

## **PROPOSED MEASUREMENT MODEL FOR UNDERSTANDING FACTORS INFLUENCING KNOWLEDGE SHARING**

**Mr Conrad van Greunen**

Department of Business Management,  
Nelson Mandela Metropolitan University  
Port Elizabeth  
E-mail: [conradvg@gmail.com](mailto:conradvg@gmail.com)

**Prof. Elmarie Venter**

Department of Business Management,  
Nelson Mandela Metropolitan University  
Port Elizabeth  
E-mail: [Elmarie.Venter@nmmu.ac.za](mailto:Elmarie.Venter@nmmu.ac.za)

### **Corresponding Author:**

Prof. Elmarie Venter  
Department of Business Management, Nelson Mandela Metropolitan University  
Po Box 77 000, NMMU South Campus,  
Port Elizabeth 6031, Republic of South Africa  
Telephone number: Tel: +27-41-5042204  
Fax number: Fax: +27-41-5044840  
E-mail address: [Elmarie.Venter@nmmu.ac.za](mailto:Elmarie.Venter@nmmu.ac.za)

### **ABSTRACT**

Research confirms that the factors that promote or discourage knowledge-sharing behaviour in businesses are poorly understood and that knowledge management systems fail due to the misunderstanding of, amongst others, 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 individuals' role in the knowledge-sharing process is critical as tacit knowledge resides within the individual and knowledge sharing starts with individuals. The objective of this paper is to propose a model and measurement of individual-related factors influencing knowledge-sharing intention of individuals 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 are also proposed, while seven demographic variables (age, gender, language, highest qualification, ethnic background, organisational tenure and job tenure of the respondent) are identified as potential influencing factors. Understanding and managing these factors could contribute to an increase in knowledge sharing among employees, and as a result, enhance the effectiveness and competitive advantage of knowledge-intensive businesses.

## INTRODUCTION

It has become generally accepted to refer to the global economy as a knowledge-based economy, since knowledge has increasingly become *the* resource, instead of *a* resource for wealth creation for individuals and businesses (Cheng, Ho and Lau, 2009: 313). In the implementation of knowledge management activities, knowledge sharing is recognised as the most important task (Ismail and Yusof, 2010: 1; Jiacheng, Lu and Francesco, 2010: 221; Abdullah, Hassim and Chik, 2009: 115) and vital in order to utilise core competencies and to achieve a sustained competitive advantage (Nordin, Daud and Osman, 2012: 696; Argote and Ingram, 2000: 155).

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 their 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 and Nor, 2011: 66-68).

Although knowledge sharing is important in all businesses, Swart and Kinnie (2003: 60) believe that it is especially crucial for knowledge-intensive businesses, if the business is 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 (Swart and Kinnie, 2003: 60). Well-educated, qualified employees constitute the major part of the workforce to create market value through the effective application of knowledge in its service provision to clients (Swart and 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.

## PROBLEM STATEMENT

As much as knowledge sharing is regarded as one of the most crucial factors in the effective management of knowledge in 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; Chow and Chan, 2008: 458-459; Bechina and Bommen, 2006: 110-113). Pilsmo (2010: 2) reports that, for a knowledge-intensive business, the most problematic and hardest aspect to overcome is the individual's survival instinct. Some individuals believe that giving away knowledge is ceding power (Pilsmo, 2010: 2).

Although many factors affecting knowledge-sharing behaviour have been reported in academic journals (e.g. Lin, 2007: 138), it is not possible to draw a comprehensive picture of factors affecting knowledge sharing as few studies have summarised and analysed their results systematically (Hung and Chuang, 2009: 1). A limited number of studies have been conducted that highlight the influence of individual perspectives on knowledge-sharing behaviour (Ismail and Yusof, 2010: 1-2; Samieh and Wahba, 2007: 1). Against this background, the primary objective of this research is to identify the individual-related factors influencing knowledge-sharing intention among employees in knowledge-intensive businesses, as well as to propose a measuring instrument measuring these factors. The identification of such variables, empirical testing and subsequently the understanding and management thereof, could contribute to an increase in knowledge sharing among employees, and as a result, enhance the effectiveness and competitive advantage of knowledge-intensive businesses.

## **LITERATURE REVIEW**

The dependent, independent and control variables of the study are discussed in the following sections.

### **DEPENDENT VARIABLE: KNOWLEDGE-SHARING INTENTION**

This study focuses on knowledge-sharing intention of individuals. It is believed that this approach would be appropriate to understand 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 confirmed by the Theory of Reasoned Action, 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 could the person's intention 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 (Chow and Chan, 2008: 459).

### **INDEPENDENT VARIABLES**

The following independent variables have been identified in the literature as 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.

#### **Individuals' awareness of the significance of knowledge sharing**

Cress, Barquero, Schwan and Hesse (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 (e.g. Nkuna, 2012: 23; Rahab, Sulistyandari and Sudjono, 2011: 118; Noor and Salim, 2011: 111) also point 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 (Alhalhouli, Hassan and Der, 2014: 926; Ali, 2012: 92; Isamail and Yusof, 2010: 8). Based on the anecdotal and empirical evidence presented above, the following hypothesis is formulated:

H<sup>1</sup>: There is a positive relationship between individuals' awareness and knowledge-sharing intention

#### **Individuals' intrinsic and extrinsic motivation to share knowledge**

Individuals' motivation to share knowledge consists of intrinsic and extrinsic motivation (Olatokun and Nwafor, 2012: 217). Intrinsic motivation refers to motivation to share knowledge that comes from inside an individual such as self-efficacy and enjoyment in helping others. There is widespread empirical evidence (Shaari, Rahman and Rajab, 2014: 41; Olatokun and Nwafor, 2012: 216; Kankanhalli, Tan and Wei, 2005: 113) of the positive relationship between intrinsic motivation and knowledge sharing. The following relationship is hypothesised:

H<sup>2a</sup>: There is a positive relationship between intrinsic motivation and knowledge-sharing intention

Extrinsic motivation refers to motivation to share knowledge that comes from outside an individual such as rewards, reputation, recognition, promotion, higher salary and job security. 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. In their empirical study, 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 confirm the views found in other empirical research (Chow, Deng and Ho, 2000: 90; Davenport and Prusak, 1998: 97) that extrinsic rewards (e.g. financial incentives and promotion) motivate individuals to share knowledge.

However, contrary to the anticipated positive effect of extrinsic rewards, some researchers' (Bock, Zmud, Kim and Lee, 2005: 88; Bock and Kim, 2002: 14) found that extrinsic rewards have a negative effect on attitudes towards knowledge sharing. A number of other studies (Olatokun and Nwafor, 2012: 216; Lin, 2007: 135; Chang, Yeh and Yeh, 2007: 276; Kwok and Gao, 2006: 45) showed no relationship between extrinsic motivation and knowledge-sharing intentions or attitudes toward knowledge sharing. Because of the mixed results 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<sup>2b</sup>: There is a positive relationship between extrinsic motivation and knowledge-sharing intention

### **Psychological contract breach**

Research does not always distinguish between specific psychological contracts, breaches, and their influence on knowledge sharing. 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 (Gupta, Agarwal, Samaria, Sarda and Bucha, 2012: 744).

Lin, Lin, Joe and Hung (2012: 5) put forward that a lack of psychological contract fulfilment (breach) in a workplace can result in a lack of collaboration and ultimately knowledge sharing effectiveness. Other anecdotal evidence (Rayton and Yalabik, 2014: 13; Unsel, Gleich and Russo, 2006: 10) also point toward a negative relationship between psychological contract breach and knowledge sharing.

Bal, Chiaburu and Diaz (2011: 736), in their empirical study on psychological contract breach 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 and found that psychological contract breach did not have a significant influence on knowledge-sharing behaviour (Gupta *et al.*, 2012: 737). The limited empirical findings call for further research into the relationship between psychological contract breach and knowledge sharing. Therefore, the following relationships are hypothesised:

H<sup>3a</sup>: There is a negative relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>3b</sup>: There is a negative relationship between relational psychological contract breach and knowledge-sharing intention

### **Relationship and task conflict**

There are generally two types of conflict, namely relationship and task conflict. Relationship conflict refers to incompatible interpersonal relationships, tension and friction, while task conflict occurs when there are disagreement over how to complete a task (Lu, Zhou and Leung, 2011: 132). With specific reference to the relationship between relationship conflict and knowledge sharing, Chen, Zang and Vogel (2011: 1005) empirically explored the underlying processes between conflict and knowledge sharing. These authors confirmed that relationship conflict has a negative, indirect effect on knowledge sharing. This view is shared by a number of other researchers (Gu and Wang, 2013: 84; Lu *et al.*, 2011: 139; Chen, 2011: 1387; Hewitt, 2008: 157; Shih, Farn and Ho, 2008: 6). In light of the anecdotal and empirical evidence presented above, the following relationship is hypothesised:

H<sup>4a</sup>: 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. 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) put forward 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. Apart from the moderating effect of extrinsic benefits (e.g. 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. Based on the evidence presented above, the following hypotheses are formulated:

H<sup>4b</sup>: Individuals' extrinsic motivation moderates the relationship between relationship conflict and knowledge-sharing intention

H<sup>4c</sup>: Individuals' intrinsic motivation moderates the relationship between relationship conflict and knowledge-sharing intention

Concerning task conflict, the potential benefit of this type of 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. Besides the anecdotal evidence, various empirical results (Lu *et al.*, 2011: 144; Van Woerkom and Sanders, 2010: 146; De Dreu, 2006: 90) also reveal the positive influence of task conflict on knowledge sharing. The following relationship is consequently hypothesised:

H<sup>4d</sup>: There is a positive relationship between task conflict and knowledge-sharing intention

### **Personality traits**

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 (Wei, 2014: 14). These personality traits have become a robust

taxonomy of personality, and may shed valuable light on knowledge sharing.

Because extroverts are likely to be emotionally positive and content when working with teams, they are likely to share knowledge among group members (Teh, Yong, Chong and Yew, 2011: 49). Hutasuhut's (2007: 3) empirical findings showed that extraversion is positively related to attitude towards knowledge sharing. In general, empirical findings (Teh *et al.*, 2011: 47; Amayah, 2011: 3; Wang, Noe and Wang, 2011: 17; Wei, 2010: 33; De Vries, Van den Hooff and De Ridder, 2006: 124) reveal a positive relationship between extraversion and knowledge sharing. In light of the discussion above, the following relationship is hypothesised:

H<sup>5a</sup>: There is a positive relationship between extraversion and knowledge-sharing intention

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 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, Raja, Johns and Bilgrami (2011: 403) successfully hypothesised that when the detected breach of psychological contract arouses feelings of violation among extroverted 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). As such, given the evidence presented above, the following relationships are hypothesised:

H<sup>5b</sup>: Extraversion moderates the relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>5c</sup>: Extraversion moderates the relationship between relational psychological contract breach and knowledge-sharing intention

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, 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 link between neuroticism and knowledge-sharing intention. Based on the discussion presented above, the following hypothesis is formulated:

H<sup>6a</sup>: There is a negative relationship between neuroticism and knowledge-sharing intention

Concerning the moderating influence of neuroticism, Wang *et al.*'s (2011: 21) findings suggest (consistent with Bordia, Irmer and Abusah, 2006: 262) that management exercises that provide both evaluation and incentives for knowledge sharing could help overcome the negative influence of evaluation apprehension. 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<sup>6b</sup>: Neuroticism moderates the relationship between extrinsic motivation and knowledge-sharing intention

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. Therefore, the following hypothesis is formulated:

H<sup>6c</sup>: Neuroticism moderates the relationship between intrinsic motivation and knowledge-sharing intention

Lepoiev's (2011: 32) findings revealed 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 and Bruning, 2008: 691; Raja, Johns and Ntalianis, 2004: 351) indicates 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), also found that individuals who are high in neuroticism tend to experience more negative emotions after a psychological contract breach. Consequently, in this research, it would be expected that individuals high in neuroticism would have a stronger negative reaction to psychological contract breach than less neurotic individuals. Therefore, the following relationships are hypothesised:

H<sup>6d</sup>: Neuroticism moderates the relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>6e</sup>: Neuroticism moderates the relationship between relational psychological contract breach and knowledge-sharing intention

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 and Wang, 2012: 355; Wei, 2010: 19). According to Hutashut's (2007: 3) empirical findings, openness to experience is positively related to attitude towards knowledge sharing. Amayah (2011: 3) also note that openness to experience has consistently been shown to have a positive relationship with knowledge-sharing intention. Generally, empirical findings (Wang and Yang, 2007: 1431; Cabrera, Collins and Salgado, 2006: 260) reveal a positive influence of openness to experience on knowledge sharing. From the evidence presented, the following hypothesis is formulated:

H<sup>7a</sup>: 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. It is likely 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. 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<sup>7b</sup>: Openness to experience moderates the relationship between extrinsic motivation and knowledge-sharing intention

Raja *et al.* (2011: 404) 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 (e.g. 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). The limited research history 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<sup>7c</sup>: Openness to experience moderates the relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>7d</sup>: Openness to experience moderates the relationship between relational psychological contract breach and knowledge-sharing intention

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, Hutasuht (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. Overall, empirical studies show that agreeableness is likely to have a positive relationship with knowledge sharing (Amayah, 2011: 3; Matzler, Renzl, Muller, Herting and Mooradian, 2008: 309; Wang and Yang, 2007: 1431) and the following hypothesis is therefore formulated:

H<sup>8a</sup>: There is a positive relationship between agreeableness and knowledge-sharing intention

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 less 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 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 following a breach compared to 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 stronger to perceived psychological contract breach than agreeable employees. Considering the discussion above, the following hypotheses are formulated:

H<sup>8b</sup>: Agreeableness moderates the relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>8c</sup>: Agreeableness moderates the relationship between relational psychological contract breach and knowledge-sharing intention



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 and Azma, 2014: 82). In fact, there is ample anecdotal and empirical evidence (Matzler *et al.*, 2008: 309; Gupta, 2008:147; Hutasuht, 2007: 3; Wang and Yang, 2007: 1434) that conscientious individuals are likely to share knowledge. The following relationship is therefore hypothesised:

H<sup>9a</sup>: 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 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 employees high in conscientiousness. Rewards are probably not as effective for conscientious individuals because these people are dutiful and less affected by external incentives (Fong and Tosi, 2007: 172). The following hypothesis is subsequently formulated:

H<sup>9b</sup>: 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, Cortina and Dudley (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, low-conscientious employees react stronger to a breach of psychological contract than high-conscientious employees. Raja *et al.* (2004: 362) also found that 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<sup>9c</sup>: Conscientiousness moderates the relationship between transactional psychological contract breach and knowledge-sharing intention

H<sup>9d</sup>: Conscientiousness moderates the relationship between relational psychological contract breach and knowledge-sharing intention

## **CONTROL VARIABLES: DEMOGRAPHIC VARIABLES**

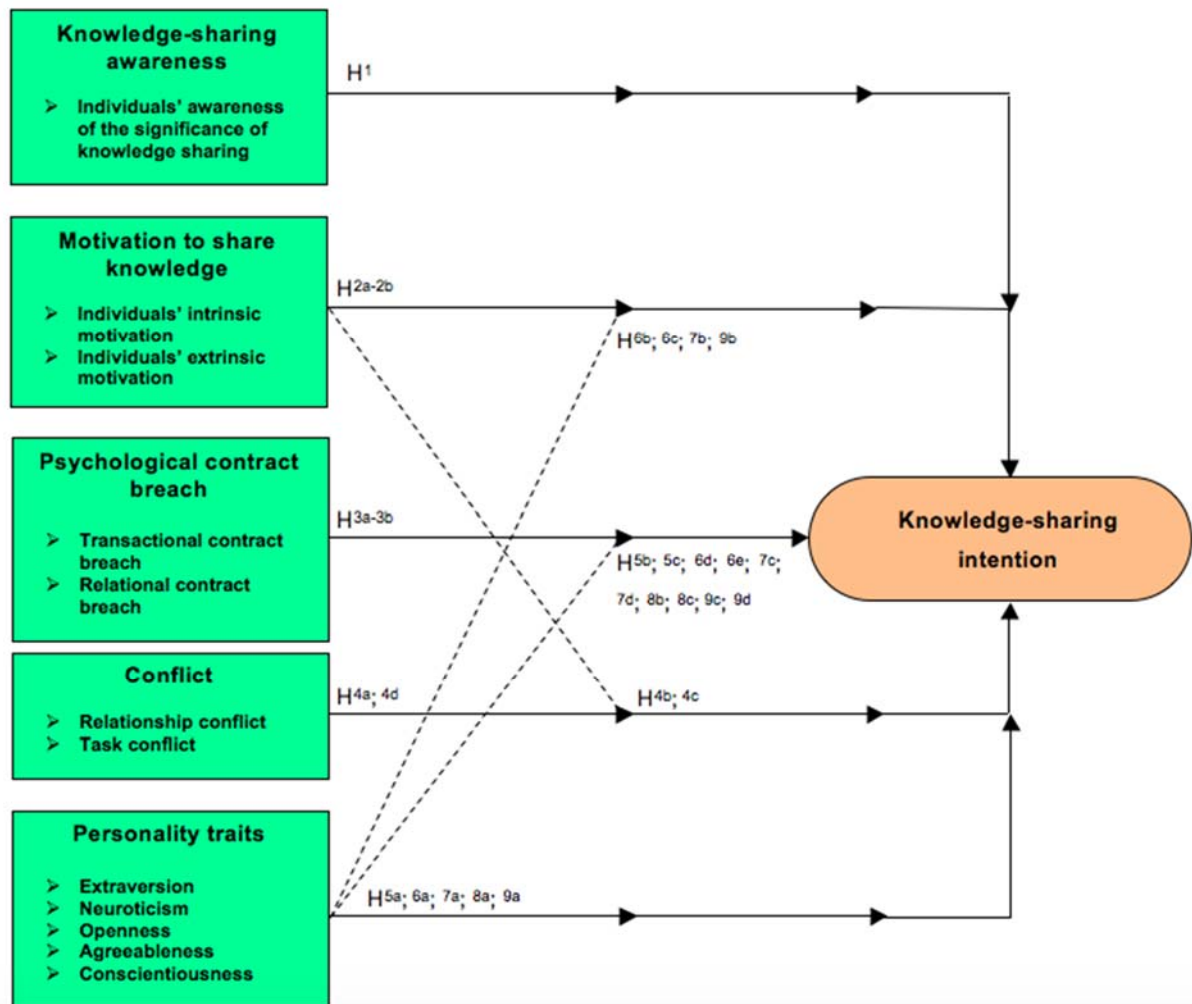
In this study, demographic variables refer to characteristics of employees such as their gender, tenure, education, age, race, and language, which have been found to influence knowledge-sharing among individuals (Nagamani and Katyayani, 2013: 121; Amin and Shahid, 2013: 38; Keyes, 2008: 46; Bordia *et al.*, 2006: 276; Lin, 2006: 236; Bakker, Leenders, Gabbay, Kratzer and Van Engelen, 2006: 602). These demographic variables are consequently used as a control variable for this study and the following hypothesis is formulated:

H<sup>10</sup>: There is a relationship between selected demographic variables and knowledge-sharing intention

## PROPOSED HYPOTHESISED MODEL

Based on an extensive analysis of literature, a hypothesised model of individual-related factors influencing knowledge-sharing intention is proposed in Figure 1.

**FIGURE 1**  
**PROPOSED HYPOTHESISED MODEL OF FACTORS INFLUENCING KNOWLEDGE-SHARING INTENTION**



In Figure 1 the independent variables consist of 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 influences the dependent variable, namely knowledge-sharing intention.

## RESEARCH DESIGN

In the present study, the population includes 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 is not available. As such, a convenience sampling technique will be used and respondents working in knowledge intensive businesses who are available and willing to participate in the research will constitute the sample in the present study.

A measuring instrument in the form of a questionnaire will be compiled to assess the dependent and independent variables. Each construct identified in the literature survey was defined and operationalised. Operationalisation was done by using reliable and valid items sourced from existing measuring instruments used in previous studies, as well as a few self-generated items based on the literature study. The items in the questionnaire are presented to respondents using a Likert-type scale. An electronic link to the final questionnaire will be e-mailed to respondents identified via the convenience sampling technique. For each of the variables 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 1.

**TABLE 1**  
**OPERATIONALISATION OF THE DEPENDENT AND INDEPENDENT VARIABLES**

<b>Dependent variable</b>	<b>Operationalisation of dependent variable</b>	<b>Sample items</b>	<b>Sources</b>	<b>Number of items</b>
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, 2007; Chennamaneni, 2006; Lee, 2001	6
<b>Independent variables</b>	<b>Operationalisation of independent variables</b>	<b>Sample items</b>	<b>Sources</b>	<b>Number of items</b>
Individuals' awareness	Refers to the ability of individuals to realise the importance, benefits 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 <i>et al.</i> , 2011; Cress <i>et al.</i> , 2007; Van den Hooff and Van Weenen, 2004)	5
Intrinsic motivation	Refers to the intrinsic (e.g. enjoyment in helping others, satisfaction and self-efficacy) benefits 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 <i>et al.</i> 2005	5

Independent variables	Operationalisation of independent variables	Sample items	Sources	Number of items
Extrinsic motivation	Refers to the intrinsic (e.g. enjoyment in helping others, satisfaction and self-efficacy) benefits 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, Makela and Rabbiosi, 2012; Olatokun and Nwafor, 2012; Lin, 2007; Kankanhalli <i>et al.</i> 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 (e.g. career development, job security etc.) 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 training that will increase my work-related expertise has been kept	Self-generated items (Rayton and Yalabik, 2014; Knoppe, 2012)	7
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

Independent variables	Operationalisation of independent variables	Sample items	Sources	Number of items
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 (Big Five Inventory) personality assessment - John, Donahue and Kentle, 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, tension and anxiety	I am someone who gets nervous easily I am someone who can be tense	BFI (Big Five Inventory) personality assessment – John <i>et al.</i> 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 (Big Five Inventory) personality assessment – John <i>et al.</i> 1991	5
Agreeableness	Refers to the extent to which an individual is cooperative, considerate, courteous, 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 (Big Five Inventory) personality assessment – John <i>et al.</i> 1991	5
Conscientiousness	Refers to the tendency of an individual to be attentive, reliable, efficient and to persevere and follow through with plans	I am someone who perseveres until the job is finished I am someone who does things efficiently	BFI (Big Five Inventory) personality assessment – John <i>et al.</i> 1991	5

## CONTRIBUTION

Knowledge sharing among individuals in knowledge-intensive businesses is crucial if the business is to gain the most from their intellectual capital as well as to compete effectively. It has also been established that most employees are reluctant to share knowledge. In this study, the factors influencing individuals' willingness to share knowledge were identified, after which a hypothesised model of individual-related factors influencing the knowledge-sharing intention among individuals in knowledge-intensive businesses was proposed. Identifying and empirically testing the proposed model will firstly contribute to the body of knowledge-sharing literature. Therefore, various gaps in the current literature on knowledge management in general, and knowledge sharing in particular will be addressed as highlighted in this research. Secondly, from an institution's perspective, the understanding and management of the factors influencing knowledge-sharing intention could enhance knowledge-intensive businesses' competitive advantage and effectiveness. More specifically, knowledge sharing between employees could result in new business ideas and opportunities, development of organisational learning, enhanced business effectiveness and productivity, improved work quality and problem solving.

## REFERENCES

- Abdullah, H.S. Hassim, A.A. and Chik, R. 2009. Knowledge sharing in a knowledge intensive organisation: Identifying the enablers. *International Journal of Business Management*, 4(4): 115-123.
- Alhalhouli, Z.T. Hassan, Z.B. and 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, M.R.M. 2012. *Determinants of Knowledge Sharing in Professional Services*. Masters dissertation. University of Gaza, Gaza City.
- 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. and 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.
- Argote, L. and Ingram, P. 2000. Knowledge transfer: A basis for competitive advantage in firms. *Organisational Behaviour and Human Decision Processes*, 82(1): 150-169.
- Bakker, M. Leenders, R.T.A.J. Gabbay, S.M. Kratzer, J. and 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. and Diaz, I. 2011. Does psychological contract breach decrease proactive behaviours? The moderating effect of emotion regulation. *Group and Organisation Management*, 36(6): 722-758.
- Bechina, A.A. and Bommen, T. 2006. Knowledge sharing practices: Analysis of a global Scandinavian consulting company. *The Electronic Journal of Knowledge Management*, 4(2): 109-116.
- Berger, J.R. 2009. *Employee Reactions to Psychological Contract Breach: The Influence of Personality*. Masters thesis. University of Amsterdam, Netherlands.
- Bock, G.W. and 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. and 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. and 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.
- Cabrera, A. Collins, W.C. and Salgado, J.F. 2006. Determinants of individual engagement in knowledge sharing. *International Journal of Human Resource Management*, 17(2): 245-264.
- Chang, T.J. Yeh, S.P. and 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. and Vraimaki, E. 2009. Knowledge-sharing behaviour of bank employees in Greece. *Business Process Management Journal*, 15(2): 245-266.
- 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. and Vogel, D. 2011. Exploring the underlying processes between conflict and knowledge sharing: A work-engagement perspective. *Journal of Applied Social Psychology*, 41: 1005-1033.
- Cheng, M. Ho, J.S. and 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.
- Chow, C.W. Deng, F.J. and 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, W.S. and Chan, L.S. 2008. Social network, social trust and shared goals in organisational knowledge. *Information and Management*, 45: 458-465.
- Hung, Y.C. and Chuang, Y.H. 2009. Factors Affecting Knowledge Sharing Behaviour: A Content Analysis of Empirical Findings. *International Conference of Pacific Rim Management*, San Francisco, USA.
- 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.
- Cress, U. Barquero, B. Schwan, S. and 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.
- Davenport, T.H. and Prusak, L. 1998. *Working knowledge: How organisations manage what they know*. Boston, MA: Harvard Business School Press.
- 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 Vries, R.E. Van den Hooff, B. and 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.
- 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.
- 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.
- Fong, E.A. and Tosi, H.L. 2007. Effort, performance, and conscientiousness: An agency theory perspective. *Journal of Management*, 33: 161-179.
- Gharanjik, E. and 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.
- Gu, L. and Wang, J. 2013. How conflicts may impact intentions to share knowledge in a virtual team. *Issues in Information Systems*, 14(2): 79-86.
- 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. and Bucha, R. 2012. Organisational commitment and psychological contract in knowledge sharing behaviour. *The Indian Journal of Industrial Relations*, 47(4): 737-749.
- 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.
- Ho, V.T. Weingart, L.R and Rousseau, D.M. 2004. Responses to broken promises: Does personality matter? *Journal of Vocational Behaviour*, 65(2): 276-293.
- Hutasuhut, I.J. 2007. *Personal Characteristics and Attitude toward Knowledge Sharing*. Masters dissertation. University of Malaysia, Sarawak.
- Huttermann, H. and 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.
- Ismail, M.B. and Yusof, Z.M. 2010. The impact of individual factors on knowledge sharing quality. *Journal of Organisational Knowledge Management*, 10: 1-13.
- 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. and Francesco, 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. and Kentle, R.L. 1991. *The Big Five Inventory-Versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- Kankanhalli, A. Tan, B.C.Y. and Wei, K.K. 2005. Contributing knowledge to electronic knowledge repositories: An empirical investigation. *MIS Quarterly*, 29(1): 113-143.
- 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].
- Kim, S. and Lee, H. 2006. The impact of organisational context and information technology on employee knowledge-sharing capabilities. *Public Administration Review*, 66(3): 370-385.
- Knoppe, M. 2012. *The Psychological Contracts of Temporary Employees*. Masters thesis. University of Amsterdam, Netherlands.
- Kwok, S.H. and Gao, S. 2006. Attitude towards knowledge sharing behaviour. *The Journal of Computer Information Systems*, 46(2): 45-51.
- Lee, J. 2001. The impact of knowledge sharing, organisational capability and partnership quality on IS outsourcing success. *Information and Management*, 38(5): 323-335.
- 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.
- Lin, C.P. 2006. Gender differs: Modelling knowledge sharing form a perspective of social network ties. *Asian Journal of Social Psychology*, 9: 236-241.
- Lin, H.F. 2007. Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2): 135-149.
- Lin, H.H. and 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, W.K. Lin, C.P. Joe, S.W. and Hung, W.T. 2012. Modeling Knowledge Sharing Effectiveness and Psychological Contract. *The 2<sup>nd</sup> International Conference on Business and Banking (ICBB)*, Denpasar, Bali.
- Lu, F. Zhou, F. and Leung, K. 2011. Effects of task and relationship conflicts on individual work behaviours. *International Journal of Conflict Management*, 22(2): 131-150.
- Matzler, K. Renzl, B. Muller, J. Herting, S. and Mooradian, T. 2008. Personality traits and knowledge sharing. *Journal of Economic Psychology*, 29: 301-313.
- Minbaeva, D. Makela, K. and Rabbiosi, L. 2012. Linking HRM and knowledge transfer via individual-level mechanisms. *Human Resource Management*, 51(3): 387-405.
- Nagamani, G. and J. 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.
- Nkuna, S. 2012. *Effective Knowledge Sharing Within Communities of Practice in a Financial Institution*. Masters dissertation. University of Johannesburg, Johannesburg, South Africa.
- Noor, N.M. and 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. and 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.
- Okyere-Kwakye, E. and Nor, K.M. 2011. Individual factors and knowledge sharing. *American Journal of Economics and Business Administration*, 3(1): 66-72.
- Olatokun, W. and 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.
- Orvis, K.A. Cortina, J.M. and Dudley, N.M. 2008. Conscientiousness and reactions to psychological contract breach: A longitudinal field study. *Journal of Applied Psychology*, 93(5): 1183-1193.
- 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.
- Pilsmo, G. 2010. *Knowledge Management in Projects - A Study of Small Consulting Firms*. Bachelor thesis. Lulea University of Technology, Sweden.
- Posthuma, R.A. 2011. Conflict management and performance outcomes. *International Journal of Conflict Management*, 22(2): 108-110.
- Rahab, Sulistyandari and 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. and 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. and Ntalianis, F. 2004. The impact of personality on psychological contracts. *Academy of Management Journal*, 47(3): 350-367.
- Rayton, B.A. and Yalabik, Z.Y. 2014. Work engagement, psychological contract breach and job satisfaction. *The International Journal of Human Resource Management*, 25(17): 2382-2400.
- Riege, A. 2005. Three-dozen knowledge-sharing barriers managers must consider. *Journal of Knowledge Management*, 9(3): 18-35.

- 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.
- Samieh, H.M. and Wahba, K. 2007. Knowledge Sharing Behaviour from Game Theory and Socio Psychological Perspectives. *Proceedings of the 40<sup>th</sup> International Conference on System Sciences*, Hawaii.
- Shaari, R. Rahman, S.A.A. and Rajab, A. 2014. Self-efficacy as a determined factor for knowledge sharing awareness. *International Journal of Trade, Economics and Finance*, 5(1): 39-42.
- Shih, J.C.W. Farn, C.K. and Ho, C.Y. 2008. Conflict is not bad: Interpersonal conflict and knowledge sharing. *Journal of Global Business Management*, 4(1): 1-8.
- Spector, P.E. and 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.
- Swart, J. and Kinnie, N. 2003. Sharing knowledge in knowledge-intensive firms. *Human Resource Management Journal*, 13(2): 60-75.
- Tallman, R.R.J. and Bruning, N.S. 2008. Relating employees' psychological contracts to their personality. *Journal of Managerial Psychology*, 23(6): 688-712.
- Teh, P.L. Yong, C.C. Chong, C.W. and 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.
- Unsel, A.C. Gleich, R. and Russo, P. 2006. The Impact of Broken Psychological Contracts on Knowledge Sharing and the Role of Communities of Practice as Mediators. *3<sup>rd</sup> International Workshop on Trust within and between Organisations*, Amsterdam.
- Van den Hooff, B. and Van Weenen, F. 2004. Committed to share: Commitment and CMC use as antecedens of knowledge sharing. *Knowledge and Process Management*, 11(1): 13-24.
- Van Woerkom, M. and 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.
- Wang, C.C. and Yang, Y.J. 2007. Personality and intention to share knowledge: An empirical study of scientists in a RandD laboratory. *Social Behaviour and Personality*, 35(10): 1427-1436.
- Wang, S. and 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. and Wang, Z.M. 2011. Motivating knowledge sharing in knowledge management systems: A quasi-field experiment. *Journal of Management*, 37(4): 1-32.
- Wei, C. 2010. *Effect of Personality Traits on Knowledge Sharing Under Extrinsic Rewards System*. Masters thesis. University of Amsterdam, Netherlands.
- Yoo, K.H. and Gretzel, U. 2011. Influence of personality on travel-related consumer-generated media creation. *Computers in Human Behaviour*, 27(2): 609-621.