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Determinants and Consequences of Knowledge Sharing Among Employees in a UAE National Oil and Gas Company

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DETERMINANTS AND CONSEQUENCES OF KNOWLEDGE SHARING AMONG EMPLOYEES IN A UAE NATIONAL OIL AND GAS COMPANY

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This dissertation is submitted in partial fulfilment of the requirements for the degree of Doctorate of Business Administration

Under the Supervision of Dr. Mumin Dayan

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Declaration of Original Work

I, Hussein Saad Elsayed Mohamed Abdalla, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this dissertation entitled "*Determinants and Consequences of Knowledge Sharing among Employees in a UAE National Oil and Gas Company*", hereby, solemnly declare that this dissertation is my own original research work that has been done and prepared by me under the supervision of Dr. Mumin Dayan, in the College of Business and Economics at UAEU. This work has not previously been presented or published, or formed the basis for the award of any academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources (whether published or unpublished) and relied upon or included in my dissertation have been properly cited and acknowledged in accordance with appropriate academic conventions. I further declare that there is no potential conflict of interest with respect to the research, data collection, authorship, presentation and/or publication of this dissertation.

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Abstract

This dissertation investigates the determinants and consequences of knowledge sharing among members of technical teams at a UAE national oil company. The research aims to identify some of the key factors that encourage knowledge sharing between members of the technical teams and the link between knowledge sharing and individual job performance. Drawing on earlier research, an integrated theoretical model linking the antecedents and outcomes of knowledge sharing was developed. A Partial Least Square (PLS-SEM) technique was used to analyze the data collected from 357 engineers in various divisions in the largest business unit of the organization in question. Results suggest that management support, task-interdependence, individual attitude towards knowledge sharing, self-efficacy and the perceived usefulness of the knowledge itself play an important role in encouraging employees to share knowledge. Furthermore, the study suggests that knowledge sharing influences individual job performance by enhancing their innovative and task-focused organizational behaviors. This research contributes to the current literature on knowledge sharing and has done so by empirically testing the relationship between the antecedents and outcomes of knowledge sharing within new cultural and industrial contexts. Additionally, it addresses a gap in the extant literature where the focus has traditionally been on the macro-organizational outcomes of knowledge sharing, e.g. innovation, financial performance and operational efficiency, and not on micro-organizational factors such as individual job performance.

Keywords: Knowledge sharing, individual job performance, innovative behavior, task-focused organizational behavior, individual job security.

Title and Abstract (in Arabic)

المحددات والنتائج المترتبة على تبادل المعرفة بين العاملين في شركة وطنية للنفط والغاز بالإمارات العربية المتحدة

الملخص

تبحث هذه الأطروحة في الأسباب والنتائج المترتبة على تبادل المعرفة بين أعضاء الفرق الفنية العاملة بأحدى شركات النفط والغاز الوطنية بالإمارات العربية المتحدة. ويهدف البحث إلى التعرف على بعض العوامل الرئيسية التي تشجع سلوك تبادل المعرفة بين أعضاء الفرق الفنية وكذلك العلاقة بين سلوك تبادل المعرفة والأداء الوظيفي الفردى. واعتمادا على أبحاث سابقة، فقد تم تطوير نموذج نظري متكامل يربط بين أسباب تبادل المعرفة بين العاملين والنتائج المترتبة على هذا السلوك. وقد تم جمع بيانات البحث عن طريق إجراء إستبيان شمل 357 مهندس من مختلف الأقسام والإدارات في أكبر وحدة أعمال بالشركة وتم تحليل هذه البيانات بإستخدام تقنية المربعات الجزئية الصغرى لتقييم النموذج الهيكلى للمعادلات (PLS-SEM) والتى تسمح بحل كافة المعادلات التى تربط بين المتغيرات فى نفس الوقت. وتشير نتائج البحث إلى أن عوامل مثل دعم الإدارة والربط بين مهام الأفراد وميول الأفراد لتبادل المعرفة و كذلك قدراتهم الشخصية وإنطباعتهم عن أهمية المعرفة المتبادلة تلعب دورا هاما في تشجيع سلوك تبادل المعرفة بين الموظفين. وعلاوة على ذلك تشير الدراسة إلى أن تبادل المعرفة بين الأفراد يؤدى إلى تحسن أدائهم الوظيفي الفردى وذلك من خلال تعزيز قدراتهم على الإبتكار وتحفيز روح الإنتماء للمؤسسة مما يساعد على تحقيق المهام المناطة بهم. ويمثل هذا البحث إضافة معرفية ثرية للمفاهيم السائدة عن العلاقة بين الدوافع والنتائج المترتبة على تبادل المعرفة بين الأفراد وذلك من خلال إختبار هذه العلاقة تجريبيا فى سياق جديد من ناحية الثقافة والصناعة التى يتم دراستها. وعلاوة على ذلك، فإنه يعالج فجوة معرفية قائمة حيث كان التركيز عادة على النتائج المترتبة على تبادل المعرفة فيما يتعلق بأداء المؤسسات، مثل الابتكار والأداء المالي، والكفاءة التشغيلية وليس على النتائج المتعلقة بالأفراد مثل الأداء الوظيفي الفردي.

مفاهيم البحث الرئيسية: تبادل المعرفة، والأداء الوظيفي الفردي والسلوك الابتكاري، والسلوك التنظيمي تركز على مهمة والأمن الوظيفي الفردي.

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This study would not have been possible without the support of my friends and colleagues at Abu Dhabi Marine Operating Company (ADMA-OPCO) who encouraged me to complete my post-graduate studies and were truly supportive of

my research to the extent of participating in the survey to share their views, opinions and perceptions of knowledge sharing within our organization.

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Finally, special thanks go to my wife and two sons who had to endure many long hours of study. I am grateful for their support and encouragement as I complete my goal of studying to doctoral level. I am also grateful to my parents and brothers and sisters for their encouragement and prayers for my success.

Above all, I am grateful to the Almighty for giving me the strength, blessings and opportunities to persevere with my studies and see them to a fruitful conclusion.

Dedication

To my beloved mother who inspired me to continually seek knowledge, and to my father who instilled the virtues of hard work in me, and to my wife

their support and encouragement.

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List of Abbreviations

ATKS	Attitude Towards Knowledge Sharing
AVE	Average Variance Extracted
CET	Cognitive Evaluation Theory
CMB	Common Method Bias
CR	Composite Reliability
CSV	Comma Separated Values
DIKW	Data-Information-Knowledge-Wisdom Hierarchy
ET	Employee Training
f-square	Effect Size
IB	Innovative Behavior
IJP	Individual Job Performance
KM	Knowledge Management
KS	Knowledge Sharing
KSB	Knowledge Sharing Behavior
MS	Management Support
OR	Organizational Rewards
PJS	Perceived Job Security
PKA	Perceived Knowledge Accessibility
PKU	Perceived Knowledge Usefulness
Q-Square	Coefficient of Predictive Relevance
R-square	Coefficient of Determination
SCT	Social Capital Theory
SE	Self-Efficacy

SEM-CB	Covariance-based Structural Equation Modeling
SEM-VB	Variance-based Structural Equation Modeling
SET	Social Exchange Theory
SPSS	Statistical Package for Social Sciences
TFCB	Task-focused Citizenship Behavior
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TSKI	Task Interdependence
VIF	Variance Inflation Factor

Chapter 1: Introduction

1.1 Overview

The knowledge-based theory of the firm considers organizational knowledge to be the most important resource that a firm possesses (Spender & Grant, 1996; Willem & Buelens, 2007). It also argues that firms exist to create, share and utilize knowledge effectively to establish a sustainable competitive advantage (Nonaka, Toyama & Nagata, 2000). Many scholars claim that by producing and developing new knowledge any firm is not only able to develop tangible new products, processes and services but also to improve existing ones more efficiently in order to strengthen its market position (Carmeli, Gelbard & Reiter-Palmon, 2013; Sirmon, Hitt & Ireland, 2007; Teece, 2000).

There is growing recognition that employees are the main source of organizational knowledge and capabilities (Henttonen, Kianto & Ritala, 2016; Mura, Lettieri, Radaelli & Spiller, 2013). In the course of their daily activities, employees' interactions and collaboration lead to improvements in work processes and also the development of new practices and processes that help organizations to achieve their business goals (Adams & Lamont, 2003; Carmeli et al., 2013; Sirmon et al., 2007). Therefore, it is crucial for organizations to create a suitable working environment and to promote a culture that encourages collaboration between employees and ensures a free flow of knowledge and ideas within the organization (Almeidaa & Soares, 2014; Duffield & Whitty, 2015; Wang & Ko, 2012).

Knowledge Sharing (KS) has been identified as one of the most critical processes in any effective knowledge management initiative (Blankenship & Ruona,

2009; Lee & Ahn, 2007; Wang & Ko, 2012). A recent literature review indicates that successful implementation of knowledge sharing practices increases coordination and cooperation between employees and improves their competencies, problem-solving abilities and job-related skills (Wang & Ko, 2012).

Knowledge sharing is the act of disseminating one's own knowledge to other members of an organization (Liao, 2008). Knowledge sharing has also been defined as both donating and receiving task-relevant ideas, specific information and suggestions from other members of an organization (Srivastava, Bartol & Locke, 2006). In fact, knowledge sharing is a process that allows an employee to gain from the experience of his/ her colleagues in order to build expertise, improve performance and enhance the quality of his/ her work, while simultaneously creating new knowledge (Argote, 2011; Tsai, 2002). It therefore follows that knowledge sharing includes not only the mutual transfer of knowledge between members of an organization, but also how to fuse new and existing knowledge in order to jointly create additional knowledge (Argote, 2011; Gagné, 2009). However, sharing knowledge among employees may be an uncomfortable experience for certain reasons. For example, the fear of losing power, a lack of trust between employees and uncertainty about the value of that knowledge (Ghobadi, 2015; Kang, Kim & Chang, 2008).

1.2 Statement of the Problem

A review of the extant literature on knowledge sharing reveals that there are two distinct research streams. The first stream includes studies that focus on identifying the key determinants of knowledge sharing within organizations (Ghobadi, 2015; Wang & Noe, 2010; Witherspoon, Bergner, Cockrell & Stone, 2013). This is

not surprising, as researchers strive to gain a better understanding of this phenomena in order to inform their recommendations and to successfully implement such knowledge management processes (Cabrera, Collins & Salgado, 2006; He & Wei, 2009; Razmerita, Kirchner & Nielsen, 2016).

The second stream includes studies that focus on the link between successful knowledge sharing practices and global organizational outcomes, such as competitiveness, innovation, financial performance and operational efficiency (Wang, Sharma & Cao, 2016; Wang, Wang & Liang, 2014; Wang & Wang, 2012; Zack, Mckeen & Singh, 2009). This is also not surprising as the results of this research drew attention to the importance of this phenomena in organizations. However, there has been less attention given to studying the impact of knowledge sharing on micro-organizational outcomes, e.g., individual job performance, or the mechanism through which knowledge sharing influences these micro-organizational outcomes (Foss, Husted & Michailova, 2010; Henttonen et al., 2016; Kim & Yun, 2015).

Furthermore, there is dearth of research related to the antecedents and consequences of knowledge sharing within the context of UAE organizations, especially those in the oil and gas sector (Boumarafi & Jabnoun, 2008; Seba, Rowley & Lambert, 2012; Siddique, 2012).

This study aims to fill the gaps identified in the literature by: (1) exploring the antecedents of knowledge sharing behavior among employees in a national oil company in the United Arab Emirates; (2) investigating the potential relationship between knowledge sharing behavior and individual job performance; and (3) examining whether this relationship between knowledge sharing behavior and job performance is mediated by other variables such as task-focused organization

citizenship and innovative behaviors of the employees. To this end, this study will answer the following research questions:

1. What are the key determinants of knowledge sharing behavior among employees at a UAE national oil company?
2. How strong is the influence of these determinants on the overall knowledge sharing behavior of employees?
3. How does knowledge sharing behavior influence individual job performance?
4. How strong is the influence of knowledge sharing behavior on individual job performance?

In addition to filling the gaps in extant literature on knowledge sharing, the findings of the study are valuable for management to formulate effective strategies to encourage knowledge sharing and improve the employees' job performance to achieve organizational objectives.

The remainder of this chapter reviews the relevant literature. Chapter 2 discusses the development of a theoretical framework and the concomitant research hypotheses, as well as reviewing a qualitative study conducted to verify the validity of the research framework. Chapter 3 covers research design, the development of the questionnaire instrument and data collection. Chapter 4 covers the statistical analysis of the data, while the results are discussed in chapter 5. Then, chapter 6 concludes with the implications, limitations and future recommendations of the research.

1.3 Literature Review

A review of relevant literature follows the roadmap presented in figure 1. First, the nature of knowledge within organizations is defined and its various classifications

are discussed. Secondly, the definition of knowledge management and its main frameworks are also presented. Finally, the various elements of knowledge sharing in organizations will be covered. A list of academic journals that were consulted to access peer-reviewed articles for this literature review is presented in Appendix-1.

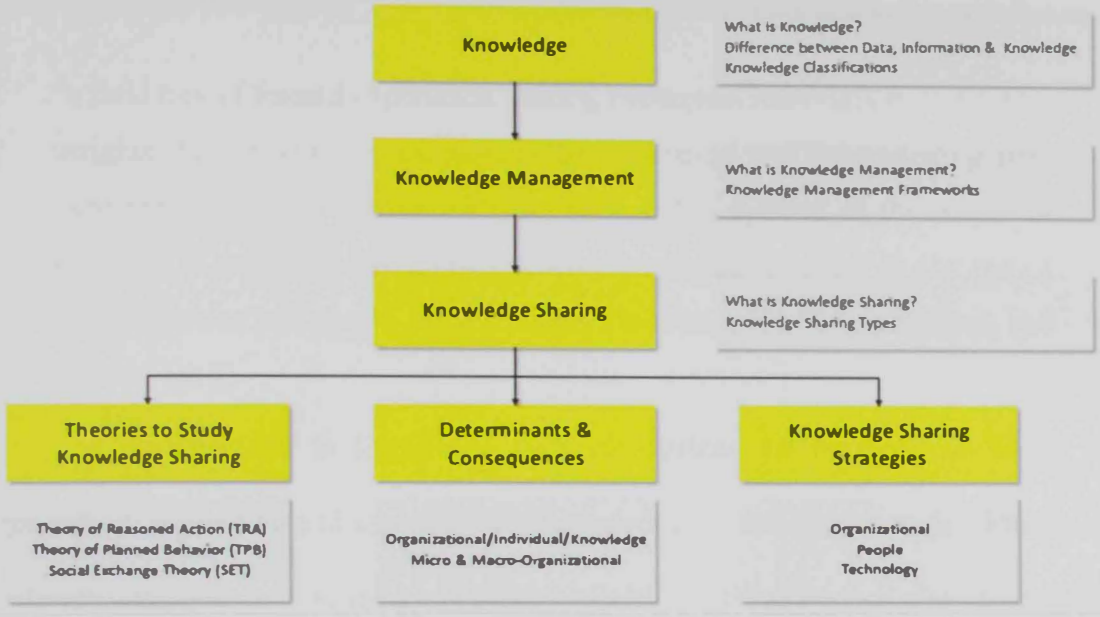

Figure 1: Roadmap for the Literature Review

1.3.1 What is Knowledge?

In the current highly competitive and dynamic global economy, it is widely recognized that knowledge is an essential strategic resource for any organization that seeks to gain a sustainable and competitive edge over its rivals and thus achieve better business results (Argote & Ingram, 2000; Foss & Pedersen, 2002; Zheng, Yang & Mclean, 2010). To stay ahead of the competition, an organization must implement a sound knowledge management strategy to manage knowledge and maximize its benefits (Bollinger & Smith, 2001; Zack et al., 2009).

The literature includes various definitions of knowledge (Alavi & Leidner, 2001; Boisot & Canals, 2004; Bollinger & Smith, 2001; Ipe, 2003) which are not strictly required in this review. For example, Zins (2007) documented 130 definitions of knowledge as put forward by 45 separate scholars. This study will use the often-cited definition provided by Davenport & Prusak (1998). This defines knowledge as:

> "a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms." (p. 5)

This definition is significant as it emphasizes the role of individuals in generating, evaluating and applying new knowledge. It also alludes to the distinction between data, information and knowledge while highlighting the tacit and also explicit classification of knowledge. Finally, it touches on the way knowledge is shared in both soft and hard forms.

1.3.1.1 Difference between Data, Information and Knowledge

The difference between data, information and knowledge has been the subject of much debate among scholars (Alavi & Leidner, 2001). Cleveland (1982) is credited as being the first scholar to develop a data, information, knowledge and wisdom (DIKW) hierarchy to differentiate between these four key concepts (Rowley, 2007; Williams, 2014). Under this hierarchal model, which is shown in figure 2, data is simply raw objective facts, observations or records of an activity which have no meaning or significance since they are not processed or organized and they also lack context (Hey, 2004; Rowley, 2007). When data is processed, organized and given

context, it is transformed into information which can answer questions such as "who", "what", "where", "how many" and "when" (Rowley, 2007; Williams, 2014). Knowledge is know-how that is developed through experience and enables the transformation of information into useable instructions for individuals as they seek to control any given system and operate it more efficiently (Hey, 2004; Rowley, 2007). Finally, wisdom is the highest level of understanding and is attained from accumulated experience which enables individuals to predict the results of any action and plan accordingly (Hey, 2004; Rowley, 2007).

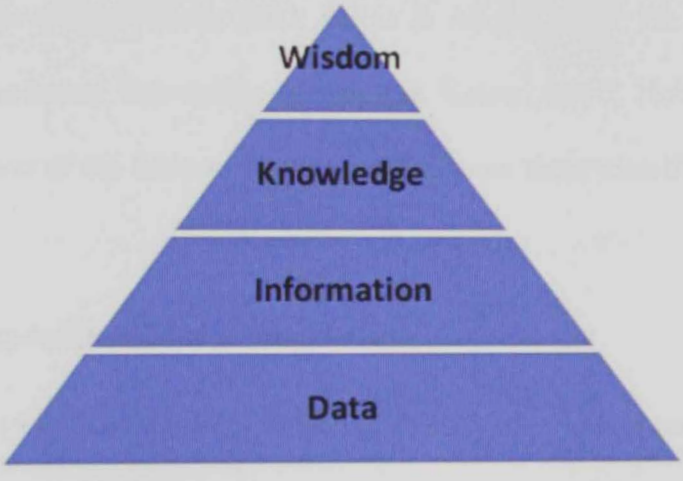

Figure 2: Data-Information-Knowledge-Wisdom Hierarchy (Cleveland, 1982)

Although many scholars have adopted the DIKW model (Faucher, Everett & Lawson, 2008; Rowley, 2007; Williams, 2014; Zeleny, 2006) to guide their development of knowledge management strategies and implementation of technology initiatives (Davenport & Prusak, 1998), some object to its uni-directionality and argue that it should be recursive as one must have a priori knowledge to guide the selection of data gathered as well as the ability to process the data and turn it into information (Tuomi, 1999). Others argue that the model is incomplete as it is focused on codified

data and ignores behavioral aspects (Frické, 2009; Hicks, Galup & Dattero, 2007), or that it has some educational value but does not help management in making the right investments concerning knowledge management programs (Earl, 2001).

1.3.1.2 Classification of Knowledge

In their studies of knowledge, scholars have used different dimensions to classify organizational knowledge (Heisig, 2009; Wang & Noe, 2010). Among the most cited classifications are tacit/ explicit knowledge (Hau, Kim, Lee & Kim, 2013; Nonaka, von Krogh & Voelpel, 2006; Reychav & Weisberg, 2010), individual/ organizational knowledge (Bhatt, 2002; Chiva & Alegre, 2005; De Long & Fahey, 2000), internal/ external knowledge (Grimpe & Kaiser, 2010; Holsapple & Joshi, 2000). This section of the literature review will discuss these classifications in more detail.

- **Tacit/ Explicit Knowledge Dimension**

Polanyi (1958) was the first scholar to classify individual knowledge as either tacit or explicit. Explicit knowledge is tangible and is usually found in a company's documents, manuals and files, while tacit knowledge is intangible and includes factors such as experience and skills (Grant, 2013). Organizations use two different strategies to deal with each respective type of knowledge: codification and personalization. Codification strategy is used to capture and store explicit knowledge in digital form (databases and archives) so as to be accessible to end users. Personalization is adopted when companies create an environment for personnel to interact either face-to-face in teams that work together on projects or by providing intranet networks, email and videoconferencing facilities in order to communicate from a distance (Dixon, 2000;

Hansen, Nohria & Tierney, 1999). Companies usually pursue one main strategy and use the second to support the first. Indeed, "Executives who try to excel at both strategies risk falling at both" (Hansen et al., 1999).

- **Individual/ Organizational Knowledge Dimension**

Individual knowledge refers to the know-how, expertise and skills that individuals develop and acquire in the course of their work. This enables them to perform their assigned tasks in an efficient and effective manner (De Long & Fahey, 2000). Organizational knowledge refers to processes, practices, business solutions and management strategies that enable an organization to conduct its business in a more efficient and cost effective manner when compared to its rivals (Matusik & Hill, 1998; Zander & Kogut, 1995). New organizational knowledge is developed through regular interaction between employees as they solve problems by integrating new knowledge acquired from external sources (Adams & Lamont, 2003; Schulz, 2001). Many organizations deploy knowledge management systems to maintain their organizational knowledge and ensure it is widely distributed and accessible to their employees, (Alavi & Leidner, 2001; Dixon, 2000).

- **Internal/ External Knowledge Dimension**

When it comes to knowledge sharing, determining the border between the external and internal is dependent on the unit being studied (whether a team, division, business unit or the whole organization). This also has an impact on the perceived value and usefulness of the knowledge (Alavi & Leidner, 2001; Kane, Argote & Levine, 2005).

Some scholars argue that members of an organization may resist external knowledge because of ego-defense, where employees consider their knowledge to be superior to certain others (Larkin, 2014), or due to power struggles within the organization leading to employees downplaying the significance of the received knowledge (Gupta & Govindaiajan, 2001). Moreover, they may have had a previous negative experience with shared knowledge (Husted & Michailova, 2002). It has been argued that knowledge from other entities within the same organization is easier to share and more likely to improve performance (Alavi & Leidner, 2001; Kane et al., 2005).

On the other hand, some scholars argue that members of an organization may prefer to use external knowledge due to its scarcity. This makes it appear exceptional and thus elevate one's status by comparison with colleagues (Menon & Pfeffer, 2003). Other reasons for organizations to utilize external knowledge are to close gaps in internal knowledge and avoid risking learning traps which can be associated with over-dependence on internal knowledge (Zack, 2005; Zack et al., 2009). Other scholars warn that over-reliance on external knowledge may degrade the organization's capacity to develop internal knowledge, as well as its ability to evaluate the quality and usefulness of external knowledge (Segelod & Jordan, 2004).

1.3.2 Knowledge Management

The knowledge-based theory of the firm considers organizational knowledge to be the most important resource that a firm possesses (Spender & Grant, 1996). It also argues that firms exist to create, share and utilize knowledge effectively in order to establish a sustainable competitive advantage (Nonaka et al., 2000). Many scholars argue that by producing and developing new knowledge a firm is not only able to

develop tangible new products, processes and services but also improve existing ones to strengthen its market position (Carmeli, Gelbard & Reiter-Palmon, 2013; Sirmon, Hitt & Ireland, 2007; Teece, 2000). As such, it is not surprising to see that organizations consider the effective management of this strategic resource as a prerequisite for success (Davenport & Prusak, 1998; Dixon, 2000).

1.3.2.1 What is Knowledge Management?

As when defining knowledge, the literature has a variety of definitions for knowledge management (Chen & Huang, 2007; Ipe, 2003; Kulkarni, Ravindran & Freeze, 2006; Lee & Choi, 2003). In this case, knowledge management is defined as "the processes by which an organization leverages the collective knowledge, both explicit and tacit, within the organization to develop a sustainable competitive advantage and improve its business performance" (Davenport & Prusak, 1998; Kulkarni et al., 2006; Von Krogh, 1998). The key challenge for management is how to "mobilize all of the knowledge resources held by individuals and teams and turn these resources into value-creating activities" (Von Krogh, 1998).

Traditionally, knowledge management implementation used to be dominated by information technology and supporting systems (Alavi & Leidner, 2001). However, there is now a greater appreciation for the need to engage employees in the knowledge management process (Sabherwal & Becerra-fernandez, 2003). Thus, it is increasingly important for organizations to create a suitable working environment and promote a culture that encourages collaboration between employees and ensures the free flow of knowledge and ideas (Aljuwaiber, 2016; Almeidaa & Soares, 2014; Cabrera & Cabrera, 2005; Duffield & Whitty, 2015).

1.3.2.2 Knowledge Management Frameworks

In their efforts to understand knowledge management in organizations, scholars and practitioners have developed various frameworks that highlight the key elements of knowledge management implementation, the relationships between those elements and their interactions (Lee & Choi, 2003; Metaxiotis, Ergazakis & Psarras, 2005). These frameworks can be broadly divided into three main types: prescriptive, descriptive, and hybrid frameworks (Heisig, 2009; Lee & Choi, 2003).

In the prescriptive frameworks, knowledge management is usually presented as a sequence of processes, without necessarily detailing how these processes are carried out (Rubenstein-Montano et al., 2001). Figure 3 shows an example of a prescriptive framework (Evans, Dalkir & Bidian, 2014). Heisig (2009) noted that different authors may use different terms to describe the same process. For example, when discussing knowledge sharing process, authors may use the terms share, transfer, distribution, knowledge communication, collaborate, diffusion or knowledge dissemination (Heisig, 2009). It was also noted that the majority of the frameworks mentioned in the literature are of the prescriptive type (Rubenstein-Montano et al., 2001).

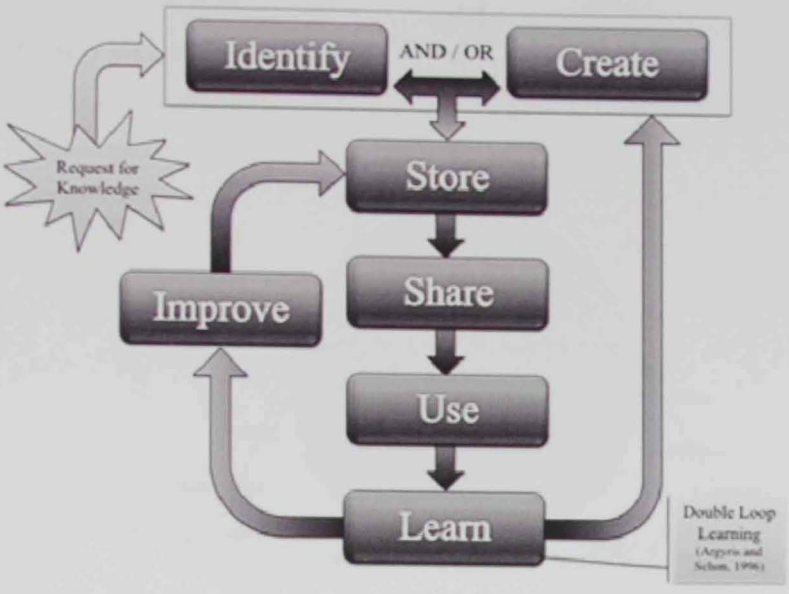

Figure 3: Prescriptive KM Framework (Evans et al., 2014)

On the other hand, descriptive frameworks use a system approach that characterizes knowledge management activities (e.g. acquiring knowledge from external sources or sharing best practices within an organization). This is, in turn, influenced by external factors that impact on its successful completion (Heisig, 2009; Rubenstein-Montano et al., 2001). Figure 4 shows an example of a descriptive framework where managerial factors (e.g., leadership and control), resource factors (e.g., human and financial), and environmental factors (e.g., markets and competition) influence the organizational knowledge management activity labelled as a "knowledge management episode" (Holsapple & Joshi, 2000).

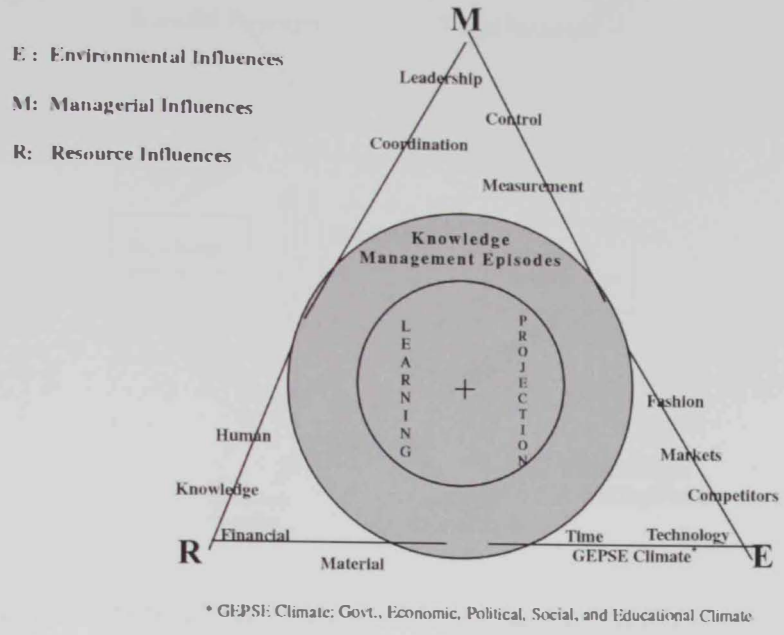

Figure 4: Descriptive KM Framework (Holsapple & Joshi, 2000)

Finally, the hybrid framework is an amalgamation of the two previous frameworks (Metaxiotis et al., 2005; Rubenstein-Montano et al., 2001). Figure 5 shows an example of a hybrid framework where the prescriptive elements of knowledge management (knowledge creation, organization, dissemination and use) are treated as a system influenced by external factors such as organizational structure and discipline (scientific aspects), employee competencies and communication (social aspects), in order to realize the benefits both for the business and the employees (McAdam & McCreedy, 1999). In essence, the hybrid model treats knowledge management as a series of dynamic interactions between knowledge processes, knowledge assets, and organizational domains (Shankar & Gupta, 2005).

Irrespective of the model, it is essential for employees to share knowledge for the initiative to succeed. Knowledge sharing processes will be covered in the following section.

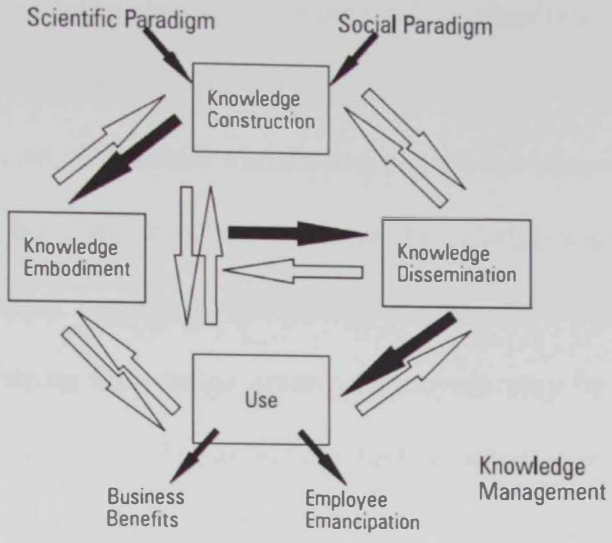

Figure 5: Hybrid KM Framework (McAdam & McCreedy, 1999)

1.3.3 Knowledge Sharing

Knowledge Sharing (KS) has been identified as one of the critical processes in any effective knowledge management initiative (Blankenship & Ruona, 2009; Lee & Ahn, 2007; Wang & Noe, 2010) and is the process that has been studied the most (Heisig, 2009). A recent literature review indicates that successful implementation of knowledge sharing practices improves coordination and cooperation between employees and enhances their competencies, problem-solving abilities, skills and job performance (Ghobadi, 2015; Wang & Ko, 2012).

Knowledge sharing is the act of disseminating one's own knowledge and know-how to other members of the organization (Liao, 2008). Knowledge sharing has also been defined as both donating and receiving task-relevant ideas, specific information and valuable suggestions in an organization (Srivastava et al., 2006). In fact, knowledge sharing is a process that allows an organizational entity, be that an individual, a team, division or business unit to benefit from the experience of others in

building expertise and improving performance, while simultaneously creating new knowledge (Argote & Ingram, 2000; Tsai, 2002). It follows that the knowledge sharing includes not only the act of mutually transferring knowledge between separate entities in the organization, but also fuses both the new and existing knowledge in order to jointly create additional knowledge (Argote & Ingram, 2000; Gagné, 2009; Tsai, 2002). However, sharing knowledge among employees may be an uncomfortable experience for various reasons. These include the fear of losing power, a lack of trust between employees and uncertainty about the value of that knowledge (Kang et al., 2008; Riege, 2005).

Although the terms knowledge sharing, knowledge transfer and knowledge exchange are sometimes used synonymously, there are subtle differences between the terms (Foss et al., 2010). Knowledge sharing is the voluntary act of providing one's know-how, expertise, task-relevant ideas and valuable feedback to others in the organization to help them solve problems or complete tasks (Srivastava et al., 2006). Knowledge transfer represents the ultimate outcome of the knowledge sharing process, which is the movement of knowledge between two different organizational entities (typically teams, divisions or business units) rather than individuals. It covers both the acquisition and successful application of the shared knowledge (Argote & Ingram, 2000; Szulanski, 2000). On the other hand, knowledge exchange refers to the outcome of interactions between two parties (mostly individuals and teams) who are, in effect, involved in mutually sharing, acquiring, combining and using the shared knowledge to enhance learning and improve performance (Wasko & Faraj, 2000; Zárraga & Bonache, 2005).

The following sections cover types of knowledge sharing, social theories that study knowledge sharing behavior, the determinants and consequences of knowledge sharing behavior and the strategies that organizations use to encourage their employee to engage in knowledge sharing activities.

1.3.3.1 Knowledge Sharing Types

Haas & Hansen (2007) have identified two distinct ways of sharing knowledge between individuals within organizations. These are the direct (personalized) and indirect (codified) methods. In the direct style, individuals engage in direct interactions in order to exchange ideas and share suggestions to complete specific tasks (Cross & Cummings, 2004; Reagans & McEvily, 2003). These interactions can take place either in face-to-face meetings or remotely via video-conferencing, email or telephone (Haas & Hansen, 2007). Due to the direct nature of these interactions this type of knowledge sharing is more suitable for tacit or non-codified knowledge (Hansen et al., 1999)

In the indirect method, individual knowledge is contained in written documents (e.g. best practices, lessons learned and reference manuals) or in electronic records stored in knowledge management systems so others in the organization can have access to that knowledge (Hansen et al., 1999). Thanks to the explicit nature of shared knowledge, this type of sharing does not require direct interaction between individuals (Haas & Hansen, 2007; Werr & Stjernberg, 2003).

Although each method of knowledge sharing has its associated benefits and costs, they are not mutually exclusive and may take place simultaneously (Haas & Hansen, 2007). Individuals who are engaged in direct communication may become aware of an example of best practice that has been recently updated. Conversely, an individual who is reviewing a static record via a knowledge management system may

need to seek direct advice to apply the new knowledge to a specific situation (Haas & Hansen, 2007).

1.3.3.2 Theories to Study Knowledge Sharing

To understand knowledge sharing behavior within organizations, scholars have traditionally relied on social theories to explain the social phenomena, what drives such phenomena and their consequences. Among the most popular theories cited are the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB) and the Social Exchange Theory (SET) (Wang & Noe, 2010). A list of key theories is given in table 1. What follows is a brief discussion of the main theories and their significance to this research topic.

- **Theory of Reasoned Action (TRA)**

The Theory of Reasoned Action (TRA) was first proposed by Fishbein & Ajzen (1975) and posits that individual behavior undergoes a two-stage development in order to occur – see figure 6. In the first stage, individuals develop an intention to act in a certain way and this intention is derived from personal attitudes and subjective norms. Personal attitudes are defined as "feelings or predispositions that result from an evaluation of the potential consequences of exhibiting a certain behavior" (Fishbein & Ajzen, 1975). This evaluation includes personal beliefs about such behavior and a careful evaluation of the potential gains of assuming such behavior. Subjective norms result from the perception of a certain behavior and may be influenced by a personal motivation to comply with existing norms (Fishbein & Ajzen, 1975).

With regard to knowledge sharing behavior, the theory suggests that influencing factors that shape individual's attitude towards knowledge sharing

behavior (e.g. the belief that sharing knowledge means commitment to the organization and would also result in a favorable recognition) and their subjective perception of norms (e.g. positive appraisal by peers and superiors and designing jobs to be interdependent to force compliance), drive individuals to develop positive intentions to share knowledge which subsequently translates into favorable knowledge sharing behavior (Fishbein & Ajzen, 1975).

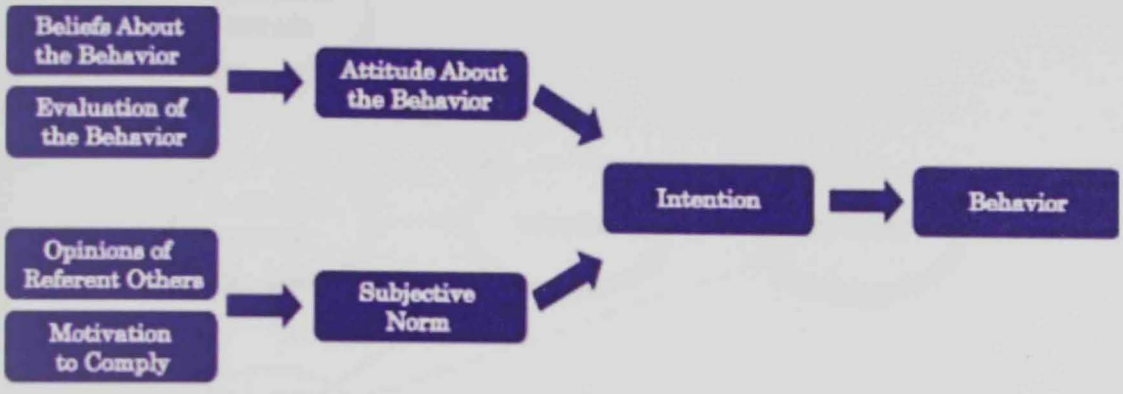

Figure 6: Elements of the Theory of Reasoned Action (Fishbein & Ajzen, 1975)

- **Theory of Planned Behavior (TPB)**

The Theory of Planned Behavior was developed by Ajzen (1985) as an extension of the Theory of Reasoned Action after realizing that the intention to behave in a certain way is not a sufficient predictor of actual behavior, particularly in cases where the employee lacks the skills, abilities, resources or opportunities to exhibit such behavior (Ajzen, 1985).

This theory posits that individual behavior is a two-stage process guided by three types of belief: behavioral, normative and control – see figure 7. Behavioral belief refers to evaluating the potential outcomes of a certain behavior and shapes individual attitudes toward that behavior. Normative belief refers to personal perceptions of the surrounding subjective norms. It derives from motivation to comply with group

opinion. Control belief is referring to the presence of favorable or unfavorable controlling factors (e.g. the availability of resources or a lack of skills) that either promotes or deters that behavior (Ajzen, 2002). A combination of these three factors: attitude, subjective norms and control, creates an intention that is then translated into the actual behavior when the opportunity arises (Ajzen, 2002).

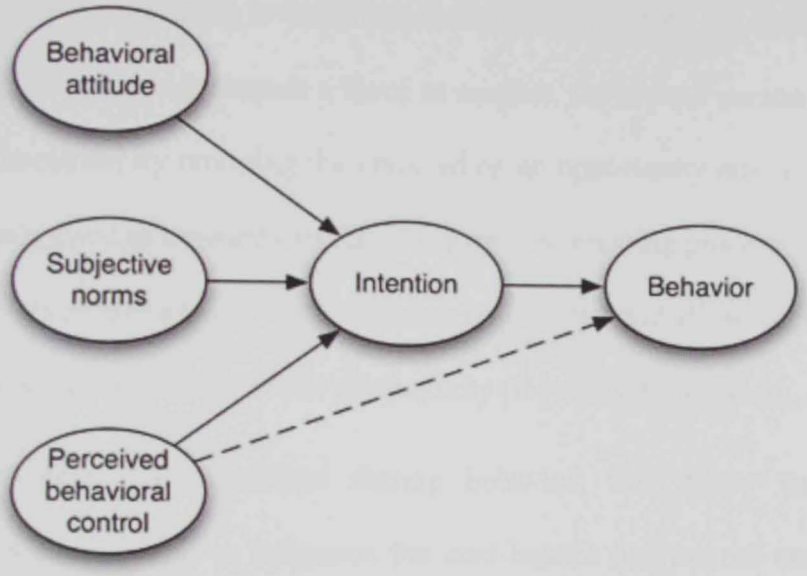

Figure 7: Theory of Planned Behavior (Ajzen, 2002)

For knowledge sharing applications, this theory suggests that in addition to catering to factors that influence attitudes towards knowledge sharing, and the perception of subjective norms, organizations need to introduce control elements such as training or access to an electronic knowledge management system in order to encourage positive intentions towards the sharing of knowledge (Gagné, 2009).

- **Social Exchange Theory (SET)**

Social Exchange Theory was developed by Blau (1964) to explain social interactions and social relations between individuals in complex social structures. Its main premise is that individual engagement in social interactions is based on a cost-

benefit analysis of the exchange. Expected benefits could be tangible, in the form of rewards and bonuses, or intangible in the form of status, recognition and trust (Davenport & Prusak, 1998).

In addition, this theory posits that social exchange involves a degree of reciprocity, which plays a central role in influencing employee opinions of one another, and also in increasing levels of productivity (Flynn, 2003). According to Blau (1964) when an individual extends a favor to another, the second person is expected to show appreciation by returning the favor when an opportunity arises. If not he or she would be viewed as unworthy of future favors. The ongoing process of giving and receiving favors creates a bond of trust between both parties and allows them to acquire valuable knowledge to improve their productivity (Reychav & Weisberg, 2010).

With regard to knowledge sharing behavior, this theory suggests that organizations should seek to influence the cost-benefit analysis of employees by increasing the benefits to be expected by introducing organizational rewards, training and development programs, personal recognition and emphasizing job security (Davenport & Prusak, 1998).

Table 1: Social Theories to Explain Knowledge Management

Social Theory	Proposed by	Key Tenets of the Theory	Theory Adopted by
Theory of Reasoned Action (TRA)	Fishbein & Ajzen (1975)	Social behavior (e.g. knowledge sharing) is driven by intentions which are influenced by subjective norms and personal attitudes.	Bock et al. (2005); Casimir et al. (2012); Hsu & Lin (2008)
Theory of Planned Behavior	Ajzen (1985)	Social behavior is driven by intentions which are determined by personal attitudes, subjective norms and perceived behavioral control.	Kankanhalli, Tan, & Wei (2005); Lin & Lee (2006)
Social Capital Theory	Nahapiet & Ghoshal (1998)	Frequent collaboration and interactions among employees would result in new intellectual capital due to knowledge sharing activities.	Cabrera & Cabrera (2005); Chiu, Hsu & Wang (2006)
Social Exchange Theory	Blau (1964)	Individuals attempt to maximize their utility by regulating their behavior during interactions with others.	Lee (2001); Liao (2008)
Cognitive Evaluation Theory	Bandura (1986)	Social behavior is the outcome of dynamic interactions between cognitive, behavioral and environmental factors.	Chiu et al. (2006); Lin, Huang & Wang (2008)
Agency Theory	Jensen & Meckling (1976)	Control mechanisms are required to align the divergent goals of employer and employees.	Björkman, Barner-Rasmussen & Li (2004; King & Marks (2008)
Knowledge-Based View of the Firm	Grant (1996)	Knowledge is the most important strategic resource that a company has to enhance its productivity and competitive advantage.	Sveiby (2001); Yli-renko, Autio & Sapienza (2001)

1.3.3.3 Determinants of Knowledge Sharing

Many scholars have studied the determinants of individual knowledge sharing behavior in the workplace (Ghobadi, 2015; Wang & Noe, 2010). In investigating the antecedents of knowledge sharing behavior, some scholars have focused on one key factor, such as management support (Carmeli, Gelbard & Reiter-Palmon, 2013), job design (Foss, Minbaeva, Pedersen & Reinholt, 2009), the intensity of training (Kuvaas, Buch & Dysvik, 2012) or organizational rewards (Bartol & Srivastava, 2002). Other scholars have focused on two factors such as trust and dependence (Park & Lee, 2014), or the sources of knowledge and organizational context (Foss & Pedersen, 2002), while others have considered the influence of multiple factors on knowledge sharing behavior (Connelly, Ford, Turel, Gallupe & Zweig, 2014).

A review of the literature reveals that the determinants of knowledge sharing behavior can also be categorized along organizational, individual and knowledge–related dimensions. The organizational dimension include factors such as management support (Carmeli, Gelbard & Reiter-Palmon, 2013; Kulkarni et al., 2006), job design (Foss et al., 2009; Gagné, 2009; Hislop, 2003), reward policies (Argote, Mcevily & Reagans, 2003; Bartol & Srivastava, 2002) and employee training and development opportunities (Gagné, 2009; Lu, Leung & Koch, 2006). On the other hand, the individual dimension includes factors such as self-efficacy (Cabrera et al., 2006; H. F. Lin, 2007; Rico, Sanchez-Manzanares, Gil, & Gibson 2008; Watson & Hewett, 2006), attitude towards knowledge sharing (Bock, Zmud, Kim & Lee, 2005; Casimir, Ngee, Ng, Liou & Cheng, 2012; Chennamaneni, Teng & Raja, 2012), and trust (Kankanhalli et al., 2005; Staples & Webster, 2008). In addition, the knowledge-related dimension includes factors such as the usefulness of the knowledge (Bock, Zmud, Kim & Lee,

2005; He & Wei, 2009; Wasko & Faraj, 2005) and the deployment of an infrastructure for the accessibility of that knowledge (Alavi & Leidner, 2001; Cabrera et al., 2006).These findings agree with earlier conclusions reached by Heisig (2009), who studied the critical factors for knowledge sharing within organizations and categorized them into the following: human-related factors, organizational and management processes and technology related factors. Riege (2005), who conducted an extensive literature review on the barriers to knowledge sharing in organizations, also concluded that barriers to knowledge sharing can be classified along organizational, individual and technological dimensions. Wang & Noe (2010) and Ghobadi (2015) also conducted extensive reviews of the drivers of knowledge sharing in organizations and reached similar conclusions. To inform future research, Wang & Noe (2010) developed a framework to describe the key determinants of knowledge sharing and highlighted those factors that had been frequently studied in the literature and those that required further study. Their framework is presented in figure 8 (below).

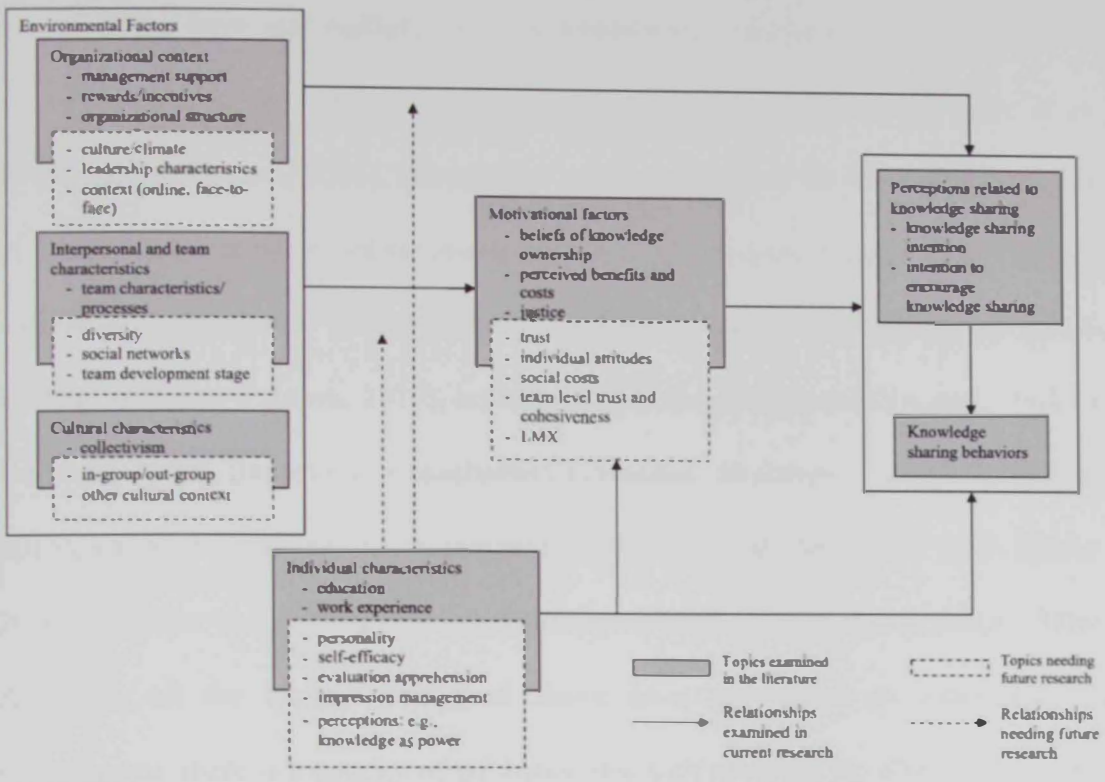

Figure 8: Framework of Knowledge Sharing Drivers (Wang & Noe, 2010)

1.3.3.4 Consequences of Knowledge Sharing

As highlighted earlier, knowledge sharing between employees can result in significant benefits both for the organization (Adams & Lamont, 2003; Nonaka et al., 2006) and for the employee (Henttonen et al., 2016; Wang & Ko, 2012). It is not surprising then to find that after exploring the determinants of knowledge sharing behavior, scholars began to shift their attention towards the relationship between knowledge sharing and its consequences (Haas & Hansen, 2005). The analysis of these consequences of knowledge sharing is usually biased towards broader organizational outcomes, e.g. innovation, operational and financial performance and competitive advantage, rather than towards individual or team outcomes, e.g. job performance (Foss et al., 2010).

As we have seen earlier, very few scholars have studied the consequences of knowledge sharing at a micro-organizational, individual or team level (Foss et al., 2010; Haas & Hansen, 2005). Researchers who have studied the individual outcomes of knowledge sharing in organizations have focused on how it can help in building individual competence (Sveiby, 2001), enhance innovative behavior (Carmeli, Gelbard & Reiter-Palmon, 2013), build trust between employees (Thomas, Zolin & Hartman, 2009), improve job satisfaction (Trivellas, Akrivouli, Tsifora & Tsoutsa, 2015), enhance organizational commitment (de Vries, van den Hooff & de Ridder, 2006) and improve the ratings for individual performance (Cross & Cummings, 2004). Although, all the factors mentioned above have an impact on individual job performance, there is a paucity of published research studying the direct relationship between knowledge sharing and individual job performance (Foss et al., 2010; Haas & Hansen, 2005; Kang et al., 2008).

1.3.3.5 Encouraging Knowledge Sharing in Organizations

Based on studies of knowledge sharing behavior in organizations, scholars have come up with various recommendations and strategies to encourage employees to share knowledge with colleagues (Bartol & Srivastava, 2002; Cabrera & Cabrera, 2005; Foss et al., 2009; Srivastava et al., 2006; Van Den Hooff & Huysman, 2009). Broadly speaking, these recommendations and strategies can be grouped as organizational, people-related and technological (see below).

- **Organizational Dimension**

A. Establish Visible Management Support

Research has shown that management support plays a crucial role in promoting and fostering knowledge sharing behavior among employees within an organization (Chiu et al., 2006; Gagné, 2009; Srivastava et al., 2006). Management can influence knowledge sharing behavior by articulating common organizational goals that encourage collaboration and cooperation between employees. They can present themselves as role models to employees, create an organizational culture that encourages knowledge sharing, provide resources that support knowledge sharing (e.g. training and development opportunities, deploying knowledge management systems and supporting employees' efforts to establish communities of practices), and assist employees in integrating new knowledge into their work (Nonaka et al., 2006; O'Neill & Adya, 2007; Rosen, Furst & Blackburn, 2007).

B. Implementing the Right Organizational Structure

Organizational structure is defined as "the formal allocation of work roles and the administrative mechanisms to control and integrate work activities including those which cross formal organizational boundaries" (Child, 1972). This definition includes three key components in its structure: formalization, centralization and integration (Chen & Huang, 2007).

Formalization refers to the degree to which tasks and activities within an organization are standardized and performed according to formal rules, regulations and procedures (Chen & Huang, 2007; Nelson & Quick, 2013). Formal organizations tend to impede voluntary knowledge sharing between employees as tasks and jobs are

standardized and employees are guided by organizational procedures, rules and guidelines which lead to fewer opportunities for employees to discuss alternative ways of doing things (Sividas & Dwyer, 2000). On the other hand, less formal organizations tend to enhance knowledge sharing as employees are expected to interact more frequently to improve their work performance (Sividas & Dwyer, 2000).

Centralization refers to the degree to which authority for making decisions stays with higher level management (Chen & Huang, 2007; Nelson & Quick, 2013). In highly centralized organization, knowledge sharing among employees is rare as employees are not involved in the decision making process and simply follow instructions (Sividas & Dwyer, 2000). Whereas, in decentralized organizations, knowledge sharing is higher as employees have more autonomy to interact, self-organize and make appropriate decisions on how to deal with new developments and problems (Gold, Malhotra & Segars, 2001).

Integration refers to the degree of coordination, communication and interaction between organizational units such as teams, departments or business units (Chen & Huang, 2007; Nelson & Quick, 2013). An organization with a high level of integration is expected to promote knowledge sharing as employees are allowed to communicate, interact and coordinate with their colleagues across organizational boundaries to find solutions to problems or new ways to perform assigned tasks (Janz & Prasarnphanich, 2003).

It follows from the discussion above that management should be cognizant that organizational structure plays an important role in promoting social interaction between employees, which in turn, encourages employees to share their knowledge (Chen & Huang, 2007; Riege, 2007; Zheng et al., 2010).

C. Establish Appropriate Organizational Incentive Schemes

Many scholars, especially those who embrace the Social Equity Theory, recommend that organizations should introduce appropriate organizational incentives to encourage employees to share their knowledge and reward them for their contribution (He & Wei, 2009; Kang et al., 2008; H.F. Lin, 2007). These recommendations are supported by other scholars who suggest that the absence of incentives, or having improper incentives, represents a barrier to knowledge sharing (Bartol & Srivastava, 2002; Cabrera & Cabrera, 2005; Yao, Kam & Chan, 2007). To encourage mutual collaboration and reinforce collective cooperation among employees, incentives should be based on achieving either team or organizational objectives rather than individual ones (Cabrera & Cabrera, 2005; Gant, Ichniowski & Shaw, 2002; Yahya & Goh, 2002).

In addition, incentive schemes should involve a mix of short-term (e.g., commissions and bonuses) and long-term (e.g., salary increases and promotion) components to address both the short- and long-term objectives of the organization (Holsapple & Joshi, 2000; Wong, 2005). Incentive schemes should also be linked to clear criteria to establish the quality of the knowledge shared in order to obtain valuable and actionable knowledge (Cabrera & Cabrera, 2005; Holsapple & Singh, 2001).

- **Individual Dimension**

A. Create Opportunities for Interaction

Knowledge sharing is a discretionary social behavior that is initiated by employees in response to the organizational context in which they work (Kelloway &

Barling, 2000; Yli-renko et al., 2001). Therefore, management should endeavor to create opportunities for employees to interact both formally (e.g. training sessions, designing job tasks to be interdependent and forming project teams) and informally (e.g. communities of practice, social events and team building exercises) in order to foster knowledge sharing activities (Bartol & Srivastava, 2002; Cabrera & Cabrera, 2005; Hislop, 2003). In addition to sharing knowledge, these interactions among employees will help in building trust between them and make them more comfortable in dealing with each other (Abrams, Cross, Lesser & Levin, 2003; Riege, 2007).

Of all the opportunities to share knowledge given above, communities of practice has attracted the attention of a lot of scholars and practitioners (Abrams et al., 2003; Dixon, 2000; Van Den Hooff & De Ridder, 2004; Wenger & Snyder, 2000). These informal groups are typically self-organized, range across business units and functional boundaries, and are populated by individuals who are bound by a common interest in a specific topic or professional discipline (e.g. petroleum engineering or drilling operations). They provide unlimited opportunities for members to interact either directly or indirectly to share ideas, experiences and best practice (Arora, 2002; Wasko & Faraj, 2005; Wenger & Snyder, 2000). Many practitioners have suggested that organizations should allow employees to establish these communities, and that management should support these initiatives with all the resources necessary (Dixon, 2000; Lu et al., 2006; Wenger & Snyder, 2000). This concept has proven to be very effective in enhancing individual problem solving skills and competence, all of which eventually helps organizations to achieve their objectives (Casimir et al., 2012; Jeon, Kim, & Koh, 2011).

B. Using Mentorship and/or a Coaching Approach for Development

Another strategy used by organizations to encourage experienced employees to share their tacit knowledge and know-how with their less experienced—yet high potential colleagues—is through the introduction of mentoring and coaching programs (Bryant, 2005; Kutzhanova, Lyons, & Lichtenstein, 2009).

Mentoring is defined as a career development relationship that involves the provision of guidance (e.g., technical advice and suggestions to improve work quality) and support (e.g., care, feedback and encouragement) from an experienced employee, in order to enhance the potential success of a lesser experienced, but talented, employee (Bozeman & Feeney, 2007; Chen, Tsui & Zhong, 2008). Likewise, coaching is defined as a structured development process that involves face-to-face interaction, between a relatively experienced employee (the coach) and a less experienced employee, with the objective of improving the less experienced employee's ability to perform their duties by influencing his/ her behavior (Allenbaugh, 1983; Kilmann, 1984).

Although coaching and mentoring are both personal development approaches that involve informal knowledge sharing and aim to build personal capacity, there are some subtly significant differences between the two techniques. Whereas coaching is structured, time-bound, specifically skills-focused and concerned with building competency, mentoring has an indeterminate timescale, is broadly focused on skills development and is concerned with integrating new insights into job performance (Desouza & Evaristo, 2006; Hislop, 2003).

C. Leverage HR Practices for Recruitment, Selection and Training

One effective strategy to foster knowledge sharing behavior is for the organization to recruit and select employees to match its desired culture, especially in terms of these knowledge sharing aspects (Robertson & Hammersley, 2000; Swart & Kinnie, 2003). Recruitment does not only cover fresh young graduates but also includes mid-career employees who have the know-how and expertise required by the organization to fill its gaps in knowledge (Haesli & Boxall, 2005). To ensure that the organization hires individuals with the right profile, current employees from different disciplines should participate in the selection process to assess whether new recruits would fit with the existing organizational culture (Cabrera & Cabrera, 2005; Soliman & Spooner, 2000).

Employee training is an important organizational strategy to develop workers and so equip them with the knowledge, skills and abilities necessary to work effectively in sustaining and improving the organization (Kaya, Koc & Topcu, 2010). Employee training is generally considered as crucial for the successful implementation of any knowledge management initiative (Lu et al., 2006).

The literature provides several insights as to how training and development can affect the knowledge sharing behavior of employees. On the one hand, employees view .training opportunities as a positive valuation of their position within the organization. This evaluation enhances their perception of organizational support and motivates them to contribute to the organization's success by sharing their knowledge with others (He & Wei, 2009; Kim & Ko, 2014; Kuvaas, 2008; Lu, Leung & Koch, 2006). Also, employee training usually results in enhancing self-efficacy, which is related to knowledge sharing behavior (Bryant, 2005; Maurer, Pierce & Shore, 2002). In

addition, on-the-job training and mentoring programs create suitable conditions for employees to communicate and share their knowledge (Casimir et al., 2012).

- **Technological Context**

The literature indicates that technology influences knowledge sharing behavior between employees (Heisig, 2009; Wang & Noe, 2010). Various studies have indicated that the ease of accessibility to knowledge and the usefulness of shared knowledge are enablers to facilitate knowledge sharing behavior (Cabrera et al., 2006; Hsu & Lin, 2008; Kulkarni et al., 2006).

A. Improve Knowledge Accessibility

Knowledge accessibility refers to the extent to which people have access to the knowledge they need to make decisions, solve problems and perform tasks (Chen, Chuang, & Chen, 2012). Organizations usually deploy ICT systems that enable knowledge searches, retrieval, processing and storage as well as communication and collaboration between employees (Huysman & Wulf, 2005; Yeh, Lai & Ho, 2006). ICT can also foster effective knowledge sharing by supporting social networks by providing an intranet, net-meetings, video-conferencing and virtual communities (Pan & Leidner, 2003).

To improve knowledge accessibility, organizations can also develop knowledge maps to identify those that are considered as subject matter experts (SMEs). They can be contacted by employees seeking knowledge and advice on solving certain work problems (Ardichvili, Page & Wentling, 2003). Naturally, organizations will need to support social interaction among employees by providing

the communication infrastructure necessary (e.g. email, intranet, net-meetings and video-conferencing facilities) (Bennett & Gabriel, 1999; Pan & Leidner, 2003).

B. Improve the Quality and Usefulness of Knowledge

Research has shown that the quality and usefulness of knowledge is one of the key drivers if individuals are to share their knowledge and contribute to the organizational knowledge management system (He & Wei, 2009; Kulkarni et al., 2006; Yu, Lu & Liu, 2010). As such, employees will believe that using shared knowledge of a high quality and value can help them to improve their job performance (Kankanhalli et al., 2005; Pituch & Lee, 2006). It follows that management needs to ensure that the organizational knowledge management system contains up-to-date, high quality and relevant knowledge to encourage employees to use it (Moon & Kim, 2001; Soliman & Spooner, 2000).

1.4 Chapter Summary

After highlighting the importance of knowledge for organizations and also individuals, research questions were formulated and justified by the need to fill gaps in the academic literature on the subject. This was followed by a review of the relevant literature covering the nature of knowledge, its different classifications, a definition of knowledge management, its main frameworks, a definition of knowledge sharing, its main drivers and also consequences. The key social theories used to study the phenomena, the individual and organizational benefits, and the key strategies recommended to improve knowledge sharing among employees were all also discussed.

The next chapter covers the theoretical framework that links the antecedents and consequences of knowledge sharing. Relevant hypotheses regarding the relationships between various model constructs will also be developed.

Chapter 2: Theoretical Framework

This chapter presents the theoretical framework that underpins the study of the relationship between the antecedents of knowledge sharing behavior and its micro-organizational outcome: individual job performance. It also includes a discussion of the rationale for selecting the various constructs for the theoretical framework.

2.1 Theoretical Foundations

The framework is based on integrating the input-process-output model developed by Hackman & Morris (1975) to study group performance effectiveness with the theory of planned behavior developed by Ajzen (1985). The Input-Process-Output Model postulates that organizational output is related to input factors (enablers) via certain organizational processes (see figure 9). In this study, the input factors are the predictors for knowledge sharing behavior; the organizational process is knowledge sharing between employees, and the intermediate outcomes are individual innovative behavior and task-focused organizational behavior. Additionally, the organizational output is individual job performance.

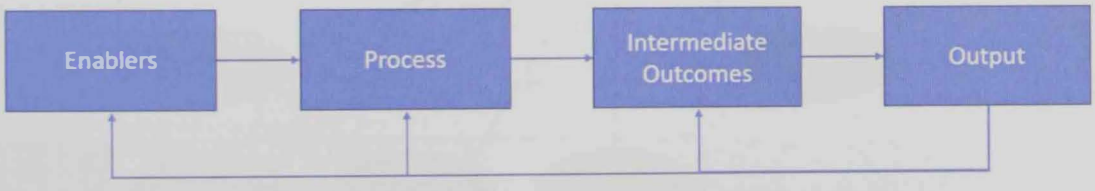

Figure 9: Input-Process-Output Model by Hackman & Morris (1975)

According to the Theory of Planned Behavior (Ajzen, 1991), the predictors for knowledge sharing are: (1) attitude towards knowledge sharing, (2) subjective norms,

such as organizational rewards, management support, interdependent tasks, perceived job security and self-efficacy; and (3) perceived behavior controls, such as employee training, knowledge accessibility and the perceived usefulness of the knowledge. These predictors have been selected according to the recommendations by (Wang & Noe (2010) to include under-researched determinants for knowledge sharing. That is, task interdependence, self-efficacy, attitude towards knowledge sharing, and perceived job security. The impact of the latter variable on knowledge sharing behavior is of topical interest due to the downturn in the oil industry which has led to many layoffs by major oil companies (Helman, 2015). In consistency with the literature, the predictors for knowledge sharing have been rearranged into three main dimensions: individual, organizational, and knowledge-related (Ghobadi, 2015; Heisig, 2009; Riege, 2005; Wang & Noe, 2010).

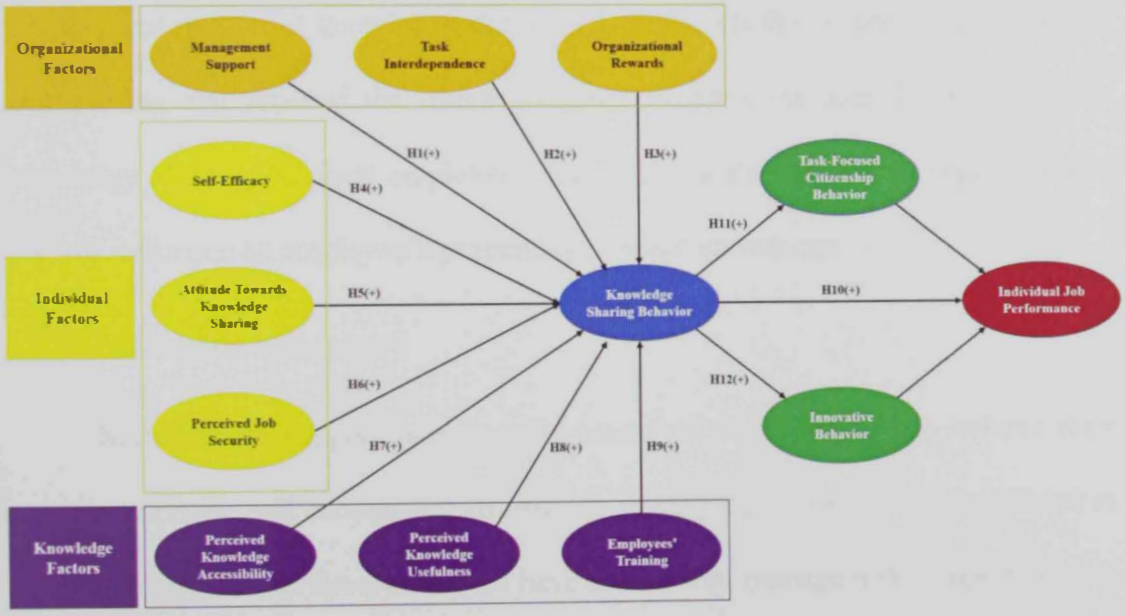

Figure 10: Theoretical Model of Knowledge Sharing and Research Hypotheses

In addition, the recommendations of Foss et al. (2010) to study the consequences of knowledge sharing at micro-organizational level (individual or

employee level) were built into the framework by including individual innovative behavior and task-focused organizational behavior, as intermediate outcomes, while individual job performance was the ultimate outcome (see figure 10). The following sections include a discussion of the rationale behind selecting the various model constructs and the justifications for relevant research hypotheses.

2.1.1 Organizational Perspectives

Organization factors such as perceived management support, task interdependence, job design and organizational rewards (which are part of the subjective norms) have been found to impact employee engagement in knowledge sharing activities (Buch, Dysvik, Kuvaas & Nerstad, 2015; Cabrera & Cabrera, 2005; Carmeli, Gelbard & Reiter-Palmon, 2013; Ghobadi & Mathiassen, 2016; Kang et al., 2008). They are included in the proposed framework to: (1) validate claims of management support of knowledge sharing, (2) check whether a recent organizational restructuring that resulted the interdependence of divisions does indeed influence knowledge sharing between employees, and (3) validate claims that organizational rewards influence an employee's propensity to share knowledge.

- **Management Support**

Management support refers to the extent to which employees believe their manager supports and encourages knowledge sharing behavior (Carmeli, Gelbard & Reiter-Palmon, 2013). Several studies have shown that management support plays a critical role in promoting and fostering knowledge sharing behavior among employees within an organization (Chiu et al., 2006; Gagné, 2009; Srivastava et al., 2006). The management can influence knowledge sharing behavior by articulating common

organizational goals that encourage collaboration and cooperation among employees. They can present themselves as role models, create an organizational culture that encourages knowledge sharing and provide resources to support that knowledge sharing (e.g. training and development opportunities, supporting employee efforts to establish communities of practices, and deploying knowledge management systems). They can also assist employees in integrating new knowledge into their work (Nonaka et al., 2006; O'Neill & Adya, 2007; Rosen, Furst & Blackburn, 2007).

Management support also plays a major role in addressing concerns by experienced staff that they lose their organizational value when they share their knowledge with others (Al-Busaidi, Olfman, Ryan & Leroy, 2010). H. F. Lin (2007) found that management support does influence employee commitment to knowledge management which leads to higher levels of knowledge sharing. Buch et al. (2015) also found that management support was correlated significantly to employee knowledge sharing behavior. Therefore, it can be hypothesized that:

H1: Management support positively influence knowledge sharing behavior between employees.

- **Task Interdependence**

Task interdependence refers to the level to which assigned tasks rely on contributions from others (Jarvenpaa & Staples, 2000; Park & Lee, 2014). It also refers to a perception that work outcomes are interdependent (Pee, Kankanhalli & Kim, 2010). Social Interdependence Theory (SIT) stipulates that the level of interaction between individuals increases when they share similar goals and when completing a task is contingent upon others (Johnson, & Johnson, 2008).

Task interdependence enhances a collective sense of responsibility by employees towards each other and provides higher incentives to help and support colleagues to complete their work and to ensure that all tasks are executed in a timely and high quality manner (Cabrera & Cabrera, 2005; C.P. Lin, 2007; Staples & Webster, 2008). Indeed, several scholars have presented empirical evidence to support the argument that task interdependence has a positive influence on knowledge sharing between employees (Cabrera & Cabrera, 2005; Jarvenpaa & Staples, 2000; C.P. Lin, 2007, 2010). Therefore, it can be hypothesized that:

H2: Task Interdependence positively influences knowledge sharing behavior between employees.

- **Organizational Rewards**

Organizational rewards refers to the extent that employees believe that they will receive economic benefits for sharing their knowledge with colleagues (Kankanhalli et al., 2005). Hall (2001) classified organizational rewards as tangibles, e.g. a salary increase, promotion, training opportunities and job security. The intangibles, for example, include an enhanced reputation and personal gratification. There are two school of thoughts regarding the use of organizational rewards to motivate employees to share knowledge (Bartol & Srivastava, 2002).

Scholars who support the Cognitive Evaluation Theory (CET) have argued against the use of organizational rewards to enhance the intrinsic motivation to share knowledge (Bartol & Srivastava, 2002). Their argument is that professionals are motivated to share their knowledge because of the self-satisfaction that they draw from completing their work (Hung, Durcikova, Lai & Lin, 2011; Seba et al., 2012). Other

scholars have shown that rewards do not encourage knowledge sharing (Bock, Zmud, Kim & Lee, 2005; Chang, Yeh & Yeh, 2007).

On the other hand, the researchers who embrace the Equity Theory (ET) argue that the absence of organizational rewards creates barrier to knowledge sharing among employees (Bartol & Srivastava, 2002; Cabrera & Cabrera, 2005; Yao et al., 2007), while others have shown that this does facilitate knowledge sharing between employees (Ipe, 2003; Nelson, Sabatier & Nelson, 2006). Furthermore, many researchers have demonstrated that having an appropriate rewards system provides a strong motivation for employees to share knowledge with colleagues (Al-Busaidi et al., 2010; He & Wei, 2009; Kang et al., 2008; Kulkarni et al., 2006; H. F. Lin, 2007). Wang & Ko (2012) have demonstrated that the successful implementation of a reward system increases coordination and cooperation among employees and improves their problem-solving abilities and other skills.

Since most employees in this case are expatriates who joined the organization for the promise of stable jobs and other associated benefits, it can be hypothesized that:

H3: Organizational rewards positively influence knowledge sharing behavior between employees.

2.1.2 Individual Perspectives

Several individual factors have been identified that influence knowledge sharing behavior between employees. These are self-efficacy, attitude towards knowledge sharing and perceived job security (Bartol, Liu, Zeng & Wu, 2009; Rico et al., 2008). The reasons for selecting these factors are as follows:

a. Self-efficacy is part of the model recommended by Wang & Noe (2010) to verify its influence on knowledge sharing behavior.

b. Attitude towards knowledge sharing is included in the model to corroborate claims in the Theory of Planned Behavior that attitude influences individual behavior (Ajzen, 1991) in the context of an oil company.

c. As crude oil prices continue to stay low, there is a degree of uncertainty surrounding the future of the oil industry that has been reflected in recent large scale layoffs by major companies (Helman, 2015). It is therefore anticipated that "perceived job security" may have a strong influence on knowledge sharing behavior, especially amongst expatriate employees.

- **Self-Efficacy**

Self-efficacy refers to an employee's confidence in his/ her ability to perform a wide range of work-related activities that go beyond assigned duties (Parker, 1998). Social Cognitive Theory posits that self-efficacy results from a dynamic interaction between individual behavior, cognition and the environment (Gist & Mitchell, 1992). Individuals are more likely to self-assess their capabilities and competencies when their colleagues ask them for help or when new problems or challenges arise. They are more likely to share that knowledge if they believe their contributions will be of value to others (Cabrera & Cabrera, 2002). Gist (1987) observed that "self-efficacy arises from the gradual acquisition of complex cognitive, social, linguistic, and/ or physical skills through experience."

It can be argued that self-efficacy determines whether an individual will share or hoard knowledge (Bandura & Locke, 2003). For example, Kankanhalli et al (2005) noted that when experienced individuals shared their knowledge with colleagues that

they gained self-confidence in their own abilities and in what they could do to benefit the organization. This heightened recognition of self-value and self-efficacy motivates individuals to continue sharing knowledge with their colleagues (Bock & Kim, 2002). Connolly et al. (2014) concurred with this finding and added that individuals with high self-efficacy are more likely to share their knowledge and expertise because they are able to manage their own tasks more efficiently.

On the other hand, Husted & Michailova (2002) argued that individuals who doubted their capabilities, or the value of their knowledge, may opt to hoard their knowledge for fear of exposure to external assessment. Kankanhalli et al. (2005) also believed that individuals who doubted the value of their experience and capabilities would not share their knowledge because of their belief that it would not be beneficial to others in the organization.

Several researchers have provided empirical evidence showing that self-efficacy is positively linked to individual knowledge sharing intentions and behavior (Cabrera et al., 2006; Jeon, Kim & Koh, 2011; H. F. Lin, 2007; Lu, Leung & Koch, 2006; Rico et al., 2008, Watson & Whet, 2006). As such, it can be hypothesized that:

H4: Self-efficacy positively influences knowledge sharing behavior between employees.

- **Individual Attitude towards Knowledge Sharing**

Individual attitude towards knowledge sharing refers to "the degree of one's positive feelings about sharing one's knowledge" (Bock et al., 2005). The Theory of Planned Behavior attributes these positive feelings to the individual's evaluation of the potentially favorable outcome of sharing knowledge. That is, the rewards, enhancing

job performance, improving relationships with colleagues and contributing to organizational results (Bock, Kim, Jang & Hong, 2002). This theory also maintains that attitudes influence behavioral intentions, which in turn are linked to actual behavior (Ajzen & Fishbein, 1977).

In a study of working groups at four Korean companies, Jeon et al. (2011) confirmed that employee attitude towards knowledge sharing influenced the intention to share knowledge, which was linked firmly to knowledge sharing behavior. Findings from several other empirical studies also confirm that attitude towards knowledge sharing influences knowledge sharing behavior (Bock et al., 2005; Casimir et al., 2012; Chennamaneni et al., 2012; de Vries et al., 2006). Cabrera & Cabrera (2005) suggested that firms should implement people management practices that constructively influence employee attitudes to knowledge sharing behavior. Therefore we can hypothesize that:

H5: A favorable attitude towards knowledge sharing positively influences knowledge sharing behavior between employees.

- **Perceived Job Security**

Perceived job security is a psychological state related to employee concerns regarding job continuity within an organization (Pearce, 1998). The extant literature shows that perceived job security has been studied as both a motivator (part of organizational rewards) and as a stressor (the threat of impending job loss). It can lead to diverse outcomes such as favorable and/ or unfavorable job-related attitudes, both good and poor task performance and can also affect physical and psychological well-being (Sverke, Hellgren & Naswall, 2002). Davenport & Klahr (1998) argued that

employees will not contribute to the organization's knowledge system if they fear that someday they may lose their jobs. Von Krogh (1998) contends that in a competitive work environment, employees may not share their valuable knowledge for fear of losing their power and influence.

In their study of ten public organizations (covering seven industries) in Singapore, (Kankanhalli et al., 2005) confirmed that perceived job security was positively linked to knowledge sharing behavior among employees. In view of the current situation in the oil market, where major oil companies have laid-off many of their employees in order to reduce their operating costs, it is anticipated that perceived job security may influence the behavior of employees in the organization being studied here. Hence, it can be hypothesized that:

H6: Positive perceptions of job security will positively influence knowledge sharing behavior between employees.

2.1.3 Knowledge Perspectives

The literature indicates that several knowledge-related factors (which fall under the perceived behavior control concept in the Theory of Planned Behavior) influence knowledge sharing behavior (Ghobadi, 2015; Heisig, 2009; Wang & Noe, 2010). Three knowledge-related variables are included in the proposed theoretical framework: accessibility to knowledge, the quality and usefulness of shared knowledge and employee training. These variables have been shown to influence knowledge sharing behavior in various studies (Cabrera et al., 2006; Hsu & Lin, 2008; Kulkarni et al., 2006). This research will assess whether they have a similar impact in the context of a UAE oil company.

- **Knowledge Accessibility**

Knowledge accessibility refers to the extent to which people have access to the knowledge they need to make decisions, solve problems and perform tasks (Chen, Chuang & Chen, 2012). The importance of knowledge accessibility has its roots in a cognitive approach to knowledge management. This is where knowledge is recognized as objective facts and concepts that can be physically transmitted through information and communication technology (ICT) systems (Swan, Newell, Scarbrough & Hislop, 1999). This has been further elaborated by Alavi & Leidner (2001) who discussed the repository approach to knowledge management. The repository approach involves building a knowledge management system that enables employees to store, retrieve, and share knowledge (Newell, Bresnen, Edelman, Scarbrough & Swan, 2006).

Organizations usually employ ICT systems that enable knowledge searching, retrieval, processing and storage as well as communication and collaboration between employees (Huysman & Wulf, 2005; Yeh et al., 2006). ICT can also foster effective knowledge sharing by supporting social networks via the Intranet, net-meetings, video-conferencing and by establishing virtual communities (Bennett & Gabriel, 1999; Pan & Leidner, 2003). Cabrera et al. (2006) have demonstrated that perceptions regarding the availability and quality of knowledge management systems are associated with individual knowledge sharing behavior. Therefore, it can be hypothesized that:

H7: Knowledge accessibility has a positive influence on knowledge sharing behavior between employees.

- **Perceived Usefulness of Knowledge**

Perceived usefulness of knowledge refers to an individual's belief that the shared knowledge is valuable and will improve one's job performance (Kankanhalli et al., 2005; Pituch & Lee, 2006). Several researchers have identified perceived usefulness as one of the key drivers if individuals are to share their knowledge and contribute to the organization's knowledge management system (Bock, Zmud, Kim & Lee, 2005; He & Wei, 2009; Wasko & Faraj, 2005; Yu et al., 2010).

The link between the perceived usefulness and sharing behaviors can be found in the extensive IS literature on technology acceptance (Gu & Jung, 2013; He & Wei, 2009; Yu et al., 2010). Indeed, several empirical studies have identified perceived usefulness as a determinant for knowledge sharing behavior (Gu & Jung, 2013; He & Wei, 2009; Kang et al., 2008; Kulkarni et al., 2006; Yu et al., 2010). Therefore, it can be hypothesized that:

H8: Perceived usefulness has a positive effect on an individual's knowledge sharing behavior

- **Employee Training**

Employees' training refers to the employees' perception of the development opportunities provided by their organizations that can equip them with the knowledge, skills and abilities necessary to work effectively in sustaining and improving current work related activities (Kaya et al., 2010). Employee training is generally considered as crucial for the successful implementation of any knowledge management initiative (Brand, 1998; Davenport, De Long & Beers, 1998).

There are several reasons why employee training and development may have a positive influence on knowledge sharing behavior (Cabrera & Cabrera, 2005; Kim & Ko, 2014; Kuvaas et al., 2012). Firstly, employees may consider training opportunities as a positive valuation of their position within the organization. This evaluation enhances their perception of organizational support and motivates them to contribute to the organization's success by sharing their knowledge with others (Kim & Ko, 2014; Lu, Leung & Koch, 2006). Secondly, employee participation in training activities provides opportunities for them to interact with colleagues; create a common language and build relationships that foster their knowledge sharing behaviors (Kuvaas et al., 2012). Thirdly, training opportunities can enhance employee self-efficacy and know-how. This was found to positively influence knowledge sharing behavior (Cabrera & Cabrera, 2005). Finally, organizations can use training opportunities to inculcate and foster a culture of knowledge sharing among employees by including communication and knowledge skills sharing in their training programs (Gagne, 2009).

A review of the literature on knowledge sharing has identified a lack of training and development as one of the key barriers to knowledge sharing among employees (Riege, 2005). Several researchers have provided empirical evidences that employee training has a positive influence on knowledge sharing behavior (Kang et al., 2008; Kim & Ko, 2014; Kuvaas et al., 2012; Lu, Leung & Koch, 2006; Watson & Hewett, 2006). Therefore, it can be hypothesized that:

H9: Employee training has a positive effect on an individual's knowledge sharing behavior.

2.1.4 Knowledge Sharing Behavior and its Outcomes

Knowledge sharing behavior refers to the employees' willingness to actively share their knowledge, know-how and expertise with their colleagues (Ipe, 2003; H. F. Lin, 2007). Knowledge sharing can take place in direct face-to-face communication or indirectly via knowledge management systems (Bock et al., 2005). Knowledge sharing includes sharing and receiving valuable suggestions and ideas that are relevant to successful performance of assigned tasks (Srivastava et al., 2006).

- **Knowledge Sharing & Individual Job Performance**

Babin & Boles (1998) define job performance as "the level of productivity of an individual employee, relative to his or her peers, on several job-related behaviors and outcomes". Cross & Cummings (2004) observe that job performance is, to some degree, the ability to solve challenging problems as a result of gaining access to the right knowledge. Employees may integrate existing knowledge in order to solve work related problems in a more efficient and cost effective manner (Christensen, 2007).

Wang & Ko (2012) found that successful implementation of knowledge sharing practices increased coordination and cooperation between employees and improved their problem-solving abilities and skills. This may explain why Kang et al. (2008) and Henttonen et al. (2016) found that successful implementation of knowledge sharing practices improved individual job performance. Therefore, it can be hypothesized that:

H10: Higher degrees of knowledge sharing will have a directly positive influence on individual job performance.

- **Knowledge Sharing & Task-Focused Citizenship Behavior**

Task-focused citizenship behavior refers to proactive on-the-job behaviors exhibited by employees, to support the interests of their colleagues or their organization, even though it may not directly lead to individual benefits (Moorman & Blakely, 1995). Examples of task-focused citizenship behavior include providing work related advice, offering new perspectives on problems, supplying factual information or direct assistance and assuming the responsibility for solving problems (Moorman & Blakely, 1995; Williams & Anderson, 1991). Organ (1988) identified five key dimensions in order to evaluate the level of organizational citizenship: altruism (taking the initiative to help others to solve problems), conscientiousness (making extra efforts beyond the expected job requirements), sportsmanship (tolerating imperfect situations without complaining), courtesy (alerting others early to avoid problems), and civic virtue (being proactive when involved in organizational activities).

By voluntarily sharing knowledge (an example of altruism) and mentoring their colleagues without expecting anything in return (an example of conscientiousness) to achieve organizational goals (an example of sportsmanship), employees are in effect exhibiting task-focused citizenship behavior (de Vries et al., 2006). It is often found that task-focused citizenship behavior is generally associated with favorable individual outcomes such as higher performance ratings, greater allocation of rewards, lower absenteeism and turnover rates (Podsakoff, Whiting, Podsakoff & Blume, 2009). Yoon & Suh (2003) demonstrated that organizational citizenship behavior is directly correlated to customers' perceptions of the quality of service, which is a manifestation of job performance. Similarly, Chiang & Hsieh (2012) have presented empirical

evidence that organizational citizenship behavior positively influences job performance. Therefore, it can be hypothesized that:

H11: Task-focused citizenship behavior will positively mediate the relationship between knowledge sharing and individual job performance.

- **Knowledge Sharing & Innovative Behavior**

Innovative behavior refers to the intentional creation, introduction and application of new ideas by individuals, teams or an organization in order to improve performance (Janssen, 2000; West, 1989). Building on earlier work on organizational innovation by Kanter (1988), Scott & Bruce (1994) described innovative behavior as a process that consists of three key stages: idea generation, idea promotion and idea implementation. In the first stage, individuals define work related problems and develop ideas, or solutions, to resolve them. These ideas or solutions can be new or borrowed from colleagues. In the second stage, individuals attempt to build support for their ideas and seek management endorsement for their implementation. In the final stage, individuals implement their solutions and promote it as institutional best practice and standard procedure for the organization. Messmann & Mulder (2012) revised the model to four stages: problem definition, idea generation, idea promotion and idea implementation.

Mura et al. (2013) found that sharing knowledge (best practices and lessons learned from previous mistakes) between employees has a positive effect on innovative behavior. This is to be expected as employees integrate shared knowledge so as to develop new, efficient methods to carry out tasks and create novel approaches to resolve work problems. That is, they increase their innovative behavior which leads

to improved performance (Carmeli et al., 2013; Kim & Lee, 2013; Mura et al., 2013). In addition, several researchers have demonstrated that innovative behavior has a positive influence on individual job performance, and on individual performance ratings by supervisors (Chilton, Hardgrave & Armstrong, 2005; Gong, Huang & Farh, 2009; Keller, 2012). Therefore, it can be hypothesized that:

H12: Individual innovative behavior will positively mediate the relationship between knowledge sharing and individual job performance.

2.1.5 Control Variables

Control variables are other factors that may have an influence on the endogenous variable, but are not specifically the subject of the research. They are included in the model to avoid potentially negative effects on the results. In this research four demographic variables were included as control variables: gender, nationality, tenure in the company (job seniority) and business unit affiliation.

Gender was expected to influence individual job performance due to local cultural constraints that limit female employees from gaining hands-on experience in an offshore field environment.

Nationality also influences individual job performance, as expatriate employees are required to have significant work experience in their specialized discipline in order to be able to join the organization in the first place. Unlike local employees, expatriate employees are expected to deal with operational challenges and technical problems due to their international experience and the training courses that they have completed prior to joining the organization.

Tenure, or job seniority, is another factor that may influence job performance as it is expected that senior employees have more experience as a result of their exposure to work problems and challenges during their long years of service with the company, when compared to newer employees (Buch, Dysvik, Kuvaas & Nerstad, 2015).

Business unit affiliations may influence job performance due to possible differences in the organizational structure of each business unit. These may be formal, centralized or integrative (Chen & Huang, 2007). In the formal structure, work is guided by organizational procedures, rules and guidelines, which leads to fewer opportunities for employees to discuss alternative ways of doing things (Sividas & Dwyer, 2000). In a centralized structure, the authority for making decisions stays with higher level management and employees just follow instructions on how to deal with problems and developments (Sividas & Dwyer, 2000). In an integrative business unit, employees are allowed to communicate, interact and coordinate with their colleagues across organizational borders in order to find solutions to problems or to develop new ways to perform assigned tasks (Janz & Prasarnphanich, 2003).

2.2 Validation of Theoretical Model

To verify that the theoretical model is relevant to the knowledge sharing behavior of employees in the organization in question structured interviews were conducted with 30 team leaders from various divisions involved with operations of Asset (A). Due to their roles and responsibilities, the team leaders' views and opinions were considered representative of the employee population that would be invited later to participate in a quantitative study by filling in questionnaires. These interviews were recorded and later transcribed. Then, the transcripts were reviewed by three

independent researchers to identify key themes and issues that were raised by the team leaders. These findings are summarized in table 2.

In line with the current literature, the team leaders identified several drivers for knowledge sharing behavior that were categorized as organizational, individual and technology-related. The organizational drivers included management support, organizational culture and structure, and reward. The individual factors included attitude, self-efficacy, personal relationships and perceived job security, while the technology-related factors included deployment of knowledge management systems, the usefulness of shared knowledge and employees training.

The team leaders also agreed that knowledge sharing among employees had positive outcomes both for the employees and the organization. For the employees, it was expected that they would develop higher levels of competency, improve their problem solving abilities, foster inter-personal relationships and thus improve performance. The organization was expected to be more efficient as employees continually improve performance. There would also be better financial results as employees benefit from lessons learned and best practices in order to minimize waste and avoid the repetition of mistakes. Therefore, the company would produce higher quality products and services due to higher levels of competency and skill among employees.

Table 2: Analysis of Team Leaders Interviews by Three Researchers

Topic	Findings by Researcher # 1	Findings by Researcher # 2	Findings by Researcher # 3
Key themes gleaned from interview records	• Definitions of knowledge terms • Drivers of knowledge sharing • Outcomes of knowledge sharing • Link between knowledge sharing and job performance • Recommendations to management	• The meaning of knowledge, knowledge management and knowledge sharing • Drivers of knowledge sharing • Outcomes of knowledge sharing • Factors affecting the relationship between drivers and outcomes • Knowledge sharing improvement recommendations to management	• Definitions of knowledge related terms • Drivers and outcomes of knowledge sharing • Relation between knowledge sharing drivers and outcomes • Recommendations to management to improve knowledge sharing.
Definition of Knowledge	• Tacit concept (e.g., know-how) • Explicit concept (e.g., documents and procedures)	• Tacit concept (e.g., know-how, network and skills) • Explicit concept (e.g., documents, manuals and books)	• Tacit knowledge (experience, in-depth insights, know-how) • Explicit knowledge (documents)
Definition of Knowledge Management	• Mechanism to disseminate knowledge within the company • Sequence of processes to handle knowledge (capture/store/share/..) • Using one's knowledge on the job • Assigning employees according to their knowledge level	• Making knowledge accessible • Capturing, storage & verification of knowledge for sharing or distribution • Using one's experience • Team management and proper instructions	• Sharing/ transfer of knowledge • Documentation of knowledge • Application of knowledge practically
Definition of Knowledge Sharing	• Exchange and transfer of knowledge during interactions between employees • Objective is to disseminate knowledge within the company	• Exchanging acquired knowledge through various ways (i.e. coaching, training, asking questions, systems) • Storage and utilization of knowledge	• Exchange of knowledge and experience during teamwork, meetings etc. • Transfer of knowledge through well managed and accessible system

Key categories of knowledge sharing drivers	• Organizational • Individual • Knowledge related	• Organizational • Individual • Knowledge technology	• Organizational • Individual • Knowledge related
Key organizational drivers of knowledge sharing	• Management support • Organizational structure • Organizational culture • Interdependent tasks • Reward schemes	• Management support • Organizational structure • Organizational culture • Job structure • Rewarding system	• Management support • Organization structure • Culture, values • The job structure • Reward/ incentive
Key individual drivers of knowledge sharing	• Personal attitude • Self-efficacy (competency) • Perceived job security	• Personal attitude • Job security • self-confidence (competence) • Peer relationship	• Attitude • Self-confidence (competence) • Job security • Relationship with colleagues
Key knowledge-related drivers of knowledge sharing	• Knowledge accessibility • Knowledge usefulness • Employee training	• Knowledge management infrastructure • Community of experts for training and coaching	• Knowledge management Infrastructure and processes • Training programs
Type of knowledge sharing outcomes	• Organizational-related • Individual-related	• Organizational-related • Individual-related	• Organizational-related • Individual-related
Key individual outcomes of knowledge sharing	• Improved job performance • Building competency • Enhance creativity/ innovation • Enhance relations with colleagues	• Enhanced job performance • Professional development • Drives innovation and creativity • Improve peer relationship	• Increased individual performance • Enhanced creativity/ innovation • Improved peer relationship/ trust

Key organizational outcomes of knowledge sharing	• Improved productivity • enhanced operational efficiency • Positive financial performance • Better quality of products and services	• Efficiency and cost reduction • Enhanced quality • Enhanced reputation • Better alignment between divisions	• Increased productivity • Increased efficiency • Cost and time effectiveness • Improved quality
Link between knowledge sharing and job performance	• Enhanced innovative behavior • Improved relations and collaboration with colleagues	• Professional development • Drives innovation and creativity • Improved peer relationship	• Enhanced creativity/ innovation • Improved peer relationship/ trust
Main recommendations to management	• Conduct a knowledge audit • Deploy a centralized knowledge management system, • Implement strategies to enhance collaboration and team building • Recognition of employees who share their knowledge	• Deploy user-friendly knowledge management system • Provide proper incentives and rewards • Fostering awareness of knowledge sharing • Encouraging teamwork through taskforce creation • Promote communication organizational wide (training and lessons learned, etc.)	• Accessible knowledge management system • Recognition/ awards for people who share knowledge. • Supportive management structure

The team leaders also suggested several recommendations to help management improve knowledge sharing behaviors within the organization. These recommendations centered on deployment of a proper knowledge management system and establishing processes to ensure that quality knowledge is easily accessible to employees. Additionally, they proposed management should foster collaboration between employees and recognize those that share their knowledge.

The findings of this mainly qualitative study provide support for the theoretical model (above) that has been developed and suggests that the model is both relevant and applicable to study knowledge sharing behavior in the context of the research organization and real work situations.

2.3 Chapter Summary

A theoretical model governing the relationship between the antecedents and consequences of knowledge sharing has been developed. All the constructs were defined and a rationale for their inclusion in the model, and the structure of that model, was presented. A summary of the proposed hypotheses linking these constructs is given in table 3 (see below).

To verify the relevance of the theoretical model to knowledge sharing behavior, a series of structured interviews with 30 team leaders was conducted. The interviews were transcribed and reviewed by three independent researchers. They identified employees' views on the drivers of knowledge sharing and the potential outcomes both at individual and organizational levels. These findings provided further support for the theoretical model. The next chapter discusses the research methods adopted to address this research problem.

Table 3: Summary of Research Hypotheses

Reference	Hypothesis
H1	Management support positively influences knowledge sharing behavior.
H2	Task interdependence positively influences knowledge sharing behavior.
H3	Organizational rewards positively influences knowledge sharing behavior.
H4	Self-efficacy positively influences knowledge sharing behavior.
H5	A favorable attitude towards knowledge sharing positively influences knowledge sharing behavior.
H6	High levels of job security positively influence knowledge sharing behavior.
H7	Knowledge accessibility has a positive influence on knowledge sharing behavior.
H8	The perceived usefulness of the knowledge has a positive effect on individual's knowledge sharing behavior.
H9	Employee training has a positive effect on individual's knowledge sharing behavior.
H10	Higher levels of knowledge sharing have a directly positive influence on job performance.
H11	Task-based citizenship behavior positively mediate the relationship between knowledge sharing and individual job performance.
H12	Individual innovative behavior positively mediate the relationship between knowledge sharing and individual job performance.

Chapter 3: Methods

To maintain academic rigor this chapter starts with an overview of the research paradigm and its associated dimensions and a justification of the choices made for this research (Coughian, Cronin & Ryan, 2007; Stockhausen & Conrick, 2015). This will be followed by a discussion on research design in order to answer the research questions formulated in chapter 1. The chapter concludes with a discussion of the ethical issues encountered while conducting this research.

3.1 Research Paradigm, Ontology, Epistemology and Methodology

3.1.1 Research Paradigm

Paradigm refers to a conceptual frame of reference that encompasses one's personal beliefs, values, ideas and assumptions. Such concepts help scholars in organizing and integrating theoretical inferences with their research (Antwi & Hamza, 2015; Babbie, 2010; Corbetta, 2003). Paradigms are important as they provide scholars with guiding principles and criteria to map their way through problems, suitable methodology and the techniques required to understand the complexity of the real world (Corbetta, 2003). In their attempts to understand social behaviors, social scientists have championed a variety of paradigms (Babbie, 2010; Blaikie, 2007). However, two of the most prominent paradigms are interpretivism and positivism (Blaikie, 2007; Corbetta, 2003; Johnson & Onwuegbuzie, 2009).

The interpretivist paradigm contends that social reality is subjective and exists only in people's minds. Therefore, researchers need to be close to the research subjects in order to gain an in-depth understanding of their perceptions of reality. It is an inductive process and is used to understand and interpret social phenomena. Thus, the

outcomes of social enquiry are constructed realities that are time- and context-specific (Johnson & Onwuegbuzie, 2009). On the other hand, the positivist paradigm approaches social enquiry in a manner similar to the physical sciences. Researchers separate themselves from the social entities being studied to eliminate bias. The outcomes of social enquiry are social laws that are both objective and generalizable, and the causes of these social outcomes can be accurately and reliably determined through a deductive process (Johnson & Onwuegbuzie, 2009).

This research adopts a positivist paradigm and considers reality to be objective, measurable and generalizable. As such, a deductive process will be followed where certain hypotheses about social reality are proposed and verified by analyzing the data collected from employees. The findings will be tested for their generalizability by comparing them with those obtained from other studies in other contexts.

3.1.2 Research Ontology

Ontology refers to philosophical beliefs and assumptions about the nature and form of social reality (Antwi & Hamza, 2015; Blaikie, 2007; Corbetta, 2003). There are essentially two dichotomous views about social reality: idealist and realist (Blaikie, 2007). The idealist theory considers reality to be a subjective construction of perceptions and assumptions, and as such, has no independent existence on its own (Blaikie, 2007; Corbetta, 2003). On the other hand, the realist theory considers reality to be objective in nature, and that its existence is independent of human perceptions or assumptions (Blaikie, 2007; Corbetta, 2003). Defining one's research ontology orientation is important as it guides the construction of the research questions and the research strategy adopted to answer those questions.

In this research, the ontological approach is realist and considers reality to be objective and independent of human interpretation. Furthermore, this reality can be determined in its truest sense since social actors operate according to specific patterns that can be predicted and measured (Corbetta, 2003).

3.1.3 Research Epistemology

Epistemology refers to the science of knowledge or how humans acquire knowledge about the world surrounding them and how they judge this knowledge to be truthful and acceptable (Antwi & Hamza, 2015; Blaikie, 2007). Basically, there are two dominant epistemological viewpoints in social research: constructionism and empiricism (Blaikie, 2007). The difference between these two views lies in the relationship that exists between the researcher and the social actors, or phenomena, under study, and whether the researcher is studying the social actors, or social phenomena, without influencing, or getting influenced by, them (Antwi & Hamza, 2015; Blaikie, 2007; Corbetta, 2003).

Constructionism requires researchers to be closely involved with their research subjects in order to gain an in-depth understanding of their perceptions and assumptions about their interaction with the external world. The researchers play an active role in constructing a social reality from these subjective perceptions (Antwi & Hamza, 2015; Blaikie, 2007; Corbetta, 2003). Empiricism, on the other hand, requires researchers to be detached from their research subjects, to employ deductive logic and to collect empirical evidence to discover causal laws that can predict general patterns of human behavior (Antwi & Hamza, 2015; Blaikie, 2007; Corbetta, 2003).

This research adopts an empiricist epistemology, where the understanding of social objective reality is achieved by collecting and analyzing empirical evidence in a detached and objective manner without influencing, or being influenced by, it.

3.1.4 Research Methodology

Research methodology is the practical approaches that help to answer research problems (Corbetta, 2003). These practical approaches are a translation of the researcher's ontological and epistemological assumptions into principles, practices and procedures that direct the way social research is conducted (Hanson, Creswell, Clark, Petska & Creswell, 2005; Marczyk, DeMatteo & Festinger, 2005). Research methodologies are important as they encourage researchers to plan their research and assess the relevance of their research decisions before implementing them. It also allows others to evaluate the rigor of the research and robustness of the results (Antwi & Hamza, 2015; Corbetta, 2003; Saunders, Lewis & Thornhill, 2009). When adopting a certain research methodology, researchers will address several issues such as the reasons for conducting their study, how to articulate the research problem, what type of data to collect, the best method for gathering data and which type of analysis to use (Antwi & Hamza, 2015; Saunders et al., 2009).

Essentially, there are two research methodologies used in social research: qualitative and quantitative (Antwi & Hamza, 2015; Marczyk et al., 2005). Qualitative methodology is typically used by scholars who espouse an interpretative paradigm and involves the use of direct interviews, observation and case studies (an in-depth examination of a social phenomenon or social actors) but without formal measurement (Antwi & Hamza, 2015; Marczyk et al., 2005). On the other hand, quantitative methodology involves the use of surveys and experiments to meticulously collect data

and analyze it in a systematic and statistical manner in order to quantify their results (Antwi & Hamza, 2015; Marczyk et al., 2005).

This study adopts a quantitative methodology. Data was collected by surveying selected employees. Such survey methodology has been successfully used in the social sciences to answer research questions that lend themselves to numerical representations and rigorous statistical analysis (Myers, 2013; Saunders et al., 2009). It was considered an appropriate methodology for this positivistic research as reality will be objectively described through measurable properties that are independent of the researcher. Furthermore, this research will measure attitudes, perceptions, opinions and the views of several hundred employees which would not be feasible using any alternative approach (Babbie, 2010).

3.2 Research Design

A structured questionnaire was prepared to operationalize various constructs in the form of statements to measure participants' attitude, opinions, assumptions and behaviors. The study is cross-sectional in nature, as the views of the employees from a variety of work divisions (e.g., Petroleum, Drilling, Production, Projects and Engineering), and different backgrounds (nationality, education and job functions) were simultaneously collected. The unit of analysis is the individual employee and an objective assessment of their views and opinions of the various model constructs was canvassed and analysed using appropriate statistical techniques.

According to Martin (2006), the development of a questionnaire must address several issues: (1) the selection of measurement scales for the various constructs, (2) formatting of the questionnaire, (3) introducing and explaining the questionnaire to

potential respondents, (4) pre-testing the questionnaire, (5) mode of distribution, and (6) data gathering and updating of the database. In addressing these issues, guidelines for designing questionnaires for survey research by Burgess (2001) were adopted.

3.2.1 Selection of Measurement Scales

The first step in developing a questionnaire is to select a suitable measurement scale for each construct. Developing and validating a new measurement scale is extremely time consuming (Corbetta, 2003; Swanson & Holton III, 2005). Hence, a recommendation by Straub (1989) that, "Researchers should use previously validated instruments wherever possible, being careful not to make significant alterations in the validated instrument without revalidating instrument content, constructs, and reliability" (p. 161) was followed.

An extensive review of relevant literature lead to the selection of measurement scales that comprised multiple-indicators in order to measure knowledge sharing behavior, its antecedents and its impact on individual job performance. These constructs are basically attitudes, opinions and personality traits which demonstrated a propensity to consistently react to certain issues in either a positive or negative manner. As such these responses could best be measured using a multi-item, 7-point Likert scale (Jarvis, Mackenzie & Podsakoff, 2004). Using multiple-indicators to measure various latent constructs such as management support, knowledge sharing behavior and individual job performance is appropriate as it provides greater insight into the various aspects of each construct, it improves the accuracy of measurement and avoids the problems associated with a single-indicator scale (Bryman, 2015). At least a four-item scale for each independent variable was selected in order to ensure the validity of construct measurement (Baumgartner & Homburg, 1996; Harvey,

Billings & Nilan, 1985). A full list of constructs, measurement scales and sources is given in Appendix-2.

3.2.2 Formatting the Questionnaire

The questionnaire was divided into four main parts. They were arranged in the following sequence: (1) the outcomes of knowledge sharing, (2) knowledge sharing behavior, (3) the determinants of knowledge sharing behavior, and (4) demographic information. This arrangement was intended to motivate the participants to complete the relatively lengthy questionnaire which included a total of 73 statements (Burgess, 2001). On starting to fill out the questionnaire, respondents would generally be alert and willing to give some thoughts and reflection to the various statements about knowledge sharing and its determinants. As they drew closer to the end, and start to experience survey fatigue, they have to answer increasingly easier demographic questions, e.g. age, gender, education and job position. This does not require such a cognitive load in order to provide a response. This was expected to minimize instances of missing data.

The questionnaire was designed in a two-column table format. The left column included the measurement scale for each of the latent variables, while the right-hand column included seven boxes for participants to indicate their response. The seven boxes matched a 7-point Likert scale that varied from "Strongly Agree" to "Strongly Disagree" with the middle box marked as "Neutral". Figure 11 shows the section related to individual knowledge sharing behavior. A copy of the full survey questionnaire is included in Appendix-3.

Part – B: Individual Knowledge Sharing Behavior

For each of the following statements please tick the box that best describes your personal opinion, feelings, perception or attitude about that statement.

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
I always share my knowledge gained through work experience with my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
I always share my knowledge gained during training with my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
I would make extra efforts to answer any question from my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
Employees in my company normally share existing reports and official documents with their colleagues at work.	☐	☐	☐	☐	☐	☐	☐
It is normal for me to regularly meet with my colleagues at work to exchange ideas and suggestions on how to solve work problems and improve work performance.	☐	☐	☐	☐	☐	☐	☐

Figure 11: The Survey Questionnaire Format

To make it easier for participants to complete the questionnaire it was created using Microsoft Word. A template was used which allowed respondents to tick the boxes of choice by clicking a mouse. Respondents then save the file and send it back as an email attachment.

3.2.3 Introducing the Questionnaire to Participants

To solicit participation in the survey, a cover letter that introduced the researcher and described the topic under research, the research objectives and its potential value for both academics and the organization was distributed along with the questionnaire. The letter emphasized the voluntary nature of participation and that respondents had the right to withdraw at any time without being penalized. The letter

also highlighted the fact that there are no right or wrong answer to any of the statements and that all answers would be treated as confidential.

A one-page guide was also prepared to help participants to fill the questionnaire. The guide described the structure of the questionnaire and explained how the respondent could tick the proper box to indicate a response for each statement. An example showing how the questionnaire box should be marked was included in the guide.

3.2.4 Pre-testing the Questionnaire

Prior to distributing the questionnaire, it was subject to a pre-test by several faculty members familiar with quantitative research to ascertain its content validity. Apart from a few statements that required re-wording to ensure clarity, the feedback indicated that the survey instrument was clear and comprehensible and that the measurement scales addressed the constructs that they intended to measure. Another recommendation for improvement was to change the layout of the document from landscape to portrait and to limit the document to a maximum of five pages. Since the questionnaire was written in English – the official language of business within the organization – there was no need to translate the document to any other language to ensure accuracy and consistency.

3.2.5 Mode of Distribution

The survey questionnaire was distributed as an email attachment to a sample population of 60 employees. There were several reasons for selecting this mode of distribution. First, the target population work in several offices located in different areas of Abu Dhabi (e.g., the HQ Building, the Capital Plaza Building, the Landmark

Building and the Mussafah Industrial Area) in addition to an offshore site. It would have been extremely difficult to personally distribute the document to each participant. Moreover, using the company's internal mail system to distribute and collect surveys would take a lot of time. Secondly, using a personalized email message served to highlight the importance assigned to each employee's input. This was instrumental in obtaining high response rate. Third, in addition to saving on paper, using a digital mode of distribution made it easier for each respondent to fill in the document simply by clicking a mouse. Having the document in digital format also made it easier for the researcher to archive data and avoid having paper copies that might suffer damage or loss. Finally, this mode of distribution allowed the researcher to send frequent reminders to employees in order to encourage them to participate in the survey. Every employee approached returned a completed questionnaire as an email attachment.

3.2.6 Summary of Research Design

The study is cross-sectional in nature, as data about every variable was simultaneously collected during the survey period. The unit of analysis is the individual employee, whose views and opinions on various model constructs was collected. The survey instrument utilized existing measurement scales as recommended by Straub (1989). The guidelines for designing questionnaires for survey research by Burgess (2001) were followed. A pre-test by a small sample of employees verified that the statements are clear and unambiguous. Digital distribution was an effective method for data collection.

3.3 Data Collection

This section discusses the research context, sample size, selection, data gathering and analysis.

3.3.1 Research Organization

The organization where the research was conducted is an offshore oil and gas company that operates offshore fields in the UAE. The organization is a joint venture company between a large national UAE oil company and three major international oil companies. This arrangement is meant to provide the UAE with access to the latest technology and industrial expertise in order to develop its oil and gas fields in an effective and economic manner. The company has recently been restructured into nine separate business units that report directly to the Chief Executive Officer (see figure 12).

It should be explained that an Asset is a business unit responsible for managing development activities in offshore fields, while other business units provide engineering, technical, operational and business support services. For example, the Drilling and Logistics business unit undertakes the drilling of new wells and the repair of inactive and problematic wells. The Projects business unit is responsible for building field infrastructure (towers, pipelines and complexes) to support field development activities. The Subsurface Technology business unit provides reservoir engineering studies and long-term field development plans. Other business units provide business support and technical assistance (e.g., integrity management, safety management, policies and standards and business planning).

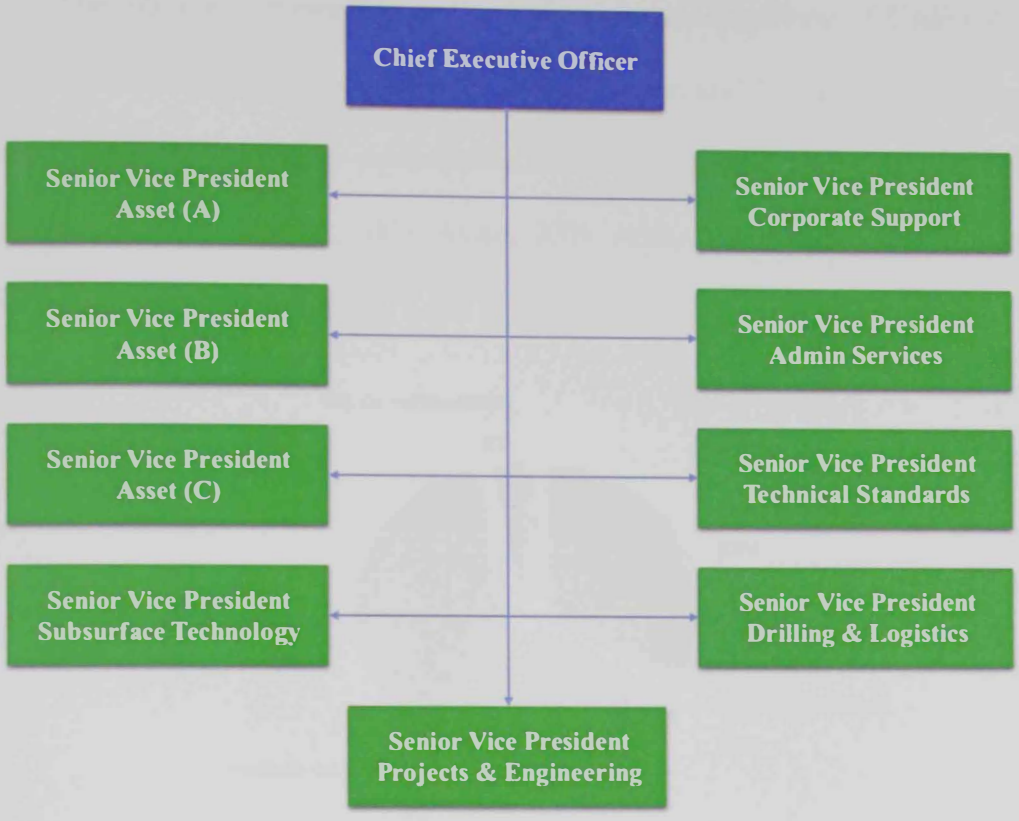

Figure 12: Organizational Structure of the Research Organization

Typically, a business unit is subdivided into several divisions that work together to achieve their objectives. For example, Asset (A) includes reservoir and production operations, maintenance, field operations and planning divisions. This research involved employees working in the Asset (A) business unit and employees in other units that provide support to Asset (A) operations. The reason for selecting Asset (A) is that it is the largest business unit and contributes 60% of the company's total oil production. Also, the management were supportive of an initiative to improve knowledge management for various strategic reasons such as, developing of young local employees, the retention of organizational knowledge as older employees retire and fostering the company's competitive position within the industry.

The organization employs a diverse workforce comprising of UAE national employees and expatriate personnel from Arab, Asian and European countries. An internal company document published in 2015 showed the nationality profile of employees as 33% Emirati, 38% Asian, 23% Arab, 3% Western and 3% other nationalities, as shown in figure 13.

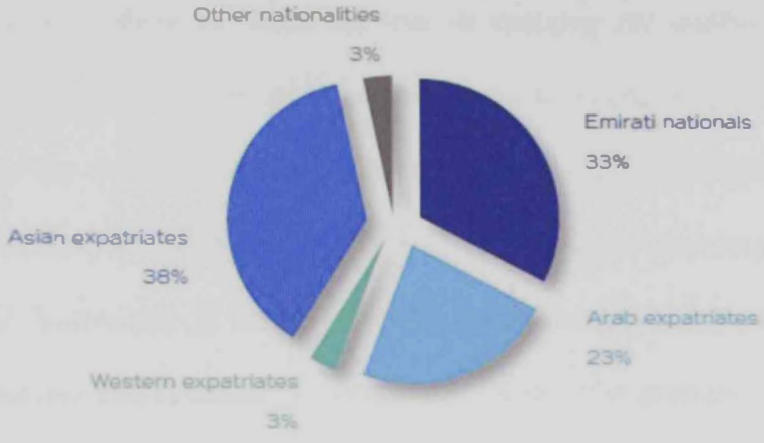

Figure 13: Employee Diversity at Research Organization

In terms of gender diversity, female employees (who are mostly UAE nationals), occupy about 10% of the professional positions in the organization. This is evidenced by the company organization chart, shown in Aappendix-4, which displays employees who manage the various divisions and business units of the company. This is also corroborated by the fact that the number of female employees in the target population of 652 employees stands at 65. The relatively low representation of female staff in the research organization was to be expected as the organization is an offshore oil company and local cultural constraints prevent female employees from working in an offshore environment. Female employees usually work in supporting technical roles such as planning, technical studies and IT support.

This organization, with its diverse employee profile provides a rich setting and context to investigate knowledge sharing behavior by professional staff. The pre-test phase of the questionnaire demonstrated that there was no problem with access to participants, at the various sites, via email.

3.3.2 Research Sample

Sample size plays an important role in ensuring the quality of statistical analysis, especially when researchers are interested in ascertaining that a particular correlation, or the outcome of a hypothesis test, is statistically significant. As the sample size increases, it is feasible to obtain greater statistical certainty in these tests (Cohen, 1992; Vanvoorhis & Morgan, 2007). There are some recommendations for appropriate sample size (Pearson & Mundform, 2010). For example, Cohen (1992) published tables that show required sample sizes in order to detect significant effects at an 80% statistical power level. Tabachnick & Fidell (2013) suggest using a simple rule of thumb: $N > 50 + 8m$ (where N is sample size and m is the number of independent variables). Other authors advocate having a minimum ratio of sample size to number of variables, e.g. Gorsuch (1983) suggests using a ratio of at least five and Nunnally (1978) recommends having samples that are at least ten times the number of variables (Maccallum, Widaman, Zhang & Hong, 1999).

For this study, an initial sample size of 57 was obtained using tables provided by Cohen (1992). This estimate was based on a statistical target level of 80%, an R^2 value of 0.5, a statistical significance level of 0.05 and a total number of nine (9) arrows directed at one construct. However, with nine independent variables, the recommendations of Tabachnick & Fidell (2013) would yield a sample size of 122. With 13 variables in the model, the sample size would be 130 according to Nunnally's

(1978) recommendations. These figures were verified using an online sample size calculator (Soper, 2017) which suggested that the sample size should be 90 based on the anticipated effect size, the desired level of statistical certainty, the number of latent variables, the number of observed variables and the level of statistical significance desired (see figure 14).

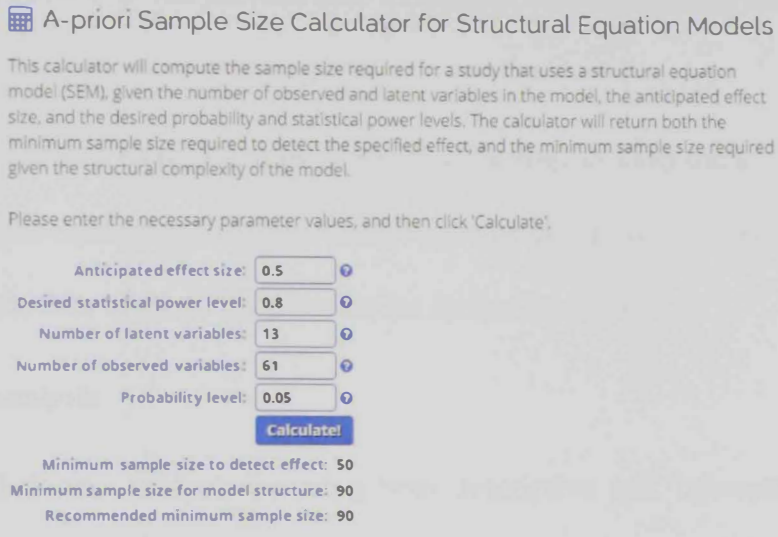

Figure 14: Recommended Sample Size for this Research (Soper, 2017)

The estimates above for sample size were taken into consideration when selecting a sample of 652 employees to participate in the survey. It was anticipated that even with a response rate of around 30%, there would be an adequate sample size to conduct a complex statistical analysis. The purposive sample included professional employees from the Asset (A) business unit and other supporting business units that provide support to that original business unit.

3.3.3 Data Gathering

The questionnaire was prepared as a formatted word document that was distributed to participants as email attachments. A total of 652 questionnaires were

distributed to participants. As mentioned earlier, this mode of distribution was deemed to be successful during the pre-test and this ensured a high response rate. Considering the large number of participants, the data collection period was set at 60 days. A maximum of three reminder messages were sent to any individual who did not respond to earlier messages. In total, 357 surveys were returned, representing an overall response rate of 54.8%. The shortest time to respond was one day and the longest was 53 days.

All responses were coded in an Excel worksheet to keep track of progress. It also allowed the researcher to conduct simple quality checks on the responses prior to transferring the data to the SPSS program for further analysis.

3.3.4 Data Analysis

Detailed data analysis covering both descriptive and inferential statistical analyses will be presented in the next chapter. The descriptive analysis provided characteristics of the respondents: age profile, gender distribution, nationality mix, tenure and business unit affiliation. It also provided various survey characteristics such as the mean, minimum values, maximum values, standard deviation, skewness and kurtosis indices. The data was first screened to ensure its accuracy, completeness and quality before its further use in the statistical analysis. The data screening and preparation were conducted using the SPSS software.

Due to the complexity of the model and the large number of latent and measured variables, variance-based structure equation modelling (SEM-VB) was used to analyze the relationship between various model constructs. The analysis started by validating the measurement model to ensure the validity and reliability of its constructs. This was followed by an assessment of the structural model's ability to

predict the relationship between constructs. SmartPLS software (Ringle, Wende & Becker, 2014) was utilized for the model analysis.

There were several reasons for selecting this data analysis technique. Variance-based structural equation modeling (SEM-VB) is currently used extensively by IS researchers as evidenced by the large number of articles in top journals (Hair, Ringle & Sarstedt, 2011; Hair, Hult, Ringle & Sarstedt, 2014; Ringle, Sarstedt & Straub, 2012). In addition, the PLS technique is more suited for studies where theories are being developed and tested (which is the case in the current study), whereas covariance-based structural equation modelling (SEM-CB) is typically used for theory confirmation (Chin, 1998; Fornell & Bookstein, 1982). Finally, the PLS technique is capable of testing both the direct effects and the interaction effects among constructs, suggesting where relationships might exist and avoiding serious problems such as inadmissible solutions and factor indeterminacy (Chin, Marcolin, & Newsted, 2003).

3.3.5 Summary of Data Collection

The research involved 652 employees who were affiliated with operations in the Asset (A) business unit or other supporting business units within the organization. Data was collected via a questionnaire distributed as an email attachment. The number of surveys returned was 357 representing a response rate of 54.8%, which exceeded the number of cases required to conduct a statistical analysis using variance-based structural equation modeling (SEM-VB). The data was originally coded in Excel before being uploaded to SPSS and SmartPLS software for further analysis. Chapter 4 covers a more detailed data analysis.

3.4 Ethical Considerations

Survey research usually raises fewer ethical issues when compared to other forms of research design such as experiments and field research (Check & Schutt, 2011). In every way this study complied with UAE University guidelines for conducting social research by securing the necessary ethical clearance from the Social Sciences Research Ethics Committee prior to commencing data collection (see Appendix-5). In addition, the study conformed to agreed standards of conduct in social science research which mandates voluntary participation, no harm to the participants, anonymity and confidentiality, avoiding deception and rigorous data analysis and reporting (Babbie, 2010).

3.4.1 Voluntary Participation

The first standard to adhere to when conducting a study is to ensure voluntary participation. Completing a questionnaire may require participants to spend a considerable amount of their time and disrupt their regular activities. In addition, the questionnaire required participants to reveal some personal information, which may be unknown to their colleagues. To comply with this standard, a cover letter was distributed along with the questionnaire and included a statement to indicate participants' consent. In addition, participants were requested to return the completed questionnaire to the researcher only if they wished to take part. It must be highlighted that this standard can impact on the generalizability of the research findings as participants are only those who are willing to participate which may reflect certain personality traits. For the study findings to be generalizable to an entire population, any sample should also include those who are not so willing to participate (Babbie, 2010).

3.4.2 No Harm to Participants

A questionnaire is not expected to cause any harm (physical or psychological) to participants. The questionnaire did not require participants to perform any physical work or take untested drugs or endure stressful testing conditions. The participants only had to respond to questions that were direct, neutral and easy to answer (Alcser, Antoun, Bowers, Clemens & Lien, 2016). Furthermore, they completed the questionnaire individually at their own leisure without being subject to peer or group pressure. Finally, to avoid any harassment to participants, the number of email reminders, was limited to a maximum of three.

3.4.3 Anonymity and Confidentiality

Participants were requested to provide personal information that was not readily available. This information, which potentially involves unpopular attitudes and unfavorable personal opinions about management and the organization, may prove embarrassing for the employee if they became publicly known – in some cases this may lead to the loss of a job or economic benefits (Babbie, 2010). Therefore several steps were taken to comply with the principle of anonymity and confidentiality in order to protect employees against any such risks (Alcser et al., 2016; Singer, 2005). These steps included:

a. The questionnaires did not include any identifying information such as full names, job titles, ID numbers, or phone numbers (Singer, 2005).
b. Participants returned the completed questionnaires to the researcher in person or as an email attachment.

c. All survey responses were treated as confidential and were stored in a dedicated folder on the researcher personal computer, which was accessible only to the researcher.

d. The list of employees approached was locked in a secure place and was accessible only to the researcher (Singer, 2005).

e. After downloading the completed questionnaire, all exchanges with participants regarding their involvement in the survey were deleted to avoid any concerns about potential, unintentional exposure or disclosure of email message that may reveal the identity of participants (Alcser et al., 2016).

3.4.4 Avoiding Deception

A cover letter was delivered along with the questionnaire to participants to introduce the researcher and his current academic research study at UAE University. The letter outlined the reasons for collecting the data and its potential future use. In return for their participation in the research, respondents were offered a summary of the study findings, if interested, but no monetary or non-monetary rewards. This way, only aggregated data would be disclosed and not individual responses, which further protects the anonymity of participants and the confidentiality of their individual responses (Babbie, 2010).

3.4.5 Data Analysis and Reporting

In addition to ethical obligations towards participants, social researchers have ethical obligations towards their peers and colleagues in the academic community concerning the integrity of data analysis and the honesty of reporting results (Babbie, 2010). Any technical limitations, as well as unexpected negative results, were

highlighted and an attempt was made to explain discrepancies in order to avoid them in future studies. (Babbie, 2010; Singer, 2005).

3.5 Chapter Summary

This chapter provided an overview of the research paradigm, its associated dimensions, and the reasoning behind the specific choices made in the current research (Coughian et al., 2007; Stockhausen & Conrick, 2015). The research paradigm chosen was positivistic, therefore this social enquiry was approached in a manner similar to the physical science. Social reality was considered as objective and generalizable and results could be obtained through a deductive process where certain hypotheses are proposed and verified by analyzing data. While collecting the empirical data the researcher attempted to detach himself from other social actors, or phenomena, to eliminate biased results.

The study used quantitative methodology via a structured questionnaire that operationalized various constructs in the form of statements to measure participants' attitudes, opinions, assumptions and behavior that was later analyzed using statistical techniques. The steps in developing the survey were discussed and explicated. These included selecting measurement scales from the existing literature (Straub, 1989), formatting the survey instrument and pre-testing it to ensure that it measures the constructs that are intended to be studied.

The chapter also discussed data collection in terms of the organization under study, the sample size and the data collection mechanism designed to ensure a high response rate. We also discussed the data analysis technique, which made use of

variance-based structural equation modeling due to the exploratory nature of the research and the complexity of the model under study.

The chapter concluded with a review of steps taken to satisfy ethical considerations in social research. This included voluntary participation, assuring no harm to participants, maintaining confidentiality and avoiding deception. The following chapter presents details of the statistical analysis of the data and concomitant results.

Chapter 4: Results

This chapter describes the data screening and preparation that ensured the quality of the responses and their subsequent use in the statistical analysis. This will be followed by a descriptive profile of the survey respondents and a statistical analysis of the measurement and structural models.

4.1 Data Screening

The data screening included checking for accuracy, missing data analysis, the presence of outliers, verification of the distribution assumptions and testing of common method bias to ensure that the data was accurate, complete and suitable for a multivariate statistical analysis.

4.1.1 Data Accuracy

To check for the accuracy of the data, descriptive statistics for every variable were generated using the SPSS package. A response of less than 1, or greater than 7, was anomalous since the survey instrument employed a 7 point Likert scale (where "Strongly Agree = 7", "Neutral = 4" and "Strongly Disagree = 1"). Any anomalous responses were identified and dealt with. A selection from the 'Frequencies Summary' is shown in figure 15. Data was verified as accurate as none of the variables gave values outside of the predicted range.

Frequencies

Statistics

		IB1	IB2	IB3	IB4	IB5	TFCB1	TFCB2	TFCB3	TFCB4	TFCB5
N	Valid	350	350	350	350	350	349	350	350	349	347
	Missing	0	0	0	0	0	1	0	0	1	3
Mean		6.54	6.34	6.31	6.27	6.12	5.55	6.17	5.72	5.71	5.90
Std. Deviation		.796	.857	.792	.860	.927	1.145	.902	1.088	1.071	1.014
Range		4	4	4	4	4	6	3	5	5	4
Minimum		3	3	3	3	3	1	4	2	2	3
Maximum		7	7	7	7	7	7	7	7	7	7

Figure 15: Partial Display of the Dataset Descriptive Statistics

In addition, each individual response was checked for non-engagement. Table 4 highlights cases that demonstrated a spurious response pattern. For example case # 490 returned the survey document without ticking any boxes. The participant may not have saved the file before sending it as an email attachment. Case # 115 is an example of non-engagement as the participant marked the box "5 = Somewhat Agree" forty-five times and the box "4 = Neutral" fourteen times irrespective of whether the question was direct or reverse-coded. To avoid bias in the subsequent statistical analysis these cases were removed from the dataset, resulting in an effective response rate of 53.7% (350 out of 652).

Table 4: Cases with Spurious Response

Case ID	**Standard Deviation**	**Response Pattern (Times Used)**
490	Div/0	Did Not Fill In The Survey
155	0.000	Blank (37) - 1 (24)
115	0.5231	5 (45) – 4 (14)
208	0.5847	6 (10) – 5 (46)
254	0.6401	5 (27) – 4 (28)
118	0.6445	5 (24) – 4 (29)
5	0.6453	5 (30) – 4 (25)

4.1.2 Missing Data

To review missing data, the SPSS Analyze / Multiple Imputation / Analyze Patterns facility generated an overall summary of the missing values, shown in figure 16. The summary includes three pie charts representing various aspects of the missing data. The Variables Chart shows that 43 variables (out of 61) have at least one missing value, whereas the Cases Chart shows that 32 cases (out of 350) had at least one missing value. Finally, the Values Chart shows that 101 of the 21,350 values (350 cases × 61 variables) were missing giving an overall missing value percentage of 0.5%.

Figure 16: Overall Summary of Missing Values in the Dataset

In addition, figure 17 highlights different patterns of missing values. For example, pattern # 1 includes cases with no missing values, pattern # 2 includes cases that are missing values for the TFCB2 indicator and pattern # 22 includes cases where the values of the ATKS1 and PKA1 indicators are missing. The figure shows no systematic trend for missing values which suggests that data is missing at random.

SPSS also generated an additional graph, figure 18, which displayed the occurrence of various missing value patterns. It was evident that cases with no missing

values dominated the dataset (90.9% of total cases) which confirms the earlier findings shown in figure 16.

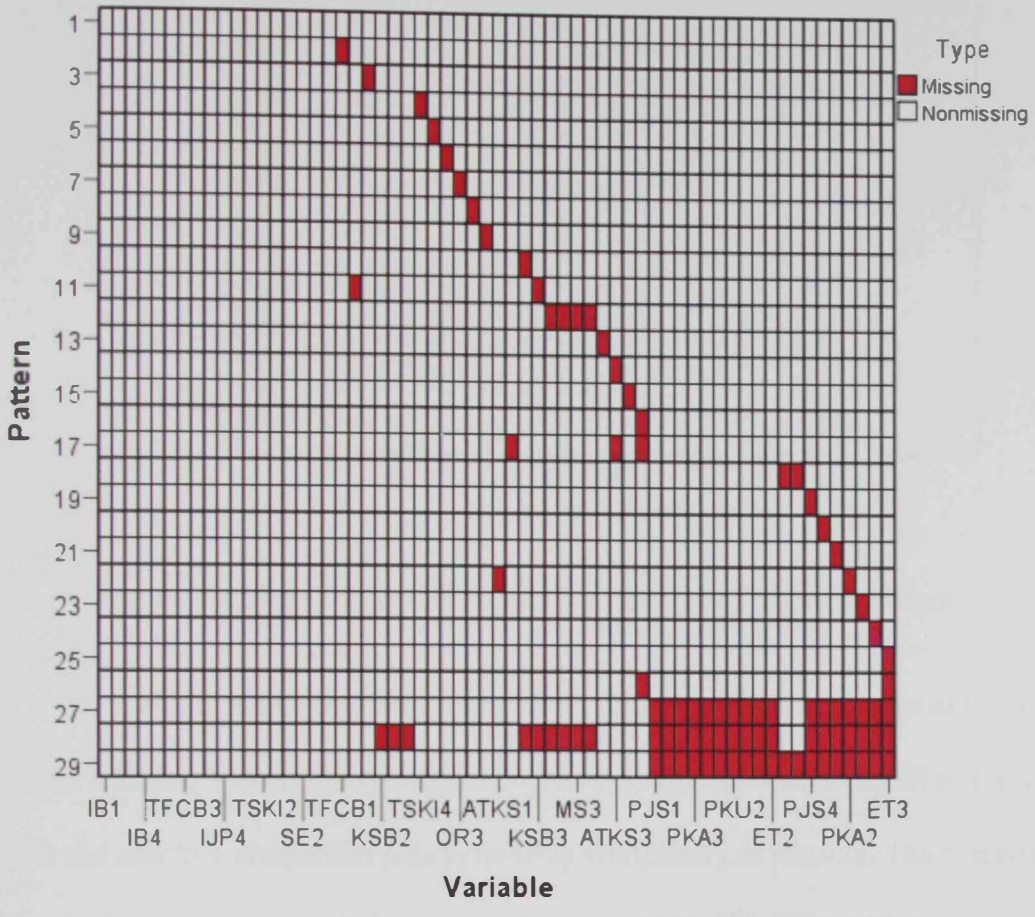

Figure 17: Patterns of Missing Values in the Dataset

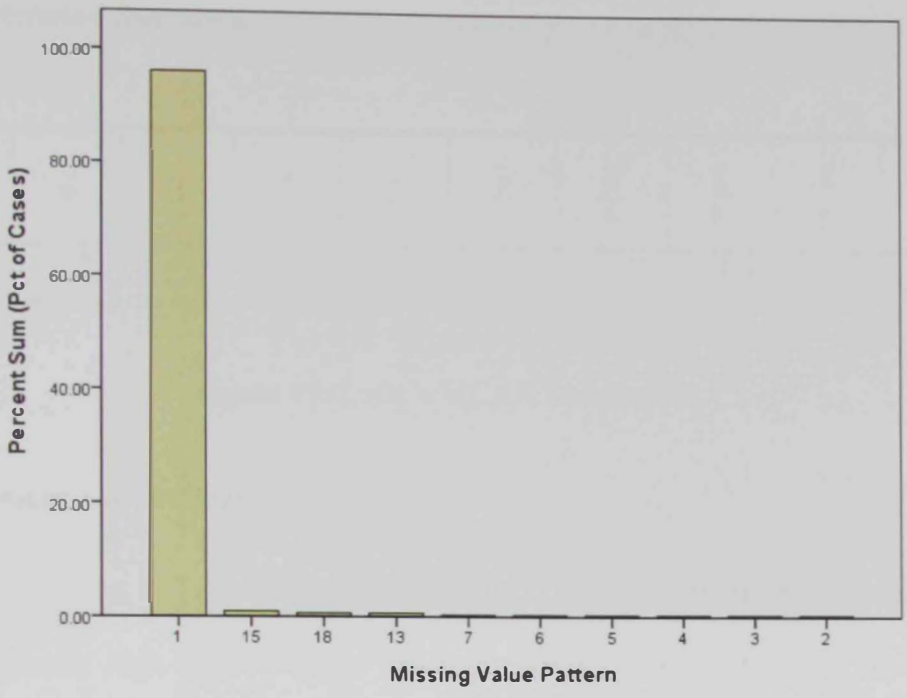

Figure 18: Most Frequently Occurring Patterns of Missing Values

To verify that data is missing at random, Little's MCAR test – part of the SPSS Analyze/ Missing Value Analysis facility – was employed. Little's MCAR test usually checks the null hypothesis that data is missing completely at random. The test results shown in figure 19 were as follows: Chi-Square = 1574.375, DF=1612, Sig. = 0.744. As the significance level was greater than 0.05, it was concluded that any data missing was completely at random. Although any other imputation technique could have been applied, the missing values were imputed using the Expectation Maximization Technique in the SPSS/ Multiple Imputation/ Impute Missing Data Value facility. This technique is the best if one wants to present the original data distribution with the least bias (J. Hair, Anderson, Black & Babin, 2014; McKnight, McKnight, Sidani & Figueredo, 2007).

EM Estimated Statistics

IB1	IB2	IB3	IB4	IB5	TFCB1	TFCB2	TFCB3	TFCB4	TFCB5
1.46	1.66	1.69	1.73	1.88	2.45	1.83	2.28	2.29	2.10

a Little's MCAR test: Chi-Square = 1574.375, DF = 1612, Sig. = .744

Figure 19: Little's MCAR Test Results

4.1.3 Presence of Outliers

According to Tabachnick & Fidell (2013), outliers are survey responses that have unusually high or low values that make them distinctly different from other responses for the same variable (univariate outliers). They could also be a unique combination of several responses that stand out from other responses across multiple variables, as in the case of multivariate analysis (multivariate outliers). Outliers can distort the results of a statistical analysis by increasing error variance, reducing the power of statistical tests and biasing estimates of substantive interest (Osborne & Overbay, 2004).

To check for the presence of univariate outliers in the data set, all the variables were first converted to standardized z-scores using the SPSS Analyze/ Descriptive Statistics/ Descriptives package. For large datasets (N>80), Tabachnick & Fidell (2013) define potential univariate outliers as those data points with absolute z-score values in excess of 3.29. Based on this rule, the standardized variables were examined and it was found that 50 data points distributed among 28 variables and 37 cases were considered as univariate outliers. Figure 20 shows the distribution of these data points, highlighted in red, within the cases affected. The cases that contained univariate

outliers were noted to see if they also appeared in the multivariate outlier assessment (Hair et al., 2014, p. 67).

To assess the presence of multivariate outliers, the Mahalanobis Distance (D^2) was calculated by regressing every independent indicator in Case ID (which is used as a dummy independent variable) using the SPSS Analyze/ Regression/ Linear function. The Mahalanobis Distance was compared with Chi-Square distribution with degrees of freedom equal to the number of independent variables (56) at a significance level of $p < 0.001$. The process was iterated three times until the test returned non-significant p-values. In total 33 cases were found to exhibit the presence of multivariate outliers (see table 5).

Table 5: Multivariate Outliers Test Results (Mahalanobis D^2 Method)

Iteration #	Case ID	Mahalanobis D^2	p-value
1	492	156.43692	1.960E-11
	39	146.41636	0.000E+00
	440	126.09947	0.000E+00
	431	120.21627	0.000E+00
	437	119.79188	0.000E+00
	628	119.17179	0.000E+00
	31	115.52152	1.000E-05
	575	114.61307	1.000E-05
	448	108.49645	3.000E-05
	26	104.09339	1.000E-04
	456	103.40063	1.200E-04
	390	101.07945	2.100E-04
	105	100.76278	2.300E-04
	410	100.42911	2.500E-04
	479	98.86619	3.600E-04
	559	97.93511	4.500E-04
	147	97.54164	4.900E-04
	553	97.04337	5.500E-04
	313	96.88579	5.700E-04
	528	96.20384	6.700E-04
	586	95.58515	7.700E-04
	28	95.12779	8.600E-04
	233	94.58629	9.700E-04
2	12	107.5027	0.00004
	601	107.29075	0.00004
	116	102.48905	0.00015
	119	98.74026	0.00037
	182	96.9007	0.00057
	446	96.2961	0.00066
	246	96.12129	0.00068
	166	94.8439	0.00092
3	131	96.06407	0.00069
	87	94.86226	0.00091

CaseID	IB1	IB2	IB3	IB4	IB5	TFCB1	TFCB3	TFCB4	IJP1	IJP2	IJP3	IJP4	KSB1	KSB2	KSB3	KSB5	MS1	MS2	TSKI1	TSKI2	TSKI3	SE1	SE3R	ATKS3	ATKS4R	PKU1	PKU3	PKU4
12	-0.582	0.393	1.655	-0.854	0.126	0.480	0.659	0.667	-0.869	0.233	0.919	0.922	1.193	-0.214	1.020	-0.437	-0.286	-0.308	0.540	0.497	0.306	0.753	3.523	-0.932	-1.018	-0.323	-0.192	-0.214
29	-0.582	-0.774	-0.869	-0.854	-0.952	1.354	-1.179	-1.203	-0.869	-0.898	0.919	-0.922	1.193	1.640	-0.966	3.811	1.405	1.364	-1.177	-1.210	-1.259	-1.242	-1.113	5.163	-1.018	-1.306	-1.187	-1.217
31	-0.582	0.393	-0.869	0.309	-0.952	-1.269	0.659	0.667	0.189	1.363	-0.919	0.922	0.117	2.568	-0.966	-0.437	3.942	3.872	-1.177	-1.210	0.306	-1.242	-1.113	-0.932	-1.018	0.660	-0.192	-0.214
39	1.932	1.561	1.655	1.471	1.205	1.354	-0.260	0.667	1.247	1.363	1.024	1.134	1.193	1.640	3.999	0.413	0.559	0.528	0.540	-0.356	0.306	0.753	2.596	2.116	0.477	1.644	0.802	-0.214
52	1.932	1.561	4.180	1.471	1.205	0.480	0.659	-0.268	0.189	2.493	1.995	0.106	0.117	0.214	1.020	0.413	-0.286	0.528	0.540	-0.356	0.306	0.753	2.596	0.084	0.477	-0.323	-0.192	0.790
53	0.675	1.561	-0.869	0.309	3.361	1.354	0.659	1.601	0.189	0.233	0.053	0.106	-0.958	1.142	-0.966	0.413	2.251	1.364	2.256	2.204	1.089	-1.242	-0.185	0.084	1.224	1.644	0.802	1.794
62	3.188	2.728	2.918	2.634	2.283	0.480	-1.179	-1.203	2.304	2.493	1.995	2.162	1.193	0.713	3.006	1.262	0.559	0.528	0.540	0.497	3.438	-1.242	-1.113	-0.932	0.477	0.660	0.802	0.790
72	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	-0.260	-1.203	0.189	-0.898	-0.919	0.106	-0.958	-1.142	0.027	-0.437	-1.132	-1.144	-0.319	-1.210	-0.476	-1.242	-1.113	0.084	3.465	-0.323	-0.192	-0.214
74	-0.582	0.393	2.918	1.471	3.361	-0.394	-0.260	-0.268	-0.869	-0.898	-0.919	-0.922	2.268	1.640	3.006	0.413	0.559	0.528	-0.319	0.497	0.306	1.751	0.742	1.100	1.224	0.660	0.802	0.790
100	1.932	1.561	1.655	1.471	1.205	0.480	0.659	0.667	1.247	1.363	1.024	-0.922	1.193	3.495	1.020	-1.287	0.559	0.528	0.540	0.497	0.306	0.753	0.742	1.100	1.224	0.660	0.802	0.790
119	1.932	1.561	1.655	1.471	0.126	0.480	0.659	0.667	0.189	2.493	1.024	1.134	1.193	0.713	3.999	2.112	0.559	2.200	-1.177	0.497	0.306	-1.242	0.742	3.132	0.477	4.593	0.802	0.790
160	-0.582	-0.774	-0.869	-0.854	-0.952	-0.394	-1.179	-1.203	-0.869	-0.898	-0.919	-0.922	-0.958	-1.142	-0.966	-1.287	-1.132	-1.144	-0.319	-1.210	-0.476	4.744	-1.113	-0.932	-1.018	-1.306	-1.187	-1.217
175	1.932	1.561	1.655	0.309	0.126	0.480	0.659	0.667	3.362	3.623	1.024	1.134	1.193	0.713	1.020	0.413	0.559	1.364	0.540	0.497	1.872	0.753	0.742	1.100	0.477	0.660	0.802	0.790
195	-0.582	-0.774	-0.869	-0.854	-0.952	-0.394	-0.260	-1.203	-0.869	-0.898	-0.919	-0.922	-0.958	-1.142	-0.966	-0.437	0.559	-1.144	0.540	0.497	-1.259	0.567	0.742	-0.932	3.465	-0.323	-1.187	-1.217
315	-0.582	-0.774	0.393	1.471	2.283	-0.394	-0.260	0.667	3.362	0.233	2.966	3.190	-0.958	0.713	-0.966	1.262	1.405	1.364	1.398	0.497	0.306	-0.245	-0.185	0.084	1.971	0.660	0.802	0.790
342	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	3.417	0.667	-0.869	-0.898	-0.919	-0.922	-0.958	-1.142	-0.966	-1.287	-1.132	-1.144	-0.319	-0.356	-0.476	-0.245	-1.113	-0.932	-1.018	-1.306	-1.187	-1.217
350	4.445	3.895	4.180	3.796	0.126	1.354	-0.260	-0.268	2.304	2.493	2.966	3.190	2.268	0.713	0.027	0.413	-1.132	-0.308	2.256	1.351	1.872	0.753	-0.185	1.100	0.477	2.627	4.779	2.798
367	1.932	2.728	1.655	3.796	1.205	0.480	0.659	1.601	0.631	1.363	2.966	2.162	1.193	0.713	2.013	0.413	0.559	0.528	-0.319	1.351	0.306	0.753	1.669	1.100	1.224	0.660	2.791	2.798
387	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	1.579	2.536	-0.869	-0.898	1.024	1.134	-0.958	1.640	-0.966	-1.287	0.559	0.528	1.398	0.497	3.438	-0.245	0.742	0.084	0.477	0.660	0.802	0.790
399	1.932	2.728	0.393	2.634	3.361	-0.394	1.579	1.601	2.304	2.493	3.938	3.190	2.268	0.713	0.027	0.413	2.251	1.364	0.540	0.497	-0.476	0.753	0.742	0.084	0.477	0.660	-0.192	-0.214
428	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	-1.179	-1.203	-0.869	-0.898	-0.919	-0.922	-0.958	-1.142	-0.966	-1.287	-1.132	-1.144	-0.319	-1.210	-0.476	0.753	-0.185	-0.932	3.465	-0.323	-0.192	-0.214
430	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	3.417	-0.268	-0.869	-0.898	-0.919	-0.922	-0.958	-1.142	-0.966	-1.287	-1.132	-1.144	1.177	-0.356	-0.476	-0.245	-1.113	-0.932	-1.018	-1.306	-1.187	-1.217
432	-0.582	1.561	-0.869	1.471	1.205	0.480	0.659	1.601	0.189	0.233	0.053	0.106	1.193	0.713	2.013	0.413	0.559	0.528	-0.319	-0.356	-0.476	1.751	0.742	-0.932	3.465	0.660	0.802	0.790
446	0.675	1.561	0.393	0.309	0.126	3.977	-1.179	-1.203	1.247	1.363	1.024	1.134	-0.958	-0.214	-0.966	-1.287	-0.286	-0.308	-0.319	-0.356	-0.476	-1.242	1.113	1.100	-0.271	-1.306	-1.187	-1.217
448	1.932	0.393	-0.869	-0.854	0.126	-1.269	-0.260	1.601	-0.869	-0.898	2.966	4.217	-0.958	0.713	1.020	1.262	-1.132	-1.144	-1.177	-1.210	-1.259	-1.242	0.742	-0.932	1.224	-1.306	-1.187	-1.217
479	-0.582	-0.774	-0.869	-0.854	-0.952	0.480	-1.179	-1.203	-0.869	0.233	0.053	1.134	1.193	1.640	0.027	0.413	-0.286	-0.308	-1.177	-0.356	0.306	-0.245	-1.113	0.084	-0.271	3.610	3.785	4.806
492	0.675	1.561	0.393	1.471	0.126	-0.394	0.659	1.601	1.247	0.233	0.053	1.134	1.193	0.713	0.027	-1.287	0.559	-0.308	2.256	2.204	3.438	0.753	2.596	0.084	-1.018	0.660	1.796	1.794
529	-0.582	0.393	-0.869	0.309	0.126	-1.269	-0.260	-0.268	-0.869	-0.898	0.053	0.106	-0.958	-0.214	-0.966	-0.437	-0.286	-0.308	-1.177	-0.356	-1.259	0.753	0.742	-0.932	3.465	2.627	0.802	0.790
553	1.932	1.561	1.655	1.471	1.205	-0.394	-0.260	-0.268	1.247	1.363	0.053	1.134	0.117	-0.214	0.027	-0.437	0.559	0.528	0.540	-0.356	1.872	0.753	-0.185	1.100	0.477	2.627	3.785	2.798
559	-0.582	1.561	0.393	2.634	0.126	1.354	1.579	2.536	0.189	0.233	1.024	-0.922	3.344	2.568	1.020	-0.437	0.559	-0.308	2.256	-1.210	0.306	-0.245	0.742	0.084	-0.271	-1.306	-1.187	-0.214
568	1.932	0.393	1.655	1.471	0.126	1.354	2.498	-0.268	1.247	1.363	1.024	1.134	3.344	2.568	2.013	1.262	0.559	0.528	1.398	1.351	1.089	1.751	1.669	2.116	-0.271	0.660	0.802	0.790
575	-0.582	0.393	-0.869	-0.854	-0.952	1.354	-0.260	-1.203	-0.869	-0.898	-0.919	-0.922	1.193	0.713	-0.966	1.262	-0.286	-1.144	-1.177	-1.210	1.872	-1.242	3.523	1.100	-0.857	-0.323	-0.192	-0.214
576	-0.582	-0.774	0.393	-0.854	-0.952	-0.394	-0.260	-0.268	0.189	-0.898	-0.919	0.106	-0.958	-1.142	0.027	-1.287	-1.132	-1.144	-1.177	-1.210	-1.259	-1.242	1.113	-0.932	3.465	-1.306	-1.187	-1.217
583	1.932	0.393	1.655	0.309	1.205	-1.269	-1.179	-0.268	2.304	1.363	1.024	2.162	-0.958	-0.214	-0.966	0.413	-1.132	-1.144	-0.319	-1.210	3.438	-1.242	-1.113	-0.932	-1.018	-0.323	-0.192	-0.214
586	0.675	-0.774	0.393	0.309	-0.952	1.354	3.417	3.471	1.247	0.233	0.053	0.106	-0.958	-1.142	-0.966	2.112	0.559	2.200	0.540	0.497	0.306	2.748	-0.185	0.084	-0.271	0.660	1.796	0.790
621	-0.582	-0.774	-0.869	-0.854	-0.952	-1.269	0.659	0.667	-0.869	0.233	-0.919	-0.922	3.344	-0.214	-0.966	0.413	-0.286	-0.308	-0.319	2.204	0.306	0.753	-0.185	-0.932	-1.018	-1.306	-1.187	-1.217
628	-0.582	-0.774	-0.869	-0.854	0.126	1.354	-0.260	2.536	1.247	0.233	0.053	-0.922	0.117	1.640	-0.966	2.112	1.405	0.528	3.973	3.911	-1.259	-0.245	-0.185	0.084	-0.271	0.660	-0.192	-0.214

Figure 20: Univariate Outliers (z-score > 3.29 Highlighted in Red)

These cases included 13 cases that were earlier found to exhibit the presence of univariate outliers; mainly in cases 12, 31, 39, 119, 446, 448, 479, 492, 553, 559, 575, 586 and 628. All 33 cases were removed to avoid any bias in the subsequent statistical analysis (Tabachnick & Fidell, 2013).

4.1.4 Distribution Assumptions

This section examines the dataset for compliance with the main distribution assumptions required for a multivariate analysis: (1) normality, (2) linearity and (3) equal variance, or homoscedasticity (Tabachnick & Fidell, 2013).

- **Normality Assumption**

The normality assumption refers to the shape of the data distribution for each variable being bell-shaped. There are two key approaches to assess whether data is normally distributed: graphical and statistical (Stevens, 2009; Tabachnick & Fidell, 2013). The graphical method involves a visual inspection of the data presented by graphs such as histograms, stem-and-leaf plots, Q-Q probability plots and cumulative frequency (P-P) plots. Besides being subjective, the graphical method may not be practical for a case where we have large set of variables to analyze. Statistical methods such as the Kolmogorov-Smirnov Test, Lilliefors Corrected K-S Test, the Shapiro-Wilk Test and the Cramer-von Mises Test and tests for skewness and kurtosis shape coefficients. This provides a more objective assessment of normality in large datasets (Stevens, 2009; Tabachnick & Fidell, 2013).

Hair, Hult, Ringle & Sarstedt (2014) suggest that the combined use of skewness and kurtosis coefficients in combination with the Shapiro-Wilk Test provides the most powerful approach to detect departures from univariate normality. The Shapiro-Wilk

Test tests the null hypothesis that data distribution is normal, whereas distributions exhibiting skewness and kurtosis values greater than +1, or lower than -1, are considered as non-normal (Hair et al., 2014, p. 54). The SPSS Analyze/ Descriptive Statistics/ Explore function was used to run normality tests. The results are shown in table 6.

Table 6: Partial Display of Normality Test Results for all Variables

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
IB1	.436	317	.000	.607	317	.000
IB2	.340	317	.000	.745	317	.000
IB3	.302	317	.000	.776	317	.000
IB4	.306	317	.000	.779	317	.000
IB5	.260	317	.000	.819	317	.000
TFCB1	.175	317	.000	.892	317	.000
TFCB2	.288	317	.000	.796	317	.000
TFCB3	.217	317	.000	.875	317	.000
TFCB4	.217	317	.000	.878	317	.000
TFCB5	.224	317	.000	.848	317	.000
IJP1	.285	317	.000	.795	317	.000
IJP2	.298	317	.000	.788	317	.000
IJP3	.264	317	.000	.815	317	.000
IJP4	.263	317	.000	.808	317	.000
IJP5	.219	317	.000	.845	317	.000
KSB1	.270	317	.000	.809	317	.000
KSB2	.190	317	.000	.869	317	.000
KSB3	.233	317	.000	.832	317	.000
KSB4	.149	317	.000	.936	317	.000
KSB5	.184	317	.000	.896	317	.000
ET1	.135	317	.000	.943	317	.000
ET2	.176	317	.000	.925	317	.000
ET3	.161	317	.000	.936	317	.000
ET4	.203	317	.000	.933	317	.000
ET5	.192	317	.000	.927	317	.000

a. Lilliefors Significance Correction

Tests were statistically significant indicating that the distribution of every indicator deviates from normal. It has been reported that for large samples normality tests may yield significant results even in cases of a small deviation from normality (Field, 2013, p. 822; Oztuna, Elhan & Tuccar, 2006).

On the other hand, a review of the skewness and kurtosis values shows that the majority of indicators have positive skewness and kurtosis values of less than 1. There were very few indicators that exceeded the skewness threshold of +1 (e.g. IB1) or the kurtosis threshold of +1 (e.g. PJS4), or -1 (e.g. SE2 and ATKS1). A visual inspection of the histograms confirms that distributions are not far from normal as shown by the results of an S-W test.

Ho (2013) suggests a simple diagnostic test to assess univariate normality based on standardized values for skewness and kurtosis values which are as follows:

$$Z_{skewness} = \frac{skewness}{\sqrt{s.e\ skewness}} \ \&$$

$$Z_{skurtosis} = \frac{kurtosis}{\sqrt{s.e\ kurtosis}}$$

If the calculated z value is found to be greater than the critical value of ±2.58, then the assumption of normality can be rejected at a 0.001 significance level. Based on this rule, only IB1 and IB2 violated the normality assumption (see table 7).

Table 7: Partial List of Standardized Skewness and Kurtosis of all Variables

	IB1	IB2	IB3	IB4	IB5	TFCB1	TFCB2	TFCB3
$Z_{skewness}$	3.994	2.678	2.022	2.027	1.532	1.293	1.802	1.358
$Z_{kurtosis}$	1.548	-0.225	-0.700	-1.067	-1.442	-0.219	-1.347	-0.954

An assessment of multivariate normality follows the procedure proposed by Burdenski (2000) whereby the Mahalanobis Distance is plotted against its Chi-square function value. In cases of multivariate normality, the graph should follow a straight line. However, the data does not fall on a straight line, thus indicating deviation from multivariate normal distribution (figure 21).

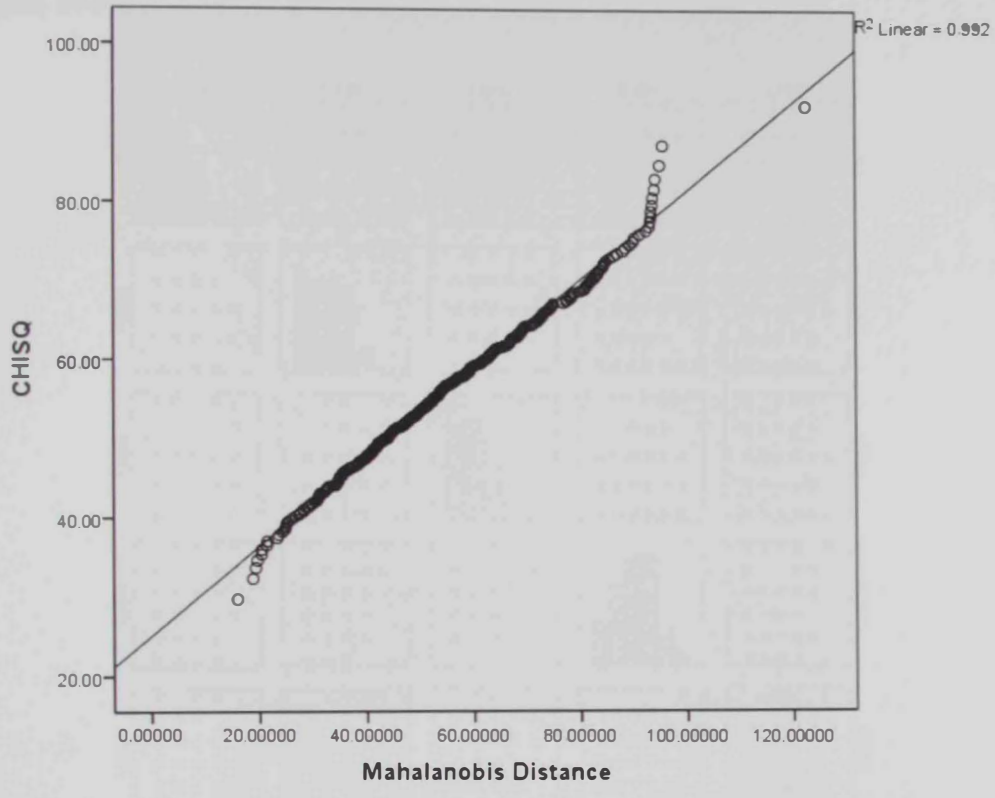

Figure 21: Multivariate Normality Test plot (Chi-Square vs. Mahalanobis Distance)

- **Linearity Assumption**

Another assumption of multivariate analysis is the linear relationship between variables. Hair et al. (2014) recommend two possible approaches to verify a linearity assumption in the dataset. In the first approach, scatterplots for all the possible combinations of the variables are generated and examined to identify any potentially non-linear trends. This approach is not especially practical as it uses 61 indicators,

however, it was run to check the relationship between indicators (shown in figure 22). The relationships between variables are mostly linear and there is no clear indication of a curved relationships. The second approach involved a regression analysis of variables against a dummy variable and plotted the standardized residuals of regression against the predicted values. Non-linearity is indicated by an unequal distribution of residuals above and below the zero line (Tabachnick & Fidell, 2013).

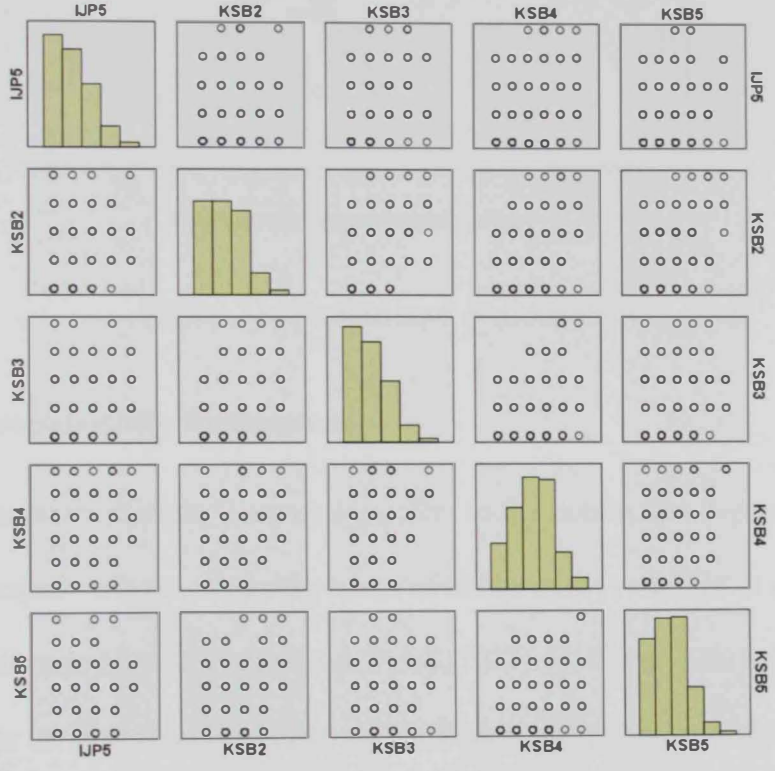

Figure 22: Verification of Linearity Between Variables IJP1 and KSB2-5

Figure 23 plots standardized residuals against the predicted values for linear regression between variables, and uses a random variable as an independent. The distribution of points around the center line indicates the existence of a linear relationship between the variables.

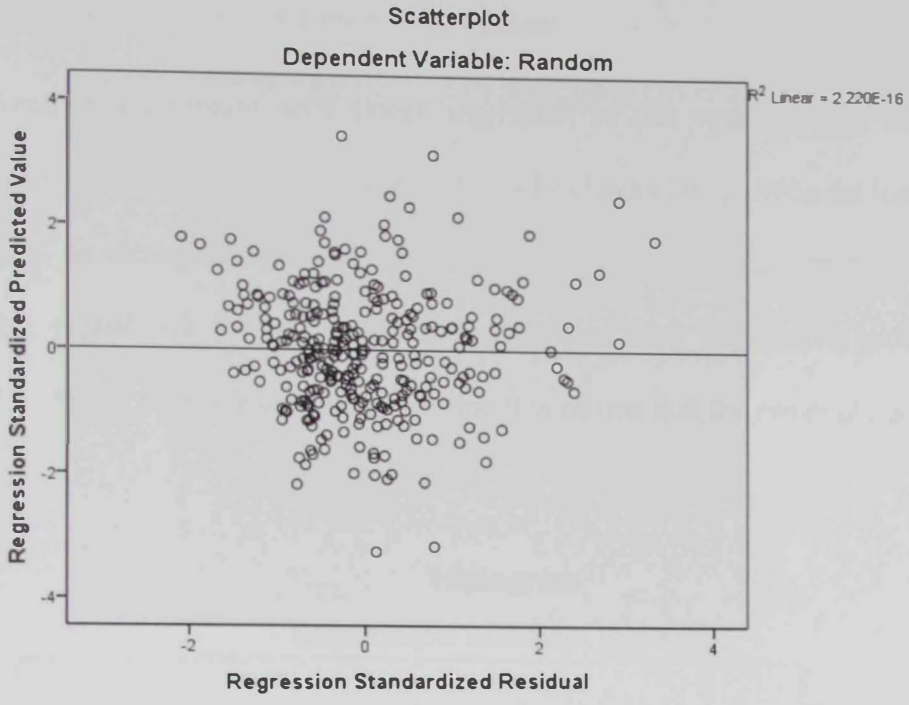

Figure 23: Standardized Residual Plot

- **Homoscedasticity Assumption**

The homoscedasticity assumption refers to the notion that dependent variable should have equal variance across the range of independent variables. It is also related to multivariate normality (Tabachnick & Fidell, 2013). Hair et al. (2014, p. 80) suggest that for metric variables used in a multiple regression, an analysis of residuals provides the best approach for assessing homoscedasticity. (Kline, 2011) highlighted that homoscedasticity can be ascertained when the residuals are evenly distributed around the zero line for the entire length of the scatterplot. Figure 23 shows that the residuals are plotted mainly between –2 and +2 on both axes with the exception of a few points which lie outside due to their non-normality.

- **Normally Distributed Error Assumption**

Another assumption with linear regression is that residuals are normally distributed across the predicted variable. This can be checked by plotting the histogram of residuals, as shown in figure 24, or by using a p-p plot that compares observed cumulative probability for the residuals against predicted cumulative probability (figure 25). As the points follow a straight line it confirms that the errors are normally distributed.

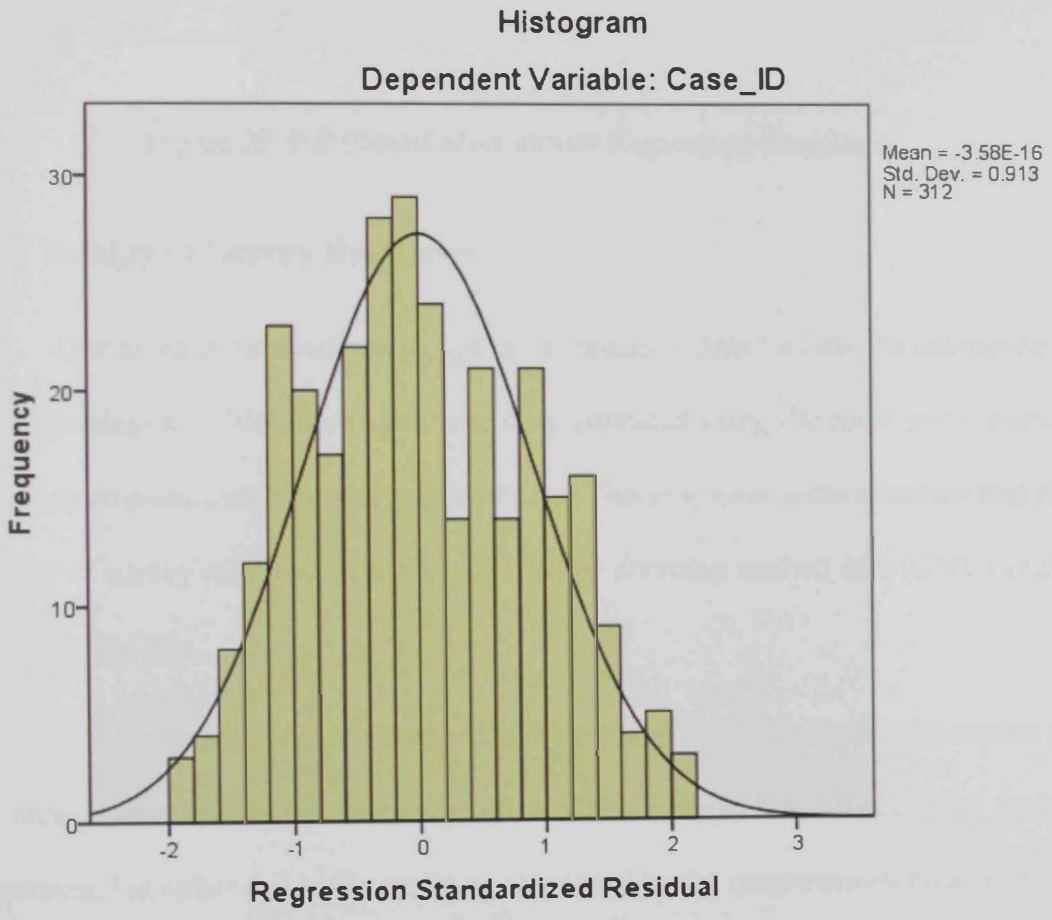

Figure 24: Normal Distribution of Multivariate Regression Residuals

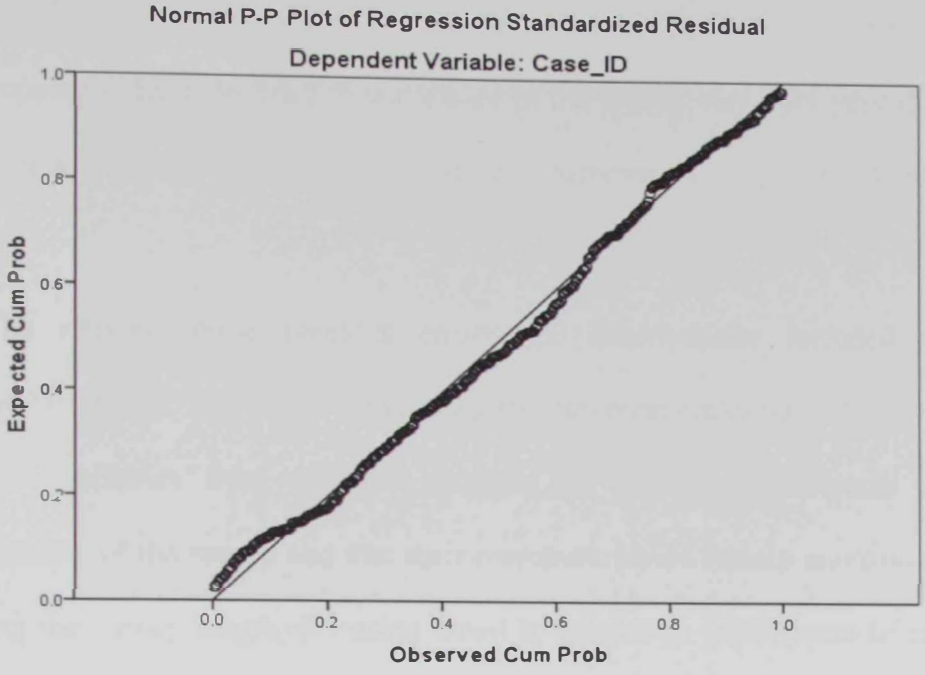

Figure 25: P-P Plot of Multivariate Regression Residuals

4.1.5 Validity of Survey Responses

Due to the cross-sectional design of the research, data for both the independent and dependent variables were simultaneously collected using the same self-reported survey instrument over a limited period of time. This may raise some concerns that the validity of survey responses could be affected by common method bias (CMB) and a non-response bias.

The common method bias refers to the argument that the observed variance in an endogenous variable is not only due to the relationship between the model constructs, but rather due to the variance introduced by the measurement method. This may result from participants who wish to make their responses project socially desirable images of themselves, or from a bias due to the simultaneous collection of data concerning both the independent and dependent variables or the ambiguity of the survey items (Mackenzie & Podsakoff, 2012; Podsakoff, MacKenzie, Lee &

Podsakoff, 2003). Non-response bias arises from the fact that some members of the target population have declined to participate in the survey may hold very different views, opinions or perceptions from those who participated (Rogelberg & Stanton, 2007).

To alleviate these potential errors, the questionnaire included several procedural strategies. They were: (1) adopting measurement scales for endogenous and exogenous variables from different sources, (2) assuring participants of the confidentiality of the survey and that their responses would remain anonymous, (3) managing the survey length, (4) using email to encourage participants to respond quickly, (5) highlighting the importance of the survey and (6) using email reminders (MacKenzie & Podsakoff, 2012; Rogelberg & Stanton, 2007). In addition to these procedural strategies, the following statistical analysis were conducted to verify that these potential sources of errors did not affect the quality of the survey data.

- **Common Method Bias (CMB)**

To check for potential common method variance, Herman's Single-Factor Test was run using the Analyze/ Dimension Reduction/ Factor facility in SPSS. The program extracted one factor to check whether a single factor could account for more than 50% of the variance. The results shown in table 8 indicate that a single factor could only account for 26.0% of the variance, which is far less than the accepted threshold of 50% (Malhorta, Kim & Patil, 2006). This confirms that the survey responses are free from significant common method bias and that it was acceptable to proceed with the model analysis.

Table 8: Results of Herman's Single-Factor Test for Common Method Bias

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.863	26.005	26.005	15.863	26.005	26.005
2	5.888	9.653	35.657			
3	4.112	6.740	42.398			
4	2.694	4.416	46.814			

Extraction Method: Principal Component Analysis.

- **Non-Response Bias**

With regard to non-response bias, it is argued that such bias could be detected by comparing the responses of earlier and later respondents (Armstrong & Overton, 1977; Rogelberg & Stanton, 2007). The rationale for selecting late respondents as a proxy for non-response is that they were not as forthcoming as earlier respondents and so there was a possibility that they could have become non-respondents (Rogelberg & Stanton, 2007).

To compare the responses of early and late respondents, the participants were divided into two dichotomous groups (waves): those who responded without receiving any reminders and those who responded after receiving one or more reminders. Levine's Test of Homogeneity of Variance of survey items for both groups was conducted using the Analyze/ Compare Means/ One-Way ANOVA in SPSS. The results of the test, shown in figure 26, indicated that there were no significant differences in variance between both groups, which confirms that the survey results were not significantly influenced by a non-response bias.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
IB1	Between Groups	.088	1	.088	.151	.698
	Within Groups	183.918	315	.584		
	Total	184.006	316			
IB2	Between Groups	.204	1	.204	.287	.592
	Within Groups	223.231	315	.709		
	Total	223.435	316			
IB3	Between Groups	.145	1	.145	.259	.611
	Within Groups	176.551	315	.560		
	Total	176.697	316			
IB4	Between Groups	.076	1	.076	.111	.739
	Within Groups	215.588	315	.684		
	Total	215.665	316			
IB5	Between Groups	.617	1	.617	.782	.377
	Within Groups	248.464	315	.789		
	Total	249.081	316			
TFCB1	Between Groups	.687	1	.687	.535	.465
	Within Groups	405.053	315	1.286		
	Total	405.740	316			
TFCB2	Between Groups	.058	1	.058	.073	.787
	Within Groups	249.330	315	.792		
	Total	249.388	316			
TFCB3	Between Groups	.013	1	.013	.013	.911
	Within Groups	331.523	315	1.052		
	Total	331.536	316			

Figure 26: Results of the Homogeneity of Variance Test

4.1.6 Data Screening Summary

This section covered the screening of survey data prior to statistical analysis. A total of 357 surveys were received from the participants. Overall, the data was found to be of good quality as measurements were within the expected range set by a 7 point Likert scale. However, seven surveys were eliminated due to poor engagement by the participants as evidenced by a low completion percentage or the presence of straight-lining.

Missing data in the remaining surveys accounted for less than 5% per case and per variable which is acceptable for analysis (Hair et al., 2014; Stevens, 2009;

Tabachnick & Fidell, 2013). The missing data was found to be missing completely at random and were imputed using EM technique. In terms of univariate outliers, the dataset had 50 points, distributed among 28 variables and 37 cases which did not warrant variable transformation. On the other hand, the dataset contained 33 cases that represented multivariate outliers. The data was removed in order to minimize any bias in the subsequent statistical analysis (Tabachnick & Fidell, 2013). As such the response rate based on valid surveys was 48.6% (317 surveys out of 652).

The distribution assumptions of normality and linearity at univariate and multivariate levels were checked. It was found that the variables were not normally distributed at univariate level, as per the Shapiro-Wilk Test, but met the skewness and kurtosis guidelines set by Hair et al. (2014) and Ho (2013). Also, the multivariate normality assessment recommended by Burdenski (2000) showed the data to be deviating only slightly from normality. This is not a major concern as the statistical analysis used a variance-based SEM software (SmartPLS) which is more tolerant to distribution violations when compared to covariance-based SEM packages such as AMOS (Hair et al., 2014). Crossplots and a Pearson Correlation Coefficient were used to verify the linearity of the data. In addition, a residuals plot was used to verify the assumption of homoscedasticity and the homogeneity of errors.

Finally, the Herman's single-factor test and Levine's homogeneity of variance tests were performed to verify that the survey data were free from the influence of common method bias and non-response bias which may be of concern due to the cross-section research design.

4.2 Survey Respondent Profile

An analysis of the demographic data showed that there were 47 valid responses from female employees were (14.8% of validated surveys) compared to 270 received from male employees (85.2% of validated surveys) (see table 9). This is consistent with the percentage of female employees in the target population standing at 11% (72 out of 652). As above, the organization is an offshore oil company and local cultural constraints prevent female employees from working in an offshore environment. Female employees are limited to planning, technical studies, and IT support roles.

Table 9: Gender Distribution among Survey Participants

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	270	85.2	85.2	85.2
	Female	47	14.8	14.8	100.0
	Total	317	100.0	100.0	

The nationality of respondents was in line with current the demographics of the organization (see table 10). The majority of participants were Asian (33.8%, mostly from India and Pakistan), followed by UAE nationals (29.7%) and other Arabs (23.7%). The remaining participants came from Europe, the USA, Africa and South America (13%). This distribution reflects the diversity within the business unit and the organization as a whole when it comes to technical jobs, such as those under scrutiny in this study.

Table 10: Nationality of Participants

Nationality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	National	94	29.7	29.7	29.7
	Arab	75	23.7	23.7	53.3
	EU/USA	23	7.3	7.3	60.6
	Asian	107	33.8	33.8	94.3
	Africa	4	1.3	1.3	95.6
	Others	14	4.4	4.4	100.0
	Total	317	100.0	100.0	

In terms of participant age profiles, 31.5% were between 35-45 years old, 30.9% were between 25-35 years old, and 24.3% were 45-55 years old (see table 11). Many employees are young nationals hired as part of the company's drive to comply with the government's Emiratization policy. The age profile was also consistent with nationality and seniority profiles.

Table 11: Age Profile of Participants

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	13	4.1	4.1	4.1
	25-35	98	30.9	30.9	35.0
	35-45	100	31.5	31.5	66.6
	45-55	77	24.3	24.3	90.9
	55-65	27	8.5	8.5	99.4
	>65	2	.6	.6	100.0
	Total	317	100.0	100.0	

As for educational level, most employees had university degrees (65%), followed by employees with post-graduate degrees (31.2%). This was anticipated as the research targeted employees engaged in technical and operational duties, either

directly, or in support roles. These employees are expected to have a degree in one of the engineering disciplines (Petroleum, Chemical, Mechanical, Electrical or Civil) to be qualified for their jobs (see table 12).

Table 12: Education Background of Survey Participants

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Post Graduate	99	31.2	31.2	31.2
	Graduate	206	65.0	65.0	96.2
	Diploma	9	2.8	2.8	99.1
	Others	3	.9	.9	100.0
	Total	317	100.0	100.0	

In terms of job function, the majority of participants were engineers (67.2%), supervisors (20.5%), managers (9.8%) and senior managers (1.6%). This job distribution reflects both the organizational hierarchy and the respective populations in each business unit (see table 13).

Table 13: Job Function for Survey Participants

Job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Senior Manager	5	1.6	1.6	1.6
	Manager	31	9.8	9.8	11.4
	Supervisor	65	20.5	20.5	31.9
	Engineer	213	67.2	67.2	99.1
	Staff	3	.9	.9	100.0
	Total	317	100.0	100.0	

The majority of participants (47.6%) had been working for 5 years, or less, in their jobs, this was followed by a group that had been on the job for 5-10 years (24.9%).

Finally, employees with more than 10 years seniority represented 27% of the total (see table 14). Employees with lower seniority included young UAE nationals who had recently graduated and more experienced expatriate employees who had joined the company during a business expansion that began in 2011.

Table 14: Seniority Profile for Survey Participants

Seniority

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5	151	47.6	47.6	47.6
	5-10	79	24.9	24.9	72.6
	10-15	43	13.6	13.6	86.1
	15-20	22	6.9	6.9	93.1
	20-25	8	2.5	2.5	95.6
	>30	14	4.4	4.4	100.0
	Total	317	100.0	100.0	

The target population included employees who work in different business units and are required to collaborate and coordinate their activities in order to develop the offshore field. The respective business unit assignment for participants is shown in table 15. The majority of participants came from Asset (A), Projects and Drilling/ Logistics business units as these are the largest in the company and are traditionally involved in manpower intensive field activities (e.g., infrastructure construction, drilling of wells, field operations and maintenance). Other business units provide business support and technical assistance to the Asset Business Unit.

Table 15: Business Unit Affiliation of Survey Participants

BU

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ZK Asset	92	29.0	29.0	29.0
	Drilling/Logistics	51	16.1	16.1	45.1
	Projects	97	30.6	30.6	75.7
	Sub-Surface Technology	36	11.4	11.4	87.1
	Technical Support	18	5.7	5.7	92.7
	Corporate Support	23	7.3	7.3	100.0
	Total	317	100.0	100.0	

4.3 Statistical Analysis

This section presents the statistical analysis of the dataset using SmartPLS 3.0 software (Ringle et al., 2014). SmartPLS uses Partial Least Squares Structure Equation Modeling (PLS-SEM), which is a second-generation statistical modeling method that allows for simultaneous analysis of pre-specified networks of relationships between latent constructs, as well as between constructs and their indicators (Hair et al., 2014). This technique was used due to the exploratory nature of the research and the complexity of the model. The model contains 13 constructs and 61 measured variables.

The analysis has been divided into three major stages: (1) evaluation of the measurement model with an emphasis on estimating the loadings of each measurement item on their respective construct to ensure the reliability and validity of the constructs (Factor Analysis). (2) Structure model analysis, where the focus is on the predictive ability of the model (R^2 values), and on estimating the strength and significance of the relationship between various model constructs (Path Analysis); and (3) analysis of the

mediation effects in order to gain an in-depth understanding of the relationships and influences between constructs (Hair et al., 2014).

4.3.1 Measurement Model Assessment

Assessment of the measurement models covers an evaluation of criteria for reliability (internal consistency and individual indicator reliability) and validity (convergent and discriminant) for every model construct. However, the first step in the process was to evaluate the loadings of measurement items on their respective latent variables.

4.3.1.1 Factor Loadings for Measurement Items

The model is constructed using SmartPLS and the SPSS data file is converted into a comma delimited format (CSV) before loading into the program. Figure 27 shows the model where nine (9) latent variables are used as predictors of knowledge sharing behavior, which in turn is used as a predictor of individual job performance (IJP). Two latent variables – innovative behavior (IB) and task-focused citizenship behavior (TFCB) – are shown as mediating between knowledge sharing behavior and individual job performance. The predicted influence of four demographic variables (gender, nationality, tenure and business unit affiliation) on individual job performance was controlled by having these categorical variables directly connected to the latent variable, IJP.

Each latent variable has its own associated measurement items. The model was run and the loadings of these latent variables were assessed according to recommended guidelines from Hair et al. (2014). According to these guidelines, any item with a loading value of less than 0.4 should be removed and those with loading values greater

than 0.7 should be retained. Items with loading values that are greater than 0.4 and less than 0.7 should be removed only when their deletion leads to an improvement in the composite reliability (CR) and average variance extracted (AVE) values of their respective latent variable.

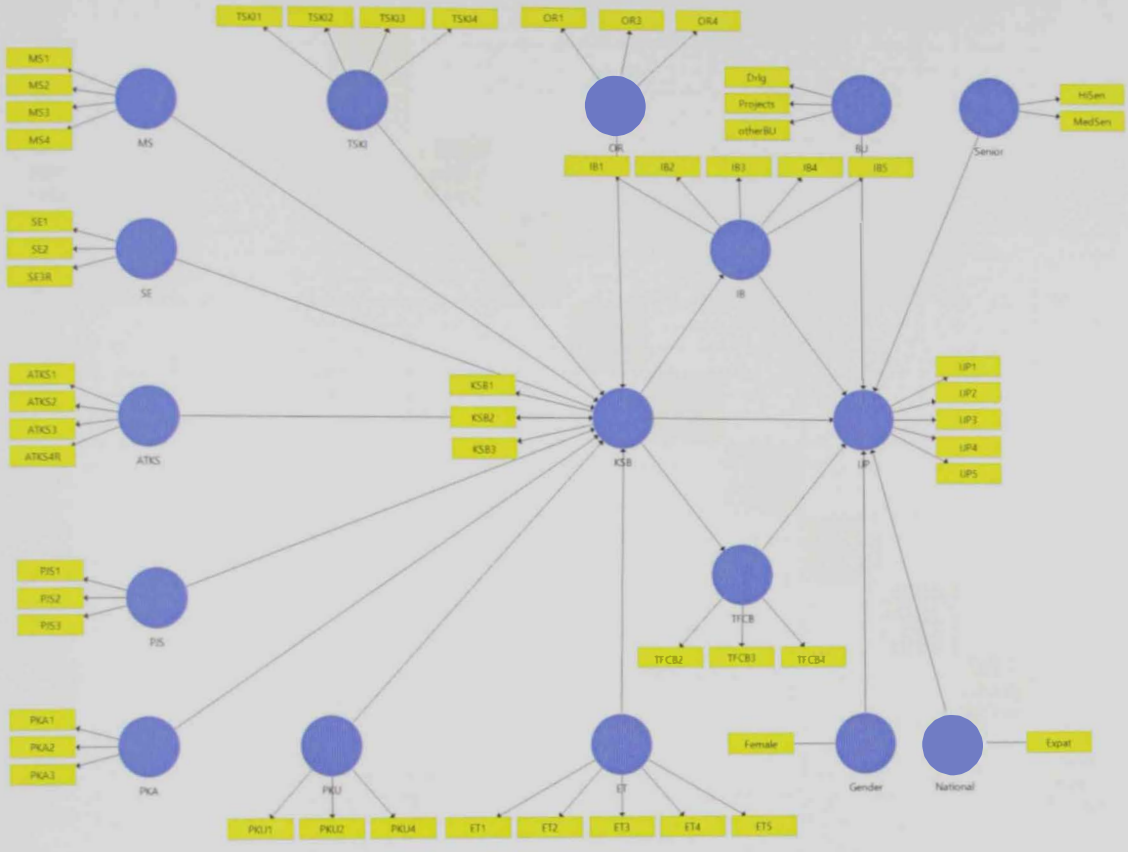

Figure 27: SmartPLS Model for the Study

A PLS algorithm was run and the loadings of various measurement items on their respective constructs were checked. Items with loadings of less than 0.4 were removed and the process reiterated. Figure 28 shows the final loadings of the remaining items on their respective constructs. Each item has a loading value greater than 0.7 which indicates that they are excellent measures of their respective constructs (Tabachnick & Fidell, 2013).

	ATKS	ET	IB	IJP	KSB	MS	OR	PJS	PKA	PKU	SE	TFCB	TSKI
ATKS1	0.882												
ATKS2	0.941												
ATKS3	0.904												
ET1		0.877											
ET2		0.905											
ET3		0.919											
ET4		0.849											
ETS		0.903											
IB1			0.743										
IB2			0.81										
IB3			0.856										
IB4			0.872										
IBS			0.804										
IJP1				0.853									
IJP2				0.868									
IJP3				0.912									
IJP4				0.915									
IJPS				0.857									
KSB1					0.87								
KSB2					0.854								
KSB3					0.806								
MS1						0.896							
MS2						0.918							
MS3						0.888							
MS4						0.854							
OR1							0.957						
OR3							0.973						
OR4							0.901						
PJS1								0.816					
PJS2								0.861					
PJS3								0.813					
PKA1									0.89				
PKA2									0.923				
PKA3									0.947				
PKU1										0.905			
PKU2										0.955			
PKU4										0.945			
SE1											0.897		
SE2											0.89		
SE3R											0.813		
TFCB2												0.812	
TFCB3												0.826	
TFCB4												0.809	
TSKI1													0.846
TSKI2													0.871
TSKI3													0.827
TSKI4													0.788

Figure 28: Loadings of Various Items on Their Respective Constructs

4.3.1.2 Construct Validity

Construct validity refers to the degree to which a concept or latent variable is defined by the set of measures that are used to measure it (Hair et al., 2014). There are two types of construct validity that need to be assessed: convergent validity and discriminant validity.

Convergent validity is established when the measurement indicators meant to measure a construct exhibit high loadings on that construct, as shown in figure 28. In

addition, these indicators should correlate positively with one another to reflect the fact that they are measuring the same construct. A typical measure to assess this positive correlation between indicators is called the average variance extracted (AVE), which is basically the average of the squared loadings of the measurement items associated with the construct. Typically, an AVE value of 0.5 or higher is considered adequate as it indicates that the construct explains more than 50% of the variance in its measurement items (Hair et al., 2014). A graphical presentation of the AVE values for various model constructs is shown in figure 29. Since the measurement items load strongly on their respective constructs and the AVE values exceed the recommended limit of 0.5, the assumption of convergent validity was supported.

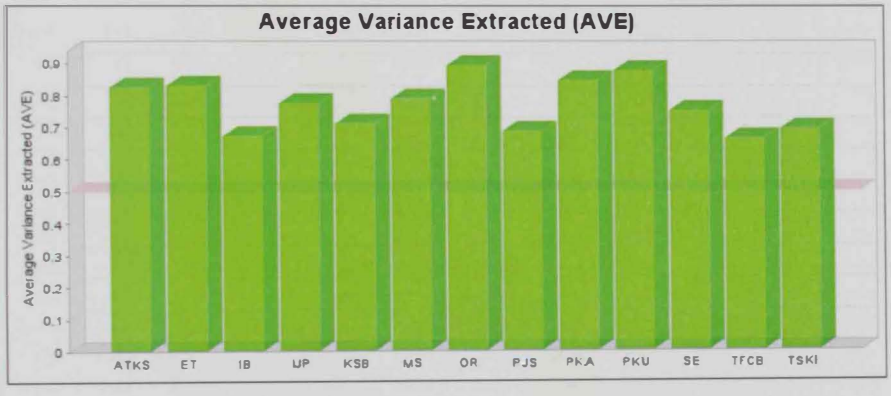

Figure 29: AVE Values for Various Model Constructs

Discriminant validity refers to the degree to which a construct is distinctive from other constructs in the model and measure different phenomena. Two approaches are typically used to assess discriminant validity: cross loadings of indicators and the Fornell-Larker Criterion (Hair, Ringle & Sarstedt, 2011).

The cross-loading approach suggests that a construct has discriminant validity when its measurement indicators load higher on that construct when compared to other constructs in the model. A difference of 0.2 in the item loadings on two different

constructs usually provides adequate support to the assumption of discriminant validity. This criterion was satisfied (see figure 30 for the cross-loadings of measurement items on different constructs).

	ATKS	ET	IB	IJP	KSB	MS	OR	PJS	PKA	PKU	SE	TFCB	TSKI
ATKS1	**0.882**	0.136	0.459	0.419	0.398	0.32	-0.097	0.18	0.144	0.388	0.506	0.429	0.209
ATKS2	**0.941**	0.164	0.517	0.51	0.497	0.358	-0.085	0.263	0.179	0.458	0.503	0.464	0.359
ATKS3	**0.904**	0.14	0.454	0.415	0.454	0.308	-0.054	0.24	0.174	0.401	0.481	0.431	0.294
ET1	0.148	**0.877**	0.173	0.232	0.195	0.464	-0.077	0.404	0.549	0.167	0.043	0.203	0.183
ET2	0.158	**0.905**	0.157	0.233	0.208	0.416	-0.053	0.412	0.54	0.174	0.037	0.191	0.176
ET3	0.178	**0.919**	0.181	0.273	0.238	0.463	-0.042	0.399	0.558	0.206	0.007	0.203	0.19
ET4	0.126	**0.849**	0.126	0.192	0.22	0.474	0.018	0.386	0.622	0.126	0.054	0.168	0.176
ET5	0.106	**0.903**	0.161	0.215	0.192	0.462	0.011	0.405	0.597	0.152	0.019	0.16	0.189
IB1	0.389	0.161	**0.743**	0.452	0.314	0.249	0.011	0.242	0.156	0.286	0.264	0.36	0.238
IB2	0.388	0.117	**0.81**	0.477	0.367	0.264	0.071	0.165	0.106	0.357	0.31	0.441	0.297
IB3	0.488	0.136	**0.856**	0.506	0.389	0.297	-0.084	0.191	0.129	0.418	0.357	0.439	0.293
IB4	0.48	0.154	**0.872**	0.622	0.488	0.341	-0.012	0.192	0.158	0.447	0.355	0.445	0.367
IB5	0.395	0.165	**0.804**	0.556	0.385	0.34	-0.041	0.232	0.201	0.429	0.304	0.402	0.31
IJP1	0.448	0.19	0.561	**0.853**	0.404	0.359	-0.082	0.3	0.213	0.468	0.271	0.401	0.329
IJP2	0.473	0.216	0.588	**0.868**	0.422	0.376	-0.064	0.279	0.249	0.46	0.309	0.441	0.385
IJP3	0.417	0.286	0.57	**0.912**	0.43	0.388	-0.031	0.314	0.256	0.533	0.272	0.463	0.392
IJP4	0.42	0.216	0.563	**0.915**	0.42	0.374	-0.049	0.299	0.2	0.537	0.216	0.435	0.376
IJP5	0.424	0.227	0.559	**0.857**	0.469	0.385	-0.031	0.256	0.208	0.467	0.292	0.436	0.415
KSB1	0.412	0.113	0.41	0.411	**0.87**	0.368	-0.012	0.159	0.212	0.36	0.432	0.496	0.267
KSB2	0.4	0.284	0.394	0.409	**0.854**	0.427	0.04	0.323	0.314	0.389	0.42	0.536	0.327
KSB3	0.447	0.201	0.414	0.412	**0.806**	0.355	-0.081	0.129	0.169	0.411	0.429	0.519	0.363
MS1	0.275	0.43	0.31	0.343	0.399	**0.896**	-0.039	0.354	0.397	0.245	0.264	0.313	0.24
MS2	0.355	0.396	0.326	0.385	0.433	**0.918**	-0.055	0.302	0.39	0.29	0.282	0.324	0.233
MS3	0.339	0.496	0.38	0.441	0.429	**0.888**	-0.026	0.385	0.554	0.343	0.241	0.387	0.271
MS4	0.318	0.51	0.286	0.342	0.347	**0.854**	-0.054	0.365	0.559	0.275	0.256	0.275	0.265
OR1	-0.084	-0.009	-0.018	-0.046	-0.022	-0.021	**0.957**	-0.038	-0.035	-0.009	0.022	0.001	0.03
OR3	-0.095	-0.041	-0.02	-0.069	-0.022	-0.075	**0.973**	-0.003	-0.043	-0.035	0.02	-0.003	0.05
OR4	-0.057	-0.046	-0.002	-0.049	-0.014	-0.039	**0.901**	-0.02	-0.027	-0.002	0.029	-0.007	0.054
PJS1	0.176	0.405	0.197	0.236	0.241	0.364	-0.091	**0.816**	0.369	0.2	0.118	0.19	0.162
PJS2	0.245	0.36	0.217	0.286	0.179	0.359	0.013	**0.861**	0.324	0.275	0.124	0.183	0.275
PJS3	0.222	0.339	0.205	0.31	0.165	0.234	0.055	**0.813**	0.363	0.253	0.089	0.209	0.263
PKA1	0.185	0.562	0.169	0.215	0.223	0.456	-0.049	0.359	**0.89**	0.134	0.097	0.19	0.164
PKA2	0.17	0.607	0.192	0.267	0.249	0.498	-0.024	0.432	**0.923**	0.159	0.091	0.177	0.183
PKA3	0.155	0.606	0.151	0.225	0.283	0.507	-0.034	0.387	**0.947**	0.168	0.102	0.211	0.141
PKU1	0.37	0.177	0.389	0.445	0.387	0.31	-0.006	0.273	0.151	**0.905**	0.286	0.324	0.373
PKU2	0.483	0.178	0.48	0.566	0.449	0.319	-0.039	0.282	0.156	**0.955**	0.38	0.399	0.471
PKU4	0.428	0.169	0.468	0.551	0.448	0.286	-0.004	0.251	0.165	**0.945**	0.348	0.337	0.447
SE1	0.468	0.046	0.33	0.224	0.497	0.232	-0.001	0.096	0.101	0.301	**0.897**	0.455	0.288
SE2	0.399	-0.036	0.295	0.237	0.39	0.22	0.037	0.031	0.052	0.237	**0.89**	0.384	0.293
SE3R	0.548	0.075	0.391	0.35	0.418	0.313	0.032	0.222	0.116	0.407	**0.813**	0.4	0.359
TFCB2	0.414	0.16	0.475	0.427	0.564	0.316	-0.048	0.107	0.16	0.283	0.397	**0.812**	0.284
TFCB3	0.416	0.154	0.394	0.371	0.455	0.278	0.027	0.223	0.166	0.294	0.438	**0.826**	0.28
TFCB4	0.356	0.195	0.371	0.406	0.471	0.302	0.022	0.255	0.188	0.352	0.339	**0.809**	0.361
TSKI1	0.247	0.207	0.315	0.337	0.324	0.271	0.049	0.262	0.147	0.374	0.279	0.303	**0.846**
TSKI2	0.282	0.149	0.324	0.345	0.303	0.259	0.061	0.252	0.133	0.386	0.347	0.341	**0.871**
TSKI3	0.335	0.206	0.332	0.41	0.372	0.249	-0.011	0.231	0.204	0.447	0.313	0.332	**0.827**
TSKI4	0.175	0.097	0.258	0.333	0.236	0.14	0.074	0.14	0.072	0.309	0.251	0.274	**0.788**

Figure 30: Cross-loading of Measurement Items on Different Model Constructs

The Fornell-Larcker Criterion is a more conservative approach to evaluate the discriminant validity of a construct. It compares the square root of AVE values with correlations between latent variables. The logic behind this approach is that a construct shares more variance with its own measurement indicators than it does with other constructs in the model (Hair, Ringle & Sarstedt, 2011). Figure 31 shows that the Fornell-Larcker criterion was satisfied for every model construct and so meets the requirements of discriminant validity.

	ATKS	ET	IB	IJP	KSB	MS	OR	PJS	PKA	PKU	SE	TFCB	TSKI
ATKS	0.909												
ET	0.162	0.891											
IB	0.525	0.179	0.818										
IJP	0.495	0.258	0.645	0.881									
KSB	0.498	0.238	0.481	0.487	0.844								
MS	0.362	0.512	0.368	0.427	0.455	0.889							
OR	-0.086	-0.032	-0.016	-0.058	-0.021	-0.049	0.944						
PJS	0.253	0.45	0.248	0.329	0.242	0.394	-0.021	0.83					
PKA	0.183	0.643	0.184	0.256	0.275	0.53	-0.038	0.427	0.92				
PKU	0.459	0.186	0.479	0.56	0.459	0.325	-0.018	0.287	0.168	0.935			
SE	0.545	0.035	0.391	0.309	0.507	0.293	0.024	0.135	0.105	0.364	0.868		
TFCB	0.486	0.208	0.511	0.494	0.614	0.368	-0.003	0.233	0.21	0.379	0.479	0.816	
TSKI	0.321	0.205	0.373	0.431	0.379	0.283	0.046	0.272	0.175	0.463	0.36	0.378	0.834

Figure 31: The Fornell-Larcker Criterion for All Model Constructs

4.3.1.3 Construct Reliability

Construct reliability refers to the extent to which a group of measurement items are internally consistent in measuring the concept that they are supposed to measure (Hair et al., 2014). Two measures are usually used to assess construct reliability: Cronbach's Alpha (α) and Composite Reliability (ρ_c). Cronbach's Alpha assumes that all measurement items in a scale are reliable and load equally on their construct. It is calculated using the equation:

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum_i V_i}{V_t}\right)$$

Where n is the number of measurement items in a scale, V_i is the variance of the scores of measurement item i, and V_t is the variance of total scores of all measurement items in the scale. On the other hand, Composite Reliability takes into account that measurement items can have different loadings on their construct and is not sensitive to a number of items. It is expressed by the equation:

$$\rho_c = \frac{(\sum_i l_i)^2}{(\sum_i l_i)^2 + \sum_i var(e_i)}$$

Where l_i is the standardized outer loading of the measurement item i of a specific construct, e_i is the measurement error of measurement item i, and $var\ (e_i)$ is the variance of the measurement error (Hair et al., 2014).

Table 16: Summary of Reliability and Validity Indices for Model Constructs.

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
ATKS	0.895	0.935	0.827
ET	0.935	0.951	0.794
IB	0.877	0.91	0.67
IJP	0.928	0.946	0.776
KSB	0.797	0.881	0.712
MS	0.912	0.938	0.79
OR	0.94	0.961	0.892
PJS	0.78	0.869	0.689
PKA	0.91	0.943	0.847
PKU	0.928	0.954	0.874
SE	0.835	0.901	0.753
TFCB	0.75	0.856	0.665
TSKI	0.855	0.901	0.695

Both Cronbach's Alpha and the Composite Reliability Index can take any value between 0 and 1, with values between 0.7 and 0.9 considered as satisfactory (Hair et al., 2014). Table 16 gives a summary of values for Cronbach's Alpha, the Composite Reliability Index and Average Variance extracted for all the model constructs. The values suggest that all the measurement constructs are both valid and reliable and can be used for path analysis.

4.3.1.4 Measurement Model Assessment Summary

In accordance with guidelines by Hair et al. (2014), the previous sections have assessed measurement items and model constructs to ensure their validity and reliability. Each item was found to have loadings greater than 0.7 on their respective constructs. The reliability of the constructs was found to be greater than 0.7, whether it was measured using Cronbach's Alpha or the Composite Reliability Index. In addition, all the constructs were found to be valid based on an analysis of cross-loadings of items, the values of average variance extracted for each construct, as well as by an examination using the Fornell-Larcker Criterion. As the measurement model satisfied the validity and reliability requirements, the analysis progressed to an assessment of the structural model. This will be covered in the next section.

4.3.2 Structural Model Assessment

A structural model assessment includes the following five key steps: (1) assessment of collinearity between predictor variables, (2) assessment of the significance and relevance of model paths, (3) assessing the model's predictive accuracy (R^2), (4) assessing the effect sizes of endogenous variables (f^2), and (5) assessing the predictive relevance of endogenous constructs (Q^2). The sequence of

steps is shown graphically in figure 32, which is based on Hair et al. (2014). This section concludes with a summary and commentary on the results of this analysis.

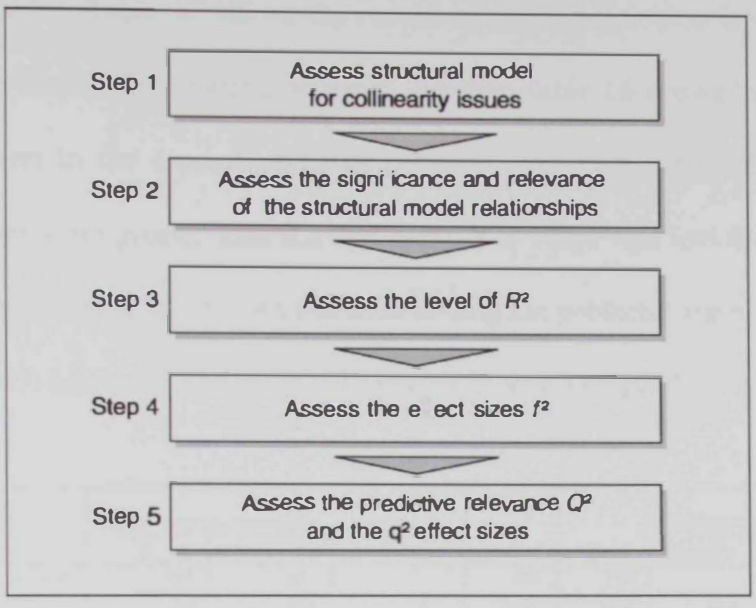

Figure 32: Structural Mdel Assessment Procedure (Hair et al., 2014).

4.3.2.1 Assessment of Multicollinearity

Multicollinearity refers to a situation where correlations between multiple predictor variables are so strong that some variables become redundant as they contain almost the same information (Hair et al., 2014). Two parameters were used to assess the level of collinearity among variables: Tolerance and the Variance Inflation Factor (VIF). Tolerance is the amount of variance in a variable that is not shared with other variables, whereas VIF is the reciprocal of Tolerance. Typically, a tolerance value that is less than 0.2 (equivalent to a VIF value of 5.0) indicates the presence of multicollinearity among predictor variables.

The structural model includes two major parts. The first part includes nine (9) exogenous variables that predict knowledge sharing behavior, while the second part

includes three (3) exogenous variables that predict individual job performance. Each part was subjected to a linear regression analysis to test for collinearity effects among predictor variables. Table 17 shows the results of linear regression in the first part, which predicts knowledge sharing behavior, whereas table 18 shows the results of a linear regression in the second part that predicts individual job performance. All tolerance values were greater than 0.2 and every VIF value was less than 5.0, which confirms that multicollinearity does not exist among the predictor variables.

Table 17: Multicollinearity for Predictors of Knowledge Sharing Behavior

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.016	.045		-.347	.729		
	ATKS	.113	.057	.113	1.991	.047	.613	1.632
	ET	.058	.056	.060	1.045	.297	.596	1.677
	MS	.156	.060	.144	2.579	.010	.631	1.584
	OR	-.041	.043	-.044	-.976	.330	.991	1.009
	PJS	-.061	.054	-.059	-1.130	.259	.716	1.396
	PKA	.078	.054	.083	1.434	.153	.592	1.690
	PKU	.198	.058	.186	3.403	.001	.663	1.508
	SE	.273	.054	.269	5.007	.000	.685	1.460
	TSKI	.114	.045	.132	2.527	.012	.718	1.392

a. Dependent Variable: KSB

Table 18: Multicollinearity for Predictors of Individual Job Performance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.028	.044		-.629	.530		
	IB	.436	.048	.459	9.079	.000	.752	1.329
	KSB	.187	.055	.181	3.371	.001	.667	1.500
	TFCB	.124	.059	.119	2.096	.037	.599	1.668

a. Dependent Variable: IJP

4.3.2.2 Assessment of Significance and Relevance of Model Path Coefficients

After running the PLS algorithm, the path coefficients representing the hypothesized relationship between the model's constructs were estimated (see figure 33). The standardized values of these coefficients varied between -1 and +1. An estimated path coefficient of +1 indicates the presence of a strong positive relationship

(similarly an estimated path of -1 indicates a strong negative relationship), which is most likely to be statistically significant. An estimated path coefficient that is close to zero indicates a weak relationship between the constructs that is most likely not statistically significant (Hair et al., 2014).

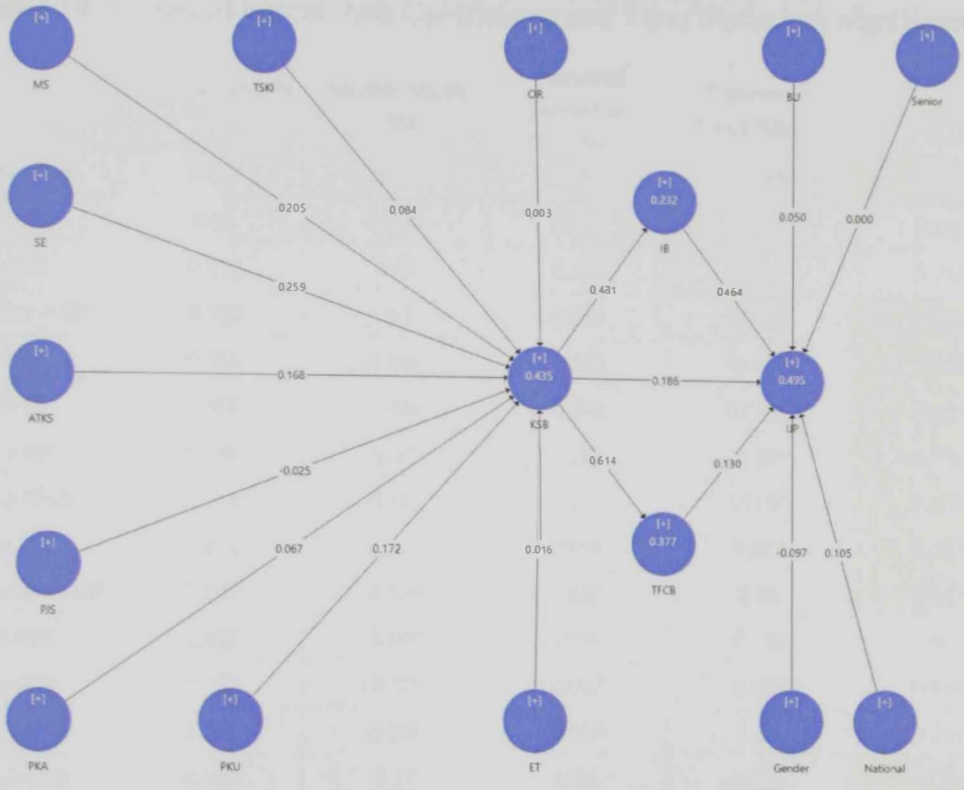

Figure 33: The Research Model Showing Values of Path Coefficients

The statistical significance of the path coefficients were assessed by running bootstrap routines. The bootstrapping routine draws a large number of sub-samples, usually 5000 subsamples, from the original data sample with replacement. Replacement means that each sub-sample is returned to the original population after being analyzed. The sub-sample size is equal to the number of valid cases used in the analysis. Each time the program draws a sub-samples, it estimates path coefficients

which allows the building of a bootstrap distribution of the path coefficients and calculates their standard errors, e*. This allows the program to calculate a t-statistic (path coefficient/ standard error) for each path coefficient that is then compared to a critical value to assess its statistical significance. The critical values that are used for two-tailed tests are 1.65 (p = 0.1), 1.96 (p = 0.05), and 2.57 (p = 0.01).

Table 19: Values of Model Path Coefficients and Their Statistical Significance

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ATKS -> KSB	0.168	0.157	0.065	2.583	0.011
BU -> IJP	0.05	0.038	0.064	0.774	0.440
ET -> KSB	0.016	0.02	0.054	0.291	0.772
Gender -> IJP	-0.097	-0.1	0.031	3.112	0.002
IB -> IJP	0.464	0.465	0.051	9.107	0.000
KSB -> IB	0.481	0.476	0.043	11.318	0.000
KSB -> IJP	0.186	0.19	0.063	2.939	0.004
KSB -> TFCB	0.614	0.616	0.038	16.077	0.000
MS -> KSB	0.205	0.2	0.054	3.807	0.000
National -> IJP	0.105	0.104	0.038	2.75	0.007
OR -> KSB	0.003	-0.006	0.04	0.076	0.939
PJS -> KSB	-0.025	-0.008	0.052	0.486	0.628
PKA -> KSB	0.067	0.061	0.059	1.14	0.257
PKU -> KSB	0.172	0.17	0.06	2.846	0.005
SE -> KSB	0.259	0.264	0.06	4.326	0.000
Senior -> IJP	0	-0.008	0.042	0.001	0.999
TFCB -> IJP	0.13	0.119	0.064	2.029	0.045
TSKI -> KSB	0.084	0.086	0.05	1.681	0.096

Table 19 shows the standardized path coefficients with the statistically significant ones highlighted in yellow. A review of the table indicates that the path coefficients between individual job performance and its predictors (knowledge sharing behavior, innovative behavior and task-focused citizenship behavior) are strong, positive and statistically significant. Equally, the relationships between knowledge

sharing behavior and five (5) of its predictors (management support, task interdependence, attitude towards knowledge sharing, self-efficacy and perceived knowledge usefulness) are also strong, positive and statistically significant. On the other hand, path coefficients for the remaining four predictors of knowledge sharing behavior (organizational rewards, perceived job security, perceived knowledge accessibility and employee training) are weak and not statistically significant. In addition, the path coefficients for the two control variables (gender and nationality) are statistically significant.

4.3.2.3 Assessment of Model Predictive Accuracy (R^2)

Any model's predictive accuracy is usually measured using the coefficient of determination (R-squared value). This coefficient is computed by squaring the correlation between the targeted endogenous construct's actual and predicted values. The coefficient represents the proportion of variance in the endogenous construct that can be explained by the exogenous variables that are connected to it (Hair et al., 2014). It has been noted that the addition of non-significant exogenous latent variables, that have slight correlation with the endogenous latent variable, can lead to an increase in the R-squared value (Hair et al., 2014). To eliminate the superficial effect caused by additional constructs and to ensure that the model meets the criteria of being parsimonious, an adjusted R-square value was computed using the equation:

$$R^2_{adj} = 1 - (1 - R^2).\frac{n-1}{n-k-1}$$

Where n is the sample size (number of cases) and k is the number of exogenous variables used to predict the endogenous construct. As in the case of path coefficients,

a bootstrapping technique was used in order to test the statistical significance of the R-squared values.

The R-squared values can range between 0 and 1, with higher values indicating greater predictive accuracy. It is worth highlighting that scholars' opinions about what constitutes an acceptable R-squared value depends on model complexity and respective research discipline (Hair et al., 2011). For example, Henseler, Ringle & Sinkovics (2009), in their study of international marketing, described R-squared values of 0.67, 0.33, and 0.19 for endogenous latent variables as substantial, moderate and weak. Whereas Cohen (1988) suggested that for the social sciences, R-squared values of 0.26, 0.13, and 0.02 for endogenous latent variables can be considered as large, medium and small.

In the research model, there were three intermediate constructs that acted as both exogenous and endogenous latent variables – knowledge sharing behavior (KSB), innovative behavior (IB), and task-focused citizenship behavior (TFCB) – and a single endogenous construct (individual job performance, IJP). Table 20 represents R-squared and adjusted R-squared values for all four constructs. IJP has the highest R-squared value of 0.495, with its adjusted R-squared value at 0.484, which indicates the model is parsimonious and can substantially predict its variance.

Table 20: R^2 and Adjusted R^2 Values for Endogenous Constructs

	R-Square	R-Square Adjusted
IB	0.232	0.229
IJP	0.495	0.484
KSB	0.435	0.419
TFCB	0.377	0.375

To check the statistical significance of these values, a bootstrapping technique was used and the results are presented in table 21. All values were statistically significant at a p = 0.001 level.

Table 21: Statistical Significance Test Results for R^2 and Adjusted R^2 Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
IB	0.232	0.229	0.040	5.771	0.000
UP	0.495	0.506	0.045	11.100	0.000
KSB	0.435	0.451	0.045	9.727	0.000
TFCB	0.377	0.381	0.047	8.056	0.000

4.3.2.4 Assessment of Effect Size (f2)

Effect size refers to the influence of a specific exogenous variable on the endogenous variable that it is supposed to predict (Hair et al., 2014). To evaluate this effect, the coefficient of determination for endogenous constructs is computed twice, once with the exogenous variable included in the model, and a second time without this variable. Effect size is then computed using the equation:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Where $R^2_{included}$ and $R^2_{excluded}$ are the R^2 values for the endogenous variable with the exogenous variable either included or excluded from the model respectively. Cohen (1988) described effect sizes of 0.35, 0.15, and 0.02 as large, medium, and small respectively.

Table 22 shows the effect size for exogenous latent variables on their associated endogenous variables. For individual job performance, innovative behavior exhibited medium effects, while knowledge sharing behavior and task-focused citizenship

behavior and nationality exhibited smaller effects. Knowledge sharing has a large effect on task-focused citizenship behavior and a medium effect on innovative behavior. All exogenous variables that predict knowledge sharing behavior have either a small or no effect on the construct.

Table 22: Effect Sizes of Exogenous Variables on Endogenous Variables

	IB	IJP	KSB	MS	TFCB
ATKS			0.029		
BU		0.005			
ET			0.000		
Gender		0.015			
IB		0.284			
IJP					
KSB	0.302	0.039			0.605
MS			0.043		
National		0.018			
OR			0.000		
PJS			0.001		
PKA			0.004		
PKU			0.034		
SE			0.077		
Senior		0.000			
TFCB		0.019			
TSKI			0.009		

A bootstrapping technique was used in order to assess the statistical significance of these effect sizes and the results are shown in table 23. Individual job performance, nationality and task-focused citizenship behavior were not found to be statistically significant. For knowledge sharing behavior, only self-efficacy and management support were statistically significant at ($p=0.04$ and $p=0.07$ respectively) and the perceived usefulness of knowledge was also significant at $p=0.111$.

Table 23: Statistical Significance Test Results for Effect Sizes

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ATKS -> KSB	0.029	0.030	0.023	1.267	0.208
BU -> IJP	0.005	0.011	0.011	0.402	0.689
ET -> KSB	0.000	0.003	0.004	0.056	0.956
Gender -> IJP	0.015	0.018	0.011	1.328	0.187
IB -> IJP	0.284	0.298	0.084	3.386	0.001
KSB -> IB	0.302	0.300	0.068	4.421	0.000
KSB -> IJP	0.039	0.046	0.028	1.373	0.173
KSB -> TFCB	0.605	0.624	0.124	4.858	0.000
MS -> KSB	0.043	0.044	0.024	1.809	0.074
National -> IJP	0.018	0.020	0.013	1.376	0.172
OR -> KSB	0.000	0.003	0.003	0.005	0.996
PJS -> KSB	0.001	0.003	0.004	0.179	0.858
PKA -> KSB	0.004	0.007	0.009	0.465	0.643
PKU -> KSB	0.034	0.037	0.024	1.413	0.111
SE -> KSB	0.077	0.084	0.039	1.975	0.051
Senior -> IJP	0.000	0.003	0.004	0.000	1.000
TFCB -> IJP	0.019	0.020	0.018	1.021	0.310
TSKI -> KSB	0.009	0.013	0.013	0.708	0.480

4.3.2.5 Assessment of Model Predictive Relevance (Q^2)

The last step in the assessment of the structural model is to evaluate its predictive relevance as measured by Stone-Geisser's Q^2 Value (Geisser, 1974; Stone, 1974). Predictive relevance refers to the model's ability to predict data points in the measurement indicators on the endogenous construct. The process is only valid for endogenous constructs with reflective items such as in the current model. The estimation of data points is done using a blindfolding technique. A blindfolding technique is a sample re-use procedure that eliminates every d^{th} point (called Omission Distance) in the measurement items on the endogenous construct. The omitted data points are treated as missing and are estimated using the remaining data. The procedure

is iterative and it is repeated to ensure all data points in the measurement indicators are estimated. The difference between the estimated and actual values for the omitted data points is then used to compute a Q^2 value. Hair et al. (2014) provide a clear step-by-step example of how to implement the procedure using SmartPLS.

A Q^2 value greater than 0 implies that the model has predictive relevance, whereas a value of less than 0 indicates that the model lacks predictive relevance (Chin, 1998). Table 24 shows the Q^2 and R^2 values for the endogenous constructs in this model. All Q^2 values are greater than 0 which means that the model has predictive relevance.

Table 24: Q^2 and R^2 Values for All Endogenous Variables

	SSO	SSE	Q^2 (=1-SSE/SSO)	R-Squared
IB	1,585.00	1,358.46	0.143	0.199
IJP	1,585.00	1,019.89	0.357	0.481
KSB	951	685.226	0.279	0.437
TFCB	951	729.262	0.233	0.377

As with effect size, changes in Q^2 values of the endogenous construct, when one of the exogenous variables is omitted, can be used to estimate the relative impact of that exogenous variable (q^2) on the endogenous construct. The equation is as follows:

$$q^2 = \frac{Q^2_{included} - Q^2_{excluded}}{1 - Q^2_{included}}$$

Where $Q^2_{included}$ and $Q^2_{excluded}$ are the Q^2 values for the endogenous variable with the exogenous variable included and excluded from the model respectively (Chin,

1998). Table 25 shows the various values of q^2, which indicates that KSB has a major influence on predictive relevance, followed by innovative behavior and task-focused citizenship behavior.

Table 25: Relative Effect of Exogenous Variables on Predictive Relevance

Variable	q^2
IB	0.135
KSB	0.199
TFCB	0.006

4.3.2.6 Analysis of Mediation and Moderation Effects

The research model suggests that innovative behavior and task-focused citizenship behavior mediate the relationship between knowledge sharing behavior and individual job performance (see figure 34). In addition, the model suggest that demographic variables such as gender, nationality, tenure and business unit affiliation moderate the final endogenous variable.

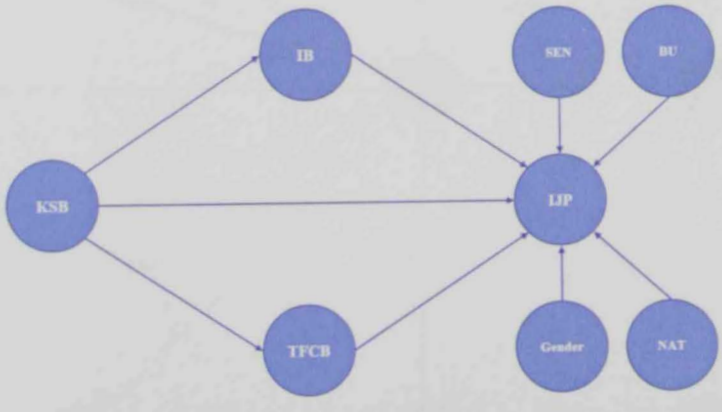

Figure 34: Section of Research Model that Contains Mediator Variables

Baron & Kenny (1986) specified three conditions for both innovative behavior (IB) and task-focused citizenship behavior (TFCB) to become mediating variables: (1)

A previously significant direct relationship between the independent variable (KSB) and dependent variable (IJP), in the absence of the mediators, is substantially reduced when the mediators are present. (2) The direct relationship between the independent variable (KSB) and the presumed mediators (IB and TFCB) is significant, and (3) the direct relationship between the mediator variables (IB & TFCB) and the dependent variable (IJP) are also significant. Mediation can take one of two forms: full mediation and partial mediation. A full mediation is said to have been established, if the direct relationship between the independent variable and dependent variable (if significant) becomes non-significant in the presence of the mediators. A partial mediation is said to exist if the direct relationship between the independent variable and dependent variable is reduced in strength but stays significant (Baron & Kenny, 1986).

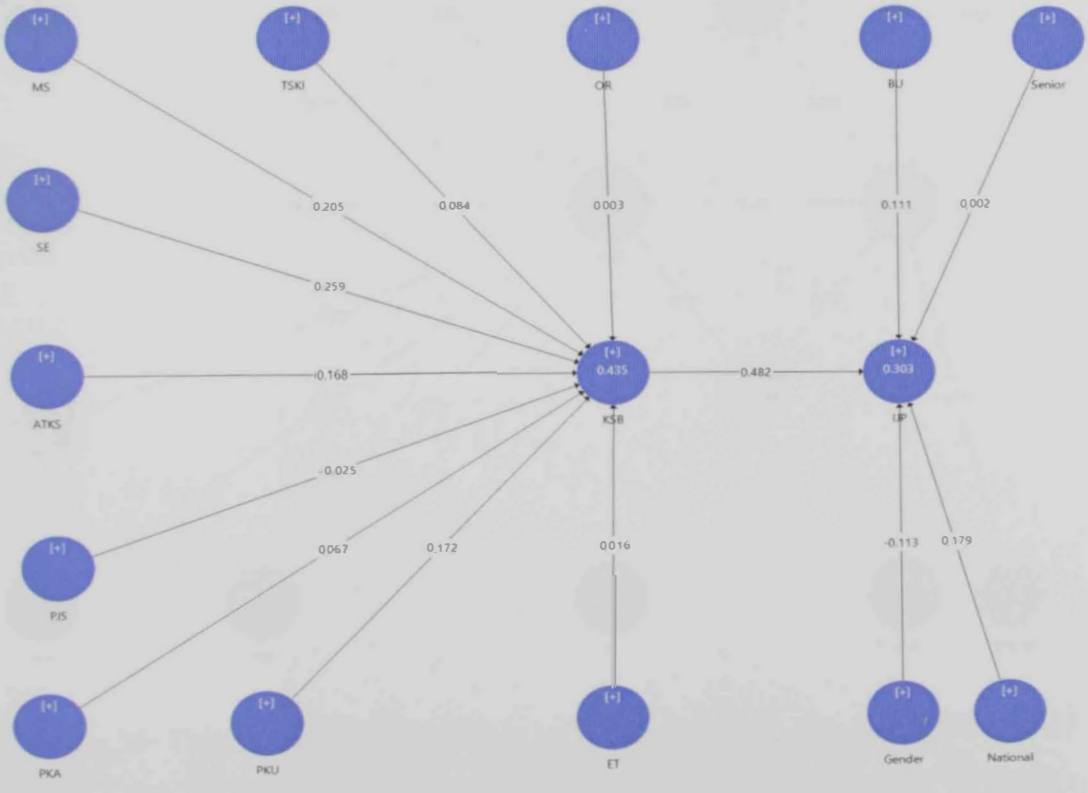

Figure 35: Testing of Direct Relationship Between KSB and IJP

To assess the proposed mediation effects of IB and TFCB on the relationship between KSB and IJP, the PLS algorithm and bootstrapping procedures were run while the two variables were omitted, in order to evaluate the direct relationship between the independent variable and the dependent variable. As shown in figure 35 this relationship was strong with a path coefficient of 0.482*** (t-statistic = 10.952). When the proposed mediators were re-introduced the direct relationship between KSB and IJP was reduced to 0.186*** (t-statistic = 3.568), as shown in figure 36. This step addresses the first condition of mediation according to Baron & Kenny (1986).

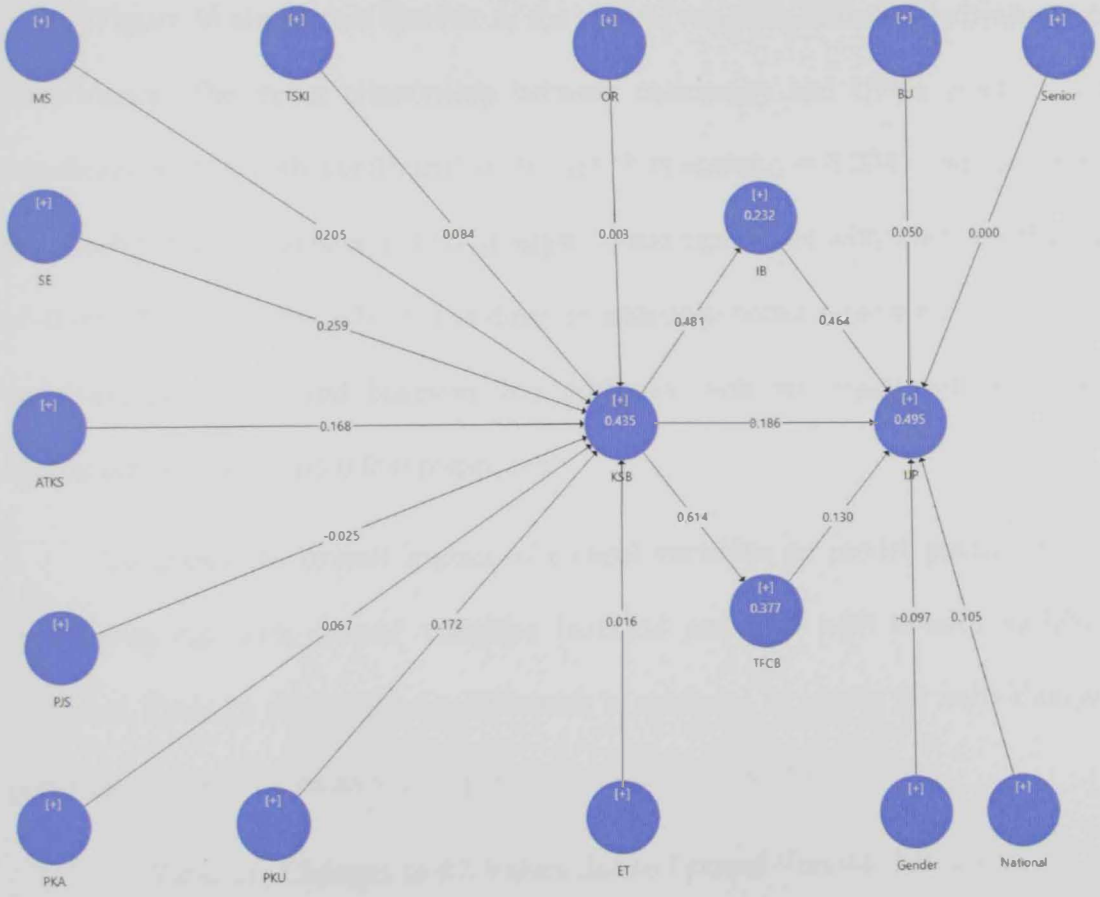

Figure 36: Testing the Mediator Effect on the Relationship Between KSB and IJP

Figure 36 also shows that the direct relationship between KSB and IB is positive and significant because the path coefficient value is 0.481*** (t-statistic =

9.036). Also between KSB and TFCB the relationship is positive and significant with a path coefficient value of 0.614*** (t-statistic = 16.855). Finally, the relationship between IB and IJP is positive and significant with a path coefficient value of 0.464*** (t-statistic = 7.516). Between TFCB and IJP it is also positive and significant with a path coefficient of 0.130* (t-statistic = 1.814). This analysis shows that the second and third condition for mediation (Baron & Kenny, 1986) has been satisfied and we can conclude that both IB and TFCB mediate the relationship between knowledge sharing and individual job performance.

Figure 36 also shows that two of the control variables influence individual job performance. The direct relationship between nationality and IJP is positive and significant with a path coefficient of 0.105*** (t-statistic = 3.274) and the direct relationship between gender and IJP is negative and significant with a path coefficient of -0.097** (t-statistic = 2.303). The direct relationship between the other two control variables, i.e. tenure and business unit affiliation was not significant with path coefficients of 0.000 and 0.050 respectively.

To assess the overall impact of control variables on model prediction, the model was run with control variables included and also with control variables excluded. Table 26 shows that the difference in predicted R^2 values for individual job performance for both cases was negligible (Aiken & West, 1991).

Table 26: Changes in R2 Values due to Control Variable Effects

	Included	Excluded	f-squared	Effect size
R-squared	0.495	0.468	0.0535	Small

4.3.2.7 Summary of Structural Model Assessment

In this section the structural model was evaluated using recommended practices for PLS modeling (Hair et al., 2014; Henseler et al., 2009). The first step was to ensure that the exogenous constructs did not suffer from multicollinearity issues, which could have affected the subsequent multiple regression analysis. Multicollinearity was assessed using Tolerance and VIF statistics and the values were found to be within accepted guidelines (Tolerance > 0.2 and VIF < 5). This was followed by an evaluation of model path coefficient values and their statistical significance. Only five (5) out of seventeen (17) model paths were found not to be statistically significant. However, every path leading to the final endogenous construct (individual job performance) was found to be statistically significant.

To evaluate the model's predictive accuracy and relevance, a PLS-algorithm and blindfolding procedure was used to compute R-squared, f-squared and Q-squared values. It was found that the model could substantively predict the final endogenous construct. Furthermore, the total effect size of various exogenous constructs on the final endogenous variable was found to be at a medium level.

Innovative behavior and task-focused citizenship behavior were confirmed to partially mediate the relationship between knowledge sharing behavior and individual job performance according to guidelines from Baron & Kenny (1986). The moderating effects of the control variables on individual job performance were small.

4.3.3 Statistical Power Analysis

To check the level of statistical power for the data analysis, the online post-hoc statistical power calculator for multiple regression by Soper (2017) was used. The

calculator is based on theoretical work by Cohen (1988) and (Cohen, Cohen, West & Aiken, 2003). The statistical power level for predicting $R^2 = .495$ for the endogenous variable IJP using three predictors (KSB, IB, and TFCB) and a sample size of 317 at a significance level of .05 was found to be 1.0 (see figure 37). In addition, the statistical power level for predicting $R^2 = .435$ for the endogenous variable KSB, using nine predictors (OR, MS, TSKI, SE, ATKS, PJS, PKA, PKU and ET), and a sample size of 317 at a significance level of .05 was also found to be 1.0 (see figure 38).

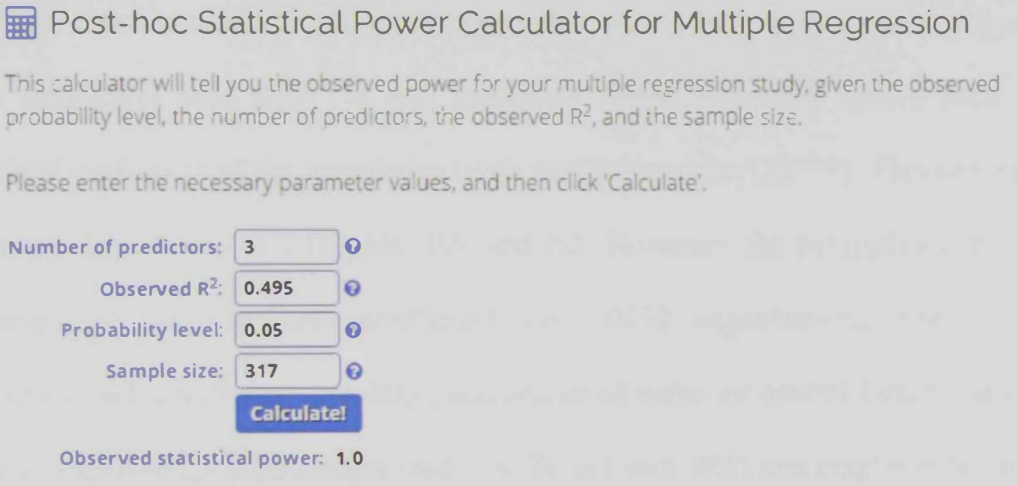

Figure 37: Statistical Power Level for Predicting Endogenous Variable, IJP

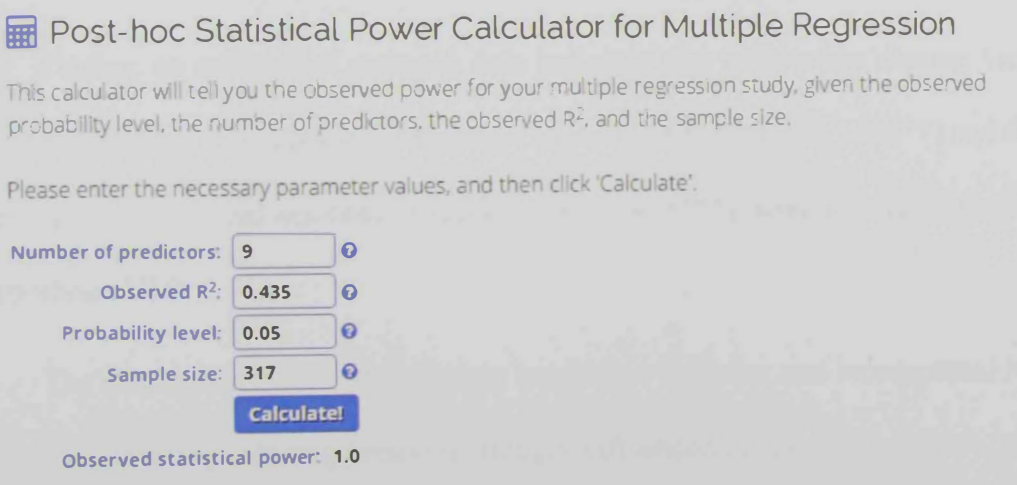

Figure 38: Statistical Power Level for Predicting Endogenous Variable, KSB

4.4 Review of Research Hypotheses

In developing the theoretical model, twelve hypotheses were posited regarding the relationship between various constructs. In view of the previous data analysis, this section discusses the results of research hypothesis testing.

The results of the data analysis showed that knowledge sharing behavior is positively influenced by employees' attitudes towards knowledge sharing (path coefficient was .168***), the subjective norm of self-efficacy (path coefficient was .259***), task-interdependence (path coefficient was .084*), management support (path coefficient was .205***) and perceived behavior control factors such as perceived usefulness of the knowledge (path coefficient was .172***). This provides support to hypotheses H1, H2, H4, H5, and H8. However, the subjective norm of perceived job security (path coefficient was -.025), organizational rewards or incentives (path coefficient was .003), and perceived behavior control factors such as perceived knowledge accessibility (path coefficient was .067) and employee training (path coefficient was .016) had no influence on knowledge sharing behavior. This indicates that hypotheses H3, H6, H7, and H9 were not supported.

Further, an analysis of research data indicates that knowledge sharing had a strong influence on individual job performance (path coefficient was .186***) and that it can explain substantial amounts of variance (R^2 = .495***), which provides support to hypothesis H10.

The results also indicated that when innovative behavior was incorporated into the model, knowledge sharing behavior strongly influenced innovative behavior (path coefficient was 0.481***) and that innovative behavior strongly influenced individual job performance in its turn (path coefficient was .464***) which provides support to

hypothesis H11. A Sobel test of mediation effects confirmed that innovative behavior mediates the relationship between knowledge sharing and individual job performance (Sobel t-static = 7.058***) (see figure 39).

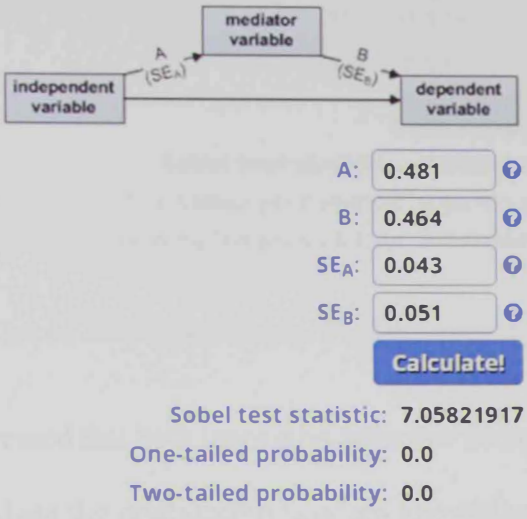

Figure 39: Sobel Test of Mediation Due to Innovative Behavior

In addition, the results indicated that when task-focused citizenship behavior is included in the model, knowledge sharing behavior strongly influenced task-focused citizenship behavior (path coefficient was 0.614***) and that task-focused citizenship behavior influenced individual job performance (path coefficient was .130**), which provide support to hypothesis H12. A Sobel test of mediation effects confirmed that task-focused citizenship behavior mediates the relationship between knowledge sharing and individual job performance (Sobel t-static = 2.015**) (see figure 40).

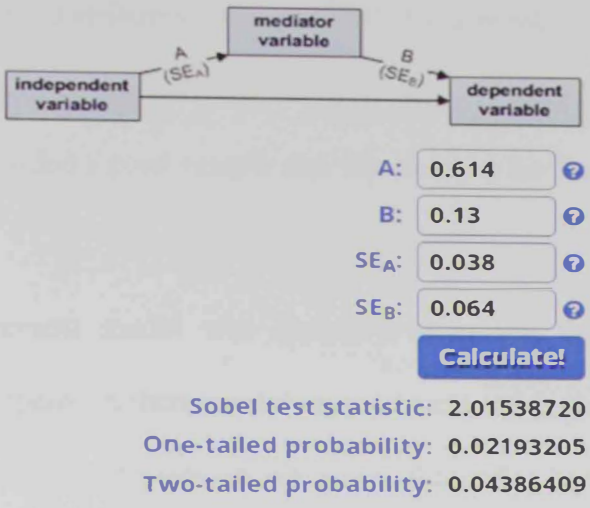

Figure 40: Sobel Test of Mediation Due to Task-Focused Citizenship Behavior

It should be stressed that both innovative behavior and task-focused citizenship behavior partially mediate the relationship between knowledge sharing behavior and innovative job performance. This is because the incorporation of both constructs in the model reduced the path coefficient between knowledge sharing behavior and individual job performance from 0.490*** to .186***, i.e., the relationship has become weaker but is still statistically significant.

Table 27 provides a summary of the status of the twelve research hypotheses regarding the relationship between knowledge sharing behavior and its determinants and outcomes.

4.5 Chapter Summary

This chapter covered the data analysis in accordance with accepted practices for multivariate data analysis (Hair et al., 2014; Hair et al., 2014; Ho, 2013; Stevens, 2012; Tabachnick & Fidell, 2013). It covered data screening and steps that ensured that data was complete and accurate enough for further analysis. The data screening included a review of spurious responses, a missing data analysis, the presence of

outliers and checking distribution assumptions. As a result, the valid number of surveys that could be used for statistical analysis was 317 out of 357 responses. The number of cases provided a good sample size that ensured the final results had strong statistical power.

The measurement model was analyzed to ensure that all measurement indicators loaded properly on their respective constructs and that there were no cross-loadings on other constructs. Constructs were also all found to be valid and reliable for further use in path model analysis. The structural model was analyzed and twelve of the seventeen paths in the model were found to be statistically significant.

The path model included an assessment of the coefficient of determination for endogenous constructs (R^2), determination of effect sizes (f^2) for various exogenous variables on their associated endogenous variables, as well as an assessment of the model's predictive relevance (Q^2).

The last section of the chapter included an analysis of the proposed mediation effects of two variables (innovative behavior and task-focused citizenship behavior) on the relationship between knowledge sharing behavior and individual job performance, as per the recommendations of Baron & Kenny (1986).

Table 27: Summary of Hypothesis Testing Results

No.	Hypothesis	Path coefficient	Status
H1	Management support positively influences knowledge sharing behavior.	.205***	Supported
H2	Task interdependence positively influences knowledge sharing behavior.	.084*	Supported
H3	Organizational rewards positively influence knowledge sharing behavior.	.003	Not supported
H4	Self-efficacy positively influences knowledge sharing behavior.	.259***	Supported
H5	A favorable attitude towards knowledge sharing positively influences knowledge sharing behavior.	.168***	Supported
H6	High levels of job security positively influences knowledge sharing behavior.	-.025	Not supported
H7	Knowledge accessibility has a positive influence on knowledge sharing behavior.	.067	Not supported
H8	Perceived usefulness of knowledge has a positive effect on individual's knowledge sharing behavior.	.172***	Supported
H9	Employee training has a positive influence on knowledge sharing behavior.	.016	Not supported
H10	High levels of knowledge sharing positively influence individual job performance	.490***	Supported
H11	Innovative behavior will mediate the positive relationship between knowledge sharing and individual job performance.	.481*** / .467***	Supported
H12	Task-focused citizenship behavior will mediate the positive relationship between knowledge sharing and individual job performance.	.614*** / .117*	Supported

The critical values used for two-tailed tests are 1.645 ($p < 0.1$), 1.96 (** $p < 0.05$), and 2.57 (*** $p < 0.01$)*

Chapter 5: Discussion

This chapter discusses the research results in relation to the objectives and theoretical framework that was developed earlier in order to study knowledge sharing phenomena.

5.1 Overview

The research aimed to explore the antecedents of knowledge sharing behavior among employees in a national oil company in the United Arab Emirates. It also investigated the potential relationship between knowledge sharing behavior and individual job performance. In addition, the study examined whether the proposed relationship between knowledge sharing behavior and job performance was mediated by other variables such as task-focused organizational citizenship and innovative behaviors.

The study was anchored theoretically in the Input-Process-Output model of Hackman & Morris (1 975) and the Theory of Planned Behavior (Ajzen, 1985). In selecting the antecedents of knowledge sharing behavior, the study drew on multiple research streams dealing with knowledge management, organizational behavior, human resource management, social psychology and strategic management. In total, nine (9) antecedents of knowledge sharing behavior: covering organizational, individual and knowledge related dimensions, were selected for the study. Consequently, twelve hypotheses were put forward regarding the relationship between the various constructs in the theoretical model.

An analysis of the 317 surveys provided empirical support for the theoretical model proposed. The results showed that the key predictors for knowledge sharing

behavior were attitude towards knowledge sharing, self-efficacy, management support, task interdependence and the perceived usefulness of the knowledge. In addition, organizational rewards, perceived job security, knowledge accessibility and employee training were not found to predict knowledge sharing behavior. The results also demonstrated that knowledge sharing influences individual job performance and that the relationship between these two constructs is partially mediated by innovative behavior and task-focused citizenship behavior. Of the twelve hypotheses, eight were supported by empirical evidence. The results showed that the determinants of knowledge sharing selected here helped to explain 43.5% of the total variance, and the entire model explained 49.5% of the variance in individual job performance. The following sections discuss the results and the validity of the respective hypotheses.

5.2 Determinants of Knowledge Sharing

The theory of planned behavior (Ajzen, 1985) indicates that individual behavior is driven by attitude towards that specific behavior, with support from subjective norms and perceived behavior controls. Based on this theory, nine potential constructs were selected as predictors of knowledge sharing behavior. They included attitude towards knowledge sharing; subjective norms such as self-efficacy, perceived job security, management support, organizational rewards, interdependent tasks and perceived behavior controls such as accessibility and usefulness of that knowledge and also employee training. Nine hypotheses were developed regarding the relationships between these predictors and knowledge sharing behavior. They are shown in table 27.

The results are partially consistent with the theoretical foundations of the model as they shows that knowledge sharing behavior is positively influenced by attitudes towards knowledge sharing, the subjective norm of self-efficacy, task-

interdependence, management support and perceived behavioral control factors, such as the perceived usefulness of the shared knowledge. However, the subjective norms of job security, organizational rewards and incentives, and also perceived behavioral control factors, such as knowledge accessibility and employee training were not found to have an influence on knowledge sharing behavior. Overall, these predictors were able to explain a substantial amount of the variance in knowledge sharing behavior (R^2 = .435).

The results for organizational rewards are explained by the fact that the employees who participated in the survey are mainly professionals with an engineering background. According to Cognitive Evaluation Theory (CET), professionals are motivated to share their knowledge because of the self-satisfaction they draw from doing so (Bartol & Srivastava, 2002). Similar results have also been obtained by other scholars (Hung, Durcikova, Lai & Lin, 2011; Seba, Rowley & Lambert, 2012). The results were also supported by the fact that self-efficacy, which reflects appreciation of one's knowledge, was a strong predictor of knowledge sharing behavior.

Although perceived job security was hypothesized to have an influence on knowledge sharing behavior, the results did not support that assumption. It should be noted that the survey was conducted during a period when the organization announced plans to drastically reduce its workforce (a reduction of more than 30%) to meet stringent financial targets set by the government. Direct statements regarding job security may have become too sensitive for expatriate personnel and remained irrelevant for UAE national employees. This could explain why many employees did not express strong opinions on this issue. The extant literature does not provide any clear indications as to the possible influence of job security on individual behavior.

Perceived job security has been studied as both a stressor (the threat of impending job loss) and a motivator (part of organizational rewards) and was found to lead to both positive and negative job related attitudes, performance and physical and psychological well-being (Sverke et al., 2002).

The accessibility of knowledge refers to the extent to which people have access to the knowledge they need to make decisions, solve problems and perform job related tasks (Kang et al., 2008). The importance of knowledge accessibility has its roots in the cognitive approach to knowledge management where knowledge is recognized as being objective facts and concepts that can be physically transmitted through information and communication technology (ICT) systems (Swan et al., 1999). This has been further elaborated by Alavi & Leidner (2001) when they discussed the repository approach to knowledge management. The repository approach involves building knowledge management systems that enable employees to store, retrieve and share knowledge (Newell et al., 2006). The analysis here shows that perceived knowledge accessibility has no influence on knowledge sharing behavior. One explanation for this comes from the qualitative study conducted prior to the survey. In that study, team leaders expressed displeasure with the knowledge management system which they considered as non-user-friendly, low quality and outdated. As a result, they resort to searching the company's records and files for useful and actionable knowledge. This manual approach provides them with quality and actionable knowledge they need and could explain why they suggested that knowledge accessibility did not affect knowledge sharing behavior.

Employee training refers to employee perception of the development opportunities provided by their organizations in order to equip them with the

knowledge, skills and abilities necessary to work effectively (Kaya et al., 2010; Lu et al., 2006). As a determinant of knowledge sharing behavior, employee training is generally considered as crucial for the successful implementation of any knowledge management initiative (Kang et al., 2008; Kim & Ko, 2014). However, the analysis indicated that participants did not consider employee training as having an influence on knowledge sharing behavior. The only plausible explanation for this result is that the statements regarding employees training were at the end of a long questionnaire (61 statements in total). It is reasonable to conclude that a degree of survey fatigue may have affected opinions regarding this important construct.

5.3 Knowledge Sharing Behavior and Individual Job Performance

In response to calls to study the consequences of knowledge sharing behavior at a micro-organizational level (Foss et al., 2010), this research attempted to explore the possible relationship between knowledge sharing behavior and individual job performance.

Knowledge sharing behavior refers to the employees' willingness to actively share their knowledge, know-how and expertise with their colleagues (Ipe, 2003; H. F. Lin, 2007). Knowledge sharing can take place in direct face-to-face communication or indirectly via a knowledge management system (Bock, Zmud, Kim & Lee, 2005). Knowledge sharing involves giving out and receiving valuable and relevant suggestions and ideas (Srivastava et al., 2006).

Job performance is defined as "the level of productivity of an individual employee, relative to his or her peers, on several job-related behaviors and outcomes" (Babin & Boles, 1998). Cross & Cummings (2004) observed that job performance was, to some degree, the ability to solve challenging problems as a result of gaining access

to appropriate knowledge. Employees may operationalize existing knowledge to solve problems in a more efficient and cost effective manner (Mura, Lettieri, Radaelli & Spiller, 2013; Wang & Ko, 2012).

Based on earlier findings that the successful implementation of knowledge sharing practices increased coordination and cooperation between employees and improves problem-solving abilities and skills (Christensen, 2007; Mura et al., 2013; Wang & Ko, 2012), it was hypothesized that having a high level of knowledge sharing behavior would influence individual job performance positively. An analysis of the research data supports this hypothesis and indicates that knowledge sharing had a strong influence on individual job performance and can explain a substantial amount of variance ($R^2 = .495$).

In addition, this research attempted to explain how knowledge sharing behavior influences individual job performance by suggesting that knowledge sharing enhances both the innovative behavior and task-focused citizenship behavior of employees.

Innovative behavior refers to the intentional creation, introduction and application of new ideas by individuals, teams, or organizations in order to improve their performance (Janssen, 2004; Scott & Bruce, 1994). Mura et al. (2013) found that sharing knowledge (best practices and lessons learned from mistakes) among employees had a positive effect on innovative behavior. This was to be expected as employees integrate shared knowledge in order to develop methods that allow them to perform efficiently and also to create novel approaches to resolve problems, i.e. enhance their innovative behavior and thus improve performance (Carmeli, Gelbard & Reiter-Palmon, 2013; Kim & Lee, 2013; Mura et al., 2013). In addition, other researchers have demonstrated that innovative behavior has a positive influence on

individual job performance and on individual performance ratings (Gong et al., 2009; Janssen, van de Vliert & West, 2004; Keller, 2012). As such, it was hypothesized that innovative behavior mediates the relationship between knowledge sharing and individual job performance.

The results indicated that when innovative behavior was incorporated into the model, knowledge sharing behavior had a strong influence on innovative behavior and, in turn, that innovative behavior influenced individual job performance very strongly. A Sobel Test of the mediation effect confirmed that innovative behavior mediates the relationship between knowledge sharing and individual job performance.

Task-focused citizenship behavior refers to proactive on-the-job behavior that supports colleagues even when it does not directly lead to individual benefit (Moorman & Blakely, 1995). Examples of task-based citizenship behavior include providing advice, offering new perspectives on problems, supplying factual information and direct assistance, and assuming responsibility for solving problems (Moorman & Blakely, 1995; Williams & Anderson, 1991). By voluntarily sharing their knowledge and mentoring colleagues without the expectation of anything in return employees are exhibiting task-based citizenship behavior which can have a positive influence on job performance (Chiang & Hsieh, 2012; de Vries et al., 2006). As such, it was hypothesized that task-focused citizenship behavior also mediates the relationship between knowledge sharing and individual job performance.

The results indicated that when task-focused citizenship behavior was incorporated into the model, knowledge sharing behavior had a strong influence on task-focused citizenship behavior and that task-focused citizenship behavior also influenced individual job performance. A Sobel Test for the mediation effect

confirmed that task-focused citizenship behavior mediates the relationship between knowledge sharing and individual job performance.

It should be stressed that both innovative behavior and task-focused citizenship behavior partially mediate the relationship between knowledge sharing and individual job performance. This is because both constructs weaken the relationship between knowledge sharing and individual job performance even though it remains statistically significant.

5.4 Control Variables

Control variables are factors that may have an influence on the endogenous variable, but are not specifically the subject of this research. They are included in the model to avoid any negative effects on the results. In this research, four demographic variables were included as control variables: gender, nationality, tenure (job seniority) and business unit affiliation.

The analysis indicated that gender had a small influence on individual job performance where female employee performance was rated as slightly poorer than for their male counterparts which was to be expected in this cultural context. The analysis also showed that nationality had a small effect on job performance as, due to greater industrial experience, expatriate employees performed better than their UAE national colleagues.

On the other hand, the data indicated that employee seniority, or tenure, had no significant effects on job performance. This can be explained by the fact that some expatriate employees were recently hired by the company (a short tenure) but have extensive prior international work experience. Business unit affiliation was also found

to have no significant effect on job performance, which may indicate that there is not much difference in management style between the various business units.

The overall impact of control variables on model prediction was quite small and is confirmed by an analysis of their effect size and Q^2 values, as well as by their impact on the model's coefficient of determination (R^2).

Chapter 6: Conclusions

The research aimed to explore the antecedents of knowledge sharing behavior among employees in a national oil company in the United Arab Emirates and investigate the potential relationship between knowledge sharing behavior and individual job performance. It also sought to examine whether the proposed relationship between knowledge sharing behavior and job performance was mediated by other variables, such as task-focused organizational citizenship and innovative behavior. The results suggest that several organizational, individual and knowledge related factors played an important role in influencing knowledge sharing behavior. Furthermore, the results suggested that knowledge sharing influenced individual job performance by enhancing innovative and task-focused organizational behaviors.

In considering the outcomes of this research, one should note that there were some limitations. First, cross-sectional design limits our ability to infer causality. Secondly, the common method bias may be a concern as the data related to each construct was collected simultaneously. Thirdly, the research involved employees in one large business unit of a national oil company so generalizing the findings to other countries and cultures has to be considered cautiously at best.

Nevertheless, this research enriches current literature on knowledge sharing by empirically testing the relationship between the antecedents and consequences of knowledge sharing within new cultural and industrial contexts. It also addresses a gap in the extant literature where the focus has traditionally been on macro-organizational outcomes, e.g. financial and operational performance and not on micro-organizational outcomes such as individual job performance. This chapter discusses the implications of the results, research limitations and directions for future research.

6.1 Managerial Implications

Identifying the key determinants and consequences of knowledge sharing within an organization can shed light on the strategies and actions that management can implement to enhance employee job performance.

Firstly, research shows that knowledge sharing behavior has a positive influence on individual job performance (Kang et al., 2008; Kim & Yun, 2015). As such, management should create a suitable work environment and foster an organizational culture that encourages formal and informal knowledge sharing between employees. Among the strategies that can be adopted to achieve this goal are supporting efforts to form autonomous communities or practice, deploying a user-friendly knowledge management system (complete with a dedicated team that ensures the system is maintained and up-to-date with high quality and useful knowledge), organizing multi-discipline peer reviews and holding sessions to discuss previous learning from finished tasks. They could also organize team-building and other social events for employees to build social and communication networks (Aljuwaiber, 2016; Almeidaa & Soares, 2014; Cabrera & Cabrera, 2005; Duffield & Whitty, 2015).

Secondly, research shows that one possible mechanism to allow knowledge sharing to influence job performance is to enhance task-focused citizenship and innovative behavior (Carmeli, Gelbard & Reiter-Palmon, 2013; Mura, Lettieri, Radaelli & Spiller, 2013; Podsakoff, Whiting, Podsakoff & Blume, 2009). Consequently, management could implement initiatives to foster this type of behavior in employees. For example, they could support active engagement with key professional societies (e.g., the American Society of Mechanical Engineers, the Society of Petroleum Engineers, etc.), and also participation in key industrial events

(e.g., the annual Abu Dhabi International Petroleum Exhibition and Conference, ADIPEC). This would allow employees to stay up to date with the latest developments in technology, encourage employees to jointly develop new initiatives and improve current work practices, processes and procedures. Employees should be encouraged to continue their personal development through post-graduate studies in specialized fields that can benefit the overall organization.

Thirdly, research has shown that management support is a strong predictor of knowledge sharing behavior. This is not surprising as the literature is replete with examples that link management support to positive knowledge sharing behavior (Buch, Dysvik, Kuvaas & Nerstad, 2015; Razmerita, Kirchner & Nielsen, 2016). Management can also play a significant role in enhancing knowledge sharing among employees by creating the right work environment for employees to share their knowledge (Cabrera & Cabrera, 2005). They can support employee initiatives for collaboration and cooperation, provide resources to support knowledge sharing, such as a reliable knowledge management system (Almeidaa & Soares, 2014), and encourage and recognizing employees who share knowledge with their colleagues. Finally, management can demonstrate a commitment to knowledge sharing by sponsoring and participating in activities such as review meetings (Cabrera, Collins & Salgado, 2006; Carmeli, Atwater & Levi, 2011; Lin, 2006; Wang & Noe, 2010).

Additionally, research indicates that employee attitudes towards knowledge sharing is a key predictor of knowledge sharing behavior. This is consistent with the premises of the Theory of Planned Behavior (Ajzen, 1985) and the empirical evidence in the literature (Bock, Zmud, Kim & Lee, 2005; Chen, Chuang & Chen, 2012; Chow & Chan, 2008). Consequently, management should implement strategies that

positively influence employees' attitudes towards knowledge sharing, such as promoting a knowledge sharing culture within the organization by frequently highlighting organizational achievements thanks to the collaborative efforts of employees and by encouraging employees to share their knowledge. They could publicly recognize those who do so and provide more opportunities for employees to work together, in groups and project teams to achieve common objectives. They should also provide formal and informal opportunities to develop social ties and networks among employees in order to realize mutual benefits. Furthermore there should be professional development opportunities in order to enhance the ability to acquire, assimilate and use shared knowledge (Buch, Dysvik, Kuvaas & Nerstad, 2015; Cabrera & Cabrera, 2005; Kwok & Gao, 2006).

Also, the research indicates that task-interdependence influences knowledge sharing behavior. This is consistent with the Social Interdependence Theory and extant empirical literature (Cabrera & Cabrera, 2005; Jarvenpaa & Staples, 2000; Lin, 2010). The Social Interdependence Theory stipulates that the level of interaction between individuals increases when they share similar goals and when completing their task is contingent on other's actions (Johnson & Johnson, 2008). As such, management should ensure that jobs are designed with a view to increasing interdependence between employees and that business objectives are aligned between the various divisions. Tasks should be evaluated based on the level of cooperation and collaboration between different divisions (Lin, 2010).

The research results clearly indicate that self-efficacy is an important antecedent for knowledge sharing behavior. This is in line with the Theory of Planned Behavior (Ajzen, 1985) and empirical evidence in the literature (Cabrera et al., 2006;

Chen et al., 2012; Gagné, 2009). There are several strategies that management can adopt in order to ensure that employees are self-efficacious. They can recruit employees who are proactive, self-motivated and have a high level of self-esteem and cognitive aptitude. They can provide training and development opportunities to build competence and skills and encourage employees to take on initiatives and provide them with feedback to improve their knowledge. Employees should be motivated by knowing that their contribution is valuable to organizational success (Gagné, 2009; Lin, 2006).

Finally, the research provides evidence that ensuring the quality, relevance and usefulness of shared knowledge is a key driver for sharing knowledge and for contributing to organizational knowledge management systems (He & Wei, 2009; Kulkarni et al., 2006; Yu et al., 2010). To ensure that the knowledge available is of high quality, useful and relevant management needs to employ a suitable knowledge management system and assign a dedicated team of subject matter experts (SMEs) to keep it up to date. The SMEs will be responsible for acquiring the latest knowledge, verifying its quality and relevance and uploading it into the system. In addition, management needs to ensure that organizational processes, practices and procedures are up to date (Yoo, Vonderembse & Ragu-Nathan, 2011; Yu et al., 2010).

6.2 Research Implications

This research makes several contributions towards advancing the theoretical understanding of knowledge sharing phenomena. First, in responding to calls to explore knowledge sharing behavior in new cultural and industrial settings (Wang & Noe, 2010), this study examines such phenomena within a UAE organization that has a diverse mix of nationalities (UAE nationals and an expatriate population from Asia,

Europe and elsewhere in the Middle East). This represents a rich new cultural context. The study showed that while all the respective nationalities agreed that knowledge sharing influences individual job performance, they differed in their perceptions of the strength of that influence. Similar results were obtained when comparing the perceptions of female employees (mostly UAE nationals) to their male counterparts. This can be understood in light of the cultural constraints on female employees that do not allow them an equal opportunity for hands-on experience and thus the opportunities to share knowledge with their colleagues in order to build competencies and skills. These findings provide further empirical support to current literature (Michailova & Hutchings, 2006; Witherspoon et al., 2013).

In addition, the study examined knowledge sharing phenomena in a UAE national oil and gas industry at a time when the energy industry was facing a turbulent period with extended periods of lower crude oil prices. The research organization initiated a lay-off program to reduce operating costs and this may explain participants' responses to statements regarding their perceptions of job security, which became a highly sensitive issue.

In addition, the research examined several organizational, individual and knowledge related antecedents for knowledge sharing behavior. Some of these antecedents have not been adequately covered in the extant literature, e.g., perceived job security, task interdependence and organizational training (Wang & Noe, 2010). These research results are consistent with the Theory of Planned Behavior (Ajzen, 1985). It suggests that attitudes toward knowledge sharing, such as subjective norms like self-efficacy, management support, task interdependence, behavioral control such as usefulness of the knowledge influences knowledge sharing behavior. The findings

also provide empirical support to extant literature on the subject (Cabrera et al., 2006; Chen et al., 2012; Kang et al., 2008; H. F. Lin, 2007; Witherspoon et al., 2013).

Moreover, the results indicated that organizational rewards did not influence knowledge sharing behavior. This finding can be explained by the Cognitive Evaluation Theory (CET) which suggests that professionals are motivated to share their knowledge because of the self-satisfaction that they draw from doing so (Bartol & Srivastava, 2002). Similar results were obtained by other scholars (Hung, Durcikova, Lai & Lin, 2011; Seba, Rowley & Lambert, 2012).

Another interesting finding was that perceived job security did not influence knowledge sharing behavior. A plausible explanation for this is that the survey was conducted during a period when plans were announced to drastically reduce the workforce (a reduction of more than 30%) to meet stringent financial targets set by the government. The question of job security became a sensitive issue for expatriate personnel and yet remained irrelevant for UAE national employees. This may explain why employees did not express strong opinions on this issue. It should be noted that the extant literature shows that job security has been studied as both a stressor (threat of impending job loss) and a motivator (part of organizational rewards) and that it can, as a result, lead to both favorable or unfavorable job related attitudes, performance and physical and psychological well-being (Sverke et al., 2002).

Other proposed antecedents of knowledge sharing behavior that were not found to influence behavior were the perceived accessibility of knowledge and employee training. These findings are not consistent with the extant literature (Alavi & Leidner, 2001; Kang et al., 2008; Kim & Ko, 2014; Lu, Leung & Koch, 2006). One explanation for this came from the qualitative study conducted prior to the survey. In that study,

team leaders expressed displeasure with the knowledge management system in their organization, which they considered as non-user-friendly and containing low quality and outdated knowledge. As a result, they revert to searching the company's records and files for useful and actionable knowledge. Although this approach is time consuming, it provides quality and actionable knowledge. This can explain why they indicated that knowledge accessibility did not affect knowledge sharing behavior. As for employee training, the only plausible explanation for this is that the statements regarding employee training were last in a long questionnaire. It is reasonable to believe that participants suffered from survey fatigue and were no longer paying enough attention to provide consistent opinions on this important construct.

Furthermore, this research responded to calls to study the consequences of knowledge sharing behavior at the micro-organizational level (Foss et al., 2010) by empirically examining the link between knowledge sharing behavior and individual job performance. Unlike the extant literature, this research provided a possible explanation as to how knowledge sharing behavior influences individual job performance by enhancing the innovative behavior and task-focused citizenship behavior of employees leading to an improvement in job performance (Henttonen, Kianto & Ritala, 2016; Kang et al., 2008; Kim & Yun, 2015).

This study provided a new theoretical model for knowledge sharing which was constructed through the integration of the Input-Process-Output Model (Hackman & Morris, 1975) with the Theory of Planned Behavior (Ajzen, 1985). The new model is unique in its holistic approach to the relationship between the antecedents of knowledge sharing and its micro-organizational outcomes, such as individual job performance. This is a new area of study and can be expanded in future by examining

other micro-organizational outcomes such as job satisfaction or the decision to stay with a company.

6.3 Research Limitations and Future Research

In considering the outcomes of this research, one should be aware of its limitations. First, the cross-sectional design limits the ability to infer causality. Future research may adopt a meta-analysis, longitudinal design, or experimental design, to address this limitation as possible causal relationships may exist between the various constructs (Spector, 1994).

Secondly, common method bias (CMB) may be a concern as the data for every construct was collected simultaneously using self-reported measures. Although post-hoc statistical tests have demonstrated the effect to be small, future research may need to take additional steps to further mitigate this concern by collecting data at different periods and from multiple sources. Also, the inclusion of an additional variable, self-desirability, may help to quantify the CMB effect on the results (Jakobsen & Jensen, 2015).

The research involved a sample of 317 employees working in one large business unit within an oil company. This may limit the generalizability of the findings to other companies, countries and cultures. To enhance the generalizability of the results, future research may need to expand its scope to include employees from other business units, within the same organization, in order to corroborate results. In addition, future research might involve employees from other oil companies in the UAE to enhance generalizability and support theory development.

The focus of the research was on the possible relationship between knowledge sharing behavior and its determinants and consequences in the context of an oil and gas company in the UAE. The research revealed that gender and nationality may have had an impact on these relationships. Future research might pursue this line of enquiry by collecting larger samples and conducting a multi-group analysis. However, that was not the objective of this research.

Additionally, this study only examined the influence of knowledge sharing behavior on individual job performance. Future research might examine the impact of knowledge sharing behavior on other micro-organizational outcomes such as job engagement, job satisfaction, organizational commitment and turnover in order to enrich the extant literature.

Finally, this research explored the influence of certain antecedents for knowledge sharing behavior along organizational, individual and knowledge related lines. Based on the results future research could incorporate other antecedents such as organizational climate (Patterson et al., 2005), pleasure in helping others (H. F. Lin, 2007), and knowledge infrastructure (H. Lee & Choi, 2003) instead of organizational rewards, perceived job security and the knowledge accessibility constructs in the current study.

Despite the limitations, this research enriches the current literature on knowledge sharing by empirically testing the relationship between the antecedents and consequences of knowledge sharing within a new cultural and industrial context. It also addresses a gap in the literature, where the focus has traditionally been on macro-organizational outcomes of knowledge sharing, e.g. financial and operational performance, rather than micro-organizational outcomes such as individual job

performance. This study also attempted to explain how knowledge sharing behavior could influence individual job performance through the mediating effect of innovative behavior and task-focused citizenship behavior.

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Appendix – 1: List of Academic Journals

The following list of academic journals were searched for peer-reviewed articles dealing with knowledge sharing in order to prepare the literature review for this study:

Journal	Impact Factor
Management Information Systems Quarterly (MIS Quarterly)	9.6
Academy of Management Review	7.475
Academy of Management Journal	6.448
Applied Psychology Journal	4.799
Organization Science	3.775
Journal of Management Studies	3.763
The Journal of Strategic Information Systems	3.76
Academy of Management Executive	3.75
Strategic Management Journal	3.341
Journal of Organizational Behaviour	3.038
Organization Studies	2.886
Management Science	2.482
Expert Systems with Applications	2.24
Organizational Behaviour and Human Decision Processes	2.201
Journal of Management Information Systems	2.062
Decision Support Systems	2.059
International Journal of Information Management	2.04
Human Resource Management	1.86
Journal of Knowledge Management	1.586
Journal of information science	1.158

List according to 2014 Journal Citation Reports released by Thomson Reuters in 2015.

Appendix – 2: List of Constructs and their Measurement Scales

Construct	Measurement Items	Cronbach Alpha	Source
Management Support	Management stresses to employees the importance of knowledge sharing to company's success.	.85	Carmeli, Gelbard & Reiter-Palmon (2013)
	Management always encourage employees to share their knowledge with each other.		
	Management provides most of the necessary resources to assist employees to share knowledge.		
	Management are *not* a role model for collaboration and knowledge sharing.		
Organizational rewards	Sharing my knowledge with colleagues should be rewarded with a higher salary	.75	Lin (2007).
	Sharing my knowledge with colleagues should be rewarded with a higher bonus		
	Sharing my knowledge with colleagues should be rewarded with a promotion		
	Sharing my knowledge with colleagues should be rewarded with an increased job security		
	Sharing my knowledge with my colleagues *should not* be rewarded.		
Self-Efficacy	I am confident in my ability to provide knowledge that others in my company consider to be valuable	.96	Kankanhalli, Tan & Wei (2005)
	I have the expertise required to provide valuable knowledge for my company		

	It does not really make any difference whether I share my knowledge with colleagues in this organization (reversed coded)		
	Most other employees can provide more valuable knowledge than I can		
Attitude towards Knowledge Sharing	Sharing my knowledge with colleagues at work is good.	.9184	Bock, Zmud, Kim & Lee (2005)
	Sharing my knowledge with colleagues at work is valuable to me.		
	Sharing my knowledge with colleagues at work is an enjoyable experience.		
	Sharing my knowledge with colleagues at work *does not* benefit me.		
	My knowledge sharing with other organizational members is a wise move.		
Perceived Job Security	I am quite certain about what my future career outlook in this company.	.90	Kraimer, Wayne, Liden & Sparrowe (2005)
	I am confident that I will be able to work for my company as long as I wish.		
	Regardless of economic conditions, I will have a job at my current company		
	My current company would transfer me to another job if I were released from my present job.		
	I *am not* really sure about my job security in this company.		
Perceived Knowledge Accessibility	In this company, employees always know where they can find knowledge they need to do their job.	.86	Bennett & Gabriel (1999)
	This company has formal systems for routing knowledge on specific topics to employees interested in these topics.		

	Within this company, employees have easy access to the knowledge they need		
	Within this company, most knowledge is held in the heads of employees rather than in documents and databases.		
	Within this company people tend to share their knowledge through informal means rather than formal ones		
Employee Training	The company provides sufficient training programs to all employees in the fields related to their work.	.84	Kaya, Koc & Topcu (2010); Rogg, Schmidt, Shull, & Schmitt (2001)
	The company's training programs are consistently evaluated for further improvement.		
	The company's training programs provides good opportunities for employees to share new knowledge.		
	The company's training programs is currently leading to satisfactory results.		
	Employees receive training on how to use the company knowledge management systems.		
Innovative Behavior	Sharing knowledge with my colleagues helps me better define work problems.	.94	Carmeli, Gelbard & Reiter-Palmon (2013)
	Sharing knowledge with colleagues helps me develop new solutions to problems.		
	Sharing knowledge with my colleagues drives me to constantly search for new methods, techniques, or technologies to improve work outcomes.		
	Sharing knowledge with my colleagues enables me to better assess what ideas are best for solving work problems.		

	Sharing knowledge with my colleagues makes it easier to implement new ideas chosen to solve a work problem.		
Task-focused Citizenship Behavior	I take time to explain company's regulations or procedures to my colleagues who may have questions about them.	.94	Moormann & Blakely (1995); Settoon & Mossholder (2002)
	I always show my colleagues where to find what they need to complete their tasks.		
	I always help my colleagues with difficult assignments, even when assistance is not directly requested.		
	I always help my colleagues who are running behind in their work activities.		
	I always encourage others to try new & more effective ways of doing their job.		
Perceived Knowledge Usefulness	Using "shared knowledge" in my job would enable me to accomplish tasks quickly	.906	Pituch & Lee (2006)
	Using "shared knowledge" helps improve my job performance.		
	Using "shared knowledge" in my job would increase my productivity.		
	Using "shared knowledge" would make it easier for me to do my job.		
Knowledge Sharing Behavior	I always share my knowledge gained from experience with my colleagues at work.	.95	Lin, H. F. (2007); Wang & Wang (2012)
	I always share my knowledge gained during training with my colleagues at work.		
	I would make extra efforts to answer any question from my colleagues at work.		
	Employees in my company frequently share existing reports and official documents with their colleagues at work.		

	It is normal for me to regularly meet with my colleagues at work to exchange ideas and suggestions on how to solve work problems and improve work performance.		
Individual Job Performance	Knowledge sharing helps me reduce my errors and mistakes at work.	.95	Igbaria & Tan (1997)
	Knowledge sharing helps me improve my decision-making quality.		
	Knowledge sharing increases my job productivity.		
	Knowledge sharing helps me improve my work performance.		
	Knowledge sharing helps me fulfill my roles and responsibilities more effectively than I typically do.		
Task Interdependence	My work is often completed in collaboration with colleagues from other divisions.	.80	Jarvenpaa & Staples (2000)
	My work often involves sharing knowledge with colleagues in other divisions.		
	The results of my work is dependent on the efforts of colleagues from within my division.		
	The results of my work is dependent on efforts of colleagues from other departments.		
	My work *does not* often involve using knowledge from other divisions		

Appendix – 3: Copy of the Survey Questionnaire Document

جامعة الإمارات العربية المتحدة
United Arab Emirates University

A Study of the Drivers and Outcomes of Knowledge Sharing Among Employees

20th March, 2016

Dear Colleague,

As part of my studies for the Doctor of Business Administration (DBA) degree at the UAE University, I am conducting an academic research to identify the key drivers and outcomes of knowledge sharing among employees within an organization to gain a better understanding of the phenomena. Knowledge sharing is defined as the act of disseminating one's own know-how and expertise to other members in the organization. It encompasses giving and receiving task-relevant ideas, specific information, and valuable suggestions between members of the organization in order to complete their assigned tasks, solve work-related problems, and improve overall performance. Knowledge sharing can take place during direct interactions between employees (meetings and conversations) or through indirect communications (e-mails and phone conversations) or by accessing existing knowledge databases.

The following survey is conducted to gather the required research data and I would highly appreciate your support by completing the attached questionnaire. The process should not take much of your time and your participation in the survey is entirely on voluntary basis. You have the right to withdraw at any stage in the process without being penalized. All answers will be treated as confidential and only the aggregated results of data analysis will be presented to maintain full anonymity. If you have any doubt or concern about participating, please do not hesitate to contact me and I will be happy to provide any required clarifications.

There are no correct or wrong answers but we are interested to know your own personal opinions and views on various statements that are included in the questionnaire as it applies to the organization. If you are interested in receiving a copy of the study results, please indicate so on the last page of the survey and I will forward you a copy once completed.

Once again, I do appreciate your participation in completing the survey questionnaire.

Hussein S. Abdulla
Well Engineering Team Leader (ZK)
Email: elsayedh@adma.ae
Tel.: (971-2) 606-4544

جامعة الإمارات العربية المتحدة
United Arab Emirates University

Drivers and Outcomes of Knowledge Sharing Among Employees

Survey Questionnaire

Case No. | | | |

Instructions:

The survey questionnaire is divided into four (4) main parts covering the following topics:

Part A: Outcomes of Knowledge Sharing

Part B: Individual Knowledge Sharing Behavior

Part C: Drivers of Knowledge Sharing

Part D: Personal Information

Each part contains statements that measure personal perceptions, opinions or attitudes regarding a specific issue being studied in the context of your organization. After reading each statement, please tick [✓] the box that best describes your perceptions, opinions, or attitudes about that statement (*just point the cursor to the box and click*). In case you neither agree nor disagree with any of the statements please tick "***neutral box***".

There are no ***right*** or ***wrong*** answers and your responses will be treated with confidence and at all times data will be presented in such a way that your identity cannot be connected with specific published data.

Example:

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
I enjoy helping my colleagues at work by sharing my knowledge.	☐	☑	☐	☐	☐	☐	☐
It feels good to help my colleagues at work solve their work-related problems by sharing my knowledge.	☐	☑	☐	☐	☐	☐	☐

Thank you for your participation in the survey.

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Part – A: Outcome of Knowledge Sharing

For each of the following statements please tick the box that best describes your personal opinion, feelings, perception or attitude about that statement.

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
Sharing knowledge with my colleagues helps me better understand work problems.	☐	☐	☐	☐	☐	☐	☐
Sharing knowledge with my colleagues drives me to constantly search for new methods, techniques, or technologies to improve work results.	☐	☐	☐	☐	☐	☐	☐
Sharing knowledge with my colleagues enables me to better assess what ideas are best for solving work problems.	☐	☐	☐	☐	☐	☐	☐
Sharing knowledge with my colleagues helps me develop new solutions to work problems.	☐	☐	☐	☐	☐	☐	☐
Sharing knowledge with my colleagues makes it easier to implement new ideas chosen to solve a work problem.	☐	☐	☐	☐	☐	☐	☐
I take time to explain the company's regulations or procedures to my colleagues who may have questions about them.	☐	☐	☐	☐	☐	☐	☐
I always show my colleagues where to find whatever knowledge they need to complete their work.	☐	☐	☐	☐	☐	☐	☐
I always help my colleagues with difficult assignments, even when assistance is not directly requested.	☐	☐	☐	☐	☐	☐	☐
I always help my colleagues who are falling behind in their work activities.	☐	☐	☐	☐	☐	☐	☐
I always encourage others to try new or more effective ways of doing their job	☐	☐	☐	☐	☐	☐	☐
Knowledge sharing helps me reduce my errors and mistakes at work.	☐	☐	☐	☐	☐	☐	☐
Knowledge sharing helps me improve my decision-making quality.	☐	☐	☐	☐	☐	☐	☐
Knowledge sharing increases my job productivity.	☐	☐	☐	☐	☐	☐	☐
Knowledge sharing helps me improve my work performance.	☐	☐	☐	☐	☐	☐	☐
Knowledge sharing helps me fulfill my roles and responsibilities more effectively than I typically do.	☐	☐	☐	☐	☐	☐	☐

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Part – B: Individual Knowledge Sharing Behavior

For each of the following statements please tick the box that best describes your personal opinion, feelings, perception or attitude about that statement.

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
I always share my knowledge gained through work experience with my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
I always share my knowledge gained during training with my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
I would make extra efforts to answer any question from my colleagues at work.	☐	☐	☐	☐	☐	☐	☐
Employees in my company normally share existing reports and official documents with their colleagues at work.	☐	☐	☐	☐	☐	☐	☐
It is normal for me to regularly meet with my colleagues at work to exchange ideas and suggestions on how to solve work problems and improve work performance.	☐	☐	☐	☐	☐	☐	☐

Part – C: Drivers of Knowledge Sharing Behavior

For each of the following statements please tick the box that best describes your personal opinion, feelings, perception or attitude about that statement.

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
Management emphasize to employees the importance of knowledge sharing to company's success.	☐	☐	☐	☐	☐	☐	☐
Management always encourages employees to share their knowledge with each other.	☐	☐	☐	☐	☐	☐	☐
Management provides most of the necessary resources to assist employees to share knowledge.	☐	☐	☐	☐	☐	☐	☐
Our Management is a role model for collaboration and knowledge sharing.	☐	☐	☐	☐	☐	☐	☐

Part – C is continued on the next page

جامعة الإمارات العربية المتحدة
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Part – C (continued)	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
To complete my work I often need the cooperation of my colleagues in other divisions.	☐	☐	☐	☐	☐	☐	☐
My work often requires sharing knowledge with colleagues in other divisions.	☐	☐	☐	☐	☐	☐	☐
The results of my work are dependent on the efforts of colleagues from within my division.	☐	☐	☐	☐	☐	☐	☐
The results of my work are dependent on efforts of colleagues from other divisions.	☐	☐	☐	☐	☐	☐	☐
My work *does not* often involve using knowledge from other divisions.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with my colleagues should be rewarded with a higher salary	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with my colleagues should be rewarded with a higher bonus	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues should be rewarded with a promotion	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues should be rewarded with an increased job security.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with my colleagues *should not* be rewarded.	☐	☐	☐	☐	☐	☐	☐
I am confident in my ability to provide knowledge that others in my company would consider to be valuable.	☐	☐	☐	☐	☐	☐	☐
I have the expertise required to provide valuable knowledge for my company.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues at work has significant impact on our performance.	☐	☐	☐	☐	☐	☐	☐
Most other employees *cannot* provide more valuable knowledge than I can.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues at work is good.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues at work is valuable to me.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues at work is an enjoyable experience.	☐	☐	☐	☐	☐	☐	☐
Sharing my knowledge with colleagues at work *has no* benefit for me.	☐	☐	☐	☐	☐	☐	☐

Part – C is continued on the next page

جامعة الإمارات العربية المتحدة
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Part – C (Continued)	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
I am quite certain about what my future career outlook in this company.	☐	☐	☐	☐	☐	☐	☐
I am confident that I will be able to work for my company as long as I wish.	☐	☐	☐	☐	☐	☐	☐
Regardless of economic conditions, I will have a job at my current company.	☐	☐	☐	☐	☐	☐	☐
My current company would transfer me to another job if I were released from my present job.	☐	☐	☐	☐	☐	☐	☐
I *am not* really sure about my job security in this company.	☐	☐	☐	☐	☐	☐	☐
In this company, employees always know where they can find knowledge they need to do their job.	☐	☐	☐	☐	☐	☐	☐
This company has formal systems for routing knowledge on specific topics to employees interested in these topics.	☐	☐	☐	☐	☐	☐	☐
Within this company, employees have easy access to the knowledge they need	☐	☐	☐	☐	☐	☐	☐
Within this company, most knowledge is held in the heads of employees rather than in documents and databases.	☐	☐	☐	☐	☐	☐	☐
Within this company people tend to share their knowledge on friendly basis	☐	☐	☐	☐	☐	☐	☐
Using "shared knowledge" in my job would enable me to complete my tasks more quickly.	☐	☐	☐	☐	☐	☐	☐
Using "shared knowledge" helps improve my job performance.	☐	☐	☐	☐	☐	☐	☐
Using "shared knowledge" in my job would increase my productivity.	☐	☐	☐	☐	☐	☐	☐
Using "shared knowledge" would make it easier for me to do my job.	☐	☐	☐	☐	☐	☐	☐
The company provides sufficient training programs to all employees in the fields related to their work	☐	☐	☐	☐	☐	☐	☐
The company's training programs are regularly evaluated for further improvement.	☐	☐	☐	☐	☐	☐	☐
The company's training programs provides good opportunities for employees to share new knowledge.	☐	☐	☐	☐	☐	☐	☐

Part – C is continued on the next page

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Part – C (Continued)	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
Employees receive training on how to use the company knowledge management systems.	☐	☐	☐	☐	☐	☐	☐
The company's training programs is currently leading to satisfactory results.	☐	☐	☐	☐	☐	☐	☐

Part – D: Personal Information

Finally could you give us a few bits of information about yourself so that we can put your other replies in greater context.

Gender	☐ Male	☐ Female				
Nationality	☐ UAE	☐ Arab	☐ EU/USA	☐ Asian	☐ Africa	☐ Others
Age Group	☐ 18 - 25	☐ 25 – 35	☐ 35 – 45	☐ 45 – 55	☐ 55 - 65	☐ >65
Education	☐ PhD/Master	☐ Graduate	☐ Diploma	☐ High School	☐ Others	
Job Position	☐ Executive	☐ Sr. Manager	☐ Manager	☐ Supervisor	☐ Engineer	☐ Staff
Business Unit	☐ Asset	☐ D/L	☐ Projects	☐ Admin.	☐ SST	☐ SST ☐ CS
Seniority in Company	☐ 0-5 years	☐ 5-10 years	☐ 10-15 years	☐ 15-20 years	☐ 20 -25 years	☐ > 25 years

Would you be interested in receiving a copy of the final study results?

☐ Yes ☐ No

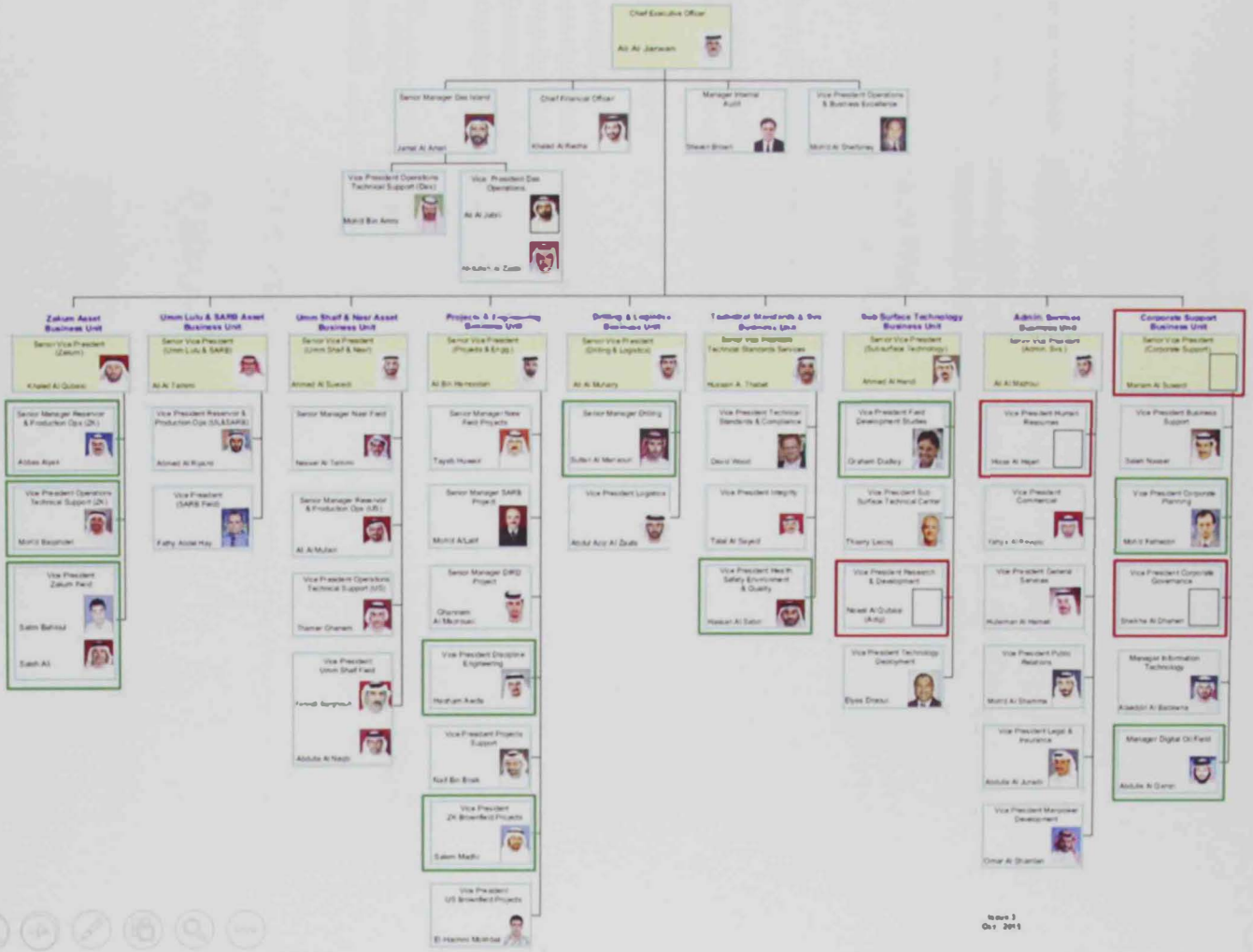
We sincerely appreciate your time and cooperation. Please check to make sure that you have not skipped any question inadvertently and return the completed questionnaire to:

Hussein Saad Abdulla

Well Engineering team Leader (ZK)

Email: elsayedh@adma.ae | Tel.: 02-606-4544

Appendix – 4: Organization Chart for Research Organization



Appendix – 5: Ethics Committee Approval to Conduct Social Research

Social Sciences Research Ethics Committee
-Approval-

Proposal number: *ERS_2016_4266*

Title of Project: Determinants and Consequences of Knowledge Sharing among Employees in a UAE National Oil and Gas Company

PI: Mumin Dayan

Co-PI:

The above proposal has been reviewed by:

☒ one member of the Social Sciences REC
☐ two members of the *Social Sciences REC*

And the decision is:

☒ Favourable
☐ Favourable with Additional Conditions
☐ Provisional Opinion
☐ Unfavourable Opinion
☐ No Opinion (Proportionate Review* only)

Reason:

After evaluating this proposal, we see no major ethical concerns. Therefore, the proposal is approved.

Name (Chair or designee): Clara Morgan

Clara Morgan

Signature

March 5, 2016
Date