An investigation of the impact of extrinsic and intrinsic motivators on organisational knowledge sharing

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CONTENTS

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ABSTRACT

A major challenge for knowledge management concerns motivating people to share their knowledge with others. Many companies address this challenge by implementing sophisticated knowledge management systems. However, despite investments in knowledge management systems and practices, significant failure rates are being reported. Studies show that an important reason for this is that people are often reluctant to share their personal knowledge. It is therefore key for companies to understand the factors that influence employee attitudes toward knowledge sharing. Previous research on motivation has attempted to understand employee attitudes, intentions and behavior in relation to organizational knowledge sharing. However, few studies have provided a comprehensive model that includes a key set of extrinsic and intrinsic motivators for knowledge sharing, such as self-efficacy, meaningfulness, impact, tangible rewards, verbal rewards, anticipated reciprocal benefits and reputation and examined their relationship with knowledge sharing attitude and intention. The objective of this research is to fill that gap by investigating how the salient intrinsic and extrinsic motivators influence knowledge sharing attitude and intention. From an extensive review of the literature, a research model was proposed and hypotheses were developed to explore the answers to the research questions. Data was collected through a survey in organizations in New Zealand and Partial Least Squares Path Modeling was used to analyze the data. Empirical results showed intention to share knowledge was determined by attitude towards knowledge sharing and self-efficacy, meaningfulness, anticipated reciprocal relationships and reputation had a significant impact on the attitude towards knowledge sharing. This research contributes to the knowledge sharing literature by providing a comprehensive model of knowledge sharing motivators, including motivators that have been largely ignored in prior studies, and by empirically examining the influence of the key intrinsic and extrinsic motivators on attitude towards knowledge sharing. Furthermore, this research benefits companies that are using or setting up knowledge management systems and practices by allowing them to better understand how to encourage employees to engage in knowledge sharing.

1.INTRODUCTION

This study is carried out to investigate extrinsic and intrinsic motivators for knowledge sharing. The introduction starts with a section that outlines the background of the study and the underlying motivations for this research. Then, the aims of this study and the research questions are presented. The last part outlines the organisation of the thesis.

1.1BACKGROUND

In the current business environment, knowledge is considered to be one of the most important strategic assets for organisations (Gagné, 2009; Ipe, 2003). The success of businesses depends heavily on their intellectual capital. Knowledge assets are difficult to imitate and socially complex (Alavi and Leidner, 2001), which provides companies with a competitive edge in a highly global, fast paced business environment. Companies that are able to leverage the knowledge held by employees, are able to be more innovative, efficient and effective (Levin and Cross, 2004).

With the increasing recognition of the importance of organisational knowledge, knowledge management has become an important discipline for organisations. Companies are making substantial investments in knowledge management systems and practices to be able to tap into the knowledge held by individual members of the organisation and move it to the group and organisational level (Cabrera and Cabrera, 2005; Ipe, 2003). In 2000, KPMG did a large industry survey on the status of knowledge management . At that time, already 62% of leading organisations in Europe and the United States of America reported they were using a knowledge management system or that they were in the process of setting it up (KPMG, 2000).

For knowledge management to be effective, individual knowledge has to be shared with other members of the organisations(Davenport and Prusak, 1998). It is ultimately the experience and expertise of people that can create value for organisations and this knowledge is personal. Whether knowledge sharing occurs or not, ultimately depends on

the willingness of people to share their personal knowledge. Despite efforts to facilitate organisational knowledge flows, it has been difficult for organisations to raise the level of knowledge sharing (Chennamaneni et al., 2012). Knowledge hoarding behaviours have been reported to cause the biggest problem for effective knowledge management initiatives(Sveiby and Simons, 2002). Employees are often reluctant to share their knowledge because they feel their personal knowledge secures their position in the workplace. When they share that knowledge, they may have a fear of becoming redundant (Gagné, 2009; Huber, 2001). Therefore, a big challenge for knowledge management is trying to encourage organisational knowledge sharing.

Many studies have focused on factors that encourage organisation knowledge sharing such as culture, perceived usefulness and motivation (Bock et al., 2005; Chennamaneni et al., 2012; Müller et al., 2005). Among these, motivation has been emphasized as critical in explaining individual behaviour, including knowledge sharing behaviour (Bock and Kim, 2002). As highlighted in a study by Davenport et al., (1998), a change in motivational practices is one of the key factors that may help a company build effective knowledge management projects. Prior research on organisational knowledge sharing has also emphasized that understanding motivation is critical for our understanding of employee attitudes towards organisational knowledge sharing and to address the problem of knowledge hoarding (Bock et al., 2005; Lin, 2007; Welschen et al., 2012).

The majority of researchers view motivation as a two-dimensional construct with one dimension being intrinsic motivation and the other extrinsic motivation. People that are extrinsically motivated are driven by the expectation they will receive external outcomes associated with their behaviour such as financial rewards (Ryan and Deci, 2000b). On the other hand, intrinsically motivated individuals are driven for behaviour by factors intrinsic to the behaviour itself, for example because they value the behaviour (Ryan and Deci, 2000b). Both intrinsic motivators, for example perceptions of self-efficacy, and extrinsic motivators such as rewards and reputation have been investigated in prior research in relation to organisational knowledge sharing (Chennamaneni et al., 2012; Bock et al., 2005; Lin, 2007). For example, Chennamaneni et al. (2012) examined how organisational rewards, reciprocal benefits and reputation influenced employee attitudes towards knowledge sharing. And Lin (2007) investigated the effect of several motivators including organisational rewards and self-efficacy on the attitude towards knowledge sharing.

By acknowledging the importance of organisational knowledge sharing for effective knowledge management, it is necessary to understand how individuals' attitudes towards

knowledge sharing are influenced. Although motivation has been identified as an important factor affecting knowledge sharing attitudes, prior research with a focus on motivators for knowledge sharing has been fragmented. Some studies have focused only on extrinsic motivators (Bock et al., 2005), and other studies on intrinsic motivators (Welschen et al., 2012). Furthermore, many studies examined a different set of intrinsic and extrinsic motivators. Moreover, some motivators have been largely omitted from organisational knowledge sharing research. In addition, the investigated motivators are often included in a larger model with other factors as well (Chennamaneni, 2012). What is missing is a cohesive, comprehensive model of the key extrinsic and intrinsic motivators in the context of knowledge sharing in order to get a comprehensive understanding of their relative importance. Furthermore, there is inconsistency in the reported results, which highlights the need for further investigation.

1.2 Research Aim and Questions

The above discussion highlights the need to conduct a study to address the gaps in existing knowledge sharing research. The aim of this study is:

- To identify the key extrinsic and intrinsic motivators that impact employee knowledge sharing attitudes based on an extensive review of the literature and examine their influence on employee knowledge sharing attitude and intention.

Based on this aim, the main research question is:

- How do extrinsic and intrinsic motivators influence knowledge sharing attitude and intention?

In order to answer this question, the following questions need to be answered:

- What are the key intrinsic and extrinsic motivators as identified by the literature?
- What is the impact of these motivators on the attitude towards knowledge sharing and intention to share knowledge?

1.3 ORGANISATION OF THE THESIS

The thesis is divided into six chapters. Each chapter will be outlined below.

Chapter 1: Introduction

The first chapter outlines the scope of this research. It presents the background of this research and highlights the importance of knowledge and knowledge management for organisations. Then, the general problem with knowledge sharing will be described and the underlying motivation for this study is provided. A short discussion of prior research follows which highlights the gaps in the current literature. The aim and research questions are presented.

Chapter 2: Literature Review

This chapter presents an extensive review of previous theories and empirical research related to motivation and organisational knowledge sharing. First, organisational knowledge sharing and motivation dimensions and their relationships including the theoretical foundation for this research are discussed. Then, a review of existing literature on the main extrinsic and intrinsic motivators is presented, followed by a summary of the gaps in the literature. Based on the literature review, a research model is proposed and the related hypotheses are discussed.

Chapter 3: Research Methodology

The third chapter outlines the research methods and techniques that are used for the data analysis. The chapter first discusses the research approach and research design and procedure including data collection procedure and the development of the instrument. Following that the data analysis techniques for this quantitative study are explained.

Chapter 4: Data Analysis Results

Chapter 4 presents the data analysis and the empirical results. The demographics of the sample are presented first. Then, the measurement model is evaluated including validity and reliability analysis of the instrument. Subsequently, results from the structural model analysis are discussed and the hypotheses are examined.

Chapter 5: Discussion

This chapter presents a discussion of the findings of the research based on the results of the data analysis.

Chapter 6: Conclusion

In this final chapter, the research contributions are presented, followed by the research implications for practice. Then, the limitations of this research are discussed and a number of important directions for future research are outlined.

2 LITERATURE REVIEW

The first chapter introduces knowledge management and highlights some of the important issues and concepts surrounding this topic. This chapter will review the current literature on knowledge sharing and motivation in organisations. It begins with a definition of knowledge sharing and motivation. Prior research on dimensions of motivation and motivators is critically reviewed with the aim of presenting the gaps in the literature. The research model and hypotheses are developed.

2.1 KNOWLEDGE SHARING IN ORGANISATIONS

2.1.1 KNOWLEDGE SHARING DEFINITION

In the context of this study, knowledge sharing is considered in the field of organisational knowledge management. It has been measured as a behaviour, typically individuals sharing their work related knowledge with others (Bock et al., 2005). Some studies adopt the view that knowledge sharing is a two-sided act based on a sender-receiver relationship. This includes both transferring knowledge to others as well as receiving knowledge from others (Cabrera et al., 2006; Foss et al., 2009). Here, knowledge sharing is a dual process in which senders and receivers exchange knowledge via for example conversations, mentoring, online forums and databases (Goh, 2002, p.27; Bosua and Scheepers, 2007). For example, Cabrera et al. (2006) examined psychological, organisational and system-related variables as determinants of knowledge sharing. Knowledge sharing included measures on both seeking and providing knowledge.

Researchers have recognised that knowledge senders might be influenced by different factors than knowledge receivers (Cabrera et al., 2006; Foss et al., 2009; Bock et al., 2006). For example, Foss et al. (2009) investigate a model which shows the impact of job design

on different types of motivation, as well as the influence of these motivation types on receiving and sending knowledge. They find that sending and receiving knowledge are influenced differently. This recognition has caused many researchers to make a distinction and investigate knowledge sending and knowledge receiving separately. While there are studies that focus solely on knowledge seeking (Bock et al., 2006), most studies investigate knowledge sending (Bock et al., 2005; Kankanhalli et al., 2005; Lin, 2007). A possible explanation for the attention knowledge sending has received in the literature, may be that the problems with knowledge sending have been identified as a key obstacle to knowledge management. One of these problems has been identified by managers to be knowledge hoarding (Sveiby and Simons, 2002, p. 421). Employees see their unique knowledge as a powerful asset that gives them competitive advantage in the job market and secures their positions within the organisation (Lee and Ahn, 2007). Through knowledge sharing, they may give up some of that power. This may inhibit employees to provide knowledge to others within the organisation. In turn, this could lead to hoarding behaviours such as being evasive; playing dumb or engage in "rationalised hiding" e.g. saying a report is confidential (HRMGuide, 2012).

The scope of this study is to investigate factors that influence employees to provide knowledge to the organisation. Most studies that investigate knowledge sending refer to this as knowledge sharing. Following this, knowledge sharing is defined in this study as a one-sided act, which involves individuals providing their work-related knowledge to others within the organisation.

2.1.2 KNOWLEDGE DEFINITION

Before continuing, it is important to discuss what knowledge is. Van der Spek and Spijkervet (1997, p.36) define knowledge as: " the whole set of insights, experiences and procedures which are considered correct and true and which, therefore, guide the thoughts, behaviours and communication of people". This definition captures the main characteristics of knowledge: Knowledge is personal, context specific and it enables people to perform tasks (Bartol and Srivastava, 2002). Polanyi (1967) made the distinction between tacit and explicit knowledge. Explicit knowledge is knowledge that is easy to formulate and capture (Nonaka, 1994). It can be separated from the knower and stored in a codified form, such as manuals, procedures and other files. Information technology is often used for capturing and storing explicit knowledge (Stenmark, 2001). Tacit knowledge on the other hand, is personal knowledge that is difficult to formulate and to communicate and it is transferred over longer periods of time. Polanyi (1967) explained

tacit knowledge with the phrase: “we know more than we can tell”. This knowledge stems from personal experiences and it is rooted in “personal beliefs, attitude and values” (Polanyi, 1967).

2.1.3 THE IMPORTANCE OF ORGANISATIONAL KNOWLEDGE SHARING

The topic of organisational knowledge sharing has gained much attention in recent years as companies regard knowledge as their primary source of competitive advantage. In the current business environment, knowledge based resources are key to providing organisations with long-term sustainability and success, because they are difficult to imitate and socially complex (Alavi and Leidner, 2001; Gagné, 2009; Ipe, 2003). Organisations are likely to be more innovative, efficient and effective in the marketplace if they can manage their collective expertise and knowledge effectively (Levin and Cross, 2004, p.3). In a survey by KMPG (2003, p.4) on knowledge management among the top 500 companies in the United Kingdom, France, Germany and The Netherlands, they found that 80% consider knowledge as a strategic asset. Furthermore, 78% of the respondents believed that they are missing out on current business opportunities by not succeeding to exploit available knowledge.

An important observation was made by Grant (1996, p. 380). Not knowledge itself but rather knowledge integration is the critical source of competitive advantage. Specialised knowledge resides in people. The experience and expertise of the individual members of the organisation creates value for organisations. But individuals are transferable between organisations. In order to obtain real competitive advantage, the personal knowledge needs to be shared with other organisational members or groups. This way personal knowledge can become organisational knowledge (Cabrera and Cabrera, 2005; Ipe, 2003). Ultimately, knowledge management aims to leverage the individual knowledge, which resides inside people, in order to become organisational knowledge.

Knowledge is personal and so regardless of the opportunities for knowledge sharing, organisations are dependent on the willingness of individuals to share (Lin, 2007). For knowledge management systems and initiatives to be a success, they ultimately depend on whether or not people are willing to participate and share knowledge. Research has shown that despite the investments in knowledge management, effective knowledge sharing does not always happen in organisations (Bartol and Srivastava, 2002). For employees, there are costs associated with knowledge sharing. First of all, it requires time and energy (Lin et al., 2012). This is time and energy that they could have spent on other work related tasks with perhaps more reward. Furthermore, as mentioned previously,

employees fear that they may lose their competitive advantage in the job market or become redundant when sharing their unique knowledge (Lee and Ahn, 2007). Fear of incurring these costs may inhibit the employee from engaging in knowledge sharing.

As knowledge sharing is key in gaining competitive advantage and critical to the success of organisations (Gagné, 2009; Grant, 1996; Ipe,2003), it is imperative for companies to understand which factors encourage employees to share knowledge with their colleagues despite the potential costs.

2.2 MOTIVATION AND ITS DIMENSIONS

2.2.1 MOTIVATION DEFINITION

In prior research, motivation has been studied across many disciplines, including organisational behaviour, industrial psychology, organisational design and knowledge management. Motivation refers to the psychological processes that give people the energy, direction and persistence for action (Ryan and Deci, 2000a). Motivation moves a person to do something. When someone feels no drive or desire for an action, he or she is unmotivated, whereas when a person is driven and activated for an action he or she is considered motivated. Dowling and Sayles (1978, p.16 in Grant, 2007) explain motivation as "an inner desire to make an effort".

2.2.2 THE IMPORTANCE OF MOTIVATION FOR KNOWLEDGE SHARING

Research has widely acknowledged the importance of individual motivation in order to understand employees' knowledge sharing behaviour (Bock et al., 2005; Lin, 2007; Foss et al., 2009). Motivation is at the core of activation and intention and has an outcome that produces certain kinds of behaviour, such as knowledge sharing behaviour. In order to explain individual as well as organisational behaviour, research has emphasised the critical importance of developing an understanding of motivation (Grant, 2008b; Ryan and Deci, 2000a). Understanding motivation is specifically important for knowledge sharing for the following reason:

Companies make substantial investments in knowledge management systems and practices with the aim of leveraging individual knowledge in order to become

organisational knowledge (Ipe, 2003). KPMG conducted an industry survey in 2000 among leading organisation in Europe and The United States of America. The results showed that 62 percent of the sample was using some kind of knowledge management system or in the process of setting it up (KPMG, 2000). Large companies in the United States (>500 employees) had an average budget of $2.7 million in 2000 (Dyer and McDonough, 2001). Unfortunately research has shown that realising the expected benefits from knowledge management initiatives has proven to be difficult and uncertain. Despite increasing sophistication of knowledge management technologies, significant failure rates of these implementations are being reported (Malhotra, 2005).

In order to gain a sustainable advantage from knowledge management, companies rely on employees' willingness to participate in these initiatives. Research has also emphasised the importance of socio-psychological factors and specifically motivation for the success of knowledge management initiatives (Davenport et al., 1998; Malhotra,2005). Davenport et al. (1998, p.53-54) observed that "the motivation to create, share, and use knowledge is an intangible critical success factor for virtually all knowledge management projects". Results of industry surveys reinforce the critical importance of motivation in the success of knowledge management system implementations (Dyer and McDonough, 2001; KPMG, 2003). KPMG's 2003 survey results showed that the leaders among the top 500 organisations in Europe and the United Kingdom think motivating the work force to use knowledge management is the second highest major challenge ahead for knowledge management (KPMG, 2003, p.12).

2.2.3 MOTIVATION DIMENSIONS

Research has long viewed motivation as a multi dimensional construct (Ryan & Deci, 2000b, Calder and Staw, 1975; Osterloh and Frey, 2000). The most common dimensions of motivation are extrinsic and intrinsic motivation. Deci & Ryan (1985) developed the Self-Determination Theory (SDT) where they distinguish between these motivation dimensions. This theory is based on the notion that there are different reasons or drivers for action. It recognises that motivation can come from different sources, with the main distinction being external or internal drivers.

When extrinsically motivated, people are driven to engage in behaviour in order to reach a positive external outcome or to avoid a negative external outcome. With extrinsic motivation, the underlying reason for behaviour is that behaviour is instrumental in

obtaining separate outcomes. On the other hand, when someone engages in behaviour for reasons intrinsic to the behaviour itself, for example because they value the behaviour, they are said to be intrinsically motivated (Ryan & Deci, 2000a). This study also considers motivation from this two-dimensional perspective. In the following sections, extrinsic and intrinsic motivation will be further explained.

2.2.3.1 Extrinsic motivation

Extrinsic motivation for behaviour is rooted in the possibility of obtaining an external outcome from engaging in the activity. The outcome is the main driver for engaging in behaviour (Ryan & Deci, 2000a). In the knowledge sharing context, an "external outcome" refers to the perceived external benefits an individual can get from engaging in knowledge sharing. Thus, specifically, extrinsic motivation means an individual's knowledge sharing is driven by his or her perceptions about the external benefits he or she can gain from knowledge sharing, such as tangible rewards (e.g. money, promotion and job security) (Bock et al., 2005; Kankanhalli et al., 2005), verbal rewards (e.g. feedback and praise) (Husted and Michailova, 2002), reciprocal relationships (Bock et al., 2005), and enhanced reputation (Wasko and Faraj, 2005).

Extrinsic motivation is considered to be important to motivate employees to perform in a coordinated and goal oriented way (Osterloh & Frey, 2000). For example, rewards are often tied to performance as a system to motivate employees. The assumption underlying this system is that if the reward is made contingent upon effective performance, then employees will perform effectively (Deci, 1972). Expectancy theory (Vroom, 1964) supports this by assuming that behaviour is goal directed. People will engage in behaviour if they believe this will lead them to a desired goal. For example, if an employee is working for a bonus that is contingent on achieving a certain target, expectancy theory states that he or she will work efficiently in order to get the bonus.

2.2.3.2 Intrinsic motivation

Intrinsic motivation is rooted in the content of an activity itself. It drives a person to do something because it is in line with their intrinsic interest and personal values, rather than to obtain a separable outcome (Ryan and Deci, 2000a). The importance of intrinsic motivation is particularly stressed by organisational behaviourists (Osterloh and Frey, 2000). Research suggests that individuals who are motivated intrinsically have more interest, excitement and confidence (Ryan and Deci, 2000a). This in turn can lead to

increased creativity, innovation and learning, which are behavioural outcomes that businesses value highly (Amabile, 1997; Vallerand and Bissonnette, 1992; Vansteenkiste et al., 2004). Intrinsic motivation is particularly likely to be important to voluntary and pro-social behaviours, such as knowledge sharing (Gagné, 2009; Grant, 2008b). When someone acts to help another person without any other goal than to benefit someone else, this is an example of pro-social behaviour.

Self-determination theory has proven to be useful to predict behaviours, such as knowledge sharing behaviour (Gagné, 2009; Ryan and Deci, 2000a). This theory states that in order to have intrinsic motivation it is necessary to satisfy some basic psychological needs. Satisfying the need for autonomy (internal locus of control) and self-efficacy (feeling of competence), contributes to reach intrinsic motivation (Gagné and Deci, 2005; Ryan and Deci, 2000a). These needs are related to the *process* of sharing knowledge. Individuals can feel autonomous in how they share knowledge or feel able (self-efficacious) to share knowledge.

In addition to process focussed variables, Thomas and Velthouse (1990) among others added that *outcome* focussed variables, such as meaning and purpose, are also important intrinsic drivers. This is especially true where it concerns motivation for prosocial behaviour (Grant, 2008b; Thomas and Velthouse, 1990). As mentioned previously, knowledge sharing behaviour is also seen as a pro-social behaviour (Gagné, 2009). Research on work motivation also shows supports for the importance of job meaningfulness and impact as intrinsic motivators in a work context (Hackman and Oldham, 1976; Thomas and Velthouse, 1990). Thus, intrinsic motivation means an individual's knowledge sharing is driven by his or her perceptions about knowledge sharing itself, such as getting a sense of self-efficacy in relation to knowledge sharing and perceiving knowledge sharing to be meaningful and have an impact.

2.2.4 THEORETICAL FOUNDATION RELATED TO MOTIVATION AND KNOWLEDGE SHARING

The Theory of Reasoned Action (TRA) is a well established, widely accepted model in social psychology to explain virtually any human behaviour (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). It provides the theoretical framework for understanding how motivation influences the attitude and intention to share knowledge at work. TRA assumes that behaviour is determined directly by an individual's intention to engage in behaviour; Actual behaviour can be predicted by intention. Attitude towards the behaviour and subjective norms are antecedents of behavioural intent. Attitude towards performing the behaviour is determined by the individual's salient beliefs that performing the behaviour

will lead to certain outcomes and the individual's evaluation of those outcomes. Subjective norms refer to an individual's perception of social pressure to perform or not perform a particular behaviour (Ajzen, 1991). Figure 1 shows the TRA model.

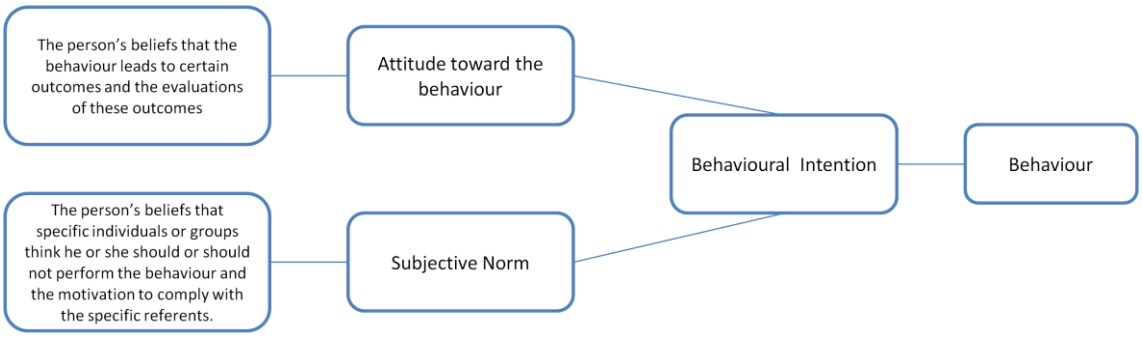


Figure 1 The Theory of Reasoned Action

The key application of the theory of reasoned action is the prediction of behavioural intention, which spans predictions of attitude and behaviour. An important aspect of TRA is that the nature of the beliefs that influence intention through attitude and subjective norms are left unspecified. This allows for integration with other theoretical perspectives to determine the salient beliefs that could impact the examined behaviours.

Many prior studies have successfully used TRA as a theoretical foundation to explain the factors that may influence knowledge sharing and to provide an overarching framework for examining the impact of motivation on knowledge sharing behaviour. For example, Bock et al. (2005) used TRA to explore how knowledge sharing intention is formed. In their study, the beliefs that underlie attitude towards knowledge sharing were specified as extrinsic motivators and social-psychological forces. They also suggested that organisational climate factors directly influenced intention. Results of their study confirmed the relationship between social-psychological forces and knowledge sharing attitude and intention and between organisational climate and intention. Another study by Chow and Chan (2008) investigated the influence of social capital factors on the willingness to share knowledge. Social network, social trust, and shared goals were combined with TRA to examine their effect on knowledge sharing attitude and intention. Their results confirmed that social network and shared goals are determinants of knowledge sharing, whereas social trust was not. A further example of how TRA was used is a study by Malhotra et al. (2008). They based their study on TRA and proposed that attitudes and intentions to use information technology may be affected by combinations of perceived external, internal and introjected influences, such as feelings towards

autonomy, perceived social rewards, and social norms. They conducted a survey with 181 responses and found support for their model. They suggested that other research should further analyse extrinsic motivations and intrinsic motivations together.

Drawing on prior research and the flexibility and explanatory power of TRA, this study examines the TRA (belief-attitude-intention) relationship to investigate intrinsic and extrinsic motivators as determinants of knowledge sharing attitude and intention.

2.3 MOTIVATORS FOR KNOWLEDGE SHARING

Understanding the motivators for knowledge sharing can provide businesses with insights they can use to encourage employees to share knowledge. Considering Self-Determination Theory, motivators are categorised as extrinsic and intrinsic motivators. The main extrinsic motivators from the literature are tangible rewards, verbal rewards, reciprocal relationships and reputation. The main intrinsic motivators from the literature are self-efficacy, meaningfulness and impact. Appendix G summarises the literature on these variables which are listed in descending chronological order.

2.3.1 EXTRINSIC MOTIVATORS

Extrinsic motivation has been widely covered in the knowledge sharing literature and many external drivers for knowledge sharing have been identified in earlier studies. The main extrinsic motivators affecting knowledge sharing that are examined in this study include tangible rewards, verbal rewards, anticipated reciprocal relationships and reputation. Each of these will be discussed in subsequent sections.

2.3.1.1 Tangible rewards

Tangible rewards are considered a key factor affecting organisational knowledge sharing. Examples of tangible rewards are pay increases, bonuses, opportunities for promotion and job security (Chennamaneni et al., 2012). Several researchers have argued for the importance of reward systems to encourage organisational knowledge sharing. Hall (2001) studies how contributions to an Intranet, which is seen as a key platform for organisational knowledge sharing, can be encouraged. Drawing from existing literature, she concludes that knowledge sharing can be motivated through tangible rewards such as economic incentives (increased pay/bonuses). This viewpoint was also adopted in Husted and Michailova's (2002) propositions regarding encouraging and stimulating knowledge sharing. They also propose that individuals need a return on their investments of time

and knowledge and therefore reward mechanisms should be in place to accommodate this need. They believe people should be rewarded for their knowledge sharing efforts. According to Bartol and Srivastava (2002) monetary rewards and promotion/merit pay can be effective knowledge sharing motivators. One example of how this might work is in the context of knowledge contributions to databases. It is argued that with this knowledge sharing method it is relatively easy to monitor the quantity and quality of knowledge that has been shared (Bartol and Srivastava, 2002, p.68). This may make it possible to provide evaluations about an individual's performance in relation to knowledge sharing over a period of time and include knowledge sharing in performance evaluations and play a part in decisions regarding merit pay and/or promotion. One example of an organisation that has implemented reward schemes to promote knowledge sharing behaviour is Cap Gemini Ernst & Young. There, the employee's knowledge sharing activities are considered in merit pay decisions (Bartol and Srivastava, 2002). Within a range of 2-5, employees can't score higher than 3 if they have not engaged in knowledge sharing.

A case study by McDermott and O'Dell (2001) showed support for the previous viewpoints. Five companies were studied where knowledge sharing was built into the culture of the company and occurred effectively. One of these companies, American Management Systems, has made knowledge sharing a criterion in performance evaluations and promotion discussions. It tracks the frequency with which people use reports from the knowledge base and hands out annual awards to recognise contributions to its knowledge centres. McDermott and O'Dell (2001) highlight that receiving tangible rewards and recognition from the company for sharing knowledge demonstrates that putting in the time and effort to share actually matters for their performance and career. But the previous studies are either conceptual (Bartol and Srivastava, 2002; Hall, 2001; Husted and Michailova, 2002) or of a qualitative nature (McDermott and O'Dell, 2001) and lack empirical testing.

Several empirical studies have also been conducted in recent years to examine tangible rewards with regards to knowledge sharing. From Appendix G, seven of the nineteen papers have examined tangible rewards as a motivator for knowledge sharing. Different terms have been used to indicate tangible rewards such as "organisational rewards" or "incentives" or just "extrinsic rewards". The measures that were used for these constructs are all indications of tangible rewards and therefore this term will be used in this study. Kankanhalli et al. (2005) examined the effect of tangible rewards on the usage of electronic knowledge repositories by knowledge contributors using a survey. As a measure of tangible rewards they asked questions on the importance of rewards like promotion, higher salary and more job security. They found only a weak but positive

influence which indicates that the use of tangible rewards as a motivator may only increase contributions to electronic knowledge repositories lightly. This research examined knowledge sharing in a clearly defined context: contributing explicit knowledge to a database. Other studies investigated knowledge sharing in a more general context, without specifying how knowledge is shared or if it concerns tacit or explicit knowledge. These studies found different results.

First of all, Bock et al. (2005) found a significant negative effect of tangible rewards on the attitude towards knowledge sharing. Items for the measurement of tangible rewards included monetary reward and promotion. This result confirmed earlier research by Bock and Kim (2002), who also found that expected tangible rewards was negatively related to attitude towards knowledge sharing. Both Lin (2007) and Chennamaneni et al. (2012) showed an insignificant effect of tangible rewards on employee knowledge sharing attitude. Lastly, Vuori and Okkonen (2012) investigated motivational factors for sharing knowledge through an intra-organisational social media platform. They distributed a questionnaire in which the respondent had to rank several statements from 1-5. Results from the survey indicated that job security, gaining financial rewards and promotion opportunities were ranked the three lowest motivators. An interesting additional result was found in the complementary comments to the survey. Although tangible rewards were seen as the least motivating factor, several respondents wrote that praise and words of thanks from the superiors would motivate them to use a social media platform for knowledge sharing.

Contrary to expectations based on Expectancy Theory (Vroom, 1964) regarding the influence of tangible rewards as a motivator for knowledge sharing, overall the results of empirical research show an insignificant or negative effect. One reason could be that contrary to tangible rewards, other "soft" rewards such as praise and verbal feedback are experienced as motivating. Another reason could be that the researchers did not specify the type of knowledge shared, being either explicit or tacit. It can be argued that tangible rewards are more effective for explicit knowledge sharing, because this is easier to measure and monitor. As tacit knowledge sharing is more complex and difficult to observe and measure, offering tangible rewards may not be a motivator for tacit knowledge sharing (Osterloh and Frey, 2000). Taking this argument further, Kwok and Gao (2006) argue that regardless of whether the knowledge shared is tacit or explicit, offering tangible rewards can only be effective for tasks that are under close supervision, routine and easy to measure quantitatively. Because knowledge sharing has opposite characteristics, offering tangible rewards may not be effective. In order to test this, they studied the effect of extrinsic motivation (being: avoiding punishment, monetary rewards and enhanced

reputation) on the attitudes of final year undergraduate students towards knowledge sharing. They did NOT predict a positive effect and the results were consistent with this hypothesis.

In summary, theoretical papers suggest that offering tangible rewards can be a motivator for knowledge sharing (Hall, 2001; Husted and Michailova, 2002; Bartol and Srivastava, 2002). But the results of empirical testing show an insignificant or negative effect of tangible rewards in relation to knowledge sharing (Chennamaneni et al., 2012; Vuori and Okkonen, 2012; Bock et al., 2005; Lin, 2007). Analysis reveals that it may be important to distinguish between explicit and tacit knowledge. Furthermore, tangible rewards may not be effective for tasks that are complex, interactive and require lasting commitment, such as knowledge sharing. Lastly, respondents indicated that opposed to tangible rewards, verbal rewards may be a motivator for knowledge sharing. The following section will discuss verbal rewards in relation to knowledge sharing.

2.3.1.2 Verbal Rewards

In the previous section, results from the study by Vuori and Okkonen (2012) highlighted that verbal rewards may be a motivator for knowledge sharing. Organisational psychology literature shows that verbal rewards such as praise and feedback are important extrinsic motivators (Frey and Jegen, 2001; Deci et al., 1999). Whereas tangible rewards may be perceived to be controlling, verbal rewards are perceived to be supporting. Receiving feedback, praise and recognition could be motivating by giving individuals a sense of competence and raise their self-esteem (Frey and Jegen, 2001). Several researchers have noted that feedback, for example through performance evaluations tied to knowledge sharing behaviour and giving recognition, is important to show the individual his or her knowledge sharing is important and valued by the organisation and matters for their performance and career. As such verbal rewards may motivate people to share (Foss et al., 2009; Cabrera and Cabrera, 2005; McDermott and O'Dell, 2001). Husted and Michailova (2002) also point out the importance of organisational recognition as a reward for knowledge sharing. If people feel like they are "just dropping their knowledge into a big, black hole" (Husted and Machailova, 2002, p.70), it may impair motivation to share. They need to know that their knowledge is being used, that people care about their contribution.

Supporting this viewpoint were findings from a case study on sharing knowledge using Web 2.0 technologies (Paroutis and Al Saleh, 2009). From 11 in-depth interviews with employees from all layers of the organisation they gathered that users value recognition of

their contributions by superiors. Respondents stated that support and recognition from the organisation are influential factors determining their participation in knowledge sharing. Furthermore, users noted the importance of acknowledgement for their efforts and that it is important for them to get credit for the ideas they share with the organisation.

Empirical research regarding the influence of verbal rewards on knowledge sharing is scarce. One study by Yahya and Goh (2002) did examine the relationship between feedback and knowledge management activities. A questionnaire was given to managerial-level employees in Malaysia investigating the influence of several factors including feedback on their knowledge management activities. These activities were defined as acquiring, documenting, transferring, creating and applying knowledge. The results show a positive effect of feedback from both internal customers and superiors on their knowledge management activities.

Both Foss et al. (2009) and Ko et al. (2005) examined extrinsic motivation in relation to knowledge sharing. Foss et al. (2009) examined a model linking job design to extrinsic and intrinsic motivation and linking both dimensions of motivation to knowledge sending and receiving. Ko et al. (2005) investigated the determinants of knowledge transfer from a consultant to a client in the context of ERP implementations and linked extrinsic and intrinsic motivation to knowledge transfer. They both measured extrinsic motivation by asking questions about praise and recognition but included questions about money and promotion as well. This shows that they recognised that praise and recognition may be important extrinsic motivators. However, by using verbal rewards and tangible rewards in the same construct, it is not possible to determine whether one has a significantly different effect on knowledge sharing than the other.

In addition to tangible and verbal rewards, social rewards such as anticipated reciprocal relationships and enhanced reputation are also considered to be external drivers for behaviour (Hall, 2001; Kankanhalli et al., 2005; Bock et al., 2005). These will be discussed in relation to knowledge sharing behaviour in the next section.

2.3.1.3 Anticipated Reciprocal Relationships

Reciprocity describes the notion that through knowledge sharing behaviour, individuals can expect the benefit of future help from others. Reciprocity refers to a sense of mutual indebtedness (Lin, 2007; Kankanhalli et al., 2005). Knowledge contribution may be based

on the premise of social exchange, in which case individuals may share knowledge in return for reciprocal benefits (Bartol and Srivastava, 2002).

The summary provided in Appendix G shows that several studies have included reciprocity as a factor influencing knowledge sharing. It also shows that the results from these studies were mixed.

In a questionnaire, Vuori and Okkonen (2012) asked respondents to rank the importance of several statements in relation to knowledge sharing. Reciprocity was among the factors which were ranked highest. This indicates that people perceive reciprocity as a significant factor influencing their knowledge sharing. This finding supports the results of other empirical studies. For example, Chennamaneni et al. (2012) examined among other factors the influence of psychological factors on knowledge sharing attitude and intention. Findings from this study showed that perceived reciprocal benefits had a positive effect on the attitude towards knowledge sharing. This finding confirmed results from Chang and Chuang (2011) and Chiu et al. (2006). Another study by Kankanhalli et al. (2005) found reciprocity to be significant for electronic knowledge repository (EKR) usage by knowledge contributors only if pro-sharing norms are weak. However, when pro-sharing norms are strong and there is a collaborative climate, then reciprocity is not important. The authors suggest that this could indicate that extrinsic benefits may only be adequate as motivators when they are provided in the appropriate context.

Contrary to the results mentioned above, other research has surfaced different results. For example, Wasko and Faraj (2005) found reciprocity to be negatively related to knowledge contribution through an electronic community of practice. Supporting this outcome are Chen and Hung's (2010) findings in their study of knowledge sharing behaviour in professional virtual communities. Here, reciprocity was not significant for knowledge contributing. Lin et al. (2009) also demonstrated that reciprocity was not related to knowledge sharing in professional virtual communities. These previous studies were unable to show overwhelming evidence of a positive effect of reciprocity on knowledge sharing due to differences in results.

In all these studies reciprocity implies that knowledge sharing is contingent on a rewarding reaction and if the sharer feels he or she does not receive the expected response, knowledge sharing is likely to cease (Chiu et al., 2006). From a different perspective, Bock et al. (2005) investigate reciprocity as a construct that they call Anticipated Reciprocal Relationships. This construct shifts the focus from the extrinsic benefit of an expected reaction that might follow from knowledge sharing to the relationship itself. Individuals who perceive that their knowledge sharing can improve

mutual relationships with others may have more positive attitudes towards knowledge sharing (Bock et al., 2005). Lin (2007) also followed this definition of reciprocal relationships as an extrinsic motivator. The results showed reciprocal benefits significantly and positively influenced attitudes towards knowledge sharing in Taiwanese organisations. These results highlight the importance of looking at relational, social capital with regards to knowledge sharing. It seems that knowledge sharing may be affected by the belief that one can obtain an improved mutual relationship through knowledge sharing.

2.3.1.4 Enhanced Reputation

As well as anticipated reciprocal relationships, enhanced reputation also seems a significant extrinsic motivator for knowledge sharing (Hall, 2001; Kankanhalli et al., 2005; O'Dell and Grayson, 1998). A good reputation can be an important asset for employees. It can give them respect and may be important for job security and advancement (Kankanhalli et al., 2005). Research has shown that knowledge sharing can be fuelled by a desire for recognition from peers (O'Dell and Grayson, 1998). Employees may feel that by sharing valuable knowledge with others at work, this may increase their reputation in the workplace. Hall (2001) also notes that building a good reputation and maintaining this needs a long-term commitment. When people recognise that knowledge sharing could enhance their reputation, this may alter their attitude towards knowledge sharing in a positive way.

Empirical research examining the effect of reputation in relation to knowledge sharing has been lacking. Only three of nineteen papers in Appendix G examined reputation as a stand-alone construct. All three show a positive influence of reputation on knowledge sharing. First, Chennamaneni et al. (2012) found in a survey conducted among MBA and senior level students in the United States that perceived reputation enhancement positively affected the attitude towards knowledge sharing. Chang and Chuang (2011) also found reputation influenced knowledge sharing in a positive way. Furthermore, Wasko and Faraj (2005) investigated the effect of reputation on the volume of contributions to an electronic network of practice also referred to as "Message Boards". Their results indicated a positive, significant effect, which means that enhanced reputation was an important factor for people to engage in knowledge sharing. The table in Appendix G also shows that some studies have asked questions on reputation. For example, Kwok and Gao (2006) investigate extrinsic motivation asking questions about receiving monetary reward, avoiding punishment and building reputation to measure the effect of extrinsic motivation

on knowledge sharing. Another example is research by Chiu et al. (2006) and Hsu et al. (2007), which included questions on reputation, sense of accomplishment and tie strength to measure the effect of personal outcome expectations in relation to knowledge sharing. This shows that researchers recognise that reputation may also be an important external driver for knowledge sharing. However by failing to examine reputation as a stand-alone construct in these studies, evidence of this influence is limited.

2.3.2 INTRINSIC MOTIVATORS

Intrinsic motivation has received increasing attention in research on knowledge sharing behaviour and its importance for knowledge sharing has been determined in prior studies (Kankanhalli et al., 2005; Ko et al., 2005; Foss et al., 2009; Hsu et al., 2007; Lin et al., 2009).

In the knowledge sharing literature intrinsic motivation is not a new concept. There are a few conceptual studies which have considered the influence of intrinsic motivation on knowledge sharing. One example is a conceptual study by Gagné (2009) which links need satisfaction to employee attitude and intention to share knowledge. There are also empirical studies which have incorporated intrinsic motivation in a model of knowledge sharing. A few studies treat intrinsic motivation as a single construct. For example, Foss et al. (2009) developed and tested a model to examine the impact of intrinsic and extrinsic motivation on employee knowledge sharing behaviour. They found that intrinsic motivation has a strong impact on both sending and receiving knowledge. Ko et al. (2005) investigated knowledge transfer between consultants and clients during an ERP System implementation and found that intrinsic motivation was a significant factor in facilitating effective knowledge transfer during such an implementation.

Other research distinguishes between various intrinsic motivators thereby recognising that people may be motivated differently by different factors (Chen and Hung, 2010; Lin et al., 2009; Hsu et al., 2007; Welschen et al., 2012). For example, Hsu et al. (2007) investigated a sense of self-efficacy and a sense of impact in their study of knowledge sharing in virtual organisation and Lin et al. (2009) examined self-efficacy and meaningfulness in relation to knowledge sharing.

This study also investigates the impact of different intrinsic drivers for knowledge sharing. Based on Self-Determination Theory (Ryan and Deci, 2000a) and Empowerment Theory (Thomas and Velthouse, 1990) three key intrinsic motivators have been identified: self-efficacy, meaningfulness and impact. The following sections will discuss prior research with regards to self-efficacy, meaningfulness and impact.

2.3.2.1 Self-efficacy

Self-efficacy is considered to be a highly significant intrinsic motivator for knowledge sharing. The definition of self-efficacy in this study is adopted from Bandura (1978, p. 240, italics added, in Staples et al., 1999, p.759): "the *judgment* an individual makes about his or her *ability* to execute a particular behaviour". It means that the higher someone's feelings of self-efficacy, the more confident they are about their capability to execute a particular behaviour. Individuals who perceive their self-efficacy as weak, are likely to put in less effort or no effort at all while individuals who perceive their self-efficacy to be strong, tend to put in greater effort to master challenging tasks (Staples et al. 1999). Some positive outcomes of high perceived self-efficacy are therefore high effort, increased determination in overcoming obstacles and initiating behaviour (Thomas and Velthouse, 1990).

Many conceptual studies on knowledge sharing behaviour support the notion that if employees feel good about their ability to provide valuable knowledge, this will encourage positive feelings towards knowledge sharing (Cabrera and Cabrera, 2005; Gagné, 2009). Bartol and Srivastava (2002) also suggest that intrinsic factors that build feelings of competence are important for influencing knowledge sharing behaviour in communities of practice, but this was not empirically examined.

From the summarised empirical studies in Appendix G, it is also clear that self-efficacy is an important factor contributing to a positive attitude towards knowledge sharing. Lin (2007) examined knowledge self-efficacy in relation to employee knowledge sharing attitudes with the use of a survey which was distributed to organisations in Taiwan. Findings showed that knowledge self-efficacy impacted attitudes towards knowledge sharing significantly and positively. Kankanhalli et al. (2005) found that knowledge self-efficacy had a positive influence on Electronic Knowledge Repository usage by knowledge contributors. Lin et al. (2009) investigated the determinants of knowledge sharing in professional virtual communities and found a significant positive relationship between knowledge sharing self-efficacy and knowledge sharing behaviour. In two other studies of knowledge sharing behaviour within virtual communities of professional societies, Hsu et al. (2007) and Chen and Hung (2010) also found a positive effect of knowledge sharing self-efficacy on knowledge sharing behaviour. Furthermore, in their study of tacit knowledge sharing, Yang and Farn (2009) found that knowledge self-efficacy had a significant positive effect on the intention to provide tacit knowledge.

2.3.2.2 Meaningfulness

In contrast to self-efficacy, meaningfulness has been less studied in relation to knowledge sharing. But meaningfulness can be an important intrinsic motivator. When a behaviour is experienced as meaningful, for example because someone believes that their knowledge sharing can be helpful to others, the motivation for that behaviour may be increased (Cabrera and Cabrera, 2005). Meaningfulness refers to people making a judgment of the value of behaviour in relation to their own a person judging the value of behaviour in relation to their own ideals or standards (Thomas and Velthouse, 1990, p. 672). Hackman and Oldham (1976, p.256) refer to meaningfulness as caring about a task. Individuals may feel a behaviour is meaningful, if they feel that the outcome of the behaviour has a worthy and valuable purpose and makes a difference (Thomas, 2009).

There are positive outcomes associated with behaviour that is perceived as meaningful. People are more excited about the behaviour and more committed to it. They also find it easier to concentrate on. Furthermore, they show high degrees of involvement and put effort and energy towards a behaviour that is perceived as meaningful (Thomas, 2009; Thomas and Velthouse, 1990).

There are only a few studies that have empirically examined meaningfulness in relation to knowledge sharing. Among those, Zhang et al. (2009) found an indirect, positive relationship between experienced meaningfulness at work and knowledge sharing behaviour. Experienced meaningfulness had a positive effect on psychological engagement at work, which in turn had a positive effect on knowledge sharing behaviour. Chen et al.'s (2011) results supported these findings. They conducted a survey in two software development companies which are knowledge intensive work environments. The outcome of this research also showed that experienced meaningfulness had a positive effect on work engagement which in turn had a positive effect on knowledge sharing. Both these studies only tested for the effect of meaningfulness on engagement and linked engagement to knowledge sharing.

Another study by Lin et al. (2009) examined several personal perceptions and their effect on knowledge sharing behaviour in virtual communities. Findings suggest that the degree to which knowledge sharing is perceived to be consistent with an individual's existing values and needs is an important driver for knowledge sharing behaviour. This finding was supported by Chen and Hung (2010). Furthermore, Welschen et al. (2012) provided evidence for the influence of meaningfulness on the attitude towards knowledge sharing in a study examining intrinsic motivators for knowledge sharing. Results showed a significant positive effect. The previous studies suggest that meaningfulness may be important for knowledge sharing.

2.3.2.3 Impact

Impact is the least studied intrinsic driver and evidence related to its effect on knowledge sharing is scarce. Impact suggests that people feel that their behaviour is "making a difference". In other words, their behaviour is producing the outcomes they intended and through behaviour they can control these desired outcomes (Gagné et al., 1997; Thomas and Velthouse, 1990). A sense of impact in relation to knowledge sharing can suggest that someone feels that through knowledge sharing he or she can help solve specific work-related problems, or that knowledge sharing can improve effectiveness at work (Lin, 2007). Accordingly this includes the perception that your knowledge sharing has the capacity to produce a desired result or effect.

An important aspect of being motivated and staying motivated is understanding the relationship between your behaviour and the result of your behaviour. Perceived impact signifies that relationship (Grant, 2007). Employees may gain a sense of impact when they are aware of the relation between their behaviour, and the effect this has on others in the organisation or on the organisation as a whole. Realising this, researchers have highlighted that it is important for employees to gain insight in the results of their behaviour (Hackman and Oldham, 1976; Thomas and Velthouse, 1990). When people know the effectiveness of their behaviour and they recognise the relationship between what they are doing and how this is contributing towards achieving the purpose of the behaviour, they may feel like they are accomplishing something and perceive they are making a difference.

Similar to meaningfulness, there are only a few empirical studies that examine impact when investigating factors that influence knowledge sharing. Bock and Kim (2002) found that employees who felt they could make a significant contribution to the performance of the organisation through knowledge sharing, also had positive attitudes towards knowledge sharing. Moreover, Welschen et al. (2012) showed a positive relationship between impact and the attitude towards knowledge sharing. Two other studies have investigated community related outcome expectations in relation to knowledge sharing behaviour. These community related outcome expectations are defined by Hsu et al. (2007, p.156) as "an individual's expectations about the impact of his knowledge sharing on virtual communities, such as achieving the goals, enriching knowledge base of virtual communities, or continuing to operate virtual communities ". This is in line with the definition of impact used in this study. Chiu et al. (2006) found that in professional virtual

communities a positive relationship exists between community related outcome expectations and the quantity of knowledge sharing. However, contrary to Chiu et al. (2006), Hsu et al. (2007) did not find a significant effect of community-related outcome expectations on knowledge sharing behaviour in virtual communities. Chiu et al. (2006) and Hsu et al. (2007) both tested their concepts in virtual communities, where Hsu et al. (2007) ascribed the contrary results to the notion that virtual communities do not have formal rules, routines and procedures to guide knowledge sharing behaviours like formal, institutionalised organisations. Formal, visible organisations may make the outcome of knowledge sharing more visible as well and a sense of impact may be a motivating factor here. However, more work is needed to assess the effect of a sense of impact in relation to knowledge sharing in order to further clarify the findings in the literature and contribute to a better understanding of its influence with regards to knowledge sharing.

2.4 GAPS IN THE LITERATURE

Based on the studies summarised in Appendix G, and the literature discussed above, there are several gaps which need to be investigated. These gaps are summarised below.

First, a review of the literature shows that research on motivational drivers for knowledge sharing is fragmented. Several studies emphasised extrinsic motivation but also include intrinsic factors, such as self-efficacy. Some studies investigated only extrinsic motivation, for example, Bock et al. (2005) examine organisational rewards and anticipated reciprocal relationships, whereas other studies only provided evidence for the influence of intrinsic motivation on knowledge sharing (Welschen et al., 2012). The majority of research does recognise that knowledge sharing motivation may be two-dimensional. Osterloh and Frey (2000) argue that employees are motivated intrinsically as well as extrinsically. They conclude that it is important for organisations to manage motivation by targeting an optimal combination of intrinsic and extrinsic motivation. Theories on intrinsic and extrinsic motivation also suggest that there are several important motivators for behaviour (Ryan and Deci, 2000a; Vroom, 1964; Thomas and Velthouse, 1990), but from Appendix G it is clear that the majority of studies examined a limited set of motivators and prior work has not included a more comprehensive set of key motivators as identified in previous sections. For example, in studying the effect of motivation in relation to knowledge sharing, Bock et al. (2005) examined expected organisational rewards and reciprocal benefits and Lin (2007) examined expected organisational rewards, reciprocal benefits and self-efficacy. Lin et al. (2009) investigate reciprocity, perceived relative

advantage, self-efficacy and perceived compatibility and Hsu et al. (2007) provided evidence on personal outcome expectations and self-efficacy and community related outcome expectations. While these studies may have provided significant evidence for understanding organisational knowledge sharing, investigating more comprehensive set of motivators altogether in one model would provide more comprehensive information about knowledge sharing motivation. Furthermore, examining all motivators in one model would enable us to understand better the relative importance of each motivator.

Second, the majority of studies that empirically examined rewards, have regarded rewards as tangible rewards, such as money and promotion. However, in addition to tangible rewards, verbal rewards are also an important extrinsic motivator. For example, Foss et al. (2009) and Ko et al. (2005) measured the construct "extrinsic motivation" by asking questions on tangible as well as verbal rewards, highlighting the importance of looking at both. This is supported by Motivation Crowding Theory which suggests that both types of rewards may have opposing effects, that is tangible rewards may be perceived to be controlling and verbal rewards may be perceived to be supporting. Even though both verbal and tangible rewards may be important motivators for knowledge sharing, there is lack of empirical research which investigates verbal rewards in relation to knowledge sharing nor have both of these constructs been empirically examined in one model in relation to knowledge sharing. This study will address that gap to allow for better understanding of the relationship between rewards and knowledge sharing.

Third, the empirical evidence for the impact of intrinsic motivational factors is limited. Most research included self-efficacy (Chen and Hung, 2010; Lin et al., 2009; Lin, 2007; Lu et al., 2006), while there may be other individual intrinsic motivators that significantly encourage employee's knowledge sharing. Process related variables, such as self-efficacy as well as outcome related variables , such as meaningfulness and impact, are important drivers of intrinsic motivation (Ryan and Deci, 2000; Thomas and Velthouse, 1990). They may also be important to encourage organisational knowledge sharing (Chen and Hung, 2010; Welschen et al., 2012; Chen et al., 2011). There are a few studies that have examined similar constructs. For example, Hsu et al. (2007) included community-related outcome expectations and Lin et al. (2009) included perceived compatibility. However, more research is needed to provide a more complete understanding of the relative impact of intrinsic motivators on attitude formation. Furthermore, these constructs have not yet been investigated altogether with extrinsic motivators in one model. This research can address this by adding these other factors in a model together with extrinsic motivators.

2.5 RESEARCH MODEL

It is well accepted that motivation has multiple dimensions of which the distinction between extrinsic and intrinsic motivation are the two main types (Ryan and Deci, 2000a; Calder and Staw, 1975). In the literature on knowledge sharing, these two dimensions have also been included in conceptual models of factors influencing knowledge sharing (Gagné, 2009; Osterloh and Frey, 2000) and examined in empirical studies (Lin et al., 2009; Kankanhalli et al., 2005; Chennamaneni et al., 2012), to indicate the importance of looking at the multi-dimensional nature of motivation in relation to knowledge sharing. Based on this, a research model is developed with the aim of investigating the relationship between extrinsic and intrinsic motivators and attitude towards and intention to share knowledge. The model is presented in Figure 2 below. The indicators measuring each construct will be discussed in Chapter 3. Overall, the model proposes that:

- Motivation is a two-dimensional construct and both dimensions may be important in influencing employees' attitude towards organisational knowledge sharing and intention to share knowledge.
- Tangible rewards, verbal rewards, anticipated reciprocal relationships and enhanced reputation may influence attitude towards knowledge sharing.
- Self-efficacy, meaningfulness and impact may influence attitude towards knowledge sharing.

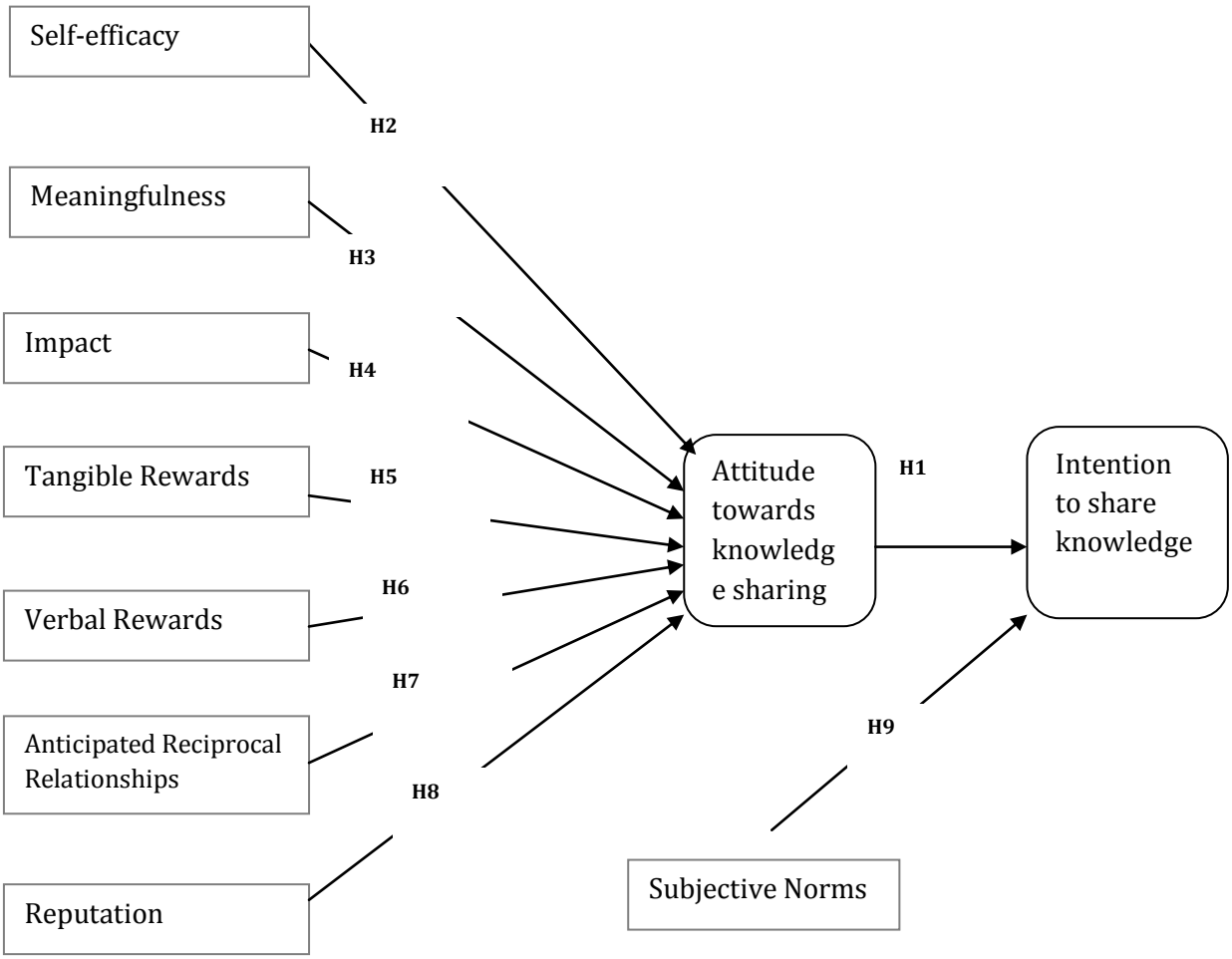


Figure 2

The development of the hypotheses is presented in the following sections.

2.6 HYPOTHESES DEVELOPMENT

The hypothesised effect of the different intrinsic and extrinsic motivators that surfaced from the literature on employees' attitude and intention to share knowledge will be discussed below. The hypothesis for each motivator will be formulated in this section based on previous empirical research. These hypotheses will be summarised Table 1 at the end of this section.

2.6.1 ATTITUDE TOWARDS KNOWLEDGE SHARING AND INTENTION TO SHARE KNOWLEDGE

Attitude is considered to be an underlying variable that influences behaviour. Attitude refers to "a person's favourable or unfavourable evaluation of an object" (Fishbein and Ajzen, 1975, p.12). Attitude is viewed as a general predisposition and in itself does not necessarily lead someone to perform a specific behaviour. But, it does determine a person's intention to engage in behaviour (Ajzen and Fishbein, 1980). As Fishbein and Ajzen (1975, p.12) put it: The strength of someone's intention to engage in behaviour is determined by a person's subjective probability that he or she will perform the behaviour.

The relationship between attitude towards knowledge sharing and intention to share knowledge has been supported by the TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) and in other studies of knowledge sharing (Bock et al., 2005; Lin, 2007; Welschen et al., 2012). For example, Bock and Kim (2002), Bock et al. (2005), Lin (2007) and Welschen et al. (2012) all found positive relationships between favourable attitudes towards knowledge sharing and intentions to share knowledge. This leads to the first hypothesis:

H1: The more favourable the attitude towards sharing knowledge, the greater the intention to share knowledge.

2.6.2 BELIEFS ABOUT KNOWLEDGE SHARING

In this study, beliefs about knowledge sharing represent the individual's motivational beliefs that influence attitude towards knowledge sharing. They are divided into two groups: extrinsic and intrinsic motivators. Intrinsic motivators reflect the belief that the individual will receive intrinsic benefits when sharing knowledge and extrinsic motivators

reflect the beliefs that the individual will receive extrinsic benefits when sharing knowledge. This study considers three motivational beliefs concerning intrinsic motivators (i.e. self-efficacy, meaningfulness and impact) and four concerning extrinsic motivators (i.e. tangible rewards, verbal rewards, anticipated reciprocal relationships and enhanced reputation).

2.6.2.1 Self-efficacy

The concept of self-efficacy refers to how an individual judges his or her capability to achieve some level of performance (Cabrera et al., 2006, p. 249). This has been studied in many disciplines studies on knowledge sharing (Kankanhalli et al., 2005; Lin, 2007; Lin et al., 2009; Lu et al., 2006; Welschen et al., 2012). Bandura, among others, did extensive research demonstrating that perceived self-efficacy influences a person's predisposition to engage in behaviour (Bandura, 1997; Gist, 1987; Gist and Mitchell, 1992). Self-efficacy has been shown to predict many positive behavioural outcomes such as improved job performance ratings by supervisors, job satisfaction and general work performance (See Cabrera et al., 2006, p.249 for an overview). Therefore, a good predictor of organisational behaviour and attitudes may be a person's belief about his or her self-efficacy regarding a particular behaviour.

A sense of self-efficacy in relation to knowledge sharing may also predict attitudes towards knowledge sharing. Researchers have argued in conceptual studies that self-efficacy will encourage positive attitudes towards knowledge sharing (Cabrera and Cabrera, 2005; Gagné, 2009). If people believe they are able to help others through sharing valuable knowledge or they believe they can contribute to solve problems or improve processes at work, they may also have more positive attitudes towards knowledge sharing (Cabrera and Cabrera, 2005; Lin, 2007).

Empirical studies have also identified the positive relationship between perceived self-efficacy and positive attitudes towards knowledge sharing. For example, Welschen et al. (2012) examined the role of knowledge self-efficacy in explaining knowledge sharing attitudes through a survey of employees from organisations in New Zealand. The findings confirmed that self-efficacy significantly and positively influenced attitudes towards knowledge sharing. Furthermore, Lin (2007) found empirical evidence for the significant, positive effect of self-efficacy on employee attitudes towards knowledge sharing in a survey of employees from 50 organisations in Taiwan. This leads to the following hypothesis:

H2: The greater the sense of self-efficacy in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.2 Meaningfulness

The concept of meaningfulness refers to how people judge the value of a particular task or behaviour in relation to their own personal beliefs, attitudes and values (Gagné et al., 1997). Empirical evidence shows that meaningfulness is an important intrinsic motivator at work (Gagné et al., 1997). Meaningfulness is also attributed to be an important intrinsic motivator for knowledge sharing.

Zhang et al. (2009) show that experienced meaningfulness positively influenced psychological engagement at work, which in turn had a significant positive impact on knowledge sharing. Psychological engagement at work is also associated with positive emotions, such as joy, interest and contentment (Bakker and Demerouti, 2008). Because a positive attitude refers to a person's positive evaluation, it can therefore be inferred that meaningfulness also affects attitude positively. Sié and Yaklef (2009) demonstrated through a case study, that when people experience meaningfulness through knowledge sharing, they have a more favourable attitude towards knowledge sharing. They interviewed experts and found that when they have invested so much into acquiring this knowledge, that they "want it to live its own life" (Sié and Yaklef, 2009, p.182). They gain a sense of meaningfulness through knowledge sharing and feel positive about sharing their knowledge. Another study examined the direct relationship between meaningfulness and attitude towards knowledge sharing (Welschen et al., 2012). Through the use of a survey, which was distributed to organisational members across all layers of the organisation, they showed that a sense of meaningfulness in relation to knowledge sharing positively affected the attitude towards knowledge sharing. Therefore,

H3: The greater the sense of meaningfulness in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.3 Impact

The term impact refers to the feeling that your behaviour will actually lead to a desired outcome. This could reflect that through knowledge sharing a person can help someone else, or make a significant contribution to the performance of the organisation (Grant, 2007; 2008a; Bock and Kim, 2002). Research has stressed the importance of employees getting to know the results of their work efforts in order for them to gain a sense of

impact. Impact has been linked to engaging in pro-social behaviour and superior effort and performance (Grant 2007; 2008a; Hackman and Oldham, 1976).

Empirical evidence from knowledge sharing literature also supports the link between impact and attitude. For example, Bock and Kim (2002) investigated several antecedents of attitude towards knowledge sharing. When people perceived that their knowledge sharing could have a significant impact on the organisation's performance, for example by improving work processes or increasing productivity, they also had more positive attitudes towards knowledge sharing. This finding was supported by Welschen et al.'s (2012) research into the relationship between intrinsic motivators and employees' knowledge sharing attitudes. Impact had a significant positive effect on the attitude towards knowledge sharing. Therefore, when employees are aware of the positive outcomes of their knowledge sharing, such as helping others solve problems, creating new business opportunities and helping the organisation achieve performance objectives (Bock and Kim, 2002), it is likely that they will also have positive attitudes towards knowledge sharing. The following hypothesis is proposed:

H4: The greater the sense of impact in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.4 Tangible rewards

Well accepted theories such as expectancy theory (Vroom, 1964) suggest that offering tangible rewards may be a useful way for managers to motivate employees to perform desired behaviours. Here, tangible rewards refer to benefits from knowledge sharing, such as money, promotion and job security. However, the majority of empirical evidence does not show support for a positive influence of tangible rewards on the attitude towards knowledge sharing.

Results from a survey, with the aim of investigating employees' knowledge sharing motivations for the use of an intra-organisational social media platform, also showed that people found tangible rewards the least motivating factor for knowledge sharing (Vuori and Okkonen, 2012). Furthermore, in a recent study, Chennamaneni et al. (2012) did not find a significant impact of tangible rewards on the attitude towards knowledge sharing. In the discussion of the results, they suggested that where it concerns social exchange, such as knowledge sharing, social concerns like relationships and reputation may be more important than economic concerns. Lin (2007) also found an insignificant impact of tangible rewards on knowledge sharing attitude while both Bock et al (2005) and Bock

and Kim (2002) found a significant negative effect for expected tangible rewards on attitude towards knowledge sharing. Supporting these negative results, Self-Determination Theory (Ryan and Deci, 2000a) suggests that offering tangible rewards can be seen as more controlling instead of supporting and may therefore have a negative impact on attitude. Employees' expectations of receiving tangible rewards for knowledge sharing are thus expected to have a negative influence on attitudes towards knowledge sharing.

The following hypothesis is proposed:

H5: The greater the expected tangible rewards in relation to knowledge sharing behaviour, the less favourable the attitude towards knowledge sharing.

2.6.2.5 Verbal rewards

In contrast to tangible rewards, Self-Determination Theory suggests that receiving verbal rewards such as praise or comments on the behaviour, is not experienced as controlling but rather as supporting (Ryan and Connell, 1989). Rewards that can inform people about how they did or if they did well, can help increase feelings of competence and self-esteem.

Empirical evidence showing the effect of verbal rewards on attitude towards knowledge sharing is limited. But conceptual studies do highlight the importance of organisational recognition for knowledge sharing (Husted and Michailova, 2002; Yahya and Goh, 2002). For example, in a different field, McNeely and Meglino (1994) conducted a study of the antecedents of pro-social behaviour; 100 female secretaries were surveyed. They found that perceptions of recognition were significantly correlated with pro-social organisational behaviour. Furthermore, Vuori and Okkonen (2012) studied what motivates employees to use an intra-organisational media platform. By distributing a questionnaire in two case companies, they surfaced that although financial rewards were seen as one of the least motivating factors, several respondents commented that praise and words of thanks from superiors were seen as motivating factors for knowledge sharing. In addition to this, Paroutis and Al Saleh (2009) conducted 11 in-depth interviews to investigate which factors influence knowledge sharing using Web 2.0. Results suggested that users value support and recognition from their superiors with regards to their knowledge sharing. Thus, verbal rewards are expected to have a positive effect on the attitude towards knowledge sharing.

The following hypothesis is proposed:

H6: The greater the expected verbal rewards in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.6 Anticipated Reciprocal Relationships

When individuals believe that knowledge sharing can improve their mutual relationships with others, they are more likely to develop positive attitudes towards sharing (Bock et al., 2005; Lin, 2007; Chow and Chan, 2008). There is empirical evidence suggesting that there is a positive effect for anticipated reciprocal relationships on attitude towards knowledge sharing. One study investigated how social capital influenced organisational knowledge sharing using the TRA as a theoretical framework (Chow and Chan, 2008).The results suggest that social capital, and specifically social and network relations, positively influences attitude towards knowledge sharing. This finding supports earlier work by Bock at al. (2005) and Lin (2007), who also found anticipated reciprocal relationships positively influenced attitudes towards knowledge sharing. In addition, Bock and Kim (2002) also found that employees who believe they can improve mutual relationships with other organisational members through their knowledge sharing, had developed a more positive attitude towards knowledge sharing.

These results are consistent with the arguments of Constant et al. (1994, p.402). They refer to interdependence theory (Kelley and Thibaut, 1978) and argue that when individuals are influenced by their social and organisational context, their attitude is determined by their concern for future relationships with others and how others will see them. This concern is focused more on the long-term relationships than on a short-term extrinsic benefit. Thus, the following hypothesis is proposed:

H7: The greater the anticipated reciprocal relationships in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.6 Reputation

The belief that knowledge sharing will lead to enhanced reputation in the workplace may motivate individuals to share knowledge. Wasko and Faraj (2005) investigated the effect of reputation on the volume of contribution to an electronic network of practice also referred to as Message Boards. Their results indicated a positive, significant effect, which means that enhanced reputation was an important factor for people to engage in knowledge sharing.

Another study specifically tested factors that may influence an employee's attitude towards knowledge sharing (Chennamaneni et al., 2012). The results suggest that perceived enhanced reputation has a positive effect on employee attitudes towards knowledge sharing. Furthermore, Hall (2001) highlights that building an enhanced reputation is a long-term project. A good reputation is not something that can be acquired from one day to the other. Individuals who realise this, may be more inclined to engage in knowledge sharing in the long-term and this may require a permanent change in attitude towards knowledge sharing. The following hypothesis is proposed:

H8: The greater the expected enhanced reputation in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.

2.6.2.7 Subjective Norms regarding Knowledge Sharing

The Theory of Reasoned Action also assumes that subjective norms influence the intention to engage in behaviour (Fishbein and Ajzen, 1975). Subjective norms refer to the perceived social pressure in relation to engaging or not engaging in a particular behaviour (Ajzen, 1991). Applied to the knowledge sharing context, subjective norms reflect the individual's perceptions of whether organisational members whose beliefs may be important to the individual, accept, encourage and engage in knowledge sharing. (Chennamaneni et al., 2012; Fishbein and Ajzen, 1975).

A few studies have reported statistically insignificant relationships between subjective norms and behavioural intention (Pavlou and Fygenson, 2006; Welschen et al., 2012). On the contrary, Kankanhalli et al. (2005) showed that pro-sharing norms defined the context for knowledge sharing. As knowledge sharing occurs in a social context, norms are expected to have an influence on a person's intention to share. There has also been considerable other empirical work that shows support for the influence of the subjective norm construct on behavioural intention with regards to knowledge sharing (Bock et al., 2005; Chennamaneni et al., 2012; Lin and Lee, 2004). In keeping with this work, the following hypothesis is therefore put forward:

H9: The greater the subjective norms to share knowledge, the greater the intention to share knowledge.

Table 1 Hypotheses

H1: The more favourable the attitude towards knowledge sharing, the greater the intention to share knowledge.
H2: The greater the sense of self-efficacy in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H3: The greater the sense of meaningfulness in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H4: The greater the sense of impact in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H5: The greater the expected tangible rewards in relation to knowledge sharing behaviour, the less favourable the attitude towards knowledge sharing.
H6: The greater the expected verbal rewards in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H7: The greater the expected reciprocal relationships in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H8: The greater the expected enhanced reputation in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.
H9: The greater the subjective norms to share knowledge, the greater the intention to share knowledge.

2.7 Chapter Summary

In this chapter, the importance of motivation for organisational knowledge sharing was explained based on the literature. Different dimensions of motivation were discussed and previous studies on motivation dimensions and the various identified motivators were summarised and reviewed to identify gaps in the literature. A research model was developed to address these gaps and explore the relationships between the main motivators and knowledge sharing attitude and intention. Hypotheses were developed for each relationship. The following chapter outlines the methodology of this research including the steps that were taken in order to be able to answer the research questions.

3. Research Methodology

Chapter 3 will explain the research approach and methodology adopted in this study. First a description of the research approach taken in this study is given followed by a description of the research design and procedure. Subsequently, the development of the instrument is described. After that, the statistical method which is used to analyse the data is described.

3.1 Research Approach

This study has adopted a positivist, quantitative research approach. Some key elements of the positivist methodology are empirical evidence, scientific method, prediction and quantitative research methods. Positivists believe there is a theory-independent set of observation statements that can be used to verify the truth of a theory. They believe a theory should be tested with empirical evidence, that is, with evidence from a sense of experience (Chua, 1986). Valid, truthful and meaningful knowledge is obtained through observation and measurement. In this research dimensions and variables are also identified in order to do empirical measurements and hypothesis testing based on a set of observation statements from a survey.

Positivists are looking for universal regularities and causal relationships (Chua, 1986). They try to explain events by presenting it as an instance of a universal law (Chua, 1986). This model is also known as the scientific method. By taking a universal law and adding a statement of relevant initial or boundary conditions, a statement about an event is deduced (Blaug, 1992). The logic used to come to a statement is deductive logic (Tashakori

and Teddlie, 1998). This statement can then be verified with empirical evidence. The model for the relationship between extrinsic and intrinsic motivators and attitude and intention towards knowledge sharing was formed through the use of deductive logic. The model draws from several conceptual, theoretical relationships in the literature. It has been deduced from existing theories. The hypotheses that are formed are subsequently tested.

Positivists also believe that if we can explain events within their boundary conditions, then by knowing these conditions, we can also predict and control events (Guba and Lincoln, 2005). This study aims to test the influence of intrinsic and extrinsic motivators on knowledge sharing attitude and intention. The nature of the research question confirmatory and positivistic: How do intrinsic and extrinsic motivators influence knowledge sharing attitude and intention? This sets the boundary conditions by which predictions can be made about knowledge sharing. The results from this study should be considered limited to the variables that are studied within the context of the proposed model. There may be other variables beyond the boundary of the model. First the model and the different relationships drawn from existing theory are explained and then the model is tested in order for it to be used to predict knowledge sharing attitude and intention.

Positivists use mainly quantitative research methods such as survey methods, laboratory experiments and statistical and mathematical methods to arrive at universal truths (Chua, 1986; Tashakori and Teddlie, 1998). This study uses the survey method in the form of a questionnaire. The method that is used to test the model is statistical in the form of Partial Least Squares Path Modelling.

3.2 Research Design and Procedure

As mentioned in the previous section, this study uses a quantitative research approach with the main unit of analysis being individual employees. The survey method was adopted to collect the data. The items in the questionnaire have been developed by adapting measures that have been validated and used in prior research. After obtaining the approval from the Human Ethics Committee, the instrument was reviewed and tested by 5 senior academics / professors with knowledge of survey design, IS and Knowledge Management and a pre-test of the instrument was also done by 10 users of knowledge

management systems. Based on the results of the instrument testing and the suggestions that were made, minor changes were made to be ready for data collection.

In the following sections, first, the data collection procedure including the survey design and sample will be discussed. Subsequently, the instrument development will be described, followed by a detailed description of the data analysis technique.

3.2.1 Data Collection Procedure and Samples

The subjects of this research are people who work in an organisation where some knowledge management system or practice is in place. This study follows Paroutis and Al Saleh (2009) and assumes that knowledge can be created, shared and used by employees across all levels and all functional areas of an organisation. Where some studies solely focus on knowledge workers or management levels (Lin, 2007; Chennamaneni et al., 2012), here the subjects are employees across all layers of the organisation and functional areas.

Several organisations throughout New Zealand that have knowledge management systems or practices in place were approached. This selection process is suitable for this research because it ensures that the organisations where the respondents work actually have a knowledge management system or practice in place. This way the respondents are actually aware of knowledge sharing in a knowledge management context instead of knowledge sharing in general. One person from each company that was responsible for knowledge management was contacted and sent an information sheet about the project and procedure (see Appendix A). This person was responsible for facilitating the recruitment and distribution of the questionnaire to members in their organisation who are aware of and have access to knowledge management systems and practices. The companies received the option of using online electronic questionnaires or paper-based questionnaires. Then, the contact person informed the selected people about this project and either emailed them the link to the online survey or handed them the paper survey.

During the process of designing the questionnaire, much attention was given to the layout and format of the questionnaire in order to limit mistakes, missing values and increase the response rate. The questionnaire begins with an introduction into the research and clear definitions and instructions on how to complete it. Then, the questions are split into Part A and Part B. Part A consists of 38 questions, relating to the employee's feelings towards knowledge sharing with 3-5 questions used to represent each construct. Part B consists of 6 questions on demographics, that is age, gender, highest level of education, organisational

tenure, type and size. The questions have been split into blocks of 3-5 questions with a grey marked area in between blocks. This increases the visibility and clarity of the individual questions in the questionnaire.

The paper-based survey was designed using Microsoft Word. The logo of the University of Canterbury was inserted and it was printed on A4 size paper.

The online survey was designed using Qualtrics.com. Qualtrics.com is the world's leading survey technology provider. This is a validated website for doing online survey and it is also the website advised by the University of Canterbury. Using Qualtrics through the University of Canterbury, gave the online survey the logo and look and feel of the University. The submitted data was stored in the database of Qualtrics.com where the researchers can log in with a username and password to gain access. The individual responses can be viewed at any time and the data can be downloaded in Excel format.

In the instances where paper-based surveys were used, the contact person collected the completed surveys and returned them to the researcher either by mail or in person. The online survey was open for a period during which two rounds of reminder emails were sent, in order to ensure a higher response rate. Participation was completely voluntary and the survey was available to employees from all layers in the organisations.

3.2.2 Ethical Considerations

Before conducting the survey, an application for ethics assessment was completed and sent to the University of Canterbury Human Ethics Committee for approval. The letter from the Human Ethics Committee confirming the approval of the project is attached in Appendix B.

3.3 Instrument Development

A questionnaire was developed to measure employees' perceptions of various elements related to organisational knowledge sharing. Fourteen constructs were developed in this study: Self-efficacy, meaningfulness, impact, verbal rewards, anticipated reciprocal relationships, reputation, tangible rewards, subjective norm, attitude towards knowledge sharing (explicit/tacit), intention to share knowledge (explicit/tacit).

To measure the various constructs, scales were adapted from validated instruments and minor modifications were made with regards to the wording of the questions in order to fit the knowledge sharing context. All constructs are measured using multiple questions.

Each question is measured on a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) with 4 (neither agree or disagree) as the midpoint. In addition, the survey instrument included 6 questions on the demographics of the individuals and the organisations they work in. Although the questions were adapted from established, validated scales, all questions were reviewed with care and attention to detail in order to avoid any ambiguity.

The scales measuring self-efficacy, meaningfulness and impact were adapted from Spreitzer's (1995) empowerment scale. This is a self-report scale that includes items adapted from previous work-related scales of self-efficacy (Jones, 1986), meaningfulness (Tymon, 1988) and impact (Ashforth, 1989). Both self-efficacy and meaningfulness included three items and impact included four items.

The five items measuring verbal rewards were adapted from several different scales, previously used by McNeely and Meglino (1994). These in turn were sourced from Sims et al.'s (1976) "Job Characteristics Inventory"(feedback), Ryan and Connell's (1989) "Self-regulation Questionnaire" (praise) and Amabile et al.'s (1994) "The work preference inventory"(recognition).

The scales for tangible rewards were adapted from Kankanhalli et al. (2005), who developed the scales based on several studies (Kalman, 1999; Hargadon, 1998; Hall, 2001; Davenport and Prusak, 1998). These included three questions. The same questions were used by Lin (2007), which further validated the scale. The scales for anticipated reciprocal relationships were adapted from Bock et al. (2005). They developed five measurement items which were based on relevant theories and prior studies. The scale was further validated by Lin (2007). Three items which were used to measure reputation were adapted from Wasko and Faraj (2005) and one item was adapted from Kankanhalli et al. (2005).

The items measuring subjective norms (three items), attitude (four items) and intention (four items) were adapted from Fishbein and Ajzen (1975) who developed the TRA. These scales have been validated in many studies using TRA (Bock et al., 2005; Lin, 2007; Welschen et al., 2012).

Appendix C gives the wording of each measurement item as it was presented in the instrument.

3.4 Data Analysis Techniques

Structural Equation Models include several statistical methodologies which can be used to estimate causal relationships based on a theoretical model. The models link two or more Latent Variables, which are measured through a number of observable indicators (manifest variables). One approach to Structural Equation Models is the Partial Least Squares (PLS) approach (Vinzi et al., 2010). PLS path modelling assesses both the reliability and validity of the measures of theoretical constructs and estimates the relationships among these construct (Chin, 1998). The PLS regression oriented methodology originated in the 1960's, when the creation of models and methods for the social sciences was heavily pursued by Herman O.A. Wold and when models aimed at prediction were highly valued (Vinzi et al., 2010). This technique can be used to analyse measurement and structural models with multi-item constructs and its use has been validated by prior research in the Information Systems area (Bock et al., 2005; Wasko and Faraj, 2005). PLS is particularly oriented to optimising predictions and makes minimal demands with respect to distribution and measurement scale (Vinzi et al., 2010). This path modelling approach also makes minimal demands to sample size, requiring 10 times the number of predictors, using either the indicators of the most complex formative constructs or the largest number of antecedent constructs leading to an endogenous construct, whichever is greater (Chin, 1998).

In this study, PLS is chosen for the analysis of the model and testing of the hypotheses, because this approach can be used to predict relationships in a highly complex model with a large number of independent variables and its use has been validated in prior information systems and knowledge management studies (Bock et al., 2005; Wasko and Faraj, 2005; Welschen et al., 2012). As the recommended procedure, the PLS model will be analysed and interpreted in two stages: first a confirmatory factor analysis to assess the reliability and validity of the measurement model and then an examination of the structural relationships (Bock et al., 2005; Wasko and Faraj, 2005). Furthermore, PLS-Graph version Build 1130 (Chin, 2001) was used for the analysis.

4. Data Analysis Results

This chapter presents the empirical results of the research model using data analysis techniques discussed in Chapter 3. First, the demographical analysis of the respondents is presented. Then, the evaluation of the measurement model is discussed followed by the

assessment of the structural model. Finally, the results of the research hypotheses are presented.

4.1 DEMOGRAPHICS

The online survey was created using Qualtrics specifically designed for the University of Canterbury (https://canterbury.qualtrics.com) and made available for a period of one month during May/June 2013. As described in Chapter 3, links to the survey were emailed to contact persons in organisations with knowledge management, who then distributed the link to members of their organisation. Over the period, 75 respondents started the survey, of which 55 completed the survey. The completion rate was 73%. Of the 55 completed questionnaires, one questionnaire had 1 missing value and one questionnaire had 2 missing values.

There were 79 responses to the paper-based survey during the period May/June 2013. Of these 79 responses, 1 questionnaire was not usable due to too many missing values. Three questionnaires had missing values, but were still usable. To deal with the missing values, a missing values replacement was done using SPSS 20.0. This produced a final, analysed sample of 133 respondents.

The characteristics of the respondents such as gender, age, education, organisational tenure as well as organisational type and organisational size are summarised in Table 2.

The sample included 59% males and 41% females. About half of the respondents were aged between 20-39 years (49%), 30% between 40-49 years, and only 1 person was younger than 20 years and the remaining 21% was over 50 years. Over half of the respondents (56%) had worked in their organisation for 3 years or less, 17% had worked in their organisation more than 10 years and the remaining 27% between 4 and 10 years. In addition, the respondents were asked to indicate their highest level of education. Of the sample, 48% had an undergraduate degree and 23% had a postgraduate degree. The remaining 29% had some undergraduate experience (0.16%) or a secondary school qualification (0.13%).

The respondents were also asked questions about the size and type of the organisation they worked in. Most organisations were medium-sized with 100-500 staff (62%). 20% of the organisations were between 20-100 staff and none had less than 20 staff. 18% of the organisation were large with 17% over 1000 staff. From the sample, 31% of the organisations respondents worked in were Manufacturing and Production, 21% were Information,Technology and Communications. 14% of the organisations were financial

services with the remaining 34% consisting of Agriculture, Horticulture and Forestry (3%), Science and Biotechnology (2%), Education (8%), Government (8%), and Other (13%).

Table 2 Demographic Profile of Respondents

	Frequency	Percent
Gender:		
Male	78	0.59
Female	55	0.41
Age:		
Less than 20 yrs	1	0.01
20-29 yrs	33	0.25
30-39 yrs	32	0.24
40-49 yrs	40	0.30
50-59 yrs	22	0.17
Over 60 yrs	5	0.04
Organisational tenure:		
less than 1 year	25	0.19
1-3 years	49	0.37
4-6 years	23	0.17
7-10 years	14	0.10
Over 10 years	22	0.17
Highest level of education:		
Secondary School Qualification	17	0.13
Some Undergraduate experience	21	0.16
Undergraduate Degree	64	0.48
Postgraduate Degree	31	0.23
Type of Organisation:		
Manufacturing and Production	41	0.31
Information, Technology and	28	0.21

Communications		
Agriculture, Horticulture, and Forestry	4	0.03
Science and Biotechnology	3	0.02
Retail	0	0.00
Education	11	0.08
Tourism	0	0.00
Energy	0	0.00
Financial Services	19	0.14
Government	10	0.08
Other	17	0.13
Size of Organisation		
Less than 20 staff	0	0.00
21-50 staff	7	0.05
51-100 staff	20	0.15
101-200 staff	52	0.39
201-500 staff	31	0.23
501-1000 staff	1	0.01
Over 1000 staff	22	0.17

4.2 Descriptive Analysis

Descriptive statistics provide a summary showing the main features of the sample. Here, the mean and standard deviation for each construct are provided in Table 4. Descriptive analysis was performed using Excel 2007.

The following section presents the results of the research model, including the measurement model and the structural model.

4.3 Results

This section presents the PLS estimates of the research model. PLS-Graph (version 3.0) was used to analyse the data. First, results for the research model are presented. Subsequently, results of the hypotheses are summarised.

4.3.1 RESULTS OF THE RESEARCH MODEL

The research model was developed to tests the influence of the extrinsic and intrinsic motivators on knowledge sharing attitude and intention. First, the measurement model is evaluated in order to test the validity and reliability of the constructs and indicators, followed by the evaluation of the structural model to test the hypotheses.

4.3.1.1 Measurement Model

The measurement model was tested by performing a confirmatory factor analysis. The constructs in the research model are reflective. For reflective constructs, the indicator reliability, convergent validity, and discriminant validity need to be examined to assess the accuracy of the instrument items (Vinzi et al., 2010). Each of these are discussed below.

4.3.1.1.1 Indicator reliability

The indicator reliability specifies to what extent each indicator reflects the latent variable. This can be assessed by PLS item loadings and weight score. For the evaluation of reflective constructs, the item loadings are more suitable, whereas for formative constructs the weight score is more suitable (Vinzi et al., 2010). According to Vinzi et al. (2010, p.694), more than 50% of an indicator's variance should be explained by the latent construct. The threshold value for item loadings of the latent constructs on an indicator variable is 0.7. Item loadings larger than 0.7 are acceptable (Vinzi et al., 2010). Reflective indicators should be eliminated from measurement models when their loadings are less than 0.4 (Hulland, 1999, p.198 in Vinzi et al., 2010). In addition, for a significance level of 0.05, the T-statistics should be higher than 1.65 and for a significance level of 0.01, the T-statistics should be more than 2. Table 3 below presents the item loadings and T-statistics for all the indicators.

Table 3 **Indicator Loadings**

Construct	Item	Loading	T-Value	Significance Level
Self-efficacy	SE01	0.9093	41.952	0.01
	SE02	0.9223	60.858	0.01
	SE03	0.9346	48.662	0.01

Meaningfulness	Mean01	0.9464	75.433	0.01
	Mean02	0.9480	83.610	0.01
	Mean03	0.9612	77.968	0.01
Impact	Impact01	0.8883	41.604	0.01
	Impact02	0.9240	50.318	0.01
	Impact03	0.9607	171.68	0.01
	Impact04	0.9582	138.91	0.01
Verbal Rewards	VerbRewSup01	0.9594	68.518	0.01
	VerbRewSup02	0.9513	67.904	0.01
	VerbRewSup03	0.9516	74.072	0.01
	VerbRewSup04	0.9259	36.527	0.01
	VerbRewSup05	0.9151	28.030	0.01
Anticipated Reciprocal Benefits	Reciproc01	0.9054	59.290	0.01
	Reciproc02	0.8906	37.235	0.01
	Reciproc03	0.9107	54.232	0.01
	Reciproc04	0.8250	16.477	0.01
	Reciproc05	0.8175	19.141	0.01
Reputation	Reput01	0.8450	31.520	0.01
	Reput02	0.9253	66.550	0.01
	Reput03	0.9159	42.664	0.01
	Reput04	0.9025	27.803	0.01
Tangible Rewards	TangRewards01	0.6373	2.312	0.01
	TangRewards02	0.8868	4.767	0.01
	TangRewards03	0.9649	4.908	0.01
Attitude towards Knowledge Sharing	Attitu01	0.8501	29.036	0.01
	Attitu02	0.8539	28.023	0.01
	Attitu03	0.9125	33.089	0.01
	Attitu04	0.8486	18.621	0.01
Intention to Share Knowledge	Intent01	0.7066	11.921	0.01
	Intent02	0.9275	48.968	0.01
	Intent03	0.7930	11.321	0.01
	Intent04	0.9366	54.413	0.01
Subjective Norms	SbNorm01	0.9152	18.210	0.01
	SbNorm02	0.9564	71.153	0.01
	SbNorm03	0.9539	54.327	0.01

The statistical results in Table 3 show that most items loaded higher on their respective constructs than 0.7 with a significance level of 0.01, except one item for tangible rewards

which had an item loading of 0.6373. This is lower than 0.7 but higher than the 0.4 threshold for elimination. Overall, the item reliability is sufficient.

4.3.1.1.2 Construct Reliability and Convergent Validity

Construct reliability assesses whether all the construct's indicators together provide an adequate measurement of the construct (Vinzi et al., 2010). In order to check how well a construct is measured by its underlying indicators, the composite reliability measure (CR) can be used. CR can vary between 0 and 1. The recommended threshold for a reliable construct is 0.7 (Hair et al., 1998).

Convergent validity assesses the degree to which the indicators of the same construct are inter correlated. It can be measured by the average variance extracted (AVE) (Vinzi et al., 2010). The AVE measure should indicate a value of 0.5 or higher to be sufficient (Fornell and Larcker, 1981), which means that at least 50% of the variance of the reflective latent variable is explained by the variance of the indicators.

Table 4 Descriptive Statistics, Composite Reliabilities and Average Variance Extracted

Measures	Items	Mean	Standard Deviation	Composite Reliability	Average Variance Extracted
Self-Efficacy	3	6.00	0.991	0.945	0.850
Meaningfulness	3	5.50	1.140	0.967	0.906
Impact	4	4.39	1.400	0.964	0.871
Verbal Rewards	5	4.00	1.415	0.975	0.885
Tangible Rewards	3	3.00	1.430	0.876	0.708
Anticipated Reciprocal Relationships	5	5.00	1.046	0.940	0.758
Reputation	4	5.00	1.101	0.943	0.806
Attitude	4	5.00	0.955	0.923	0.751
Subjective Norms	3	5.00	1.174	0.959	0.887
Intention	4	6.00	0.915	0.909	0.716

Attitude=Attitude towards Knowledge Sharing; Intention= Intention to Share Knowledge

Table 4 shows the results of the construct reliability and convergent validity analysis. These estimates can be obtained from the generated output of the bootstrap technique in PLS-Graph 3.0. The composite reliability values range from 0.876 to 0.975, which are higher than the 0.7 threshold. The AVE by this study's measures range from 0.708 to 0.906, which are also above the acceptability value. Therefore construct reliability and convergent validity for all constructs are acceptable.

4.3.1.1.3 Discriminant Validity

Besides the assessment of the reliability of the indicators and constructs, a thorough evaluation of the measurement model also includes discriminant validity. There are two ways to confirm discriminant validity:

1. Discriminant validity is confirmed when the individual indicators load above 0.50 on their associated construct and when the loadings within constructs are higher than those across constructs. Appendix D shows the loadings and cross-loadings for the items used in this study. All indicators loaded above 0.50 on their associated constructs and all indicators loaded higher on their associated construct than they loaded on any other construct.
2. Establishing discriminant validity in PLS also requires analysis on the square root of the AVE as recommended by Fornell and Larcker (1981). Discriminant validity is satisfactory when the square root of the AVE for each construct is greater than the levels of correlations involving the construct (Vinzi et al., 2010). This indicates that more variance is shared between the indicators of a construct and the respective construct, than with another construct representing a different set of indicators (Fornell and Larcker, 1981). Table 5 lists the correlation matrix, with correlations among constructs and the square root of the AVE on the diagonal. Table 3 presents the correlations of latent variables and the squared AVE's for each latent variable. In all cases the square root of the AVE for each construct is larger than the correlation of that construct with other constructs in the model, which further confirms discriminant validity.

Table 5 Correlations of Latent Variables*

	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Self-Eff	**0.922**									
Meaningf	0.499	**0.952**								
Impact	0.462	0.421	**0.933**							
VRewards	0.31	0.352	0.465	**0.941**						
Reciproc	0.406	0.554	0.538	0.45	**0.871**					
Reputati	0.332	0.399	0.507	0.499	0.625	**0.898**				
Tangible	0.186	0.252	0.397	0.365	0.295	0.534	**0.841**			
Attitude	0.576	0.582	0.447	0.305	0.612	0.564	0.303	**0.867**		
Intentio	0.486	0.547	0.38	0.255	0.594	0.494	0.282	0.75	**0.846**	
Subjecti	0.438	0.369	0.41	0.379	0.522	0.515	0.333	0.496	0.466	**0.942**

*Diagonal elements are the square root of AVE.

These values should exceed the interconstruct correlations for adequate discriminant validity.

Self-Eff=Self-Efficacy; Meaningf=Meaningfulness; VRewards=Verbal Rewards; Reciproc= Anticipated Reciprocal Relationships; Reputati=Reputation; Tangible=Tangible Rewards; Attitude=Attitude towards Knowledge Sharing; Intentio= Intention to Share Knowledge; Subjecti=Subjective Norms

4.3.1.1.4 Common method bias

To test for common method bias, the Harman one-factor test was performed which included an exploratory factor analysis on all survey items. The value (calculated using SPS 20.0) is 41.33%, meaning that no single factor accounted for more than 50% of the variance. Therefore, common method bias is not likely to be an issue in this study.

Confirmation of the reliability and validity of the measurement model gives assurance of the quality of the structural model. A detailed discussion of the results of the structural model is outlined in the next section.

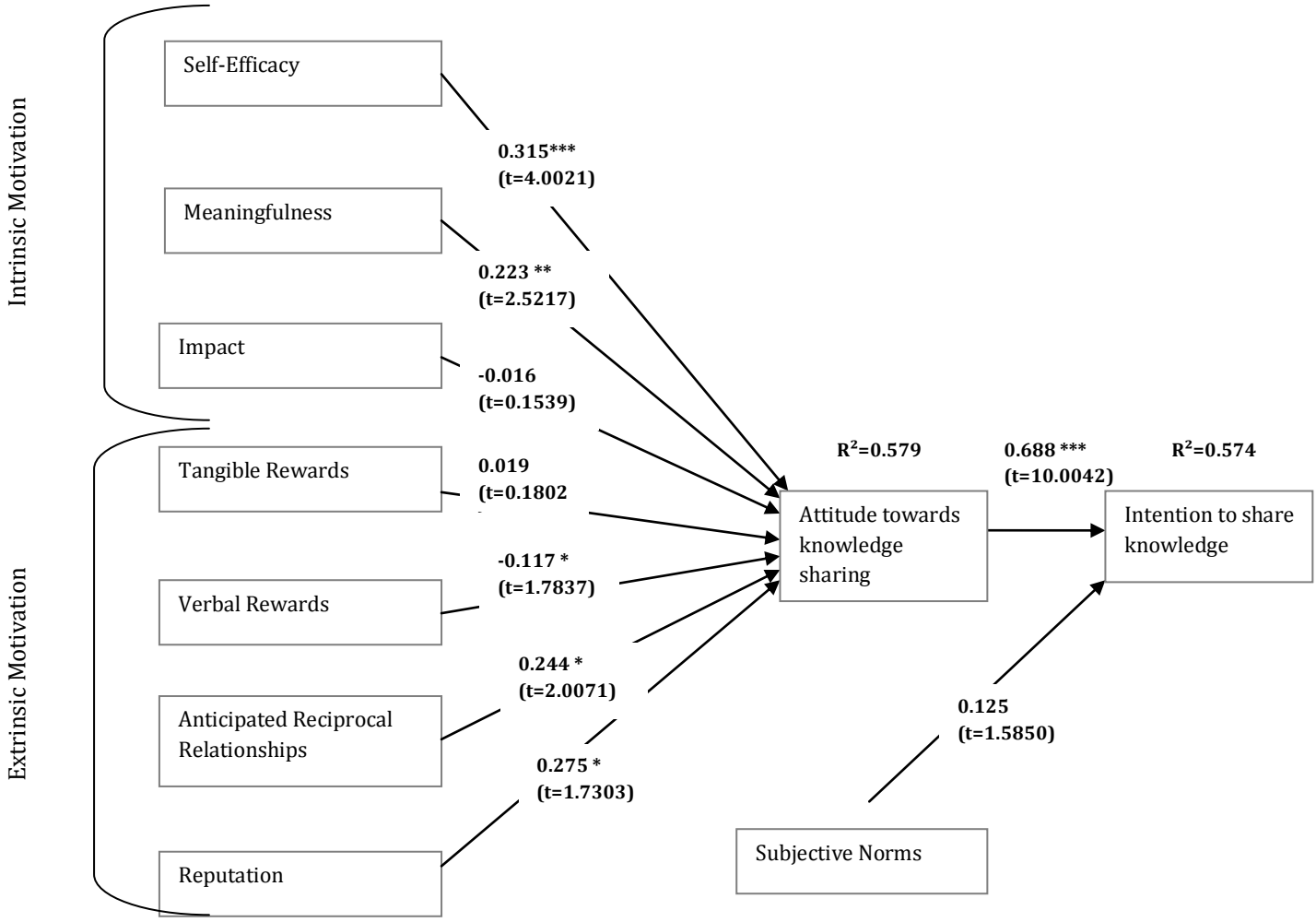
4.3.1.1 Structural Model

With an adequate measurement model, the relationships among hypothesised constructs were tested with PLS. Exogenous variables are latent variables that only predict other latent variables. Endogenous variables are dependent variables in at least one causal relationship (Vinzi et al., 2010). The evaluation of the quality of the structural model is based on the determination coefficient of the endogenous variable (R^2-value) and also on the directions and significance of the path coefficients (Vinzi et al., 2010). The R^2 values represent the amount of variance explained by the independent variables. The estimates of the path coefficients indicate the strengths of the relationships between dependent and independent variables. Together, the loadings and significance of the path coefficients and R^2 -values indicate how well the data support the hypothesized model.

The determination coefficient R^2 reflects how much of the variation in the dependent variable is explained by the variation in the independent variables. R^2 can assume values between 1 and 0. An R^2-value of 1 means that 100% of the variance in de dependent variable is predicted by the independent variable. There are no generalised thresholds for acceptable levels of R^2 (Vinzi et al., 2010). The bigger the R^2, the greater the predictive power of the research model.

The individual path coefficients of the PLS structural model represent the predictive relationships between constructs. The significance of the estimated path coefficients estimated with PLS can be tested with T-statistics, which can be obtained by the PLS re-sampling bootstrapping technique. Hypotheses are not supported when the paths are insignificant or show signs with a different direction than hypothesised. Hypothesised relationship is supported, when the path direction is similar to the hypothesis and paths are significant. Appendix E shows the '.lst' file generated by PLS to examine the causal relationships. Appendix F shows the output of the bootstrapping procedure to show the statistical significance. The bootstrapping technique produced 100 re-samples.

Figure 3 below presents the results of the analysis of the structural model. The significance of the path-coefficients was generated using the PLS-Bootstrap re-sampling procedure. The results of the structural model analysis will be presented below.



Significance level: * p≤0.05 ** p≤0.02 *** p≤0.001

Figure 3

The results show that attitude towards knowledge sharing and subjective norms accounted for 0.574 of the variance observed for intention to share knowledge. The antecedent variable attitude (β =0.688; p≤0.001) was significant with respect to intention to share knowledge, however subjective norms (β =0.125) were not significant regarding intention to share knowledge. Hypothesis 1 is therefore supported in congruence with

prior research applying TRA to explain behavioural intentions, but no support has been found for Hypothesis 9.

The model further accounted for 0.579 of the variance observed for attitude towards knowledge sharing. The results were mixed with regard to the relationships of the motivators and attitude towards knowledge sharing. For the intrinsic motivators, self-efficacy (β=0.315; p=≤0.001) and meaningfulness (β=0.223; p=≤0.02) were significant determinants of attitude towards knowledge sharing. Hypotheses 2 and 3 were supported. The expected influence of impact (β=-0.016) was not significant with respect to attitude towards knowledge sharing. Hypothesis 4 was therefore not supported. For the extrinsic motivators, verbal rewards (β=- 0.117; p=0.05) had an unexpected negative influence on attitude towards knowledge sharing; Hypothesis H6 was not supported. Hypothesis H5 was also not supported with the effect of tangible rewards not being significant (β=0.019). The results did show significant links between attitude and anticipated reciprocal relationships (β=0.244; p=0.05) and reputation (β=0.275; p=0.05). Hypothesis 7 and Hypothesis 8 were therefore supported. These results are summarised in Table 6.

Table 6 Results of Hypotheses Testing

Hypotheses	Results
H1: The more favourable the attitude towards knowledge sharing, the greater the intention to share knowledge.	**Supported**
H2: The greater the sense of self-efficacy in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Supported**
H3: The greater the sense of meaningfulness in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Supported**
H4: The greater the sense of impact in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Not Supported**
H5: The greater the expected tangible rewards in relation to knowledge sharing behaviour, the less favourable the attitude towards knowledge sharing.	**Not Supported**
H6: The greater the expected verbal rewards in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Not Supported**
H7: The greater the expected reciprocal benefits in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Supported**

H8: The greater the expected enhanced reputation in relation to knowledge sharing behaviour, the more favourable the attitude towards knowledge sharing.	**Supported**
H9: The greater the subjective norms to share knowledge, the greater the intention to share knowledge.	**Not Supported**

5. DISCUSSION

5.1 DISCUSSION OF THE RESULTS

The main research question in this study was: How do intrinsic and extrinsic motivators influence knowledge sharing attitude and intention? To answer this, two sub-questions needed to be addressed. The first sub-question was: what are the key extrinsic and intrinsic motivators as identified by the literature? From a thorough investigation of the relevant prior literature, the main intrinsic motivators are self-efficacy, meaningfulness and impact. The main extrinsic motivators are tangible rewards, verbal rewards, anticipated reciprocal relationships and reputation. The second sub-question was: what is the impact of these motivators on knowledge sharing attitude and intention? Hypotheses were proposed to examine the relationships between the intrinsic and extrinsic motivators and knowledge sharing attitude and intention. The results show support for some of the hypotheses. The following sections will discuss the results of the hypotheses testing in detail.

5.1.1 UNDERSTANDING THE RELATIONSHIP BETWEEN KNOWLEDGE SHARING ATTITUDE, SUBJECTIVE NORMS AND INTENTION TO SHARE KNOWLEDGE

As the Theory of Reasoned Action suggests, the more positive an individual's attitude towards organisational knowledge sharing, the greater his or her intention to share knowledge. Findings from the structural model supported this hypothesis. This was also found in other studies about knowledge sharing using TRA (Bock et al., 2005; Lin, 2007; Welschen et al., 2012).

Results showed that subjective norms was not found to be a significant determinant of intention to share knowledge. Even though this outcome was not hypothesised, there is research which likewise suggests that the influence of subjective norms on intention may depend on the settings in which the behaviour takes place (Ajzen and Fishbein, 1980; Hsu and Lin, 2008; Venkatesh and Davis, 2000). Venkatesh and Davis (2000) found for example that there was a difference between voluntary and mandatory settings, where subjective norms had a direct effect for the latter and not for voluntary use. Furthermore, it is argued by Muller, Spiliopoulou and Lenz (2005) that visibility of the behaviour and a non-anonymous setting, in which the knowledge sharer can be identified, may be conditions in which subjective norms can affect knowledge sharing. In this study, the likelihood that the settings for knowledge sharing would vary was high. The sample was drawn from across different units within firms with the respondents also being from different organisations and different industries. For example, knowledge sharing may have been invisible in a voluntary setting or acknowledged in a mandatory setting, which could impact the results. But this was undetectable due to the limited samples drawn from each setting. Therefore, further research could investigate the influence of subjective norms across different knowledge sharing contexts further.

The R^2 for intention to share knowledge was 0.574, which indicated that attitude together with subjective norms (though insignificant) accounted for more than half (57.4%) of the variance observed for intention to share knowledge. This study focused on the impacts of attitude and subjective norms on intention. The results indicate there are other factors that may also impact the variability in an individual's intention to share knowledge. For instance, Chennamaneni et al. (2012) tested for the impact of perceived behavioural control on knowledge sharing intention. Results show that the perceived ease or difficulty of knowledge sharing, combined with the individual's sense of control over his or her knowledge sharing, was also a significant determinant of intention to share knowledge. Future studies can also include this factor to explore its impact on knowledge sharing intention.

5.1.2 INTRINSIC MOTIVATORS AND KNOWLEDGE SHARING ATTITUDE

The other results provided mixed support for the hypothesised relationships as shown in the research model (Figure 3).

Findings show that self-efficacy is a significant determinant of employee attitude towards knowledge sharing, with a path coefficient of 0.315 and significance at the 0.001 level. The results are consistent with previous empirical results (Lin 2007; Lin, 2009; Kankanhalli et

a;., 2005; Hsu et al., 2007; Chen and Hung, 2010). The notion is supported that if employees judge their own capability to share knowledge highly, they will have a more favourable attitude towards knowledge sharing (Cabrera and Cabrera, 2005; Gagné, 2009). This implies that in order to engage in knowledge sharing behaviour at work, feelings of self-efficacy may be an important requirement. Where previous studies have measured self-efficacy as a single construct to reflect intrinsic motivation, this study included other intrinsic motivators as well. The results also showed that self-efficacy has indeed the greatest influence on attitude towards knowledge sharing, compared to other intrinsic motivators.

Besides self-efficacy, meaningfulness is also an intrinsic driver of a favourable attitude towards knowledge sharing with a path coefficient of 0.223 and significant at the 0.02 level. This finding indicates that not only do employees need to feel capable of knowledge sharing, they also need to feel that knowledge sharing is "valuable, useful and worthwhile" (Zhang et al., 2009). This further confirms the results of Welschen et al. (2012) who found the same positive effect. When individuals experience knowledge sharing to be meaningful and when they feel knowledge sharing is beneficial and worth the effort, this positively affects their attitude towards knowledge sharing. With a few exceptions (Lin et al., 2009; Welschen et al., 2012), meaningfulness has been largely omitted from much of the empirical research regarding knowledge sharing. However, the findings from this study confirm that meaningfulness may be an important intrinsic motivator for knowledge sharing.

This study did not find a significant influence of impact on attitude towards knowledge sharing. There has been limited evidence in the knowledge sharing literature of the relationship between impact and attitude towards knowledge sharing. The result of this study provides an addition to the empirical evidence. Previous results were mixed; Welschen et al. (2012) found a significant positive effect regarding the influence of impact on knowledge sharing attitude. Chiu et al. (2006) also provided support for the importance of impact for knowledge sharing in virtual communities. In contrast, Hsu et al (2007) did not find a significant effect. A possible explanation may be that organisational context may make a difference to the effect of impact on attitude towards knowledge sharing. For example, the impact of one's knowledge sharing may be less visible in a virtual context, such as virtual knowledge sharing networks than in a non-virtual organisation (Hsu et al., 2007). This may cause individuals to perceive a lack of impact regarding their knowledge sharing.

Another explanation for this result could be that most respondents do not receive information (feedback) regarding the outcome of their knowledge sharing. They may not always be aware of whether their knowledge sharing could or does have an impact on the organisation, because they do not have any knowledge of the results of their efforts. This is supported by Hackman and Oldham (1976, P.251) who also claim that knowledge of results is important in order to gain a sense of impact.

5.1.3 EXTRINSIC MOTIVATORS AND KNOWLEDGE SHARING ATTITUDE

This study also found that contrary to the hypotheses, verbal rewards had a very small, but negative effect on attitude with a path coefficient of -0.117 and at a 0.05 significance level. Previous research did however indicate that verbal rewards may be a motivating factor although this had rarely been investigated in the knowledge sharing context. This result is surprising because studies in other disciplines, such as organisational psychology (Deci et al., 1999; Frey and Jegen, 2001), show that verbal rewards are important motivators for behaviour. In addition, respondents from several knowledge sharing studies indicated that it is important for them to get recognition for their knowledge sharing and to feel that their knowledge sharing is being acknowledged (Vuori and Okkonen, 2012; Paroutis and Al Saleh, 2009). This result may be supported by Kohn (1993), who argues that rewards can only temporarily change our behaviour and do not have a lasting effect. From this point of view, it is suggested that rewards do not change the underlying attitude towards behaviour. They merely produce a short-term effect on behaviour.

The effect of tangible rewards on attitude was not significant. This was not surprising as previously mentioned, the results of the effect of tangible rewards on attitude towards knowledge sharing were negative or insignificant. (Lin, 2007; Bock et al., 2005; Bock and Kim, 2002; Chennamaneni et al., 2012; Kwok and Gao, 2006). This further supports Osterloh and Frey's (2000) argument that for tasks such as knowledge sharing, which are complex, interactive, and require lasting commitment, tangible rewards may not be an effective motivator.

The results of this study suggest that giving rewards in general may not improve the attitude towards knowledge sharing. That extrinsic rewards turned out to be ineffective in developing positive attitudes was already suggested by Kohn (1993). According to this author, rewards are ineffective in producing lasting changes in attitude and behaviour. They do not create a lasting commitment to engage in certain behaviour and can only temporarily change what we do. When the reward is no longer available, people change

back to their old behaviours. In this regard, rewards do not actually alter the attitudes that underlie our behaviours.

The other two extrinsic motivators, anticipated reciprocal relationships and reputation, did have significant positive influences on attitude, confirming the hypotheses. The results suggest that the attitudes of people at work towards knowledge sharing, are determined positively by expectations regarding reciprocal relationships. This is consistent with the results of Bock et al. (2005) and Lin (2007). When people feel that, by engaging in knowledge sharing they can improve mutual relationships at work, they develop more positive attitudes towards sharing knowledge.

The benefit of enhanced reputation through sharing knowledge with co-workers is also conducive to a more positive attitude towards knowledge sharing. These results are supportive of the premise of social exchange and indicate that the expectation of extrinsic benefits that increase social rewards may motivate people to engage in social interactions such as knowledge sharing behaviour (Bartol and Srivastava, 2002).

5.1.4 SUMMARY

In summary, this section discusses the findings of the study presented in Chapter 4, including the effects of the different extrinsic and intrinsic motivators on knowledge sharing attitude and intention. The results showed support for some of the hypotheses which were developed in the literature review chapter, whereas some results were unexpected.

6. CONCLUSION

This research makes several significant contributions to research and practice in the field of knowledge management. The sections below outline the theoretical and practical contributions. Furthermore, the study's limitations are discussed, followed by directions for future research.

6.1 CONTRIBUTIONS

In an extensive review of the knowledge sharing literature, several knowledge gaps were identified. Based on these gaps, this study aimed to investigate motivation for

organisational knowledge sharing. In specific, a comprehensive research model was developed to examine the impacts of extrinsic and intrinsic motivators on knowledge sharing attitude and intention. This research has generated several contributions to theory. These will be discussed in the following sections. Furthermore, the implications of the results for practice are presented, followed by a discussion of the limitations to the research.

6.1.1 Theoretical Contribution

This study has used motivational theories (Ryan and Deci, 2000a; Thomas and Velthouse, 1990; Vroom, 1964) to explore the influence of different motivators on knowledge sharing attitude from a two-dimensional perspective, that is extrinsic motivation and intrinsic motivation. A comprehensive set of extrinsic and intrinsic motivators has been investigated for their influence on knowledge sharing attitude. This study extends prior research which focused on a limited set of extrinsic and intrinsic drivers for knowledge sharing.

Specifically this research contributed to the advancement of theory on organisational knowledge sharing in the following ways. First, although relationships between knowledge sharing and intrinsic as well as extrinsic motivators have been confirmed in previous research, few studies have examined these all together in one model. This study has contributed to provide a comprehensive understanding of the extrinsic and intrinsic motivational drivers for knowledge sharing and showed how they impact knowledge sharing attitude and intention. The main contribution of this study is that it empirically examined the effects of different extrinsic and intrinsic motivational drivers for knowledge sharing on attitude, including motivators that have received less attention in prior research and provided important insights into how they influence employees' attitudes towards organisational knowledge sharing and intention to share knowledge.

Secondly, although prior research has included organisational rewards as a determinant of knowledge sharing, and specifically knowledge sharing attitude, it has failed to distinguish between tangible and verbal rewards. Motivational theories suggest that tangible rewards may affect attitude towards behaviour differently than verbal rewards, but this has not been empirically examined as such in the knowledge sharing literature. This study has addressed this gap and contributed to our understanding of the impact of external rewards on attitudes towards knowledge sharing.

Thirdly, this study incorporated intrinsic motivators for knowledge sharing that have been largely ignored in previous studies, namely meaningfulness and impact. Earlier studies have focused mainly on process-related intrinsic factors like self-efficacy. Also including outcome-related variables (meaningfulness and impact) as identified from the body of research on motivation, has contributed significantly to theory by extending previous models with a more comprehensive set of intrinsic motivators for knowledge sharing.

6.1.2 Implications for Practice

This study provides some important contributions and implications for organisations and their managers. The results showed that intrinsic motivators as well as extrinsic motivators, in particular, self-efficacy, meaningfulness, anticipated reciprocal relationships and reputation, are very important in determining the attitude of employees towards knowledge sharing. This implies that business managers need to use a wider range of strategies to address the factors that encourage their employees to share knowledge, rather than putting an emphasis on a single motivator.

In order to facilitate extrinsic motivations, many organisations still have a major focus on offering rewards to encourage knowledge sharing. However, this research has confirmed that offering rewards for knowledge sharing such as monetary rewards or praise, do not alter an employee's attitude towards knowledge sharing, meaning it is not a long-term beneficial solution to encourage organisational knowledge sharing. One important implication of this study is therefore that organisations need to build their strategies around other extrinsic motivators such as expected reciprocal relationships and reputation.

Managers need to put effort towards creating an environment conducive to forming mutual social exchange relationships. Specifically, they can actively bring people together by the formation of knowledge networks which contribute to a knowledge-based culture. Managers can also encourage their employees to make the time and put in the effort to help their co-workers if they need their knowledge (Chennamaneni et al., 2012). Additionally, organisations should encourage social events for staff so they can develop social relationships with their co-workers (von Krogh, 1998).

Gaining enhanced reputation also seems important to having a more positive attitude towards knowledge sharing. Managers should aim to publicly acknowledge the knowledge contributions made by their employees to promote their reputation. For example,

assigning status to individuals in electronic networks of practice, and showing this status to other members of the network or organisation, could be helpful to build reputations (Wasko and Faraj, 2005).

Managers should also aim to create meaningfulness for their employees. One way to do this is to develop a work environment that is humane, challenging and rewarding (Cartwright and Holmes, 2006). If people feel passionate about and energized by their work, this could contribute to a sense of meaningfulness Sie and Yakhlef, 2009). Furthermore, managers should promote social interaction and personal relationships at work, for example by organising social events and stimulating socialising with colleagues, as this is a recognised way of creating meaning (Sie and Yakhlef, 2009). In addition, theory on work motivation highlights that task significance is an indicator of the experienced meaningfulness of a task (Hackman and Oldham, 1976). In the knowledge sharing context, this means that realising the significance of your knowledge sharing, for example how important it is for someone to get your help or how your knowledge sharing can influence organisational performance, can contribute to a sense of meaningfulness from your knowledge sharing. For managers, this means that it is important to communicate and signal to employees how important their knowledge sharing is.

Furthermore, it is important for managers to promote employee development in order to enhance self-efficacy beliefs. Self-efficacy beliefs may be enhanced when employees can improve their confidence in their abilities. Managers could ensure adequate training and development programmes for employees in order to achieve this (Cabrera and Cabrera, 2005). Employees should be able to occupy some of their time with personal learning and development as this may increase their confidence in their ability to share valuable knowledge which in turn may develop more positive attitudes towards knowledge sharing (Lin, 2007; Ryan and Deci, 2000a).

In summary, this study has made several important contributions to further our understanding of theory of knowledge sharing motivation and in providing guidance for businesses who want to encourage organisational knowledge sharing. However, the findings of the proposed research must be interpreted in the light of the study's limitations. The limitations of this study will be discussed in the next section.

6.2 Limitations of the Research

The first limitation relates to the generalizability of the results. The data collection was limited to a convenience sample of organisations in New Zealand and the distribution of the surveys was managed through known contacts in these companies. This means that the results could be affected by specific organisational culture as well as the national culture of New Zealand (Bock et al., 2005; Lin, 2007; Conelly and Kelloway, 2003; Su et al., 2010).

Furthermore, the sample size was relatively small. Although it was sufficient for testing of the model (Chin, 1998) and in knowledge sharing research small samples are evident (Ko et al., 2005), this may raise concerns if the sample is representative of a larger population. Future studies should aim for a larger sample size to address this limitation and make it more representative of a larger population.

Another limitation is the scope of the study. Although the intrinsic and extrinsic motivators were identified from a well-established literature (Gagné, 2009; Grant, 2007; Hackman and Oldham, 1980; Ryan and Deci, 2000; Thomas and Velthouse, 1990; Vroom, 1964; Bartol and Srivastava, 2002), there are other motivators and factors e.g. perceived usefulness (Hsu and Lin, 2008) and organisational climate (Bock et al., 2005) that were not considered in this study. Future research could therefore examine the impact of other motivators on knowledge sharing, as well as the differential influence of motivators in different organisational settings. Due to constraints such as time, sample size and respondent's attention it was not feasible to include that many constructs.

6.3 Directions for Future Research

With the limitations of the study in mind, some directions for future research are presented.

First, researchers are encouraged to consider the importance of extrinsic as well as intrinsic motivation in studying knowledge sharing behaviour. Future research could extend this model to include actual behaviour. Furthermore, the R^2 of intention to share knowledge was 0.574, indicating that knowledge sharing intention may also be explained by other factors, such as environment factors like trust and openness to innovation (Bock et al., 2005).

Second, research findings in this study were based on data that was collected from organisations in New Zealand. Future research can also test the model in different countries to examine the model in different contexts. Furthermore, cultural differences between organisations could also influence how employees perceive knowledge sharing and other studies can take this into consideration and include organisational culture (Lin, 2007).

Third, research suggests that there may be an interaction between some extrinsic motivators (i.e. extrinsic rewards) and intrinsic motivation for knowledge sharing (Osterloh and Frey, 2000; Deci et al., 1999). In specific, suggestions are made that extrinsic rewards undermine intrinsic motivation, because they are perceived to be controlling and thereby lower self-determination and self-esteem (Frey and Jegen, 2001). Future studies could investigate whether such an interaction effect exists and determine the implications for organisational knowledge sharing.

Finally, researchers could examine the relationships posited in this study's research model with a larger sample and based on data collected over a longer period of time in order to provide more robust results (Lin, 2007).

6.4 Concluding Remarks

By successfully exploring the formation of knowledge sharing attitude and intention from a motivational perspective, this study has made significant contributions to both theory and practice. Several key extrinsic and intrinsic motivators have been identified from the literature and applied to the knowledge sharing context. Empirical evidence is provided showing how these motivators impact knowledge sharing attitudes and intentions. The Theory of Reasoned Action was used as a framework for developing the research model. With the use of a survey, data was gathered and the model was then analysed using Partial Least Squares Path Modelling. Overall the results showed support for many of the hypothesized relationships, in particular the results showed support for self-efficacy, meaningfulness, anticipated reciprocal relationships and reputation as significant motivators, but the effect of impact, tangible and verbal rewards was not supported. Overall, the model gives good insights into the importance of extrinsic and intrinsic motivators in the knowledge sharing context.

The importance of knowledge sharing for companies operating in the current business environment means that managers can use the findings of this study to target specific motivators, in particular self-efficacy, meaningfulness, anticipated reciprocal relationships and reputation. Furthermore, others engaged in research aimed at investigating the drivers of organisational knowledge sharing can use the findings presented in this study to further advance organisational knowledge sharing theory.

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APPENDIX A QUESTIONNAIRE INFORMATION SHEET

Department of Accounting and Information Systems
Email: judith.welschen@pg.canterbury.ac.nz
03/05/2013

An investigation of the motivators for organisational knowledge sharing

You are invited to participate in a research project on knowledge sharing motivators.
I am a student at the University of Canterbury and I am writing a Master thesis on the influence of different motivators on individuals' attitudes and intentions towards knowledge sharing in organisations.

Organisations are making substantially large investments in setting up knowledge management systems and practices in order to manage the knowledge they have more effectively. They are doing this because knowledge is being recognised as the most important resource of organisations. However, research has shown that people are not always willing to share their knowledge and therefore organisations cannot get the full benefit from their investments.
The purpose of this research is therefore to deepen our understanding of the factors that influence employee attitudes towards knowledge sharing. The findings of the study will provide a better understanding of how individuals are motivated to share knowledge in their organisations. This understanding can be of benefit to organisations as they can adapt their management strategies to improve employees' motivation.

Your involvement in this project will be to facilitate the recruitment of voluntary participants and the distribution of an anonymous questionnaire to members of your organisation. For the recruitment of participants you can email members of staff or post a notice in a shared communication space to inform employees of this survey. Participation is completely voluntary.

There are two options for the questionnaire distribution:

- Hard copies of the questionnaire. We can provide you with hard copies of the questionnaire and self-addressed envelopes. Volunteers can collect the copies of the questionnaire from you or a shared space and post the completed questionnaires directly to us. If it is more convenient, completed questionnaires can be collected in a box and we can arrange for someone to come and collect it.
- Electronic surveys. A link to an online survey will be provided and participants can submit their questionnaires electronically.

You can select your preferred option.

The survey will take 5 to 7 minutes to complete. All responses are aggregated in a spreadsheet. The data collected from all participants will then be analysed to test the importance of various motivational factors.

You may request a copy of the project results at the conclusion of the project. To receive a copy of the results please email the project supervisor Nelly Todorova at nelly.todorova@canterbury.ac.nz.

Participation is voluntary and participants have the right to withdraw at any stage up to submitting the questionnaire by mail or electronically. Once questionnaires have been submitted they cannot be retrieved as they are completely anonymous.

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public. To ensure anonymity and confidentiality, there are no questions in the survey that can link the answers to anyone in particular. The only individuals with access to the data will be the researchers on the project. The thesis publishing the results of the study will be a public document and will be available through the UC Library.

The project is being carried out as a requirement for a Master of Commerce degree by Judith Welschen under the supervision of Nelly Todorova who can be contacted at nelly.todorova@canterbury.ac.nz or by phone on 03 3642628. She will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If your organisation is interested in participating in this study, please contact me and we will arrange the timing and method for the distribution of the questionnaires.

Yours sincerely,

Judith Welschen

APPENDIX B HUMAN ETHICS COMMITTEE APPROVAL

HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen

Email: human-ethics@canterbury.ac.nz

Ref: HEC 2013/12/LR

8 May 2013

Judith Welschen

Department of Accounting & Information Systems

UNIVERSITY OF CANTERBURY

Dear Judith

Thank you for forwarding your Human Ethics Committee Low Risk application for your research proposal "An investigation of motivators for knowledge sharing".

I am pleased to advise that this application has been reviewed and I confirm support of the Department's approval for this project.

Please note that this approval is subject to the incorporation of the amendments you have provided in your emails of 24 April and 6 May 2013.

With best wishes for your project.

Yours sincerely

Lindsey MacDonald

Chair, Human Ethics Committee

APPENDIX C INSTRUMENT

Questionnaire Items	
Definitions provided to survey respondents:	
Knowledge sharing means *providing or transferring one's knowledge to others in the context of work practices.* Knowledge sharing is possible through various methods such as formal and/or informal meetings and information systems	
Construct	Item
Self-efficacy (Spreitzer, 1995)	1. I am confident about my ability to share knowledge with other organisational members.
	2. I have mastered the skills necessary to share knowledge with other organisational members.
	3. I am self-assured about my capabilities to share knowledge with other organisational members.
Meaningfulness (Spreitzer, 1995)	1. My knowledge sharing with other organisational members is personally meaningful to me.
	2. The knowledge sharing I do with other organisational members is very important to me.
	3. The knowledge sharing I do with other organisational members is meaningful to me.
Impact (Spreitzer, 1995)	1. My knowledge sharing with other organisational members has a large impact on what happens in my organisation.
	2. Through my knowledge sharing with other organisational members, I have a great deal of control over what happens in my organisation.
	3. My knowledge sharing with other organisational members has a great effect on what happens in my

	organisation.
	4. My knowledge sharing with other organisational members has a significant influence over what happens in my organisation.
Verbal rewards (McNeely and Meglino,1994; Sims et al., 1976; Ryan and Connell, 1989; Amabile et al., 1994)	1. My superiors compliment me when I am seen sharing my knowledge with other organisational members.
	2. My superiors express appreciation when I am seen sharing my knowledge with other organisational members.
	3. My superiors praise me when I share my knowledge with other organisational members.
	4. My superiors give me feedback when I share my knowledge with other organisational members.
	5. My superiors give me comments when I share my knowledge with other organisational members.
Anticipated Reciprocal Relationships (Bock et al., 2005)	1. My knowledge sharing would strengthen the ties between existing members in the organisation and myself.
	2. My knowledge sharing would get me well-acquainted with new members in the organisation.
	3. My knowledge sharing would expand the scope of my association with other members in the organisation.
	4. My knowledge sharing would draw smooth cooperation from outstanding members in the organisation in the future.
	5. My knowledge sharing would create strong relationships with members who have common interests in the organisation.
Reputation (Wasko and Faraj,2005; Kankanhalli et al.,2005)	1. I earn respect from other organisational members by sharing my knowledge in the organisation.
	2. I feel that sharing my knowledge with other organisational members improves my status in the organisation.
	3. Sharing my knowledge with other organisational members enhances my reputation in the organisation.
	4. Sharing my knowledge with other organisational members improves others' recognition of me in the

	organisation.
Tangible Rewards (Kankanhalli et al., 2005)	1. I will receive monetary rewards in return for my knowledge sharing with other organisational members. 2. I will receive increased promotion opportunities in return for my knowledge sharing with other organisational members. 3. I will receive increased job security in return for my knowledge sharing with other organisational members.
Attitude towards Knowledge Sharing (Fishbein and Ajzen, 1975)	1. My knowledge sharing with other organisational members is good. 2. My knowledge sharing with other organisational members is an enjoyable experience. 3. My knowledge sharing with other organisational members is beneficial. 4. My knowledge sharing with other organisational members is a wise move
Intention to share knowledge (Fishbein and Ajzen, 1975)	1. I intend to share my knowledge with other organisational members more frequently in the future. 2. I will always make an effort to share my knowledge with other organisational members. 3. I will always share my knowledge at the request of other organisational members. 4. I will try to share my knowledge with other organisational members.
Subjective Norms (Fishbein and Ajzen, 1975)	1. People in my organisation who are important to me think I should share my knowledge with other members in the organisation 2. People in my organisation who influence my decisions think I should share my knowledge with other organisational members. 3. People in my organisation whose opinions I value think I should share my knowledge with other organisational members.

APPENDIX D MATRIX OF LOADINGS AND CROSS-LOADINGS

Matrix of Loadings and Cross Loadings										
	SE	Mean	Impact	TangRew	VerbalR	Reciproc	Reputati	Attitude	SubjNorm	Intention
SE01	**,909**	,498	,406	,144	,265	,409	,283	,581	,379	,514
SE02	**,922**	,399	,467	,217	,300	,374	,338	,524	,448	,424
SE03	**,935**	,481	,403	,154	,296	,333	,297	,479	,385	,395
Mean01	,461	**,946**	,393	,213	,292	,538	,430	,572	,345	,549
Mean02	,448	**,948**	,389	,260	,378	,500	,321	,530	,362	,486
Mean03	,516	**,961**	,420	,249	,338	,542	,383	,557	,347	,523
Impact01	,365	,442	**,888**	,344	,380	,556	,407	,430	,407	,411
Impact02	,422	,314	**,924**	,355	,421	,433	,448	,368	,301	,298
Impact03	,428	,388	**,961**	,398	,451	,484	,528	,425	,414	,344
Impact04	,505	,418	**,958**	,381	,481	,524	,507	,440	,394	,357
TangRewards01	-,048	,055	,179	**,637**	,289	,074	,332	-,020	,220	,002
TangRewards02	,133	,140	,299	**,887**	,333	,223	,480	,190	,315	,158
TangRewards03	,188	,286	,409	**,965**	,350	,300	,511	,326	,310	,314
VerbRewSup01	,318	,331	,426	,294	**,959**	,425	,473	,289	,352	,249
VerbRewSup02	,348	,371	,440	,331	**,951**	,425	,513	,369	,350	,292
VerbRewSup03	,270	,312	,450	,385	**,952**	,432	,484	,279	,332	,228
VerbRewSup04	,230	,297	,446	,353	**,926**	,405	,422	,223	,383	,178
VerbRewSup05	,260	,327	,434	,371	**,915**	,432	,430	,231	,384	,220
Reciproc01	,364	,491	,501	,306	,416	**,905**	,574	,544	,492	,499
Reciproc02	,381	,482	,415	,115	,338	**,891**	,513	,559	,434	,562
Reciproc03	,405	,517	,479	,303	,371	**,911**	,582	,593	,516	,566
Reciproc04	,202	,415	,411	,233	,350	**,825**	,475	,410	,353	,422
Reciproc05	,380	,494	,530	,326	,485	**,818**	,565	,529	,452	,514
Reput01	,340	,437	,510	,456	,524	,623	**,845**	,515	,439	,456
Reput02	,333	,345	,443	,480	,344	,518	**,925**	,567	,453	,443
Reput03	,249	,322	,445	,489	,462	,528	**,916**	,462	,438	,393
Reput04	,257	,321	,421	,494	,475	,575	**,903**	,468	,519	,478
Attitu01	,563	,503	,404	,268	,276	,524	,423	**,850**	,420	,614
Attitu02	,529	,585	,377	,315	,286	,508	,531	**,854**	,417	,602
Attitu03	,466	,459	,363	,207	,273	,552	,484	**,913**	,428	,697
Attitu04	,444	,470	,408	,262	,225	,535	,516	**,849**	,454	,683
SbNorm01	,429	,370	,334	,303	,389	,541	,452	,444	**,915**	,415
SbNorm02	,420	,337	,445	,300	,352	,503	,525	,496	**,956**	,449
SbNorm03	,393	,340	,376	,335	,340	,425	,480	,463	**,954**	,441
Intent01	,222	,452	,277	,268	,176	,407	,373	,503	,288	**,707**
Intent02	,487	,526	,392	,302	,327	,571	,510	,724	,415	**,928**
Intent03	,425	,374	,274	,164	,066	,453	,285	,570	,358	**,793**
Intent04	,475	,497	,336	,224	,258	,562	,480	,714	,493	**,937**

APPENDIX E PLS OUTPUT .LST FILE

```
 P  L  S  G R A P H

          for

  Partial Least Squares Analysis

       (2004 Feb 27)


 YEAR-MONTH-DAY: 2013-11-16

  HOUR:MIN:SECS: 21:21:55.


(HOWDY PARDNER!!  HOW Y'ALL  DOING, EH?)

0    600000 = Available Field Length.

     600000 = Requested Field Length.


0CPU-Time =   0 min  0.00 sec

Total =      0 min  0.00 sec


0    Comments..

COMM

PLS Deck generated for Wynne Chin - personal copy

0JBL            P  L  S  X
```

0BLOC CAS DIM OUT WGH NIT DEC MET JAC JOD

10 133 12285 1 100 5 1 0 0

0JBL 1.8

==========

0-- P L S X --

0-- LATENT VARIABLES PATH ANALYSIS --

- PARTIAL LEAST-SQUARES ESTIMATION -

0

0==========

0Number of Blocks NBLOCS = 10

Number of Cases NCASES = 133

Number of Dimensions NDIM =1

0Output Quantity OUT = 2285

Inner Weighting Scheme IWGHT = 1

Number of Iterations NITER = 100

Estimation Accuracy EPS = 5

Analysed Data Metric METRIC = 1

0MV(j) = 3 3 4 5 5 4 3 4 4 3

0LV-Mode= 0 0 0 0 0 0 0 0 0 0

0Deflate= 1 1 1 1 1 1 1 1 1 1

0VarName=

SE01 SE02 SE03 Mean01 Mean02

Mean03 Impact01 Impact02 Impact03 Impact04

VerbRewS VerbRewSVerbRewS VerbRewS VerbRewS

Reciproc Reciproc Reciproc Reciproc Reciproc

Reput01 Reput02 Reput03 Reput04 TangRewa

TangRewa TangRewa Attitu01 Attitu02 Attitu03

Attitu04 Intent01 Intent02 Intent03 Intent04

SbNorm01 SbNorm02 SbNorm03

0Read matrix, Unit = 5, Rewind = 0

Format =(2A4,10F2.0)

0D(B) .. Design of path coefficients

==========

Self-Eff Meaningf Impact VRewards Reciproc Reputati Tangible

Self-Eff 0	0	0	0	0	0	0	
Meaningf	0	0	0	0	0	0	0
Impact 0	0	0	0	0	0	0	
VRewards	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0
Attitude	1	1	1	1	1	1	1
Intentio	0	0	0	0	0	0	0
Subjecti	0	0	0	0	0	0	0

==========
==========

0D(B) .. Design of path coefficients

==========

	Attitude	Intentio	Subjecti
Self-Eff	0	0	
Meaningf	0	0	0
Impact	0	0	0
VRewards	0	0	0
Reciproc	0	0	0
Reputati	0	0	0
Tangible	0	0	0
Attitude	0	0	0
Intentio	1	0	1
Subjecti	0	0	0

==========

0==========

Block	N-MV	Deflate	LV-Mode	Model
Self-Eff	3	yes	outward	Exogen
Meaningf	3	yes	outward	Exogen
Impact	4	yes	outward	Exogen
VRewards	5	yes	outward	Exogen
Reciproc	5	yes	outward	Exogen

Reputati	4	yes	outward	Exogen
Tangible	3	yes	outward	Exogen
Attitude	4	yes	outward	Endogen
Intentio	4	yes	outward	Endogen
Subjecti	3	yes	outward	Exogen

---

38 .

==========

0D(B) .. Design of path coefficients

	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible
Self-Eff	0	0	0	0	0	0	
Meaningf	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	
VRewards	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0
Attitude	1	1	1	1	1	1	1
Intentio	0	0	0	0	0	0	0
Subjecti	0	0	0	0	0	0	0

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0D(B) .. Design of path coefficients

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	Attitude	Intentio	Subjecti
Self-Eff 0	0	0	
Meaningf	0	0	0
Impact 0	0	0	
VRewards	0	0	0
Reciproc	0	0	0
Reputati	0	0	0
Tangible	0	0	0
Attitude	0	0	0
Intentio	1	0	1
Subjecti	0	0	0

==========

0Read matrix, Unit = 5, Rewind = 0

Format =(2A4,38F12.2)

0Real words needed 9776 from 600000

0Char words needed 363 from 40000

1Means and Standard Deviations of Data Matrix.

==========

Variable	Mean	Stand.Deviat.
SE01	5,7519	1,0142
SE02	5,3383	1,1298
SE03	5,4586	1,0656
Mean01	5,5865	1,177
Mean02	5,4135	1,2023
Mean03	5,5113	1,1991
Impact01	4,9624	1,4582
Impact02	4,0526	1,5233
Impact03	4,2632	1,4963
Impact04	4,2632	1,5014
VerbRewS	4,3609	1,4834
VerbRewS	4,4286	1,4832
VerbRewS	4,2105	1,5514
VerbRewS	4,203	1,4652
VerbRewS	4,2857	1,4997
Reciproc	5,3609	1,2222
Reciproc	5,4511	1,1068
Reciproc	5,4286	1,2219
Reciproc	5,1053	1,234
Reciproc	5,406	1,2017
Reput01	5,188	1,091
Reput02	4,8872	1,3358

Reput03	4,9699	1,2622
Reput04	5	1,1889
TangRewa	2,3759	1,5049
TangRewa	3,3383	1,6898
TangRewa	3,5263	1,6524
Attitu01	5,3985	1,0686
Attitu02	5,1579	1,1493
Attitu03	5,5113	1,0663
Attitu04	5,4211	1,1119
Intent01	4,9925	1,0934
Intent02	5,5789	1,1051
Intent03	5,8872	1,1013
Intent04	5,5789	1,0348
SbNorm01	5,1504	1,2714
SbNorm02	5,1579	1,2314
SbNorm03	5,1729	1,2233

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0S .. MV-Covariance matrix

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	SE01	SE02	SE03	Mean01	Mean02	Mean03	Impact01
SE01	1						
SE02	0,723	1					

SE03	0,766	0,839	1				
Mean01		0,462	0,354	0,457	1		
Mean02		0,46	0,356	0,415	0,833	1	
Mean03		0,5	0,427	0,499	0,864	0,881	1
Impact01		0,35	0,364	0,292	0,438	0,408	0,415
Impact02		0,359	0,427	0,383	0,281	0,288	0,327
Impact03		0,37	0,437	0,377	0,356	0,366	0,386
Impact04		0,433	0,515	0,451	0,381	0,381	0,431
VerbRewS		0,269	0,308	0,304	0,279	0,342	0,327
VerbRewS		0,321	0,322	0,318	0,325	0,377	0,359
VerbRewS		0,229	0,273	0,246	0,254	0,36	0,282
VerbRewS		0,181	0,226	0,234	0,232	0,319	0,3
VerbRewS		0,205	0,254	0,266	0,259	0,372	0,308
Reciproc		0,339	0,347	0,317	0,48	0,446	0,474
Reciproc		0,428	0,317	0,296	0,472	0,436	0,466
Reciproc		0,432	0,374	0,299	0,526	0,468	0,482
Reciproc		0,171	0,223	0,163	0,366	0,381	0,436
Reciproc		0,36	0,342	0,348	0,475	0,435	0,498
Reput01		0,3	0,32	0,32	0,476	0,371	0,398
Reput02		0,301	0,344	0,274	0,362	0,258	0,36
Reput03		0,188	0,276	0,228	0,341	0,256	0,318
Reput04		0,212	0,263	0,237	0,36	0,263	0,29
TangRewa		-0,101	0,027	-0,051	0,016	0,101	0,043
TangRewa		0,097	0,165	0,106	0,085	0,153	0,163
TangRewa		0,145	0,219	0,158	0,259	0,292	0,266
Attitu01		0,535	0,524	0,493	0,46	0,498	0,481
Attitu02		0,472	0,521	0,469	0,565	0,524	0,58
Attitu03		0,527	0,381	0,363	0,486	0,416	0,407
Attitu04		0,479	0,395	0,338	0,472	0,404	0,465

Intent01	0,215	0,197	0,197	0,412	0,449	0,422	0,245
Intent02	0,517	0,427	0,387	0,525	0,465	0,509	0,419
Intent03	0,46	0,357	0,345	0,405	0,285	0,374	0,32
Intent04	0,502	0,418	0,38	0,505	0,448	0,464	0,383
SbNorm01	0,39	0,43	0,36	0,368	0,363	0,324	0,352
SbNorm02	0,375	0,41	0,375	0,31	0,311	0,337	0,439
SbNorm03	0,307	0,426	0,354	0,3	0,35	0,319	0,358

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0S .. MV-Covariance matrix

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	Impact02	Impact03	Impact04	VerbRewS	VerbRewS	VerbRewS	VerbRewS
Impact02	1						
Impact03	0,861	1					
Impact04	0,875	0,923	1				
VerbRewS	0,401	0,401	0,44	1			
VerbRewS	0,376	0,423	0,459	0,917	1		
VerbRewS	0,399	0,439	0,473	0,892	0,892	1	
VerbRewS	0,43	0,428	0,447	0,845	0,818	0,848	1
VerbRewS	0,392	0,439	0,444	0,839	0,79	0,837	0,904
Reciproc	0,377	0,45	0,477	0,388	0,388	0,42	0,366
Reciproc	0,329	0,355	0,399	0,318	0,363	0,321	0,282
Reciproc	0,351	0,432	0,475	0,342	0,363	0,377	0,317

Reciproc	0,385	0,368	0,391	0,345	0,288	0,31	0,354
Reciproc	0,457	0,497	0,533	0,462	0,438	0,446	0,457
Reput01	0,451	0,513	0,484	0,488	0,536	0,496	0,446
Reput02	0,391	0,451	0,457	0,317	0,389	0,334	0,277
Reput03	0,415	0,482	0,468	0,435	0,457	0,46	0,41
Reput04	0,349	0,448	0,409	0,473	0,469	0,461	0,397
TangRewa	0,211	0,193	0,183	0,226	0,231	0,275	0,354
TangRewa	0,265	0,298	0,294	0,284	0,302	0,346	0,337
TangRewa	0,371	0,412	0,39	0,272	0,316	0,37	0,335
Attitu01	0,347	0,405	0,399	0,246	0,295	0,258	0,208
Attitu02	0,326	0,374	0,403	0,275	0,344	0,251	0,209
Attitu03	0,27	0,316	0,353	0,254	0,342	0,262	0,203
Attitu04	0,333	0,381	0,371	0,227	0,296	0,197	0,155
Intent01	0,258	0,277	0,239	0,155	0,174	0,165	0,142
Intent02	0,321	0,349	0,366	0,327	0,367	0,306	0,243
Intent03	0,192	0,223	0,277	0,062	0,094	0,045	0,019
Intent04	0,238	0,309	0,313	0,261	0,309	0,224	0,175
SbNorm01	0,221	0,319	0,338	0,382	0,345	0,35	0,371
SbNorm02	0,332	0,455	0,421	0,31	0,338	0,305	0,357
SbNorm03	0,294	0,39	0,352	0,305	0,307	0,286	0,354

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0S .. MV-Covariance matrix

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VerbRewS	Reciproc	Reciproc	Reciproc	Reciproc
Reciproc	Reput01			

VerbRewS	1						
Reciproc	0,399	1					
Reciproc	0,285	0,747	1				
Reciproc	0,335	0,823	0,791	1			
Reciproc	0,378	0,718	0,664	0,663	1		
Reciproc	0,499	0,643	0,648	0,644	0,63	1	
Reput01	0,477	0,575	0,552	0,577	0,482	0,515	1
Reput02	0,268	0,472	0,421	0,504	0,381	0,464	0,69
Reput03	0,398	0,49	0,403	0,476	0,451	0,484	0,665
Reput04	0,417	0,528	0,463	0,528	0,395	0,574	0,667
TangRewa	0,316	0,082	-0,03	0,06	0,153	0,086	0,264
TangRewa	0,312	0,232	0,075	0,239	0,145	0,273	0,377
TangRewa	0,373	0,312	0,121	0,302	0,26	0,316	0,454
Attitu01	0,276	0,46	0,458	0,497	0,356	0,489	0,407
Attitu02	0,227	0,468	0,44	0,46	0,391	0,444	0,498
Attitu03	0,172	0,493	0,531	0,565	0,296	0,472	0,447
Attitu04	0,131	0,464	0,505	0,531	0,379	0,429	0,431
Intent01	0,189	0,3	0,369	0,357	0,385	0,346	0,348
Intent02	0,259	0,48	0,555	0,557	0,374	0,491	0,477
Intent03	0,074	0,393	0,418	0,438	0,274	0,421	0,274
Intent04	0,208	0,489	0,533	0,535	0,4	0,47	0,423
SbNorm01	0,388	0,522	0,465	0,549	0,373	0,432	0,43
SbNorm02	0,346	0,482	0,422	0,5	0,321	0,45	0,431
SbNorm03	0,354	0,391	0,342	0,413	0,307	0,397	0,381

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0S .. MV-Covariance matrix

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	Reput02	Reput03	Reput04	TangRewa	TangRewa	TangRewa	Attitu01
Reput02	1						
Reput03	0,827	1					
Reput04	0,781	0,812	1				
TangRewa	0,294	0,338	0,298	1			
TangRewa	0,443	0,452	0,453	0,651	1		
TangRewa	0,453	0,462	0,467	0,601	0,736	1	
Attitu01	0,405	0,355	0,343	-0,037	0,154	0,294	1
Attitu02	0,536	0,433	0,424	0,061	0,209	0,336	0,671
Attitu03	0,473	0,38	0,427	-0,082	0,108	0,231	0,699
Attitu04	0,548	0,432	0,427	-0,009	0,188	0,268	0,587
Intent01	0,308	0,338	0,335	0,107	0,128	0,314	0,35
Intent02	0,462	0,39	0,498	0,009	0,209	0,315	0,613
Intent03	0,267	0,209	0,27	-0,092	0,057	0,198	0,473
Intent04	0,433	0,382	0,483	-0,005	0,129	0,248	0,6
SbNorm01	0,36	0,359	0,473	0,226	0,288	0,284	0,338
SbNorm02	0,482	0,448	0,519	0,151	0,3	0,27	0,432
SbNorm03	0,435	0,427	0,476	0,247	0,303	0,323	0,413

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0S .. MV-Covariance matrix

	Attitu02	Attitu03	Attitu04	Intent01	Intent02	Intent03	Intent04
Attitu02	1						
Attitu03	0,701	1					
Attitu04	0,589	0,757	1				
Intent01	0,444	0,429	0,51	1			
Intent02	0,579	0,68	0,634	0,557	1		
Intent03	0,448	0,542	0,512	0,349	0,659	1	
Intent04	0,555	0,672	0,644	0,582	0,858	0,671	1
SbNorm01	0,395	0,404	0,397	0,206	0,377	0,345	0,454
SbNorm02	0,386	0,431	0,468	0,263	0,414	0,346	0,477
SbNorm03	0,398	0,376	0,416	0,333	0,382	0,321	0,461

0S .. MV-Covariance matrix

	SbNorm01	SbNorm02	SbNorm03
SbNorm01	1		
SbNorm02	0,801	1	
SbNorm03	0,795	0,895	1

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0Dimension No. 1

0Partial Least-Squares Parameter Estimation

0Change of Stop Criteria during Iteration

0Cycle No.	CR1	CR2	CR3	CR4	CR5
1	1,04E+00	1,15E-01	4,58E-01	4,43E-01	3,24E-01
2	1,84E-03	1,26E-04	6,02E-06	9,03E-06	2,05E-05
3	2,22E-04	3,56E-07	2,16E-06	3,22E-06	-2,43E-06
4	1,81E-06	4,84E-07	-9,29E-09	-6,09E-09	-2,93E-08

0Convergence at Iteration Cycle No. 4

0B .. Path coefficients

	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible
Self-Eff	0	0	0	0	0	0	
Meaningf	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	
VRewards	0	0	0	0	0	0	0

Reciproc	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0
Attitude	0,315	0,223	-0,016	-0,117	0,244	0,275	0,019
Intentio	0	0	0	0	0	0	0
Subjecti	0	0	0	0	0	0	0

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0B .. Path coefficients

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	Attitude	Intentio	Subjecti
Self-Eff 0	0	0	
Meaningf	0	0	0
Impact 0	0	0	
VRewards	0	0	0
Reciproc	0	0	0
Reputati	0	0	0
Tangible	0	0	0
Attitude	0	0	0
Intentio	0,688	0	0,125
Subjecti	0	0	0

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0R .. Correlations of latent variables

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Self-Eff Meaningf Impact VRewards Reciproc Reputati Tangible

Self-Eff	1					
Meaningf	0,499	1				
Impact	0,462	0,421	1			
VRewards	0,31	0,352	0,465	1		
Reciproc	0,406	0,554	0,538	0,45	1	
Reputati	0,332	0,399	0,507	0,499	0,625	1
Tangible	0,186	0,252	0,397	0,365	0,295	0,534	1
Attitude	0,576	0,582	0,447	0,305	0,612	0,564	0,303
Intentio	0,487	0,547	0,38	0,255	0,594	0,494	0,281
Subjecti	0,438	0,369	0,409	0,379	0,521	0,514	0,333

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0R .. Correlations of latent variables

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Attitude Intentio Subjecti

Attitude	1		
Intentio	0,75	1	
Subjecti	0,496	0,466	1

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0Inner Model

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Block	Mean	Location		Mult.RSq	AvResVar	AvCommun	AvRedund
Self-Eff		0	0	0,1497	0,8503	0	
Meaningf		0	0	0,094	0,906	0	
Impact		0	0	0,129	0,871	0	
VRewards		0	0	0,1148	0,8852	0	
Reciproc		0	0	0,2417	0,7583	0	
Reputati		0	0	0,1941	0,8059	0	
Tangible		0	0	0,2922	0,7078	0	
Attitude		0	0	0,5786	0,2489	0,7511	0,4346
Intentio		0	0	0,574	0,2836	0,7164	0,4112
Subjecti		0	0	0,1126	0,8874	0	
Average				0,1153	0,1882	0,8118	0,089

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0Outer Model

Variable	Weight	Loading	Location	ResidVar	Communal	Redundan
Self-Eff			outward			
SE01	0,3983	0,9093	0	0,1733	0,8267	0
SE02	0,3591	0,9223	0	0,1493	0,8507	0
SE03	0,3281	0,9346	0	0,1265	0,8735	0
Meaningf			outward			
Mean01	0,3622	0,9464	0	0,1044	0,8956	0
Mean02	0,3359	0,948	0	0,1013	0,8987	0
Mean03	0,3525	0,9612	0	0,0762	0,9238	0
Impact			outward			
Impact01	0,2771	0,8883	0	0,2109	0,7891	0
Impact02	0,2372	0,924	0	0,1463	0,8537	0
Impact03	0,274	0,9607	0	0,0771	0,9229	0
Impact04	0,2833	0,9582	0	0,0819	0,9181	0
VRewards			outward			
VerbRewS	0,2203	0,9594	0	0,0795	0,9205	0
VerbRewS	0,281	0,9513	0	0,095	0,905	0
VerbRewS	0,2127	0,9516	0	0,0944	0,9056	0
VerbRewS	0,1701	0,9259	0	0,1426	0,8574	0
VerbRewS	0,1763	0,9151	0	0,1627	0,8373	0

Reciproc	outward					
Reciproc	0,2364	0,9054	0	0,1803	0,8197	0
Reciproc	0,2429	0,8906	0	0,2068	0,7932	0
Reciproc	0,2577	0,9107	0	0,1706	0,8294	0
Reciproc	0,1782	0,825	0	0,3193	0,6807	0
Reciproc	0,2298	0,8175	0	0,3317	0,6683	0
Reputati	outward					
Reput01	0,285	0,845	0	0,2861	0,7139	0
Reput02	0,3141	0,9253	0	0,1438	0,8562	0
Reput03	0,256	0,9159	0	0,1611	0,8389	0
Reput04	0,2594	0,9025	0	0,1855	0,8145	0
Tangible	outward					
TangRewa	-0,0417	0,6373	0	0,5938	0,4062	0
TangRewa	0,4044	0,8868	0	0,2136	0,7864	0
TangRewa	0,6923	0,9649	0	0,069	0,931	0
Attitude	outward					
Attitu01	0,2803	0,8501	0	0,2774	0,7226	0,4181
Attitu02	0,2876	0,8539	0	0,2708	0,7292	0,4219
Attitu03	0,2937	0,9125	0	0,1673	0,8327	0,4818
Attitu04	0,2924	0,8486	0	0,2799	0,7201	0,4167
Intentio	outward					

Intent01	0,2314	0,7066	0	0,5007	0,4993	0,2866
Intent02	0,3347	0,9275	0	0,1397	0,8603	0,4938
Intent03	0,266	0,793	0	0,3711	0,6289	0,361
Intent04	0,3364	0,9366	0	0,1228	0,8772	0,5035

Subjecti	outward					
SbNorm01	0,3374	0,9152	0	0,1625	0,8375	0
SbNorm02	0,3644	0,9564	0	0,0853	0,9147	0
SbNorm03	0,3593	0,9539	0	0,0901	0,9099	0

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0Theta .. Outer residual covariance

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	SE01	SE02	SE03	Mean01	Mean02	Mean03	Impact01
SE01	0,173						
SE02	-0,116	0,149					
SE03	-0,084	-0,023	0,127				
Mean01	0,001	-0,013	0,013	0,104			
Mean02	0,011	0,002	-0,016	-0,064	0,101		
Mean03	-0,012	0,011	0,003	-0,046	-0,03	0,076	
Impact01	0,029	-0,01	-0,024	0,025	-0,002	-0,023	0,211
Impact02	-0,012	-0,001	0,016	-0,011	0	0,011	-0,089
Impact03	-0,006	0,002	0,005	-0,006	0,008	-0,002	-0,056

Impact04	-0,013	0,009	0,006	-0,009	-0,005	0,014	-0,077
VerbRewS	-0,003	0,002	0,002	0,005	-0,015	0,009	0
VerbRewS	0,021	-0,012	-0,012	0,013	-0,017	0,002	0,017
VerbRewS	0	0,011	-0,011	-0,003	0,022	-0,018	-0,006
VerbRewS	-0,013	0,002	0,014	-0,011	-0,003	0,015	-0,006
VerbRewS	-0,016	0,001	0,018	-0,013	0,022	-0,007	-0,013
Reciproc	-0,027	0,012	0,019	0,003	0,003	-0,006	0,036
Reciproc	0,046	-0,034	-0,019	0,004	0,002	-0,005	0,019
Reciproc	0,028	0,002	-0,036	0,023	0	-0,024	0,019
Reciproc	-0,045	0,037	0,013	-0,037	0,009	0,03	-0,039
Reciproc	-0,018	-0,008	0,03	-0,004	-0,012	0,016	-0,049
Reput01	0,007	-0,02	0,014	0,018	0,005	-0,022	0,037
Reput02	0,015	0,007	-0,026	-0,013	-0,016	0,028	-0,004
Reput03	-0,021	0,017	0,007	-0,012	0,004	0,009	-0,062
Reput04	-0,005	-0,003	0,009	0,008	0,01	-0,018	0,025
TangRewa	-0,042	0,042	0,006	-0,02	0,036	-0,013	-0,065
TangRewa	-0,001	0,002	-0,001	-0,024	0,002	0,023	0
TangRewa	-0,002	0,001	0,001	0,013	0,001	-0,014	-0,004
Attitu01	-0,025	0,011	0,018	-0,035	0,039	-0,001	-0,034
Attitu02	-0,057	0,039	0,026	-0,007	-0,013	0,019	-0,063
Attitu03	0,052	-0,042	-0,018	0,032	0	-0,032	0,052
Attitu04	0,028	-0,007	-0,025	0,008	-0,024	0,014	0,042
Intent01	-0,036	0,011	0,032	-0,034	0,046	-0,008	-0,049
Intent02	0,008	0,001	-0,012	-0,002	-0,004	0,005	0,003
Intent03	0,017	-0,015	-0,004	0,026	-0,044	0,016	0,019
Intent04	0,004	0,003	-0,008	0,005	0,007	-0,012	0,016
SbNorm01	0,019	-0,004	-0,018	0,022	0,001	-0,024	0,016
SbNorm02	0,012	-0,018	0,006	-0,004	-0,018	0,022	0,002
SbNorm03	-0,03	0,023	0,012	-0,017	0,017	0	-0,017

Self-Eff 0	0	0	-0,012	-0,026	0,036	-0,045	
Meaningf	0,044	-0,062	0,014	0	0	0	0,067
Impact -0,014	0,042	-0,029	-0,006	-0,01	0,015	0	
VRewards	-0,017	0,014	0,006	-0,041	0,044	0	-0,033
Reciproc	0,039	-0,001	-0,046	0,014	-0,025	0,009	0,078
Reputati	-0,018	0,032	-0,013	0,053	-0,057	0	-0,043
Tangible	-0,025	0,045	-0,02	-0,025	0,021	0,006	-0,008
Attitude	0,057	-0,008	-0,06	0,022	-0,021	-0,002	0,032
Intentio	0,072	-0,025	-0,06	0,032	-0,032	-0,002	0,073
Subjecti	-0,02	0,044	-0,024	-0,004	0,012	-0,007	0,044

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0Theta .. Outer residual covariance

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	Impact02	Impact03	Impact04	VerbRewS	VerbRewS
	VerbRewS	VerbRewS			
Impact02	0,146				
Impact03	-0,026	0,077			
Impact04	-0,01	0,002	0,082		
VerbRewS	0,016	-0,012	-0,002	0,079	
VerbRewS	-0,022	-0,003	0,004	0,005	0,095
VerbRewS	-0,008	0,003	0,009	-0,021	-0,013	0,094
VerbRewS	0,026	-0,004	-0,012	-0,043	-0,063	-0,033	0,143
VerbRewS	-0,001	0,018	-0,004	-0,039	-0,081	-0,034	0,057

Reciproc	-0,028	-0,001	-0,011	-0,005	-0,006	0,02	-0,009
Reciproc	0,002	-0,014	-0,007	-0,001	0,044	-0,004	-0,021
Reciproc	-0,033	0,002	0,008	-0,007	0,013	0,021	-0,016
Reciproc	0,058	0	-0,01	0,015	-0,043	-0,026	0,04
Reciproc	0,019	0,015	0,018	0,002	-0,021	-0,019	0,017
Reput01	-0,003	-0,011	-0,023	-0,01	0,005	-0,01	-0,005
Reput02	0,001	-0,011	0,014	-0,008	0,025	-0,002	-0,005
Reput03	0,024	0,018	0,023	-0,002	-0,018	0,012	0,019
Reput04	-0,021	0,007	-0,014	0,023	-0,018	0	-0,007
TangRewa	0,053	0,01	0,01	-0,016	-0,034	-0,023	0,077
TangRewa	-0,002	-0,005	0,006	0,014	-0,001	-0,004	0,015
TangRewa	0,004	0,003	-0,003	-0,009	-0,002	0,001	-0,004
Attitu01	0,013	0,021	0,002	-0,015	-0,034	0,005	0,003
Attitu02	0,016	0,016	0,033	0,004	0,005	-0,011	-0,005
Attitu03	-0,023	-0,028	-0,005	-0,004	0,011	0,013	0,005
Attitu04	-0,005	-0,007	-0,03	0,015	0,016	-0,007	-0,002
Intent01	0,043	0,03	-0,017	-0,017	-0,028	0,008	0,02
Intent02	0,009	-0,008	-0,003	0,008	0,01	0,008	-0,006
Intent03	-0,019	-0,023	0,02	-0,005	-0,008	-0,007	0,003
Intent04	-0,023	0,006	-0,002	0,008	0,016	-0,009	-0,01
SbNorm01	-0,016	-0,02	0,017	0,022	-0,013	0,008	-0,016
SbNorm02	-0,005	0,008	-0,006	-0,014	0,015	0	0,003
SbNorm03	0,02	0,01	-0,009	-0,006	-0,003	-0,007	0,012
Self-Eff	-0,005	-0,016	0,063	0,02	0,053	-0,025	-0,057
Meaningf	-0,076	-0,017	0,014	-0,006	0,036	-0,023	-0,029
Impact	0	0	0	-0,021	-0,003	0,007	0,015
VRewards	-0,009	0,004	0,035	0	0	0	0
Reciproc	-0,064	-0,033	0,009	-0,007	-0,003	0,004	-0,012
Reputati	-0,021	0,04	0,021	-0,006	0,039	0,009	-0,04

Tangible	-0,011	0,017	0,001	-0,056	-0,016	0,037	0,015
Attitude	-0,045	-0,005	0,011	-0,004	0,078	-0,012	-0,06
Intentio	-0,053	-0,021	-0,007	0,005	0,05	-0,014	-0,057
Subjecti	-0,077	0,021	0,002	-0,012	-0,011	-0,029	0,031

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0Theta .. Outer residual covariance

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	VerbRewS	Reciproc	Reciproc	Reciproc	Reciproc	Reciproc	Reput01
VerbRewS	0,163						
Reciproc	0	0,18					
Reciproc	-0,043	-0,06	0,207				
Reciproc	-0,022	-0,002	-0,02	0,171			
Reciproc	0,041	-0,029	-0,07	-0,088	0,319		
Reciproc	0,038	-0,098	-0,08	-0,1	-0,044	0,332	
Reput01	0,02	0,004	0,034	-0,001	0,002	-0,04	0,286
Reput02	-0,023	-0,006	0	0,02	-0,009	-0,01	-0,091
Reput03	-0,001	0,004	-0,028	-0,016	0,052	0,002	-0,109
Reput04	0,006	-0,001	-0,01	-0,008	-0,044	0,054	-0,096
TangRewa	0,027	-0,011	-0,002	-0,03	0,098	-0,029	-0,019
TangRewa	-0,026	-0,005	0,007	0,005	-0,03	0,015	-0,032
TangRewa	0,017	0,002	-0,004	-0,005	0,023	-0,011	0,018
Attitu01	0,064	-0,006	-0,02	-0,011	0,004	0,036	0,017

Attitu02	0,006	0,017	-0,024	-0,033	0,053	0,004	0,017
Attitu03	-0,034	0,002	0,026	0,029	-0,073	-0,006	0,004
Attitu04	-0,034	-0,013	0,017	0,013	0,017	-0,033	-0,037
Intent01	0,038	-0,036	-0,011	-0,026	0,102	-0,003	0,009
Intent02	-0,029	-0,002	0,015	0,013	-0,034	-0,003	0,011
Intent03	0,024	0,014	-0,012	0,006	-0,046	0,027	0,002
Intent04	-0,016	0,016	0,002	0	-0,001	-0,017	-0,018
SbNorm01	0	0,011	0,009	0,016	-0,005	-0,036	0,045
SbNorm02	-0,01	0,005	0,001	0	-0,023	0,011	-0,015
SbNorm03	0,01	-0,016	-0,01	-0,016	0,027	0,022	-0,027
Self-Eff	-0,024	-0,004	0,02	0,035	-0,134	0,048	0,059
Meaningf	0,005	-0,011	-0,011	0,013	-0,042	0,041	0,1
Impact	0,008	0,014	-0,064	-0,011	-0,033	0,09	0,082
VRewards	0	0,009	-0,062	-0,039	-0,022	0,118	0,102
Reciproc	0,02	0	0	0	0	0	0,095
Reputati	-0,026	0,009	-0,044	0,013	-0,04	0,055	0
Tangible	0,037	0,039	-0,147	0,035	-0,011	0,085	0,005
Attitude	-0,048	-0,01	0,014	0,036	-0,095	0,029	0,038
Intentio	-0,013	-0,038	0,033	0,025	-0,068	0,029	0,039
Subjecti	0,037	0,02	-0,031	0,041	-0,077	0,026	0,005

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0Theta .. Outer residual covariance

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Reput02	Reput03	Reput04	TangRewa	TangRewa	TangRewa
Attitu01					

Reput02	0,144						
Reput03	-0,02	0,161					
Reput04	-0,054	-0,015	0,185				
TangRewa	-0,004	0,035	-0,009	0,594			
TangRewa	0,011	0,013	0,009	0,086	0,214		
TangRewa	-0,007	-0,006	-0,006	-0,014	-0,12	0,069	
Attitu01	-0,024	0,014	-0,003	-0,027	-0,016	0,008	0,277
Attitu02	0,006	-0,006	-0,02	0,042	-0,003	0,004	-0,055
Attitu03	-0,016	-0,013	0,028	-0,02	-0,004	0,001	-0,077
Attitu04	0,033	0,006	-0,004	0,004	0,023	-0,013	-0,135
Intent01	-0,024	0,041	-0,021	0,064	-0,042	0,029	-0,059
Intent02	0,003	-0,022	0,007	-0,019	0,026	-0,016	0,02
Intent03	0,014	-0,006	-0,014	-0,056	-0,016	0,006	0,007
Intent04	0,002	-0,002	0,019	0,019	0,016	-0,008	0,016
SbNorm01	-0,036	-0,023	0,016	0,025	0	0,001	-0,037
SbNorm02	0,019	0	-0,006	-0,049	0,013	-0,011	0,013
SbNorm03	0,014	0,021	-0,008	0,025	-0,014	0,01	0,022
Self-Eff 0,026	-0,055	-0,043	-0,166	-0,032	0,009	0,073	
Meaningf	-0,024	-0,043	-0,039	-0,106	-0,084	0,042	0,009
Impact -0,027	-0,02	-0,037	-0,073	-0,052	0,026	0,023	
VRewards	-0,117	0,005	0,025	0,056	0,009	-0,002	0,016
Reciproc	-0,06	-0,044	0,012	-0,113	-0,038	0,015	0,004
Reputati	0	0	0	-0,009	0,007	-0,004	-0,057
Tangible	-0,014	-0,001	0,012	0	0	0	0,01
Attitude	0,045	-0,055	-0,041	-0,213	-0,079	0,033	0
Intentio	-0,014	-0,06	0,033	-0,178	-0,092	0,043	-0,023
Subjecti	-0,023	-0,033	0,055	0,007	0,02	-0,011	-0,002

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0Theta .. Outer residual covariance

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	Attitu02	Attitu03	Attitu04	Intent01	Intent02	Intent03	Intent04
Attitu02	0,271						
Attitu03	-0,078	0,167					
Attitu04	-0,135	-0,017	0,28				
Intent01	0,043	-0,037	0,052	0,501			
Intent02	-0,004	0,008	-0,023	-0,098	0,14		
Intent03	-0,009	0,012	-0,009	-0,211	-0,076	0,371	
Intent04	-0,019	0,009	-0,005	-0,08	-0,011	-0,072	0,123
SbNorm01	0,023	0,022	-0,009	-0,049	0,004	0,024	0,01
SbNorm02	-0,031	0,002	0,016	-0,014	0,011	-0,001	0
SbNorm03	0,009	-0,023	-0,007	0,06	-0,015	-0,021	-0,01
Self-Eff	0,037	-0,06	-0,045	-0,123	0,035	0,039	0,019
Meaningf	0,088	-0,072	-0,023	0,062	0,019	-0,059	-0,015
Impact	-0,005	-0,046	0,028	0,004	0,039	-0,028	-0,02
VRewards	0,025	-0,006	-0,035	-0,004	0,091	-0,136	0,02
Reciproc	-0,014	-0,006	0,016	-0,019	0,021	-0,018	0,006
Reputati	0,049	-0,031	0,037	0,021	0,052	-0,106	0,017
Tangible	0,056	-0,069	0,005	0,066	0,041	-0,059	-0,039
Attitude	0	0	0	-0,029	0,028	-0,025	0,011

Intentio	-0,038	0,013	0,047	0	0	0	0
Subjecti	-0,007	-0,024	0,033	-0,044	-0,017	-0,012	0,056

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0Theta .. Outer residual covariance

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	SbNorm01	SbNorm02	SbNorm03	Self-Eff	Meaningf	Impact	VRewards
SbNorm01	0,162						
SbNorm02	-0,074	0,085					
SbNorm03	-0,078	-0,017	0,09				
Self-Eff	0,027	0,001	-0,026	1			
Meaningf	0,032	-0,017	-0,013	0,499	1		
Impact	-0,041	0,053	-0,015	0,462	0,421	1	
VRewards	0,04	-0,013	-0,025	0,31	0,352	0,465	1
Reciproc	0,066	0,007	-0,069	0,406	0,554	0,538	0,45
Reputati	-0,021	0,032	-0,013	0,332	0,399	0,507	0,499
Tangible	-0,001	-0,017	0,018	0,186	0,252	0,397	0,365
Attitude	-0,011	0,021	-0,011	0,576	0,582	0,447	0,305
Intentio	-0,008	0,006	0,001	0,487	0,547	0,38	0,255
Subjecti	0	0	0	0,438	0,369	0,409	0,379

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0Theta .. Outer residual covariance

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	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Reciproc	1					
Reputati	0,625	1				
Tangible	0,295	0,534	1			
Attitude	0,612	0,564	0,303	1		
Intentio	0,594	0,494	0,281	0,75	1	
Subjecti	0,521	0,514	0,333	0,496	0,466	1

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0 ==PLSW no prob, eh?

0CPU-Time = 0 min 0.17 sec

Total = 0 min 0.17 sec

0 No errors reported.

APPENDIX F PLS BOOTSTRAPPING OUTPUT

Output results with Construct Level sign change preprocessing:

Bootstrap raw data generated for Wynne Chin - personal copy

Number of cases in full model: 133

Number of cases per sample: 133

Number of samples generated: 100

Number of good samples: 100

Outer Model Weights:

	Original sample estimate	Mean of subsamples	Standard error	T-Statistic
Self-Eff:				
SE01	0,3983	0,3939	0,031	12,8564
SE02	0,3591	0,3637	0,0297	12,077
SE03	0,3281	0,3289	0,0218	15,0325
Meaningf:				
Mean01	0,3622	0,3646	0,0149	24,361
Mean02	0,3359	0,3369	0,0146	23,063
Mean03	0,3525	0,3498	0,011	32,0148
Impact :				
Impact01	0,2771	0,2754	0,0303	9,1323
Impact02	0,2372	0,2369	0,0254	9,3379
Impact03	0,274	0,274	0,0133	20,5349
Impact04	0,2833	0,2849	0,0172	16,5124
VRewards:				

VerbRewS	0,2203	0,2212	0,0254	8,666
VerbRewS	0,281	0,2862	0,0528	5,327
VerbRewS	0,2127	0,2146	0,0178	11,9231
VerbRewS	0,1701	0,1668	0,0446	3,8125
VerbRewS	0,1763	0,1762	0,0334	5,2836
Reciproc:				
Reciproc	0,2364	0,2369	0,0144	16,4126
Reciproc	0,2429	0,2401	0,0216	11,2486
Reciproc	0,2577	0,2604	0,0175	14,7608
Reciproc	0,1782	0,1788	0,0254	7,0074
Reciproc	0,2298	0,2306	0,0267	8,6066
Reputati:				
Reput01	0,285	0,2879	0,0253	11,2769
Reput02	0,3141	0,3122	0,0238	13,2172
Reput03	0,256	0,2586	0,0279	9,1696
Reput04	0,2594	0,2547	0,0238	10,8843
Tangible:				
TangRewa	-0,0417	-0,0385	0,436	0,0956
TangRewa	0,4044	0,3689	0,1373	2,9453
TangRewa	0,6923	0,6397	0,308	2,2477
Attitude:				
Attitu01	0,2803	0,2801	0,0176	15,8985
Attitu02	0,2876	0,2891	0,0157	18,3351
Attitu03	0,2937	0,2925	0,0128	22,9745
Attitu04	0,2924	0,3004	0,015	19,429
Intentio:				
Intent01	0,2314	0,2346	0,0296	7,8163
Intent02	0,3347	0,3341	0,019	17,6233
Intent03	0,266	0,2612	0,0298	8,9284
Intent04	0,3364	0,3386	0,0193	17,3994
Subjecti:				

SbNorm01	0,3374	0,3284	0,0578	5,8411
SbNorm02	0,3644	0,359	0,036	10,1206
SbNorm03	0,3593	0,3722	0,0535	6,7149

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Outer Model Loadings:

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	Original sample estimate	Mean of subsamples	Standard error	T-Statistic
Self-Eff:				
(Composite Reliability = 0.850)	0.945 , AVE =			
SE01	0,9093	0,9071	0,0217	41,9523
SE02	0,9223	0,9223	0,0152	60,858
SE03	0,9346	0,9327	0,0192	48,6615
Meaningf:				
(Composite Reliability = 0.906)	0.967 , AVE =			
Mean01	0,9464	0,9463	0,0125	75,4331
Mean02	0,948	0,9472	0,0113	83,6099
Mean03	0,9612	0,9604	0,0123	77,9675
Impact :				
(Composite Reliability = 0.871)	0.964 , AVE =			
Impact01	0,8883	0,8858	0,0214	41,6044
Impact02	0,924	0,924	0,0184	50,3177
Impact03	0,9607	0,9607	0,0056	171,6892
Impact04	0,9582	0,9599	0,0069	138,9096
VRewards:				
(Composite Reliability = 0.885)	0.975 , AVE =			
VerbRewS	0,9594	0,9557	0,014	68,518
VerbRewS	0,9513	0,945	0,014	67,9044

VerbRewS	0,9516	0,9482	0,0128	74,0722
VerbRewS	0,9259	0,9214	0,0253	36,5273
VerbRewS	0,9151	0,9035	0,0326	28,03

Reciproc:

(Composite Reliability = 0.940 , AVE = 0.758)

Reciproc	0,9054	0,9046	0,0153	59,2897
Reciproc	0,8906	0,8878	0,0239	37,2346
Reciproc	0,9107	0,9092	0,0168	54,232
Reciproc	0,825	0,8234	0,0501	16,4774
Reciproc	0,8175	0,8136	0,0427	19,1411

Reputati:

(Composite Reliability = 0.943 , AVE = 0.806)

Reput01	0,845	0,8463	0,0268	31,5195
Reput02	0,9253	0,9246	0,0139	66,5501
Reput03	0,9159	0,9184	0,0215	42,6644
Reput04	0,9025	0,8996	0,0325	27,8034

Tangible:

(Composite Reliability = 0.876 , AVE = 0.708)

TangRewa	0,6373	0,5823	0,2756	2,3123
TangRewa	0,8868	0,811	0,186	4,7672
TangRewa	0,9649	0,8877	0,1966	4,9079

Attitude:

(Composite Reliability = 0.923 , AVE = 0.751)

Attitu01	0,8501	0,8377	0,0293	29,0361
Attitu02	0,8539	0,8477	0,0305	28,0225
Attitu03	0,9125	0,9074	0,0276	33,0892
Attitu04	0,8486	0,8497	0,0456	18,621

Intentio:

(Composite Reliability = 0.909 , AVE = 0.716)

Intent01	0,7066	0,717	0,0593	11,9211
Intent02	0,9275	0,9262	0,0189	48,9676
Intent03	0,793	0,7782	0,07	11,3205
Intent04	0,9366	0,935	0,0172	54,4128

Subjecti:

(Composite Reliability = 0.959 , AVE = 0.887)

SbNorm01	0,9152	0,9074	0,0503	18,2098
SbNorm02	0,9564	0,9567	0,0134	71,153
SbNorm03	0,9539	0,9554	0,0176	54,3267

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Path Coefficients Table (Original Sample Estimate):

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	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Self-Eff	0	0	0	0	0	0	0	0	0	0
Meaningf	0	0	0	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	0	0	0	0
VRewards	0	0	0	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0	0	0	0
Attitude	0,315	0,223	-0,016	-0,117	0,244	0,275	0,019	0	0	0
Intentio	0	0	0	0	0	0	0	0,688	0	0,125
Subjecti	0	0	0	0	0	0	0	0	0	0

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Path Coefficients Table (Mean of Subsamples):

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	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Self-Eff	0	0	0	0	0	0	0	0	0	0
Meaningf	0	0	0	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	0	0	0	0

VRewards	0	0	0	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0	0	0	0
Attitude	0,3152	0,2323	-0,0362	-0,0905	0,2546	0,2598	0,0211	0	0	0
Intentio	0	0	0	0	0	0	0	0,7031	0	0,1041
Subjecti	0	0	0	0	0	0	0	0	0	0

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Path Coefficients Table (Standard Error):

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	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Self-Eff	0	0	0	0	0	0	0	0	0	0
Meaningf	0	0	0	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	0	0	0	0
VRewards	0	0	0	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0	0	0	0
Attitude	0,0787	0,0884	0,1039	0,0656	0,1216	0,1589	0,1054	0	0	0
Intentio	0	0	0	0	0	0	0	0,0688	0	0,0789
Subjecti	0	0	0	0	0	0	0	0	0	0

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Path Coefficients Table (T-Statistic)

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	Self-Eff	Meaningf	Impact	VRewards	Reciproc	Reputati	Tangible	Attitude	Intentio	Subjecti
Self-Eff	0	0	0	0	0	0	0	0	0	0
Meaningf	0	0	0	0	0	0	0	0	0	0
Impact	0	0	0	0	0	0	0	0	0	0
VRewards	0	0	0	0	0	0	0	0	0	0
Reciproc	0	0	0	0	0	0	0	0	0	0
Reputati	0	0	0	0	0	0	0	0	0	0
Tangible	0	0	0	0	0	0	0	0	0	0

Attitude	4,0021	2,5217	0,1539	1,7837	2,0071	1,7303	0,1802	0	0	0
Intentio	0	0	0	0	0	0	0	10,0042	0	1,585
Subjecti	0	0	0	0	0	0	0	0	0	0

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APPENDIX G SUMMARY OF LITERATURE

Motivators for knowledge sharing			*Motivators*		
Study	Context/RQ	Research Design	Extrinsic	Intrinsic	Findings
Vuori and Okkonen (2012)	What motivates employees to share their knowledge through an intra-organisational social media platform?	Survey (n=148)	• Reciprocity • Financial rewards • Praise and recognition	• Adding value to knowledge and trusting knowledge sharing is worthwhile	• Financial rewards and recognition were ranked lowest. • Reciprocity and trusting sharing is worthwhile were ranked highest.
Chennamaneni et al. (2012)	Investigate psychological, organisational and technological antecedents and their influence on knowledge sharing behaviour	Survey (n=180) TPB	• Perceived organisational incentives • Perceived reciprocal benefits • Perceived reputation enhancement		• Reputation and reciprocal benefits both influenced attitude towards knowledge sharing • Organisational incentives did not influence attitude towards knowledge sharing

Welschen et al. (2012)	Investigate the impact of intrinsic motivators on organisational knowledge sharing	Survey (n=64)	•	• Self-efficacy • Autonomy • Meaningfulness • Impact	• Self-efficacy, meaningfulness and impact positively influenced attitude towards knowledge sharing, autonomy did not
Chang and Chuang (2011)	How can individual motivation and social capital facilitate knowledge sharing behaviour in a virtual community context?	Survey (n=282)	• Reciprocity • Reputation	•	• Reciprocity had a positive effect on knowledge sharing • Reputation did not influence quantity of knowledge sharing but it did influence quality of knowledge sharing.
Chen and Hung (2010)	Examine the effect of contextual factors and individual factors on knowledge sharing behaviour in professional virtual communities	Survey (n=323)	• Reciprocity • Perceived relative advantage	• Self-efficacy • Perceived compatibility (meaningfulness)	• Reciprocity did not influence knowledge contributing behaviour • Perceived compatibility had a weak influence on knowledge contributing behaviour • Self-efficacy and perceived relative advantage had a positive influence on

					knowledge contributing behaviour
Foss et al. (2009)	Investigates the influence of job design on motivation and the influence of motivation on knowledge sharing behaviour	Survey (n=186)	• Extrinsic motivation (praise, promotion)	• Intrinsic motivation (important part of job, personally satisfying)	• Extrinsic motivation negative effect on sending knowledge • Intrinsic motivation positive effect on sending knowledge
Paroutis and Al Saleh (2009)	Investigate factors influencing knowledge sharing using Web 2.0	Case study (11 in-depth interviews)	• Recognition	•	• Users value support and recognition from their superiors and the organisation
Lin et al. (2009)	Investigate the relationships between contextual factors, personal perceptions of knowledge sharing behaviour, knowledge sharing behaviour and community loyalty in professional virtual communities	Survey (n=350)	• Reciprocity • Perceived relative advantage	• Self-efficacy • Perceived compatibility (meanigfulness)	• Reciprocity did not influence knowledge sharing behaviour • Self-efficacy, perceived rel. Advantage and perceived compatibility had a significant positive effect on knowledge sharing behaviour
Hsu et al. (2007)	Exploring the relationship between trust, self-efficacy and outcome expectations with knowledge sharing behaviour in	Survey (n=250)	• Personal outcome expectations (recognition, reputation, strengthen ties)	• Knowledge sharing self-efficacy • Community related outcome expectations	• Self-efficacy and personal outcome expectations influence knowledge

	virtual communities			(impact)	sharing behaviour, outcome expectations did not.
Lin (2007)	Examine the role of extrinsic and intrinsic motivators in explaining knowledge sharing intentions	Survey (n=172) TRA	• Expected organisational rewards (monetary+promotion) • Reciprocal benefits	• Self-efficacy	• Reciprocal benefits, Self-efficacy and enjoyment positively related to attitude. Organisation rewards not significantly related to attitude.
Chiu et al. (2006)	Investigate the motivations underlying knowledge sharing behaviour in virtual communities	Survey (n=310)	• Reciprocity • Personal outcome expectations (reputation, sense of accomplishment, strengthen ties)	• Community-related outcome expectations (impact)	• Reciprocity and community-related outcome expectations influenced quantity of knowledge sharing, personal outcome expectations did not.
Kwok and Gao (2006)	Test the relationship between extrinsic motivation, absorptive capacity and channel richness and the attitude towards knowledge sharing behaviour	Survey (n=75)	• Extrinsic motivation (receiving monetary reward, avoiding punishment, building reputation)		• Extrinsic motivation had no impact on the attitude towards knowledge sharing
Lu et al. (2006)	-Explore what intrinsic and extrinsic factors can enhance or inhibit organisational	Survey (n=208)	•	• Self-efficacy	• self-efficacy positively influenced knowledge

	knowledge sharing behaviours				sharing
Ko et al. (2005)	What are the antecedents of knowledge transfer from a consultant to a client and to what extent do they explain KT in the context of ERP implementations?	Survey (n=96 projects, 80 firms)	• Extrinsic motivation	• Intrinsic motivation	• Extrinsic motivation not significant determinant of knowledge transfer, intrinsic motivation significant.
Kankanhalli et al. (2005)	How is EKR usage by knowledge contributors influenced	Survey (n=150)	• Organisational rewards (economic incentives) • image • reciprocity.	• Self-efficacy	• organisational rewards, self-efficacy and enjoyment are positively related to EKR usage • Reciprocity is positively related to EKR usage only when pro sharing norms are weak.
Bock et al. (2005)	What factors increase or lessen employees' tendencies to engage in knowledge sharing behaviours	Survey (n=154) TRA	• Anticipated extrinsic rewards (monetary+promotion) • Anticipated reciprocal relationships • Sense of self-worth (if employees see themselves providing value to organisation through their knowledge sharing)		• Rewards show significant negative relationship with attitude towards KS • Reciprocal relationships and self-worth show positive relationship with attitude towards knowledge sharing
Wasko and Faraj	Examine why people	Archival,	• Reciprocity		• Negative

(2005)	voluntarily contribute knowledge and help others through electronic networks	network, survey and content analysis	• Reputation		relationship between reciprocity and volume of contribution • Positive effect of reputation on volume of contribution
Bock and Kim (2002)	Investigate factors that affect individual's knowledge sharing behaviour in organisations	Survey (n=467) TRA	• Expected rewards (financial, promotion) • Expected Associations (improve relationships)	• Expected contribution (make contributions to organisational performance (impact))	• Expected associations and contribution were positively related to knowledge sharing attitude • Expected rewards was negatively related to attitude towards knowledge sharing
Yahya and Goh (2002)	Investigate factors relating to HRM practices and their influence on knowledge management activities	Survey (n=300)	• Feedback	•	• Positive effect of feedback from internal customers and superiors on knowledge management activities