-->	e45	224.376	0.223

*Not included in next model

The inter-item correlations in Table 6.27 were analysed, and as an example, possible reasons for some correlations are highlighted in Table 6.28. It should be noted that not all the inter-item correlations that were identified are included in Table 6.28, as all the other correlations could be explained in a similar manner. The inter-item correlations marked with an asterisk (*) in Table 6.27 were not included for further analysis as little or no theoretical support for these correlations could be established.

Table 6.28: Explanation of cross-correlations identified from Model 2

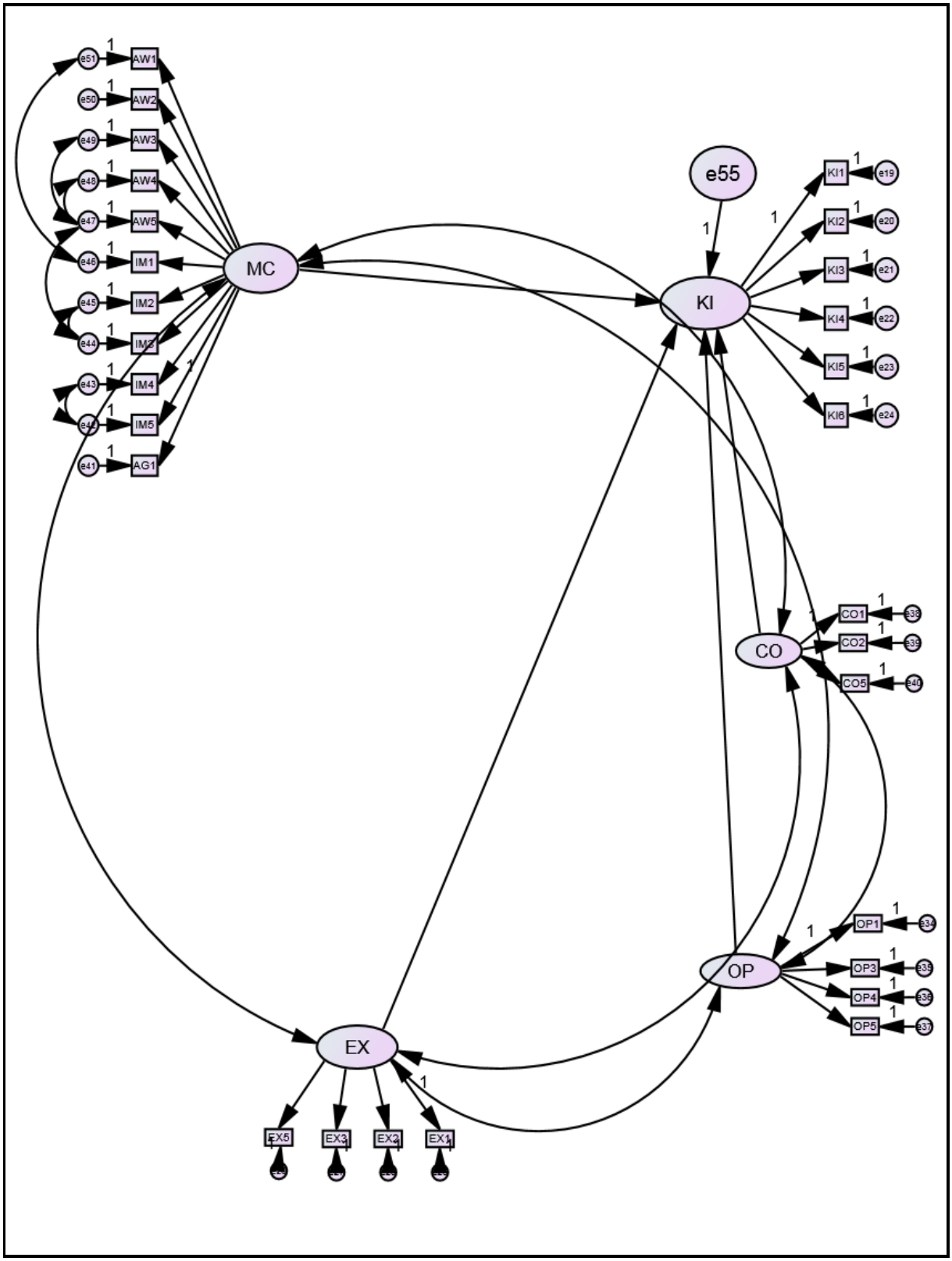
Correlation	Explanation
e42 <--> e43	Both these items relate to respondents' self-assuredness that their knowledge (e42) or expertise (e43) will help or be valuable to co-workers.
e47 <--> e49	Both these items refer to similar concepts, namely the benefits (e47) and the importance (e49) of knowledge sharing for the business.
e20 <--> e43	These items are correlated because they deal with concepts that are related, namely sharing work know-how (e20) and sharing expertise (e43).
e47 <--> e48	These items are correlated as they deal with concepts that are related, namely benefits of knowledge sharing for the business (e47) and benefits are knowledge sharing for co-workers (e48).
e44 <--> e45	Both these items include similar concepts that are related, namely enjoyment (e44) and pleasure (e45) of sharing knowledge with co-workers.

Against this background, the researcher defined Model 3 (Proposed model) where all significant variables and the inter-item correlations were included. Tables 6.26 and 6.27 illustrate this respectively.

6.9.1.3 Model 3 (Proposed model)

Figure 6.4 illustrates Model 3 where the significant relationships (Table 6.26) and inter-item correlations (Table 6.27) were included.

Figure 6.4: Model 3 (Proposed model)



Model 3 (Proposed model) estimates 72 distinct parameters, with 406 distinct sample moments and 334 (406 – 72) degrees of freedom. In order to compare the fit of Model 3 with the fit of Model 2, the goodness-of-fit indices were calculated once more. These are presented in Table 6.29.

Table 6.29: Model 3 goodness-of-fit indices

Index	Norm	Results for Model 3
CMin/df (x^2/df)	Less than 3.0	3.386
RMSEA	Smaller than 0.07	0.063
CFI	Above 0.90	0.922
TLI	Above 0.90	0.912
PGFI	The higher the better	0.721

It is evident from Table 6.29 that the model fit of Model 3 is a good fit as x^2/df is only marginally above the recommended norm of 3.0. RMSEA is below 0.070, CFI and TLI are both above 0.90, and the PGFI is the highest of all three models.

Table 6.30 presents the parameter estimates, standard errors, test statistic value (CR) and p-values of Model 3.

Table 6.30: Model 3 parameter estimates and p-values

			Estimate	SE	CR	P
KI	<---	EX	-0.132	0.038	-3.493	***
KI	<---	CO	-0.148	0.053	-2.805	0.005
KI	<---	OP	0.072	0.039	1.846	0.065
KI	<---	MC	1.189	0.082	14.501	***

*** $p < 0.001$

Table 6.30 reveals a negative relationship (-0.132, $p < 0.001$) between *Knowledge-sharing intention* and *Extraversion*. Although this relationship is significant, the direction of the relationship is unexpected. Based on previous research (see Teh *et al*., 2011:47; Amayah, 2011:3), a positive relationship was hypothesised and expected between these constructs. A possible explanation for the negative relationship found in this study is that in a knowledge-intensive

environment, where knowledge is valuable and even considered as giving a competitive advantage or power to an employee, extravert individuals would rather seek or gain knowledge from others, instead of sharing their tacit knowledge with others. Given the finding concerning *Extraversion* and *Knowledge-sharing intention* in the present study, hypothesis H^{5a} cannot be supported. Even so, this unexpected outcome makes a valuable contribution to knowledge-sharing literature and offers a new perspective on the relationship between extravert individuals and knowledge sharing in a corporate knowledge-intensive environment where knowledge is cherished.

Similarly, the results in the present study suggest a negative relationship (-0.148, $p = 0.005$) between *Conscientiousness* and *Knowledge-sharing intention*. Again, this result is unexpected and not congruent with previous research (see Gharanjik & Azma, 2014:81; Wang & Yang, 2007:1434) which found a positive relationship between knowledge-sharing intention and conscientious individuals. Hypothesis H^{8a} can therefore not be supported. A possible explanation for the result in the present study is that conscientious individuals may feel reluctant to share their valuable experiences, know-how and insights that they have acquired over years of hard work with other individuals whom they believe are not as conscientious as they are. This finding offers a valuable new viewpoint on the relationship between conscientious individuals and their willingness to share knowledge in a corporate environment where knowledge is considered a valuable asset to not only a business, but also to an individual's competitiveness.

The findings as per Table 6.30 also suggest that *Openness to experience* is positively related to *Knowledge-sharing intention*, assessed against $p < 0.10$. When comparing this result to previous empirical studies (Wang & Yang, 2007:1431; Cabrera *et al*., 2006:260), this finding cannot summarily be excluded in view of the risk of making a Type II error. Therefore, for the purpose of this study, hypothesis H^{7a} is supported at the 10% level of significance. This means that the more inventive, imaginative and original an individual is, the more likely it is that such an individual would be willing to share his or her (tacit) knowledge with others.

Finally, *Mature cooperation* is also positively related to *Knowledge-sharing intention* (1.189, $p < 0.001$) and hypothesis H^1 can therefore be supported. This finding suggests that the more mature an individual is in terms of recognising the significance of knowledge sharing and to realise intangible, intrinsic benefits, for sharing knowledge, the more likely it is that such an individual would be willing to share his or her tacit knowledge with others. This empirical finding echoes the views of previous research (see Alhalhouli *et al*., 2014:926; Cress *et al*., 2007:434) who highlight the positive influence of individuals' awareness on knowledge sharing as well as other research (see Olatokun & Nwafor, 2012:216; Lin, 2007a:135) who found a positive relationship between intrinsic benefits and the likelihood of individuals to share knowledge.

Based on the SEM analyses, Model 3 is recommended as the model of choice and therefore as the revised model for this study. Table 6.31 represents a comparison of the goodness-of-fit indices of the three models discussed in the preceding sections.

Table 6.31: Comparison of goodness-of-fit indices

Index	Norm	Results for Model 1	Results for Model 2	Results for Model 3
CMin/df (x^2/df)	Less than 3.0	2.954	4.643	3.386
RMSEA	Smaller than 0.07	0.057	0.078	0.063
CFI	Above 0.90	0.867	0.879	0.922
TLI	Above 0.90	0.859	0.865	0.912
PGFI	The higher the better	0.712	0.689	0.721

As noted in section 6.7 and illustrated in Table 6.19, various hypotheses were subjected to empirical testing. Based on the SEM analyses, a number of these hypotheses were not supported, as sufficient statistical support for these hypotheses could not be established. Table 6.32 provides a summary of the hypotheses that were supported or not supported, as well as the hypotheses that still need to be tested.

Table 6.32: Summary of supported/not supported hypotheses

Hypothesis Number	Hypothesis	Supported/ Not supported	Comment
H^{1}:	There is a positive relationship between *Mature cooperation* and *Knowledge-sharing intention*.	Supported	See Table 6.30
H^{2}:	There is a positive relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{3}:	There is a negative relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{4a}:	There is a negative relationship between *Relationship conflict* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{4b}:	*Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.	*	*
H^{5a}:	There is a positive relationship between *Extraversion* and *Knowledge-sharing intention*.	Not supported	See Table 6.30
H^{5b}:	*Extraversion* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	*	*
H^{6a}:	There is a negative relationship between *Neuroticism* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{6b}:	*Neuroticism* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	*	*
H^{6c}:	*Neuroticism* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	*	*
H^{7a}:	There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*.	Supported (at $p < 0.10$)	See Table 6.30
H^{7b}:	*Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	*	*
H^{7c}:	*Openness to experience* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	*	*

H^{8a}:	There is a positive relationship between *Conscientiousness* and *Knowledge-sharing intention*.	Not supported	See Table 6.30
H^{8b}:	*Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	*	*
H^{8c}:	*Conscientiousness* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	*	*
H^{9a}:	There is a relationship between *Age* and *Knowledge-sharing intention*.	*	*
H^{9b}:	There is a relationship between *Gender* and *Knowledge-sharing intention*.	*	*
H^{9c}:	There is a relationship between *Home language* and *Knowledge-sharing intention*.	*	*
H^{9d}:	There is a relationship between *Highest academic qualification* and *Knowledge-sharing intention*.	*	*
H^{9e}:	There is a relationship between *Ethnic background* and *Knowledge-sharing intention*.	*	*
H^{9f}:	There is a relationship between *Organisational tenure* and *Knowledge-sharing intention*.	*	*
H^{9g}:	There is a relationship between *Job tenure* and *Knowledge-sharing intention*.	*	*

*** Still to be tested**

As a subset of SEM, GLM analyses were conducted to examine the influence of demographic variables (hypotheses H^{9a} - H^{9g}) on *Knowledge-sharing intention*. This is explained in the following section.

6.9.2 General linear modelling (GLM) analyses of the influence of demographic data

To address the primary objective of the study, an analysis was performed to assess the influence of selected demographic variables on *Knowledge-sharing intention* and thus to obtain a more parsimonious model. In this respect, a variable reduction technique was applied to determine the influence of demographic variables on *Knowledge-sharing intention*.

In section 3 of the measuring instrument the following demographic information was obtained from the respondents:

- Age of respondent (Age)
- Gender of respondent (Gen)
- Language of respondent (Lang)
- Highest qualification of respondent (Qual)
- Ethnic background of respondent (Race)
- Organisational tenure (TotW)
- Job tenure (JobT)

The demographic variables listed above were added to Model 3 and a backwards sequential variable reduction technique resulted in the removal of the following demographic variables:

- Job tenure (JobT)
- Language of respondent (Lang)
- Highest qualification of respondent (Qual)
- Gender of respondent (Gen)

From the analyses it was concluded that only the demographic variables *Age of respondent* ($p < 0.10$), *Ethnic background of respondent* ($p < 0.05$) and *Organisational tenure* ($p < 0.10$) have an influence on *Knowledge-sharing intention*. As such, hypotheses H^{9a}, H^{9e} and H^{9f} can be supported. Figures 6.5 – 6.7 illustrate the results from the GLM analyses pertaining to each significant demographic variable.

Figure 6.5: GLM: Age of respondent (Age)

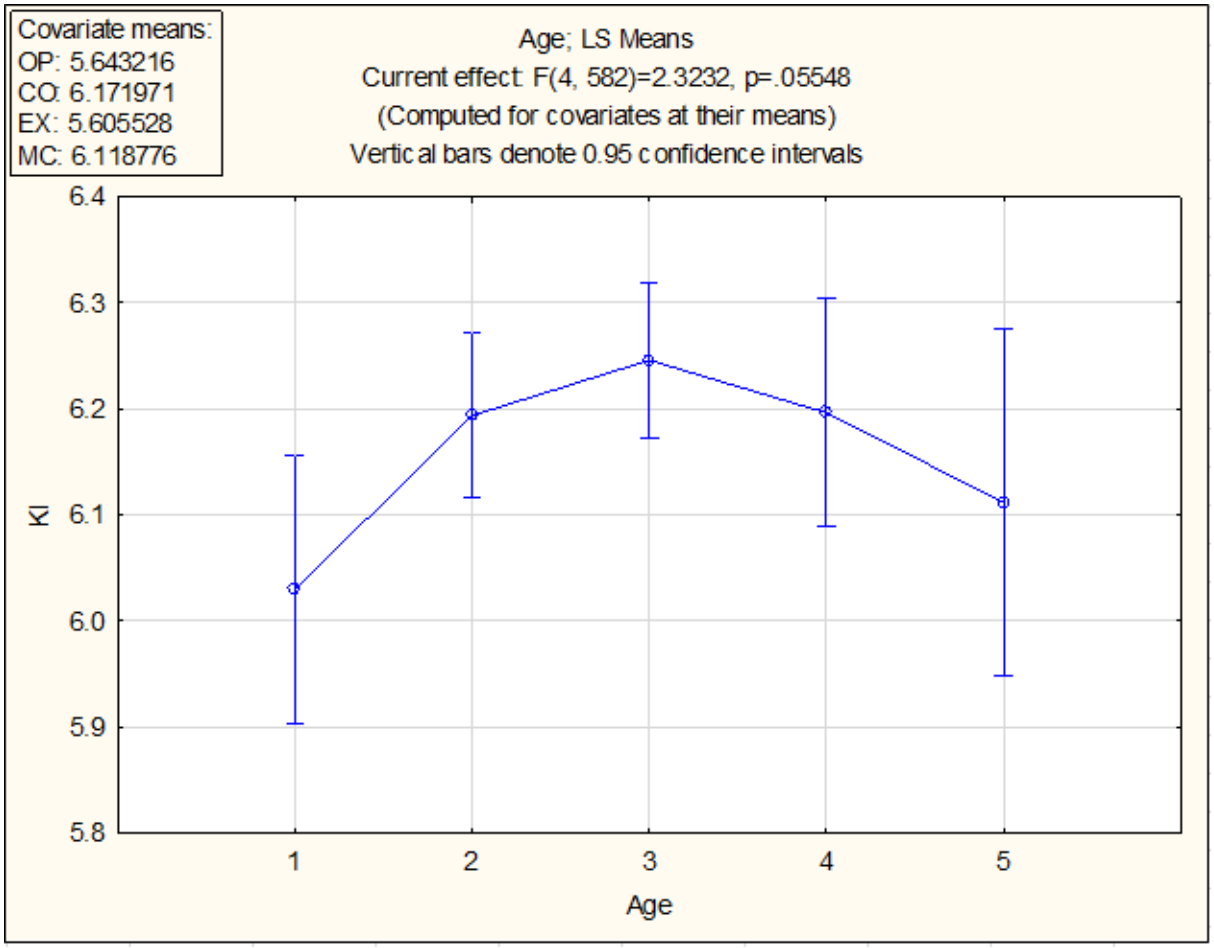


Figure 6.5 illustrates that respondents between 18-24 years of age (group 1) tend to be least willing to share their tacit knowledge with co-workers compared to individuals in other age categories. An interesting finding is that respondents in the young adulthood category (groups 2 and 3) (25-40 years of age) tend to be more willing to share their tacit knowledge with co-workers. This intention to share tacit knowledge however decreases with middle-aged and older respondents in groups 4 and 5 (older than 40 years of age).

A possible explanation for this finding is that young (18-24 years of age) employees do not always have the confidence that their knowledge might be valuable to others given their limited work-related experiences, insights, know-how and expertise. As a result, these individuals are less willing to share tacit knowledge with co-workers. As employees' careers develop over time and they gain more tacit knowledge, they become more confident to willingly share their

knowledge with co-workers (25-40 years of age). At a specific point in their career (older than 40 years), when it becomes increasingly more difficult to find a new career, an individual allocates more value to their tacit knowledge as they now consider it their power and competitive advantage (especially in a South African context). As such, they tend to be less willing to share their experiences, insights, know-how and expertise with co-workers. This finding is consistent with the views of Keyes (2008:46) who found that senior workers who are more mature in years may feel threatened by younger workers and therefore do not share knowledge with them. Similarly, Lou *et al*.'*s* (2007:148) empirical results indicate that respondents aged 30-39 tend to be more willing to share knowledge than respondents who were aged 40-49.

Figure 6.6: GLM: Ethnic background of respondent (Race)

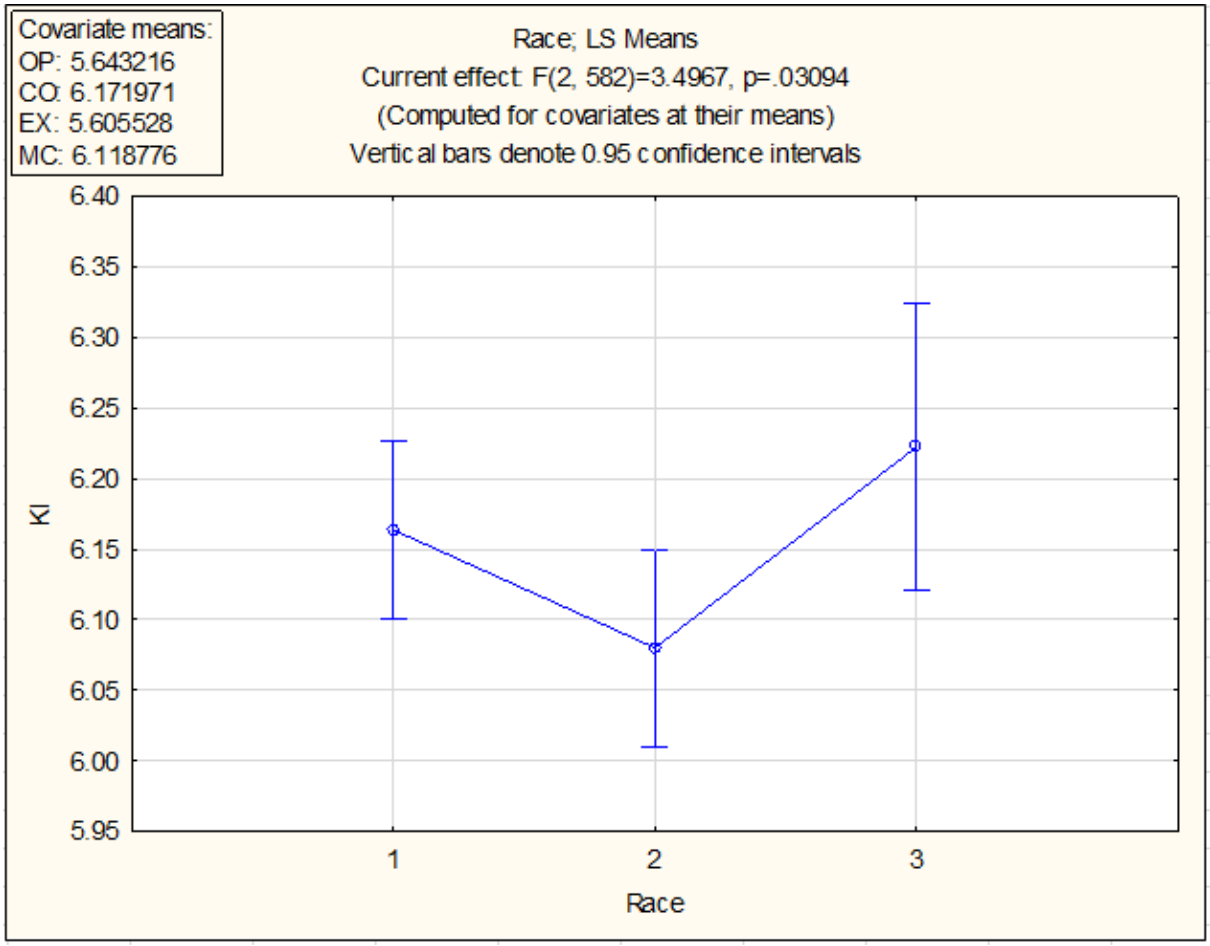


Figure 6.6 illustrates the relationship between respondents' *Ethnic background* and their *Knowledge-sharing intention*. In this respect, the figure shows that Black respondents (group 2) are least willing to share their tacit knowledge compared to White (group 1) and other (group 3) ethnic groups. A possible explanation for this finding might be linked to the history of South Africa. More specifically, certain Black respondents may still experience the lasting effects of racial segregation and inequality that was rife during the apartheid regime. Subsequently, certain Black respondents may still be too sceptical and lack confidence to share their knowledge, and therefore prefer to retain their valuable insights and knowledge, which they regard as a valuable competitive advantage in a knowledge-intensive environment. The researcher acknowledges that this is a sensitive issue, and is merely expressing an opinion based on the results obtained in the present study. The researcher's opinion is, however, in line with the sentiments of Dube and Ngulube (2012:69) who maintain that South Africa's apartheid policies established

heterogeneity and division. In this regard, fundamental inequalities lead to or shape distinct knowledge-sharing behaviours. For example, in South Africa, knowledge sharing has developed along different paths. On one hand are those who want to preserve apartheid, while on the other hand are those who try to overcome it. Apart from such viewpoints that invade the social and political landscape, these trajectories also cause the evolution of diversity and heterogeneity within organisations that could generate a lack of trust and scepticism, and as a result, politicking and resentment towards knowledge sharing (Dube & Ngulube, 2012:70). A climate which creates a lack of trust and scepticism might be a possible reason why Black individuals are inclined to be less willing to share their tacit knowledge than other ethnic groups in the present study.

Figure 6.7: GLM: Organisational tenure (TotW)

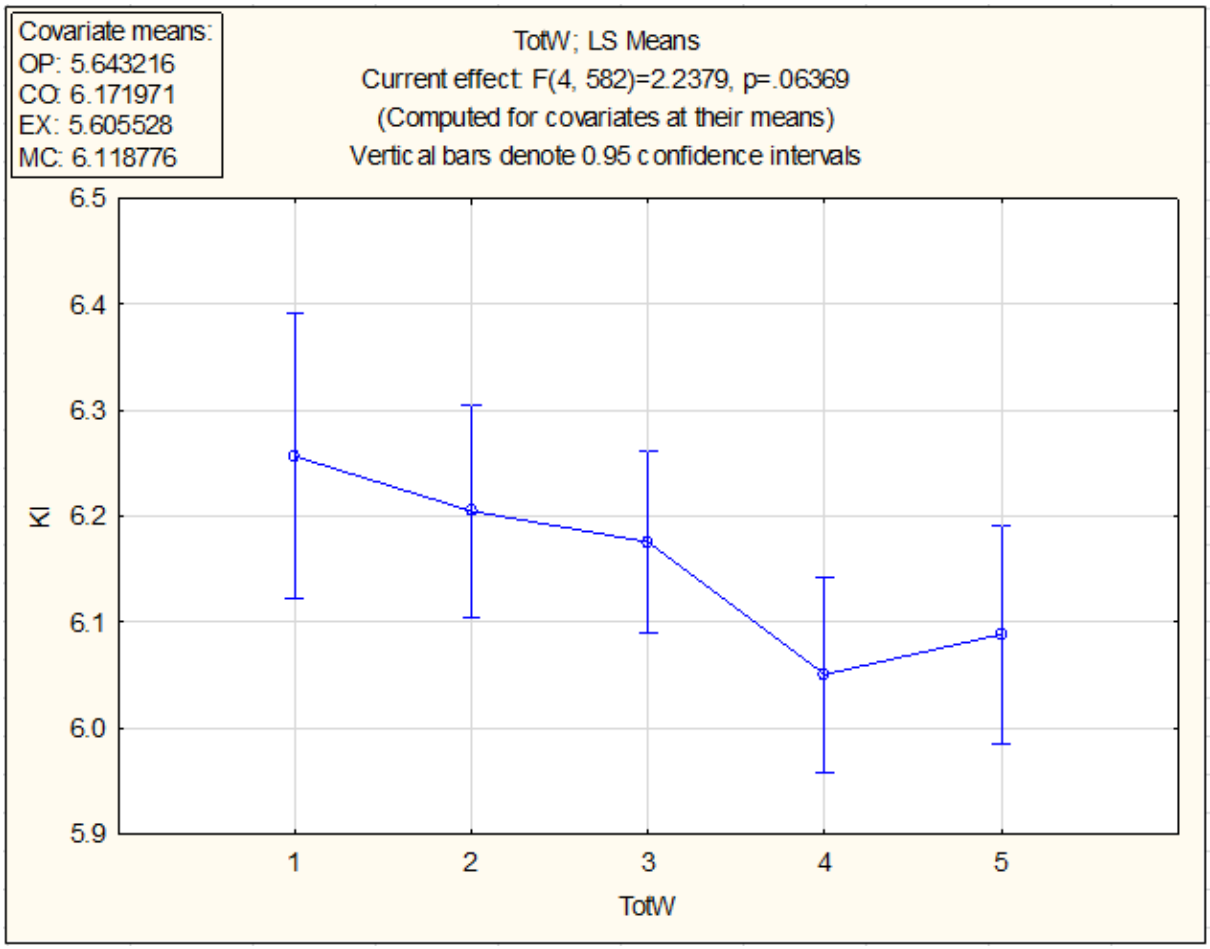


Figure 6.7 represents the relationship between respondents' *Organisational tenure* and their *Knowledge-sharing intention*. The results clearly show that as

respondents' *Organisational tenure* increased (groups 1-4), they tended to be less willing to share their tacit knowledge. This finding contradicts the findings of other researchers (see Watson & Hewitt, 2006:150; Bordia *et al*., 2006:270) who suggest a positive relationship between an individual's knowledge sharing and his or her organisational tenure. Further analysis of Figure 6.7 does however indicate that previous findings (Watson & Hewitt, 2006:150; Bordia *et al*., 2006:270) may, to some degree, be true. In this respect, respondents in group 5 (working in the organisation more than 10 years) tend to be more willing to share their tacit knowledge compared to respondents in group 4 (organisational tenure between 6 and 10 years). As such, an upward trend seems to be developing from this point. This is an interesting finding. A possible explanation for this result may be that respondents with limited organisational tenure (less than 10 years) may not yet be fully committed to the organisation or may not trust other individuals enough to share their knowledge with co-workers. At some point in their organisational tenure (more than 10 years), they become more committed to the business and therefore tend to be more willing to share their knowledge. At this stage in a career it is also possible that an individual has a more senior position in the organisation and therefore better understands the value of knowledge sharing for the business. This sentiment is in line with views of Watson and Hewitt (2006:150) who argue that as organisational tenure increases, trust in and commitment to the business also improve; therefore, tenure would be positively related to knowledge sharing.

From the preceding discussion of Figures 6.5 to 6.7, it can be concluded that particular demographic variables are likely to influence individuals' *Knowledge-sharing intention*. Hypotheses H^{9a}; H^{9e} and H^{9f} are therefore supported and Table 6.33 illustrates each significant demographic variable.

Table 6.33: Significant demographic variables

Variable	p
Age of respondent	0.055
Ethnic background of respondent	0.031
Organisational tenure	0.064

6.10 GENERAL LINEAR MODELLING (GLM) – EVALUATION OF MODERATING RELATIONSHIPS

Various moderating relationships were proposed between the factors identified in the revised hypothesised model (Figure 6.1). Following SEM analyses, some of these factors (*Psychological contract breach, Extrinsic motivation, Relationship conflict, Neuroticism)* were found to be insignificant in the complete model (Model 1) and were consequently not included in the final proposed model (Model 3) of factors influencing *Knowledge-sharing intention*. Although these factors proved to be insignificant in the complete model (Model 1) that assessed direct relationships between the independent and dependent variables, the researcher decided for the purpose of this study to test the moderating relationships linked to these factors independently as theory lends convincing support to the existence of moderating relationships between these factors. In this way, the researcher gives effect to the purpose of this study, and more specifically to selected secondary research objectives as proposed in Chapter 1. Against this background, GLM analyses are conducted in the following section to examine various moderating relationships as proposed in the hypothesised model (Figure 6.1).

GLM analyses (as a subset of SEM) were carried out to examine various moderating relationships as illustrated in Table 6.34.

Table 6.34: Moderating relationships hypothesised

Hypothesis Number	Hypothesis
H^{4b}:	*Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.
H^{5b}:	*Extraversion* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{6b}:	*Neuroticism* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{6c}:	*Neuroticism* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{7b}:	*Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{7c}:	*Openness to experience* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.
H^{8b}:	*Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.
H^{8c}:	*Conscientiousness* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.

The results from the GLM analysis revealed only one significant ($p < 0.05$) moderating relationship. In this instance, Table 6.35 first reveals that *Openness to experience* and *Psychological contract breach* have a significant relationship with *Knowledge-sharing intention*. These results lend support to the SEM analysis results in section 6.9.1.3 that confirmed hypothesis H^{7a} (There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*). Table 6.35 also shows that *Openness to experience* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention* ($p < 0.05$). Hypothesis H^{7c} can therefore be supported, while hypotheses H^{4b}; H^{5b}; H^{6b}; H^{6c}; H^{7b}; H^{8b} and H^{8c} cannot be supported.

Table 6.35: Parameter estimates

	KI Param.	KI Std.Err	KI t	KI p
Intercept	-1.8310	0.9322	-1.9641	0.0500
EM	0.1661	0.1692	0.9811	0.3269
NE	0.0641	0.0940	0.6819	0.4956
OP	0.5870	0.1587	3.6986	**0.0002**
PB	0.8971	0.1667	5.3831	**0.0000**
RC	-0.0266	0.1170	-0.2277	0.8200
EX	0.2540	0.1182	2.1493	0.0320
CO	0.4331	0.1837	2.3576	0.0187
EM*RC	-0.0027	0.0253	-0.1052	0.9162
EX*PB	-0.0288	0.0231	-1.2454	0.2135
NE*EM	-0.0206	0.0133	-1.5456	0.1228
NE*PB	0.0021	0.0154	0.1352	0.8925
OP*EM	0.0134	0.0204	0.6573	0.5113
OP*PB	-0.0885	0.0273	-3.2437	**0.0012**
CO*EM	-0.0328	0.0250	-1.3126	0.1898
CO*PB	-0.0209	0.0311	-0.6703	0.5029

The moderating effect that *Openness to experience* has on Psychological *contract breach* can be interpreted as evidence that the expected *Knowledge-sharing intention* of individuals per unit change of *Psychological contract breach* is influenced by their *Openness to experience*. This result is a valuable contribution to the body of knowledge-sharing literature given the lack of research on this personality trait with respect to knowledge sharing, especially as a moderating variable (Raja ***et al***., 2011:404; Berger, 2009:20; Raja *et al*., 2004:351).

The following section summarises all the hypothesised and significant relationships:

6.11 SUMMARY OF HYPOTHESISED AND SIGNIFICANT RELATIONSHIPS

Table 6.36 presents all the hypothesised relationships and shows which hypotheses were supported or not supported.

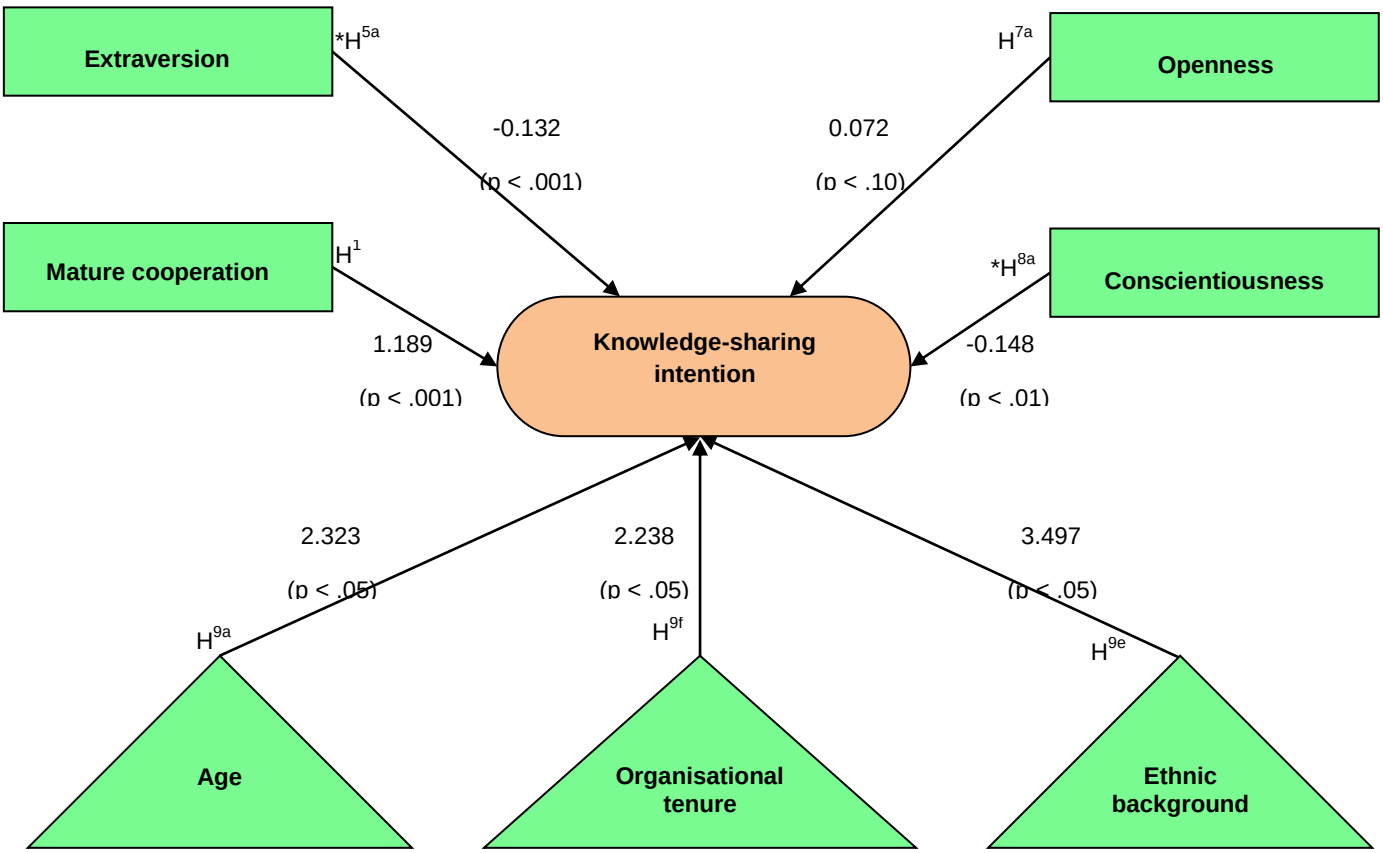
Table 6.36: Final summary of supported/not supported hypotheses

Hypothesis Number	Hypothesis	Supported/ Not Supported	Comment
H^{1}:	There is a positive relationship between *Mature cooperation* and *Knowledge-sharing intention*.	Supported	See Table 6.30
H^{2}:	There is a positive relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{3}:	There is a negative relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{4a}:	There is a negative relationship between *Relationship conflict* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{4b}:	*Extrinsic motivation* moderates the relationship between *Relationship conflict* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
*H^{5a}:	There is a positive relationship between *Extraversion* and *Knowledge-sharing intention*.	Not supported	See Table 6.30
H^{5b}:	*Extraversion* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{6a}:	There is a negative relationship between *Neuroticism* and *Knowledge-sharing intention*.	Not supported	See Table 6.24
H^{6b}:	*Neuroticism* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{6c}:	*Neuroticism* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{7a}:	There is a positive relationship between *Openness to experience* and *Knowledge-sharing intention*.	Supported	See Table 6.30
H^{7b}:	*Openness to experience* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{7c}:	*Openness to experience* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Supported	See Table 6.35
*H^{8a}:	There is a positive relationship between	Not supported	See Table 6.30

	Conscientiousness and *Knowledge-sharing intention*.		
H^{8b}:	*Conscientiousness* moderates the relationship between *Extrinsic motivation* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{8c}:	*Conscientiousness* moderates the relationship between *Psychological contract breach* and *Knowledge-sharing intention*.	Not supported	See Table 6.35
H^{9a}:	There is a relationship between *Age* and *Knowledge-sharing intention*.	Supported	See Figure 6.5
H^{9b}:	There is a relationship between *Gender* and *Knowledge-sharing intention*.	Not supported	See Section 6.9.2
H^{9c}:	There is a relationship between *Home language* and *Knowledge-sharing intention*.	Not supported	See Section 6.9.2
H^{9d}:	There is a relationship between *Highest academic qualification* and *Knowledge-sharing intention*.	Not supported	See Section 6.9.2
H^{9e}:	There is a relationship between *Ethnic background* and *Knowledge-sharing intention*.	Supported	See Figure 6.6
H^{9f}:	There is a relationship between *Organisational tenure* and *Knowledge-sharing intention*.	Supported	See Figure 6.7
H^{9g}:	There is a relationship between *Job tenure* and *Knowledge-sharing intention*.	Not supported	See Section 6.9.2

It should be noted that certain hypotheses ($*H^{5a}$ and $*H^{8a}$) were not supported, not because significant relationships could not be found between the variables, but because the direction of the relationships found was inconsistent with the hypothesised relationships. Nonetheless, significant relationships were still found as presented in Table 6.30 and likely explanations were given for the established relationships. As such, Figure 6.8 summarises the significant relationships found through the SEM analysis.

Figure 6.8: Summary of significant relationships in the structural models used to determine the factors influencing knowledge-sharing intention in knowledge-intensive businesses



* Significant relationships were found between these independent variables (*Extraversion* and *Conscientiousness*) and the dependent variable (*Knowledge-sharing intention)*, although the direction of the relationships found was inconsistent with the hypothesised relationships.

Moreover, as noted in section 6.10, the moderating relationships were assessed seperately and not as part of the complete model as was the case with the other hypothesised relationships. Consequently, the moderating effect of *Openness to experience* on the relationship between *Psychological contract breach* and *Knowledge-sharing intention* (refer to section 6.10) is not revealed in Figure 6.8, given that it was tested seperately.

6.12 COMMON METHOD VARIANCE

Common method variance relates to the variance ascribed to the measurement method, rather than to the constructs the measures denote. There is a risk of common method variance when self-report questionnaires are used to gather data at the same time from the same respondents (Chang, Van Witteloostuijn & Eden, 2010:178). This phenomenon is a problem in behavioural research as it threatens the validity of data and the conclusions about the relationships between measures. In fact, method biases are one of the main sources of measurement error and could have confounding influence on empirical findings and resulting conclusions (Podsakoff, MacKenzie, Lee & Podsakoff, 2003:879).

Padsakoff *et al*. (2003:881) identify the consistency motif and social desirability as two sources of common method biases. The consistency motif relates to individuals responding to questions in a consistent and rational way, therefore searching for similarities in the questions asked of them. Subsequently, inaccurate relationships are produced that would not exist in a real-life setting. In the same way, social desirability refers to the propensity of individuals to present themselves in a favourable way, irrespective of their true feelings about an issue or topic. As is the case with the consistency motif, the need for social approval and acceptance may front the true relationships between variables. In the present study, a number of items in the measuring instrument (for example, personality traits and internal motivation) could lead to a social desirability bias on the part of individuals as a result of their desire to appear consistent in their responses.

With specific reference to the present study, Wang and Noe (2010:126) put forward the notion that when measuring willingness to share knowledge or self-reported knowledge-sharing behaviours, researchers should not rule out the possibility of common method variance. Subsequently, for this study both procedural and statistical remedies were employed to control common method variance as suggested by Padsakoff *et al*. (2003:887-888). Concerning procedural remedies, the questionnaire was finalised only after conducting a pilot study and consulting experts to ensure unambiguous questions and to minimise biased responses. Another procedural remedy (Padsakoff *et al*., 2003:888) employed in

this study was to protect respondents' anonymity and to assure respondents that there were no right or wrong answers. These procedures are likely to reduce respondents' tendencies to answer questions in a socially desirable way and in a way that they think is consistent with what the researcher wants (Padsakoff *et al*., 2003:888). In addition, the order of the questions in the measuring instrument was randomised so as to reduce the likelihood that respondents would combine related items that could lead to a biased pattern of responses (Chang *et al*., 2010:178).

If not totally eliminated, researchers can at least minimise the possible effects of common method variance on their empirical findings. However, statistical remedies are also available to control common method variance. In the present study, Harman's single-factor test was employed from a statistical remedy point of view (Padsakoff *et al*., 2003:889). This technique establishes whether one single factor accounts for the majority of the covariance among the measures, which was not the case in the present study given the EFA results. Subsequently, no factor emerged that could indicate influence of common method variance.

Against this background, no significant influence of common method variance could be established in the present study. Nonetheless, no claims are made that common method variance was totally eliminated, and it should therefore be regarded as a potential limitation in this study.

6.13 SUMMARY

The empirical results of the present study were presented in Chapter 6. The chapter commenced with a discussion of the sample size and response rate of the study, followed by a summary of the demographic profile of the 597 respondents. Thereafter, an EFA was carried out on the collected data, which resulted in the identification of eight independent variables (*Mature cooperation*, *Extrinsic motivation*, *Psychological contract breach*, *Relationship conflict*, *Extraversion*, *Neuroticism*, *Openness to experience* and *Conscientiousness*) and one dependent variable (*Knowledge-sharing intention*). Subsequently, the hypothesised model was adjusted and presented in Figure 6.1.

After the EFA, the validity and reliability of the measuring instrument were assessed. This was followed with a presentation of selected descriptive statistics on the factors influencing *Knowledge-sharing intention*. In the latter part of the chapter, SEM was used to assess the various relationships proposed in the revised hypothesised model. In this respect, the structural and measurement model was specified and the reliability of the indicators confirmed. The relationships in the first SEM model were identified and various fit indices were considered to assess the degree to which the model represented an acceptable estimate of the data. Models were adjusted until a model that returned satisfactory results was finalised for the study (Model 3). The influence of various demographic and moderating variables on *Knowledge-sharing intention* was also assessed using GLM, which is a subset of SEM.

In the next chapter, a summary of the present study will be provided and the empirical results presented in Chapter 6 will be interpreted with specific reference to knowledge-intensive businesses. Chapter 7 will highlight the contributions and limitations of the present study and make recommendations for future research.

CHAPTER 7
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter presents a brief overview of the research and a discussion of the main empirical findings and recommendations pertaining to the individual-related factors influencing *Knowledge-sharing intention* in knowledge-intensive businesses. The empirical findings of the study are interpreted and their implications for knowledge-intensive businesses are discussed.

The contributions of the study are also highlighted and the chapter concludes with a discussion of the limitations of the study and recommendations for future research. Against this background, this chapter will address the seventh methodological research objectives as depicted in Table 7.1 of this chapter.

7.2 OVERVIEW OF RESEARCH

Given the importance of knowledge sharing among individuals in knowledge-intensive businesses, as well as the current lack of understanding of the individual-related factors influencing knowledge sharing between individuals, the primary objective of this study was to identify and empirically investigate the individual-related factors influencing the Knowledge-*sharing intention* of individual employees in knowledge-intensive businesses. This was done by initially undertaking a comprehensive theoretical investigation into the nature and importance of knowledge sharing, and into the factors influencing knowledge sharing. Second, a hypothesised model of individual-related factors that could influence the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses was developed. Third, an appropriate research design was established to facilitate the answering of all the research questions. Thereafter, a suitable measuring instrument was developed to empirically test the relationships as described in the hypothesised model. Next, an empirical investigation was undertaken among employees working in knowledge-intensive businesses, and the relationships which had been proposed and identified during the literature

review were examined. Following the empirical investigation, the research findings were reported, interpreted and compared to previous research findings, and relationships emanating from the data analysis were addressed. Finally in this chapter, guidelines and recommendations are provided for knowledge-intensive businesses to manage the individual-related factors influencing the *Knowledge-sharing intention* of individual employees. The understanding and management of these factors could contribute to an increase in knowledge sharing of employees, as well as to an increase in the competitiveness of the business.

Against this background, the achievement of the research objectives is briefly outlined.

7.2.1 Achievement of the research objectives

The primary research objective of this research was to identify and empirically investigate the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses.

To achieve the primary objective, a number of secondary objectives were formulated, namely:

SO^1 To investigate the relationship between individuals' awareness of the importance of knowledge sharing and their *Knowledge-sharing intention*.

SO^2 To investigate the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.

SO^3 To investigate the relationship between psychological contract breach and *Knowledge-sharing intention*.

SO^4 To investigate the relationship between conflict and *Knowledge-sharing intention*.

SO^5 To investigate the relationship between personality traits and *Knowledge-*

sharing intention.

SO^6 To investigate the moderating influence of personality traits on the relationship between psychological contract breach and *Knowledge-sharing intention*.

SO^7 To investigate the moderating influence of personality traits on the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.

SO^8 To investigate the moderating influence of individuals' motivation to share knowledge on the relationship between conflict and *Knowledge-sharing intention*.

SO^9 To investigate the relationship between selected demographic variables and *Knowledge-sharing intention*.

In order to address the above mentioned primary and secondary objectives, the following methodological objectives were identified:

MO^1 To undertake a comprehensive theoretical investigation into the nature and importance of knowledge sharing, and possible factors that could influence knowledge sharing among individuals.

MO^2 To develop a hypothesised model of individual-related factors that could influence the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses, and to suggest appropriate hypotheses pertaining to the relationships depicted in the hypothesised model.

MO^3 To determine an appropriate research design that would be most suitable for this study to facilitate the answering of all the research questions.

MO^4 To develop a measuring instrument to empirically test the relationships as

described in the hypothesised model.

MO[5] To conduct an empirical investigation and empirically test the relationships proposed in the hypothesised model on a sample of employees working in knowledge-intensive businesses.

MO[6] To report research findings, interpret data, compare findings to previous research and address potential relationships that emanate from the data analysis.

MO[7] To interpret the research findings and provide guidelines and recommendations to knowledge-intensive businesses on how to manage the individual-related factors influencing *Knowledge-sharing intention* of individual employees. This could lead to more knowledge sharing among employees and consequently render a competitive advantage for the business.

The completion of the study has confirmed the achievement of all the above-mentioned objectives. Table 7.1 specifies the chapters in which the study's objectives were achieved.

Table 7.1: Objectives achieved in the relevant chapters

Primary objective	Where objective was covered
The primary research objective of this research is to identify and empirically investigate the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses.	Chapters 1 - 7
Secondary objectives	**Where objective was covered**
To investigate the relationship between individuals' awareness of the importance of knowledge sharing and their *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the relationship between psychological contract breach and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the relationship between conflict and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the relationship between personality traits and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the moderating influence of personality traits on the relationship between psychological contract breach and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the moderating influence of personality traits on the relationship between individuals' motivation to share knowledge and their *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the moderating influence of individuals' motivation to share knowledge on the relationship between conflict and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
To investigate the relationship between selected demographic variables and *Knowledge-sharing intention*.	Chapter 3 Chapter 4 Chapter 6
Methodological objectives	**Where objective was covered**
To undertake a comprehensive theoretical investigation into the nature and importance of knowledge sharing, and possible factors that could influence knowledge sharing among individuals.	Chapter 2 Chapter 3

To develop a hypothesised model of individual-related factors that could influence the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses, and to suggest appropriate hypotheses pertaining to the relationships depicted in the hypothesised model.	Chapter 4
To determine an appropriate research design that would be most suitable for this study to facilitate the answering of all the research questions.	Chapter 5
To develop a measuring instrument to empirically test the relationships as described in the hypothesised model.	Chapter 5 Annexure A
To conduct an empirical investigation and empirically test the relationships proposed in the hypothesised model on a sample of employees working in knowledge-intensive businesses.	Chapter 6
To report research findings, interpret data, compare findings to previous research and address potential relationships that emanate from the data analysis.	Chapter 6
To interpret the research findings and provide guidelines and recommendations to knowledge-intensive businesses on how to manage the individual-related factors influencing *Knowledge-sharing intention* of individual employees. This could lead to more knowledge sharing among employees and consequently render a competitive advantage for the business.	Chapter 7

7.2.2 Research process

This study set out to integrate prior findings and theory on knowledge sharing from various disciplines; to incorporate these findings into a comprehensive hypothesised model of individual-related factors influencing the *Knowledge-sharing intention* of individuals in knowledge-intensive businesses; to empirically test the various relationships hypothesised in the model; and finally, to interpret the research findings and provide guidelines and recommendations to knowledge-intensive businesses on how to manage the individual-related factors influencing *Knowledge-sharing intention* of individual employees.

Based on a comprehensive literature review and secondary sources from various fields including knowledge management, human resources management, information management and business management, possible individual-related

factors that could influence knowledge sharing of individuals in knowledge-intensive businesses were identified. Based on this review, the researcher proceeded to construct a hypothesised model of individual-related factors influencing *Knowledge-sharing intention*.

The hypothesised model included 12 independent variables, namely *Individuals' awareness*, *Intrinsic motivation, Extrinsic motivation*, *Transactional psychological contract breach, Relational psychological contract breach*, *Relationship conflict, Task conflict*, *Extraversion*, *Neuroticism*, *Openness to experience*, *Agreeableness* and *Conscientiousness*, influencing the dependent variable *Knowledge-sharing intention*. Various direct and moderating relationships were proposed between the dependent, independent and control variables in the hypothesised model.

Each construct in the hypothesised model was defined and operationalised using items sourced from validated measuring instruments in previous studies. In this regard, items from previous instruments were slightly adjusted to make the items more suitable for the present study. Several self-generated items based on secondary sources were also formulated. These items were used to empirically test the relationships proposed in the hypothesised model.

The measuring instrument in the present study was in the form of a structured questionnaire. Following a preliminary evaluation, adjustments were made to the questionnaire, after which the final measuring instrument (Annexure A) was presented in the form of an internet questionnaire to respondents who were identified by means of convenience sampling. In total, 597 usable questionnaires were received.

Statistical analyses were performed on the data collected from the usable questionnaires. In this instance, an EFA was first conducted to identify the unique factors present in the data, confirming the validity of the measuring instrument used. The EFA confirmed selected factors identified in the hypothesised model. Moreover, the EFA showed that certain factors had more than one dimension, while other factors encompassed only some of the initial items included in the measuring instrument. Given the results of the EFA, selected variables were

renamed and the hypothesised model was revised using the following independent variables identified in the EFA: *Mature cooperation*, *Extrinsic motivation*, *Psychological contract breach, Relationship conflict, Extraversion*, *Neuroticism*, *Openness to experience* and *Conscientiousness*. The results of the EFA confirmed the dependent variable as *Knowledge-sharing intention*.

Cronbach-alpha coefficients were calculated to confirm the reliability of the measuring instrument. Satisfactory Cronbach-alpha coefficients were reported for all the constructs identified during the EFA, confirming the reliability of the measuring instrument.

SEM was used as the main statistical procedure to assess the significance of the relationships proposed in the hypothesised model between the various independent and dependent variables. A subset of SEM, namely GLM, was employed to assess various relationships between selected demographic variables and *Knowledge-sharing intention* and to assess various moderating relationships as proposed in the hypothesised model. A summary of the significant empirical results and recommendations is presented in the next section.

7.3 SUMMARY OF THE EMPIRICAL RESULTS AND RECOMMENDATIONS

7.3.1 Demographic profile of the respondents

The majority of respondents in this study were between 31 and 40 years of age, while the gender of the respondents was more or less evenly spread between males and females. The majority of the respondents were English-speaking and held a bachelors or honours degree. These results correspond with other knowledge-intensive samples where most of the respondents are well-educated, qualified employees (June & Kheng, 2014:178; Abdullah *et al*., 2009:118).

With respect to ethnic background, the majority of the respondents were White. In addition, most respondents had worked in their organisations and current positions for between three and five years. This could be expected in a South African

knowledge-intensive business, especially given the skills shortages in South Africa. In this respect, well-educated, qualified employees could easily be drawn to competitive firms with lucrative career offers, therefore remaining with a particular firm for only a short time until they receive a better offer elsewhere. This further highlights the significance of tacit knowledge sharing among employees, as employees who leave a business take their valuable knowledge and experience with them. In fact, the demographic results of the study show that only 6.5% of respondents had worked in their current positions for more than 10 years. Retention strategies are therefore of utmost importance in knowledge-intensive businesses.

7.3.2 Discussion and recommendations from the SEM analyses

From the statistical analyses a number of relationships were found to be significant and are summarised in Figure 6.8 of Chapter 6. These relationships are discussed in Chapter 6 during the assessment of the various SEM models. All the significant relationships are summarised in the following section and suitable recommendations are put forward for knowledge-intensive businesses to manage the individual-related factors influencing the *Knowledge-sharing intention* of individual employees. These recommendations could contribute to an increase in knowledge sharing among employees, and as a result, enhance the effectiveness and competitive advantage of knowledge-intensive businesses.

7.3.2.1 Personality traits

Of all the individual-related factors investigated, it is noticeable (refer to Figure 6.8) that personality traits are strong predictors of individual employees' willingness to share knowledge. The findings in this study confirm that *Extraversion*, *Conscientiousness* and *Openness to experience* are significantly related to *Knowledge-sharing intention*.

Extraversion refers to an individual's tendency to be outgoing, enthusiastic, active and talkative. The findings reveal that *Extraversion* is significantly and negatively related to *Knowledge-sharing intention*. This finding implies that individuals higher

in extraversion are less likely to share their valuable experiences, know-how, insights and expertise with other employees in a knowledge-intensive business. Instead, extravert individuals are likely to hoard their knowledge in a knowledge-intensive business environment, where knowledge is valuable and considered as power to an employee. This unexpected outcome makes a valuable contribution to knowledge-sharing literature and offers a new perspective on the relationship between extravert individuals and knowledge sharing in a corporate knowledge-intensive business environment where knowledge is cherished. It could well be that, as a result of their outgoing, enthusiastic, active and talkative personality, extravert individuals would rather seek to gain knowledge from others, instead of sharing their tacit knowledge.

The personality trait *Conscientiousness,* which in this study refers to the degree to which an individual is efficient and to which an individual perseveres and follows through with plans, is also significantly and negatively related to *Knowledge-sharing intention*. This finding implies that employees who are conscientious are less likely to share their valuable experiences, know-how, insights and expertise with co-workers in a knowledge-intensive business. As is the case with *Extraversion*, this outcome is unexpected. This result however provides valuable insight into the relationship between conscientious individuals and their willingness to share tacit knowledge, especially in an environment where knowledge is often perceived as power. In fact, a reasonable explanation for this findings is that conscientious employees could be reluctant to simply share the valuable experiences, know-how, insights and expertise that they have acquired over years of hard work with those who they do not consider to be equally conscientious.

Finally, *Openness to experience* refers to the extent that an individual is being original, open-minded, imaginative, inventive and a deep thinker. Concerning this personality trait, the findings confirm a significant, positive relationship with *Knowledge-sharing intention*. This result implies that those employees who are open to experiences are more likely to be willing to share their valuable experiences, know-how, insights and expertise with other employees in a knowledge-intensive business. This finding is supported by the literature, as shown in section 6.9.1.3. Moreover, *Openness to experience* was found to

significantly moderate the relationship between *Psychological contract breach* and *Knowledge-sharing intention*. This result suggests that the expected *Knowledge-sharing intention* of individuals per unit change of *Psychological contract breach* is influenced by their *Openness to experience* (refer to section 6.10).

Given these results regarding personality traits, the following recommendations are made:

- Knowledge-intensive businesses should assess the personality type of potential employees before appointing them, and in this instance the recruitment process of knowledge-intensive businesses could play an important role. The purpose of this assessment should not be to discriminate against the employment of certain personality types (such as extraverts and conscientious individuals), but rather to be aware of the various personality types in the business. By screening potential employees with respect to their personality types, management could know what to expect of these individuals in terms of their *Knowledge-sharing intention*, as well as have a better idea of training methods to suit a particular personality type. These personality-screening tests could be extended to current employees in addition to prospective employees. In this regard, management could identify specific employees (such as extraverts and conscientious individuals) who are already employed in the business and focus on encouraging them to share tacit knowledge with co-workers.
- Formal and informal methods (refer to Chapter 2 section 2.5) can be geared towards individuals (especially extravert and conscientious individuals) to encourage them to share their tacit knowledge. For example, employees could be required, as part of a developmental plan, to participate in formal knowledge-sharing initiatives such as peer assists, after-action reviews, retrospects, knowledge fairs and formal group-based knowledge sharing. In addition, management could encourage the use of informal, unstructured knowledge networks and communities of practice. Informal knowledge-sharing methods can involve knowledge sharing among groups that consist of professionals in a business or in several businesses, or even with a non-work-related community. Even so, it is still important for managers to

encourage these methods to facilitate an environment, culture and habit of knowledge sharing, particularly among individuals who are by nature not willing to share tacit knowledge. Informal knowledge-sharing methods such as these provide an excellent platform for individuals to share valuable ideas and experiences with other professionals, while the business reaps rewards in terms of newly acquired knowledge of its employees that could be applied within the business.

- Management should acknowledge and communicate special efforts which are made by employees throughout the business. By communicating and confirming these efforts, certain employees (such as conscientious individuals) may be more likely to share tacit knowledge with other employees whom they perceive to be equally conscientious. Such individuals may be more comfortable in sharing the valuable tacit knowledge that they have acquired over years of hard work with other individuals whom they also consider to be efficient and persevering.
- Finally, management should pay specific attention to team composition. Teams should not include predominantly conscientious and/or extravert individuals. Individuals who are original, open-minded, imaginative, inventive and deep thinkers (*Openness to experience*) should complement the other personality types (for instance conscientious individuals and extraverts) within the team who have been found to be less likely to share tacit knowledge. In this way, open individuals (those more likely to share tacit knowledge in a knowledge-intensive business) could indirectly encourage conscientious and extravert individuals to share valuable experiences, know-how, insights and expertise with other employees. As such, management should make strategic use of individuals who score high in *Openness to experience* in order to reap the benefits of knowledge sharing among employees, such as increased productivity and competitiveness. The selection, and more importantly, the retention of individuals who are original, open-minded, imaginative and inventive (*Openness to experience*) should therefore be given priority in the recruitment and selection process of knowledge-intensive businesses.

7.3.2.2 Mature cooperation

Mature cooperation refers to the maturity of individuals, both in realising the significance and value of sharing their knowledge with others, and in recognising the intrinsic benefits of sharing as a motivation to share knowledge. The findings of this study confirm a significant, positive relationship between *Mature cooperation* and *Knowledge-sharing intention*. This result is supported by literature (refer to section 6.9.1.3), and suggests that individuals who are aware that knowledge sharing is important (not only to the business, but also for co-workers, who as a result of knowledge sharing could perform their jobs better), are more likely to be willing to share their valuable experiences, know-how, insights and expertise with their co-workers. The findings further suggest that individuals who are intrinsically motivated are more likely to be willing to share their valuable tacit knowledge with co-workers. For example, employees who believe in their ability to share knowledge that co-workers may find valuable, are more likely to be willing to share these valuable experiences, know-how, insights and expertise with their co-workers. In addition, employees who gain personal satisfaction from sharing knowledge and who feel pleasure and enjoyment in sharing their tacit knowledge are more likely to be willing to share their valuable experiences, know-how, insights and expertise with their co-workers.

In light of these results, the following recommendations are put forward to increase employees' awareness of the importance of knowledge sharing, and to intrinsically motivate employees to share knowledge. Subsequently, these recommendations could increase employees' willingness to share tacit knowledge with co-workers:

- Management should make knowledge-sharing efforts part of employees' performance evaluation criteria, in particular, participation in formal initiatives (such as knowledge fairs) and informal knowledge-sharing initiatives (such as communities of practice). This will not only create awareness of the value that management places on knowledge-sharing efforts and initiatives, but also of the significance of knowledge sharing for the business and employees.
- Internal training sessions could be a good starting point to emphasise the

importance of knowledge sharing. In this regard, training sessions should be started and concluded with a reminder of the significance and value of knowledge sharing among employees. Employees could even be requested to share their most recent experiences about knowledge sharing and the value they have gained from a colleague who shared valuable experiences, know-how, insights or expertise with them.

- Knowledge-sharing awareness should form an integral part of a business's orientation programme for new employees. Apart from highlighting the key policies and processes of a business, an induction program should, as soon as possible, make new staff aware that management places a high priority on a knowledge-sharing culture (because of the benefits it holds for the business and its employees).
- Sending employees from knowledge-intensive businesses on skills development courses to develop their skills in particular fields, such as finance and information technology, has become popular. Management should also consider investing in the wellbeing of the business by sending employees on knowledge-management short courses, with particular emphasis on knowledge sharing and the benefits that knowledge sharing among employees holds for a business and for the employees themselves. Various higher education institutions in South Africa provide courses on knowledge management and some institutions even flexibly structure and facilitate executive courses according to their clients' unique needs. In addition to these short courses, various MBA courses offered in South Africa include a component on knowledge management. Employees should be requested to enroll in such courses, especially if the business is investing in and funding employees' studies.
- Concerning rewards for knowledge sharing, management should not focus only on extrinsic rewards such as promotion, bonuses, salary increases and job security as primary motivational mechanisms to motivate employees to share their tacit knowledge. Instead, intrinsic motivation should form the focus point of management to increase employees' willingness to share knowledge. Because intrinsic motivation such as knowledge self-efficacy was found to be an important determinant of employees' willingness to share knowledge, management should pay specific attention to increasing

employees' confidence that the knowledge they share is useful and valuable to others in the business. In this regard, management should provide positive feedback on employees' knowledge-sharing efforts. Moreover, management should make it enjoyable for employees to share their knowledge. Employees should feel positive when they share knowledge. Management could, for example, encourage knowledge fairs where information on a specific theme is presented by a variety of means such as kiosks, presentations, showcases, panels, scale models and demonstrations. Knowledge fairs are flexible, and individuals can see what others are doing while interacting with each other (Pienaar, 2007:54; Denning, 2000), therefore making it more enjoyable for employees to share knowledge.

7.3.2.3 Demographic variables

A GLM analysis was performed to assess the influence of selected demographic variables on *Knowledge-sharing intention* to obtain a more parsimonious model. From the analyses it was concluded that only the demographic variables *Age of respondent*, *Ethnic background of respondent* and *Organisational tenure* have a significant influence on *Knowledge-sharing intention* (refer to section 6.9.2).

Figure 6.5 shows that respondents between 18 and 24 years of age tend to be the least willing to share their tacit knowledge with co-workers compared to individuals in other age categories. Respondents between 25 and 40 years of age tend to be more willing to share their knowledge with co-workers. This intention to share tacit knowledge however decreases with middle-aged and older respondents (those older than 40 years of age). As was explained in section 6.9.2, it could be that young employees (18-24 years) do not always have the confidence that their knowledge might be valuable to others given their limited work-related experiences, insights, know-how and expertise. This explanation is supported by the findings concerning employees' motivation to share knowledge (refer to sections 6.9.1.3 and 7.3.2.2). In this respect, the SEM results in this study confirm that employees who have confidence (internal motivation) to provide knowledge that their co-workers might consider valuable are more willing to share their

valuable tacit knowledge. In addition, it was also clarified that at a specific point in their career (older than 40 years), when it becomes increasingly more difficult to find a new career, individuals could allocate more value to their tacit knowledge as they now consider it their power and competitive advantage. As such, they tend to be less willing to share their experiences, insights, know-how and expertise with co-workers. Given these findings concerning the relationship between the *Age of respondents* and their *Knowledge-sharing intention*, management should pay specific attention to increasing young employees' confidence that the knowledge they share is useful and valuable to others in the business. Management should therefore provide positive feedback on young employees' knowledge-sharing efforts. Furthermore, management should regularly communicate the importance of knowledge sharing to older employees in particular. In this instance, management should highlight to older employees that the old paradigm "knowledge is power" has shifted to "knowledge-sharing is power".

With reference to the significant relationship found between *Ethnic background* and *Knowledge-sharing intention*, the results revealed that Black respondents were the least willing of ethnic groups to share their tacit knowledge. From a South African perspective, it is realistic to expect that this ethnic group may still experience the lasting effects of racial segregation and inequality that was rife during the apartheid regime. Subsequently, certain Black respondents may still be too sceptical to share their knowledge and rather prefer to retain their valuable insights and knowledge. They may regard this as a valuable competitive advantage in a knowledge-intensive environment (refer to section 6.9.2). Management should clearly communicate and institutionalise workplace equity and anti-discrimination policies and programmes to create an organisational culture in which employees do not feel excluded and where they believe they can reach their full potential without prejudice and discrimination.

The significant relationship between *Organisational tenure* and *Knowledge-sharing intention* implies that respondents' who had worked in their organisation for less than 10 years tend to be less willing to share their tacit knowledge. From this point onwards (organisational tenure of more than 10 years), employees are more likely to be willing to share valuable tacit knowledge with co-workers. Such results could

well be expected in a knowledge-intensive business where employees with limited organisational tenure (for example less than 10 years) may not yet be fully committed to the organisation or sufficiently confident to share knowledge. They may also not yet trust their co-workers enough to share knowledge with them. At some point in their tenure (such as an organisational tenure of more than 10 years), they become more committed to the business and trust its employees, and therefore tend to be more willing to share their knowledge. In fact, trust has been found to be an important predictor of knowledge sharing between employees (see Ling, 2011:330; Wang & Noe, 2010:121). Therefore, management should create an organisational culture characterised by trust and open communication among employees. Trust among employees, and therefore the confidence between employees that knowledge sharing will not bring bad results to either party, could facilitate interaction which, in turn, is favourable for employees to share their knowledge. Trust-building workshops where employees can openly communicate and share ideas are a good starting point for employees to nurture their trust in one another.

7.3.3 Findings and recommendations from the validity and reliability testing

The present study can be accepted as valid, based on the assessment of the validity of the measuring instrument it employed. The study confirmed the construct validity because all three measures (face, convergent and discriminant validity) used to evaluate the construct validity were satisfactory. The factor loading obtained from the EFA, the AVE values, and the function where the square root of the AVE value for any two factors was compared with the correlation estimates between the two factors, were satisfactory.

Moreover, the Cronbach-alpha coefficient employed in this study as a measure of reliability indicated high internal consistency. This implies that the measuring instrument used in the present study can be employed in future studies. Although it is not required, the measuring instrument could be improved in future studies by reducing the number of items per construct.

7.4 CONTRIBUTIONS OF THE STUDY

This study adds to the body of knowledge management research, in particular knowledge-sharing research, by investigating selected individual-related factors influencing *Knowledge-sharing intention* of individuals in a particular subset of businesses, namely knowledge-intensive businesses, and focusing on a particular type of knowledge, namely tacit knowledge. The development and empirical testing of a comprehensive, integrative model of individual-related factors influencing *Knowledge-sharing intention* has, to the best knowledge of the researcher, only been performed in a limited number of cases in the world, and never before in South Africa. The inclusion of each individual-related factor in the hypothesised model was appropriately justified by underlining the lack of research pertaining to the respective factor and knowledge sharing, therefore addressing various gaps in knowledge-sharing literature.

A further contribution of this study is the development of a reliable instrument that measures individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses. As affirmed in section 7.3.3, the measuring instrument in the present study provides a valuable starting point. Nonetheless, it can be enhanced by making it more parsimonious by reducing the number of items per variable. The measuring instrument can also be used by other researchers and business and knowledge managers to assess the individual-related factors influencing *Knowledge-sharing intention* over time. Reducing the number of items per variable, therefore using a shortened version of the instrument that demands less time from employees' busy schedules, could be more appropriate for internal business surveys.

Another valuable contribution of the study is that it focuses on knowledge-sharing between individual employees. It therefore adopts an individual unit of analysis, and addresses the gap in knowledge-sharing research that has paid inadequate attention to knowledge sharing between individual employees. Instead, such research was concentrated on knowledge transfer at team, unit and organisational level (Wang *et al*., 2011:2).

Furthermore, from an empirical perspective, the researcher could not find evidence of the use of an advanced statistical technique such as SEM to analyse various direct, and especially moderating relationships, as proposed in the hypothesised model. Again, this is a valuable contribution to the body of knowledge-sharing literature. The empirical investigation (EFA) further revealed a new factor that has an influence on *Knowledge-sharing intention* that has not been previously identified in knowledge-sharing literature. This new factor which emerged from the empirical investigation was named *Mature cooperation*. *Mature cooperation* refers to the maturity of individuals, both in realising the significance and value of sharing their knowledge with others, and in recognising the intrinsic benefits of sharing as a motivation to share knowledge.

From a business's perspective, understanding and managing the individual-related factors influencing *Knowledge-sharing intention* could contribute to an increase in knowledge sharing of employees. As a result, the effectiveness and competitive advantage of knowledge-intensive businesses could be enhanced. More specifically, to mention only a few examples, knowledge sharing has been associated with generating new business ideas and opportunities, developing organisational learning, enhanced business effectiveness and productivity, improved work quality and problem-solving (refer to Chapter 2 section 2.4). The recommendations put forward in section 7.3 therefore make a valuable contribution to knowledge-intensive businesses.

7.5 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

The present study attempted to make an important contribution to the body of knowledge management literature in general, and knowledge sharing in particular. As with all empirical studies, certain limitations should be considered when interpreting, concluding and generalising the findings of the study. Although the individual-related factors influencing the *Knowledge-sharing intention* of individual employees in knowledge-intensive businesses were explored and greater understanding attained, new opportunities for future research have also been

revealed. Consequently, the following limitations of the present study and recommendations for future research are suggested.

Although the sample of the quantitative study is thought to be a good representation of the population as a whole, the extent to which a non-probability sample represents the population can be questioned (Leedy & Ormrod, 2013:214). Nonetheless, the researcher feels that the findings of the study can be generalised to some extent as the empirical analysis of the data was based on a relatively large sample of 597 respondents.

The quantitative data presented in the study was subject to the self-report of respondents. This could lead to response bias. For example, the items in the quantitative questionnaire measuring psychological contract breach could have been answered with a degree of response bias as some respondents in this study may have been in high hierarchical positions (such as co-owners of the business) and therefore of the opinion that expectations between themselves (as employers/owners) and their employees have been kept. Future studies could limit response bias and test these specific factors by using a sample that is spread across all hierarchical levels. Also, as was the case in the current study, both procedural and statistical remedies can be employed to control common method bias.

Another limitation of this study is that when structural equation models are used, the data cannot confirm a model, but can only fail to disconfirm it. Subsequently, there is a possibility that alternative models to those proposed in this study may also fit the data. Nonetheless, the researcher is of the opinion that the benefits of SEM analysis outweigh its shortcomings and that the present study makes a great contribution to knowledge-sharing literature by applying an advanced statistical technique to analyse the data.

Although it was not the purpose of this study, a section could have been created on the quantitative questionnaire to indicate the name of the company or industry. This would have allowed for comparisons between perceptions of employees in different knowledge-intensive industries.

Despite the limitations identified, the results of this study make a valuable contribution to the field of knowledge management in general and knowledge sharing in particular. In light of the above, numerous ideas can be proposed for future studies. The present study could be extended to a comparative study that includes knowledge-intensive businesses outside South Africa. It would be worth investigating whether cultural differences play a role in the willingness of individuals to share tacit knowledge.

In addition, as the field of knowledge sharing evolves, a more holistic representation of factors could be included in future studies and be empirically tested with regard to their relationship with *Knowledge-sharing intention* (or even attitudes toward knowledge sharing). The present study only focused on selected individual-related factors influencing *Knowledge-sharing intention*. Although these factors were identified and justified in the literature as important factors that require further empirical investigation with regard to their relationship with knowledge sharing, there might also be other possible factors that potentially could influence knowledge-sharing such as organisational structure (refer to the integrative theoretical framework of factors influencing knowledge sharing in Figure 3.1 of Chapter 3). Also, as a result of the practical problems of requesting respondents to complete a comprehensive and time-consuming questionnaire, as well as sample size restriction, the focus of the present study was limited to specific factors.

The focus of this study was on *Knowledge-sharing intention*, with a specific focus on tacit knowledge. Another study could focus on both explicit and tacit knowledge. In this respect, it would be worth investigating whether the intention to share different types of knowledge is influenced by different individual-related factors.

Although this study investigated various moderating relationships between several individual-related factors and *Knowledge-sharing intention*, there continues to be a lack of research in this regard. Future studies could significantly benefit from further research that identifies possible moderating variables that would change

the strength of relationships pertaining to *Knowledge-sharing intention*. For example, this study investigated the moderating influence of personality traits on the relationship between psychological contract breach and *Knowledge-sharing intention*. Apart from personality traits, it could be worth testing whether other possible factors might moderate the relationship between psychological contract breach and *Knowledge-sharing intention*. For example, it could be worth investigating the moderating influence of emotion regulation strategies (Bal *et al*., 2011:724) and prior experience with breach (Orvis *et al*., 2008:1191) on the relationship between psychological contract breach and *Knowledge-sharing intention*.

Although challenging because of respondents' time constraints, longitudinal knowledge-sharing research would also add considerable value to the field of knowledge sharing. In this regard, it would be worth investigating whether different factors influence individuals' *Knowledge-sharing intention* over time. For example, it is possible that a change in the economic environment over time (such as from economic growth to tough economic conditions/recession) may influence employees to consider external rewards for sharing knowledge and to attach less value to internal rewards.

The implementation of the recommendations put forward in this study pertaining to the factors influencing *Knowledge-sharing intention* also warrants further research. Finally, a qualitative, in-depth study investigating employees' willingness to share tacit knowledge holds potential for future research.

7.6 CONCLUDING REMARKS

The sharing of valuable experiences, know-how, insights and expertise among employees holds various advantages for knowledge-intensive businesses, as highlighted throughout this study. To assist knowledge-intensive businesses to reap the benefits of knowledge sharing among employees, several recommendations have been put forward in this chapter. These recommendations relate to selected individual-related factors that have been found to be strong predictors of employees' willingness to share their valuable tacit knowledge. Over

and above all the recommendations presented in this chapter, the researcher advises knowledge-intensive businesses to create a knowledge-sharing audit checklist that incorporates the recommendations proposed in this study. A shift in the paradigm of “knowledge is power” to a mindset of “knowledge sharing is power” is vital to realise the full benefits of knowledge sharing among employees. In the words of Margaret Fuller:

“If you have knowledge, let others light their candles in it.”

REFERENCES

Aamir, A. 2010. *Framework of intrinsic and extrinsic motivators of knowledge sharing and the role of personality attributes: A case of petronas training institutes*. Masters thesis, University Teknologi Petronas, Malaysia.

Abdullah, H.S., Hassim, A.A. & Chik, R. 2009. Knowledge sharing in a knowledge intensive organisation: Identifying the enablers. *International Journal of Business Management*, 4(4):115-123.

Abdullah, N.L., Hamzah, H., Arshad, R., Isa, R.M. & Ghani, R.A. 2011. Psychological contract and knowledge sharing among academicians: Mediating role of relational social capital. *International Business Research*, 4(4):231-241.

Abili, K., Thani, F.N., Mokhtarian, F. & Rashidi, M.M. 2011. The role of effective factors on organisational knowledge sharing. *Education and Educational Psychology*, 29:1701-1706.

Ajmal, M.M., Kekale, T. & Koskinen, K.U. 2009. Role of organisational culture for knowledge sharing in project environments. *International Journal of Project Organisation and Management*, 1(4):358–374.

Ajzen, I. 1985. *From intention to action a Theory of Planned Behaviour in action control from cognitions to behaviours*. New York: Springer.

Al-Alawi, A., Al-Marzoogi, N. & Mohammad, Y. 2007. Organisational culture and knowledge sharing: Critical success factors. *Journal of Knowledge Management*, 11(2):22-42.

Al-Busaidi, K.A., Olfman, L., Ryan, T. & Leroy, G. 2010. Sharing knowledge to a knowledge management system: Examining the motivators and the benefits in an Omani organisation. *Journal of Organisational Knowledge Management*, 1-12.

Alam, S.S., Abdullah, Z., Ishak, N.A. & Zain, Z.M. 2009. Assessing knowledge sharing behaviour among employees in SMEs: An empirical study. *International Business Research*, 2(2):115-122.

Alavi, M. & Leidner, D.E. 2001. Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1):107-136.

Alhalhouli, Z.T., Hassan, Z.B. & Der, C.S. 2014. Factors affecting knowledge sharing behaviour among stakeholders in Jordanian hospitals using social networks. *International Journal of Computer and Information Technology*, 3(5):919-928.

Ali, A.H.A. 2013. *The effect of knowledge sharing practices on organisation performance*. Masters dissertation, The British University, Dubai.

Ali, M.R.M. 2012. *Determinants of knowledge sharing in professional services*. Masters dissertation, University of Gaza, Gaza City.

Allam, H. 2013. *Social, technical, and organisational determinants of employees' participation in enterprise social tagging tools: A conceptual model and an empirical investigation*. Doctoral thesis, Dalhousie University, Canada.

Amason, A.C. 1996. Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of Management Journal*, 39(1):123-148.

Amayah, A.T. 2011. Knowledge sharing, personality traits and diversity: A literature review. *Conference Paper presented at the Midwest Research-to Practice Conference in Adult, Continuing, and Community Education*, Lindenwood University, St. Louis.

Amin, A. & Shahid, M.I. 2013. *Influence of language on knowledge sharing: A case study of Pakistani workers in selected Swedish multinational companies*. Masters thesis, Mälardalen University, Sweden.

Amin, A., Hassan, M.F.B. & Ariffin, M.B.M. 2010. Framework of intrinsic and extrinsic motivators of knowledge sharing: A case of training institutes of an oil and gas company in Malaysia. *Proceedings of the International Symposium on Information Technology*, Kuala Lumpur, Malaysia.

Amiri, R.H. & Sotoudeh, M.R.Z. 2014. The effect of knowledge management and information technology in education and human resources. *Indian Journal of Fundamental and Applied Life Sciences*, 4(1):237-245.

Anadachee, K. 2012. *Examination of outsourcing in an accounting firm, a shift in the unit of analysis*. Doctoral thesis, University of London, United Kingdom.

Antonova, A. & Gurova, E. 2006. A note on organisational learning and knowledge sharing in the context of communities of practice. *Proceedings of International Workshop in Learning Networks for Lifelong Competence Development*, TENCompetence Conference, September 12th, Sofia, Bulgaria: TENCompetence.

Anvari, R., Amin, S.M., Ismail, W.K.W., Ahmad, U.N.U. & Seliman, S. 2011. Mediating effects of affective organisational commitment and psychological contract in the relationship between strategic training practices and knowledge sharing. *African Journal of Business Management*, 5(6):2189-2202.

Anwar, M., Shahzad, K. & Rehman, Q.I. 2012. Managing conflicts through personality management. *African Journal of Business Management*, 6(10): 3725-3732.

Apostolou, D., Papailiou, N. & Mentzas, G. 2007. Developing knowledge networks: A practical methodology and experiences from cases. *International Journal Knowledge Management Studies*, 1(3/4):330-355.

Argote, L. & Ingram, P. 2000. Knowledge transfer: A basis for competitive advantage in firms. *Organisational Behaviour and Human Decision Processes*, 82(1):150-169.

Asgharian, R., Zohoori, M., Malakouti, M. & Attarnezhad, O. 2013. Factors influencing knowledge sharing toward innovation: A study of electronic industry of Iran. *Interdisciplinary Journal of Contemporary Research in Business*, 5(1):708-721.

Atkinson, C. 2007. Building high performance employment relationships in small firms. *Employee Relations*, 29(5):506-519.

Awad, E.M. & Ghaziri, H.M. 2007. *Knowledge Management*. India: Pearson.

Babbie, E. & Mouton, J. 2001. *The practice of social research*. First Edition. Cape Town: Oxford University Press.

Bakker, M., Leenders, R.T.A.J., Gabbay, S.M., Kratzer, J. & Van Engelen, J.M.L. 2006. Is trust really social capital? Knowledge sharing in product development projects. *The Learning Organisation*, 13(6):594−605.

Bal, P.M., Chiaburu, D.S. & Diaz, I. 2011. Does psychological contract breach decrease proactive behaviours? The moderating effect of emotion regulation. *Group and Organisation Management*, 36(6):722-758.

Bandura, A. 1986. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Barreto, C. 2003. *The motivators and effects of formalised knowledge sharing between employees through knowledge management initiatives: A multi-case study approach*. Doctoral dissertation, Syracuse University, United States.

Barrick, M.R., Mount, M.K. & Judge, T.A. 2001. Personality and job performance at the beginning of the new millenium: What do we know and where do we go next? *International Journal of Selection and Assessment*, 9:9-30.

Barrick, M.R., Parks, L. & Mount, M.K. 2005. Self-monitoring as a moderator of the relationships between personality traits and performance. *Personnel Psychology*, 58:745-767.

Barrick, M.R., Stewart, G.L., & Piotrowski, M. 2002. Personality and job performance: Test of the mediating effects of motivation among sales representatives. *Journal of Applied Psychology*, 87:43-51.

Bechina, A.A. & Bommen, T. 2006. Knowledge sharing practices: Analysis of a global Scandinavian consulting company. *The Electronic Journal of Knowledge Management*, 4(2):109-116.

Bendersky, C & Shah, N.P. 2013. The downfall of extraverts and rise of neurotics: The dynamic process of status allocation in task groups. *Academy of Management Journal*, 56(2):387-406.

Benet-Martinez, V. & John, O.P. 1998. Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, 75(3):729-750.

Berger, J.R. 2009. *Employee reactions to psychological contract breach: The influence of personality*. Masters thesis, University of Amsterdam, Netherlands.

Bessick, J. & Naicker, V. 2013. Barriers to tacit knowledge retention: An understanding of the perceptions of the knowledge management of people inside and outside the organisation. *SA Journal of Information Management*, 15(2):1-8.

Bhuvan, U. 2008. Handbook of research in mobile business. Second Edition. USA:IGI Global.

Bijleveld, C., Van der Kamp, L., Mooijaart, A.B., Van der Kloot, W.A., Van der Leeden, R. & Van der Burg, E. 1998. *Longitudinal data analysis: Designs, models and methods*. London: Sage Publications.

Blau, P.M. 1964. *Exchange and power in social life*. New York: John Wiley and Sons.

Blumberg, B., Cooper, D.R. & Schindler, P.S. 2011. *Business research methods*. Third Edition. London: McGraw-Hill.

Bock, G.W. & Kim, Y.G. 2002. Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing. *Information Resources Management Journal*, 15(2):14-21.

Bock, G.W., Zmud, R.W., Kim, Y.G. & Lee, J.N. 2005. Behavioural intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organisational climate. *MIS Quarterly*, 29(1):87-111.

Bordia, P., Irmer, B.E. & Abusah, D. 2006. Differences in sharing knowledge interpersonally and via databases: The role of evaluation apprehension and perceived benefits. *European Journal of Work and Organisational Psychology*, 15(3):262-280.

Breckler, S.J. 1990. Applications of covariance structure modeling in psychology: *Cause for concern? Psychological Bulletin*, 107(2):260-273.

Brijball, N. 2010. *The impact of culture on knowledge sharing*. Masters dissertation, University of Pretoria, Pretoria, South Africa.

Bryman, A. & Bell, E. 2011. *Business research methods*. Third Edition. New York: Oxford University Press.

Bryman, A. & Bell, E. 2014. *Research methodology: Business and management contexts*. First Edition. South Africa: Oxford University Press.

Byrne, B.M. 2010. *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. New York: Taylor and Francis.

Cable, D.A.J. 2008. *The psychological contract: The development and validation of a managerial measure*. Doctoral thesis, University of Waikato, New Zealand.

Cabrera, A., Collins, W.C. & Salgado, J.F. 2006. Determinants of individual engagement in knowledge sharing. *International Journal of Human Resource Management*, 17(2): 245-264.

Cabrera, E.F. & Cabrera, A. 2005. Fostering knowledge sharing through people management practices. *International Journal of Human Resource Management*, 16: 720-735.

Castellano, W.G. 2010. *Contract human capital human resource architecture*. Doctoral dissertation, Rutgers, State University of New Jersey, United States.

Cavusgil, T.S., Calantone, R.J. & Zhao, Y. 2003. Tacit knowledge transfer and firm innovation capability. *Journal of Business and Industrial Marketing*, 18(1):6-21.

Chang, C.C., Chiu, H.C., Keng, N. & Chou, S.Y. 2008. A study on the knowledge sharing behaviour on blogs and forums. *Journal of e-Business*, 10(4):885-908.

Chang, S.J., Van Witteloostuijn, A. & Eden, L. 2010. From the editors: Common method variance in international business research. *Journal of International Business Studies*, 41:178-184.

Chang, T.J., Yeh, S.P. & Yeh, I.J. 2007. The effects of joint reward system in new product development. *International Journal of Manpower*, 28(3/4):276-297.

Chatzoglou, P. & Vraimaki, E. 2009. Knowledge-sharing behaviour of bank employees in Greece. *Business Process Management Journal*, 15(2):245-266.

Chee, W.W.H. 2009. *The predictability of individual, organisational, and technology factors on knowledge sharing processes in the construction industry of Hong Kong*. Doctoral dissertation, The University of Newcastle, Australia.

Chen, C.J. & Huang, J.W. 2007. How organisational climate and structure affect knowledge management: The social interaction perspective. *International Journal of Information Management*, 27:104-118.

Chen, H.L., Fan, H.L. & Tsai, C.C. 2014. The role of community trust and altruism in knowledge sharing: An investigation of a virtual community of teacher professionals. *Educational Technology and Society*, 17(3):168-179.

Chen, Z. & Leung, K. 2010. The effect of team conflict and task type on team knowledge sharing through transactive memory system. *The Second IEEE International Conference Information Management and Engineering (ICIME)*, Chengdu, China.

Chen, Z. 2011. The interactive effects of relationship conflict, reward, and reputation on knowledge sharing. *Social Behaviour and Personality*, 39(10):1387-1394.

Chen, Z., Zhang, X. & Vogel, D. 2011. Exploring the underlying processes between conflict and knowledge sharing: A work-engagement perspective. *Journal of Applied Social Psychology*, 41:1005-1033.

Chen, Z.X., Tsui, A.S. & Zhong, L. 2008. Reactions to psychological contract breach: A dual perspective. *Journal of Organisational Behaviour*, 29(5):527-548.

Cheng, F., Yeh, C., Tu, C. 2008. Trust and knowledge sharing in green supply chains. *Supply Chain Management: An International Journal*, 13(4):283-295.

Cheng, J., Wang, Y., Song, M & Huang, S. 2013. The effect of psychological contract, motivation on staffs' tacit knowledge sharing. *Advances in Information Sciences and Service Sciences*, 5(9):713-722.

Cheng, M., Ho, J.S. & Lau, P.M. 2009. Knowledge sharing in academic institutions: A study of Multimedia University Malaysia. *Electronic Journal of Knowledge Management*, 7(3):313-324.

Chennamaneni, A. 2006. *Determinants of knowledge sharing behaviours: Developing and testing an integrated theoretical model*. Doctoral dissertation, University of Texas, Arlington.

Chiu, C.M., Hsu, M.H. & Wang, E.T.G. 2006. Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, 42(3):1872-1888.

Cho, N., Li, G.Z. & Su, C.J. 2007. An empirical study on the effect of individual factors on knowledge sharing by knowledge type. *Journal of Global Business and Technology*, 3(2):1-16.

Chong, S. 2006. *KM critical success factors: A comparison of perceived importance versus implementation in Malaysian ICT companies*. The Learning Organisation, 13(2/3):230-256.

Chow, C.W., Deng, F.J. & Ho, K.J. 2000. The openness of knowledge sharing within organisations: A comparative study in the United States and the People's Republic of China. *Journal of Management Accounting Research*, 12(1):65-96.

Chow, C.W., Harrison, G.L., McKinnon, J.L., & Wu, A. 1999. Cultural influences on informal information sharing in Chinese and Anglo-American organisations: An exploratory study. *Accounting, Organisations and Society*, 24(7):561-582.

Chow, W.S. & Chan, L.S. 2008. Social network, social trust and shared goals in organisational knowledge. *Information and Management*, 45:458-465.

Chowdhury, S. 2005. The role of affect and cognition-based trust in complex knowledge sharing. *Journal of Managerial Issues*, 17(3):310-326.

Chua, A. 2003. Knowledge sharing: A game people play. *Aslib Proceedings*, 55(3):117-129.

Coetzee, J.C., Beek, W.S.B. & Buys, A. 2012. *A practical knowledge management framework within the pyrometallurgical industry*. *Journal of the Southern African Institute of Mining and Metallurgy*, 112(7):621-630.

Cohen, W.M. & Levinthal, D.A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1):128-152.

Collins, C.J. & Smith, K.G. 2006. Knowledge exchange and combination: The role of human resource practices in the performance of high-technology firms. *Academy of Management Journal*, 49(3):544-560.

Collis, J. & Hussey, R. 2009. Business research: A practical guide for undergraduate and postgraduate students. Third Edition. London: Palgrave Macmillan.

Connelly, C. 2000. *Predictors of knowledge sharing in organisations*. Unpublished masters thesis, Queens School of Business, Queen's University, Kingston, Ontario Canada.

Connelly, C.E. & Kelloway, K. 2003. Predictors of employees' perceptions of knowledge sharing cultures. *Leadership and Organisational Development Journal*, 24(5/6):294-301.

Connelly, C.E., Ford, D.P., Turel, O., Gallupe, B. & Zweig, D. 2013. *I'm busy (and competitive)! Antecedents of knowledge sharing under pressure*. [Online]. Available: http://www.palgrave-journals.com/kmrp/journal/vaop/ncurrent/abs/kmrp201261a.html [Accessed 6 March 2013].

Connolly, H.J.B. 2007. *Structured articulation of knowledge: The influence of question response structure on recipient attitude*. Doctoral thesis, University of Waikato, New Zealand.

Constant, D., Sproull, L. & Kiesler, S. 1996. The kindness of strangers: The usefulness of electronic weak ties for technical advice. *Organisation Science*, 7(2):119-135.

Conway, N., Guest, D. & Trenberth, L. 2011. Testing the differential effects of changes in psychological contract breach and fulfilment. *Journal of Vocational Behaviour*, 79(1):267-276.

Cooper, D.R. & Schindler, P.S. 2007. *Business research methods*. Ninth Edition. New York: McGraw-Hill.

Cooper, D.R. & Schindler, P.S. 2011. *Business research methods*. Eleventh Edition. New York: McGraw-Hill.

Costa, P.T.J. & McCrae, R.R. 1992. *Revised NEO Personality Inventory and NEO Five-Factor Inventory professional manual*. Odessa, FL: Psychological Assessment Resources.

Cress, U., Barquero, B., Schwan, S. & Hesse, F.W. 2007. Improving quantity and quality of contributions: Two models for promoting knowledge exchange with shared databases. *Computers and Education*, 49(2):423-440.

Cruywagen, M. 2010. *Knowledge-centric capabilities: A configurational approach*. Doctoral dissertation, University of Stellenbosch, Cape Town, South Africa.

Cullinane, N. & Dundon, T. 2006. The psychological contract: A critical review. *International Journal of Management Reviews*, 8(2):113-129.

Cyr, S. & Choo, C.W. 2010. The individual and social dynamics of knowledge sharing: An exploratory study. *Journal of Documentation*, 66(6):824-846.

Daud, S. & Yusoff, W.F.W. 2010. Knowledge management and firm performance in SMEs: The role of social capital as a mediating variable. *Asian Academy of Management Journal*, 15(2):135-155.

Davenport, T.H. & Prusak, L. 1998. *Working knowledge: How organisations manage what they know*. Boston, MA: Harvard Business School Press.

Davison, R.M., Ou, C.X.J. & Martinsons, M.G. 2013. Information technology to support informal knowledge sharing. *Information Systems Journal*, 23(1):89-103.

De Dreu, C.K.W. 2006. When too little or too much hurts: Evidence for a curvilinear relationship between task conflict and innovation in teams. *Journal of Management*, 32(1):83-107.

De Long, D. & Fahey, L. 2000. Diagnosing cultural barriers to knowledge management. *Academy of Management Executive*, 14(4):113-127.

De Vries, R.E., Van den Hooff, B. & De Ridder, J.A. 2006. Explaining knowledge sharing: The role of team communication styles, job satisfaction, and performance beliefs. *Communication Research*, 33(2):115-135.

Deng, P.S. 2008. Applying a market-based approach to the development of a sharing-enabled KM model for knowledge-intensive small firms. *Information Systems Management,* 25(2):174-187.

Denner, L. 2012. *Employing knowledge networks as tools for the development of Caribbean small island developing states*. [Online]. Available: http://www.eclac.org/publicaciones/xml/1/48001/LCARL344.pdf [Accessed 2 September 2013].

Denning, S. 2000. *The horisontal organisational ritual: The knowledge fair*. [Online]. Available: http://www.stevedenning.com/Knowledge-Management/knowledge-fairs.aspx [Accessed 2 September 2013].

Desouza, K.C. 2003. Facilitating tacit knowledge exchange. *Communication of the ACM*, 46(6):85-88.

Disterer, G. 2001. Individual and social barriers to knowledge transfer. *Proceedings of the International Conference on System Sciences*, Hawaii.

Dixon, N. 2009. *Five actions organisations can take to increase knowledge sharing*. [Online]. Available: http://www.nancydixonblog.com/2009/03/five-actions-organizations-can-take-to-increase-knowledge-sharing.html [Accessed 2 September 2013].

Draaijer, R. 2008. *Why share? An empirical investigation of knowledge contribution within electronic networks of practice*. Masters dissertation, University of Twente, Netherlands.

Du Plessis, M. 2006. *The impact of organisational culture on knowledge management*. Chandos Publishing: UK.

Dube, L. & Ngulube, P. 2012. Knowledge sharing in a multicultural environment: Challenges and opportunities. *South African Journal of Libraries & Information Science*, 78(1):68-78.

Dunford, R. 2000. Key challenges in the search for the effective management of knowledge in management consulting firms. *Journal of Knowledge Management*, 4(4):295-302.

Dwivedi, Y.K., Lal, B., Williams, M.D., Schneberger, S.L. & Wade, M. 2009. *Handbook of research on contemporary theoretical models in information systems*. Hershey: IGI Global.

Dyer, J.H. & Nobeoka, K. 2000. Creating and managing a high-performance knowledge-sharing network: The Toyota case. *Strategic Management Journal*, 21:345-367.

Ehtamo, J. 2013. *Searching the links between "knowledge governance mechanisms", "the conditions of individual knowledge sharing", and "individual's knowledge sharing behaviour.*" Masters Thesis, Lappeenranta University of Technology, Finland.

Eisenhardt, K.M. & Santos, F.M. 2001. Knowledge-based view: A new theory of strategy? In Pettigrew, A., Thomas, H. & Whittington, R. *Handbook of strategy and management*. London: Sage Publications.

Erwee, R. 2005. Evaluating a virtual team assignment in a distance education course. *International Journal of Business & Management Education*, 13(1):1-20.

Eucker, T.R. 2007. Understanding the impact of tacit knowledge loss. *Knowledge Management Review*, 10(1):10-13.

Evans, M.M. 2012. *Knowledge sharing: An empirical study of the role of trust and other social-cognitive factors in an organisational setting*. Doctoral thesis, University of Toronto, Ontario, Canada.

Evans, N., Bosua, R. & Sawyer, J. 2013. Using social networks for knowledge acquisition in regional Australian SMEs: Management considerations. *Journal of Knowledge Management Practice*, 14(2).

Farrington, S.M. 2009. *Sibling partnerships in South-African small and medium-sized family businesses*. Doctoral thesis, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Finestone, N. & Snyman, R. 2005. Corporate South Africa: Making multicultural knowledge sharing work. *Journal of Knowledge Management*, 9(3):128-141.

Fishbein, M. & Ajzen, I. 1975. *Belief, attitude, intention and behaviour: An introduction to theory and research*. MA: Addison-Wesley.

Fong, E.A. & Tosi, H.L. 2007. Effort, performance, and conscientiousness: An agency theory perspective. *Journal of Management*, 33:161-179.

Foos, T., Schum, G. & Rothenberg, S. 2006. Tacit knowledge transfer and the knowledge disconnect. *Journal of Knowledge Management*, 10(1):6-18.

Ford, D.P. & Chan, Y.E. 2003. Knowledge sharing in a multi-cultural setting: A case study. *Knowledge Management Research and Practice*, 1(1):11−27.

Foss, J.N., Michailova, S. & Husted, K. 2010. Governing knowledge sharing in organisations: Levels of analysis, governance mechanisms, and research directions. *Journal of Management Studies*, 47(3):455-482.

Fox, W. & Bayat, M.S. 2012. *A guide to managing research*. Cape Town: Juta and Co Ltd.

French, N. 2010. *Factors which influence organisational knowledge sharing*. Masters thesis, University of Pretoria, Pretoria, South Africa.

Frost, A. 2013. *Knowledge sharing*. [Online]. Available: http://www.knowledge-management-tools.net/knowledge-sharing.html [Accessed 6 August 2013].

Gammelgaard, J. 2007. Why not use incentives to encourage knowledge sharing? *Journal of Knowledge Management Practice*, 8(1).

Gharanjik, E. & Azma, F. 2014. The relationship between five-factor personality and willingness of employees to share organisational knowledge. *Advanced Research in Economic and Management Sciences*, 17(1):76-84.

Ghelichkhani, M. & Khaiami, R. 2015. A knowledge sharing model for Iranian educational and research organisations. *Indian Journal of Science and Technology*, 8(28):1-8.

Ghitan, F. 2009. *Employees' perception of psychological contract breach in Dutch universities*. Masters dissertation, University of Amsterdam, Netherlands.

Gholami, M.H., Asli, M.N., Shirkouhi, S.N. & Noruzy, A. 2013. Investigating the influence of knowledge management practices on organisational performance: An empirical study. *Acta Polytechnica Hungarica*,10(2):205-216.

Glinow, M.A.V., Shapiro, D.L. & Brett, J.M. 2004. Can we talk, and should we? Managing emotional conflict in multicultural teams. *The Academy of Management Review*, 29(4):578-592.

Goodman, P.S. & Darr, E.D. 1998. Computer-aided systems and communities: Mechanisms for organisational learning in distributed environments. *MIS Quarterly*, 22(4):417−440.

Gouldner, A.W. 1960. The norm of reciprocity: A preliminary statement. *American Sociological Review*, 25(2):161-178.

Grant, R.M. 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17:109-122.

Gu, L. & Wang, J. 2013. How conflicts may impact intentions to share knowledge in a virtual team. *Issues in Information Systems*, 14(2):79-86.

Guest, D.E. 2004. The psychology of the employment relationship: An analysis based on the psychological contract. *Applied Psychology*, 53(4):541-555.

Gupta, B. 2008. Role of personality in knowledge sharing and knowledge acquisition behaviour. *Journal of the Indian Academy of Applied Psychology*, 34(1):143-149.

Gupta, B., Agarwal, A., Samaria, P., Sarda, P. & Bucha, R. 2012. Organisational commitment and psychological contract in knowledge sharing behaviour. *The Indian Journal of Industrial Relations*, 47(4):737-749.

Gupta, B., Joshi, S. & Agarwal, M. 2012. The effect of expected benefit and perceived cost on employees' knowledge sharing behaviour: A study of IT employees in India. *Organisations and Markets in Emerging Economies*, 3(1):8-19.

Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C., 1998. *Multivariate data analysis*. Fifth Edition. New Jersey: Prentice Hall.

Hair, J.F., Black, W.C., Babin, J.B. & Anderson, R.E. 2014. *Multivariate data analysis*. Seventh Edition. United Kingdom: Pearson Education.

Hair, J.F., Black, W.C., Babin, J.B., Anderson, R.E. & Tatham, R.L. 2006. *Multivariate data analysis*. Sixth Edition. Upper Saddle River, New Jersey: Pearson/Prentice Hall.

Hair, J.F., Celsi, M.W., Money, A.H., Samouel, P. & Page, M.J. 2011. *Business research methods*. Second Edition. New York: M.E. Sharpe.

Harder, M. 2008. How do rewards and management styles influence the motivation to share knowledge*? SMG Working Paper*, Copenhagen Business School.

Hassan, M.F., Ariffin, M.M. & Rehman, M. 2011. Knowledge sharing: Two-dimensional motivation perspective and the role of demographic variables. *Journal of Information and Knowledge Management*, 10(2):135-149.

Hassandoust, F. & Kazerouni, M.F. 2011. Implications knowledge sharing through e-collaboration and communication tool. *Journal of Knowledge Management, Economics and Information Technology*, 1(3):43-52.

Hau, Y.S., Kim, B., Lee, H. & Kim, Y.G. 2013. The effects of individual motivations and social capital on employees' tacit and explicit knowledge sharing intentions. *International Journal of Information Management*, 33(2):356-366.

He, W. & Wei, K.K. 2009. What drives continued knowledge sharing? An investigation of knowledge contribution and seeking beliefs. *Decision Support Systems*, 46(4):826-838.

Henderson, J.K. 2005. Language diversity in international management teams. *International Studies of Management and Organisation*, 35(1):66-82.

Hew, K.F. & Hara, N. 2007. Knowledge sharing in online environments: A qualitative case study. *Journal of the American Society for Information Science and Technology*, 58(14):2310-2324.

Hewitt, B.A. 2008. *Why differences make a difference redux: A field study of the effect of conflict, diversity, and knowledge sharing on the performance of information technology project teams*. Doctoral thesis, University of Texas at San Antonio, Texas, United States.

Hewlitt, A., Barnard, G. & Fisher, C. 2005. *Chat show as a knowledge sharing methodology*. [Online]. Available: http://www.google.co.za/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CD8QFjAD&url=http%3A%2F%2Fenrapkscurriculum.pbworks.com%2Ff%2FChat%2Bshow.doc&ei=bgknUsn5NInPhAf2p4DICg&usg=AFQjCNGQfMLVfvhkSXKcMXyr5KbljPZog&sig2=BiDb3JhbaL40nPULwvwenw [Accessed 6 September 2013].

Ho, V.T., Weingart, L.R. & Rousseau, D.M. 2004. Responses to broken promises: Does personality matter? *Journal of Vocational Behaviour*, 65(2):276-293.

Hoe, S.L. 2008. Issues and procedures in adopting structural equation modeling technique. *Journal of Applied Quantitative Methods*, 3(1):76-83.

Holste, J.S. & Fields, D. 2010. Trust and tacit knowledge sharing and use. *Journal of Knowledge Management*, 14(1):128-140.

Holste, J.S. 2003. A *study of the effects of affect-based trust and cognition-based trust on intra-organisational knowledge sharing and use*. Doctoral dissertation, Regent University, Virginia Beach, Virginia.

Hooper, D., Coughlan, J. & Mullen, M.R. 2008. Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1):53-60.

Hoyle, R.H. 2014. *Handbook of structural equation modeling*. First Edition. Unites States: Guilford Publications.

Hsieh, P.J., Lin, B. & Lin, C. 2009. The construction and application of a knowledge navigator model: An evaluation of knowledge management maturity. *Expert Systems with Applications*, 36:4087-4100.

Hsu, C.L. & Lin, J.C.C. 2008. Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information and Management*, 45(1):65-74.

Hsu, I. 2006. Enhancing employee tendencies to share knowledge - Case studies of nine companies in Taiwan. *International Journal of Information Management*, 26(4):326-338.

Hsu, J.L., Chou, H.W., Hwang, W.Y. & Chou, S.B. 2008. A two-dimension process in explaining learners' collaborative behaviours in CSCL. *Educational Technology and Society*, 11(4):66-80.

Hung, Y.C. & Chuang, Y.H. 2009. Factors affecting knowledge sharing behaviour: A content analysis of empirical findings. *Conference Paper, Proceedings of the International Conference of Pacific Rim Management*, San Francisco, USA.

Hunt, J. 2009. *Coach? Mentor? Leader? Manager?* [Online]. Available: https://fortress.wa.gov/cjtc/www/administrator/class/2356_2.pdf [Accessed 6 August 2013].

Hutasuhut, I.J. 2007. *Personal characteristics and attitude toward knowledge sharing*. Masters dissertation, University of Malaysia, Sarawak.

Huttermann, H. & Boerner, S. 2011. Fostering innovation in functionally diverse teams: The two faces of transformational leadership. *European Journal of Work and Organisational Psychology*, 20(6):833-854.

Iacobucci, D. 2010. Structural equations modeling: Fit Indices, sample size, and advanced topics. *Journal of Consumer Psychology*, 20(1):90-98.

Isa, R.M., Abdullah, N.L. & Senik, Z.C. 2010. Social capital dimensions for tacit knowledge sharing: Exploring the indicators. *Jurnal Pengurusan*, 30:75-91.

Isfahani, A.N., Nilipour, A., Aghababapour, T. & Tanhaei, M.H. 2013. Studying the impact of attitude towards knowledge sharing on employees' happiness. *International Journal of Academic Research in Business and Social Sciences*, 3(4):139-150.

Islam, Z., Ahmed, S.M., Hasan, I. & Ahmed, S.U. 2011. Organisational culture and knowledge sharing: Empirical evidence from service organisations. *African Journal of Business Management,* 5(14):5900-5909.

Ismail, M.B. & Yusof, Z.M. 2008. Factors affecting knowledge sharing in public organisations in Malaysia. *Proceedings of the Fourth Knowledge Management International Conference*, 10-12 June, Langkawi, Malaysia.

Ismail, M.B. & Yusof, Z.M. 2009. Demographic factors and knowledge sharing quality among Malaysian government officers. *Communications of the International Business Information Management Association*, 9:1-8.

Ismail, M.B. & Yusof, Z.M. 2010. The impact of individual factors on knowledge sharing quality. *Journal of Organisational Knowledge Management*, 10:1-13.

Ismail, N.A.M. 2012. *Key determinants of research-knowledge sharing in UK higher education institutions*. Doctoral thesis, University of Portsmouth, United Kingdom.

Jacobs, E.J. & Roodt, G. 2011. The mediating effect of knowledge sharing between organisational culture and turnover intentions of professional nurses. *South African Journal of Information Management*, 13(1):1-6.

Jafri, H. 2014. Influence of personality on perception of psychological contract breach. *Psychological Thought*, 7(2):168-178.

Jain, K.K., Sandhu, M.S. & Sidhu, G.K. 2007. Knowledge sharing among academic staff: A case study of business schools in Klang Valley Malaysia. *Journal for the Advancement of Science and Arts*, 2:23-29.

Jamaliah, A.H. & Sarinah, S. 2013. Relationship between perceived costs, perceived benefits and knowledge sharing behaviour among lecturers in educational institution in Malaysia. *Pertanika Journal of Social Sciences and Humanities*, 21(3):937-951.

Jarvenpaa, S.L. & Staples, D.S. 2001. Exploring perceptions of organisational ownership of information and expertise. *Journal of Management Information Systems*, 18(1):151-183.

Jehn, K.A. 1995. A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, 40:256-282.

Jiacheng, W., Lu, L. & Fracesco, C.A. 2010. A cognitive model of intra-organisational knowledge-sharing motivations in the view of cross-culture. *International Journal of Information Management*, 30:220-230.

John, O.P., Donahue, E.M. & Kentle, R.L. 1991. *The Big Five Inventory-Versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

John, O.P., Naumann, L.P. & Soto, C.J. 2008. Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In John, O.P., Robins, R.W. & Pervin, L.A. (Eds.) *Handbook of personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.

Johnson, J.D. 2009. *Managing knowledge networks*. Cambridge: Cambridge University Press.

Jones, G.R. & George, J.M. 1998. The experience and evolution of trust: Implications for cooperation and teamwork. *Academy of Management Review*, 23(3):531-546.

Juhasz, K. 2005. *The cultivation and management of communities of practice in contrast to community-based interventions*. [Online]. Available: http://www.vivetechnologies.com/onelearning/pdfs/CmntyInterventions2005.pdf [Accessed 1 February 2014).

June, S. & Kheng, Y.K. 2014. Innovation work behaviour (IWB) in the knowledge intensive business services (KIBS) sector in Malaysia: The effect of leader-member exchange (LMX) and social capital (SC). *Asian Social Science*, 10(2):172-182.

Kamruddin, S. & Akram, S. 2016. Knowledge management practices in information technology sector in India: A study. *International Journal of Management*, 7(2):652-662.

Kankanhalli, A., Tan, B.C.Y. & Wei, K.K. 2005. Contributing knowledge to electronic knowledge repositories: An empirical investigation. *MIS Quarterly*, 29(1):113-143.

Kearney, E. & Gebert, D. 2009. Managing diversity and enhancing team outcomes: The promise of transformational leadership. *Journal of Applied Psychology*, 94(1):77–89.

Kexiang, W. & Pu, Z. 2013. An empirical study of golfer group atmosphere, psychological contract and knowledge sharing. *Journal of Business Management and Economics*, 4(8):173-180.

Keyes, J. 2008. *Identifying the barriers to knowledge sharing in knowledge intensive organisations*. [Online]. Available: http://www.newarttech.com/KnowledgeSharing.pdf [Accessed 16 January 2013].

Khan, K. 2009. *The violation of psychological contract: Possible causes for the failure of organisational incentive system to motivate knowledge sharing*. Masters thesis, Massey University, Palmerstone North, New Zealand.

Kharabsheh, R.A. 2007. A model of antecedents of knowledge sharing. *The Electronic Journal of Knowledge Management,* 5(4):419-426.

Kickul, J., Lester, S.W. & Finkl, J. 2002. Promise breaking during radical organisational change: Do justice interventions make a difference? *Journal of Organisational Behaviour*, 23(4):469-488.

Kim, S. & Lee, H. 2006. The impact of organisational context and information technology on employee knowledge-sharing capabilities. *Public Administration Review*, 66(3):370-385.

King, W.R. & Marks, P.V. 2008. Motivating knowledge sharing through a knowledge management system. *Omega*, 36(1):131-146.

Kline, R.B. 2011. *Principles and practice of structural equation modeling*. Third Edition. New York: Guilford Press.

Knoppe, M. 2012. *The psychological contracts of temporary employees*. Masters thesis, University of Amsterdam, Netherlands.

Ko, D.G., Kirsch, L. & King W.R. 2005. Antecedents of knowledge transfer from consultants to clients in enterprise systems implementations. *MIS Quarterly*, 29(1):59-85.

Koskinen, K.U. 2013. *Knowledge production in organisations: A processual autopoietic view*. Springer: Cham.

Krishnaveni, R. & Sujatha, R. 2012. Communities of practice: An influencing factor for effective knowledge transfer in organisations. *The IUP Journal of Knowledge Management*, 10(1):26-40.

Kruger, C.J. 2008. *Knowledge management maturity from a strategic/managerial perspective*. Doctoral thesis, University of Pretoria, Pretoria, South Africa.

Kubo, I., Saka, A. & Pan, S.L. 2001. Behind the scenes of knowledge sharing in a Japanese bank. *Human Resource Development International*, 4(4):465-485.

Kulkarni, U.R., Ravindran, S. & Freeze, R. 2007. A knowledge management success model: Theoretical development and empirical validation. *Journal of Management Information Systems*, 23(3):309-347.

Kumar, M., Jha, V. & Vaidya, S.D. 2007. Empirical investigation of impact of organisational culture, prosocial behaviour and organisational trust on sharing mistakes in knowledge management systems. *Proceedings of the Pacific Asia Conference on Information Systems (PACIS)*, Pacific Asia.

Kwok, S.H. & Gao, S. 2006. Attitude towards knowledge sharing behaviour. *The Journal of Computer Information Systems*, 46(2):45-51.

Lam, A. & Lambermont-Ford, J.P. 2009. Knowledge sharing in organisational contexts: A motivation-based perspective. *Journal of Knowledge Management*, 14(1):51-66.

Lauring, J. & Selmer, J. 2012. Knowledge sharing in diverse organisations. *Human Resource Management Journal*, 2(1):89-105.

Le, T.T.B. 2012. *The psychological contract of temporary employees with a university degree in Vietnam*. Masters thesis, University of Minho, Portugal.

Ledesma, R.D. & Valero-Mora, P. 2007. Determining the number of factors to retain in EFA: An easy-to-use computer program for carrying out parallel analysis. *Practical Assessment, Research and Evaluation*, 12(2):1-11.

Lee, C.C., Lee, Y.H., Chen, H.H., Hsieh, P.S., Yeh, Y.Y. & Lin, M.C. 2014. The impact of team diversity, task interdependence, team conflict and team cooperation on job performance: Using real estate brokers as examples. *International Journal of Management and Sustainability*, 3(7):415-432.

Lee, C.K. & Al-Hawamdeh, S. 2002. Factors impacting knowledge sharing. *Journal of Information and Knowledge Management*, 1(1):49-56.

Lee, D.J. & Ahn, J.H. 2007. Rewards systems for intra-organisational knowledge sharing. *European Journal of Operations Research*, 180:938-956.

Lee, J. 2001. The impact of knowledge sharing, organisational capability and partnership quality on IS outsourcing success. *Information and Management*, 38(5):323-335.

Lee, J.H., Kim, Y.G. & Kim, M.Y. 2006. Effects of managerial drivers and climate maturity on knowledge-management performance: Empirical validation. *Information Resources Management Journal*, 19(3):48−60.

Leedy, P.D. & Ormrod, J.E. 2013. *Practical research: Planning and design*. Tenth Edition. Boston: Pearson Education.

Lepoiev, M. 2011. *The effect of psychological contract breach and violation on employees' responses - the moderating effect of personality*. Masters thesis, University of Amsterdam, Netherlands.

Lichtenstein, S. & Brain, M.E. 2006. Understanding the impact of organisational downsizing on knowledge sharing. *Proceedings of the Nineteenth European Conference on Information Systems*, ECIS, Gotegorg, Sweden.

Liebowitz, J. 1999. *The knowledge management handbook*. Boca Raton, FL: CRC Press.

Lin, C.P. 2006. Gender differs: Modelling knowledge sharing from a perspective of social network ties. *Asian Journal of Social Psychology*, 9:236-241.

Lin, H.F. 2007a. Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2):135-149.

Lin, H.F. 2007b. Knowledge sharing and firm innovation capability: An empirical study. *International Journal of Manpower,* 28(3/4):315-332.

Lin, H.F., Lee, H.S. & Wang, D.W. 2009. Evaluation of factors influencing knowledge sharing based on a fuzzy AHP approach. *Journal of Information Science*, 35(1):25-44.

Lin, H.H. & Wang, Y.S. 2012. Investigating the effect of university students' personality traits on knowledge withholding intention: A Multi-theory perspective. *International Journal of Information and Education Technology*, 2(4):354-357.

Lin, Q., Ye, D. & Bi, B. 2014. A longitudinal and multilevel investigation on factors influencing knowledge sharing behaviour. *Journal of Management Policy and Practice*, 15(3):88-101.

Lin, W. 2008. The effect of knowledge sharing model. *Expert Systems with Applications*, 34:1508-1521.

Lin, W.K., Lin, C.P., Joe, S.W. & Hung, W.T. 2012. *Modeling knowledge sharing effectiveness and psychological contract*. The Second International Conference on Business and Banking (ICBB), Denpasar, Bali.

Ling, C.T.N. 2011. Culture and trust in fostering knowledge-sharing. *The Electronic Journal of Knowledge Management*, 9(4):328-339.

Liu, C.C., Liang, T.P., Sambamurthy, V., Rajagopalan, B. & Wu, J.C.H. 2011. Knowledge sharing as social exchange: Evidence from a meta-analysis. *Pacific Asia Journal of the Association for Information Systems*, 3(4):21-47.

Liu, F.C., Cheng, K.L., Chao, M. & Tseng, H.M. 2012. Team innovation climate and knowledge sharing among healthcare managers: Mediating effects of altruistic intentions. *Chang Gung Medical Journal*, 35(5):408-419.

Liu, H., Ding, G., Huang, L. & Huang, Q. 2014. Guanxi orientation and subjective norms in knowledge sharing: The mediating effects of loss of knowledge power and codify effort. *Proceedings of the Eighteenth PACIS Conference*, Chengdu, China.

Lou, S.J., Yang, Y.S., Shih, R.C. & Tseng, K.H. 2007. A study on the knowledge sharing behaviour of information management instructors at technological universities in Taiwan. *World Transactions on Engineering and Technology Education*, 6(1):143-148.

Lu, F., Zhou, F. & Leung, K. 2011. Effects of task and relationship conflicts on individual work behaviours. *International Journal of Conflict Management*, 22(2):131-150.

Lucas, L.M. 2006. Things are not always what they seem: How reputations, culture, and incentives influence knowledge transfer. *The Learning Organisation*, 13(1):7-24.

MacCurtain, S., Flood, P.C., Ramamoorthy, N., West, M.A. & Dawson, J.F. 2010. The top management team, reflexivity, knowledge sharing and new product performance: A study of the Irish software industry. *Creativity and Innovation Management*, 19(3):219-232.

Makela, K., Kalla, H.K. & Piekkari, R. 2007. Interpersonal similarity as a driver of knowledge sharing within multinational corporations. *International Business Review*, 16(1):1-22.

Malhotra, Y. 2004. Why knowledge management systems fail - Enablers and constraints of knowledge management in human enterprises. In Koenig, M.E.D. *Knowledge management lessons learned: What works and what doesn't*. New Jersey: Information Today Inc.

Manaf, H.A. 2012. *The influence of knowledge sharing on performance among Malaysian public sector managers and the moderating role of individual personality*. Doctoral thesis, University of Hull, United Kingdom.

Matzler, K., Renzl, B., Mooradian, T., Von Krogh, G. & Mueller, J. 2011. Personality traits, affective commitment, documentation of knowledge and knowledge sharing. *The International Journal of Human Resource Management*, 22(2):296-310.

Matzler, K., Renzl, B., Muller, J., Herting, S. & Mooradian, T. 2008. Personality traits and knowledge sharing. *Journal of Economic Psychology*, 29:301-313.

McDermott, R. & O'Dell, C. 2001. Overcoming cultural barriers to sharing knowledge. *Journal of Knowledge Management*, 5(1):76-85.

Medina, F.J., Munduate, L., Dorado, M.A., Martinez, I. & Guerra, J.M. 2005. Types of intragroup conflict and affective reactions. *Journal of Managerial Psychology*, 20(3/4):219-230.

Milton, N. 2013. *Knoco stories: From the knowledge management front line*. [Online]. Available: http://www.nickmilton.com/search/label/success%20story [Accessed 4 July 2013].

Min, R., He, J. & Gan, J. 2010. An analysis of knowledge sharing within organisation based on the psychological contract. *The Seventeenth International Conference on Industrial Engineering and Engineering Management* (IE&EM), Xiamen, China.

Minbaeva, D. 2007. Knowledge transfer in multinational corporations. *Management International Review*, 47(4):567-593.

Minbaeva, D., Makela, K. & Rabbiosi, L. 2012. Linking HRM and knowledge transfer via individual-level mechanisms. *Human Resource Management*, 51(3):387-405.

Mogotsi, I.C., Boon, J.A. & Fletcher, L. 2011. Knowledge sharing behaviour and demographic variables amongst secondary school teachers in and around Gaborone, Botswana. *SA Journal of Information Management,* 13(1):1-6.

Mohamed, M., Stankosky, M. & Murray, A. 2006. Knowledge management and information technology: Can they work in perfect harmony? *Journal of Knowledge Management*, 10(3):103-116.

Mohammed, W. & Jalal, A. 2011. The influence of knowledge management system (KMS) on enhancing decision making process (DMP). *International Journal of Business and Management*, 6(8):216-229.

Moloto, M.S. 2008. *The acceptance of technology-based knowledge management systems by knowledge workers*. Masters dissertation, University of Johannesburg, Johannesburg, South Africa.

Momeni, S., Zohoori, M., Musram, A.M. & Hosseinipour, S.J. 2013. Relationship between organisational structure and knowledge sharing culture. *Interdisciplinary Journal of Contemporary Research in Business*, 5(2):518-524.

Mooradian, T., Renzl, B. & Matzler, K. 2006. Who trusts? Personality, trust and knowledge sharing. *Management Learning*, 37(4):523-540.

Morse, S. 2009. Who's contributing? *Do personality traits influence the level and type of participation in online community*? Masters thesis, Victoria University of Wellington, New Zealand.

Nagamani, G. & Katyayani, J. 2013. Knowledge sharing practices among academicians: Assessing the role of demographic variables. *International Journal of Business Management and Research*, 3(4):113-124.

Nahapiet, J. & Ghoshal, S. 1998. Social capital, intellectual capital, and organisational advantage. *Academy of Management Review*, 23(2):242-266.

Nassuora, A.B. 2011. Knowledge sharing in institutions of higher learning. *International Journal of Economics and Management Sciences*, 1(3):29-36.

Natalegawa, A. 2013. *The effects of personality on group identity and interaction*. Honours thesis, Colgate University, Hamilton, New York.

Nelson, A., Sabatier, R. & Nelson, W. 2006. Toward an understanding of global entrepreneurial knowledge management (EKM) practices: A preliminary investigation of EKM in France and the U.S. *Journal of Applied Management and Entrepreneurship*, 11(2):70-89.

Ngaruiya, G.N. 2013. *Application of value innovation as the basis for blue ocean strategy at Safaricom Limited*. Masters project, University of Nairobi, Nairobi.

Nkuna, S. 2012. *Effective knowledge sharing within communities of practice in a financial institution*. Masters dissertation, University of Johannesburg, Johannesburg, South Africa.

Noh, J.H. 2013. *Employee knowledge sharing in work teams: Effects of team diversity, emergent states, and team leadership*. Doctoral dissertation, University of Minnesota, United States.

Nonaka, I. & Takeuchi, H. 1995. *The knowledge creating company*. Oxford: Oxford University Press.

Nonaka, I. & Von Krogh, G. 2009. Tacit knowledge and knowledge conversion: Controversy and advancement in organisational knowledge creation theory. *Organisational Science*, 20(3): 635-652.

Nonaka, I. 1994. A dynamic theory of organisational knowledge creation. *Organisation Science*, 5(1):14-37.

Noor, N.M. & Salim, J. 2011. Factors influencing employee knowledge sharing capabilities in electronic government agencies in Malaysia. *International Journal of Computer Science Issues*, 8(4):106-114.

Nordin, N.A., Daud, N. & Osman, W.U.K.M. 2012. Knowledge sharing behaviour among academic staff at a public higher education institution in Malaysia. *International Journal of Social, Management, Economics and Business Engineering*, 6(12):696-701.

Nunes, M.B., Annansingh, F., Eaglestone, B. & Wakefield, R. 2006. Knowledge management issues in knowledge-intensive SMEs. *Journal of Documentation*, 62(1):101-119.

Nunnally, J.C. & Bernstein, I.H. 1994. *Psychometric theory*. Third Edition. New York: McGraw-Hill.

Nunnally, J.C. 1978. *Psychometric theory*. Second Edition. New York: McGraw-Hill.

O'Dell, C. & Grayson, C. 1998. If only we knew what we know: Identification and transfer of internal best practices. *California Management Review,* 40(3):154-174.

O'Neill, B. & Adya, M. 2007. Knowledge sharing and the psychological contract: Managing knowledge workers across different stages of employment. *Journal of Managerial Psychology*, 22:411-436.

O'Neill, J.W., Beauvais, L.L. & Scholl, R.W. 2001. The use of organisational culture and structure to guide strategic behaviour: An information processing perspective. *Journal of Behavioural and Applied Management,* 2(2):131-150.

Ojha, A.K. 2005. Impact of team demography on knowledge sharing in software project teams. *South Asian Journal of Management*, 12(3):67-78.

Okyere-Kwakye, E. & Nor, K.M. 2011. Individual factors and knowledge sharing. *American Journal of Economics and Business Administration*, 3(1):66-72.

Olapegba, P.O., Balogun, A.G. & Idemudia, E.S. 2013. Examining the influence personality factors on knowledge sharing intention among employees of two selected banks. *Journal of Psychology*, 4(1):33-38.

Olatokun, M. & Elueze, N. 2012. Analysing lawyers' attitude towards knowledge sharing. *South African Journal of Information Management*, 14(1):1-11.

Olatokun, W. & Nwafor, C.I. 2012. The effect of extrinsic and intrinsic motivation on knowledge sharing intentions of civil servants in Ebonyi State, Nigeria. *Information Development*, 28(3):216-234.

Olsson, U.H., Foss, T. & Breivik, E. 2004. Two equivalent discrepancy functions for Maximum Likelihood estimation: Do their test statistics follow a noncentral CM-square distribution under model misspecification? *Sociological Methods and Research*, 32(May):453-510.

Olsson, U.H., Foss, T., Troye, S.V. & Howell, R.D. 2000. The performance of ML, GLS and WLS estimation in structural equation modelling under conditions of misspesification and nonnormality. *Structural Equations Modeling*, 7:557-559.

Ones, D.S., Viswesvaran, C. & Dilchert, S. 2005. Personality at work: Raising awareness and correcting misconceptions. *Human Performance*, 18:389-404.

Orvis, K.A., Cortina, J.M. & Dudley, N.M. 2008. Conscientiousness and reactions to psychological contract breach: A longitudinal field study. *Journal of Applied Psychology*, 93(5):1183-1193.

Osterloh, M. & Frey, B.S. 2000. Motivation, knowledge transfer, and organisational forms. *Organisation Science,* 11(5):538-550.

Oye, N.D., Mazleena, S. & Noorminshah, A. 2011. Knowledge sharing in workplace: Motivators and demotivators. *International Journal of Managing Information Technology*, 3(4):71-84.

Pangil, F. & Nasurdin, A.M. 2008. Demographics Factors and Knowledge Sharing Behaviour among R&D Employees. *Knowledge Management International Conference and Exhibition*, Langkawi, Malaysia.

Panteli, N. & Sockalingam, S. 2005. Trust and conflict within virtual inter-organisational alliances: A framework for facilitating knowledge sharing. *Decision Support Systems*, 39(4):599-617.

Papoutsakis, H. 2007. Sharing knowledge in the organisation: A retrospective analysis and an empirical study. *The Electronic Journal of Knowledge Management,* 5(2):231-244.

Pate, J., Martin, G. & McGoldrick, J. 2003. The impact of psychological contract violation on employee attitudes and behaviour. *Employee Relations*, 25(6):557-573.

Paulin, D. & Suneson, K. 2012. Knowledge transfer, knowledge sharing and knowledge barriers: Three blurry terms in KM. *The Electronic Journal of Knowledge Management*, 10(1):81-91.

Peihua, Z. 2011. *Analysis of factors affecting individual knowledge sharing behaviour in construction teams in Hong Kong*. Doctoral thesis, University of Hong Kong, Hong Kong.

Pekdemir, I., Kocoglu, M. & Gurkan, G.C. 2013. The effects of harmony of family, distributive justice, and role ambiguity on family member impediment: The mediating role of relationship conflict as an example of developing country Turkey. *Asian Social Science*, 9(9):131-145.

Penrose, E.T. 1959. *The theory of the growth of the firm*. New York: Wiley.

Perik, H.T.M. 2014. *Research into factors that influence the intention to share knowledge on a knowledge community platform within youth care: The case of Jeugdkwartier*. Masters thesis, University of Twente, Netherlands.

Peterson, R.A. & Kim, Y. 2013. On the relationship between coefficient alpha and composite reliability. *Journal of Applied Psychology*, 98(1):194-198.

Petrauskaite, G. 2011. *What's mine is yours, or is it? Knowledge sharing in voluntary project based organisations*. Masters thesis, Umea University, Sweden.

Pham, T.B.N. 2008. *Intra-organisational knowledge transfer process in Vietnam's information technology companies*. Doctoral thesis, University of Fribourg, Switzerland.

Phuong, T.H. 2013. How to measure psychological contract breach as a predictor of workplace outcomes: Evidence from Vietnam. *The Macrotheme Review*, 2(2):32-42.

Pienaar, J.J. 2007. *The role of the learning organisation paradigm in improving intellectual capital*. Masters thesis, University of Johannesburg, Johannesburg, South Africa.

Pilsmo, G. 2010. *Knowledge management in projects - A study of small consulting firms*. Bachelor thesis, Lulea University of Technology, Sweden.

Podsakoff, P.M., Mackenzie, S.B., Lee, J.Y. & Podsakoff, N.P. 2003. Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5):879-903.

Posthuma, R.A. 2011. Conflict management and performance outcomes. *International Journal of Conflict Management*, 22(2):108-110.

Quinlan, C. 2011. *Business research methods*. First Edition. United Kingdom: Cengage Learning.

Rad, P., Alizadeh, N., Miandashti, N.Z. & Fami, H.S. 2011. Factors influencing knowledge sharing among personnel of agricultural extension and education organisation in Iranian ministry of Jihad-e agriculture. *Journal of Agricultural Science and Technology*, 13(4):491-501.

Rahab, Sulistyandari & Sudjono. 2011. The development of innovation capability of small medium enterprises through knowledge sharing process: An empirical study of Indonesian creative industry. *International Journal of Business and Social Science*, 2(21):112-123.

Raja, U., Johns, G. & Bilgrami, S. 2011. Negative consequences of felt violations: The deeper the relationship, the stronger the reaction. *Applied Psychology: An International Review*, 60(3):397-420.

Raja, U., Johns, G. & Ntalianis, F. 2004. The impact of personality on psychological contracts. *Academy of Management Journal*, 47(3):350-367.

Rao, S. 2010. *Knowledge management and contract professionals: A study of contingent employment and knowledge sharing in organisations*. Doctoral thesis, University of Sydney, Australia.

Rasula, J., Vuksic, V.B. & Stemberger, M.I. 2012. The impact of knowledge management on organisational performance. *Economic and Business Review,* 14(2):147-168.

Rayton, B.A. & Yalabik, Z.Y. 2014. Work engagement, psychological contract breach and job satisfaction. *The International Journal of Human Resource Management*, 25(17): 2382-2400.

Rehman, M., Mahmood, A.K., Salleh, R. & Amin, A. 2011. Review of factors affecting knowledge sharing behaviour. *International Proceedings of Economics Development and Research*, 3(1):223-227.

Rehman, M., Mahmood, A.K., Salleh, R. & Amin, A. 2014. Framework to increase knowledge sharing behaviour among software engineers. *Research Journal of Applied Sciences, Engineering and Technology*, 7(4):849-856.

Renzl, B. 2008. Trust in management and knowledge sharing: The mediating effects of fear and knowledge documentation. *Omega*, 36(2):206-220.

Rhodes, J., Hung, R., Lok, P., Wu, C.M. & Lien, Y.H. 2008. Factors influencing organisational knowledge transfer: Implication for corporate performance. *Journal of Knowledge Management*, 12(3):84-100.

Riege, A. 2005. Three-dozen knowledge-sharing barriers managers must consider. *Journal of Knowledge Management,* 9(3):18-35.

Robinson, S.J. & Morrison, E.W. 2000. The development of psychological contract breach and violation: A longitudinal study. *Journal of Organisational Behaviour*, 21(5):525-546.

Ross, L.M. 2006. *The impact of e-government on Aberdeen city council: How knowledge sharing can benefit the citizen in improving service delivery*. Masters dissertation, Robert Gordon University, United Kingdom.

Rousseau, D.M. 1989. Psychological and implied contracts in organisations. *Employee Responsibilities and Rights Journal*, 2(2):121-139.

Rousseau, D.M. 1995. *Psychological contracts in organisations: Understanding written and unwritten agreements*. Thousand Oaks, California: Sage Publications.

Rousseau, D.M. 2004. Psychological contracts in the workplace: Understanding the ties that motivate. *Academy of Management Executive*, 18(1):120-127.

Ryan, S.D., Windsor, J.C., Ibragimova, B. & Prybutok, V.R. 2010. Organisational practices that foster knowledge sharing: Validation across distinct national cultures. *Informing Science Journal*, 13(1):139-164.

Saes, M. 2008. *The influence of a proactive personality on knowledge sharing: What is the role of innovative ideas, conflict and trust.* Masters thesis, University of Twente, Netherlands.

Said Ali, M.M. 2009. *Cultural influences on knowledge sharing in a Kuwaiti higher education institution: A case study approach*. Doctoral thesis, Loughborough University, Leicestershire, United Kingdom.

Salis, S. & Williams, A.M. 2008. Knowledge sharing through face-to-face communication and labour productivity: Evidence from British workplaces. *British Journal of Industrial Relations*, 48(2):436-459.

Samieh, H.M. & Wahba, K. 2007. Knowledge sharing behaviour from game theory and socio psychological perspectives. *Proceedings of the Fortieth International Conference on System Sciences*, Hawaii.

Saunders, M., Lewis, P. & Thornhill, A. 2009. *Research methods for business students*. Fifth Edition. Essex: Pearson Education Limited.

Saunders, M., Lewis, P. & Thornhill, A. 2016. *Research methods for business students*. Seventh Edition. Essex: Pearson Education Limited.

Savalei, V. 2008. Is the ML Chi-Square ever robust to nonnormality? A cautionary note with missing data. *Structural Equation Modeling*, 15(1):1-22.

Sawng, Y.W., Kim, S.H. & Han, H.S. 2006. R&D group characteristics and knowledge management activities: A comparison between ventures and large firms*. International Journal of Technology Management*, 35(1-4):241−261.

Schepers, P. & Van den Berg, P.T. 2007. Social factors of work-environment creativity. *Journal of Business and Psychology*, 21(3):407-428.

Scholing, M.J. 2011. *The differences in knowledge sharing between profit and nonprofit organisations*. Masters thesis, University of Groningen, Netherlands.

Seidler-de Alwis, R. & Hartmann, E. 2008. The use of tacit knowledge within innovative companies: knowledge management in innovative enterprises. *Journal of Knowledge Management*, 12(1):133-147.

Sekaran, U. & Bougie, R. 2010. Research methods for business: A skill building approach. New York: John Wiley & Sons.

Shaari, R., Rahman, S.A.A. & Rajab, A. 2014. Self-efficacy as a determined factor for knowledge sharing awareness. *International Journal of Trade, Economics and Finance*, 5(1):39-42.

Shah, R. & Goldstein, S.M. 2006. Use of structural equation modeling in operations management research: Looking back and forward. *Journal of Operations Management*, 24:148-169.

Sharratt, M. & Usoro, A. 2003. Understanding knowledge-sharing in online communities of practice. *Electronic Journal on Knowledge Management*, 1(2):187-196.

Shih, J.C.W., Farn, C.K. & Ho, C.Y. 2008. Conflict is not bad: Interpersonal conflict and knowledge sharing. *Journal of Global Business Management*, 4(1):1-8.

Siemsen, E., Balasubramanian, S. & Roth, A.V. 2007. Incentives that induce task-related effort, helping, and knowledge sharing in workgroups. *Management Science*, 53(10):1533-1550.

Sonnenberg, M. 2006. *The signalling effect of HRM on psychological contracts of employees a multi-level perspective*. Doctoral dissertation, Erasmus University, Rotterdam, Netherlands.

Spector, P.E. & Jex, S.M. 1998. Development of four self-report measures of job stressors and strain: Interpersonal conflict at work scale, organisational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology,* 3(4):356-367.

Srikantaiah, T.K., Koenig, M.E.D. & Hawamdeh, S. 2010. *Convergence of project management and knowledge management*. Scarecrow Press: UK.

Srivastava, A., Bartol, K.M. & Locke, E.A. 2006. Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. *Academy of Management Journal*, 49(6):1239-1251.

Stock, R. 2004. Drivers of team performance: What do we know and what have we still to learn? *Schmalenbach Business Review*, 56(3):274-306.

Styhre, A. 2012. *Knowledge sharing in professions: Roles and identity in expert communities*. England: Gower Publishing.

Suazo, M.M. 2009. The mediating role of psychological contract violation on the relations between psychological contract breach and work-related attitudes and behaviours. *Journal of Managerial Psychology*, 24(2):136-160.

Sun, P.Y. & Scott, J.L. 2005. An investigation of barriers of knowledge transfer. *Journal of Knowledge Management*, 9(2):75-90.

Susanty, A.I. & Wood, P.C. 2011. The motivation to share knowledge of the employees in the telecommunication service providers in Indonesia. *International Proceedings of Economics Development and Research*, 5(2):159-162.

Sveiby, K.E. & Simons, R. 2002. Collaborative climate and effectiveness of knowledge work. *Journal of Knowledge Management*, 6(5):420-433.

Swart, J. & Kinnie, N. 2003. Sharing knowledge in knowledge-intensive firms. *Human Resource Management Journal,* 13(2):60-75.

Szabo, L. & Csepregi, A. 2011. Competences found important for knowledge sharing: Investigation of middle managers working at medium and large-sized enterprises. *The IUP Journal of Knowledge Management*, 9(3):41-58.

Szulanski, G., Cappetta, R. & Jensen, R.J. 2004. When and how trustworthiness matters: Knowledge transfer and the moderating effect of causal ambiguity. *Organisation Science*, 15:600-613.

Tallman, R.R.J. & Bruning, N.S. 2008. Relating employees' psychological contracts to their personality. *Journal of Managerial Psychology*, 23(6):688-712.

Tan, N.L., Lim, Y.S. & Ng, T.H. 2009. Trust: Facilitator of knowledge-sharing culture. *Communications of the IBIMA*, 7:137-142.

Tan, N.L., Lye, Y.H., Ng, T.H. & Lim, Y.S. 2010. Motivational factors in influencing knowledge sharing among banks in Malaysia. *International Research Journal of Finance and Economics*, 44:186-196.

Teh, P.L., Yong, C.C., Chong, C.W. & Yew, S.Y. 2011. Do the Big Five Personality factors affect knowledge sharing behaviour? A study of Malaysian universities. *Malaysian Journal of Library and Information Science*, 16(1):47-62.

Teigland, R. & Wasko, M.M. 2003. Integrating knowledge through information trading: Examining the relationship between boundary spanning communication and individual Performance. *Decision Sciences*, 34(2):261-286.

Theriou, N.K., Aggelidis, V. & Theriou, G.N. 2009. A theoretical framework contrasting the resource-based perspective and the knowledge-based view. *European Research Studies*, 12(3):177-190.

Thomas-Hunt, M.C., Ogden, T.Y. & Neale, M.A. 2003. Who's really sharing? Effects of social and expert status on knowledge exchange within groups. *Management Science*, 49(4):464−477.

Thomas, R.W., Fugate, B.S. & Koukova, N.T. 2011. Coping with time pressure and knowledge sharing in buyer–supplier relationships. *Journal of Supply Chain Management*, 47(3):22-42.

Tjakraatmadja, J.H. & Martini, L. 2011. Knowledge sharing in academic institution: The relationship between knowledge sharing, channel richness, and absorptive capacity. *International Research Symposium in Service Management*, Yogyakarta, Indonesia.

Tobin, P.K.J. & Franze, M.H. 2005. Organisational structure and knowledge management: A case study. *Mousaion*, 23(2):149-164.

Tsai, M.T. & Chen, K.S. 2012. Understanding knowledge sharing intention in optometry practices: Examining the roles of extrinsic and intrinsic motivation. *Life Science Journal*, 9(1):900-902.

Turnley, W.H. & Feldman, D.C. 2000. Re-examining the effects of psychological contract violations: Unmet expectations and job dissatisfaction as mediators. *Journal of Organisational Behaviour*, 21(1):25-42.

Unselt, A.C., Gleich, R. & Russo, P. 2006. The impact of broken psychological contracts on knowledge sharing and the role of communities of practice as mediators. *Third International Workshop on Trust within and between Organisations*, Amsterdam.

Usoro, A., Sharratt, M.W., Tsui, E. & Shekhar, S. 2007. Trust as an antecedent to knowledge sharing in virtual communities of practice. *Knowledge Management Research and Practice,* 5:199-212.

Van den Brink, P. 2003. *Social, individual and technological conditions that enable knowledge sharing*. Doctoral dissertation, University of Amsterdam.

Van den Heever, T.S. 2014. *Perceived value creation in technology-based entrepreneurial businesse*s. Doctoral thesis, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Van den Hooff, B. & De Ridder, J.A. 2004. Knowledge sharing in context: The influence of organisational commitment, communication climate and CMC use on knowledge sharing. *Journal of Knowledge Management*, 8(6):117-130.

Van den Hooff, B. & Hendrix, L. 2004. Eagerness and willingness to share: The relevance of different attitudes towards knowledge sharing. *Fifth European Conference on Organisational Knowledge, Learning and Capabilities*, Innsbruck, Austria.

Van den Hooff, B. & Huysman, M. 2009. Managing knowledge sharing: Emergent and engineering approaches. *Information and Management*, 46(1):1-8.

Van den Hooff, B. & Van Weenen, F. 2004. Committed to share: Commitment and CMC use as antecedents of knowledge sharing. *Knowledge and Process Management*, 11(1):13-24.

Van Vliet, L. 2010. *A research on how knowledge transfer in a project-based organisation is influenced*. Masters thesis, RSM Erasmus University, Rotterdam.

Van Woerkom, M. & Sanders, K. 2010. The romance of learning from disagreement. The effect of cohesiveness and disagreement on knowledge sharing behaviour and individual performance within teams. *Journal of Business and Psychology*, 25:139-149.

Waheed., H. Masood., T. Khan., M.A. & Tahir, S. 2013. Mediating role of knowledge sharing: Organisational performance for competitive advantage and innovation. *African Journal of Business Management*, 7(7):536-547.

Wang, C.C. & Yang, Y.J. 2007. Personality and intention to share knowledge: An empirical study of scientists in an R&D laboratory. *Social Behaviour and Personality*, 35(10):1427-1436.

Wang, S. & Noe, R.A. 2010. Knowledge sharing: A review and directions for future research. *Human Resource Management Review,* 20:115-131.

Wang, S., Noe, R.A. & Wang, Z.M. 2011. Motivating knowledge sharing in knowledge management systems: A quasi–field experiment. *Journal of Management*, 37(4):1-32.

Wasko, M.M., & Faraj, S. 2005. Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1):35-57.

Watson, S. & Hewett, K. 2006. A multi-theoretical model of knowledge transfer in organisations: Determinants of knowledge contribution and reuse. *Journal of Management Studies,* 43(2):141-173.

Wee, S.H. 2012. Important enabler in the knowledge sharing process: Top management support. *International Conference on Innovation, Management and Technology Research (ICIMTR2012)*, Malacca, Malaysia.

Wegner, T. 2012. *Applied business statistics*. Third Edition. Cape-Town: Juta & Company Ltd.

Wei, C. 2010. *Effect of personality traits on knowledge sharing under extrinsic rewards system*. Masters thesis, University of Amsterdam, Netherlands.

Welman, C., Kruger, F. & Mitchell, B. 2005. *Research methodology*. Third Edition. Cape Town: Oxford University Press.

Wickramasinghe, N. & Von Lubitz, D.K.J.E. 2007. *Knowledge-based enterprise: Theories and fundamentals*. USA: Idea Group.

Willem, A. & Buelens, M. 2009. Knowledge sharing in inter-unit cooperative episodes: The impact of organisational structure dimensions. *International Journal of Information Management*, 29:151-160.

Willem, A. & Scarbrough, H. 2006. Social capital and political bias in knowledge sharing: An exploratory study. *Human Relations*, 59(10):1343-1370.

Winter, R. & Jackson, B. 2006. State of the psychological contract: Manager and employee perspectives within an Australian credit union. *Employee Relations*, 28(5):421-434.

Wittgenstein, J. 2013. *The moderating role of personality on workplace conflict and outcomes*. Masters thesis, Florida International University, United States.

Wolf, E.J., Harrington, K.M., Clark, S.L. & Miller, M.W. 2013. Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 73(6):913-934.

Xue, Y., Bradley, J. & Liang, H. 2011. Team climate, empowering leadership, and knowledge sharing. *Journal of Knowledge Management*, 15(2):299-312.

Yang, C. & Chen, L.C. 2007. Can organisational knowledge capabilities affect knowledge sharing behaviour? *Journal of Information Science*, 33(1):95-109.

Yang, J. 2007. The impact of knowledge sharing on organisational learning and effectiveness. *Journal of Knowledge Management*, 11(2):83-90.

Yao, L.J., Kam, T.H.Y. & Chan, S.H. 2007. Knowledge sharing in Asian public administration sector: The case of Hong Kong. *Journal of Enterprise Information Management*, 20(1):51-69.

Yoo, K.H. & Gretzel, U. 2011. Influence of personality on travel-related consumer-generated media creation. *Computers in Human Behaviour*, 27(2):609-621.

Yoshimichi, A. 2011. An Examination of the SECI Model in Nonaka's theory in terms of the TEAM Linguistic Framework. *Yamanashi Glocal Studies: Bulletin of Faculty of Glocal Policy Management and Communications*, 6:21-34.

Young, R. 2010. *Knowledge management tools and techniques manual*. Japan: Asian Productivity Organisation.

Yu, T.K., Lu, L.C. & Liu, T.F. 2010. Exploring factors that influence knowledge sharing behaviour via weblogs. *Computers in Human Behaviour*, 26(1):32-41.

Zait, A. & Bertea, P.E. 2011. Methods for testing discriminant validity. Management and Marketing, 9(2):217-224.

Zhang, X., Chen, Z., Vogel, D. & Guo, C. 2009. Exchange ideology as a moderator of knowledge sharing in virtual teams: A social exchange theory perspective. *International Journal of Internet and Enterprise Management*, 6:143-163.

Zhao, H., Wayne, S.J., Glibkowski, B.C. & Bravo, J. 2007. The impact of psychological contract breach on work-related outcomes: A meta-analysis. *Personnel Psychology*, 60(3):647-680.

Ziaei, S., Walczak, S. & Nor, K.M. 2014. The impact of ethnic and lingual diversity on short term knowledge sharing. *International Journal of Business Environment*, 6(3):246-265.

Zikmund, W.G., Babin, B.J., Carr, J.C. & Griffin, M. 2013. *Business research methods*. Ninth Edition. Mason, OH: Cengage Learning.

Zubair, T. 2013. *Keep critical data with a knowledge management system*. [Online]. Available: http://www.internetevolution.com/author.asp?section_id=1433&doc_id=262922 [Accessed 4 July 2013].

ANNEXURE A: QUESTIONNAIRE AND EMAIL LETTER

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Nelson Mandela Metropolitan University
for tomorrow

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July 2015

Dear Respondent

RESEARCH PROJECT: INDIVIDUAL-RELATED FACTORS INFLUENCING KNOWLEDE-SHARING INTENTION IN KNOWLEDGE-INTENSIVE BUSINESSES

Thank you for your willingness to participate in this research project.

Your organisation has been selected to participate in this study amongst knowledge-intensive businesses in South Africa. By completing the online electronic questionnaire, you will be automatically entered into a lucky draw to win **R5 000** in cash.

This research is currently being conducted by the Unit for Applied Business Management (UABM). The UABM is a research unit functioning under the auspices of the Department of Business Management at the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth. Ethical clearance has been obtained for the research and the ethical clearance number is: **H-15-BES-BMa-008**

The primary objective of this research is to identify and empirically investigate the individual-related factors influencing the knowledge-sharing intention of individual employees in knowledge-intensive businesses. The identification of such factors, empirical testing and subsequently the understanding and management thereof, could contribute to an increase in knowledge sharing of employees. In addition, management could design possible strategies and programmes that could be

implemented to encourage knowledge sharing of employees as well as increase the competitive advantage of the business.

Please complete the questionnaire independently and **without** consultation with other colleagues by clicking on the following link:

http://forms.nmmu.ac.za/websurvey/q.asp?sid=1451&k=iqsrifxrqq

The first and second set of questions solicits information about factors that will influence your knowledge-sharing intention with colleagues at work. The third set of questions solicits basic demographic data about you. Please indicate the **extent of your agreement** with these statements by clicking in the appropriate column. There are no right or wrong answers and only the **perceptions** you hold are important.

The questionnaire should take about ten **(10)** minutes to complete.

Even though no confidential information is required, your responses will be treated with the strictest confidentiality. Names of individuals will not appear in the research report. Only aggregate data and summary statistics will be reported.

Should you **be interested** in the results of this study, a copy of the findings would be emailed to all respondents who have completed the questionnaire.

Thank you once again for your willingness to contribute to the success of this important research project. If you have any questions you are welcome to contact me on 0726971805 or conradvg@gmail.com

Yours faithfully

Conrad van Greunen (Researcher and Doctoral student) and Prof Elmarie Venter (Supervisor).

SECTION 1: FACTORS INFLUENCING KNOWLEDGE-SHARING INTENTION

Below are a number of statements relating to selected individual-related factors influencing knowledge-sharing intention. Please indicate the extent to which you agree or disagree with the following statements relating to the factors that influence knowledge-sharing intention by selecting one option for each statement. A (1) indicates “strongly disagree”, (2) “disagree”, (3) “somewhat disagree”, (4) “neutral or no opinion”, (5) “somewhat agree”, (6) “agree” and (7) “strongly agree”. Note that there are no correct or incorrect answers.

	Statements relating to selected individual-related factors influencing knowledge-sharing intention	**Strongly disagree**	**Disagree**	**Somewhat disagree**	**Neutral or no opinion**	**Somewhat agree**	**Agree**	**Strongly agree**
1.1	I am someone who gets nervous easily.	1	2	3	4	5	6	7
1.2	I am someone who is original, comes up with new ideas.	1	2	3	4	5	6	7
1.3	I would find it personally satisfying to share my expertise with co-workers.	1	2	3	4	5	6	7
1.4	My expectation of my employer to pay my salary on time has been kept.	1	2	3	4	5	6	7
1.5	I am someone who likes to reflect and play with ideas.	1	2	3	4	5	6	7
1.6	I am someone who can be tense.	1	2	3	4	5	6	7
1.7	The importance of sharing my knowledge with co-workers is clear to me.	1	2	3	4	5	6	7
1.8	I would share my expertise with co-workers if I knew I would be promoted.	1	2	3	4	5	6	7
1.9	I am someone who is outgoing and sociable.	1	2	3	4	5	6	7
1.10	I am someone who perseveres until the job is finished.	1	2	3	4	5	6	7
1.11	I am someone who makes plans and follows through with them.	1	2	3	4	5	6	7
1.12	My expectation of my employer to provide me with opportunities to develop my career has been kept.	1	2	3	4	5	6	7
1.13	I know being aware of co-workers knowledge needs is important for the business.	1	2	3	4	5	6	7
1.14	I am someone who likes to cooperate with others.	1	2	3	4	5	6	7
1.15	It is important for the business that I share my knowledge with co-workers.	1	2	3	4	5	6	7
1.16	I am someone who is considerate and kind to most people.	1	2	3	4	5	6	7
1.17	I would share my expertise with co-workers if I knew I would get a salary raise and/or bonus.	1	2	3	4	5	6	7

Statements relating to selected individual-related factors influencing knowledge-sharing intention		Strongly disagree	Disagree	Somewhat disagree	Neutral or no opinion	Somewhat agree	Agree	Strongly agree
1.18	I would willingly share work experiences with my co-workers.	1	2	3	4	5	6	7
1.19	I am someone who worries a lot.	1	2	3	4	5	6	7
1.20	I am an enthusiastic person.	1	2	3	4	5	6	7
1.21	It would give me pleasure to share my experience with co-workers.	1	2	3	4	5	6	7
1.22	I would enjoy sharing my expertise with co-workers.	1	2	3	4	5	6	7
1.23	I am someone who is active/lively.	1	2	3	4	5	6	7
1.24	My expectation of my employer to provide me with training that will facilitate my personal development has been kept.	1	2	3	4	5	6	7
1.25	My expectation of my employer to reward me with a fair salary in exchange for my expertise has been kept.	1	2	3	4	5	6	7
1.26	I would share my expertise with co-workers if I knew I would get their acknowledgement.	1	2	3	4	5	6	7
1.27	I am someone who gets along with others.	1	2	3	4	5	6	7
1.28	It would feel good to help co-workers by sharing my expertise.	1	2	3	4	5	6	7
1.29	I would share work know-how with my co-workers.	1	2	3	4	5	6	7
1.30	My expectation of my employer to be honest with me concerning job-related aspects/issues has been kept.	1	2	3	4	5	6	7
1.31	My expectation of my employer to provide me with job security has been kept.	1	2	3	4	5	6	7
1.32	I am someone who is attentive.	1	2	3	4	5	6	7
1.33	I am someone who has an active imagination.	1	2	3	4	5	6	7
1.34	I would willingly share insights that I have learned from work with my co-workers.	1	2	3	4	5	6	7
1.35	I am someone who easily gets upset.	1	2	3	4	5	6	7
1.36	I am someone who can be moody.	1	2	3	4	5	6	7
1.37	I would share my expertise with co-workers if I knew it would improve my job security.	1	2	3	4	5	6	7
1.38	I would willingly share business knowledge with my co-workers.	1	2	3	4	5	6	7
1.39	I am someone who is a reliable worker.	1	2	3	4	5	6	7

	Statements relating to selected individual-related factors influencing knowledge-sharing intention	Strongly disagree	Disagree	Somewhat disagree	Neutral or no opinion	Somewhat agree	Agree	Strongly agree
1.40	My expectation of my employer to provide continuous training that will increase my work-related expertise has been kept.	1	2	3	4	5	6	7
1.41	I would share ideas with co-workers if I knew my colleagues would in turn share their expertise with me.	1	2	3	4	5	6	7
1.42	My expectation of my employer to reward me for work well done has been kept.	1	2	3	4	5	6	7
1.43	If I share my knowledge with co-workers it could help them in doing their jobs better.	1	2	3	4	5	6	7
1.44	My expectation of my employer to be trustworthy has been kept.	1	2	3	4	5	6	7
1.45	My expectation of my employer to provide a clear job description has been kept.	1	2	3	4	5	6	7
1.46	I would willingly share my work expertise with my co-workers.	1	2	3	4	5	6	7
1.47	I am someone who has a forgiving nature.	1	2	3	4	5	6	7
1.48	I am someone who is inventive.	1	2	3	4	5	6	7
1.49	I am someone who is helpful and unselfish with others.	1	2	3	4	5	6	7
1.50	I am someone who has an assertive personality.	1	2	3	4	5	6	7
1.51	I have the confidence to provide knowledge that co-workers might consider valuable.	1	2	3	4	5	6	7
1.52	My expectation of my employer to provide me with continued feedback on my performance has been kept.	1	2	3	4	5	6	7
1.53	I easily engage in conversation with others.	1	2	3	4	5	6	7
1.54	I am someone who is a deep thinker.	1	2	3	4	5	6	7
1.55	I would intentionally share my knowledge with my co-workers if they ask.	1	2	3	4	5	6	7
1.56	Sharing my knowledge is beneficial for the business.	1	2	3	4	5	6	7
1.57	I am someone who does things efficiently.	1	2	3	4	5	6	7

SECTION 2: FACTORS INFLUENCING KNOWLEDGE-SHARING INTENTION

Below are a number of statements relating to selected individual-related factors influencing knowledge-sharing intention. Please indicate the extent to which you agree with the following statements relating to the factors that influence knowledge-sharing intention by selecting one option for each statement. A (0) indicates “never”, (1) “rarely”, (2) “sometimes”, (3) “very often” and (4) “always”. Note that there are no correct or incorrect answers.

	Statements relating to selected individual-related factors influencing knowledge-sharing intention **How often….**	**Never**	**Rarely**	**Sometimes**	**Very often**	**Always**
2.1	do you experience friction from co-workers within the workplace?	0	1	2	3	4
2.2	are there arguments at work between yourself and co-workers?	0	1	2	3	4
2.3	is there conflict about the work you do in your work unit?	0	1	2	3	4
2.4	do you experience emotional conflict at work?	0	1	2	3	4
2.5	do you have a different opinion from your colleagues on how to complete a task/job in your work unit?	0	1	2	3	4
2.6	do you experience personality conflict at work?	0	1	2	3	4
2.7	do you have a different opinion from your colleagues concerning the content of a tasks/job being performed?	0	1	2	3	4
2.8	are colleagues rude to you at work?	0	1	2	3	4
2.9	are you involved in conflict about ideas related to a task/job in your work unit?	0	1	2	3	4
2.10	do you experience tension with other co-workers at work?	0	1	2	3	4

SECTION 3: DEMOGRAPHIC DETAILS

The following questions request demographic information about you. Please indicate your response by selecting the appropriate box. Note that there are no correct or incorrect answers.

3.1 Please indicate your age

18-24 Years		1
25-30 Years		2
31-40 Years		3
41-50 Years		4
51-60 Years		5
61-70 Years		6
Older than 70 years		7

3.2 Please indicate your gender

Male		1
Female		2

3.3 Please indicate your home language

Afrikaans		1
English		2
Xhosa		3
Zulu		4
Sotho		5
Other. Please specify below:		6

3.4 Please indicate your highest academic qualification

Grade 11 and lower		1
Grade 12 or equivalent qualification		2
Higher Certificate		3
Diploma		4
Bachelors degree		5

Honours degree		6
Masters degree/MBA or higher		7
Other. Please specify below:		8

3.5 Please indicate your ethnic background

White		1
Black		2
Asian		3
Coloured		4
Other. Please specify below:		5

3.6 Please indicate how many years you have worked in the organisation (round off to the nearest year, i.e. 2.5 years falls into the category as 3 years)

Less than a year		1
1-2 Years		2
3-5 Years		3
6-10 Years		4
11-15 Years		5
16-20 Years		6
More than 20 years		7

3.7 Please indicate how many years you have worked in your current position/role (round off to the nearest year, i.e. 2.5 years falls into the category as 3 years)

Less than a year		1
1-2 Years		2
3-5 Years		3
6-10 Years		4
11-15 Years		5
16-20 Years		6
More than 20 years		7

SECTION 4: RESEARCH FINDINGS AND LUCKY DRAW

If you would like the final research findings to be made available to you, or if you want to enter the lucky draw, please provide your details below and select the appropriate box:

Name and Surname: _____

Telephone number: _____

Email address: _____

I would like the the final research findings to be made available to me.	**Yes**	**No**
I want to enter the lucky draw.	**Yes**	**No**

Thank you for your time and cooperation!