Analyzing the Effects of Knowledge Sharing on Innovation and KMS Success: A Case Study of the International Cooperation and Development Fund

By

Nadeige Bernard

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of

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Major: International Human Resource Development

Advisor: Cheng-Ping Shih, Ph.D

National Taiwan Normal University
Taipei, Taiwan
June, 2012
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Approved:

___________________________
Dr. Cheng-Ping Shih,
Thesis Advisor

___________________________
Dr. Wei-Wen Chang,
Committee Member

___________________________
Dr. Pai-Po Lee,
Committee Member

____________________________
Dr. Chih-Chien Lai
Director of the Graduate Program

Graduate Institute of International Human Resource Development
National Taiwan Normal University
Taipei, Taiwan
June, 2012
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ABSTRACT

Knowledge is considered as a key organization resource and as a result its preservation has become one of the primary interests of organizations. Additionally, not only should organizations be preserving knowledge but they should also find ways to facilitate its distribution and accessibility for all organizational members by encouraging knowledge sharing. Sharing knowledge is not only important in enhancing organization innovation but is also recognized as a crucial key success factor for organization knowledge management system (KMS). As both KMS and innovation are essential to ensure organization sustainability, knowledge sharing is a must.

However, knowledge sharing cannot be taken as given, organization contexts shape individuals’ knowledge sharing behavior. Therefore understanding the impact of organization contexts on knowledge sharing is essential in ensuring KMS and innovation success. This research aims to measure the effect of knowledge sharing on KMS and innovation by surveying 90 full time employees working at a Taiwanese nonprofit organization known as The International Cooperation and Development Fund (Taiwan ICDF). Partial least square and hierarchical regression analyses are used to study the direct effect and the mediating effect of knowledge sharing on KMS and innovation.

This study makes several contributions to the literature on knowledge sharing, KMS, and innovation both in theory and practice. From a theoretical perspective, this research extends and enriches our understanding of knowledge sharing in a nonprofit organization context. From a practical perspective, the results of this study help practitioners better understand the importance of organization contexts in shaping individuals’ knowledge sharing behavior and subsequently the impact of knowledge sharing on the organization’s KMS and innovation.

In general, the results show that organization contexts have a positive and significant effect on knowledge sharing, KMS and innovation. In addition, the findings indicate that knowledge sharing has positive effect on KMS and innovation and that knowledge sharing has a mediating effect on the relationship between organization contexts and KMS and on the relationships between organization contexts and innovation.

Keywords: Nonprofit organizations, organization context, knowledge sharing, innovation, KMS
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CHAPTER I. INTRODUCTION

This chapter gives an insight of the study background, the purposes, the questions that frame the investigation for the study and the research significance. The definitions of key terms are included in order to provide a comprehensive focus of this entire research.

Background of the Study

Globalization and technological advances have changed the dynamic business context in which organizations operate. To survive and thrive, organizations need to respond to the new changes and challenges of the external environment in order to generate the best outcomes from the resources they have at their disposal (Debowski, 2006). Knowledge, a unique and an inimitable resource, is considered as the most strategically important asset which organizations possess. If properly managed, knowledge allows organizations to achieve sustainable competitive advantage, increase effectiveness, foster innovation and creativity, and reduce risk and cost. Consequently, the awareness of the importance of knowledge as an exceptional resource has compelled many organizations to effectively manage and use knowledge throughout the organization.

In an industry survey conducted by KMPG (2000), 81 percent of leading organizations in Europe and the United States have indicated several reasons for managing knowledge that include gaining competitive advantage (79 percent), increasing marketing effectiveness (75 percent), developing customer focus (72 percent), or improving product innovation (64 percent), achieving revenue and profit growth (63 percent) and promoting employee development (53 percent). In contrast, another KMPG (2003) survey indicated that 78 percent of organizations believed that failure to harness knowledge may result in loss of business opportunities. According to this survey, it is also estimated that an average of 6 percent revenue as a percentage of total turnover or budget yearly is being missed from failing to exploit knowledge effectively (p.8). Organizations such as Xerox, IBM, Microsoft, and Shell have achieved sustainable competitive advantage as a result of pursuing KM.

KM has become critical for the corporate sector, the government/public and nonprofit sector (Anantatmula & Kanungo, 2007; Lettieri, Borga, & Salvodelli, 2004; Syed Ihksan &
Rohland, 2004). Nonprofit organizations such as Rockefeller Foundation, Wallace Foundation, Tzu-Chi Foundation and Taiwan ICDF are also increasingly relying on KM to improve customer service and increase their performance, efficiency and competitive advantage. As the increasingly complex external environment has also changed the landscape for nonprofit organizations’ operations and has risen up their management and performance challenges to new heights; nonprofit organizations have seen themselves obligated to adopt similar for-profit organizations’ strategies in order to cope with the new challenges.

Nonprofit organizations have to play various roles and deal with multiple objectives. Similar to for-profit companies, nonprofit organizations faces extensive social responsibility (Hull & Lio, 2006). Moreover, these organizations also have to meet never ending expectations and demands for more effective and efficient programs and services from multiple stakeholders which include citizens, government, donors, employees and special interest groups. Not only are they expected to create value for the society (Lettieri et al., 2004) but they are also expected to succeed in areas where government and private organizations fail (Kuan, Kao, & Pelchat, 2003; McHargue, 2003). Unless nonprofits organizations effectively manage knowledge to fulfill performance expectations, their reason for existence will be threatened.

KM main purpose is to support organizations’ effort in managing tacit and explicit knowledge to create value. KM lasting advantage comes from developing and using KMS to facilitate the accessibility and availability of knowledge throughout the organization. KMS enables organizations to capture, organize, reuse and transfer experience-based knowledge that resides within the organization and make that knowledge available to organizational members (Lin, 2007) and as such it reinforces organizations’ ability to learn from previous success and failure experiences to increase productivity and boost performance (Lettieri et al., 2004; Kuo & Lee, 2009). KMS helps to create a sustainable organization as it generates increasing returns and continuing advantages (Chandran & Raman, 2009). The benefits of an effective KMS for organizations include for example, cost reduction of activities, increased sales, personnel reduction, higher profitability, lower inventory levels, better service, targeted and proactive marketing (Alavi & Leidner, 1999) and harmonized standards and improvements in the decision-making process (Hansen, Mors, & Lovas, 2005).
In addition, KM is also increasingly perceived to contribute to organization innovation. Similar to KMS, innovation drives organization performance. It is considered to be a mean to achieve competitive advantage (e.g. du Plessis, 2007b, Nacinovic, Galetic, & Cavlek, 2009; Rhodes et al., 2008) and organization performance (e.g. Khalifa, Yu, & Shen, 2008; Rhodes et al., 2008; Subramanian & Nilakanta, 1996; Yamin et al., 1999). Innovation is also crucial to organization sustainability. Management expert Peter Drucker quoted in Shukla (2005) noted ‘if an established organization which in this age necessitating innovation, is not able to innovate, it faces decline and extinction’. For KMS and innovation to enhance organization sustainability, knowledge sharing is a must.

Knowledge sharing as the kernel of KM plays a fundamental role in determining its outcomes and achieving its full value (Abdullah, Hassim, & Chik, 2009; Apostolou, Mentzas, & Abecker, 2008, 2009). In point of fact, organizations’ ability to ensure that knowledge is shared among organizational members is claimed to be essential to the success of KMS (Babcock, 2004; King & Marks, 2008) and innovation (Kim & Lee, 2006; Lin, 2007b). Therefore a lack of knowledge sharing may cause serious problems for organizations. Various factors stemming from organization and interpersonal contexts have been claimed to affect knowledge sharing. Consequently Lin (2007a) and Yang and Chen (2007) suggested that factors influencing knowledge sharing should be the centre of attention of any KM effort.

Knowledge resides in individuals and its sharing depends on their willingness to make it available to the entire organization. It is also well-known that individuals’ knowledge sharing behavior can be a reaction to their organization contexts. According to Riege (2005) ‘one of the key issues of sharing knowledge in an organizational context is related to the right organization environment and conditions’. Organization contexts are argued to have either a positive or negative effect on knowledge sharing behavior. Studies conducted by (Kim & Lee, 2006; Pai, 2006; Ruggles, 1998; Wang & Noe, 2009, 2010) have indicated that contextual factors such as information technology, top management support, organization culture and organization structure have an impact on knowledge sharing.

Given the importance of knowledge sharing for KMS and innovation, understanding how these contextual factors promote or hinder knowledge sharing and how knowledge sharing
affects KMS and innovation are essential steps towards determining the factors that ensure an organization’s KMS and innovation success.

**Research Purposes**

Drawing from the assumptions mentioned above, the purposes of this research are formulated as follows:

1. Examine the effect of organization contexts on knowledge sharing.
2. Analyze the effect of knowledge sharing on innovation and KMS.
3. Investigate the mediating effect of knowledge sharing on the relationship between organization contexts and KMS.
4. Investigate the mediating effect of knowledge sharing on the relationship between organization contexts and innovation.

**Research Questions**

Deriving from the research purposes, the research questions are framed as follows:

1. Do organization contexts have an effect knowledge sharing?
2. Does knowledge sharing have an effect on innovation and KMS success?
3. Does knowledge sharing have a mediating effect on the relationship between organization contexts and KMS?
4. Does knowledge sharing have a mediating effect on the relationship between organization contexts and innovation?
Research Significance

This study makes important contribution to the literature on knowledge sharing, KMS, and innovation in nonprofit organizations both in theory and in practice. While ample research on knowledge sharing has been conducted in private organizations/corporations (e.g. see Liao, Chang, Cheng, & Kuo, 2004; Ling, Sandhu, & Jain, 2009; Ruggles, 1998), governments and public organizations (e.g. see Kang, Kim, & Chang, 2008; Kim & Lee, 2006; Md Noor & Salim, 2011; Pardo, Cresswell, Thompson, & Zhang, 2006), there is little information and empirical studies on knowledge sharing in nonprofit organizations. Consequently researchers like (Lettieri et al., 2004; Staples & Young, 2008) have called for additional studies of knowledge sharing in nonprofit organizations.

Most studies of knowledge sharing have considered it as a one-dimensional construct, the types of knowledge shared (i.e. tacit and explicit) are rarely taken into account. Ismail, Md Nor, and Marjani (2009) pointed that when addressing knowledge sharing, it is fundamental to distinguish explicit knowledge and tacit knowledge because tacit knowledge is shared in different ways than explicit knowledge. Taking into account knowledge types in knowledge sharing into consideration is particularly important since competitive advantage can be gained as organizations value both their tacit and explicit knowledge and ensure that is shared among its members.

Moreover, there is dearth of theoretical and empirical studies of organization contexts influence on tacit and explicit knowledge sharing. Therefore the findings of this study have the potential to assist nonprofit organizations in unlocking economic value from the knowledge (i.e. tacit and explicit) that resides in its people as it attempts to identify the contextual factors that support these types of knowledge sharing behavior. In addition, the management of Taiwan ICDF may also find the results of this study of practical benefits as it intends to broaden the knowledge on the factors that increase employees’ tendencies to engage in knowledge sharing behavior in order to successfully develop effective knowledge sharing strategies.

Given that organization success depends mainly on the ability to capitalize on the value of knowledge, various organizations including nonprofit organizations are increasingly developing and implementing KM strategy such as KMS to manage and leverage their knowledge resources.
(Kankanhalli, Tan, & Wei, 2005). However, ‘the strategy of utilizing KMS to capture and distribute knowledge requires that individuals contribute their knowledge to the system’ (King & Marks, 2008). Although knowledge sharing has been claimed to be an important key success factor in KMS success, little research with the exception of studies conducted by Akhavan, Jafari, Fathian (2006) and Pai (2006) have provided evidence of knowledge sharing impact on KMS success. Studies conducted to date have been mainly theoretical. This study extends on the KMS literature as it provides empirical support for the type of desired knowledge sharing behavior that is essential to the system’s success.

In addition, there is a lack of theoretical model and empirical examinations on KMS success factors (Alavi & Leidner, 2001; Kulkarni, Ravidran, & Freeze, 2006/2007) particularly in the nonprofit sector (Lettieri et al., 2004). Lettieri et al. (2004) noted that although KM facilitates nonprofit organizations’ excellence, empirical studies about design and implementation of KMSs remain scarce. This study formulates and empirically tests a theoretical model to explain organization contexts and knowledge sharing influence and importance for KMS success. Therefore the results of this study may be of interest to organizations that seek to implement KMS and to researchers in the field of KMS.

Innovation has become crucial for nonprofit organizations’ survival. Jaskyte and Dressler (2005) advanced that it is vital for these organizations to develop innovative capacities as they allow them to respond to the needs of the internal or external environment, to take advantage of and use external resources for the creation and provision of new services, to have control over their environment and to respond swiftly to changing demographics (p. 24). The increasing importance of innovation for nonprofit organizations has increased the need to identify factors that foster innovation. However, few researches have tried to identify factors that affect these organizations’ innovation capability (Jaskyte & de Riobo, 2004, p.72). Knowledge sharing has been claimed to be essential for innovation and various studies have provided substantial evidence on these relationships, however research with empirical evidence on the type of knowledge sharing that is crucial to innovation success is relatively scarce. Thus an important contribution of this research is represented by the role of tacit and explicit knowledge sharing for organization innovation.
The study results contribute to raise awareness among nonprofit organization leaders about the importance of a careful management of both types of knowledge (i.e. tacit and explicit). Aside from identifying the type of knowledge sharing that is essential to innovation success; this research contributes also to the innovation literature as it provides empirical evidence on the importance of organization contexts for innovation. Finally, this research also provides conceptual, theoretical and empirical contributions to the extant literature of knowledge sharing due to the fact that it investigates the mediating role of knowledge sharing between organization contexts, KMS and innovation.

At last, this thesis provides a theoretically-based and empirically proven model, which showed that innovation and KMS success are affected by organization contexts and knowledge sharing. It also proposes that factors that affect KMS success may also affect innovation.

**Definitions of Terms**

**Nonprofit Organizations (NPOs)**

Nonprofit organizations encompass all organizations that are self-governing and institutionally separate from the government (i.e. non-governmental). In addition, they include organizations whose main aim is to create value for society rather than to derive profit for its stakeholders (Lettieri et al., 2004). Dalziel (2007, p. 199) referring to Salomon’s typology of nonprofit organizations suggested that these organizations can be categorized into: 1) member-serving organizations (e.g. labor unions, trade associations, cooperatives); 2) fund-raising intermediaries (e.g. United Way, private foundations); 3) public-serving organizations (e.g. educational institutions, cultural institutions, health care organizations, social welfare agencies), and 4) religious organizations.

**Knowledge Management (KM)**

KM is commonly described as the process for acquiring, organizing and communicating both tacit and explicit knowledge so that employees may make use of it to be more effective and
productive in their work (Alavi & Leidner, 1999) and ultimately improve organization performance.

**Explicit Knowledge Sharing**

Explicit knowledge refers to the academic knowledge or “know-what” that is described in formal language, print or electronic media, often based on established work processes, use people-to-documents approach (Smith, 2001). Explicit knowledge has fixed-content, it is documented and public, structured, externalized and conscious and can be easily shared through information technology (Mian, Takale, & Kekale, 2008; Reychav & Weisberg, 2009; Yang & Farn, 2009).

**Tacit Knowledge Sharing**

Tacit knowledge refers to the practical, action-oriented knowledge or “know how” that is based on practice, and acquired by personal experience (Smith, 2001). Tacit knowledge is personal, undocumented, context-sensitive, internalized and can be shared through people to people approach. Tacit knowledge sharing is subject to interaction and takes place when workers share their experience and when knowledge is transmitted between organizational members (Yang & Farn, 2009; Mayfield, 2010).

**KMS Success**

KMS refers to IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application (Alavi & Leidner, 2001, p. 114). According to (Jennex, Smolnik, & Croasedll, 2008, 2009) KM effectiveness, KM success and KMS success can be used interchangeably. KMS success is defined as making KMS components more effective by improving search, accuracy and the like in order to enhance effective decision-making. Enhancing the effectiveness of the KMS makes the KMS more successful and ensures KM success.
CHAPTER II. LITERATURE REVIEW

The purpose of this chapter is to review the most relevant literature and related empirical evidence of the variables of interests in order to provide a theoretical basis for the conceptual model underlying this study. First, it provides an introduction of the Taiwanese nonprofit sector and its challenges. Second, it addresses the importance of knowledge sharing in nonprofit organizations. Third, it covers the definition for key variables such as knowledge sharing, knowledge types, organization context. Finally, it highlights the relationship among the variables that represent the main focus of this research.

Taiwan’s Nonprofit Sector- Background and Challenges

The situation of nonprofit organizations in Taiwan has changed with the lifting of Taiwan’s Martial Law in 1987. The number of nonprofit organizations has steadily increased, and their services have expanded. Taiwan’s nonprofit organizations types are various. According to (Hsiao, 2000) the most popular ones include membership-based associations and endowment-based foundations. Kuan, Duh and Wang (2010) study showed that aside foundations and associations, religious organizations presence in the nonprofit sector is also becoming more noticeable. Philanthropic, social welfare, and charitable foundations are believed to be the most numerous kind of foundations, succeeded by public interest research, education, culture and arts, international culture exchange and so on (Hsiao, 2000). All membership-based associations and endowment-based foundations’ operations and establishment are regulated on the basis the Civil Code, which was originally legislated in 1927.

It is mandatory for nonprofit organizations in Taiwan to register as a legal person with the appropriate supervising government agencies and to be submitted to an administrative review and approval procedure. According to Kuan et al. (2010) estimates, the types and number of NPOs registered with the government in Taiwan can be divided into four categories: (1) “Social organizations” registered with the Ministry of the Interior and local governments numbered 34,171 in 2009; (2) “Trust foundations” registered with the responsible central government agencies and local governments numbered 4,000; (3) “Trade organizations” registered with the Ministry of the Interior, Council for Labor Affairs and local governments such as unions, trade
federations, trade unions, farmer's associations and fisherman's associations numbered 10,286; (4) Faith-based organizations such as "Temples and Churches" registered with the Ministry of the Interior and local governments numbered 15,118. The sum of all four categories is 63,575. Based on these categories and statistics, the various organizations of the Third Sector in Taiwan including foundations, social organizations, unions, trade federations, trade unions, temples and churches number more than 60,000.

Taiwan nonprofit organizations cater their services to different groups of clients and as such they can also be classified as primarily member-serving organizations and primarily public-serving organizations. With regards to clients’ characteristics for services or programs, Kuan et al. (2010) study showed that 42.5 percent of Taiwanese NPOs indicated that they serve the general public whereas 39.5 percent of NPOs indicated that their organization serves both members and non-members. Combining the two meant that 81 percent of NPOs provided services to the general public. Even when distinguishing between members and non-members, they still provided services to both. Just 18 percent of NPOs indicated that their organization only serves members. However, a comparison of associations and foundations showed that a significantly higher proportion of the former (24.6 percent) indicated that "our organization only serves members" compared to the latter (5 percent).

Taiwan’s nonprofit organizations face significant challenges. Based on reports from (Hsiao, 2000; Kuan, Kao & Pelchat, 2003; Liu & Fang, 2002, 2010), challenges arise in the form of accountability, increased social responsibility and demands in services, growing competition, shortage of resources, turnover, and knowledge management. Becoming the main part of society with the government and enterprises, nonprofit organizations have been called on to meet social needs that were not efficiently tackled by the government and the business sectors (Hsiao, 2000). Nonprofit organizations’ involvement can be found within various areas, such as identifying and mobilizing to meet the new and emerging needs, producing goods, providing social service, and devising policy recommendations as well as doing advocacy activities for policy making.

Based on a comparison of foundations and associations, Kuan et al. (2010) showed that more than half of the former category (57.3 percent) believed that there has been a significant change in the demand for services or programs provided by Taiwanese NPOs in the past three years. Less than half of the latter agreed with this view (48.2 percent). The foundations that were
interviewed also emphasized that the demand increased by around 10 ~ 25 percent (35.9 percent) or increased significantly by more than 25 percent (6.8 percent), giving a total of 42.7 percent. Among associations, the combined tally was just 31.7 percent. This showed that in Taiwan, foundation-type NPOs have experienced a greater demand for the services or programs they provide from society over the last 3 years compared to association-type NPOs.

Based on a summary provided by (Vacek, 2001), about 70 percent of foundations in Taiwan are private, supported by individuals and the general public, 25 percent are corporate foundations, and the remainder are government-linked foundations. Moreover, the author noted that 85 percent have an endowment of less than NT $ 10 million and 49 percent have an endowment of below NT $ 5 million. Although the nonprofit sector in Taiwan has gained renowned reputation along the years, most organizations have to struggle to attract funding for their activities due to economic downturn and are forced to carry out their mission with fewer resources. For example, Kuan, Kao and Pelchat (2003) noted that some of the big government-endowment or corporate foundations that mostly depended on the interest generated by their endowments and did little fundraising with the general public have seen their incomes shrink due to low interest rates. Likewise foundations that could not rely mainly on their small endowment and always turned to other sources of funding now have to compete for fewer resources, since governments’ subsidies, corporate sponsorships and individuals’ donations have decreased (p.9).

Aside from having to cope with fundraising, service provisions problems, staffing has become one of the many great challenges that nonprofit organizations have to deal with. The majority of workers in Taiwan nonprofit organizations are mostly female, are in the 21- 30 demographic, have a length of service of 1-5 years and hold a college/university degree (Fang & Liu, 2002, Liu & Fang, 2010). These authors explained that the predominance of female workers in such sector is due do the fact that women have more empathy to contribute for charity whereas men are less interested in working for organizations where salary and promotion opportunities are not as attractive as in business organizations. In addition, these authors further indicated that as the younger staff in Taiwan nonprofit organization quit their job, most of the remaining staff are at a retiring age. This further amplifies human resources problems for these organizations which without adequate funding cannot afford higher wages that will attract professional employees (Kuan, Kao & Pelchat, 2003).
The high turnover rate among staffs in nonprofit organizations has also serious implications for these organizations effectiveness and survival. As KM has become essential for these organizations’ operations performance, the absence of adequate strategies that promote knowledge sharing and knowledge preservation, staff turnover may affect nonprofit organizations capacity to develop an institutional memory (Kuan, Kao, & Pelchat, 2003). Hurley and Green (2005) further pointed that ‘without a system that facilitate the capture and sharing of tacit and explicit knowledge, nonprofit organizations face a constant risk of losing their competitive edge’.

**Knowledge Sharing in Nonprofit Organizations**

Nonprofit organizations of all sizes wrestle with various management pressures. Researchers such as Drucker (1995) indicated that when it comes to effective management, nonprofit organizations need to follow on the footsteps of their for-profit counterparts. Research conducted by KMPG (2000, 2003) has shown that by implementing KM, organizations expect to enhance their capability of managing their knowledge to achieve greater performance. KM is vital for nonprofit organizations whose effectiveness according to Hurley and Green (2005) depends on the transfer of its tacit and explicit knowledge.

Hurley and Green (2005) further noted that nonprofit sector’s failure to replicate successful programs is associated with the lack the critical processes and knowledge needed to help them develop, evaluate, document, and share successful programs. Nonprofits organizations’ success is not only defined by their mission and financial performance, but also by their knowledge performance which reflects their ability and capability to act on what has been learned, resulting in continuous improvement and innovation (Som et al., 2010). Therefore, the need to develop better projects or programs has urged nonprofit organizations to capitalize on their ability to tailor the prospective projects by using specialized knowledge. KM facilitates employees in the organization to rely on past experience and knowledge in conducting organization operations and subsequently to achieve superior performance. However, for employees to be able to tap into the knowledge available within the organization, knowledge sharing needs to take place. Lettieri et al. (2004, p.17) stated that ‘only by identifying and sharing the available knowledge spread across the organization can each worker operate appropriately’.
Knowledge sharing is of paramount importance for nonprofit organizations success. In terms of organization success, studies have also shown that knowledge sharing can be an important mean to reach success. First, knowledge sharing has been associated with positive organization outcomes that include performance (e.g. Du et al., 2007; Hsu, 2008; Kang, Kim & Chang, 2008); project success (e.g. Hawryszkiewycz, 2010; Ismail, Md Nor, & Marjani, 2009); improved organizational learning (Hall, 2001); service delivery (e.g. Ismail & Yusof, 2009); innovation (e.g. Liao, 2006; Lin, 2007c); customer and employee satisfaction (e.g. Bercerra-Fernandez & Sabherwal, 2010; Ismail & Yusof, 2010).

Secondly, knowledge sharing can be a tool of strategic management. Various researchers have linked knowledge sharing to individuals’ desired behaviors such as organization commitment (e.g. Wong, Tong, & Mula, 2009); organization citizenship (e.g. Mogotsi, Boon, & Fletcher, 2011); employee adaptability (e.g. Almahamid, McAdams & Kalaldeh, 2010). Moreover, it has also been found to be negatively related with turnover intentions (Jacobs & Roodt, 2007, 2011). At last, knowledge sharing helps to enhance employees’ learning and exposure to the latest knowledge in their fields. Geisler and Wickramasinghe (2009) stated that people experience improved literacy, skills, abilities, competence and experience higher sense of accomplishment and empowerment when they have access to usable knowledge and are able to adapt it to their current needs.

Despite the importance of knowledge sharing for the success and competitiveness for all types of organizations, few researches with the exception of those conducted by Vuong and Staples (2008) and Liu and Fang (2010) have put an emphasis on its occurrence in nonprofit organizations. Based on the theory of reasoned action (TRA), Vuong and Staples (2008) drew on Bock and Kim (2005) knowledge sharing study to determine whether the findings for for-profit organizations would also be applicable to nonprofit organizations. In order to do so, they analyzed how the influence of individuals’ self rated expertise, commitment to organization, anticipated extrinsic and intrinsic incentives and perceptions of organization climate and norms for sharing affected their attitudes toward knowledge sharing by using a sample of 201 of volunteers and paid staff from various Canadian nonprofit organizations. Their findings indicated that while self-rated expertise had no significant impact on attitudes toward knowledge sharing, commitment to organization and extrinsic and intrinsic incentives combined with norms for
sharing were significantly associated with positive attitudes toward knowledge sharing. The author also concluded that intrinsic incentives had greater influence on individuals’ attitudes toward knowledge sharing than extrinsic incentives.

Liu and Fang (2010) used a sample of 336 volunteers and full-time staff of several Taiwanese nonprofit organizations to analyze the effect of intrinsic and extrinsic motivation on knowledge sharing behavior. The results suggested that individuals’ internal motivation had greater influence on knowledge sharing than external motivation. In addition, findings from the study indicated that while hygiene factors were solely related with knowledge sharing behavior, reputation and mutual benefit factors and altruistic characteristics of internal motivation had a significant effect on knowledge sharing willingness and behavior.

Research has showed that while individuals may be inclined to voluntary share knowledge with their peers or co-workers, the organization contexts need to support their effort. For example, Janz and Prasarnphanich (2003) stated that organizations need to nurture and develop an environment in which employees are motivated to share what they know in order to improve their knowledge sharing efforts. Although, Bach, Lee, and Carroll (2009) acknowledged the presence of knowledge sharing technologies, and technologies such as e-mail, database store, document management systems, search engine that allow users to share knowledge in nonprofit organizations, little empirical study have addressed whether the organization contexts of these organizations promote employees’ knowledge sharing behavior. In this regard, this research intends to tease out the contextual factors that may support nonprofit organizations’ endeavors in achieving effective implementations of knowledge sharing strategies.
Literature on Knowledge Sharing

Knowledge sharing definitions abound and vary across perspectives. Some authors have equated knowledge sharing to knowledge transfer (e.g. Alavi & Leidner, 2001; Bock & Kim, 2002; Darvish & Nikbakhsh, 2010). For example, Darvish and Nikbakhsh (2010, p. 33) described knowledge sharing as an equation where \textbf{knowledge sharing (transfer) = Transmission + Absorption (in use)}. Such definition of knowledge sharing suggests that knowledge sharing involves two actions which are the recipient’s transmission and absorption and use of the knowledge. Gupta and Govidarajan (2000) definition suggested that knowledge sharing and knowledge flow are intertwined, they described it as the process of identification, outflow, transmission, and inflow of knowledge within an organization. Knowledge sharing has also been described as a learning process whereby there is an adaptation of ideas (Hutchings & Michailova, 2004; Mian, Takala, Kekale, 2008). It is also referred as the ‘set of behaviors that involve the exchange of information or assistance to others’ (Connelly & Kelloway, 2003). Lin (2007a) suggested that knowledge sharing refers to a social interaction culture which involves the exchange of employee knowledge, experiences, and skills through the whole department or organization.

Various approaches have been used to examine knowledge sharing. Most studies measured knowledge sharing using either willingness or intention to share knowledge (e.g. Chen, Chen, & Kinshuk, 2009; Cho et al., 2007). Others authors have depicted knowledge sharing as having two facets. For example, Quigley, Tesluk, Locke, and Bartol (2007) proposed a theoretical model connecting two perspectives: the knowledge sender and the knowledge recipient. Several measures have been used to assess knowledge sharing as a combined process of receiving knowledge and sending knowledge (e.g. Foss, Minbaeva, Pedersen, & Reinholt, 2009) and utilizing knowledge and/or seeking knowledge (e.g., Cabrera et al., 2006). Other studies have also conceptualized and measured knowledge sharing as a process involving knowledge donating and collecting (e.g. de Vries et al., 2006; van den Hoof & de Ridder, 2004; Wong et al., 2009). Finally others studies have measured knowledge sharing as knowledge quality and quantity of knowledge (e.g. Chui, Hsu, & Wang, 2006; Ju, Su, Chao, & Wu, 2009).

Ho, Hsu, and Oh (2009) noted that the difficulty in setting a standard definition of knowledge sharing is due to the fact that it includes key elements such as the ways of sharing,
levels of sharing and the type of knowledge shared. Although research on knowledge sharing is increasing and indicates that knowledge sharing is complicated due to the fact that it can take different forms, little attention is given to the types of knowledge shared. Knowledge is generally conceived as having two aspects, both tangible and intangible in nature. Tacit knowledge is characterized as intangible whereas explicit knowledge is described as tangible. With that said, each would necessitate different method of sharing. As Guzman and Trivelato (2008) pinpointed ‘overlooking the nature of knowledge weakens any serious examination of the process of transferring knowledge since the process to transfer explicit and tacit knowledge is distinct’. Abdullah et al. (2009) further stressed that the ‘nature of knowledge is a key factor in effective knowledge sharing’. Ma, Qi, and Wang (2008) pointed that wherever knowledge sharing takes place, it is necessary to understand the characteristics of the knowledge itself, such as tacit knowledge or explicit knowledge, in order to obtain effective knowledge sharing.

Various researchers have acknowledged the existence of knowledge types in knowledge sharing (e.g. see table 2.1) and some studies have also analyzed knowledge sharing from either a tacit or explicit perspective. For example, Hislop (2002) referring to the transmitter-receiver conduit model of knowledge sharing prioritized explicit knowledge over tacit knowledge. According to the model, the knowledge shared is explicit and is transferred from an isolate sender to a separate receiver (see figure 2.1). Other studies related to knowledge sharing have increasingly emphasized on the importance of tacit knowledge sharing rather than explicit knowledge sharing (e.g. Lin, 2007a; Yang & Farn, 2009). Only a few have addressed both types of knowledge sharing (e.g. Holste, 2003; Lu et al., 2006). Tacit knowledge and explicit knowledge if shared may yield considerable benefits to organizations. Therefore it is important to analyze the knowledge types in knowledge sharing as Bechina and Ndlela (2008/2009) noted: ‘recognizing the distinction between knowledge types is necessary to reveal their potential contribution to organization performance’.

Knowledge sharing is commonly perceived as a human behavior. It may reflect the degree to which individuals engage in knowledge sharing related activities. It may also reflect the extent to which people are willing to communicate to others their knowledge (i.e. tacit and explicit). For example, Zheng and Bao (2006) described knowledge sharing as the behavior of disseminating and assimilating one’s acquired knowledge with other members within the organization. This
sharing can be carried through different mechanisms. Bartol and Srivasta (2002) noted that individuals can share knowledge: (1) through organizational databases; (2) in formal interactions within or across team or work units; (3) in informal interactions with individuals; and (4) through community of practice. Similarly, Chang, Ho, and Lau (2009) proposed two ways of sharing knowledge which include closed network sharing (i.e. person to person sharing) and open network sharing (i.e. sharing through a KMS).

Since the researcher is interested in identifying the impact of knowledge sharing behavior on KMS and innovation, this study adopts the tacit and explicit knowledge sharing behavior approaches of (Aulawi et al., 2009; Holste, 2003; Lu et al., 2006) and the definition of knowledge sharing from Staples and Webster (2008, p.620) which the authors described as an exchange where one party gives some knowledge that she/he has (explicit or tacit) to another party (a person or a repository).


**Table 2.1**

<table>
<thead>
<tr>
<th>Authors /Years</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aulawi, Surdiman, Suryadi, &amp; Govindaraju (2009, p.2239)</td>
<td>Knowledge sharing is explained into tacit knowledge sharing behavior and explicit knowledge sharing behavior.</td>
</tr>
</tbody>
</table>

(continued)
### Table 2.1 continued

**Knowledge sharing definitions based on knowledge types**

<table>
<thead>
<tr>
<th>Authors / Years</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bercerra-Fernandez &amp; Sabherwal (2010)</td>
<td>Knowledge sharing is defined as the process through which tacit or explicit knowledge is communicated to other individuals.</td>
</tr>
<tr>
<td>Hislop (2002, p. 167)</td>
<td>Knowledge is shared by the transferral of explicit and codified knowledge (in the form of text, a diagram or an electronic document) from an isolate sender to a separate receiver.</td>
</tr>
<tr>
<td>Lee (2001)</td>
<td>Knowledge sharing refers to activities of transferring or disseminating knowledge (including implicit and explicit knowledge) from one person, group of organization to another.</td>
</tr>
<tr>
<td>Siakas &amp; Georgiadou (2006); Van den Hoof &amp; de Ridder (2004)</td>
<td>Knowledge sharing is the process where individuals mutually exchange both tacit and explicit knowledge, and jointly create new knowledge.</td>
</tr>
<tr>
<td>Staples &amp; Webster (2008)</td>
<td>Knowledge sharing is an exchange where one party gives some knowledge that she/ he has (explicit or tacit) to another party (a person or a repository).</td>
</tr>
</tbody>
</table>

### Knowledge Types- Tacit and Explicit

Numbers of writers attempted to delineate a dichotomy between tacit and explicit knowledge. Some suggested that tacit and explicit knowledge are inseparable and mutually constituted (Tsoukas, 1996; Werr & Stjernberg, 2003). Others maintained that explicit and tacit knowledge are separate and distinctive (Haas & Hansen, 2007; Seidler-de Alwis & Hartmann, 2007).
Throughout the KM literature several fundamental differences between these two knowledge characteristics can be highlighted.

One important differentiating aspect is the **difficulty or ease of codifiability and storage of knowledge**. It is argued that the extent to which knowledge can be articulated or codified and stored stems from the very nature of knowledge types. For example, whereas tacit knowledge includes hard-to-communicate skills, know-how and practical knowledge that cannot be easily articulated to another person, explicit knowledge can be easily copied and communicated to others (Cabrera & Cabrera, 2002; Nonaka & Takeuchi, 1995). In addition, while explicit knowledge can be stored in a mechanical and technological way such as KMS (Reychav & Weisberg, 2009), tacit knowledge is mostly stored in human beings and can also be effectively stored in social processes and personal face to face interactions (Zaim, 2006).

Another essential distinctive characteristic between tacit and explicit knowledge is reflected through their **degree of teachability**. Smith (2001) stressed that while explicit knowledge can be taught by using for example a trainer’s designed syllabus, or formats selected by the organization, tacit knowledge can mostly be taught through one-to-one basis such as mentorship, coaching, internship, on-the-job training, and apprenticeships. Bercerra-Fernandez and Sabherwal (2010) indicated that while explicit knowledge is high in teachability and codifiability, tacit knowledge is low in teachability and codifiability.

Other area of comparison between tacit and explicit knowledge include the **method of acquisition of knowledge**. Yi (2006) suggested that explicit knowledge can be generated through logical deduction and acquired by formal study. In contrast, tacit knowledge can merely be acquired through practical experience in the relevant context. Smith (2001) also pointed that the type of thinking for tacit and explicit knowledge differs. The author maintained while explicit knowledge is logical, based on facts and proven methods facilitates convergent thinking, tacit knowledge is creative, flexible, unchartered and lead to divergent thinking.

Tacit and explicit knowledge also differ in their respective **role in the organization and outcomes on organization tasks**. Rhodes et al. (2008) suggested that explicit knowledge plays a prominent role in the organization’s strategy formulation process. In addition, it has a relatively less expensive economic value because it is impersonal and easy to transfer to other employees.
through IT (Reychav & Weisberg, 2009). Although tacit knowledge is considered more expensive, it is valuable because it is concerned with shared activities, observation of behavior and direct contact which are associated with more complex ways to interact and acquire knowledge from coworkers (Reychav & Weisberg, 2009, p. 286). In addition, tacit knowledge is found to be a key success in promoting new product development (Subramanian & Venkatraman, 2001) and innovation and performance (Gokman & Hamsioglu, 2011; Harlow, 2008).

Lee (2001) used a sample of 195 government offices in Korea that included city, provincial, district and county offices to analyze the influence of knowledge sharing on outsourcing success and partnership quality. The results of their study showed that both tacit and explicit knowledge sharing was positively associated with outsourcing success and partnership quality. Although the correlations of tacit and explicit knowledge sharing and outsourcing were found to be significant at p<.01, the correlation between of explicit knowledge sharing and outsourcing success was slightly higher (r=.444) than that between tacit knowledge sharing and outsourcing success (r=.408). However, the correlations between tacit knowledge sharing and partnership quality was higher (r=.578) than the correlations between explicit knowledge sharing and partnership quality (r=.515). The author concluded that the higher the degree of tacit and explicit knowledge sharing, the greater the accomplishment of the strategic, economic and technological benefits of IS outsourcing.

According to Smith (2001) explicit knowledge can be reused to solve many similar types of problems or connect people with valuable, reusable knowledge. As marketplace competition, changing customer needs, among other factor reduces stability; the author suggested that gathering and using explicit knowledge help assume a predictable, relatively stable environment. In contrast, the author explained that opportunities to use tacit knowledge are prime factors in attracting and maintaining a talented and loyal workforce. Smith (2001) also noted that many companies use tacit knowledge to increase individuals’ academic learning and experience.

An empirical study conducted by Haas and Hansen (2007) showed that the acquisition and sharing of tacit and explicit knowledge had distinctive benefits for task productivity. For example, in relation to the task productivity measure of time saved, the use of explicit knowledge did have positive time saving benefits, but the acquisition of tacit knowledge did not. By contrast, the sharing of tacit knowledge had different benefits and impacts on task productivity, improving
both task quality and client’s perception of competence, with both being positively related to the quality of the tacit knowledge that was shared.

Finally, tacit and explicit knowledge requires different processes and modes for sharing knowledge. Bercerra-Fernandez and Sabherwal (2010) claimed that whether explicit or tacit knowledge is being shared, exchange or socialization processes are used. Socialization, as they discussed, facilitates the sharing of tacit knowledge in cases where new tacit knowledge is being created as well as when new tacit knowledge is not being created. Exchange process differs from socialization as it focuses on the sharing of explicit knowledge (Becerra-Fernandez and Sabherwal, 2010). It is used to communicate or transfer explicit knowledge among individuals, groups, and organizations (Grant, 1996, cited in Becerra- Fernandez-Sabherwal (2010).

Besides requiring different processes, the methods for sharing tacit and explicit knowledge also differ. Lee (2001) study suggested that explicit knowledge can be shared through business proposals and reports, business manuals and models, success and failures stories, newspapers, magazines and journals whereas tacit knowledge can be shared through education and training. The author added that tacit knowledge sharing takes place when know-how from work experience and know-where and know-whom are shared. Similarly, an empirical study conducted by Lu, Leung and Koch (2006) has also suggested several means for sharing these two types of knowledge. For instance, Lu et al. (2006) in their research asked the participants to recall the frequency with which they shared eight types of knowledge with their co-workers. Tacit knowledge sharing types included stories about one’s success or failure in the workplace, interpersonal skills, experience and expertise; where and from whom to obtain solutions, and uncodified job-related skills and know-how, whereas explicit knowledge sharing methods included work reports and work requirements, knowledge about archives or databases, and codifiable knowledge.

**Organization Context**

Context can be described as the characteristics of organizations’ setting, of individuals and their role in the organization, and of any other environmental factor that may trigger their responses (Rousseau, 1978). Wang and Noe (2009, 2010) indicated that environment factors
include organization context, interpersonal and team characteristics, and cultural characteristics. Albino, Garavelli, and Schiuma (1998) suggested that context can be divided into internal and external context. Internal context refers to organizational variables such as organization culture that represents groups of behavioral skills, and attitudes. In contrast, the external context refers to all the variables where inter-organizational relationships take place.

Organization context has been found to be instrumental in shaping individuals’ attitudes and behaviors (e.g., Rousseau, 1978; Sutton & Rouseau, 1979). Consequently, various research have used organization contexts to study individuals’ responses to socialization (Islam, Ahmad, & Mahtab, 2010); knowledge transfer (Minbaeva, 2007; Rhodes et al., 2008); knowledge sharing (Bock & Kim, 2002; Islam et al., 2010; Lu, Leung, & Koch, 2006; Pai, 2006; Wang & Noe, 2009, 2010); innovation (Carbonell & Rodriguez-Escudero, 2009; Nystrom, Ramamurthy, & Wilson, 2002; Oliveira & Martins, 2011), and KMS use (Kankanhalli, Tan, & Wei, 2005).

Organization contexts also referred to as organizational factors (Rhodes et al., 2008) are crucial in influencing individuals’ knowledge sharing behavior. As stressed by Flowers et al. (2010) ‘if employees believe the conditions in their organizations facilitate exchange of information and ideas, they may be more receptive to engage in knowledge sharing behavior’. Moreover, Lu et al. (2006) explained that organization context creates opportunities for employees to interact with each other and foster different degrees and nature of interpersonal relationships. In addition, they stressed that organizations have the authority to take steps to achieve specific goals and can provide resources to support or inhibit certain employee actions.

A review of the literature on organization context indicated that contextual factors include technology, top management support, organization culture, and organization structure (e.g. Islam, Mahtab, & Ahmad, 2008; Lu et al., 2006; Pai, 2006; Rhodes et al., 2008). These factors have been claimed to have a positive impact on knowledge sharing. For example, some researchers suggested that technology, organization culture and organization structure can act as enablers (e.g. Gold et al., 2001; Kim & Lee, 2006). While others indicated that they could act as inhibitors or barriers. For example, an empirical investigation conducted by Ruggles (1998) identified main factors that may impede knowledge sharing include culture (54 percent), top Management (32 percent), organizational structure (28 percent) information technology (22 percent). Ling et al.
(2009) identified several major organizational inhibitors to share knowledge that include lack of management support, lack of attention to organizational culture, and organizational structure.

Therefore, to analyze organization context influence on knowledge sharing in a nonprofit organization, this study partially builds on Ruggles (1998) study and partially adopts Lu et al. (2006) tacit and explicit knowledge sharing research framework (see figure 2.3). In addition, KMS and innovation are added for further analysis since they are also affected by both individuals’ knowledge sharing behavior and contextual factors.

**Figure 2.2** The structural model of knowledge sharing. Adapted from “Managerial knowledge sharing: The role of individual, interpersonal, and organizational factors” by L. Lu, K. Leung, P.T. Koch, 2006, Management and Organization Review, 2 (1), p.31. Copyright 2006 by The Authors Journal of Compilation and by 2006 Blackwell Publishing Ltd.

**Relationship between Organization Contexts and Knowledge Sharing**

This section presents a review of the literature on organization contexts relationship with knowledge sharing. As previously stated, in this study organization contexts encompass information technology, top management support, collaborative culture and organization structure. The hypothesis formulated for this section is as follow:

*Hypothesis 1:* Organization contexts have an effect on knowledge sharing.
Information Technology and Knowledge Sharing

Information technology’s role in facilitating knowledge sharing is often a contested topic among researchers and scholars. It is widely argued that although information technology provides a platform for knowledge sharing, it does not suffice to entice nor motivate employees to be engaged in knowledge sharing behavior. Among the empirical studies that asserted the limited role of information technology in ensuring knowledge sharing is the study of a knowledge intensive firm by Robertson and O’Malley (2000) which showed that consultants favored face to face interaction rather than intranet discussion. Similarly, Bordia, Imer, and Abusah’s (2006) study also suggested that knowledge sharing were more significant in the interpersonal context than in the database context. Lin (2007b) study findings showed that information technology was positively associated with knowledge collecting and not related with knowledge donating.

Likewise Lin & Lee’s (2006) research concluded that information technology support did not significantly influence knowledge sharing. Alavi, Leidner , and Kaywoth (2005, 2006) found that the values of organizational members influenced the ways in technologies were used, indicating that organizations cannot expect unanimity in the ways in which different groups within the organization will utilize management tools. Contrary to these findings, Bock and Kim’s (2002) research results from the field survey of 467 employees of four public organizations in Korean showed no relationship between information technology usage and knowledge sharing.

Various studies, however have found a positive association between information technology and knowledge sharing. For example, Kim and Lee (2006) used a convenience sample of 322 employees in five public and five private organizations in South Korea to analyze the impact of organizational culture, organizational structure, and information technology utilization on employee’s perceptions of knowledge sharing capabilities. The findings revealed that information technology had a significant impact on employees’ perceptions of knowledge sharing capabilities in both public and private sector and among other factors was found to be the most significant factor determining employee knowledge sharing in public organizations.

Additionally, Tan, Lye, Hock Ng and Lim (2010) examined the motivational impact of intrinsic factors such as trust, learning, behavior and extrinsic factors as for instance
organizational culture, rewards systems, and information technology on knowledge sharing among 195 employees in Malaysian banks and found that information technology was not only significantly correlated with knowledge sharing, but compared to the other studied factors had a greater influence on knowledge sharing.

Information technology capability for knowledge sharing has also been claimed to depend on knowledge type. Some authors have suggested explicit knowledge sharing is enabled through information technology (Mian, Takala, & Kekale, 2008; Reychav & Weisberg, 2009) while others maintained that tacit knowledge due to its embodied nature cannot be shared through information technology. For example, Leonard and Sensiper (1998) noted that much tacit knowledge is generated and transferred through body language, therefore, the use of information technology is only partly possible.

Similarly, Haldin-Herrgard (2000) and Hislop (2002) suggested the role of information technology in the sharing of tacit knowledge is somewhat limited. Other authors have adopted different stances by recognizing that information technology plays a stronger role in supporting the sharing of explicit knowledge rather than the sharing of tacit knowledge (Hildreth & Kimble, 2002; Lu et al., 2006).

**Top Management Support and Knowledge Sharing**

Some studies have shown that top management can be a key inhibitor of knowledge sharing (Ling et al., 2009; McDermott & O’Dell, 2001). Other studies have found that top management support can be positively associated with employees’ perceptions of a knowledge sharing culture, willingness to share knowledge, knowledge sharing behavior (Connelly & Kelloway, 2003; Lin & Lee, 2004; Lin, 2007a; Kang, Kim & Chang, 2008). For example, Connelly and Kelloway (2003) research findings suggested that perceptions of a positive social interaction culture and perceptions about management’s support for knowledge sharing can be significant predictors of a positive knowledge culture. Similarly, Xiong and Deng (2008) used a multi-case study approach to investigate the impact of culture on knowledge sharing in two Chinese joint ventures. They found that top management manifested support for knowledge sharing by advocating active communication between all levels of staff as well as developing a strong team spirit. In addition, their support was apparent in overcoming cultural differences for knowledge sharing by 1)
employing project interpreters to resolve language barrier between the foreign and local employees; and 2) carrying a regular outward training to enhance organizational cohesiveness of employees (p. 1096). Likewise, Lin and Lee (2004) in a survey of 154 Taiwanese senior managers showed that a supportive supervisor and his/her attitude toward knowledge sharing behavior positively influenced intentions to encourage knowledge sharing.

Based on a survey of 172 employees from 50 large organizations in Taiwan, Lin (2007a) found that top management support is strongly associated with employee willingness to share knowledge (i.e. knowledge donating and knowledge collecting). Similarly, Kang, Kim and Chang (2008) analyzed the perceptions of 323 public employees in South Korea to determine knowledge sharing impact on work performance and found that support from top management was perceived to have a positive impact on knowledge sharing. Using a sample of 42 organizations in Korea, Lee et al. (2006) found that top management support affected both level and quality of knowledge sharing through influencing employee commitment through KM. Ling et al.’s (2009) found that top management support is vital to ensure knowledge sharing success in organizations. Studies conducted by (Gupta & Govindarajan, 2000) also indicated that management support is essential to promote knowledge sharing within the organization.

Top management support has also been found to influence employees’ knowledge through information technology use. Lu, Leung and Koch (2006) found that organization support seemed to promote both tacit and explicit knowledge sharing through encouraging the use of information technology. Moreover, management support for knowledge sharing is also reflected through the provision of rewards. Reychav and Weisberg (2009, p.289-290) noted that while employee tacit knowledge sharing is “expensive”, explicit knowledge sharing is “cheap” and contended that individuals willingness to share both may depend on monetary and non-monetary benefits. Thus management offering rewards for knowledge sharing is also expected to have a positive influence on both tacit and explicit knowledge sharing.

**Organization Culture and Knowledge Sharing**

Organization culture has been shown to be positively related with knowledge sharing. Empirical studies conducted by (Alam, Abdullah, Ishak, & Zain, 2009; Tan, Lye, Hock Ng, and Lim, 2010) reported a positive association between organization culture and knowledge sharing.
In contrast, Cheng, Ho, and Lau (2009) study reported no relationship between organization culture and knowledge sharing. Organization culture commonly refers to the set of shared values, beliefs, and norms that influence the way employees behave toward each other and accomplish their tasks. According to some researchers, culture affects knowledge by determining how it is used and shared within the organization.

Several reasons why organization culture should be seen as the basis of how well knowledge is shared are highlighted in de Long & Fahey (2000) study. According to their study:

- culture shapes what knowledge is and what knowledge is worth sharing,
- culture defines the relationship between the employee and organizational knowledge. It determines what knowledge belongs to the organization and to their members.
- culture establishes the context for employee interaction, determining how knowledge should be and will be shared in any particular situation,
- culture shapes the creation and adoption of new knowledge.

Research has shown that organization culture types, characteristics and norms affect knowledge sharing. For example, Suppiah and Sandhu (2011) investigated the influence of organization culture types on tacit knowledge sharing by surveying 362 participants from seven organizations. The research results indicated that organization culture types may have a positive or negative influence on tacit knowledge sharing. Lu et al.’s (2006) study surveyed 246 part-time MBA students and middle-level employees for five firms in China, and found that co-worker collegiality facilitated knowledge sharing.

Akgun, Keskin and Gunsel (2007) used a sample of 101 samples from small and medium sized firms located in Gebze to investigate the impact of organization culture on tacit and explicit knowledge sharing. They found that a stable culture had no impact on knowledge sharing whereas a flexible culture and trust were positively related to tacit and explicit knowledge sharing. In contrast, Kim and Lee (2006) found no statistically significant associations between trust, organization goals/ vision and knowledge sharing. Lin (2008) found that trust, creative and supportive characteristics of organization culture are essential to knowledge sharing. Likewise,
Islam et al. (2011) study indicated that cultural dimensions such as trust, communication and leadership were positively and significantly associated with knowledge sharing.

Others researchers maintained that organization culture’s influence on knowledge sharing is based on the norms that are held by the organization. Ahmed et al. (2002, p.59) urged that adequate norms need to be held within the organization in order to promote knowledge sharing. They stated that “if the wrong cultural norms exist, regardless of the effort and good intention of individuals trying to promote knowledge, little knowledge sharing is likely to be forthcoming as a result”. In other words, organizations need to promote norms that are supportive of knowledge sharing. Yang (2007) used a sample of 499 employees working in international tourists hotels in Taiwan, and found that collaborative culture is strongly correlated with knowledge sharing. Similarly, Islam, Mahtab, and Ahmad (2008) study findings indicated that a supportive and collaborative culture was positively associated with knowledge sharing.

Collaboration is often cited as one of the cultural norms that lead to effective KM (e.g. Alavi, Kayworth & Leidner, 2005, 2006; Al-Alawi et al., 2007; Bhatt, 2001; de Long & Fahey, 2000; de Long 1997; Lopez et al., 2004). In a thorough review of literature, Slater (2004) pointed that although terms such as collegiality, congeniality, cooperation, consultation and collaboration are often used synonymously, he argued that collaboration include key components such as: a) common goals, joint work and interdependence; b) parity or equality in relationship; and c) voluntary participation. Hurley and Hult (1998) and Tahir et al. (2010) defined collaboration as the degree to which people actively support and help one another in their work. Since sharing knowledge may involve risks to an individual and rely on individuals’ relationship strength and level, a culture that promotes collaboration is expected to facilitate knowledge sharing (i.e. tacit and explicit). Moreover, Gold, Malhotra and Segars (2001) pinpointed that interaction and collaboration among employees is crucial when attempting to transmit tacit knowledge between individuals or convert tacit knowledge into explicit knowledge, thereby transforming it from the individual to the organizational level.

**Organization Structure and Knowledge Sharing**

Zhou and Fink (2003) indicated that organization structure compared to organization culture and information technology plays prominent role for effective knowledge sharing. Studies have
shown that organization structure characteristics have an impact on knowledge sharing. For example, Kim and Lee (2006) study findings showed that centralization is negatively associated with knowledge sharing. In addition, their results reported no significant association between formalization and knowledge sharing. Lin (2008) empirically investigated five high tech industries in Taiwan and found out the lower the formalization in the organization is, the greater the knowledge sharing among units of an organization is. In addition, these authors also found the higher the complexity of an organization structure, the lower the knowledge sharing among organization units is.

In contrast, Islam, Ahmad, and Mahtab (2010)’s empirical study did not found formalization in the organization structure to be a significant predictor of knowledge sharing. In addition, the research also showed that an organization structure characterized by decentralization did not have any impact on knowledge sharing. Islam et al. (2008) study also indicated that a centralized organization structure was not related with knowledge sharing. Kim and Lee (2006) study suggested that a less centralized structure is preferred for facilitating knowledge sharing. Al-Alawi et al. (2007) study results indicated that knowledge sharing is enabled in a structure where the level of participation is increased and where boundaries of organization levels are reduced. Song (2009) advocated a flat organization structure in project work in order to encourage tacit knowledge sharing.

While hierarchical structure has been claimed to inhibit knowledge sharing, an open and flexible organization structure has been claimed to support knowledge sharing best (e.g. De Long & Fahey, 2000; Nonaka & Takeuchi, 1995). Consequently, O’ Dell and Grayson (1998) and Gold et al. (2001) have emphasized the need for organizational structures to be flexible in order to encourage sharing and collaboration across boundaries within the organization. Nonaka and Takeuchi, (1995) further advanced that formal hierarchical structure can be maintained while the dimension flexibility is added and thereby increasing the chance for knowledge sharing and collaboration. Such claims were not supported by an empirical study conducted by Kang, Kim, and Chang (2008) which investigated the impact of knowledge sharing on individual work performance by using a sample of 323 public employees in South Korea. The findings revealed that a flexible organization structure did not have any significant influence on knowledge sharing.
A flexible organization structure has also been claimed to affect the sharing of knowledge types. Organizational structure is the way of organizational arrangements of people and jobs to meet in order to achieve organizational goals effectively and efficiently (Zulfiqar et al., 2010). Structure is believed to affect KM processes by shaping patterns and frequencies of communication among organizational members. Consequently, it also affects knowledge sharing which is facilitated by interactions and communication between individuals. For example, Chen and Huang (2007, p.114) suggested that organizations should design their structure as less formalized, more decentralized in order to provide autonomy and make them feel honored to participate in their work. The authors added that this would motivate employees to increase their behavior of social interaction and result in favorable knowledge sharing.

With regards to knowledge sharing types, Seidler-de Alwis and Hartmann (2008) argued that the organization structure often hinders tacit knowledge sharing by establishing wrong authorities. Walczak (2005) suggested that an organization structure that encourages teamwork may facilitate the sharing of tacit and explicit knowledge. Sharrat and Usoro (2003) noted that organizations with a centralized, bureaucratic management style can stifle the creation of new knowledge, while a flexible, decentralized organization structure encourages knowledge-sharing, particularly knowledge that is more tacit in nature.

**Relationship between Organization Contexts, Knowledge Sharing and KMS**

This section presents a review of the literature on organization contexts relationship with KMS, and knowledge sharing and KMS. Three hypotheses are formulated for this section as follow:

*Hypothesis 1*: Organization contexts have an effect on KMS.

*Hypothesis 2*: Knowledge sharing has an effect on KMS.

*Hypothesis 3*: Knowledge sharing has a mediating effect on the relationship between organization contexts and KMS.

**Knowledge Sharing and KMS**

Studies on KMS success suggested that the system’s effectiveness primarily depends on the quality of its components. Shih & Morisson (2009) suggested that KMS can be measured by
assessing the effectiveness of the knowledge service and the success and sustainability of the knowledge service. According to the authors, while effectiveness of knowledge service includes indicators such as cultural and community development, needs appropriateness, professionalism, and communication; success and sustainable knowledge service encompasses indicators such as cultural appropriateness, ease and clarity of the system, adaptability of the system, design of the system, and continuity of the system (p.36-37). Geisler and Wrickramasinghe (2009) argued that since KMS provides users or employees with a service, therefore it should have the attributes of reliability, recoverability, and flexibility. Researchers and scholars commonly agreed that making the knowledge service more effective is a necessary condition for its success (e.g. Debowski, 2006; Geisler & Wrickramasinghe, 2009; Jennex & Olfman, 2006, p. 54).

Studies have also shown that KMS success factors are similar to those affecting knowledge sharing. For example, Quaddus & Xu, (2005) indicated that KMS is influenced by organizational and individual factors. KMS success is said to be achieved through the combined integration of technology, organizational structure, culture, knowledge processes (e.g. Bhatt, 2001; du Plessis, 2007a). Research that investigated the failure of KM initiatives such as the development and implementation of KMS have acknowledged information technology (Alavi & Leidner, 1999; Jennex, Smolnik, & Croasdell, 2008, 2009; Ryan & Prybutok, 2001; Moffett et al., 2003), top management support (Davenport et al. 1998; Holsapple & Joshi, 2000; Jennex & Olfman, 2005; Jennex et al., 2008, 2009; Yu et al., 2007), organization culture (Davenport et al., 1998; Debowksi, 2006; Jennex & Olfman, 2005; Jennex et al., 2008, 2009), organization structure (Becerra-Fernandez and Sabherwal, 2010; Jennex & Olfman, 2005; Jennex et al., 2008, 2009), and knowledge sharing (Al Bushaidi et al., 2010; Babcock, 2004; King & Marks, 2008; Hislop, 2002; Yu, et al., 2007) as essential key factors to the system’s performance.

In addition, recent studies indicated that KMS success depends on the effects of the above factors on knowledge sharing. For example, Marks, Polay, McCoy, and Galletta (2008, p. 62) noted that because KMS requires individuals to share their knowledge, success is not guaranteed given that several factors can hinder knowledge sharing. Carter and Scarbrough (2001) and Voelpel, Dous and Davenport quoted in Wang and Noe (2009, 2010) pinpointed that the failure of KMS to accomplish its purposes result from the lack of consideration of how the organizational and interpersonal contexts as well as individual factors affect knowledge sharing.
Al-Busaidi et al. (2010) have called on further research to investigate factors that affect knowledge sharing behavior as a crucial step to ensure the successful development of an organization KMS.

Organizations failed attempts to successfully pursue KM initiatives seemed to be deeply rooted in knowledge sharing. Jones and Leonard (2009) referring to a previous study indicated that employees’ willingness to share is the most critical success factor for the success of KM. With regards to the importance of knowledge sharing for KMS, Babcock (2004)’s study noted that investments that have been made to promote KM initiatives in organizations resulted in an estimated loss of $31.5 billion are lost per year by Fortune 500 companies due to lack of knowledge sharing. Similarly, Kankanhalli et al. (2005) noted that the most often observed problem in KMS is the low degree of participation for knowledge sharing or shared database use.

Some empirical evidence has also been found on the literature with regards to the importance of knowledge sharing for KMS. A rare study conducted by Pai (2006) provided empirical support to these arguments by demonstrating that knowledge sharing behavior was essential to the effectiveness of IS/IT Strategic Planning (ISSP). Akhavan, Jafari, and Fathian (2006) carried out a qualitative case study that investigated critical success factors of KMS by using data from six successful companies in KM program. These organizations included Ernst & Young, Hewlett-Packard, BusinessEdge Solutions, Microsoft, Teltech and Siemens. The findings showed that knowledge sharing was among the important key success factors for KMS in organization such as Hewlett-Packard, Siemens, Ernst & Young, Teltech, BusinessEdge Solutions. These results also indicated that knowledge sharing was identified to be vital to KM success in almost every organization that these authors examined.

Knowledge sharing is commonly perceived as one important process of KM and a main component of KMS (Alavi & Leidner, 2001; Ryu, Hee, & Han, 2003). Zhang et al. (2010) developed a conceptual model describing knowledge sharing as a process where individuals contribute and use knowledge from the systems (see figure. 2.4). KMS is mainly design to capture individuals’ knowledge and requires that they contribute their knowledge (i.e. tacit and explicit) to the system. Akhavan et al. (2006) noted that it is crucial for organization to be able to save both tacit knowledge and explicit knowledge because they are among the most important elements of a KMS. Likewise du Plessis (2007a) KM success is also defined by the support of
tacit and explicit knowledge. In contrast, Aulawi et al. (2009, p. 2265) stressed that in order to ensure KM success, organization must decide which knowledge is perceived to be critical and decide who has the information.

Figure 2.3. The model of knowledge sharing dynamics in a KMS. Adapted from “Knowledge-sharing reward dynamics in Knowledge Management Systems: Game theory–based empirical validation” by X. Zhang, Z. Chen, D. Vogel, M. Yuan, & C. Guo, 2010, Human Factors and Ergonomics in Manufacturing & Service Industries 20 (2), p. 104. Copyright 2010 by Wiley Periodicals, Inc.

Information Technology, Knowledge Sharing and KMS

There is an ongoing debate among researchers on the role of information technology in KMS. While some researchers have emphatically maintained that information technology is not essential for KM initiative success (McDermott, 1999; McDermott & O’Dell, 2001), others have suggested that KM necessitates the assistance of information technology to maintain the efficiency of knowledge activities (Li & Tsai, 2009) and considered it to be a pre-requisite for KM success (Aulawi et al., 2009). Various authors including (Alavi and Leidner, 1999; Hasanali, 2002) stated that information technology infrastructure is a key driver to KMS. Still yet others have pinpointed that although information technology is necessary, it is not sufficient to KM success (e.g. Balthazar & Cooke, 2004; Hall, 2001; Wong, 2005; Yu, Kim, Kim, 2004). For example, Kulkarni et al. (2006/2007) and Grant and Qureshi (2006) noted that by solely relying on technology may cause KMS to be doomed to failure.
Arguments and empirical studies can be found throughout the KM literature with regards to the role of information technology in KMS success (e.g., Anantatmula, 2008; Chen, 2009; Kankanhalli et al., 2003; Tseng, 2008). For example, Tseng (2008) selected four organizations in Taiwan that include Uni-President Corporation, Foxsemicon Integrated Technology Incorporation and InnoLux Display Corporation, and Advanced Semiconductor Engineering Inc. as case studies to explore the role and effect of information technology in KMS. The findings suggest that information technologies such as groupware, group decision support systems, workflow software, video conferencing, and intranet, can facilitate internal information exchanges, group discussions and communication in organizations. Furthermore, information technologies, such as virtual communities, e-mail, electronic bulletin boards, long-distance learning technology and extranet, can facilitate cross-functional communication, external information searches and knowledge transmission among internal divisions of the same company.

An empirical study conducted by Chen (2009) showed that information technology capability was positively related with KMS success. The findings revealed that information technology was most significantly associated with the system quality than the knowledge quality and service quality of the KMS. Studies conducted by Chen (2009) and Tseng (2008) showed that information technology should be considered as one the KMS components that lend support to the KMS functions. Authors like Abdullah and Selmat (2005) that identified information technologies as part of a KMS defined KMS from a technical perspective (see figure 2.5). The KMS’ technical perspective consists of three components that include information technologies, functions and knowledge. A variety of technologies supports knowledge work or activities through its functions which are using, finding, creating knowledge and packaging. Luan and Serban (2002)’s study similarly to Abdullah and Selmat (2005) indicated that information technologies such as document management, data mining and search provide essential support for KMS.

Kankanhalli, Tanudidjaja, Sutanto, and Tan (2003) study of information technology role in KM initiatives highlighted two main functions of information technology that include 1) helping people locate each other and communicate so as to achieve complex knowledge transfer and 2) helping people share knowledge through common knowledge bases so as to achieve the
economic reuse of knowledge. Similarly, various researchers have acknowledged that the importance of information technology for KMS success lies in its capability to facilitate knowledge sharing (e.g., Hall, 2001; Yeh, Lai, & Ho, 2006). For example, Hall (2001) cautioned that the technical infrastructure depends on the value of the content it holds. Addressing the importance of knowledge sharing for KMS, Hall (2001) suggested that the success of the KM initiatives depends on the willingness of employees to participate in the creation of common knowledge base (p. 140).

Figure 2.4. The technical perspective of a KMS. Adapted from “A framework for knowledge management systems implementation in collaborative environment for higher learning institution” by R. Abdullah, & M. H. Selamat, (2005), Journal of Knowledge Management Practice. Available at http://www.tlainc.com/articl83.htm.
Top Management Support, Knowledge Sharing and KMS

Top management support has been associated theoretically and empirically with the successful implementation of various types of information systems (e.g. Bajwa et al., 1998; Lee & Ahn, 2010; Pai, 2006; Young & Jordan, 2008). For instance, Bajwa et al. (1998) study showed that high levels of top management support indirectly influence the success of executive information systems by developing a supportive context for the organization. Likewise Guimaraes and Igbaria (1997) suggested several reasons for the importance of management support for any system success. These authors contended that management support for a system success is essential to receive personnel and monetary resources necessary to the system development. They also added that management support is crucial to user satisfaction and adoption of the system.

With regards to KMS, research has also shown that management support is essential for system adoption (e.g. Wong & Aspinall, 2006), perceived usefulness of the system (Quaddus & Xu, 2005) and system implementation (Akhavan et al., 2006). For example, Akhavan et al. (2006) qualitative case study indicated that KMS requires CEO/management support during its design and implementation phases. Researchers and Scholars are increasingly acknowledging that KMS success depend on top management support for knowledge sharing. Davenport et al. (1998) and McKenzie, Truch, and van Winkelen (2001, p.69) pointed that top management plays an important role in ensuring KM success by sending messages that KM is critical to company’s success, identifying the type of knowledge that is important for the organization, and by describing their vision of how this knowledge can make a difference to the organization. Various studies have provided evidence that top management behavior need to be consistent with their messages and vision for KMS and emphasize the importance of knowledge sharing in order to ensure the success of the system. One interviewee in Al- Alawi et al.’s (2007, p.35) pointed this fact by stating that:

‘…my communication of information via e-mail or circulars is usually not taken very appreciatively by my coworkers because they think it is my personal initiative due to lack of management support and praise to that initiative”.

Likewise, in a survey of 173 employees working in the administrative affairs of a large US university Flowers et al.’s (2010) concluded that top management openness led to employees’
contribution to an electronic knowledge sharing database (EKSDB). Through an analysis of successful case studies of KMS, Benbya and Belbaly (2005) indicated that employees’ perception of management support for knowledge sharing can be one the mechanisms for KMS effectiveness. Similarly, Al-Busaidi et al. (2010) used a partial least square methodology to analyze the factors that determine the individual knowledge sharing behavior to a repository KMS by surveying 104 employees working in a private petroleum organization in Oman. The authors concluded that management support encouraged individual’s knowledge sharing behavior to KMS.

In contrast, a study conducted by Ciborra & Patriotta (1998) showed that numbers of employees refrained from engaging in electronic exchange forums due to concerns held about how their knowledge might be used or interpreted by senior managers. For example, Ciborra & Patriotta (1998) found that in one of groupware systems they examined, individuals’ contribution levels changed noticeably due to comments put on the system by a senior manager. This led to a panic reaction among employees and contributed to a freeze in the use of the system for months. Using a sample of 151 of IT/IS executive managers based on data collected from 805 large companies in Taiwan, Pai (2006) study showed that top management support had a positive impact on knowledge sharing behavior and was subsequently associated with ISSP effectiveness.

**Organization Culture, Knowledge Sharing and KMS**

Researchers agree that the key success to KM resides in organization’s capability to nurture an adequate organization culture. Forcadelll and Guadamillas (2002) case study of Itziar Company indicated that the corporate culture given its influence on the other organization factors was one of the essential factors that influence the successful implementation of KMS. Likewise Akhavan et al. (2006) qualitative case study findings showed that organization culture was an essential factor for KMS success for every organization that they investigated. In contrast, Al-Alawi (2005) study of knowledge intensive Bahraini organizations indicated that KMS failed due to organization culture. The study revealed that KM initiatives were weak in Bahraini organizations due to the lack of consideration that were given to cultural and organizational development issues that are seminal to any successful KM project or system.
There is a common perception that in order to develop successful KMS, the culture of an organization needs to support knowledge sharing (Ruggles 1998). A collaborative culture is not only perceived to be essential to knowledge sharing but it is also claimed to be important for KMS success. Alavi, Kayworth & Leidner (2005) cited expertise, formalization, innovativeness, collaboration and autonomy as the values of organizational culture that lead to effective KM. Debowksi (2006) indicates a collaborative culture needs to be nurtured to ensure KMS success. In contrast, a culture that is based on hostility will cause the organization to fail in achieving potential benefits of effective KMS (Allame, Nouri, Tavakoli, & Shokrani, 2011). For example, research conducted by Orlikowski (1992, 2000) showed that consultants in a large US services firm avoided Lotus Notes, a groupware for knowledge sharing due to the fact that the incentive policy and evaluation criteria did not encourage cooperation and knowledge sharing through the KMS. Furthermore, the competitive culture, low mutual trust and high fear of share in the firm hindered the sharing of individual knowledge to the intranet-based KMS.

Similarly, Lam (2005) found that organization culture was the main cause for the unsuccessful implementation of an intranet based KMS in an Indian software development company. The organization adopted a codification based approach strategy where an intranet system was established to facilitate employees to record essential knowledge that could be accessed by other organizational members. The majority of employees were unwilling to codify any of their knowledge due to the individualistic and competitive nature of the organizational culture. For example one interviewee mentioned, ‘I’m the expert and I know all there is to know’ while another interview observed, ‘why should I share with others, what’s in it for me (e.g. financial or career development)?’

In addition, the study also showed that people were concerned that their repetitive and continuous use of the codified knowledge made available through the KMS by their colleagues could be perceived as a weakness by colleagues, and as a lack of innovativeness to develop their own ideas. Thus, one interviewee expressed this concern by saying, ‘people will see me as dependent on the brain of others’. Ruppel and Harrington (2001, p.38) suggested that ‘since sharing on intranets imply sharing both explicit and tacit knowledge therefore an organizational culture that encourage sharing is conducive to more effective KM, intranet use and success’. Furthermore, Jennex, Smolnik, and Croasdell (2008, 2009) suggested that an organization
culture that support learning, knowledge sharing and use is essential to KM success. Collaborative culture has been identified to be among the culture characteristics that facilitate knowledge sharing and KMS success.

**Organization Structure, Knowledge Sharing and KMS**

Though organization structure has been claimed to be related with organization culture (Gupta & Govindarajan, 2000; Kulkarni et al., 2006/2007), researchers have also identified it as a critical key factor for KM initiative success. Malhotra (2002) and Allame et al. (2011) indicated that it could be also be as well a key constraint to the success of KMS. The influence of organization structure on KMS can be acknowledged from several aspects. First, according to Mayer and colleagues in McNeish and Mann (2010) the impact of organization structure on the division of labor, allocation of decision rights, choice of coordinating mechanisms, delineation of organization boundaries, and networks of information relationships impacts the way knowledge is managed and shared. Similarly, Debowski (2006) also indicated that organization structure influences how knowledge is created and most importantly disseminated. Organization structure defines the relationship between individual and organization knowledge by determining who is expected to control specific knowledge, as well as who must share it and who can hoard it.

Hasanali (2002) indicated that organization structure is vital for KM success and also suggested that roles and responsibilities are also crucial to KMS success. Akhavan et al. (2006)’s qualitative case study revealed that organization structure was considered to be among the most important key factors for KMS success for organizations such as Microsoft, Hewlett-Packard, Siemens, Teltech, and BusinessEdge Solutions. These authors hinted that a decentralized and a value oriented organization structure facilitate the implementation of KMS. Anantatmul and Kanungo (2007) indicated that formalization can influence KM success. In contrast, formalization and standard operating procedures have been claimed to impede KM initiative success (Levy, Hadar, Greenspan, & Hadar, 2010).

Similarly, Conley and Zheng (2009) advanced that a formalized and centralized structure undermines KM success whereas a flexible structure promotes it. Davenport et al. (1998) conducted an exploratory study of 31 KM projects in 24 organizations which sought to identify the factors related to KM effectiveness. The authors indicated that a standard and flexible
knowledge structure were associated to KM effectiveness. Similarly, Forcadell and Guadamillas (2002) case study revealed that the flexible structure of ‘Itziar Company’ facilitated the successful implementation of KMS. Jennex et al. (2008, 2009) indicated that an organization structure that support learning knowledge sharing and use is essential to KM success.

**Relationship between Organization Contexts, Knowledge Sharing and Innovation**

This section provides a review of the literature on organization contexts relationship with innovation, and knowledge sharing and innovation. Three hypotheses are formulated for this section as follow:

*Hypothesis 1*: Organization contexts have an effect on innovation.

*Hypothesis 2*: Knowledge sharing has an effect on innovation.

*Hypothesis 3*: Knowledge sharing has a mediating effect on the relationship between organization contexts and innovation.

**Knowledge Sharing and Innovation**

Innovation is commonly defined as the introduction of newness into an organization. It is generally conceived to include the adoption, generation, development, and implementation of new ideas or behavior (Damanpour, 1991; Damanpour & Gopalakrishan, 2001). Various authors propounded that innovation success depends on organization’s ability to capitalize on the knowledge available in the organization and the expertise possessed by its staff. In contrast, other authors contended that knowledge should be managed in order to foster innovation. For example, Gloet and Terzioski (2004) and Leiponen (2006) argued that innovation depends heavily on organization’s capability to effectively manage knowledge.

Authors like Bhirud, Rodrigues, and Desai (2005) maintained that knowledge sharing is the antecedent of innovation and that KM and innovation are linked to innovation by knowledge sharing (see figure 2.6). Knowledge sharing is considered as the antecedent of innovation. Calhoghirou, Kastelli and Tsakanikas (2004) sustained that the organization’s internal capability and openness towards knowledge sharing are essential to its innovative performance. Similarly,
Darroch and McNaughton (2002) added that by encouraging employees to contribute knowledge within groups, organizations are more likely to generate new ideas and develop new business opportunities, thus facilitating innovation activities. Much of the KM literature attributes organization innovation success to effective knowledge sharing.

Knowledge sharing and innovation seemed to share similar characteristics with regard to human behavior, and organization issues. Both knowledge sharing and innovation necessitate special behavioral support from employees such as individual motivation and interaction. Nacinovic, Galetic, and Cavlec (2009) posited that innovation greatly depends upon motivated employees that take initiatives and are creative in their work. Similarly, Yoo and Torrey in Bock, Zmud, Kim and Lee (2005) pointed that knowledge sharing behaviors are likely to be influenced by personal motivations. In addition, knowledge sharing and innovation depend on individuals’ interaction. Wong et al. (2009) stated that the sharing of knowledge implies interactions between individuals with agreed and acceptable behavior. Likewise Axtell et al. (2000) defined innovation as the process where the implementation of ideas requires the involvement of others.

Furthermore, various authors maintained that factors affecting knowledge sharing can be classified into individual and organizational factors (e.g. Connelly & Kelloway, 2003; Lin, 2007b). Likewise there seems to be a common agreement among researchers that individual factors and organizational factors have an impact on innovation (e.g. Jaskyte, 2011). Similar to knowledge sharing, information technology, top management support, organization culture, and organization structure have also been found to have an impact on innovation.

Researchers and scholars have theoretically and empirically emphasized the importance of knowledge sharing in enhancing innovation (e.g. Darroch & Mc Naughton, 2002, Calhogirou et al., 2004; Liao, 2006; Lin, 2007b; Zhi-hong, Li-bo & Shu, 2008). The majority of empirical studies have showed that knowledge sharing is essential in fostering innovation activities, and ensuring organization innovation capability and performance. For example, Kim and Kim (2000) surveyed 150 professional employees in six business corporations in South Korea, and found a significant positive relationship between knowledge sharing and organizational innovation. Similarly, Liao (2006) used a sample of 271 from computer manufacturing in Taiwan found that employees’ knowledge sharing behavior is positively related to firm innovation. In addition,
Lin’s (2007b) research results which also revealed that employees’ willingness to share knowledge is significantly related to firm innovation capability.

Similarly, Zhi-hong et al. (2008) used a sample of 115 Chinese firms to explore the relationship between knowledge sharing and absorptive capacity on innovation capability and find that knowledge sharing within firms has a positive influence on innovation. Kamasak and Bulutlar (2010) examined two knowledge sharing forms such as knowledge collecting and donating on innovation by surveying 246 middle and top-level managers in Turkey and found that knowledge sharing particularly knowledge collecting had a significant influence on all types of innovations. Lastly, Thompson and Heron’s (2006) research suggest that knowledge sharing behaviors among R&D employees are positively associated with innovative performance. Their study are supported by Sáenz et al. (2009) and Carmelo-Ordaz et al.’s (2011) studies which also reported a positive relationship between knowledge sharing and innovation performance.

Knowledge sharing types, particularly tacit knowledge sharing has been claimed to be crucial for innovation success. Cavusgil, Calantone, and Zhao (2003) surveyed various US manufacturer and service firms to analyze the effect of tacit knowledge sharing on firm innovation capability. Blumm’s case studies cited in Seidler- de Alwis and Hartmann (2008) revealed that tacit knowledge sharing sped up the innovation process that led to innovation success. In the same line of thinking, Nonaka and Takeuchi (1995) suggested that achieving a high level of shared tacit knowledge plays a crucial role in achieving sustainable innovation. Furthermore, they explained that an organization can increase innovation by turning tacit knowledge into explicit knowledge through externalization and sharing it with others. On the bases of Nonaka (1995), it can be assumed that both the sharing of explicit knowledge and tacit knowledge are essential in fostering innovation.

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\text{Knowledge Management} \quad \text{Knowledge Sharing} \quad \text{Innovation}
\]

*Figure 2.5 The link between KM and innovation. Adapted from “Knowledge sharing practices in KM: A case study in Indian software subsidiary” by S. Bhirud, L. Rodrigues, & P. Desai, 2005, Journal of Knowledge Management Practice. Available at: http://www.tlainc.com/articl103.htm*
Information Technology, Knowledge Sharing and Innovation

Recent studies have showed that information technology practices, infrastructure and capability can be an important mean for innovation. For example, Chen and Tsou (2007) through a survey of 558 financial firms located in Taiwan showed that components of information technology adoption such as information technology infrastructure had a positive effect on process and product innovation. Using a sample of 87 people working in 18 different sectors in Istanbul, Zehir et al. (2008) analyzed the impact of information technology and organization learning on firm performance and innovation and showed from correlations and multiple regression analyses that information technology had a positive and significant effect on firm innovation.

Rhodes et al. (2008) examined the relationship between organizational factors, knowledge transfer, innovation capability and organizational performance by surveying 223 Taiwanese high-tech industry companies. The authors found that information technology capability was positively and significantly associated with organization innovation. Gloet and Terziovski (2004) indicated that the success of innovation performance, which includes new process, product and service, depends highly on the integration of KM processes with soft HRM activities and hard information technology activities. Sáenz et al.’s (2009) study results showed that information technology, employees and processes had a positive effect on knowledge sharing effectiveness. Subsequently, the knowledge sharing was found to have a positive effect on enhancing innovation capability.

Information technology influence on innovation can be understood from three perspectives. First, information technology contributes to the integration of knowledge or even to the stimulation of new knowledge (Davenport & Prusak, 1998). Second, information technology increases the speed on the availability of information, which in turn enhances innovations (Johanssen et al., 2001). Finally, information technology facilitates innovation as it allows individuals to be connected through its infrastructure which allows the sharing of knowledge across the organization and reuse of knowledge in the creation of new goods and services (Nerkar & Paruchuri, 2005). From the literature review, knowledge sharing is vital for innovation, thus it can be assumed that information technology that facilitate knowledge sharing may have a positive impact on innovation.
Top Management Support, Knowledge Sharing and Innovation

Various studies have indicated that top management support can either have a positive or negative impact on innovation. Page (1993)’s study indicated that one out of every four innovators qualify top management support as a prerequisite for success. Atuahene-Gima (1996) used a survey 600 Australian firms to compare innovation activities between manufacturing and services firms, and found that the most important factors affecting new service performance seemed to be the extent of the firm’s focus on innovation activities in human resource strategy, teamwork and management support. Likewise, Gupta and Wilemon’ (1996) survey results of 120 technical directors from technology-based companies reported that senior management support to various technical activities was one of the key factors in successful innovation. Carbonell and Rodriguez-Escudero (2009)’s study findings of 183 new product projects indicated that top management support had a positive effect on innovation speed under conditions of high technology novelty and high technological turbulence.

In contrast, Kanter in McLean (2005) listed 10 “Rules for stifling innovation” that included lack of management support or encouragement. Similarly, an empirical study Lansisalmi et al. (2004) surveyed 750 employees in 40 small and middle-sized industrial enterprises focused on six types of barriers of innovation among which non-supportive managerial behavior. Similarly, Taminiau, Smit, and de Lange (2009) based on in-depth interview with 29 consultants in the Netherlands found that lack of management support represented a major barrier for innovation. Their research indicated that consultants stated that they were not supposed to invent or come up with something new and that top management was mainly concerned with the revenues. As one interviewee noted (p.50):

‘…one expects the consultant to be an expert in the service it offers, not to invent something new. Ideas are worked out if it fits the main street and if it provides revenues’.

The findings also suggested that top management failed to provide the necessary financial resources and this resulted in a situation where the consultants had to elaborate their innovative ideas in their own time, with no support from colleagues or without access to the relevant network.
Various authors agreed that top management plays an important role in providing appropriate leadership and nurturing a supportive organization culture. For example, Axtell et al. (2000) study findings implied that in order to get ideas implemented there needs to be a supportive group and organization environment that included participation in decision-making and management support. McGourty et al. (1996) used a sample 14 US companies to develop a model of innovation based on both theory and research which provided a framework for facilitating innovative activities within organizations. The research concluded that an organization's culture can be modified to encourage innovative behaviors through specific management practices. Zhuang et al.'s (1999) study of 199 managers of various organizations revealed that while most organizations have realized the importance of innovation and were prepared to mobilize their managers to be involved in innovation projects, many of them have not yet been able to create an innovation culture and devise suitable policies to encourage innovation positively within the wider context of their organizations.

Authors have indicated that management support for innovation goes beyond providing resources, attracting employees’ participation and nurturing a supportive environment. Top management support for knowledge sharing is found to be equally vital for innovation success. Aulawi et al. (2009) claimed that the development of innovation capability of an individual through the development of knowledge sharing behavior necessitates adequate support from the management of the company. Ahmed, Kwang, Kok, and Loh (2002, p.69) further added that successful knowledge management companies depend on their leaders’ efforts in nurturing organizational culture and climate that continually promote learning and innovation through knowledge sharing. In addition, Lin (2007c) maintained that top management facilitation of knowledge sharing is fundamental to enable an organization with superior competence in knowledge sharing to succeed in innovation performance.

**Organization Culture, Knowledge Sharing and Innovation**

Various researches indicated a positive association between organization culture and innovation. For example, Lee, Tan, and Chiu (2008) conducted an empirical study on organization culture and organization learning impact on innovation performance by surveying
seven Taiwan high tech industries. The findings indicated that organization culture is positively and significantly related with innovation.

Furthermore, the results suggested that organization culture types have different levels of influence on innovation. Jaskyte and Dressler (2005) study findings indicated that strongly shared culture may not be appropriate for fostering innovation. These authors also concluded the higher the cultural consensus on values such as stability, security, low level of conflict, predictability, rule orientation, team orientating, working in collaboration with others, the less innovative the organization may be. Analyzing a sample of 68 Croatian firms, Nacinovic, Galetic, and Cavlec (2009) concluded that corporate culture can support innovation through values and norms that can be shape with certain features of rewards systems. Yang and Hsu (2010) explored the relationship between organizational process alignment, culture and innovation by collecting surveys from 175 high-tech firms in Taiwan and found that organization culture had a positive impact on innovation. An empirical study conducted by Valencia, Valle, and Jimenez (2010) indicated that organization culture can enhance or inhibit innovation.

According to the literature there is some broad agreement on the types or norms of organization culture needed to improve organization innovation. By conducting an interpretive study to compare differences in culture between high-innovative and low-innovative companies, Jassawalla and Sashittal (2002) identified several features of highly innovation-supportive cultures which included favoring collaboration, creativity, and risk-taking. Similarly, Kanter in McLean (2005, p.32) suggested that innovation is most likely to occur in organizations that emphasize collaboration and teamwork. An empirical study conducted by Hurley and Hult (1998) showed that from a survey of 9648 employees of a large US government R & D unit, a supportive and collaborative culture had a positive influence on organization innovation.

Citing from previous, Hurley and Hult (1998) further explained that support and collaboration reduces fear and increases openness and therefore increases new ideas and risk taking that lead to successful innovation. Anantatmula (2008) advanced that promoting innovation using the KM process requires collaborative culture and participation in decision-making. Mian, Takala, and Kekale (2008) explained that organization culture can establish the effectiveness of knowledge sharing practices which may lead to innovation.
Organization Structure, Knowledge Sharing and Innovation

Organization structure may facilitate innovation by fostering a working environment that encourages interaction among employees. Organization structure may also influence innovation by promoting communication across departments and informal meetings. For example, Robbins (2003) highlighted four factors that have an effect on innovation and indicated that an organic organization structure and good communication between departments can enable innovation. In addition, the structure of an organization may promote innovation through its decision-making process and knowledge sharing.

For example, an organization structure that supports employees’ participation in the decision-making process is claimed to be conducive to innovative approaches to problem solving. Studies conducted by (Axtell et al., 2000; West & Anderson, 1996) suggested that employee participation in the decision-making process can enhance innovation. According to Islam, Ahmad and Mahtab (2010), the greater the flexibility in organization structure is, the lower the obstacles in communication flow in the organization are. Moreover, these authors stressed that as rules and regulations are secondary in such a structure, employees are more enable to use their area of expertise to quickly address a crisis and to freely share knowledge among them to eradicate the crisis as soon as possible.

Several studies have shown how certain organizational structures facilitate the creation of new products and processes, especially in relation to fast changing environments. For example, Cho’s (1996) case study of a Korean firm, Samsung, to identify the characteristics of the organizational innovations in the era of globalization; investigate the consequences of the organizational innovations and analyze the problems the company face in implementing them; and finally determine the remedies for overcoming those problems. The study revealed that the organization strived to implement innovation in three ways: 1) Operating teams; 2) networking; and 3) flattening of hierarchy. The author concluded that a “clustered web” organizational structure is desirable for innovation. Similarly, Ozsomer et al. (1997) study showed that a flexible organization structure had both a direct and indirect effect on innovation and concluded that adopting a flexible organization structure is the prerequisite to innovation.

Analyzing the effect of organization structure on innovation in a retail chain, Chang and Harrington (1998) explained that in a centralized structure, the organization headquarter is the
sole source of new ideas while in a decentralized structure store managers have the freedom to adopt their own ideas and disseminate innovations. The authors concluded that a centralized organization structure is more suitable when innovation opportunities are moderate whereas a decentralized structure is desirable when such opportunities are rich. In contrast, Mian, Takala & Kekale (2008) suggest that rigid, formal and command and control structures may promote functional efficiency at the detriment of collaborative and innovative activities. Chen and Tsou’s (2007) study of 558 Taiwanese financial firms show that organization structure had a positive effect on innovation. Miller and Toulouse (1986) and Wissema et al. (1980) quoted in Cosh et al. (2005) maintained that innovation requires organization flexibility to facilitate the coordination between the departments within the innovative firm, and to manage change, foster new ideas and effectively commercialize them.

Cosh, Fu, and Hughes’s (2005) survey of 465 innovative British small and medium enterprises (SMEs) showed that the innovative efficiency of these organizations was positively affected by the flexibility of the organizational structure. A flexible organization structure has also been claimed to encourage knowledge sharing and consequently provide an adequate environment for the creation of new ideas. Seidler-de Alwis and Hartmann (2004) explained that organization structure characteristics that include openness and information management where people are not inhibited in sharing knowledge, and do not fear that sharing knowledge will cost them their jobs affect the innovation capability of organization.
CHAPTER III. METHODOLOGY

This chapter introduces the research design and methodology. It highlights the theory that supports the research and presents the research hypotheses derived from the research questions. It also provides a detailed description of the research questionnaire, research procedure as well as the approach for validation of the measurement instrument. Furthermore, it describes different constructs used and their associated reliability estimates, showing that they meet the requirements for academic research.

Research Framework

Relying on the review of the literature discussed in chapter 2 and the research purposes and questions, the conceptual framework for the study was developed (see figure 3.1, p. 51). This research seeks to analyze the effect of knowledge sharing on innovation and KMS. Theoretical and empirical studies suggested that knowledge sharing affect innovation and KMS success. In addition, there is a common consensus among scholars and researchers that knowledge sharing does not happen in a vacuum. Wang and Noe (2009, 2010) indicated organization contexts as one of the environmental factors affecting knowledge sharing. According to organization theory and knowledge sharing theory, organization contexts may have an influence individuals’ knowledge sharing behavior. Based on organization theory, knowledge is a crucial ‘source of competitive advantage when it is integrated effectively; it can create or add value to organizations in the long run (Jain, Sandhu, & Sindhu, 2007). Researchers (e.g., Alavi & Leidner, 1999; Flowers et al., 2010; Janz & Prasarnphanich, 2003) argued that knowledge increases in value when it is shared and requires supportive environment for growth. Christensen (2007) also stressed that organization theory combined with knowledge sharing theory addresses important issues influencing knowledge sharing behavior.

For example, Christensen (2007) and Orlikowski (1992) identified organization structure and technology as important variables in organization theory that have an influence on knowledge sharing. Therefore one of the objectives of this study is to examine the influence of organization contexts (i.e. information technology, top management support, collaborative
culture and organization structure) on knowledge sharing. Moreover, the literature contends that organization contexts do not only affect knowledge sharing but are also believed to have an effect on innovation and KMS. Therefore the relationships between organization contexts, knowledge sharing, KMS and innovation are also analyzed. Knowledge sharing is studied as mediator, organization contexts are considered as the independent variables and KMS and innovation as the dependent variables. Demographic factors such as (age, gender, education, and tenure) are integrated only in the hierarchical regression analysis as control variables and as alternative explanations showing the extent to which the independent variables affect the mediator and the dependent variables.

Figure 3.1 Conceptual Framework
Research Hypotheses

On the bases of the research questions, the literature review, the research framework and Baron and Kenny (1986) guidelines for mediation testing, the research hypotheses are formulated as follow:

Hypothesis1: Organization contexts have a positive effect on KMS.

Hypothesis2: Organization contexts have a positive effect on innovation.

Hypothesis3: Organization contexts have a positive effect on knowledge sharing.

Hypothesis4: Knowledge sharing has a positive effect on KMS.

Hypothesis5: Knowledge sharing has a positive effect on innovation.

Hypothesis6: Knowledge sharing has a mediating effect on the relationship between organization contexts and KMS.

Hypothesis7: Knowledge sharing has a mediating effect on the relationship between organization contexts and innovation.

Research Procedure

The research procedure path is illustrated in figure 3.2 and described in details as follow:

A review of the literature on KM revealed several key topics commonly linked to KM that include KMS, innovation, knowledge sharing, and organization contexts. Further literature review has been carried out on the basis of the interests generated from these variables to determine the nature of their connections. The literature also revealed that few studies related to KM and knowledge sharing has been conducted on voluntary organizations, this has prompted this research to focus on nonprofit organizations as an area for investigation. Given that the topic was not previously well-researched; all the constructs have been identified and described and a theory have been selected from the literature in order to build a good theoretical model. Moreover, the relationships among the constructs were also addressed so as to form a clear idea
about the research objectives and frame the questions for the study and provide a comprehensive research framework.

The research population/sampling were also selected on the basis of the literature. Convenience sampling was used as the researcher was interested in investigating the research topic in a nonprofit organization. Purposive sampling was adopted given the targeted participants for the study was full-time employees. The criteria for choosing the survey participants were also established on the basis of the literature. Once the research population and sampling were identified, a quantitative survey methodology was selected given its suitability in fulfilling the research purposes and answering the research questions and hypotheses. Questionnaires were selected as effective tools for data collection.

The measurements for all research constructs were adopted from the work of previous researchers that have been published in scholarly journals. Only two measurements, explicit knowledge sharing and KMS effectiveness were drawn from master theses. Given that the questionnaire for KMS effectiveness was extracted from an unpublished master thesis, the researcher contacted the author to obtain permission, discuss the measurements presented in the questionnaire and to obtain information on how the questionnaire needed to be cited in references. The common characteristic of all the measurements used for this thesis was that their authors carried satisfactory reliability and validity analyses on the selected constructs.

Once the survey questionnaires were collected, participants’ answers were first coded in excel 2007 and analyzed in SPSS19.0 and Smart PLS. Overall statistic analyses included reliability and validity analyses, descriptive statistics, and correlations analysis. Finally after analyzing the data and assessing the implications, the researcher drew the conclusions for the research and provided some recommendations for the case organization and for future studies.
Figure 3.2 Research Procedure
Research Method

This research used a quantitative case study that followed a self-reported survey methodology to gather the necessary data and to investigate the relationship among the variables of interest. The case study was used to enable the researcher to closely examine the data within a specific context which is in this case a Taiwanese nonprofit organization.

Survey was employed for the following reasons. First, surveys can be readily analyzed and interpreted, because they are structured around key items and topics. Second, they ensure confidentiality for the respondents who may be more inclined to provide honest feedback if their identity remains undisclosed (Debowski, 2006, p. 278).

Since the researcher was interested in determining the factors affecting employees’ tacit and explicit knowledge sharing behavior, self-reported measures were used. Behaviors and attitudes are determined by the individuals’ perceptions of reality rather than by objective reality (Rentsch, 1990), self-reporting quantitative surveys allowed respondents to report their own perceptions of reality. Self-reported measures are considered as the most suitable methodology for the study of individuals’ behavior (Howard, 1994; Spector 1994).

Research Instrument Description

Research instrument design

The research instrument used consists of a self-reported survey questionnaire to collect the required data and to test the established hypotheses. The research instrument was developed by applying the best practices and good design principles as follow:

- A cover letter was used to introduce the study and its purposes were clearly stated.
- The questions were grouped into sections on the basis of their relevance and relationship.
- Simple instructions were provided at the beginning of the questionnaire and at each section.
- The questions were free from subjective tones in order to prevent bias.
- The questions were applicable and answerable by most participants.

On the basis of the research purposes, this study can be divided into three sections. Therefore the questionnaire consisted of four sections: A) Contextual Factors; B) Knowledge sharing types; C) KMS and innovation and D) participant background.
The participant background section was added as a fourth section in order to provide a descriptive analysis of the survey respondents. This section contained demographic information such as participants’ age, gender, tenure, education and department. Given that this section was included for primarily for informative purpose, the related questions were located at the end of the research instrument. This allowed the researcher to begin the questionnaire with items that were the primary focus of the research.

**Research instrument translation**

The constructs that composed the research instrument were originally developed in English. Applying the same procedures as Song, Kim and Kolb (2009), translation procedures were conducted according to these criteria: (1) clarity, (2) common language, (3) cultural adequacy, and (4) contextual understanding to ensure that the items were applicable to the Taiwanese nonprofit organization. Furthermore, the final version was reviewed by two bilingual professionals including the researcher’s thesis advisor, and an experienced professional working in a Taiwanese nonprofit organization for more than 20 years in order to establish the content and face validity of the final survey instrument.

**Research instrument validity and reliability**

Using SPSS19.0, reliability analysis was carried out on the basis of Bartee, Grandjean and Bieber (2004) theory based questionnaire as Cronbach’s alpha coefficient and Cronbach’s alpha item if deleted. In addition corrected item total correlation was also taken into account in examining the internal consistency of the research instrument. Finally, the research instrument construct validity was assessed through factor analysis on the basis of guidelines provided by Hair et al. (2006). See Table3.1.

Using Smart PLS, reliability and validity analyses included average variance extracted, composite reliability, loadings, and Cronbach’s alpha. Content validity was established by adopting measurements that have already been used and validated in relevant research. The operational measures of each construct are presented in (Table 3.2, p. 58) and discussed as follow:
**Information Technology**

Information technology survey items were adopted from Rhodes et al.’s (2008) study which analyzed organizational context factors on knowledge transfer and organization performance. The Cronbach alpha for the overall five items in the scale was .92.

**Top Management Support**

Top management questionnaire was applied to measure the participants’ perceptions of support from upper management. The items for this scale were adopted from Kang, Kim, and Chang’s (2008) research which investigated the effect of knowledge sharing on work performance. This scale is composed of three items and the overall Cronbach alpha was .74.

**Collaborative Culture**

This scale was aimed to measure the general level of collaboration among employees by using the three items developed by Hurley and Hunt (1998). The Cronbach alpha for this measure was .72.

**Organization Structure**

Organization structure was assessed by using the four items drawn from Kang, Kim and Chang’s (2008) study which analyzed the influence of organizational dimension factors, individual dimension factors, and characteristics of knowledge dimension on knowledge sharing. It contained four items and the Cronbach alpha was .90.

**Tacit Knowledge Sharing**

Tacit knowledge sharing was measured by four items drawn from Lin’s (2007) study which analyzed the antecedents and mediators of tacit knowledge sharing. The author developed the scale based on previous research by Bock and Kim (2002) and Daft (2001). The Cronbach alpha for this construct was .88.
**Explicit Knowledge Sharing**

Explicit knowledge sharing scale items were drawn from Holste’s (2003) doctoral dissertation which examined the effect of trust on intra-organizational knowledge sharing and use. The cronbach alpha for his study was .90.

**Innovation**

The five items in innovation questionnaire were drawn from Hurley and Hult (1998)’s study which examined organizational characteristics impact on innovation. The Cronbach alpha of the questions items developed was .82.

**KMS**

KMS scale items were drawn from Shih and Morisson (2009) KMS effective knowledge service questionnaire in Morisson’s (2009) master thesis. This measure contained 11 items and the Cronbach’s alpha for the study was .86.

Table 3.1

*Hair et al. (2006) guidelines for factor loading cutoff points based on sample size.*

<table>
<thead>
<tr>
<th>Sample Size needed for significance</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>.30</td>
</tr>
<tr>
<td>250</td>
<td>.35</td>
</tr>
<tr>
<td>200</td>
<td>.40</td>
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<tr>
<td>150</td>
<td>.45</td>
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<td>120</td>
<td>.50</td>
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<td>100</td>
<td>.55</td>
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<td>85</td>
<td>.60</td>
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<td>70</td>
<td>.65</td>
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<tr>
<td>60</td>
<td>.70</td>
</tr>
<tr>
<td>50</td>
<td>.75</td>
</tr>
</tbody>
</table>
Table 3.2

**Content validity** - Previous studies' results for internal consistency reliability tests

<table>
<thead>
<tr>
<th>Authors</th>
<th>Constructs</th>
<th>Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodes et al. (2008)</td>
<td>Information Technology</td>
<td>5</td>
<td>.92</td>
</tr>
<tr>
<td>Kang et al. (2008)</td>
<td>Top Management Support</td>
<td>3</td>
<td>.74</td>
</tr>
<tr>
<td>Hurley &amp; Hult (1998)</td>
<td>Collaborative Culture</td>
<td>3</td>
<td>.72</td>
</tr>
<tr>
<td>Kang et al. (2008)</td>
<td>Organization Structure</td>
<td>4</td>
<td>.90</td>
</tr>
<tr>
<td>Hurley &amp; Hult (1998)</td>
<td>Innovation</td>
<td>5</td>
<td>.82</td>
</tr>
<tr>
<td>Shih &amp; Morisson (2009)</td>
<td>KMS</td>
<td>11</td>
<td>.86</td>
</tr>
</tbody>
</table>

**Data Collection**

The targeted organization for this research was a nonprofit organization that had implemented KM initiatives. Data collection was carried out in various stages. In the first stage, the researcher sent a letter and a sample of the survey questionnaire to the targeted nonprofit organization explaining the purpose of the study and requesting permission for distributing the questionnaire. Survey questionnaires were used as a method for gathering the data because they are considered efficient data collection method. In addition, survey methodology was used to collect the data for testing the research hypotheses because it enhances the generalizability of the results (Dooley, 2001). Convenience sampling was used for data collection in order to retrieve a larger number of completed responses quickly and efficiently.
In the second stage, after permission to conduct the survey was given, paper-based surveys were hand-delivered to the case organization in April, 2011 by the researcher. The researcher was able to count with the assistance of a Human Resource employee designated by the organization in helping with the distribution of the survey. In a final stage, a follow-up study was conducted later in November 2011; the data was collected three weeks later. In addition in order to facilitate access to all employees, the survey was also made available for 80 days through a web link: https://www.surveymonkey.com/s/5Y5JLBV.

**Nonprofit Organization Selected for Study: Taiwan ICDF Background**

The International Cooperation and Development Fund (Taiwan ICDF 國際合作發展基金會) was established in 1996 as an independent organization to consolidate and manage international assistance that the government of the Republic of China on Taiwan has been providing through international cooperation programs; to establish friendly relations with African countries, the Middle East, Central and South America, East Asia and the Asia-Pacific region; and finally to assist diplomatic allies and friendly nations in achieving economic and social development.

The Fund’s core competencies include lending and investment, technical cooperation, humanitarian assistance, and international education and training. With a mission of “working for humanity, sustainable development, and economic progress”, Taiwan ICDF is responsible for planning, implementing, and evaluating effective projects that support sustainable development. The organization’s funding activities range from providing micro financing to funding agricultural development projects, private sector development, emergency recovery projects, overseas projects and large-scale infrastructure projects.

The organization structure comprises the Board of Directors which is the Fund’s highest decision-making body (see fig.3.2, p.64). The Secretary General, assisted by the Deputy Secretary General, is responsible for the operations of the organizations, supported by the work of five departments and seven offices which are the Technical Cooperation Department, Humanitarian Assistance Department, Lending and Investment Department, International Education and Training Department, General Management Department, the Accounting Office,
the Financial Affairs Office, the Public Relations Office, the Personnel Office, Legal Affairs Office, Information Technology Office, and the Auditing Office. Overall, Taiwan ICDF has 92 domestic personnel, 225 overseas experts, 56 overseas volunteers, and 99 youth overseas servicemen.

As of 2009, the organization had a net balance of NT $ 15.6 billion which is generated from its funding fund, donated fund and accumulated earnings. Taiwan ICDF consistently strives to strengthen its methods of delivery to improve performance and bring renewed energy to its foreign aid operations. Taiwan ICDF work emphasizes on professionalism, growth, and innovation.

**Population and Sample**

The targeted population for this study consisted of full-time employees working at Taiwan ICDF for the following reasons. First, employees are the most important source of organization knowledge because they possess the professional expertise necessary for managing operations successfully. Desouza (2003) noted that employees are the crucial ingredient in the organizational evolution of tacit knowledge sharing as they are the knowledge providers and users. Third, alike KMS, innovation requires employees support for success (Nacinovic, Galetic & Cavlec, 2009). Sajeva (2010, p. 769) stressed that among all the stakeholders in KMS, employees are the most significant participants since that they are the key source of the intellectual capital acquired and managed by the KMS. Finally, employees can provide a more realistic account of the organization they belong to.

The sampling of the study was satisfactory for partial least square (PLS) analysis which required a sample size that is ten (10) times the total indicator for the research. For this study, a minimum sample size of 60 (6x10) was needed. It was also acceptable based on Green’s (1991, cited in Wilson, Voorhis, & Morgan, 2007) procedures used to determine regression sample sizes according to which: \( N > 50 + 8m \) (m representing the independent variables). Since mediation variables were included the sample should have been \( N > 50 + 8 \times 6 = 98 \) samples. As a total of 90 questionnaires among 103 were returned, the ratio of participation was approximately 87%.
Figure 3.3 Taiwan International Cooperation and Development Fund (ICDF) Organizational chart.
Data Analysis Methods

Prior to testing the hypotheses, responses were examined for missing data. Reversed items were corrected for testing. Dummy variables were created for gender and department, other coding were adopted for tenure, education. After the data was successfully coded; several analytical procedures were used to analyze the data. Statistical analyses included for example, reliability and validity analyses, descriptive statistics and correlation analysis, and mediation analysis. Mediation analysis was carried based on two methods: hierarchical regression and partial least square (PLS) analysis. The researcher used Social Sciences Package (SPSS 19.0) to conduct hierarchical regression and Smart Partial Least Square (Smart PLS) software to carry out the analyses. The statistical procedures used for data analysis are described in details as follow.

Statistical Analyses

In order to analyze the effect of knowledge sharing on KMS and innovation and further examine the relationships between organization context, knowledge sharing, KMS, and innovation, a mediation regression approach was adopted. The mediated regression analysis followed a three-step process as described by Baron and Kenny (1986). According to Baron and Kenny (1986) there’s mediation when the following conditions are met:

1) the independent variable (s) is/ are significantly related to the dependent variables (knowledge sharing) in the first test;

2) the independent variable (s) is/ are significantly related to the mediator (s) in the second test;

3) the mediator (s) is/are significantly related to the dependent variables ; and. the beta value of the independent variables on the dependent variables is less in the third test than in the second test.

According to Baron and Kenny (1986), full mediation applies when an independent variable becomes insignificant in the final test. Partial mediation exists when an independent variable is still significant in the final test for mediation procedure.
Statistical Analyses in SPSS 19.0

A series of validity and reliability tests were carried out to ensure the accuracy of the measurements. Reliability tests were conducted to evaluate the consistency of the participants’ answers to the items in the questionnaire. Reliability tests included Cronbach’s alpha item if deleted, Cronbach’s alpha coefficient, and Corrected item-total correlation.

Cronbach’s alpha item if deleted was used to identify what items in a scale were not homogenous and did not load on the same scale. This was achieved by checking the “Cronbach’s alpha item if deleted” column and examining whether any entries in the column were greater than the overall Cronbach’s alpha coefficient. Bartee et al. (2004) explained that if Cronbach’s alpha increased as a result of deleting any particular items, this would signal that these items measure something different than what the other items measure. The authors further added that these items might not belong in the same scale with others.

Item total correlation was examined to determine how well the items in a scale were related to one another. In addition it also helped the researcher to evaluate the performance of the questions. Bartee et al. (2004) stressed that item total correlation values should be positive. It is recommended that values for item total correlation should be greater than three. Values for an item total correlation between 0 and .19 may suggest that the question is not discriminating well, and values .40 and above indicate very good discrimination.

The research instrument construct validity was assessed through factor analysis. At least four criteria were taken into account when examining the appropriateness of the factors’ scales. First, individual item loading should exceed the factor loading cutoff point respective to the final sample size (see table 3.1, p.58) recommended by Hair et al. (2006). For example, according to Hair et al. (2006) sample of 350 requires that the factor loading for each construct’s item should to be greater than .30 while the threshold for a sample size of 50 is .75. Second, the construct’s eigen value should be greater than 1 (Hair et al., 2006). Third, each factor should explain at least 50 % of the variance of its indicator and finally Kaiser-Meyer-Olkin measure of sampling adequacy values should be between .50 and 1 (Krizman, 2009). Kaiser-Meyer-Olkin is useful to determine the appropriateness of the data set for the factor analysis.
Following reliability and validity analyses, descriptive statistics and hierarchical regression analysis were conducted. As a first step in conducting hierarchical regression, correlation analysis was carried out to diagnose the strength of the relationship between the independent variables, the mediator and dependent variables. In addition, Pearson correlation tests were performed to fulfill Baron and Kenny (1986)’s primary requirement for mediation analysis. Based on their guidelines, the correlations among the independent variables (i.e. organization contexts) should be significantly associated to the mediator variable (i.e. knowledge sharing).

**Statistical Analyses in Smart PLS**

Authors such as Staples & Webster, 2008; Zhi-Hong, Li, Bo, & Shu, 2008 indicated that structural equation modeling (SEM) is appropriate for a mediated research model. Zhi-Hong et al. (2008) further added that SEM is especially effective when testing models that 1) are path analytic with mediating variables; and 2) contain latent constructs that are measured with multiple indicators (p. 974). Since the research model fulfilled these characteristics, PLS-based SEM analysis of variance was used for data analysis.

In addition, PLS uses a combination of principal component analysis, path analysis and a set of regressions to simultaneously evaluate the theory and the data (Staples & Webster, 2008, p. 626; Yu, Kim, & Kim, 2007). Aside from being an effective tool to confirm both theory and predictions, PLS was used in this study for the following reasons. First, PLS is adequate for small sample analysis and complex models. PLS necessitates a sample size that is ten (10) times the total indicator for complex construct of the research. Since this study 6 indicators therefore a sample size of (6x10) =60 would be necessary.

Second, PLS is also useful for exploratory analysis investigating whether relationships might exist among variables (Yu, Kim, & Kim, 2007). In addition PLS have been applied in previous studies related to organization behavior (e.g. Higgins, Duxbury, & Irving, 1992), KMS success (e.g. Al-Busaidi et al., 2010), innovation and knowledge sharing (e.g. Bock et al., 2005; Krizman, 2009). Third, PLS is essential for model including formative and reflective indicators as it is the case for this study. For these reasons and the ones mentioned above, PLS was used to test the hypothesized relationships among the study variables. Following the recommendations
indicated in (Al-Busaidi et al., 2010, Bock et al., 2005; Karim, 2009) studies, analyses in PLS were carried and interpreted in two stages: the measurement model and the structural model.

**Measurement Model**

The reliability of the constructs was determined by composite reliability and Cronbach’s alpha. Nunally and Bernstein (1994) suggested that Cronbach’s alpha value of .70 is satisfactory. Similarly, to Cronbach’s alpha, composite reliability was considered as a measure for internal consistency. According to Lawson et al. (2009) a value of .70 or higher is recommended as evidence of composite reliability. Construct validity was assessed by examining the loadings of the constructs and the average variance extracted (AVE). Whereas Li et al. (2009) advanced that a loading of .70 is considered desirable, Hair et al. (2006) suggested that the threshold for the factor loading is determined by the size of the sample size (see Table 3.2). For AVE, a cut-off value above or equal to .50 or higher is considered acceptable (Al-Busaidi et al., 2010; Li et al., 2009).

**Structural Model**

The structural model was evaluated by examining the value of $R^2$ of the latent variables, the path coefficients and the goodness of fit. The $R^2$ values were used to examine the predictive relevance of a structural model for the dependent latent variable. As in indicated in Karim (2009), this study also considered $R^2$ values of .67, .33, and .19 of latent variables as substantial, moderate, and weak respectively. With regards to the quality of the model, three indicators were taken into account: communality indexes and average communality, average redundancy and goodness of fit. The goodness of fit (GoF) of the model was used to determine the overall fit of the model and was assessed on the basis of Tenenhaus, Vinzi, Chatelin, and Lauro (2005) global fit measure. The corresponding formula is written as follow:

$$\text{GoF} = \sqrt{\text{communality} \times R^2}.$$
CHAPTER IV. RESULTS AND DISCUSSION

The purpose of this chapter is to present the main findings of the current study. It starts with analyses carried out in SPSS19.0 followed by analyses conducted in Smart PLS. This chapter also contains the discussion and implications for the study. The discussion section covers two parts: the discussion for hierarchical regression analysis and the partial least square regression analysis.

Sample Characteristics

The characteristics of the participants are described in Table 4.1 in terms of gender, age, education, tenure in the organization, and department. The response shows that the majority of the respondents were female (66.7 percent) against male (33.3 percent). This is a typical characteristic of Taiwan nonprofit organizations. Liu & Fang (2010) indicated that most staff working in Taiwan nonprofit organizations are female. The largest group of the respondents was between the age group of 26 and 35 (37.8 percent), nearly 7 percent were under 25 years and a share of 30 percent was between 36 and 45 years of age. About 6 percent of the respondents were above 56 and 40 percent were between the age of 46 and 55. In relation to educational level, the participants were well-educated with 57.8 percent holding a master degree and 37.8 percent having a bachelor degree. Only 3.3 percent of the participants were technical school graduate. With regards to the length of service, the results indicated that the majority of employees 30 percent have been working for a period between 3-5 years whereas 27.8 percent of them have been employed for more than 8 years. Nearly 7 percent of the respondents had a tenure of less than 1 year, 15 percent had a tenure ranging from 1 to 2 years, 20 percent served the organization for a period between 6-8 years. The majority of the participants (24.4 percent) work at the General Management Office, and Humanitarian Assistance Office (12.2 percent). Please refer to Table 4.1.
Table 4.1  
*Distribution of Research Respondents based on Demographic Variables (N=90)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Entries</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>33.3</td>
</tr>
<tr>
<td>Female</td>
<td>60</td>
<td>66.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25</td>
<td>6</td>
<td>6.7</td>
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<tr>
<td>26~35</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>36~45</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>46~55</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Above 56</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td><strong>Education</strong></td>
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<td></td>
</tr>
<tr>
<td>High school degree</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Technical school</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>Master degree</td>
<td>52</td>
<td>57.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td><strong>Tenure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>6</td>
<td>6.7</td>
</tr>
<tr>
<td>1-2 years</td>
<td>14</td>
<td>15</td>
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<td>3-5 years</td>
<td>27</td>
<td>30</td>
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<tr>
<td>6-8 years</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>More than 8 years</td>
<td>25</td>
<td>27.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>99.5</td>
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</table>

*Note: (continued)*
Table 4.1 (continued)

Distribution of Research Respondents based on Demographic Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Entries</th>
<th>Percentage (%)</th>
</tr>
</thead>
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<td>Department</td>
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<td></td>
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<tr>
<td>Humanitarian Assistance</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td>Technical Cooperation</td>
<td>9</td>
<td>10.0</td>
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<tr>
<td>Lending and Investment</td>
<td>8</td>
<td>8.9</td>
</tr>
<tr>
<td>Education and Training</td>
<td>6</td>
<td>6.7</td>
</tr>
<tr>
<td>General Management</td>
<td>22</td>
<td>24.4</td>
</tr>
<tr>
<td>Accounting Office</td>
<td>9</td>
<td>10.0</td>
</tr>
<tr>
<td>Financial Affairs Office</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Public Relations Office</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Personnel Office</td>
<td>9</td>
<td>10.0</td>
</tr>
<tr>
<td>Auditing Office</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td>Information Technology</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>89</td>
<td>98.8%</td>
</tr>
</tbody>
</table>

Note: 89 out of 90 participants indicated the department (office) they belong to.

Statistical Analyses

In order to test the research hypotheses, various statistical analyses were carried out in SPSS19.0 and Smart PLS. Partial least analysis included tests related to the measurement model and structural model whereas SPSS 19.0 analyses included detailed reliability and validity tests, descriptive statistics, correlations and hierarchical regression analyses discussed as follow:

Reliability and Validity Analysis

Three indicators of internal consistency measures were calculated to assess the reliability of the research instrument: corrected item-total correlation, Cronbach’s alpha item if deleted and Cronbach's alpha. The values of cronbach alpha item if deleted for each item were compared to the values of overall Cronbach’s alpha to determine whether any entry was greater than the overall alpha of the entire scale. Consequently, one out of four items in explicit knowledge sharing EK1 “People in my organization frequently share with their co-workers tools they have developed by themselves” and two items in innovation IN4 “People are penalized for new ideas
that don’t work” and IN5 “Innovation in ICDF is perceived as too risky and is resisted” were deleted.

While the overall cronbach’s alpha value for explicit knowledge sharing was .849, EK1’s Cronbach’s alpha item if deleted was .872. According to Bartee et al. (2004), this indicated that this item was measuring something different from what the other items measured and did not belong in the same scale with the others. After EK1 was deleted, reliability test was carried out and the results indicated that no more items needed to be deleted. With regards to innovation, the values for IN4 and IN5’s Cronbach’s alpha item if deleted were respectively .687 and .740 while the overall Cronbach’s alpha value for all five innovation items was .644. In addition, the values for corrected item-total correlation for these two items although positive were less than .30. On the basis of these guidelines, these two items were also deleted.

Once IN4 and IN5 were deleted, reliability tests were further conducted for the remaining innovation items. IN1’s Cronbach’s alpha item if deleted is .920 whereas the overall Cronbach’s alpha for the remaining three innovation items was .905. Therefore, IN1 was deleted. Out of five items, only two items IN2 and IN3 fulfill the reliability for internal consistency. Corrected item-total correlation for each of the items is highlighted in Table 4.2. All items’ values of corrected item-total correlation were higher than .30 and no negative value existed. This indicated that questions item in each scale discriminated well against each other and that there was high consistency. The final cronbach alpha reliability test showed coefficient values for each construct were higher than .80 (see Table 4.12); indicating that they all were higher than the acceptable level of .70 (Nunnally & Bernstein, 1994).

In order to examine the convergent validity of the questionnaire items, a factor analysis was carried out to determine whether all items within each construct were adequate. The final research sample was 90 so items with a loading of less than .60 should be discarded on the basis of (Hair et al., 2006). Employing the same approach as (Krizman, 2009; Teh et al., 2010), principal axis factoring method was separately conducted on each set of the items representing a particular scale due to the size of the observations to determine the appropriateness of the factor loadings. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and eigen values were examined. For KMO, values between .50 and 1.0 indicate that factor analysis is appropriate (Krizman, 2009). Factors with eigen value of more than one would be retained for further
analysis (Hair et al. 2006). Although the loading of one item in KMS, KM11 “sensitive information is handled with confidentiality” did not meet the acceptable loading cutoff point, it was not deleted because it loading was slightly lower than .60. (Please see Table 4.3). In addition, when the research attempted to delete KM 11, reliability tests showed that the overall Cronbach’s alpha value for KMS dropped to .923. This indicated that keeping KM11 increased the reliability of the construct which was .924.

The KMO and eigen values for each construct were as follows: information technology (KMO=.807; Eigen=2.648); top management support (KMO=.736; Eigen=2.019); collaborative culture (KMO=.702; Eigen value=1.869); organization structure (KMO=.736; Eigen value=2.481); tacit knowledge sharing (KMO=.787; Eigen value=2.140); explicit knowledge sharing (KMO=.724; Eigen value=2.101); KMS (KMO=.887; Eigen value=5.907); and innovation (KMO=.500; Eigen value=1.700). In addition each factor explained at least 50% of the variance of its indicator. Please refer to Table 4.3 for detailed factor analysis results.

The overall test for all the remaining items in the questionnaire indicated that the total reliability estimate was greater than .80 (See Table 4.12). Thus, it can be concluded that the scales for all constructs had a high level of internal consistency and validity.
Table 4.2

*Constructs’ Reliability Analysis for this Study*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach Alpha if item deleted</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization contexts</strong></td>
<td>IT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT1</td>
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<td></td>
<td>IT2</td>
<td>.700</td>
<td>.805</td>
<td></td>
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<td></td>
<td>IT3</td>
<td>.654</td>
<td>.817</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT4</td>
<td>.673</td>
<td>.812</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT5</td>
<td>.580</td>
<td>.836</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TM1</td>
<td>.737</td>
<td>.802</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TM2</td>
<td>.745</td>
<td>.796</td>
<td>.860</td>
</tr>
<tr>
<td></td>
<td>TM3</td>
<td>.725</td>
<td>.814</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC1</td>
<td>.714</td>
<td>.732</td>
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<tr>
<td></td>
<td>CC2</td>
<td>.615</td>
<td>.827</td>
<td>.827</td>
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<td></td>
<td>CC3</td>
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<td>.717</td>
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<tr>
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<td>OS</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>OS2</td>
<td>.725</td>
<td>.825</td>
<td>.865</td>
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<tr>
<td></td>
<td>OS3</td>
<td>.774</td>
<td>.803</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS4</td>
<td>.658</td>
<td>.850</td>
<td></td>
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<td><strong>Knowledge Sharing</strong></td>
<td>EK</td>
<td></td>
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<td></td>
<td>EK1</td>
<td>.532</td>
<td>.872</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EK2</td>
<td>.725</td>
<td>.793</td>
<td>.849</td>
</tr>
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<td></td>
<td>EK3</td>
<td>.724</td>
<td>.793</td>
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<td></td>
<td>EK4</td>
<td>.784</td>
<td>.768</td>
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</tr>
</tbody>
</table>

(continued)
Table 4.2 continued

*Constructs’ Reliability Analysis for this Study*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach Alpha if item deleted</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge sharing</td>
<td>TK</td>
<td>TK1 .648 TK2 .602 TK3 .699 TK4 .616</td>
<td>.769 .791 .745 .783</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.819</td>
</tr>
<tr>
<td>Sustainability Indices</td>
<td>IN</td>
<td>IN1 .743 IN2 .872 IN3 .827</td>
<td>.920 .812 .851</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.905</td>
</tr>
</tbody>
</table>

Note: IT= information technology; TM=top management support; CC= collaborative culture; OS=organization structure; TK= tacit knowledge sharing; EK=explicit knowledge sharing, IN=innovation
Table 4.3

Constructs’ Validity Analysis for this Study

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Factor Loading</th>
<th>KMO</th>
<th>Eigenvalue</th>
<th>% Variance Explained</th>
<th>Barlett’s Test of Sphericity</th>
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</thead>
<tbody>
<tr>
<td>IT</td>
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<td>.756</td>
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</tr>
<tr>
<td></td>
<td>IT2</td>
<td>.780</td>
<td>.807</td>
<td>2.648</td>
<td>52.962%</td>
<td>$\chi^2 = 182.150; p = 0.000$</td>
</tr>
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<tr>
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<td>IT5</td>
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<tr>
<td>TM</td>
<td>TM1</td>
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</tr>
<tr>
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<td>.736</td>
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<td>67.287%</td>
<td>$\chi^2 = 120.656; p = 0.000$</td>
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<td>TM3</td>
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<td>CC</td>
<td>CC1</td>
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<tr>
<td></td>
<td>CC2</td>
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<td>.702</td>
<td>1.869</td>
<td>62.305%</td>
<td>$\chi^2 = 101.650; p = 0.000$</td>
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<tr>
<td></td>
<td>CC3</td>
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<td>.736</td>
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<td>62.022%</td>
<td>$\chi^2 = 192.620; p = 0.000$</td>
</tr>
<tr>
<td></td>
<td>OS3</td>
<td>.771</td>
<td></td>
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<td></td>
<td>OS4</td>
<td>.711</td>
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<tr>
<td>EK</td>
<td>EK2</td>
<td>.810</td>
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<td>EK3</td>
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<td>2.101</td>
<td>70.035%</td>
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(continued)
Table 4.3 continued

Constructs’ Validity Analysis for this Study

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Factor Loading</th>
<th>KMO</th>
<th>Eigenvalue</th>
<th>%variance explained</th>
<th>Barlett’s Test of Sphericity</th>
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</thead>
<tbody>
<tr>
<td>TKS</td>
<td>TK1</td>
<td>.732</td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td>TK2</td>
<td>.673</td>
<td>.787</td>
<td>2.140</td>
<td>53.498%</td>
<td>$\chi^2=120.178;p=0.000$</td>
</tr>
<tr>
<td></td>
<td>TK3</td>
<td>.812</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TK4</td>
<td>.701</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>IN2</td>
<td>.922</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>IN3</td>
<td>.922</td>
<td>.500</td>
<td>1.700</td>
<td>85.021%</td>
<td>$\chi^2=112.817;p=0.000$</td>
</tr>
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<td>.752</td>
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</tr>
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<td></td>
<td>KM4</td>
<td>.692</td>
<td>.887</td>
<td>5.907</td>
<td>53.702%</td>
<td>$\chi^2=562.276;p=0.000$</td>
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<td>KM5</td>
<td>.773</td>
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</tbody>
</table>

Note: IT= information technology; TM=top management support; CC= collaborative culture; OS=organization structure; TK= tacit knowledge sharing EK=explicit knowledge sharing, IN=innovation
Descriptive Statistics Analysis

The following section provides a summary of the responses to the questions relating to the variables under research. It provides each construct’s mean and standard deviation which reveals how well the mean represents the data. All variables are measured on five point Likert scale. Participants were asked to indicate their agreement to the statements with anchors ranging from “strongly disagree” (1) to “strongly agree” (5). The average response for each variable is greater than the midpoint (3) of the Likert scale (see Table 4.12). This indicates that the respondents show some level of agreement since their answers range between neutral and agree. Details of descriptive statistics are presented and discussed below.

Descriptive Statistics for Organization Contexts

Information Technology

With regards to information technology, employees indicated that they somewhat agree with IT5 ‘the organization has two-way communications that include for example e-billboards or regular conferences’. This item gathered the highest mean (M=3.69). Lastly, IT4 ‘managers are good at using IT to communicate with employees’ gathered the lowest mean (M=3.24), this indicates that employees are quite neutral regarding managers’ ability of using information technology to communicate with organizational members.

Table 4.4

Descriptive statistics for Information Technology

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT1</td>
<td>Organization is good at using IT to achieve success</td>
<td>3.31</td>
</tr>
<tr>
<td>IT2</td>
<td>Organization key capabilities are integrated through IT</td>
<td>3.39</td>
</tr>
<tr>
<td>IT3</td>
<td>Database has provided support and improvement to skill.</td>
<td>3.41</td>
</tr>
<tr>
<td>IT4</td>
<td>Managers are good at using IT to communicate</td>
<td>3.24</td>
</tr>
<tr>
<td>IT5</td>
<td>Existence of two-way communication (eg. E-billboards)</td>
<td>3.69</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation
Top Management Support

In relation to top management support, TM2 ‘TM encourages employees to share know-how and professional knowledge’ had the highest mean (M=3.59). This indicates that employees somewhat agree that management support this type of sharing behavior among organizational members. However, TM3 ‘TM makes effort to foster knowledge sharing culture by offering rewards’ gathered the lowest mean (M=3.21). This suggests that employees are rather neutral towards management’s provision of rewards in developing a knowledge sharing culture.

Table 4.5
Descriptive Statistics for Top Management Support

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM1  TM emphasizes the importance of knowledge sharing.</td>
<td>3.52</td>
<td>.851</td>
</tr>
<tr>
<td>TM2  TM encourages employees to share know-how and professional knowledge.</td>
<td>3.59</td>
<td>.833</td>
</tr>
<tr>
<td>TM3  TM makes effort to foster knowledge sharing culture e.g. offering rewards.</td>
<td>3.21</td>
<td>.880</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD= Standard deviation

Collaborative Culture

When it comes to collaborative culture construct, CC1 ‘people throughout ICDF are supportive and helpful’ gathered the highest mean (M=3.40). This shows that employees somewhat agree that their colleagues are somewhat supportive and helpful. However, CC2 ‘there is a willingness to accept responsibility for failure’ accounted for the lowest mean (M=3.13). This shows that employees feel quite neutral towards the sense of collective responsibility among organizational members.
Table 4.6

Descriptive Statistics for Collaborative Culture

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC1 People throughout ICDF are supportive and helpful.</td>
<td>3.40</td>
<td>.845</td>
</tr>
<tr>
<td>CC2 There is a willingness to accept responsibility for failure.</td>
<td>3.13</td>
<td>.837</td>
</tr>
<tr>
<td>CC3 There is a willingness to collaborate across organizations units.</td>
<td>3.26</td>
<td>.881</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation

Organization Structure

Referring to organization structure, employees somewhat agree with OS3 ‘a host of work rules spell out ways to handle work tasks in my department’ and OS2 ‘there is a standard operating procedure in handling work tasks in my department’. These two items gathered the highest mean scores which are respectively (M=3.69) and (M=3.67). Question OS1 ‘there is a good system of delegation of power in my department’ gathered the lowest mean score (M=3.33) this points that employees feel quite neutral towards the delegation of power within department.

Table 4.7

Descriptive Statistics for Organization Structure

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS1 Good system of delegation of my power in my department.</td>
<td>3.33</td>
<td>.793</td>
</tr>
<tr>
<td>OS2 SOP in handling work tasks in my department.</td>
<td>3.67</td>
<td>.848</td>
</tr>
<tr>
<td>OS3 Work rules spell out ways to handle work tasks.</td>
<td>3.69</td>
<td>.802</td>
</tr>
<tr>
<td>OS4 Employee participation in decision making process</td>
<td>3.36</td>
<td>.724</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation
Descriptive Statistics for Knowledge Sharing

Tacit Knowledge Sharing

Concerning the sharing of tacit knowledge, TK2 ‘People in my organization frequently share their expertise at the request of their co-workers’ shows the highest mean (M=3.60), this suggests that employees somewhat agree that organizational members put their expertise at the service of their colleagues when it is needed. However, employees signal a quite neutral agreement with TK3 ‘people in my organization frequently share their ideas about jobs with their co-workers’. This statement gathered the lowest mean score (M=3.41).

Table 4.8
Descriptive Statistics for Tacit Knowledge Sharing

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK1 Sharing of job experience with co-workers.</td>
<td>3.54</td>
<td>.721</td>
</tr>
<tr>
<td>TK2 Sharing expertise at the request of co-workers.</td>
<td>3.60</td>
<td>.731</td>
</tr>
<tr>
<td>TK3 Sharing ideas about jobs with co-workers.</td>
<td>3.41</td>
<td>.701</td>
</tr>
<tr>
<td>TK4 Talking about tips on jobs with co-workers.</td>
<td>3.49</td>
<td>.674</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation

Explicit Knowledge Sharing

When it comes to explicit knowledge sharing, table 4-11 shows that EK4 ‘people in my organization frequently share with their co-workers printed or electronic copies of documents and/ or manuals they have produced’ had the highest mean score (M=3.48). EK3 ‘people in my organization frequently share with their co-workers data/ databases/ spreadsheets they maintain’ referring to employees ‘sharing data/ databases/ spreadsheets they kept for personal use with co-workers’ had the lowest mean (M=3.33). This indicates that they employees feel quite neutral toward the sharing of these types of documents among organization members.
Table 4.9

*Descriptive Statistics for Explicit Knowledge Sharing*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>EK2</td>
<td>3.37</td>
<td>.771</td>
</tr>
<tr>
<td>EK3</td>
<td>3.33</td>
<td>.807</td>
</tr>
<tr>
<td>EK4</td>
<td>3.48</td>
<td>.753</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation

*Descriptive Statistics for Organization’s Sustainability Indices*

**Innovation**

Although IN1, IN4 and IN5 were deleted in order to increase the reliability and validity of the questionnaire, they were retained with the rest of the items in order to discuss the overall descriptive statistics results. From table 4-10, IN4 “people are penalized for new ideas that do not work” had the lowest mean (M=2.84), suggesting that they disagree with such a statement. However, question IN3 ‘innovation is readily accepted in program/ project management had the highest mean (M=3.41). This confirms that employees are somewhat agree that innovation is welcomed within the organization’s program.
Table 4.10

*Descriptive Statistics for Innovation*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1 Technical innovation, based on research result is readily accepted.</td>
<td>3.27</td>
<td>.790</td>
</tr>
<tr>
<td>IN2 Management actively seeks innovative ideas.</td>
<td>3.31</td>
<td>.870</td>
</tr>
<tr>
<td>IN3 Innovation is readily accepted in program/ project management.</td>
<td>3.41</td>
<td>.873</td>
</tr>
<tr>
<td>IN4 People are penalized for new ideas that do not work.</td>
<td>2.84</td>
<td>.820</td>
</tr>
<tr>
<td>IN5 Innovation in ICDF is perceived as too risky and is resisted.</td>
<td>3.08</td>
<td>.753</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation

**KMS**

In relation to KMS knowledge service effectiveness (see table 4.11), KM4 ‘The service has a range of services available to employees (e.g. frequently asked questions, discussion forums) and access to research available to employees’ had the highest mean (M=3.56), this suggests that employees somewhat agree that KMS provides the above mentioned services to organization members. In contrast, question KM2 which addresses ‘the knowledge service offers strong support for you to build up your existing knowledge (use existing research to create new findings and knowledge)’ shows the lowest mean score (M=3.19). This indicates that employees feel rather neutral towards this aspect of the knowledge service.
Table 4.11  
*Descriptive Statistics for KMS*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM1 All users are able to use and understand all aspects of the system.</td>
<td>3.26</td>
<td>.712</td>
</tr>
<tr>
<td>KM2 Service strongly encourages knowledge scaffolding.</td>
<td>3.19</td>
<td>.717</td>
</tr>
<tr>
<td>KM3 Service takes into account employees requirements.</td>
<td>3.38</td>
<td>.787</td>
</tr>
<tr>
<td>KM4 Service has a range of services available to employees.</td>
<td>3.56</td>
<td>.721</td>
</tr>
<tr>
<td>KM5 Service meets the employees’ needs.</td>
<td>3.37</td>
<td>.726</td>
</tr>
<tr>
<td>KM6 Employees suggest service requirements.</td>
<td>3.40</td>
<td>.667</td>
</tr>
<tr>
<td>KM7 Service is reliable, dependable and accurate.</td>
<td>3.24</td>
<td>.798</td>
</tr>
<tr>
<td>KM8 Service assures employees that their concerns and needs are important.</td>
<td>3.21</td>
<td>.814</td>
</tr>
<tr>
<td>KM9 Employees are treated courteously and sympathetically by the service workers.</td>
<td>3.53</td>
<td>.950</td>
</tr>
<tr>
<td>KM10 The service has a professional appearance.</td>
<td>3.43</td>
<td>.862</td>
</tr>
<tr>
<td>KM11 Sensitive information is handled with confidentiality.</td>
<td>3.51</td>
<td>.838</td>
</tr>
</tbody>
</table>

Note: N=90; Max=5; SD=Standard deviation
Discussion for Descriptive Statistics Analysis

From table 4.3 to 4.6, the results for the descriptive statistics showed several elements in the organization context that need to be addressed. From technical perspective, the mean score for IT4 which referred top management ability to use IT to communicate with employees gathered the lowest mean score (M=3.24). Information technology is commonly perceived to be an effective tool in decreasing boundaries among organization members, supporting communication and facilitating collaboration among individuals. Therefore top management may consider making more use of information technology to communicate with employees to reinforce such perceptions. Top management sets the tone within the organization, it is thus crucial that they model all of the desired behavior that they want employees to emulate. As quoted in Lin and Jang (2008, p.604) ‘whatever management does, in whatever direction they push, and how hard they push dictates where the organization eventually goes’

In relation to the support from top management, the mean score for TM3 which indicated that top management provides rewards in efforts of building a knowledge sharing culture (M=3.21) was the lowest. Goodman and Darr (1998) study indentified rewards as an important element in fostering a knowledge sharing culture. With that said, management may need to consider providing adequate rewards in order to developing such a culture. This may indicate how much top management values knowledge sharing. When it comes to organization structure, two items OS1 and OS4 had the lowest mean scores. Therefore in order to increase the flexibility of the organization structure, management may consider addressing issues related to delegation of power and employee participation in decision making. Management may also encourage horizontal communication among members in organization units/ departments as a way to improve employees’ perceptions of organization structure’s flexibility.

Overall the mean scores for collaborative culture compared to other contextual factors were relatively lower. The highest mean score for collaborative culture was related to CC1 which is related with the perception of a supportive and collaborative attitude of organization members towards each other. However, the mean scores for CC2 (M=3.13) and CC3 (M=3.26) implied that employees collaborate to some extent. For example, for CC2 ‘there is a willingness to accept responsibility for failure’ and CC3 ‘there is a willingness to collaborate across organizational units’ indicated that such collaboration may not necessarily translate into a sense of collective
responsibility and transcend organization unit boundary. These results suggest that these aspects from a collaborative culture are lacking given that in such a culture, it would be expected that staff members come together to discuss, plan and mutually learn from each other as they share the collective responsibility for organization success. The lower mean for CC3 also indicates that there may be a lack of communication and interaction across organization units.

Furthermore the descriptive statistics results for knowledge sharing in table 4.7 and 4.8 indicated that employees in general had a propensity to share their tacit knowledge rather than their explicit knowledge with co-workers. The mean scores for tacit knowledge sharing were relatively higher than those for explicit knowledge sharing. The overall mean scores results for knowledge sharing showed that the two most common behaviors for tacit knowledge sharing included the ‘sharing of expertise at the request of co-workers’ (M=3.60) and the ‘sharing of job experience with co-workers’ (M=3.54). Whereas the most common observed behavior for explicit knowledge was the ‘sharing of printed or electronic copies of documents and/or manuals with co-workers’ (M=3.48).

Moreover, the mean score results for tacit and explicit knowledge sharing also signaled that employees knowledge sharing behavior with colleagues seemed to depend on the type of information being shared. For example, the sharing ‘ideas about job with co-workers’ and ‘tips on jobs with co-workers’ gathered substantially lower mean scores (see table 4.10). This could be due to the fact that these modes of sharing may be perceived by employees as involving a competitive advantage cost. Mean scores for the sharing of ‘lectures/presentations that they have personally prepared’ and ‘data/databases/spreadsheets they have kept for personal use’ also receded (see table 4.11). This could be due to the fact that individuals do not perceived any benefits for sharing the knowledge that they have recorded for personal use. Another possible reason could be sharing this type of knowledge is not articulate in their job responsibilities.

It is widely agreed that organizations that successfully implemented innovation has several important features that include support from top management, and most importantly the tolerance of failure given that failure is seen as a learning opportunity and therefore unsuccessful attempt should not be punished (Nacinovic, Galetic, & Cavlec, 2009). Descriptive statistics analysis results indicated that employees disagreed with the statement that organization members are penalized for ideas that do not work (M=2.84). The findings also showed that employees
somewhat agree that innovation is accepted in project/program management (M=3.41). Therefore reinforcing employees’ perception that innovation is desired for the organization may require as suggested by (Nacinovic et al., 2009) that innovation may be introduced as an important part of employees’ job which can be done by allocating the necessary time and resources for employees to pursue new ideas.

In relation to KMS effectiveness, the mean score results indicated that employees showed some level agreement with the system’s service quality which include ‘knowledge service has a range of service available to employees’ has a mean (M=3.56). Although the mean score for employees are treated courteously and sympathetically by the service workers’ is among the highest for KMS (M=3.53), its respective standard deviation (S.D=.950) was very high, thus implying that there is some inconsistency. Although the mean score for ‘employees suggest service requirement’ (M=3.40) is slightly lower, however the standard deviation (S.D. =.667) is the lowest, thus indicating that employees are consistent on answering this item.

The descriptive statistics results also showed various aspects of KMS knowledge service can be improved. KMS success is also determined by how well the knowledge service performs its intended function. The most crucial aspect of the knowledge service that need be emphasized upon include KM2 which refers to the knowledge scaffolding had the lowest mean (M=3.19). Following KM8 ‘the knowledge service assures employees that their concerns and needs are important’ (M=3.21) and KM7 ‘service is reliable, dependable and accurate’ (M=3.24) and KM1 ‘all users are able to understand all aspects of the system’ (M=3.26) all gathered low mean scores.

Researchers have indicated that KMS success depends on the perceived usefulness of the system, perceived ease of use/perceived user friendliness, ability of the user to identify system content, and knowledge quality (Adams & Lamont, 2003; Kuo & Lee, 2009; Whitfield, 2008). If employees do not find valuable knowledge in the KMS that they need to carry out their tasks or increase their performance or if employees cannot locate nor have access to the required knowledge, they may refrain from using KMS which may lead to the system’s failure. Halawi, McCarthy, and Aronson (2007/2008) study findings indicated that the knowledge quality and the system quality of KMS were positively associated to user intention to use the system.
Moreover, Withfield (2008) stressed that a KMS that does not provide knowledge that is considered valuable for the organization or does not provide it in a timely manner is considered a failure. In addition, a good KMS design must also consider the problem of system design (Kuo & Lee, 2009). Employees are the main users of KMS, their concerns and needs should be made a priority. With that said, the knowledge staff or KM developers should collaborate with organization members in order to identify ways in which the system can be developed or upgraded to meet users’ needs and to overcome resistance to the system.
Correlations Analysis

The relationship between all variables in the current study was investigated by using Pearson coefficient correlation (see Table 4.12). Drawing from Cohen (1988)’s guidelines, this study considered correlations between .10/-.10 and .29/-29 as low; .30/-30 and .49/-49 as moderate and correlations between .50/-50 to 1.00/-1.00 as high.

According to these guidelines, information technology has a moderate positive significant correlations with tacit knowledge sharing ($r=0.348, p<0.01$) and explicit knowledge sharing ($r=0.366, p<0.01$), and has high positive significant correlation with KMS ($r=0.736, p<0.01$), and innovation ($r=0.542, p<0.01$). From these relationships, it can be assumed that information technology is positively related with the sharing explicit and tacit knowledge and the success of KMS and innovation.

Top management support also shows a moderate positive significant correlations with tacit knowledge sharing ($r=0.491, p<0.01$), whereas it has it has low positive significant correlation with explicit knowledge sharing ($r=0.267, p<0.05$), In addition, the results indicate that top management support has high positive significant correlations with KMS ($r=0.679, p<0.01$) and innovation ($r=0.500, p<0.01$). Therefore it can be concluded that top management support is positively associated with tacit and explicit knowledge sharing, KMS and innovation.

Collaborative culture shows a moderate positive significant relationship with tacit knowledge sharing ($r=0.482, p<0.01$), explicit knowledge sharing ($r=0.391, p<0.01$), and high positive significant relationship with KMS ($r=0.620, p<0.01$) and innovation ($r=0.532, p<0.01$). Based on these results, collaborative culture is positively related with tacit and explicit knowledge sharing, KMS and innovation.

Organization structure shows a low positive significant relationship with tacit knowledge sharing ($r=0.289, p<0.01$), and explicit knowledge sharing ($r=0.246, p<0.05$), and innovation ($r=0.264, p<0.05$). Organization structure has a moderate positive correlation with KMS ($r=0.340, p<0.01$). Organization is positively related with tacit and explicit knowledge sharing, KMS and innovation.
Finally, tacit knowledge sharing shows a moderate positive association with KMS ($r=.427$, $p<.01$), and innovation ($r=.494$, $p<.01$). Explicit knowledge sharing shows a moderate positive and significant relationship with KMS ($r=.444$, $p<.01$), and innovation ($r=.431$, $p<.01$).

The findings from the correlations are pertinent to provide significant findings of the next mediation analyses.

Table 4.12

Correlations among Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 IT</td>
<td>3.40</td>
<td>.67</td>
<td>.654**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.848</td>
</tr>
<tr>
<td>2 TM</td>
<td>3.44</td>
<td>.75</td>
<td>.501** .543**</td>
<td></td>
<td></td>
<td></td>
<td>.235* .395**</td>
<td></td>
<td></td>
<td></td>
<td>.860</td>
</tr>
<tr>
<td>3 CC</td>
<td>3.26</td>
<td>.73</td>
<td>.348** .491** .482** .289**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.597**</td>
<td></td>
<td></td>
<td>.827</td>
</tr>
<tr>
<td>4 OS</td>
<td>3.51</td>
<td>.66</td>
<td>.280** .348** .491** .482** .289**</td>
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<td></td>
<td></td>
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<td></td>
<td>.865</td>
<td></td>
</tr>
<tr>
<td>5 TKS</td>
<td>3.51</td>
<td>.59</td>
<td>.348** .348** .491** .482** .289**</td>
<td></td>
<td></td>
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<td>.872</td>
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</tr>
<tr>
<td>6 EKS</td>
<td>3.32</td>
<td>.64</td>
<td>.366** .267* .391** .246* .597**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.819</td>
<td></td>
</tr>
<tr>
<td>7 IN</td>
<td>3.18</td>
<td>.52</td>
<td>.542** .500** .532** .264* .494** .431**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.920</td>
<td></td>
</tr>
<tr>
<td>8 KMS</td>
<td>3.37</td>
<td>.59</td>
<td>.736** .679** .620** .340** .427** .444** .608**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.924</td>
<td></td>
</tr>
</tbody>
</table>

Complete Test | .953 |

Note: N=90; **$p<.01$; *$p<.05$ Final results for Cronbach’s alpha values from reliability and validity tests are reported on the vertical line and in bold. All Cronbach’s alpha coefficients exhibited acceptable reliability.
Hierarchical Regression Analysis

The research hypotheses were first tested using hierarchical regression. Hierarchical regression analyses were conducted respectively on KMS, innovation, and knowledge sharing. In the first step, four demographics variables (i.e. age, gender, education, and tenure) were included as controls. These demographics variables can be classified as individuals’ factors, which are by definition factors that are derived from the individuals personally. Therefore demographic variables are controlled because studies have acknowledged that individuals’ factors can have an effect on knowledge sharing, KMS, and innovation.

Variables that were hypothesized to have an impact on KMS, innovation, and knowledge sharing were entered in the second step. These variables (i.e. information technology, top management support, collaborative culture and organization structure) are known as organization contexts. For analytic purposes, the dependent variables (i.e. KMS, innovation) and the mediator (i.e. Knowledge sharing) were regressed on the mean average of the four independent variables referred to as organization contexts. Hierarchical regression analyses were conducted on the seven hypotheses. Results for the first step and second step of these analyses are reported in Model 1 and Model 2 respectively and are discussed in details below.

Analysis for Hypothesis 1

**Hypothesis 1:** Organization contexts have a positive effect on KMS.

In order to examine the effects of organization contexts on KMS, KMS was regressed on individuals’ demographic in the first step of testing this hypothesis. The results are showed in Model 1 and indicated that demographics explained 16.1% of the variance in KMS which is highly significant as indicated by an F value that is less than .01 (F=4.082 ; p<.001) and an adjusted R² of .12. Model 1 also showed that tenure had a positive and significant effect on KMS (β=.336; p<.001). See Table 4.13.

In the second step of testing the hypothesis, organization contexts were subsequently included in the regression after individuals’ demographics were controlled. This produced an F change of (ΔF=120.219, p < .001) and R² change of (ΔR²=.494, p < .001). In this test, organization contexts are shown to significantly account for more variance in KMS than
individuals’ demographics alone. The results are presented in Model 2 and indicated a significant and a positive effect of organization contexts ($\beta = .736$; $p < .001$) on KMS. Therefore hypothesis 1 was supported. It is also important to note that the effect of tenure on KMS remained significant in Model 2, showing a positive and significant effect ($\beta = .149$; $p < .05$).

Table 4.13

*Empirical Results for Organization Contexts’ Effects on KMS*

<table>
<thead>
<tr>
<th></th>
<th>KMS (Y1)</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\beta$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.037</td>
<td>- .013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.053</td>
<td>.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>.336***</td>
<td>.149*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-.198+</td>
<td>-.121+</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization Contexts</td>
<td></td>
<td>.736***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.161</td>
<td>.655</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>.122</td>
<td>.634</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R2$</td>
<td>.161**</td>
<td>.494***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>4.082**</td>
<td>31.889***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta F$</td>
<td>4.082**</td>
<td>120.219***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>df (Final)</td>
<td>4.85</td>
<td>1.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: ***$p < .001$, **$p < .01$, *$p < .05$, + $p < .10$
Analysis for Hypothesis 2

**Hypothesis 2**: Organization contexts have a positive effect on innovation.

Following the effects of organization contexts on innovation was examined. Innovation was regressed on individuals’ demographic in the first step of testing this hypothesis. The results are showed in Model 1 and indicated that demographics explained .089% of the variance in innovation and showed an adjusted $R^2$ of .042. Model 1 also showed that tenure had a positive and significant effect on innovation ($β=.191; p<.1$). See Table 4.14.

In the second step of testing this hypothesis, organization contexts were subsequently added after individuals’ demographics were controlled. This produced an $F$ change of ($ΔF=43.046, p < .001$) and $R^2$ change of ($ΔR^2=.310, p < .001$). In this test, organization contexts are shown to significantly account for more variance in innovation than individuals’ demographics alone. The results are presented in Model 2 and indicated a significant and a positive effect of organization contexts ($β=.583; p<.001$) on innovation. Therefore *hypothesis 2 was supported*. 
Table 4.14

Empirical Results for Organization Contexts’ Effects on Innovation

<table>
<thead>
<tr>
<th></th>
<th>Innovation (Y2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
</tr>
<tr>
<td><strong>Model 1</strong></td>
<td><strong>Model 2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.178</td>
<td>.139</td>
</tr>
<tr>
<td>Gender</td>
<td>.072</td>
<td>.039</td>
</tr>
<tr>
<td>Tenure</td>
<td>.191+</td>
<td>.042</td>
</tr>
<tr>
<td>Education</td>
<td>-.007</td>
<td>.054</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization Contexts</td>
<td></td>
<td>.583***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.085</td>
<td>.395</td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>.042</td>
<td>.359</td>
</tr>
<tr>
<td>$\triangle R2$</td>
<td>.085</td>
<td>.310***</td>
</tr>
<tr>
<td>F</td>
<td>1.985</td>
<td>10.983***</td>
</tr>
<tr>
<td>$\triangle F$</td>
<td>1.985</td>
<td>43.046***</td>
</tr>
<tr>
<td>$df$ (Final)</td>
<td>1,84</td>
<td>4,85</td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

Note:***p<.001, **p<.01, *p<.05, + p < .10
Analysis for Hypothesis 3

**Hypothesis 3**: Organization contexts have a positive effect on knowledge sharing.

Hypothesis 3 was tested by regressing knowledge sharing on individuals’ demographic in the first step of testing this hypothesis. The results are showed in Model 1 and indicated that demographics explained 14.5% of the variance in KMS which is highly significant as indicated by an F value that is less than .01 (F=3.598 ; p < .01) and an adjusted R² of .105. Model 1 also showed that tenure had a positive and significant effect on knowledge sharing (β=.347; p<.001). See Table 4.15.

In the second step of testing the hypothesis, organization contexts were subsequently included in the regression after individuals’ demographics were controlled. This produced an F change of (ΔF=12.170, p < .001) and R² change of (ΔR²=.108, p < .001). In this test, organization contexts are shown to significantly account for more variance in knowledge sharing than individuals’ demographics alone. The results are presented in Model 2 and indicated a significant and a positive effect of organization contexts (β=.345; p<.001) on knowledge sharing. Therefore **hypothesis 3 was supported**. It is also important to note that the effect of tenure on knowledge sharing remained significant in Model 2, showing a positive and significant effect (β=.259; p<.01).
Table 4.15

Empirical Results for Organization Contexts’ effects on Knowledge Sharing

<table>
<thead>
<tr>
<th></th>
<th>Knowledge Sharing (M)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td></td>
</tr>
<tr>
<td>β</td>
<td>β</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.004</td>
<td>-.020</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.125</td>
<td>.106</td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>.347***</td>
<td>.259**</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.105</td>
<td>.141</td>
<td></td>
</tr>
<tr>
<td>Independent variables</td>
<td>Organization Contexts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.345***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.145</td>
<td>.253</td>
<td></td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>.105</td>
<td>.209</td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.145**</td>
<td>.108***</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3.598**</td>
<td>5.690***</td>
<td></td>
</tr>
<tr>
<td>$\Delta F$</td>
<td>3.598**</td>
<td>12.170***</td>
<td></td>
</tr>
<tr>
<td>$df$ (Final)</td>
<td>4,85</td>
<td>1,84</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

Note:***p<.001, **p<.01,*p<.05, +p < .10
Analysis for Hypothesis 4

**Hypothesis 5**: Knowledge sharing has a positive effect on KMS.

Model 1 in Table 4.16 is the base model for individuals’ demographics effect on KMS and previously tested in hypothesis 1. To analyze the effects of knowledge sharing on KMS, KMS was regressed on knowledge sharing in Model 2. The results are showed in Model 2 and indicated that knowledge sharing explained 28.3% of the variance in KMS which is highly significant as indicated by an F value that is less than .001 (F=6.646; p < .001) and an adjusted R² of .241. The regression in Model 2 showed an F-value and R2 value that are higher and more significant than in Model 1.

When knowledge sharing was subsequently included in the regression to fulfill the second step of the analysis for the hypothesis in Model 2, this produced an F change of (ΔF=14.340, p < .001) and R² change of (ΔR²=.122, p < .001). Model 2 also showed that knowledge sharing had a positive and significant effect on KMS (β=.378; p<.001). Therefore **hypothesis 4 was supported**. See Table 4.16.
### Table 4.16

**Empirical Results for Knowledge Sharing’ Effect on KMS**

<table>
<thead>
<tr>
<th>Control variables</th>
<th>Model 1 β</th>
<th>Model 2 β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.037</td>
<td>.035</td>
</tr>
<tr>
<td>Gender</td>
<td>.053</td>
<td>.006</td>
</tr>
<tr>
<td>Tenure</td>
<td>.336***</td>
<td>.205*</td>
</tr>
<tr>
<td>Education</td>
<td>-.198+</td>
<td>-.238*</td>
</tr>
</tbody>
</table>

**Mediator**

| Knowledge Sharing | .378*** |

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>.161</td>
<td>.283</td>
</tr>
<tr>
<td>$R_{adj}^2$</td>
<td>.122</td>
<td>.241</td>
</tr>
<tr>
<td>$\Delta R2$</td>
<td>.161**</td>
<td>.122***</td>
</tr>
<tr>
<td>$F$</td>
<td>4.082**</td>
<td>6.646***</td>
</tr>
<tr>
<td>$\Delta F$</td>
<td>4.082**</td>
<td>14.340***</td>
</tr>
<tr>
<td>$df$ (Final)</td>
<td>4,85</td>
<td>1,84</td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

Note: ***$p<.001$, **$p<.01$, *$p<.05$, + $p < .10$
Analysis for Hypothesis 5

**Hypothesis 5**: Knowledge sharing has a positive effect on innovation.

Model 1 in Table 4.17 is the base model for individuals’ demographics effect on innovation and previously tested in hypothesis 2. To examine the effects of knowledge sharing on innovation, innovation was regressed on knowledge sharing in Model 2. The results are showed in Model 2 and indicated that knowledge sharing explained 22% of the variance in innovation which is highly significant as indicated by an F value that is less than .001 (F= 4.740; p < .001) and an adjusted R² of .174. The regression in Model 2 showed an F-value and R2 value that are higher and more significant than in Model 1.

When knowledge sharing was subsequently included in the regression to fulfill the second step of the analysis for the hypothesis in Model 2, this produced an F change of (ΔF=14.498, p < .001) and R² change of (ΔR²=.135, p < .001). Model 2 also showed that knowledge sharing had a positive and significant effect on innovation (β=.397; p<.001). Therefore hypothesis 5 was supported. See Table 4.17.
### Table 4.17

**Empirical Results for Knowledge Sharing’ Effect on Innovation**

<table>
<thead>
<tr>
<th>Control variables</th>
<th>Model 1 β</th>
<th>Model 2 β</th>
<th>Innovation (Y2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.178</td>
<td>.177</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.072</td>
<td>.022</td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>.191+</td>
<td>.053</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-.007</td>
<td>-.049</td>
<td></td>
</tr>
<tr>
<td>Mediator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td>.397***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Model 1</th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>.085</td>
<td>.220</td>
<td></td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>.042</td>
<td>.174</td>
<td></td>
</tr>
<tr>
<td>$\triangle R2$</td>
<td>.085</td>
<td>.135***</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1.985</td>
<td>4.740***</td>
<td></td>
</tr>
<tr>
<td>$\triangle F$</td>
<td>1.985</td>
<td>14.498***</td>
<td></td>
</tr>
<tr>
<td>df(Final)</td>
<td>4,85</td>
<td>1,84</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

Note:***$p<.001$, **$p<.01$, *$p<.05$, + $p < .10$
Analysis for Hypothesis 6

Hypothesis 6: Knowledge sharing has a mediating effect on the relationship between organization contexts and KMS.

One of the main purposes of this study is to test the mediating effect of knowledge sharing on the relationship between organization contexts and KMS. In testing this hypothesis, KMS was regressed on a set of demographic variables, organization contexts and knowledge sharing in subsequent order.

Table 4.18 shows that in all three models the F values were found to be significant and had gradually increased in Model 2 and slightly decreased 3. In addition, the findings also showed that the values of $R^2$ increased in Model 2 and 3 and were highest in Model 3. Given that a higher $R^2$ is indicative of the explaining power of a model, the $R^2$ value of Model 3 suggests that Model 3 is acceptable. However, the F change and $R^2$ change values for Model 2 were higher than those in Model 3. In the last model, the F change ($\Delta F=2.835, p < .1$) and the $R^2$ change ($\Delta R^2=.011, p < .1$).

The beta weight for organization contexts in Model 2 ($\beta=.736; p<.001$) and slightly dropped to ($\beta=.694; p<.001$) in Model 2 but remained significant. This decrease in beta score in organization contexts can be attributed to the mediating effect of knowledge sharing since regression in Model 3 also included knowledge sharing besides organization contexts, individuals’ demographics. The beta weight for knowledge sharing in Model 3 is significant ($\beta=.124; p<.1$). From these results, it can be concluded that knowledge sharing partially mediates the relationship between organization contexts and KMS. Therefore hypothesis 6 was supported.
Table 4.18

*Empirical Results for Knowledge Sharing Mediation Effect on KMS*

<table>
<thead>
<tr>
<th></th>
<th>KMS (Y1)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( \beta )</td>
<td>( \beta )</td>
<td>( \beta )</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.037</td>
<td>-.013</td>
<td>-.011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.053</td>
<td>.012</td>
<td>-.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>.336***</td>
<td>.149*</td>
<td>.117+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-.198+</td>
<td>-.121+</td>
<td>-.139*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization Contexts</td>
<td></td>
<td>.736***</td>
<td>.694***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mediator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td></td>
<td></td>
<td>.124+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.161</td>
<td>.655</td>
<td>.666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2_{adj} )</td>
<td>.122</td>
<td>.634</td>
<td>.642</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta R^2 )</td>
<td>.161**</td>
<td>.494***</td>
<td>.011+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( F )</td>
<td>4.082**</td>
<td>31.889***</td>
<td>27.627***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta F )</td>
<td>4.082**</td>
<td>120.219***</td>
<td>2.835+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( df ) (Final)</td>
<td>4.85</td>
<td>1.84</td>
<td>1.83</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N: 90

*Note:* ***\( p < .001 \), **\( p < .01 \), *\( p < .05 \), +\( p < .10 \)
Analysis for Hypothesis 7

Hypothesis 7: Knowledge sharing has a mediating effect on the relationship between organization contexts and innovation.

Following the same procedures previously used for testing hypothesis 6, results for hypothesis 7 were obtained by regressing innovation on the chosen set of demographic variables. Organization contexts and knowledge sharing were later added in subsequent order.

Table 4.19 showed that in all three models the F values were found to be significant, particularly in Model 2 and 3 at (p < .001). The findings also showed that the values of R^2 increased in Model 2 and 3 and were highest in Model 3. Given that a higher R^2 is indicative of the explaining power of a model, the R^2 value of Model 3 suggests that Model 3 is acceptable. However, the F change and R^2 change values for Model 2 were higher than those in Model 3. In the last model, the F change (ΔF=4.738, p < .05) and the R^2 change (ΔR^2=.033, p < .05).

The beta weight for organization contexts in Model 2 was (β=.583; p<.001) and slightly decreased in Model 2 to (β=.511; p<.001) but remained significant. This decrease in beta score can be attributed to the mediating effect of knowledge sharing which was added in Model 3 together with organization contexts and individuals’ demographics. The beta weight for knowledge sharing in Model 3 is significant at (β=.209; p<.05). From these results, it can be concluded that knowledge sharing partially mediates the relationship between organization contexts and innovation. Therefore hypothesis 7 was supported.
Table 4.19

*Empirical Results for Knowledge Sharing Mediation Effect on Innovation*

<table>
<thead>
<tr>
<th>Control variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.178</td>
<td>.139</td>
<td>-.143</td>
</tr>
<tr>
<td>Gender</td>
<td>.072</td>
<td>.039</td>
<td>.017</td>
</tr>
<tr>
<td>Tenure</td>
<td>.191+</td>
<td>.042</td>
<td>-.012</td>
</tr>
<tr>
<td>Education</td>
<td>-.007</td>
<td>.054</td>
<td>.024</td>
</tr>
</tbody>
</table>

**Independent variables**

<table>
<thead>
<tr>
<th>Organization Contexts</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.583***</td>
<td>.511***</td>
<td></td>
</tr>
</tbody>
</table>

**Mediator**

<table>
<thead>
<tr>
<th>Knowledge Sharing</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.209*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Model Summary

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>.085</td>
<td>.395</td>
<td>.428</td>
</tr>
<tr>
<td>R² adj</td>
<td>.042</td>
<td>.359</td>
<td>.387</td>
</tr>
<tr>
<td>△ R2</td>
<td>.085</td>
<td>.310***</td>
<td>.033*</td>
</tr>
<tr>
<td>F</td>
<td>1.985</td>
<td>10.983***</td>
<td>10.350***</td>
</tr>
<tr>
<td>△ F</td>
<td>1.985</td>
<td>43.046***</td>
<td>4.738*</td>
</tr>
<tr>
<td>df (Final)</td>
<td>1.84</td>
<td>4.85</td>
<td>1.83</td>
</tr>
</tbody>
</table>

| N                  | 90      | 90      | 90      |

Note: ***p<.001, **p<.01, *p<.05, + p < .10
On the basis of Baron and Kenny (1986) conditions for mediation analysis, the meditational model for this study was judged as valid for the following reasons:

1) There must be a significant relationship between the independent variable(s) and the dependent variable(s). This requirement is met through hypotheses 1 and 2. In hypothesis 1, organization contexts were found to have a positive effect on KMS while in hypothesis 2 organization contexts had a positive impact on innovation.

2) The independent variable(s) should be significantly related with the mediator. This condition is also met since hypothesis 3 was supported. Organization contexts had a positive and significant effect on knowledge sharing.

3) The mediating variable(s) should affect the dependent variable in a regression of both the independent variable(s) and the mediating variable(s) on the dependent variable(s). This condition is also fulfilled in testing Hypotheses 6 and 7 which were supported. In hypotheses 6 and 7 on a regression of individuals’ factors, organization contexts and knowledge sharing on KMS and innovation, it was found that knowledge sharing had a positive effect on these two dependent variables. As the beta scores for organization contexts slightly decreased on the third equation in Model 3 as shown in Table 4.18 and 4.19, it can be concluded that knowledge sharing partially mediates the relationship between organization contexts and KMS and that it also partially mediates the relationship between organization contexts and innovation.

4) The effects of the mediator(s) on the dependent variable(s) in a regression of the independent variable(s) and the mediator(s) on the dependent variable should be higher than the effect of the independent variable (Lee, 2001). This requirement was also fulfilled in testing hypotheses 6 and 7. The hierarchical regression results reported in Table 4.18 and 4.19 showed that there is an increase of $R^2$ from Model 2 to Model 3.
Partial Least Square (PLS) Analysis

Once the research hypotheses were tested using hierarchical regression, further tests were carried out using PLS analysis to validate the research model and to examine the effects of the indicators in organization contexts and knowledge sharing on innovation and KMS. Given that the KM literature indicated that KMS and innovation can be crucial means for organizations to achieve performance and competitive advantage and are as such essential for organizations’ sustainability. Therefore for PLS analysis purposes, the researcher identified KMS and innovation as sustainability indices (see figure 4.1).

Measurement Model

Table 4.20 and Table 4.21 provided the tests’ results for the measurement model. The data showed that the measures of the constructs analyzed in this research were satisfactory in terms of their internal consistency reliability as indexed by composite reliability. Given the research’s constructs included reflective indicators, composite reliability was considered as a fundamental mean for assessing reliability. In general, guidelines provided by scholars (e.g. Lawson et al., 2009; Nunally & Bernstein, 1994) suggested constructs’ reliability should be equivalent to or greater than .70. In line with recommendations from scholars, this study’s results showed that composite reliabilities values exceed the threshold value (see Table 4.20).

Constructs’ Cronbach’s alpha coefficients were also examined to assess their reliability. The adequacy of the measurements was determined: 1) through reliability guidelines provided by scholars and 2) through comparison with composite reliability values. Although the results showed that some of the constructs did not fully meet the criteria for reliability established by Nunally (1994), the overall measurements were deemed as acceptable on the basis of the guidelines provided by Peterson (1994). This author indicated that cronbach’s alpha values of .60 represent the criterion in use. Cronbach’s alpha coefficients for knowledge sharing and sustainability indices clearly exceeded this threshold value (See Table 4.20).

In general composite reliability is considered a better estimate for reliability. While Cronbach’s alpha implicitly presumes that each item has the same weight, composite reliability depends on the actual loadings to determine the factor score. With that said, Cronbach’s alpha is
expected to provide lower bound estimates of reliability than composite reliability. On the basis of Fornell and Lacker (1981), the internal consistency for the measurement model was considered satisfactory given that the composite reliability was superior to the Cronbach alpha (see Table 4.20). For these reasons, the reliability of the measurement model was upheld.

The results also demonstrated satisfactory validity of the measures (see Table 4.21). In relations to convergent validity, the results were consistent with the recommendations of (Al-Busaaidi et al., 2010; Li et al., 2009). Average variance extracted for all constructs exceeded the recommended threshold value of .50. In addition, the factor loadings for almost all constructs were found to exceed the threshold value suggested in (Hair et al., 2006; Li et al., 2009). Although the factor loading for organization structure did not fulfill the threshold requirement for (Hair et al., 2006), the construct was considered as valid since its loading value was closed to .60. Average variance extracted values were used to evaluate the discriminant validity. Discriminant validity of the measurement model was assessed by checking whether the correlations among the research variables were lower than the square root of the average variance extracted \((\sqrt{AVE})\). The results in Table 4.22 showed that the square root of each AVE was greater than the off-diagonal correlations. This suggested acceptable discriminant validity among research variables.

Table 4.20

*Measurement Model Reliability Analysis*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Communality</th>
<th>Composite reliability (CR)</th>
<th>Cronbach’s Alpha</th>
<th>(R^2)</th>
<th>Redundancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization contexts</td>
<td>.553</td>
<td>.828</td>
<td>.725</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge sharing</td>
<td>.754</td>
<td>.859</td>
<td>.674</td>
<td>.215</td>
<td>.161</td>
</tr>
<tr>
<td>Sustainability indices</td>
<td>.744</td>
<td>.853</td>
<td>.656</td>
<td>.555</td>
<td>.380</td>
</tr>
</tbody>
</table>

Note: Sustainability indices include KMS and innovation.
Table 4.21

*Measurement Model Convergent Validity Analysis*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization contexts</td>
<td>Information technology (.797), top management support (.822), collaborative culture (.782), organization structure (.537). AVE=.553</td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td>Explicit knowledge sharing (.854), Tacit knowledge sharing (.882). AVE=.754</td>
</tr>
<tr>
<td>Sustainability Indices</td>
<td>KMS (.877), Innovation (.847). AVE=.744</td>
</tr>
</tbody>
</table>

Note: Sustainability indices include KMS and innovation.

Table 4.22

*Correlation Matrix and Measurement Model Discriminant Validity Analysis*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Organization contexts</td>
<td>3.405</td>
<td>.540</td>
<td>.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Knowledge sharing</td>
<td>3.418</td>
<td>.541</td>
<td>.528**</td>
<td>.868</td>
<td></td>
</tr>
<tr>
<td>3 Sustainability indices</td>
<td>3.276</td>
<td>.502</td>
<td>.718**</td>
<td>.558**</td>
<td>.863</td>
</tr>
</tbody>
</table>

Note: Sustainability indices include KMS and innovation. Final results for discriminant validity tests are reported on the diagonal line and in bold.
Structural Model

Having satisfied the requirement arising from measurement issues, the structural model in Figure 4.2 was subsequently tested. Figure 4.2 shows the variance explained ($R^2$) in the dependent constructs and the path coefficients ($\beta$) and their corresponding t-values and the goodness of fit (GoF) for the model.

The results of the multivariate test of the structural model are presented in Table 4.20 and 4.22. Table 4.20 showed that the structural model as whole explained 21.5 and 55.5% of the variance in knowledge sharing and sustainability indices (i.e. KMS and innovation), respectively. The results also showed that all independent variables (i.e. information technology, top management support, collaborative culture, and organization structure) including the mediator variable (i.e. knowledge sharing types) explained 55.5% of the variance in the impact of innovation and KMS success. On the basis of the guidelines provided in Karim (2009) for $R^2$ relevance, it can be concluded that this model explained a substantial percentage of the variance in organization contexts and knowledge sharing impact on KMS and innovation ($R^2=55.5$). This fulfilled the basic premise for the study which implied that organization contexts and knowledge sharing are important for innovation and KMS success.

Consistent with this research’s expectations, organizations contexts had a positive and significant effect on KMS and innovation. Although organization contexts was also found to have a positive effect on knowledge sharing, and that knowledge sharing had a positive effect on KMS and innovation, these results were inconsistent with this study’s expectations due to the fact the effects of organization contexts on knowledge sharing, and those of knowledge sharing on KMS and innovation were lower than expected. For example, organization contexts only explained 21.5 % percent of the variance in knowledge sharing. Although this $R^2$ value is acceptable on the basis of Falk and Miller (2002) guidelines which suggested that an explanatory power of $R^2$ value greater than 10 percent is adequate, however, it can be considered somewhat moderate based on the guidelines provided in Karim (2009) which indicated that the exploratory power of an $R^2$ value of .33 and .19 should be considered as moderate and weak respectively.

Referring to the effects of organization contexts on knowledge sharing and KMS and innovation and the effects of knowledge sharing on KMS and innovation, the path coefficients
and their respective t-values are examined. With regards to path coefficients, Bontis and Fitz-enz (2002) suggested that path coefficients values are more accurate than correlations since they account for mediating and indirect causal paths. These authors also noted that each path coefficient value should fall between the range of -1.00 and +1.00. In addition, as shown in Table 4.23 and Figure 4.2, the path coefficients for this study’s variables were greater than .20. Consequently they were considered as meaningful on the basis of guidelines provided by Chin (1998).

These paths also gave an overview of the magnitude of direct effects, indirect effects (i.e., the effect of the independent variables on the dependent variables through the mediators), and the effect coefficients (i.e., total effect equal to the direct plus indirect effects). Through the analysis of these direct and indirect relationships, the link between the research variables can be further assessed and understood. As showed in Figure 4.1, the paths that resulted from the regression equations provided in Table 4.23 indicated the association between organization contexts and KMS and innovation can be analyzed: 1) in terms of directness; 2) in relation to the form of effects and 3) in terms of the extent of effect. From table 4.24, it should also be noted that knowledge sharing had direct effect on KMS and innovation. In contrast, organization contexts besides of having a direct effect on KMS and innovation had also an indirect effect on these dependent variables through knowledge sharing.

With regards to the form of effect, the total effect can be discussed as follow. Since knowledge sharing included both tacit and explicit knowledge sharing, the indirect effect of organization contexts on KMS and innovation through explicit knowledge sharing was .082 leading to the total effect of .708 (direct effect + indirect effect= .626+.082). The indirect effect of organization contexts on KMS and innovation through tacit knowledge sharing was .084 leading to the total effect of .710 (direct effect + indirect effect=.626+.084). In relations to the extent of organization contexts and knowledge sharing effects on KMS and innovation, the results showed that organization contexts and knowledge sharing direct and positive associations with the sustainability indices were more significant. Although weaker, their indirect associations with KMS and innovation were significant.
From Table 4.24, the results related to the total effect showed that the indirect effects of organization contexts on KMS and innovation neither negated nor diminished their associated direct effects. In conclusion, organization contexts had an impact on the sustainability indices and the fact that these independent variables had also indirect links with KMS and innovation confirmed this study’s assumptions and provided adequate evidence that the relationships between organization contexts and sustainability indices (i.e., KMS and innovation) were mediated by knowledge sharing.

In order to further test the structural model and to examine the research hypotheses, t-values were generated through bootstrapping technique. Bootstrapping technique was utilized with a re-sampling of 900 (generated from the original data set) to test the significance of the PLS estimates of path coefficients. Table 4.23 showed that all path coefficients were positive and significant at \( p < .001 \) and that all hypotheses were supported. From this table, it can be seen that the formulated hypotheses were accepted:

**Hypothesis 1**: Organization contexts have a positive effect on KMS.

**Hypothesis 2**: Organization contexts have a positive effect on innovation.

**Hypothesis 3**: Organization contexts have a positive effect on knowledge sharing.

**Hypothesis 4**: Knowledge sharing has a positive effect on KMS.

**Hypothesis 5**: Knowledge sharing has a positive effect on innovation.

Given that the path from organization contexts to knowledge sharing (3.761, \( p < .001 \)) was significant and the path from organization contexts to innovation and KMS (6.767, \( p < .001 \)) including the path from knowledge sharing to innovation and KMS (2.256, \( p < .001 \)) were also significant, it was concluded that knowledge sharing had a mediating effect between the relationship of organization contexts and innovation. It was also concluded that knowledge sharing had a mediating effect between the relationship of organization contexts and KMS. Therefore **Hypotheses 6 and 7 were also supported**.

Overall the results showed that organization contexts (i.e. information technology, top management support, collaborative culture, and organization structure) had a positive effect on
knowledge sharing (i.e. tacit and explicit). In addition, it also showed that both types of knowledge sharing have a positive effect on KMS and innovation and organization contexts together with knowledge sharing types had a positive effect on innovation and KMS. In line with Figure 4.2 and Table 4.23, two structural equations can be reported.

\[
\text{Knowledge sharing (KS)} = 0.463 \times \text{OC} + \varepsilon.
\]

Since sustainability indices encompass KMS and innovation, the corresponding structural equation that showed the effect of organization contexts and knowledge sharing on KMS and innovation can be written as:

1) **Sustainability indices (SI)** = 0.626 \times \text{OC} + 0.208 \times \text{KS} + \varepsilon.

At last, when analyzing the quality of the model, three indicators were taken into account 1) communality index and average communality; 2) average redundancy; 3) goodness of fit (GoF). As shown in Table 4.20, results for communality indexes indicated that the quality of the measurement model for each block of indicators were adequate. In addition, the average communality value was equal to 0.684. This showed that all constructs, on average, reflected their nature through their indicators at a good level. Values for both communality indexes and average communality exceeded 0.50. Moreover, scores for communality indexes were similar to those of average variance extracted as discussed in (Pauwels et al., 2009).

The average redundancies at the level of 0.161 and 0.380 suggested that the constructs in each path of the structural model successfully reflected their role toward the outcome indicators at an acceptable level (see Table 4.20). Finally, the goodness of fit of the model was determined by applying the Tenenhaus et al. (2005)’s goodness of fit measure. The square root of the product between average communality and average $R^2$ showed that the GoF value for this model was equal $\sqrt{0.684 \times 0.385} = 0.513$. This value clearly fell between the range of 0 and 1 as recommended in Karim (2009). In addition, it also indicated that the structural model could satisfactory predict the sustainability indices.
Table 4.23

**PLS Hypotheses Testing Results**

<table>
<thead>
<tr>
<th>Path</th>
<th>$\beta$-path</th>
<th>Adj. t-value</th>
<th>Sig.</th>
<th>Direction</th>
<th>Support for hypotheses</th>
<th>GoF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Contexts $\rightarrow$ Knowledge Sharing</td>
<td>.463</td>
<td>3.761</td>
<td>***</td>
<td>+</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Organization Contexts $\rightarrow$ KMS, Innovation</td>
<td>.626</td>
<td>6.767</td>
<td>***</td>
<td>+</td>
<td>Yes</td>
<td>.513</td>
</tr>
<tr>
<td>Knowledge Sharing $\rightarrow$ KMS, Innovation</td>
<td>.208</td>
<td>2.256</td>
<td>***</td>
<td>+</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Note: *** p < .001.

Table 4.24

**Effects of Organization Contexts on KMS and Innovation**

<table>
<thead>
<tr>
<th>Path</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Contexts $\rightarrow$ Knowledge Sharing</td>
<td>.463</td>
<td></td>
<td>.463</td>
</tr>
<tr>
<td>Organization Contexts $\rightarrow$ KMS, Innovation</td>
<td>.626</td>
<td></td>
<td>.626</td>
</tr>
<tr>
<td>Organization Contexts $\rightarrow$ EKS $\rightarrow$ KMS, Innovation</td>
<td>.463x.854x.208=.082</td>
<td></td>
<td>.708</td>
</tr>
<tr>
<td>Organization Contexts $\rightarrow$ TKS $\rightarrow$ KMS, Innovation</td>
<td>.463x.882x.208=.084</td>
<td></td>
<td>.710</td>
</tr>
<tr>
<td>Knowledge Sharing $\rightarrow$ KMS and Innovation</td>
<td>.208</td>
<td></td>
<td>.208</td>
</tr>
</tbody>
</table>
Figure 4.1 Structural model’s empirical results
## Results for Research Hypotheses

Table 4.25

*Final Results for Research Hypotheses*

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1  Organization contexts have a positive influence on KMS.</td>
<td>Supported</td>
</tr>
<tr>
<td>H2  Organization contexts have a positive influence on innovation.</td>
<td>Supported</td>
</tr>
<tr>
<td>H3  Organization contexts have a positive influence on knowledge sharing.</td>
<td>Supported</td>
</tr>
<tr>
<td>H4  Knowledge sharing has a positive influence on KMS.</td>
<td>Supported</td>
</tr>
<tr>
<td>H5  Knowledge sharing has a positive influence on innovation.</td>
<td>Supported</td>
</tr>
<tr>
<td>H6  Knowledge sharing has a mediating effect on the relationship between</td>
<td>Supported</td>
</tr>
<tr>
<td>organization contexts and KMS.</td>
<td></td>
</tr>
<tr>
<td>H7  Knowledge sharing has a mediating effect on the relationship between</td>
<td>Supported</td>
</tr>
<tr>
<td>organization contexts and innovation</td>
<td></td>
</tr>
</tbody>
</table>

Note: In hierarchical regression analysis for hypotheses H6 and H7 there’s a partial mediation.
Discussion for Hierarchical Regression Analysis

Results from hierarchical analysis confirmed the formulated hypotheses for the research. The findings showed the following:

Effects of organization contexts on knowledge sharing, KMS, and Innovation

The results from hierarchical regression analysis showed that organization contexts do have an effect on knowledge sharing, KMS, and innovation. Moreover, it also indicated that knowledge sharing partially mediates the relationship between organization contexts and innovation.

According to Falk and Miller (2002), the explanatory power of R^2 value greater than 10 percent is acceptable. Therefore the model that resulted from hierarchical regression results which indicated that demographic and organization contexts (i.e. information technology, top management, support, collaborative culture, and organization structure) explained 25.3% of the variance in knowledge sharing is acceptable. According to this finding it can also be concluded that since this R^2 value is closer to .33, the effects organization contexts on knowledge sharing is moderate on the basis of guidelines provided in Karim (2009) which suggested that R^2 value of .66 , .33, .19 should be considered as substantial, moderate and weak, respectively.

Since organization contexts and demographics explained 65.5% of the variance in KMS, it can be concluded that this model is not only acceptable but also that they have substantial effect on KMS on the basis of the guidelines provided by (Falk & Miller, 2002; Karim, 2009). Similarly, organization contexts and demographics explained 39.5% of the variance in innovation. Although the model is acceptable, the effects of these factors on innovation can be considered as moderate according to guidelines provided in Karim (2009).

The model fit in hierarchical regression analysis for organization contexts’ effects on knowledge sharing, KMS and innovation are all significant respectively at (p<.001).

In addition, hierarchical regression also revealed that knowledge sharing and individuals’ demographics together explained 22% of the variance in innovation. This is acceptable on the basis of Falk and Miller (2002)’s guidelines. The variance in innovation explained by knowledge sharing was relatively low compared to other studies that have examined the relationships between these two variables. For example, Liao (2006) reported that 64% of the variance in firm
innovation was explained by knowledge sharing. According to Karim (2009), the effects of knowledge sharing on innovation is somewhat weak.

Similarly, the hierarchical regression findings indicated that individuals’ demographics together with knowledge sharing explained 28.3% of the variance in KMS. The model is also acceptable on the basis of Falk and Miller (2002)’s guidelines. In addition the effects of knowledge sharing on KMS is moderate on the basis of (Karim, 2009)’s guidelines.

The model fit (s) for knowledge sharing effects on KMS and innovation are all significant (p<.001). At last the results showed that organization contexts had a greater impact on KMS than knowledge sharing and innovation.

Effects of demographic factors on knowledge sharing, KMS and innovation

Hierarchical regression results revealed that individuals’ demographics alone explained 14.5% of the variance in knowledge sharing. Although their effect on knowledge sharing is relatively weak according to Karim (2009)’s guidelines, the model is acceptable on the basis of Falk and Miller (2002)’s guidelines and has model fit significant at (p<.01). With regards to demographic factors impact on knowledge sharing, the findings of hierarchical regression confirmed previous studies’ results and arguments on their relationships. In relations to age, the results showed no association between age and knowledge sharing. This is in accordance with Ojha (2005) and Watson and Hewett (2006) studies which also did not find any causal relationship between age and knowledge sharing. However, it somewhat contradicts Gumus (2007) study which found that age had an impact on knowledge collecting and not on knowledge donating and revealed that individuals that are in the 31-39 demographics are not willing to collect knowledge. When it comes to gender, no causal relationship was found between gender and knowledge sharing. This is also compatible with Ojha (2005) and Watson and Hewett (2006) investigations that did not report any associations between these two variables. In addition, it does not provide support for research conducted by Lin (2006) which indicated that gender may have an effect on knowledge sharing as they implied that women may be more willing to share knowledge than men. Hierarchical regression results also showed that educational levels had no effect on knowledge sharing. This confirmed results obtained in Ojha (2005) study which did not find any relationship between educational level and knowledge sharing. Overall, this study’s results do not provide support for Riege (2005) study which suggested that age differences,
gender differences, and differences in educational levels can have an effect on knowledge sharing. Since this study measured knowledge sharing in terms of tacit knowledge sharing and explicit knowledge sharing, the non significant effect of gender, age on knowledge sharing is partly compatible with Holste and Fields (2009) study who also found no relationship and no causal effect of these factors on tacit knowledge sharing. However, unlike these authors’ study, this study found that tenure was positively associated with knowledge sharing (i.e. tacit and explicit).

However, with respect to organization tenure, this study found a significant and positive relationship with knowledge sharing. Although this finding is in accordance with Bordia et al. (2006), and Watson and Hewett (2006) study findings, it is contrary to Ojha (2005)’s study which indicated a significant negative relationship between organization tenure and knowledge sharing. As knowledge sharing is assessed as tacit and explicit knowledge sharing, the positive effect of organization tenure on knowledge sharing is somewhat not compatible with the study conducted by Holste and Fields (2009) which reported that tenure was not associated with tacit knowledge sharing.

Hierarchical regression showed that individuals’ demographics alone did not have any significant effect on innovation. However, surprisingly organization was found to have a positive effect on innovation. In relation to innovation, a study conducted by Carmeli, Meitar, and Weisberg (2006) showed that tenure was positively associated with innovative behavior. Therefore it is probable that organization tenure may have an effect on innovation as the results suggested. The findings also indicated that age, gender and educational levels had no effect on innovation.

Hierarchical regression analysis also revealed that individuals’ demographics alone explained 16.1 % of the variance in KMS. Although their effects on innovation are relatively weak according to guidelines in Karim (2009), this model is acceptable on the basis of (Falk & Miller, 2002). This model showed also an overall fit that is significant at (p<.01). Organization tenure was also found to have a positive and significant effect on KMS while education was found to be negatively at significantly related with KMS. Contrary to previous studies (Taylor et al., 2004) that suggested that gender may have an effect on KMS, this study did not found any significant relationship with KMS.
Discussion for Partial Least Square Analysis

Partial Least Square analysis revealed that organization contexts (i.e. information technology, top management support, collaborative culture and organization structure) had an effect on knowledge sharing (i.e. tacit knowledge sharing) and also had an effect on KMS and innovation. In addition knowledge sharing (i.e. tacit and explicit) was also found to have a positive effect on KMS and innovation. The results are discussed in details on the basis of previous findings from the literature.

Effects of organization contexts on knowledge sharing

Information technology was found to have a positive effect of knowledge sharing (i.e. tacit and explicit knowledge sharing). The positive effect of information technology on explicit knowledge sharing is consistent with other researchers’ findings and claims that explicit knowledge can be shared through technology (Mian, Takala, & Kekale, 2008; Reychav & Weisberg, 2009). From this result, it can be assumed that individuals with more favorable perception of information technology may demonstrate more explicit knowledge sharing behavior. Since information technology was also found to have a positive impact on tacit knowledge sharing, it can be deducted that the finding does not adhere to previous researchers’ argument which maintained that information technology is less effective for the sharing of tacit knowledge (McNeisch & Mann, 2010).

Top management support was also found to have a strong effect on tacit knowledge sharing, thus it can be assumed that the greater the support from top management, the greater the chance for the sharing of tacit knowledge. In addition, the results indicated that support from top management had a positive effect on explicit knowledge sharing. According to Cabrera, Collins, and Salgado (2006) top management can send strong messages directly or indirectly, through modeling, rewards and recognition as signs of knowledge sharing importance. Thus, adhering to previous empirical studies and arguments, it can be concluded that top management support can have a positive effect on knowledge sharing as showed in empirical studies by (Connelly & Kelloway, 2003; Kang, Kim, & Chang, 2008; Lin, 2007).

Organization structure had a positive effect on tacit and explicit knowledge sharing. One possible cause for the positive relationship between organization structure and knowledge sharing may be due to the fact roles and responsibilities are clearly assigned within the
organization. Anantatmula (2008, p.455) suggested that ‘defining each member’s role would help in creating and sharing of knowledge’.

Various authors have advocated organizations to develop a collaborative culture to nurture individuals’ knowledge sharing behavior. Lee and Choi (2003) maintained that a collaborative culture fosters exchange among individuals by reducing fear and increasing openness among members. Reid (2003) proposed that effective knowledge sharing requires a supportive organization culture. This study’s results indicate that a collaborative culture predicts knowledge sharing. This is in line with the claim from (Lee & Choi, 2003; Reid, 2003) that such culture is essential for promoting knowledge sharing behavior. In addition, Islam et al. (2007) and Yang (2007) studies also reported a significant relationship between collaborative culture and knowledge sharing. At last, it adheres to previous arguments and empirical studies (e.g. de Long & Fahey, 2000; van den Brink, 2001) that organization’s capability to cultivate and reinforce collaboration will affect employees’ willingness to share knowledge. With that said, it can be expected that the greater the collaboration among employees, the greater the sharing of tacit and explicit knowledge. It can be concluded that in such organization culture employees are even more willing to share their explicit knowledge with their colleagues.

Effects of organization contexts on KMS

Information technology was found to have a positive and significant effect on KMS. This result is consistent with previous findings from Chen (2009) study that reported a positive relationship between information technology and KMS. This finding also supports the arguments that information technology is a key enabler of KM success (Bhatt, 2001; du Plessis, 2007) and contradicts prior arguments from investigators that sustained KM initiatives could be successful without using information technology tools (McDermott, 1999; McDermott & O’Dell, 2001). The positive effect of information technology on KMS also confirms claims that organizations must have access to an integrated information technology infrastructure in order to ensure KMS success. Furthermore, this result stresses the need for organizations to effectively deployed information technology capabilities for KMS success.
The results for this study shows that top management support had a positive and significant effect on KMS. This is contrary to studies conducted by (Ciborra & Patriotta, 1998; Mason & Pauleen, 2003). However, the findings provide support for Al-Busaidi and Olfman (2005) and Al-Busaidi et al. (2010) which showed that management support was positively associated with KMS success. In addition, it also confirms previous findings and arguments of (Debowskii, 2006; Du Plessis, 2007; Jennex & Olfman, 2005; Wong & Aspinall, 2005) which underlined management support as a sine qua non condition for KM success. Finally, given that this study alike previous studies conducted on information systems found that top management is a key success factor, it can be concluded that support from top management goes hand in glove with the success of any system.

This study’s finding indicated that collaborative culture had a positive and significant effect on KMS success. As pointed by several authors, to be successful KMS need to be supported by a collaborative culture (Debowskii, 2006; Du Plessis, 2007; Jones & Leonard, 2009). This suggests that when employees perceived that their organization support collaboration, they may be more inclined to make contribution to the organization KMS, leading to its success. Therefore the positive effect of collaborative culture on KMS reconfirms conclusions from prior studies conducted by (Alavi, Kayworth & Leidner, 2005; Anantatmula & Kanungo, 2007; Berchina & Ndlela, 2008/2009) that collaboration is a desirable behavior or norm among organization members for successful implementation of KM. In addition, this study provides evidence that organization culture is positively associated with the success of KM initiatives as suggested by prior studies conducted by (Moffett et al., 2003).

The findings also indicated that organization structure had a positive and significant impact on KMS success. This supports the arguments made by (Claver-Cortés et al., 2007; Bechina & Ndlela, 2008/2009) that organization structure is essential for the successful implementation of KM. From these findings, it can be concluded that the key factors of a successful KMS are not locked simply in its design and the effectiveness of the knowledge service. The overall findings reinforced the arguments and empirical evidence that (information technology, management support, organization culture and structure) are critical factors for KM success (Anantatmula, 2008; du plessis, 2007). However, they contradicted Whietfield (2008) research which did not
report significant causal relationships between organizational factors (i.e. information technology, top management support, organization culture, organization structure) and KMS.

One important implication for the overall results is that although information technology is found to be an important enabler for KMS success, managers should be careful in placing too much emphasis on technology at the expense of social/cultural dimensional aspects of KMS. With that said acquiring sophisticated information technology or simply making it available within the organization should not be the answer for making KMS successful given that these initiatives have failed as a result of lack of knowledge sharing.

**Effects of organization contexts on innovation**

Information technology had also a positive and significant effect on innovation. This finding adheres with Rhodes et al. (2008) study which indicated that information technology and innovation are positively associated. In addition, this finding is also relevant to research conducted by Martins and Terablanche (2003) which noted information technology as one of the important support mechanisms that should be present in the culture of an organization in order to foster an environment that will promote innovation.

Collaborative culture had also a positive and significant effect on innovation. Thus an organization culture where norms promote collaboration may more likely facilitate interactions among individuals that will stimulate creative ideas that lead to innovation. Thus it can be assumed that the greater the collaboration among individuals the greater the chance for innovation. This result contradicts Jaskyte and Dressler (2005)’s study results which hypothesized that organizations cultural values leading to higher working in collaboration with others, the less innovative the organization may be. However, it is consistent with research conducted by McLean (2005) which stated that collaboration as an essential cultural factor in fostering innovation. The positive influence of collaborative culture on innovation also adheres to the study findings of Hurley and Hult (1998) which reported a positive association between collaborative culture and innovation.

Consistent with the expectations generated from the studies conducted by Page (1993) and Beatty et al. (2001) which indicated that top management is crucial as in almost all innovative
endeavors in the organization. This study found that top management support was found to be a significant driver of innovation. The finding also provided support for Read (2000)’s study which highlighted management support as the most important determinant of innovation. Given that the positive link between top management support and innovation was confirmed, it can be concluded that the greater the support from top management, the greater the chance for innovation.

Organization had a positive effect on innovation. The positive influence of organization structure on innovation could be due to the fact that work rules spell out ways to handle work tasks as showed in the descriptive analysis results. That’s mean if the organization tasks rules emphasize on the need for employees to be innovative in their job (as it is likely the case for Taiwan ICDF) therefore it is very likely that they may be a key factor for organization innovation success.

Finally, these findings provide empirical evidence that organizational factors are essential to the success of innovation. Furthermore, the results of this study is also in accordance with Job and Sanghamitra (2007) case study which indicated seven key determinants of innovation among which information technology, management support, organization culture and structure were found to be essential to innovation.

**Effects of Knowledge sharing on KMS and Innovation**

According to the findings, tacit knowledge sharing and explicit knowledge sharing had a positive and significant impact on KMS. It can also be concluded that both types of knowledge sharing are essential to the system’s success. The positive effect of explicit knowledge sharing on KMS adhered to Al Bushaidi et al. (2010) argument which suggested that ‘without the codified knowledge, KMS cannot operate’. On the basis of this finding, it can thus be claimed that encouraging individuals to share tacit and explicit knowledge on KMS is crucial to its success.

The ability to share knowledge among organizations members is argued to be a key lever for organization innovation (Kim & Lee, 2006; Lin, 2007). This study’s results indicated that both tacit and explicit knowledge sharing have a positive and significant impact on innovation.
and as such stressed the importance of having both knowledge effectively distributed throughout the organization. These results are compatible with Rhodes et al. (2008) study which also found that both tacit knowledge and explicit knowledge had a positive impact on innovation as they suggested that either adopting a personalization or a codification strategy should lead to innovation.

Much of the KM literature have been conveying in the greater value of the tacit knowledge over explicit knowledge for innovation. For example, Seidler-de Alwis and Hartmann (2008) and Taminiau et al. (2009) have argued that it is tacit rather than explicit knowledge, which will typically be of more value to innovation. This argument was sustained given that according to their respective beta weight the sharing of tacit knowledge ($\beta=.882$) compared to that of explicit knowledge ($\beta=.854$) was found to have a stronger influence on innovation.

This finding also supports the claim of Nonaka and Takeuchi (1995) that achieving a level of shared tacit knowledge played a vital role in achieving a sustainable innovation. Thus it can be assumed that the greater the sharing of tacit knowledge among members of the organization, the greater the chance for innovation. In addition, the common perception that innovation result from the knowledge created by the interaction between explicit and tacit knowledge is not sustained. Explicit knowledge sharing and tacit knowledge sharing are found to separately influence innovation.

Explicit knowledge sharing is also found to have a positive influence on innovation. Smith (2001) put forward that explicit knowledge can be reused to solve many similar types of problems or connect people with valuable, reusable knowledge. Lin (2007) stressed that an organization’s ability to transform and exploit knowledge may affect its level of innovation, such as faster problem-solving capability and enhanced rapid reaction to new information. Arguably then, explicit knowledge sharing is essential in ensuring innovation. Thus the more explicit knowledge is more available in the organization by encouraging its sharing among organizational members, the greater the chance for innovation.
CHAPTER VI. CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the conclusions and recommendations for the study. The conclusion section includes the conclusion for correlation analysis and the conclusion of mediated regression results and the research questions. Also, the study provided some recommendations for the case organization on the basis of descriptive statistics and hierarchical regression and partial least square results. Finally, some recommendations are given for future research on this topic.

Research Conclusions

The purposes of this research were to 1) examine the effects of organization contexts on knowledge sharing; 2) analyze the effect of knowledge sharing on innovation and KMS success and 3) investigate the mediating effect of knowledge sharing between the relationship of organization contexts and KMS 4) investigate the mediating effect of knowledge sharing between the relationship of organization contexts and innovation.

Prior to testing the causal relationship among these research variables, correlation analysis was conducted to determine whether there was an association among the variables. Correlation analysis was also conducted to fulfill the primary requirement in Baron and Kenny (1986) guidelines for studies involving mediation analysis. With regards to the relationship between organization contexts and knowledge sharing, correlation analyses revealed that information technology, top management support, collaborative culture, and organization structure were positively associated with both tacit and explicit knowledge sharing.

However, the correlations between collaborative culture and explicit knowledge sharing (r=.391) and information technology and explicit knowledge sharing (r=.366) compared with those of top management support and organization structure and explicit knowledge sharing were the highest. In contrast, the correlations between top management support and tacit knowledge sharing (r=.491) and collaborative culture and tacit sharing (r=.482) were the highest compared to the correlations of information technology and organization structure and tacit knowledge sharing. From these results, it seemed that collaborative culture seemed to be the most strongly associated with knowledge sharing.
In addition, correlation analysis results also indicated that tacit knowledge sharing was positively related with explicit knowledge sharing (r=.597) and vice versa. This finding adhered to Reychav and Weisberg (2009) study which also reported a positive association between these two types of knowledge sharing. The positive relationship between the explicit knowledge sharing and tacit knowledge sharing may suggest that explicit knowledge depends on tacit knowledge to be successfully codified. As stressed by Brown and Duguid (1998), explicit knowledge of “know-what” requires the more tacit knowledge “know-how” to put the “know-what” into practice. Similarly, the results indicated the codified knowledge may be unusable without the augmentation of tacit knowledge. Consequently, organizations need to value and encourage the sharing of both types of knowledge.

According to Kalhifa, Yu, and Shen (2008, p.123) KMSs are designed to support and enable KM processes, and therefore are expected to enhance organization innovativeness. This research found a positive relationship between KMS and innovation (r=.608), this provided some support for Kalhifa et al. (2008) argument and for (Adams & Lamont, 2003) proposition that an organization KMS effectiveness may be associated to organization innovation.

Finally correlation analysis results also showed that organization contexts (i.e. information technology, top management support, collaborative culture, organization structure) were not only positively associated with effective knowledge sharing but were also related to innovation and KMS success.

Hierarchical regression results showed that organization contexts had not only an effect on knowledge sharing, but also had an effect on innovation and KMS. The results also showed that organization contexts had a greater effect on KMS than on knowledge sharing and innovation. The results also indicated that knowledge sharing partially mediated the relationship between organization contexts and KMS and that it also partially mediated the relationship between organization contexts and innovation. As hypothesized, knowledge sharing was also found to have positive effects on innovation and KMS.

Referring to the relationship between organization contexts, knowledge sharing, KMS, and innovation, PLS results confirmed that organization contexts (i.e. information technology, top management support, organization culture, and organization structure) had an impact on
knowledge sharing (i.e. tacit and explicit), KMS and innovation. PLS results also showed that organization contexts had a greater influence on innovation and KMS than on knowledge sharing. Such findings indicated that organization contexts should always be considered when promoting effective knowledge sharing behavior, and particularly when fostering innovation, and ensuring successful implementation of KMS. This finding lent empirical support to Al-Busaidi et al. (2010) argument that emphasized that ‘understanding factors that affecting knowledge sharing is essential to the successful deployment of KMS’.

Since the results also showed that organization contexts had an impact on knowledge sharing and innovation, with that said this study laid the groundwork for future studies to further examine factors that affect knowledge sharing in order to unveil their potential influence or importance for innovation.

With regards to the effect of knowledge sharing on innovation and KMS success, PLS findings revealed that both tacit and explicit knowledge sharing are considered as essential in ensuring organization innovation and KMS success. This reinforced the argument that organizations need to foster an environment where both tacit and explicit knowledge can be shared. While Seidler-de Alwis and Hartmann (2008) argued that explicit knowledge compared to tacit knowledge does not provide a competitive advantage, this study’s results clearly showed that the sharing of tacit and explicit knowledge is essential in helping organization building their competitive advantage.

**Research Recommendations**

- **Recommendation for Taiwan ICDF**

  This study provided evidence on the importance of organization contexts (i.e. information technology, top management support, collaborative culture, and organization structure) for nurturing tacit and explicit knowledge sharing behavior and ensuring KMS and innovation success in nonprofit organizations such as Taiwan ICDF. Although the organization has a centralized structure which supposedly would be expected to inhibit knowledge sharing, the positive impact of organization structure on knowledge sharing suggested that its structure should not be altered. As Nonaka (1995) suggested hierarchical structure can be maintained
while the flexibility dimension is added so as to encourage knowledge sharing and collaboration among individuals.

In relation to descriptive statistics results for organization structure, ‘there is good system of delegation of power in my department’ and ‘employees’ participation in decision-making process’ gathered the lowest mean scores. Therefore giving more power to employees in their work and acknowledging or inviting employees to be engage in the decision making process may increase the level of flexibility in the organization structure and subsequently promote individuals’ tacit and explicit knowledge sharing behavior. It has been reported by Al-Alawi et al. (2007) that an organizational structure characterized by participative decision making, ease of information flow and cross functional teams was vital to knowledge sharing. In addition, study conducted by Jones (2002) indicated that the higher the degree of employee participation in decision making, and the more employment conditions were satisfactory, the greater were the preparedness of employees to share knowledge.

Increasing employees’ right to participation in decision making is even more important if the organization’ goal is to foster innovation. Research has shown that being able to participate in decision making was a key factor in enhancing innovation (e.g. Axtell et al., 2000; Forcadell & Guadamillas, 2002; West & Anderson, 1996). In order to improve employees’ participation in decision-making process, it is recommended that management welcomes employees’ opinions, particularly to those issues that are of concern to them and nurtures collegiality in meetings as a way to invite individuals to openly discuss their ideas.

When it comes to collaborative culture, ‘there is a willingness to accept responsibility for failure’ and ‘there is a willingness to collaborate across organizations units’ gathered the lowest means scores. Accordingly, it is recommended that management organizes periodic meetings across organizations units in order to promote good communication between departments/organization units. An open door communication policy supporting open communication between individuals and departments may be an important step in helping building a collaborative culture. Moreover, encouraging employees to communicate will help to build relationships between people, establish trust among organizational members. In addition, management needs to create awareness on the importance of tasks colleagues work on through project debriefing as a way to develop connections and collaboration among individuals. Project
deb briefings for example can help individuals identify who possess the knowledge and the area of expertise of the knowledge providers that they may call upon when the need arises. Through these debriefings, organization members can learn from the success stories that they need to continue to emulate as well as to extract the lessons learned from past failures. In addition, management should focus on building relationships on partnerships in order to nurture a sense of collective responsibility among employees.

In relation to top management support, ‘top management’ efforts in fostering knowledge sharing culture by offering rewards’ had the lowest mean score. Therefore recognizing individuals for their knowledge contribution through rewards can have positive impact on their knowledge sharing behavior. With that said it is recommended that management recognizes employees that have made valuable knowledge contribution to the organization. While all these suggestions could be effective ways to encourage knowledge sharing, management in collaboration with human resource officers needs to understand employees’ needs and objectives in order to tailor effective rewards that may be susceptible to trigger their knowledge sharing behavior.

Referring to information technology, it is suggested that management make more use of information technology to communicate with employees in order to set the example. It is important that organization members understand information technology’s use implications for work, collaboration and communication. For example, the mean response for ‘organization is good at using IT in achieving success’ showed that employees felt somewhat neutral toward such statement. In reference to knowledge sharing, technology applications such as e-mail, videoconferencing, and the like have been found to be effective in facilitating tacit knowledge sharing. Management’s increasing use of information technology to share knowledge may reinforce the message that utilizing technology for knowledge sharing is a desired behavior.

With regards to knowledge sharing, it is recommended that management articulates a knowledge strategy that supports both tacit and explicit knowledge sharing within the organization. According to the results, it seems like the organization favors a personalization strategy. While a personalization strategy may be adopted, it is recommended that some degree of codification strategy should be embraced by management. The codification of knowledge is not only necessary for effective use of knowledge but also is necessary for re-using it when
needed so that the knowledge in question is going to belong to the organization rather than the knower (Zaim, 2006, p. 8). While management may continue to promote the sharing of tacit knowledge through socialization, mentoring and the like, it is also recommended that management encourages the exchange of work related reports among organization members (e.g. PowerPoint slides, spreadsheet) on the organization KMS so that the organization can track the knowledge contributor and evaluate the value of knowledge provided for rewards allocation.

With regards to KMS knowledge service, it is also recommended that management pays great attention to the performance of the KMS. Various researchers (e.g. Al-Busaidi et al., 2010; Cabrera, Salgado & Collins, 2006) have indicated that the effectiveness of a KMS can affect attitude toward knowledge sharing. On the basis of the descriptive statistics results for KMS, it is recommended that the knowledge staff work closely with employees in order to develop an effective system that will meet all employees’ needs for knowledge sharing since they are the main users of the system. System facilitation for knowledge contribution to the system may be one of the primary steps in efforts of making KMS more effective for knowledge sharing.

Moreover, the knowledge staff needs to make the necessary update so that the KMS service is more reliable, dependable and accurate. Cabrera, Collins, and Salgado (2006) noted that individuals’ knowledge sharing may be affected by the system contents quality by shaping perceptions on the importance and impact of contributions. They contended that the quality of the system may encourage people to share their knowledge as this may contribute to project a positive personal image of expertise. In order to improve employees’ perception about KMS content quality, it is recommended that management conduct evaluation related to employees’ satisfaction with the system.

At last, management with the assistance of the organization Human Resource leaders needs to ensure that all users are able to use and understand all aspects of the systems. As perceived ease of use of the system has been found to affect individuals’ attitude toward knowledge sharing, it is therefore recommended that the KMS interface should be easy to operate in order to facilitate access to all users. To this end, it is suggested that management offers their support for KMS use through the development and implementation of training programs necessary to enhance individuals’ skills in using the system.
Finally, Taiwan ICDF should not focus on the discussed contextual factors only in developing knowledge sharing strategies. It is highly recommended that the organization leaders take into account other factors outside the scope of this research that may influence employees’ knowledge sharing behavior. Knowledge sharing behavior based on some researchers’ definition can be analyzed as a function where: \( F(X_{ks}) = a_0 + (\beta_1\text{organization context} + \beta_2\text{interpersonal context} + \beta_3\text{individual factors}) + \epsilon \). So far the study investigated only \( (\beta_1\text{organization context}) \). Organization context is important because it has the potential to shape individuals’ behavior and to influence interpersonal relationship among organizational members and individual factors.

**Limitations and Recommendations for Future Research**

In light of the limitations and delimitations of the study, recommendations for future are given. The researcher placed some delimitation in order to manage the scope of the study. First, it was delimitated to Taiwan and to one nonprofit organization, the International Cooperation and Development Fund (Taiwan ICDF). Furthermore, the research was also delimitated to full time employees working in specific offices such as personnel, accounting, legal affairs, and information technology and so on.

Drawing from the delimitations, this study was limited to Taiwan and was carried in one nonprofit organization therefore the results cannot be generalized to other nonprofit organizations. In addition, the research participants consisted only of Taiwanese employees working full time. Since people can have different perceptions of the organizations they belong to and may respond differently to their organization environment, the findings of this study may be context specific and may not be applicable to other group of organization members (i.e. volunteers, part-time employees, organization experts) and to other nationalities.

This study had also various methodological limitations. This study embraced only a quantitative survey methodology. One of the disadvantages of survey research includes the inability to gather anything more than superficial data without much data. Thus, to better comprehend the impact of organization contexts on knowledge sharing, future studies may need to incorporate a qualitative approach. Qualitative studies provide a rich and in-depth examination of the organizational context in which knowledge sharing occurs (Wang & Noe, 2010). For
example, it would be informative for future research to identify the specific elements in a collaborative culture that employees believe demonstrate support for knowledge sharing.

Furthermore, the units of analysis are exclusively full time employees working at Taiwan ICDF. Thus future studies addressing knowledge sharing in nonprofit organizations may target volunteers as population of interest since nonprofit organizations’ personnel comprises both full time employees and volunteers. Volunteers are responsible for many of the programs and accomplishments associated with nonprofit organizations, but leave the organization after a limited tenure resulting in knowledge loss for the organization (Bach, Lee, & Carroll, 2009). Thus the need to understand the factors affecting volunteers’ knowledge sharing behavior within nonprofit organizations is critical to combating and preventing knowledge loss, developing effective KM initiatives and ensuring organization’s competitive advantage.

Given that knowledge sharing can be described as a function where knowledge sharing = organization context factors + interpersonal context factors + individual factors, the research model may be modified to include individuals’ factors in an attempt to identify what group of factors weighs in the most in ensuring knowledge sharing. It would also be interesting for future studies to include rewards policy as a contextual variable and organization commitment as an individual variable.

Future studies may also investigate whether there is a relationship between knowledge sharing and KMS by shifting their direction (see figure 5.1). Authors like (Al-Busaidi et al., 2010; Collins, Cabrera, & Salgado, 2006) have indicated that the effectiveness/quality of KMS can contribute to higher level of knowledge sharing behavior within organizations. Therefore it would be interesting to further examine the effects of KMS on knowledge sharing and innovation. Future studies may also consider integrating organization commitment within this research’s framework. Organization commitment has been claimed to be essential for the success of any organization initiatives whether it includes promoting effective knowledge sharing, ensuring KMS success, and fostering innovation. It is also well-known that organization contexts have an impact on organization commitment. Such a framework may provide a new perspective on these variables’ relationships.
Finally, studies can also investigate the impact of explicit and tacit knowledge sharing on the performance of different types of innovation as for instance administrative and service innovation.

**Organization Contexts**

![Diagram showing the relationship between Information Technology, Top Management Support, Collaborative culture, Organization Structure, KMS, Knowledge Sharing, and Innovation.](image)

*Figure 5.1: Proposed conceptual framework*
REFERENCES


Fang, C.-L., & Liu, W.-C. (2002). The effects of personality on willingness and behavior of knowledge sharing. Available at: [http://www.ncu.edu.tw/~ncu7020/Files/Phd_Repord/97/14/paper.pdf](http://www.ncu.edu.tw/~ncu7020/Files/Phd_Repord/97/14/paper.pdf)


textile industry. *International Journal of Economic and Administrative Studies, 4* (7), 19-34.


APPENDIX A: COVER LETTER FOR QUESTIONNAIRE

敬愛的受訪者：

我是 Nadeige Bernard，目前是國立臺灣師範大學的研究生，正在撰寫有關知識管理領域的論文；此研究將透過更深入瞭解影響知識分享的因素，探討推動或成功達成組織之創新及實施知識管理系統的方式。

隨著知識正逐漸視為是保持永續競爭優勢、經濟成長，以及企業價值的主要無形來源，因此保存及獲取知識遂成為許多組織主要聚焦的工作。然而，對於潛在受益於知識的組織而言，這些組織須確保組織上下全體皆可共同分享知識。

因此，邀請您一同參與問卷調查，協助研究人員發現，可能有助於「國際合作發展基金會」瞭解成為知識型組織，並在非營利部門保有競爭優勢的重要因素。

您的參與及本問卷是否填寫完整，攸關著本研究能否成功。本問卷共有 46 項問題，其中包括 6 個個人背景資料問題。全部的問題皆經過設計，以便於您作答，您約須 20 分鐘的時間完成本問卷。此次調查需要極少的書寫。此特別版的問卷，是供本研究的「前導試驗」階段使用。

問卷中沒有任何會觸及敏感性的問題。請從公正客觀的角度回答，並儘管放心，您所提供的資訊將會保密。而且，您的答覆僅作為學術目的之用；不會公開任何個人資訊。此外，您若希望對本研究進行後續追蹤，研究結果將可供您之用。另歡迎您給予評論、建議及意見回饋。如有任何疑問或疑慮，請立即直接撥打 0939-272-749 與我聯絡。

感謝您的參與及支持。

謹啟

Nadeige Bernard
NADEIGE BERNARD

附件 (4)
### APPENDIX B: QUESTIONNAIRE

1. 非常不同意  2. 不同意  3. 普通  4. 同意  5. 非常同意

**Section A:** 此部分問項主要探討貴組織的(資訊科技，管理階層的支持，合作的文化，組織架構)。

| 1. 國合會專善於運用資訊科技來獲致成功。 | 1 | 2 | 3 | 4 | 5 |
| 2. 透過資訊科技（IT），國合會之關鍵能力在於有效整合能力。 | 1 | 2 | 3 | 4 | 5 |
| 3. 國合會資料庫提供之資訊可支援並能對員工之技能。 | 1 | 2 | 3 | 4 | 5 |
| 4. 經理人員善於運用 IT 平台來與員工溝通。 | 1 | 2 | 3 | 4 | 5 |
| 5. 國合會設置有雙向溝通管道，譬如電子佈告欄或定期會議。 | 1 | 2 | 3 | 4 | 5 |
| 6. 管理階層重視各作業單位間的知識分享。 | 1 | 2 | 3 | 4 | 5 |
| 7. 管理階層非常鼓勵員工分享他們的專業技術與專門知識。 | 1 | 2 | 3 | 4 | 5 |
| 8. 管理階層持續努力創造知識分享文化(譬如提供獎金)。 | 1 | 2 | 3 | 4 | 5 |
| 9. 國合會全體員工都非常支持其他同事並願意提供協助。 | 1 | 2 | 3 | 4 | 5 |
| 10. 員工願意承擔失敗的責任。 | 1 | 2 | 3 | 4 | 5 |
| 11. 國合會各單位皆願意協同合作。 | 1 | 2 | 3 | 4 | 5 |
| 12. 我工作的部門無論垂直或水平面都有很好的授權制度。 | 1 | 2 | 3 | 4 | 5 |
| 13. 我工作的部門設置有處理工作的標準作業程序。 | 1 | 2 | 3 | 4 | 5 |
| 14. 我工作的部門設置有處理工作的作業準則大綱。 | 1 | 2 | 3 | 4 | 5 |
| 15. 我工作的部門保障員工能夠參與決策過程。 | 1 | 2 | 3 | 4 | 5 |
Section B: 此部分問題主要探討貴組織正式的工具知識分享與默許的知識分享。

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continued
Section C: 此部分問項在於了解您對貴組織使用系統的經驗和創新能力來做答。

| 24. 所有使用者皆將能夠使用及瞭解系統之所有功能。 | 1 | 2 | 3 | 4 | 5 |
| 25. 此系統對於以原有的知識為基礎來創造新的知識提供了強而有力的支援（利用現存的研究來創造新的發現及知識）。 | 1 | 2 | 3 | 4 | 5 |
| 26. 此系統考慮到顧客（員工）的條件。 | 1 | 2 | 3 | 4 | 5 |
| 27. 此系統有多種的服務（例如常見問題、論壇及提供給員工的研究報告）。 | 1 | 2 | 3 | 4 | 5 |
| 28. 此系統滿足員工的需求。 | 1 | 2 | 3 | 4 | 5 |
| 29. 員工幫助決定此系統所需的條件。 | 1 | 2 | 3 | 4 | 5 |
| 30. 此系統不論何時當它被需要時都能使用，亦即此系統是可靠的、可信任的及精準的。 | 1 | 2 | 3 | 4 | 5 |
| 31. 此系統向員工保證他們的關心的事情是重要的。 | 1 | 2 | 3 | 4 | 5 |
| 32. 系統的工作人員禮貌地及有同理心地對待員工。 | 1 | 2 | 3 | 4 | 5 |
| 33. 此系統有專業的形象。 | 1 | 2 | 3 | 4 | 5 |
| 34. 敏感的資訊都以秘密的方式來處理。 | 1 | 2 | 3 | 4 | 5 |
| 35. 公司隨時願意接受依據研發結果所進行之技術創新。 | 1 | 2 | 3 | 4 | 5 |
| 36. 管理階層主動的尋求創新想法。 | 1 | 2 | 3 | 4 | 5 |
| 37. 擬定計畫時願意接受創新想法。 | 1 | 2 | 3 | 4 | 5 |
| 38. 同仁將因為創新想法不成功而受到懲罰。 | 1 | 2 | 3 | 4 | 5 |
| 39. 於國合會，創新想法被認定為太具風險而不願意接受。 | 1 | 2 | 3 | 4 | 5 |
Section D: 個人基本資料

41. 年齡： □25 歲以下 □26-35 歲 □36-45 歲 □46-55 歲 □56 歲以上

42. 性別： □男性 □女性

43. 到職期間： □少於 1 年 □1-2 年 □3-5 年 □6-8 年 □超過 8 年

44. 您的最高學歷為：

教育背景： □ 高中畢業 □技術學校畢業 □學士 □碩士 □博士

45. 現任部門：

□人道援助處 □技術合作處 □投資處 □國際教育訓練處
□綜合管理處 □會計室 □財務室 □公關室
□人事室 □稽核室 □資訊室 □法務室
APPENDIX C: PLS RESULTS