THE RELATIONSHIP BETWEEN INDIVIDUAL, ORGANIZATIONAL AND INTERPERSONAL FACTORS AND TACIT KNOWLEDGE SHARING WITH ICT USAGE AS THE MEDIATOR

By

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ABSTRAK

Terdapat dua fokus utama kajian ini. Pertama, kajian ini mengkaji hubungan langsung antara faktor individu (sikap individu, komitmen organisasi, dan efikasi kendiri berkaitan ilmu), organisasi (suasana organisasi, sokongan pengurusan, sistem ganjaran, dan struktur organisasi), danantara perorangan(kepercayaan antara perorangan dan jaringan sosial), dan perkongsian ilmu tasit. Kedua, ia mengkaji kesan perantara penggunaan teknologi informasi dan komunikasi (ICT) ke atas hubungan antara faktor-faktor individu, organisasi dan antara perorangan, dan perkongsian ilmu tasit. Sebanyak 400 borang soal selidik telah diedarkan kepada staf teknikal dalam sektor ICT di Jordan. Daripada 400 borang soal selidik yang diedarkan, sebanyak 375 soal selidik telah diterima semula. Walau bagaimanapun, hanya 365 soal selidik boleh digunakan untuk analisis selanjutnya, mewakili kadar maklum balas sebanyak 92.75%. Hipotesis berkaitan kesan langsung diuji dengan menggunakan analisis regresi berganda, manakala kesan perantara diuji dengan menggunakan analisis Preacher dan Hayes. Dapatan kajian menunjukkan bahawa sikap individu, efikasi kendiri berkaitan ilmu, suasana organisasi, struktur organisasi, sokongan pengurusan dan kepercayaan antara perorangan adalah berhubung secara signifikan dengan perkongsian ilmu tasit. Sementara itu, analisis perantara menunjukkan bahawa penggunaan ICT memainkan peranan sebagai perantara separa dalam perhubungan antara efikasi kendiri berkaitan ilmu, suasana organisasi, struktur organisasi, dan kepercayaan antara perorangan,dan perkongsian ilmu tasit. Terdapat beberapa implikasi dari kajian ini. Dari segi ilmu, ia memberikan kefahaman tentang faktor-faktor yang mempengaruhi perkongsian ilmu tasit. Dari segi amalan, ia mencadangkan bahawa pengurus harus fokus kepada menyediakan sokongan pengurusan, suasana organisasi dan struktur organisasi untuk perkongsian ilmu tasit.Di samping itu, amalan yang dapat meningkatkan komitmen organisasi, efikasi kendiri berkaitan ilmu, dan kepercayaan antara perorangan perlu dilaksanakan. Penggunaan ICT juga perlu dikuatkuasa bagi memudahkan perkongsian ilmu tasit. Selain itu, ia juga memberi cadangan untuk kajian akan datang untuk memperkembangkan lagi kajian dari segi pembolehubah kajian dan juga sampel kajian bagi mendapatkan kefahaman yang lebih baik tentang peranan sikap individu, kepercayaan antara perorangan dan organisasi berkenaan perkongsian ilmu tasit.

Kata kunci: Perkongsian Ilmu Tasit, Faktor Individu, Faktor Organisasi, Faktor Antara Perorangan, Penggunaan ICT

ABSTRACT

The main focus of this study is twofold. Firstly, the thesis attempts to examine the direct relationship between individual (individual attitude, organizational commitment, and knowledge self-efficacy), organizational (organizational climate, management support, reward system and organizational structure), and interpersonal (interpersonal trust and social network) factors, and tacit knowledge sharing. Secondly, it is to examine the mediating effect of information and communication technology (ICT) usage on the relationship between individual, organizational and interpersonal factors, and tacit knowledge sharing. A total of 400 questionnaires were distributed to the technical staff of ICT sector in Jordan. Out of 400, only 375 questionnaires were returned. However, only 365 were usable for further analysis, representing a response rate of 92.75%. Hypotheses for direct relationships were tested using multiple regression, while the mediating effect were tested using the Preacher and Hayes analyses. Results indicated that individual attitude, knowledge self-efficacy, organizational climate, organizational structure, management support and interpersonal trust were significantly related to tacit knowledge sharing. However, the mediating analysis showed that ICT usage only partially mediated the relationship between knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust, and tacit knowledge sharing. The current research have several implications. Knowledge wise, it provides understanding on the factors that affects tacit knowledge sharing. Practise wise, it suggests to managers that they should focus on providing the right management support, organizational structure and climate for sharing tacit knowledge. In addition, any practices that could promote organizational commitment, knowledge self-efficacy and interpersonal trust should also be implemented. The use of ICT should also be enforced so as to facilitate tacit knowledge sharing. Besides that, suggestions were also made for further research to be conducted the exploration of the variables tested in this study on other settings, and with different sample frames, in order to achieve a more robust finding towards a better understanding of the role of individual, interpersonal and organizational factors on tacit knowledge sharing.

Keywords: Tacit Knowledge Sharing, Individual Factors, Organizational Factors. Interpersonal Factors, ICT Usage

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

There is no doubt that the world is facing many changes in the information and communication technology domain, known as "information revolution". These changes have been competitively based on the effective exploitation of information and knowledge. Therefore, organizations need to change their internal structure and organizations need to recognize the importance of knowledge as a crucial factor for the success of an organization (Rezaie, Byat &Shirkouhi, 2009). Specifically, organizations need to understand that knowledge is power and it is also an important strategic resource of all organizations (Sung-Ho, Kim, & Kim, 2004; Alhawary & Al-Zegaier, 2009). Hence, knowledge should be the core competence of any organizations (Prahalad & Hamel, 1990).

Today, most economy depends mainly on knowledge, and for that reason today's economy is known as the knowledge economy or "k-economy" (Sunassee & Sewry 2003; Halawi, Aronson &McCarthy, 2005). Knowledge economy is shared worldwide (Civi, 2000). It is characterized by rapid development, does not depend on traditional capital assets, and it is dynamic. (Hijazi, 2005). As such, it is imperative for organizations to focus on investment in knowledge resources or intellectual capital (e.g. experience, skills, capabilities, patents) (Wei, Choy & Yew, 2009). This is because the importance of knowledge as an intangible asset for an organization is

more important than tangible assets such as land, equipments, capital (Civi, 2000; Zaim, Tatoglu & Zaim, 2007).

Knowledge is important because of its various characteristics that distinguish it from other resources of an organization. According to Wigg (1997), knowledge is an intangible resource and difficult to measure. It is volatile, embedded in agent with wills, not consumed but sometime increases by using. Knowledge could not be bought at any markets or at any time but could be used in different processes at the same time. Hence, there is a consensus among many researchers on the importance of knowledge as a major source of competitive advantage in the twenty-first century (Helfat & Raubitschek, 2000; Hitt, Biermant, Shimizu & Kochhar, 2001; Halawi *et al*., 2006; Al-Alawi, Al-Marzooqi &Mohammed, 2007; Alhawary & Al-Zegaier, 2009; Wei *et al*., 2009), as such it must be properly managed.

In managing knowledge effectively, organizations must be able to manage the creation of knowledge, the storage of knowledge, the use of knowledge and finally the dissemination or sharing of knowledge (Davenport, 1998). Although all these four aspects of knowledge management are important, knowledge sharing was given a lot of emphasize in research because it was argued that through knowledge sharing, more knowledge could be created, stored and used. However, according to Wah(1999), 90 percent of the knowledge in any organization is embedded in tacit form and sharing the tacit knowledge could be very difficult.

Nonetheless, many researchers have indicated the importance of tacit knowledge sharing (Herrgard, 2000; Nonaka, 1995; Wah, 1999; Grant, 1996, Alwis& Hartmann,

2008; Ambrosini& Bowman, 2001; Lam, 2000). For example, Herrgard (2000) stated that tacit knowledge sharing provides great value to an organization. Specifically, the tacit knowledge sharing is beneficial for improving decision-making, quality, producing, and competitiveness (Bennett, 1998). This notion is supported by Nonaka, (1991) who asserted that tacit knowledge is the most significant resource for an organization (in Grant, 1996). Furthermore, Nonaka (1991) also indicated that tacit knowledge is the source of all knowledge, especially to create new ideas in the organization (Grant, 1996). It is a source of competitive advantage, learning, and innovation process (Lam, 2000; Ambrosini & Cliff 2001; Alwis & Hartmann, 2008). McAdam, Mason and McCrory (2007) confirm the importance of the organizations' recognition of the tacit knowledge value. Hence, better attention should be given to the tacit knowledge sharing in the organization, because of its significant role in achieving the organization objectives effectively.

1.2 Background of the Study

Jordan is a country that suffered from a lack of natural and economic resources (Taghdisi-Rad, 2012). To counter this problem, the country focuses on knowledge as a resource to boost their economy. His Majesty King Abdullah II fervently believes that a foundation for the new Middle East k-economy can only be established if all sectors of Jordan economy invest in their human and knowledge resources. In fact, His Majesty King Abdullah II at World Economic Forum, Davos- Switzerland - Jan-2003 stated that:

> "Most important, we have invested heavily in the development of our greatest national asset - our people. In a knowledge-economy world, human resources are the real advantage that will sustain our economic drive. And that capability will, I believe, be the source of Jordan's future and a foundation for the new Middle East."(The King Abdullah II Award for Excellence in Government Performance and Transparency, 2002).

In other words, the vision of His Majesty King Abdullah II indicates that Jordan can overcome challenges and accomplish great success by exploiting the vast knowledge resources of Jordan. He therefore calls upon all sectors of the Jordanian economy to provide the conducive environment that will nourish creative skills and innovative ideas in citizens. Moreover, His majesty demands that laws and regulations guiding international investment be transformed to accommodate knowledge resources management. This was highlighted in King Abdullah II speech at the 13th Parliament- November 25, 2000, where he stated that:

> "The realization of this vision requires that we work with vigor and diligence to equip Jordanian citizens with the necessary skills, and create the right environment for releasing their creative talents. We also have to reconsider laws and legislation that hamper the development process. We have to effect new laws that will enable us to modernize state institutions and agencies and enhance their ability to achieve." (The King Abdullah II Award for Excellence in Government Performance and Transparency, 2002).

As a result, Jordanian officials are working hard in order to improve the performance and competitive advantage of Jordanian organizations. In fact, the Jordanian government is working hard to transform the country by trying to initiate an attractive environment for external investments in various sectors. This is hoped to lead to Jordan's economic growth and the nation's standard of living. For that reason, a lot of effort is being made toward successful knowledge management (KM) initiatives in Jordanian organizations.

1.2.1 The Knowledge Management Initiative

One of the most important efforts in this domain is “King Abdullah II award for excellence for the private sector” and “The King Abdulla II Award for Excellence in Government Performance and Transparency”. KM is considered as one of the criteria of this award. The King Abdullah II Award was created in 1999 and is considered as the top level of quality and excellence recognition in the country. The objective of behind its establishment is the promotion of quality awareness and excellent performance and the cognizance of quality and business achievements of organizations in Jordan. It also aims at achieving sharing of knowledge, experience and success stories of participating organizations (The King Abdullah II Award for Excellence for the private sector, 1999). As illustrated in Figure 1-1, KM is considered as one of the criteria of this award.

Figure 1-1
The Award Concept
Source: http://www.kaa.jo

In addition to that, there are also the establishment of manyof the Jordanian projects that represent the application of knowledge management such as, Knowledge Stations (http://www.ks.gov.jo), Jordan e-Government Program (http://www.moict.gov.jo), National Information System (http://www.nis.gov.jo), and Al-Manar Project

(http://www.almanar.jo). These projects aim at driving nation's transformation into a knowledge society founded on a competitive and dynamic economy.

Moreover, it attempts to develop relations between institutions within the national network; relations that provide advanced economic, social, and technological information and knowledge. The projects are aimed at improving the development and use of both knowledge and human resources in Jordan.

The information and communication technology organizations in the private sector greatly contribute to the development of Jordan's economy. The sector concentrates more in knowledge management implementation as opposed to the public sector. This is because it is convinced of the innumerable benefits and high profits that are produced from knowledge resource investment as clearly evidenced by His Majesty's King Abdullah II Vision for ICT regarding investments in the private sector where he was quoted as stating;

> "We realize that private investment is the real engine for sustainable economic development. We have, therefore, adopted a course of action to encourage such investments in key sectors of Jordan's economy. This course includes legislation aimed at liberalizing these sectors through privatization proper regulation and the guarantee of fair competition" (he Telecommunications Regulatory Commission, 1995).

There is a lot of effort being made toward successful knowledge management (KM) initiatives in Jordanian organizations, and to the establishment of many of Jordanian projects that represent the application of knowledge management. Nevertheless, one of the problems that most Jordanian organizations face today is the lack of tacit knowledge sharing (Alhammad, Al Faori& Abu Husan, 2009; Alhalhouli, Hassan &

Der, 2014). Due to this problem, Jordanian organizations face delay in the achievement of its goals.

1.2.2 The Issue of Brain Drain

Despite all the efforts and resources that have been invested by the Jordanian government, it seems that this country is still unable to capitalize on its knowledge resources (i.e. human resources). Evidences showed that the country is losing their knowledge resources to its neighboring countries. For example, according to Bil-Air (2012) there are 600000 to 670000 Jordanian are employed outside Jordan. In fact, it was estimated that 75% of them are working in Gulf countries and most of them are found to be highly educated. Similarly, data from the Public Security Directorate, which is illustrated in Figure 1-2, also confirms the fact many Jordanians are moving out of the country, when the government has struggled to develop incentives to keep them close to home (Charp, 2010). In short, Jordan is suffering from brain drain problem, and retaining valuable knowledge becomes a very important agenda in the knowledge management effort. One way to address this problem is to encourage knowledge sharing, especially tacit knowledge sharing(Hijazi, 2005; Eftekharzadaeh, 2008).

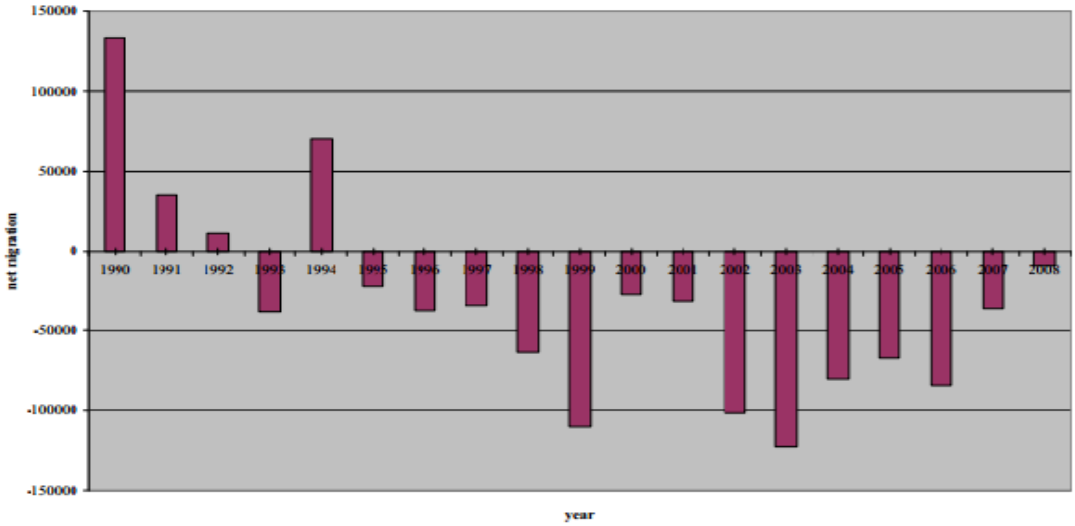

Figure 1-2
Net Migration of Jordanian
Source: Public Security Directorate

In the context of organizations, sharing of tacit knowledge can help organizations retain their intellectual capital (Hijazi, 2005; Eftekharzadaeh,2008), which is important for their competitive advantage and survival. Moreover, Eftekharzadaeh (2008) and Hlidreth (1999) pointed out that the lack of tacit knowledge sharing could lead to the loss of organizations' "intellectual capital" which takes place by losing the knowledge when the individuals leaves the organization. Therefore, effective tacit knowledge sharing provides solutions to the "brain drain" problem and maintains the intellectual capital of an organization (Awad&Ghaziri, 2004; Eftekharzadaeh, 2008; Grandan&Grandan, 2003). In addition, according to McAdam*et al*. (2007) the sharing of tacit knowledge contributes to solving the problem of "reinventing the wheel" which takes place when one of the employees leaves the organization.

1.3 Problem Statement

The importance of tacit knowledge is show not yet fully understood and not well taken into account compared to the importance of explicit knowledge (Davenport & Prusak 1998; Zack, 1999; McAdam *et al*., 2007). There is a general agreement in the literatures that tacit knowledge is difficult to share (Nonaka & Takeuchi 1995; Leonard & Sensiper 1998; Nonaka & Konno 1998; Zack 1999; Haldin-Herrgard 2000; Wasonga & Murphy 2006; McAdam *et al*., 2007), and difficult to express (Wagner, 1987; Nonaka & Konno, 1998; Lubit, 2001; Wasonga & Murphy, 2006; McAdam *et al*., 2007). However, studies that investigated the tacit knowledge sharing are quite limited in numbers. Among the most important studies are those by Lin and Lee (2006), and Lin (2007b) and (McAdam *et al*., 2007). Most other studies studied knowledge sharing in general. For example, the study by Wang and Noe (2010), Constant *et al*. (1994), Jarvenpaa and Staples, (2000), Bock *et al*. (2005), Wasko and Faraj (2005), Kankanhalli*et al*. (2005), and Kuo and Young (2008).Due to this situation, the reason for why people share their tacit knowledge is not fully understood. As a result, what are the factors that lead to tacit knowledge sharing among employees cannot determine.

Previous studies have indicated that there are many variables that could affect knowledge sharing (Mesmer-Magnus &DeChurch, 2009; King & Marks, 2008; Lin, 2007d; Chiu, Hsu, & Wang, 2006; Collins & Smith, 2006; Liao, 2006; Ruppel& Harrington, 2001; Willem & Scarbrough, 2006). However, most of these researches only studied knowledge sharing in general, and not focusing on tacit knowledge sharing. In fact, as emphasized by Wang and Noe (2010) there is a need to study the individual and organizational factors that affect tacit knowledge sharing. Furthermore,

several researchers have emphasized the insufficient many of studies that employed quantitative approach in investigating the success factors of tacit knowledge sharing (Wang and Noe, 2010; Jennex & Zakharova, 2005)especially tacit knowledge sharing. In short, discussion on the importance of tacit knowledge sharing for organizational successhas been plenty, but up to date, not many empirically evidence that show factors that could contribute to tacit knowledge sharing.

Literature have discussed various different factors that could affect knowledge sharing in general and also tacit knowledge sharing. Nonetheless, many researches in the area of knowledge sharing has repeatedly emphasize the importance of **individual factors** (Nonaka, 1994; Constant et al., 1994; Jarvenpaa & Staples, 2000; Bock et al., 2005; Wasko&Faraj, 2005; Kankanhalliet al., 2005; Kuo& Young, 2008) as a factor that could affect knowledge sharing. Moreover, Wang and Noe, (2010) and McAdam et al.(2007) have articulated that individual factors are important predictors of tacit knowledge sharing and need to be empirically investigated in relation to tacit knowledge sharing.

One individual factor that has been found to affect knowledge sharing is **individual attitude** (e.g.,Bock, Zmud, Kim & Lee, 2005; Huang, Davision & Gu, 2008). However, these previous findings only indicate the relationship between individual attitude and knowledge sharing in general. How individual attitude affect tacit knowledge sharing is still have not been determined, and there is a need to know whether individual attitude is also important for tacit knowledge sharing.

Another individual factor that was found to affect employees tendency to share their knowledge is **knowledge self-efficacy** (Wasko & Faraj, 2005; Luthans, 2003; Constant et al., 1994). In essence, knowledge self-efficacy should be very important for tacit knowledge sharing because it gives the confidence for employees to share their knowledge with others. However, studies that relate knowledge self-efficacy and knowledge sharing is very limited (Wasko & Faraj, 2005; Luthans, 2003; Constant et al., 1994), much less on tacit knowledge sharing. Nonetheless, these studies that have been done on knowledge self-efficacy confirms that this factor is a significant predictor. Therefore, knowledge self-efficacy should also be studied to determine its whether it is one of the individual factor that predicts tacit knowledge sharing.

Organizational commitment, on the other hand, has been proven in knowledge sharing field as an individual factor that have a significant impact on knowledge sharing in general (Casimir, Lee & Loon, 2012; Storey & Quintas, 001; McKenzie, Truch & Winkelen, 2001) and tacit knowledge sharing in specific (Pangil & Mohd. Nasurdin, 2009). Indeed, the effect of organizational commitment is quite consistent and therefore this variable must be included in this study to further confirm the effect of organizational commitment on tacit knowledge sharing.

Another important group of factor that should be studied in knowledge sharing field are the **organizational factors** (Bartol & Srivastava, 2002; Lin & Lee, 2004; Bock *et al.,* 2005). Ekore (2014) emphasized the importance of organizational factors for knowledge sharing, when he found that organizational factors predicts knowledge sharing as well as knowledge transfer success. In fact, Wang and Noe (2010) and Lin (2007d) claimed that organizational climate, management support, rewards system,

and organizational structure are important organizational factors for knowledge sharing.

As argued by various researchers (e.g; Bock *et al*., 2005; Lin & Lee, 2006), one organizational factor that has been found to affect knowledge sharing is **organizational climate**. These researchers found that organizational climate can significantly influence the knowledge sharing. This may give a sign to other researchers to put the spotlight on exploring the association between organizational climate and tacit knowledge sharing.

Besides organizational, **management support** has also been studied in relation to knowledge sharing. Although not many studies have examined the relationship between the two variable, researchers have found that management support is positively related with a knowledge sharing (Connelly & Kelloway, 2003; Lin, 2007). Based on this findings it is also believed that management support is crucial for tacit knowledge sharing, and thus far the connection between this two variables has not been empirically tested.

Another organizational factor that has been discussed to affect employees' tendency to share their knowledge is **rewards system** (Liebowitz, 2003; Lin, 2007; Nelson, Sabatier, & Nelson, 2006). However, the study by Lin (2007) showed that rewards do not affect knowledge sharing (Lin, 2007). Nonetheless, based on social exchange and social capital theories, the rewards system should be positively associated to the knowledge sharing. In fact the findings of Kankanhalli*et al*., (2005) proves that especially when employees are identified with the organization. Due to

inconsistencies of research findings, there is need to further study this variable, and therefore, there is a need to know whether if rewards system is also important for tacit knowledge sharing.

Furthermore, an additional organizational factor that has been shown to have a significant effect on knowledge sharing is **organizational structure** (Lam, 1996; Tagliaventi & Mattarelli, 2006). Kim and Lee, (2006) have emphasized that empirical research that investigated the impact of organizational structure on knowledge sharing are still not enough to provide conclusive evidence on the relationship between these variables. They revealed that organizational structure has a significant effect on knowledge sharing. However, the previous studies have investigated the effect of organizational structure on knowledge sharing. Moreover, there are inconsistency results in predicting knowledge sharing among researchers (Wang & Noe, 2010).However, the studies that have been done on organizational structure were made on different sectors such as industrial and services sectors. Consequently, there is a need to examine the impact of organizational structure on tacit knowledge sharing in ICT sector (Wang & Zhang, 2012).

Additionally, many research in the area of knowledge sharing has repeatedly emphasize the importance of **interpersonal factors** (Wu, Hsu, & Yeh, 2007; Abrams, Cross, Lesser, and Levin, 2003). It has been shown by researchers that interpersonal factors have a positive impact on tacit knowledge sharing in general (Chowdhury,2005; Mooradian, Renzl, & Matzler,2006; Wu *et al.*, 2007).

Previous studies shown that **interpersonal trust** was found to affect knowledge sharing (Chowdhury, 2005; Mooradian, Renzl, & Matzler,2006; Wu et al., 2007).Examining trust is considered an important role in the area of management because that knowledge sharing involves providing knowledge to another person or a collective such as a team or community of practice with expectations for reciprocity (Wu, Hsu, & Yeh, 2007). These previous findings only indicate the relationship between individual trust and knowledge sharing. How interpersonal trust affect tacit knowledge sharing is still inconclusive, and there is a need to know whether interpersonal trust is also important for tacit knowledge sharing.

The second factor in the interpersonal factor that was found to affect employees tendency to share their knowledge is **social networking** (Cross & Cummings, 2004; Hansen, 1999; Reagans & McEvily, 2003). The social networking is important because both the number of direct ties and personal relationships an individual has with other members have been shown to be positively related to the quantity and the perceived helpfulness of knowledge shared (Chiu et al., 2006; Wasko & Faraj, 2005).However, currently the evidence that support the relationship between social networking and tacit knowledge sharing is documented on few studies (Chiu et al., 2006; Wasko & Faraj, 2005).So there is a need to reconfirm the relationship between social networking and tacit knowledge sharing.

Although, all these variables have been found to affect knowledge sharing in general, the effect is not that strong. This is evident based on the β-value of these variables in relation to knowledge sharing. For example, in the study by Lin (2007) the results for the relationship between knowledge self-efficacy and knowledge

sharing is β=0.45 (p=0.01), between management support and knowledge sharing is β=0.23 (p=0.01), and between organizational reward and knowledge sharing is β=0.12 (not significant). Therefore, it is possible the relationship between all these variables and tacit knowledge sharing is mediated by another variable.

In the current organizational environment, the information and communication technology (ICT) has been argued to be crucial for organizational performance (Melville, Kraemer, & Gurbaxani, 2004). In relation to knowledge sharing, **ICT usage** has been found to be highly associated (Han & Anantatmula, 2007;Lin, 2007d;Wang & Zhang, 2012; Zack, 1999). The reason behind that is ICT usage can enable rapid search, access and retrieval of information, and can support communication and collaboration among organizational employees (Huysman & Wulf, 2006). Hence, ICT usage could be a mediator in the relationship between various individual, organizational and interpersonal variables, and tacit knowledge sharing.

Previous studies discussed mainly individual and organizational factors affecting the tacit knowledge sharing separately (Connelly & Kelloway, 2003; Lin, 2007d, Wasko and Faraj, 2005). Therefore, this study differs in the combination of the studying of the individual, interpersonal, and organizational factors in relation to the sharing of tacit knowledge. For example, Tohidinia and Mosakhani (2010) investigated the influence of the attitude, the organizational climate, and the perceived behavioral control on the intention to share knowledge. They found these factors have significant influence on the intention to share knowledge. According to Wang and Noe (2010), the studying of

the individual and organizational factors and the tacit knowledge sharing is very necessary for creating a causal relationship among them.

Obviously, findings from previous literatures (e.g. Bock & Kim, 2002; Lin & Lee, 2004; Lin, 2007c; Wang & Noe, 2010) could not be generalized on Jordan in knowledge sharing, due to many differences between Jordan and other countries such as culture, personal traits, environment work, customs and traditions, lack of natural and economic resources, perception of knowledge sharing (Alhammad *et al.*, 2009). Furthermore, researches in the field of knowledge sharing are scarce in Middle Eastern cultures (Seba, Rowley, & Lambert, 2012), and in developing country (Boumarafi&Jabnoun, 2008; Eftekharzadeh, 2008). Jordan as one of the developing countries faces the same dilemma in this field (Hijazi, 2005).

To sum up, the motivation to conduct this research is because thus far there is no study that looked into tacit knowledge sharing in the ICT organizations in Jordan when it is important to do so since the government has expended a huge amount of money and effort to encourage this to boost up the country's economy. Most importantly, studies that empirically link the individual, interpersonal, organizational, and technological factor to tacit knowledge are still lacking and therefore it is difficult to make any conclusion whether those factors have significant influence on tacit knowledge sharing regardless of industry and culture.

Therefore, the aim of this study is to investigate the effect of individual factors, organizational factors, and interpersonal factors on tacit knowledge sharing. In addition to, this study exploring the mediating effect of ICT usage on the

relationship between individual factors, organizational factors, and interpersonal factors and tacit knowledge sharing.

1.4 Research Questions

This study thus was aimed at answering the following questions:

1. Do the individual, organizational, and interpersonal factors relate to tacit knowledge sharing?

2. Does the ICT usage mediate the relationship between individual, organizational, and interpersonal factors and tacit knowledge sharing?

1.5 Research Objectives

Generally, this research aims to investigate individual, organizational, and interpersonal factors that influence tacit knowledge sharing. Therefore, to answer the research questions posed above, the following research objectives were formulated:

1. To examine the relationship between individual factors (individual attitudes, knowledge self-efficacy, and organizational commitment) and tacit knowledge sharing.
2. To study the relationship between organizational factors (organizational climate, management support, rewards system, organizational structure) and tacit knowledge sharing.
3. To investigate the relationship between interpersonal factors (interpersonal trust and social networks) and tacit knowledge sharing.
4. To determine the mediating effect of ICT usage on the relationship between individual factors and tacit knowledge sharing.

5. To determine the mediating effect of ICT usage on the relationship between organizational factors and tacit knowledge sharing.
6. To determine the mediating effect of ICT usage on the relationship between interpersonal factors and tacit knowledge sharing.

1.6 Significance and Contribution of the Study

The contribution of this study could be divided into theoretical and practical contributions.

1.6.1 Theoretical Contribution

This study contributes to the body of knowledge in enhancing the theory of tacit knowledge sharing. It also provides empirical evidence in relation to the linkage between the individual, interpersonal, and organizational factors, and tacit knowledge sharing. Specifically, this study tested a framework that relates the individual, interpersonal, and organizational factors to the tacit knowledge sharing and suggests the ICT use as a mediator between these factors and the tacit knowledge sharing.

1.6.2 Practical Contribution

This study produces a set of guidelines for improving tacit knowledge sharing. These guidelines take into consideration the most important and most influencing factors on the tacit knowledge sharing within the organization. It provides insights for the decision makers toward better decision making. In addition, these guidelines serve as recommendations, requirements, best practices, and opportunities or challenges for increasing the effectiveness and efficiency of tacit knowledge sharing.

1.7 Definition of Key Terms

The following terms are defined in the context of this research construct.

Table 1-1
Definition of key terms

Construct	Definition
Tacit Knowledge Sharing	"As a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organization" (Bock & Kim, 2002).
Individual Attitude to TKS	"The degree of one's favourable or positive feeling about sharing one's knowledge" (Bock, Zmud, Kim, & Lee, 2005).
Organizational Commitment	"The strength of an individual's identification with and involvement in a particular organization" (Porter, Steers, Mowday, &Boulian, 1974).
Knowledge Self-Efficacy	"The judgments of individuals regarding their capabilities to organize and execute courses of action required to achieve specific levels of performance" (Lin, 2007d).
Organizational Climate to TKS	"The employee's positive or negative feeling regarding organizational environment" (Tohidinia & Mosakhani, 2010).
Management Support	"The degree of the top management supports the employees to share the knowledge" (Tan & Zhao, 2003).
Rewards System	"The extent to which employees believes that theywill receive extrinsic incentives (such as salary, bonus, promotion, or job security) for sharing knowledge with colleagues" Hargadon (1998) and Davenport & Prusak, 1998).
Organizational Structure(Centralization)	"The locus of decision-making authority lying in the higher levels of a hierarchical relationship" (Chen & Huang, 2007).
Organizational Structure(Formalization)	"The degree to which jobs within the organization are standardized and the extent to which employee behavior is guided by rules and procedures"(Chen & Huang, 2007).
Interpersonal Trust	"The willingness to rely on the word, action, and decisions of other party" (Yilmaz & Hunt, 2001).
Social Networking	"Modes of sharing within networks include communication, dialogue, and individual or group interactions that support and encourage knowledge-related employee activities"(Kim & Lee, 2006).
ICT Usage	"The degree of technological usability and capability regarding knowledge sharing" (Lin & Lee, 2006).

1.8 Organization of Chapters in Thesis

This chapter is the first of the five chapters in this thesis. Chapter 2 is a general review of the literature on knowledge management, and knowledge sharing. Tacit knowledge sharing, and success of managing the tacit knowledge sharing was given particular attention in this chapter. Chapter 3 describes the method employed in the study, namely the research design and procedures, the selection of participants, sample type and size, the development of the questionnaire for the research and a brief description of the strategies and procedures use to analyze data collected from the survey. Chapter 4 discusses the method used to analyze the data collected and the overall results of the study. Finally, Chapter 5 discusses the interpretation of the research finding of the study. The findings are compared to the findings of previous researches reviewed in chapter 2. New findings are also discussed, and the chapter ends with a discussion on limitation of the study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

In this chapter, a thorough literature review was carried out in the field of knowledge sharing and its relative management. Whereby, the literature review is focused on the importance and significance of intangible knowledge, commonly referred to as tacit knowledge and the realization of its success. In addition to that, this chapter also discusses the variables that could affect tacit knowledge sharing followed by the conceptual framework along with the hypotheses proposed for the research. The chapter ends with the summary and conclusion of the literature review.

2.2 Tacit Knowledge

In this section, all aspects of the theoretical background of tacit knowledge are discussed, including the nature, importance, evolution and the role of tacit knowledge, which encompasses within the knowledge management theory.

2.2.1 Nature of Tacit Knowledge

Polanyi (1962, 1966) argues tacit knowledge to be in-articulable and is the results of actions of the individual. Polanyi (1969) argues that there is a close relationship between the concept of tacit knowledge and that of skills (Nelson & Winter, 1982).

They also postulate that tacit knowledge is in fact gathered through a cycle of multi dimensional practical experiences occurring in various contextual environments.

Robert Sternberg and his colleagues have done an extensive body of research to explore tacit knowledge from the perspective of multiple intelligences (Wagner & Sternberg, 1986; Williams, & Horvath, 1995; Sternberg & Horvath, 1999; Sternberg *et al*., 2000). These commentators term the adoption and dissemination of tacit knowledge as practical intelligence or experience. Other knowledge may come in the form of direct knowledge. These researchers defined tacit knowledge to be action-oriented knowledge which is not like other direct knowledge. By this tacit knowledge, individuals are able to achieve according to their personal values (Sternberg *et al*., 1995). More specifically, their definition describes three characteristics of tacit knowledge: (a) acquisition with modest or even no environmental support features; (b) technical; and (c) practical usefulness.

The extent and dimension of implicit or tacit knowledge are explored by Wagner (1987), under the supervision of Sternberg *et al*. (2000). His definition considers implicit or tacit knowledge as practical formation of abilities, open expressions or statements of which is not possible and acquisition of which must be out-with that of direct mentoring. Multiple content and contexts of using tacit knowledge are also proposed by Wagner (1987) who highlights that tacit knowledge is about directing not only oneself but other individuals, teams and tasks that those individuals and teams undertake. Managing or directing oneself refers to self-intrinsic values of motivation and development as well as belief in the growth and management of self-organizational and administrative skills. Managing tasks or task based activities refers

to better ways of behaving or doing specific actions. Managing people and teams refers to knowledge related to managing subordinates and interacting with peers.

The context to which tacit knowledge is applicable can be either local or global (Wagner, 1987). When the task is accomplished without the consideration or deliberation of one's aspirations, values, career goals, or in other words, the "big picture", is referred to as the local context. On the other hand, when the task accomplishment considers long term goals and achievements and how actions in the present connect to future aspirations and behaviour, is referred to as the global context. Wagner's (1987) support for a multi-platform based model of intrinsic tacit knowledge. A characteristic of his multi-platform model refers to the expression of the ability to acquire knowledge in a tacit form. Furthermore, career success and job experience are found to increase the tacit knowledge.

Two dimensions are argued by Nonaka and Konno (1998): cognitive dimension and technical dimension. These two dimensions, as they are described, have similar features. As the intrinsic knowledge is scripted it has a cognitive dimension. These scripts are the result of beliefs, ideas, norms and values that may often be overlooked, unappreciated or indeed taken for granted. The generally accepted technical definition of tacit knowledge is the "know-how" or what is referred to as the intrinsic attitudes that results in a specific ability or skill. Table 2.1 shows these various definitions and dimensions of covert, intrinsic or tacit knowledge. In the literature review, it is highlighted that there is a multi-angled indication that tacit knowledge grows via action and practice. Nonetheless, little interest has been shown into investing practical effort on exhibiting such characteristics (Leonard & Insch, 2005).

Table 2-1
Definitions and Dimensions of Tacit Knowledge

Polanyi (1966)	**Nonaka & Konno (1998)**	**Wagner (1987)**	**Sternberg *et al.* (1995)**
Acquired via experience	"Cognitive dimension"	"Managing self Self-motivation Self-organization"	"Action-oriented Goal-directed"
	"Technical skills dimension"	"Managing tasks"	"Self-acquired"
		"Managing others Knowledge of others Ability to interact"	"Procedural Structure"
		"Local vs. global"	"High practical Usefulness"

In the classical Latin term, "Tacit Knowledge" is known as *tacit are*. In other word, the definition of this term is "highly complex to express or recognize" (Nickols, 2000). As reported by Polanyi (1966), tacit knowledge is difficult to express because what people can tell is less than what they really know. The occurrence of tacit knowledge is available at both individual and collective levels (Dalkir, 2005). Collective level in the organizations are able to generate knowledge of their own as at this level the organization possess cognitive learning abilities. The reconcilability of tacit knowledge is not easy. Still, scholars in the field of KM admit the necessity of recognizing tacit knowledge since it is essential for the improvement of strategic problem solving and decision making (Brockmann & Anthony, 2002). Tacit knowledge is given high value because despite having an elusive nature, tacit knowledge constitutes most of the body of knowledge that belongs to human (Stenmark & Lindgren, 2006).

Researchers strongly express the critical requirements of understanding, acknowledging, and studying the actual elements that uncover the very nature of tacit knowledge. Tacit knowledge is well known as action-dependent, contextual, factual, perceptive, personal, and complex to express (Ambrosini, 2003; Nonaka, 2008; Polanyi, 1966). The inherent elements of critical knowledge are focal subsidiary awareness , where the former wholly relates to an object, while the latter refers to various components that makes up an object (Polanyi, 1966). The way individuals process and organize the knowledge does not allow them to be aware of what they know (Hartman, 2003). The tacit knowledge capturing process is critical for the relationship between the knower and the knowledge. Tacit knowledge is not easily recognizable. This is why articulating tacit knowledge is difficult (Brockmann & Anthony, 2002; Polanyi, 1966). Even so, this articulation is a key factor in enhancing strategic decision making. According to Brockmann and Anthony (2002), overt employment of tacit knowledge capturing techniques during strategy sessions can make better decision making more probable.

There is a close relationship between tacit knowledge and the concept of skills. In the area that involves multiple intelligences, research work had been widely carried out. Therefore, such work covers the cognitive, scientific, and social perspectives in a multidimensional framework (Leonard & Insch, 2005). The Tacit knowledge is related to the processes of creating performance and knowledge base of an organization, and considered highly important components.

2.2.2 The Importance of Tacit Knowledge

As today's development of interactive knowledge development will become the core knowledge of tomorrow, the knowledge creating ability and continuous learning can become a competitive advantage (Zack, 1999). According to Grant (1996), knowledge, especially, tacit knowledge is viewed by many corporations as a significant strategic tool and resource for an organization. The strategic importance of tacit knowledge is also identified by Sobol and Lei (1994) and Nonaka (1991) for the firm. They also contended that in order to maintain competitive advantages in growth and market dominance, tacit knowledge has to be viewed as an underlying source of competitive sustained activity in the corporate world.

Brown and Duguid (1998) argue that one of the core competencies of an organization is not only an understanding and an accepted awareness of the 'know-how' factor in tacit knowledge. But also to utilize, adopt and implement the 'know-how'. Thus, by utilizing the 'know-how', fundamentally, and practically, organizations need ''tacit know how''. Moreover, according to Lawson and Lorenzi (1999), everyone can find and use explicit knowledge, whereas only masters, compared to common, can utilize tacit knowledge. Importance of tacit knowing in the existing literature is not limited to the competitive advantage or edge (Johannessen *et al*., 2001). The significance of this point is also described from the perspective of learning and mentoring (Lam, 2000), innovation (Lam, 2000) and developing (Kreiner, 2002).

Wagner (1987) argues that managerial success has a great dependence on the extent to which tacit knowledge can be acquired and managed. Recruitment and use of a talented and productive workforce is possible by the use of strategic covert tacit knowledge. Wah (1999) points out that the knowledge available in any corporate structure is actually 90% rooted and synthesized in tacit form. However, the overall effectiveness and output of knowledge in leveraging organizations to positions of competitive advantage is possible by the key role played by tacit knowledge in itself (Wah, 1999).

Academics, managers and policy-makers, until recently, as compared to organizational competitiveness, overlooked tacit knowledge (Sveiby, 1997; Howells, 1996; Fleck, 1996). According to Howells (1996), the case of tacit knowledge, as an unexplained element, is similar to unexplained technological innovation that is applied within the economic development and corporate performance. However, the recognition of tacit knowledge playing and being a strategic pawn in organizational growth, economic development and market dominance is supported by (Nonaka, 1994; Nonaka & Takeuchi, 1995; Grant, 1996).

2.2.3 The Role of Tacit Knowledge in Knowledge Management

Tacit knowledge is usually treated as the goal of excellence in KM practice by KM research. Organizations interested to spread knowledge within it their structure create a stimulus for greater innovation, there by viewing the capturing if tacit knowledge as a positive challenge. It is treated as a reserve that needs to be targeted and extracted because it is deposited deep within the ground. In contrast, explicit knowledge is

easier to target and extract. Tacit knowledge can be viewed in the perspective whereby is similar to surface water that represents only a fraction of the organizational knowledge and in similar comparison to the tip of an iceberg. On the area of tacit knowledge, theorists hold opposing views. As opposed to being objective and exogenous, Nonaka and Takeuchi (1995) described it as subjective and endogenous. Therefore, they treat the obscurely opaque reserve as having various chemical compounds and structures or as they point out, in an altered physical state and this helps them to continue the reserve metaphor. It cannot be successful by merely pumping out. Processing and conversion into a new form is necessary.

Between tacit and explicit knowledge, some other theorists like Nissen (2005), does not differentiate or characterize a substantial difference. Nissen (2005) considers the visible surface pool the same as whatever is buried. Like a hidden reserve of underground water in a limestone hollow mountain, tacit knowledge is similarly straightforward as surface pools, however it is more complex to access and extract due to its placement and surrounding environment.

In knowledge management efforts, both these overly simplistic conceptions may lead confusion. These conceptions have a common problem. If something has value in and of itself, they are treated as tacit knowledge. However, the characteristic difference in composition between implicit, tacit and explicit knowledge has already been mentioned before. The relation between these two is possible to identify by this structural distinction: explicit knowledge has the dependence on the tacit knowledge. Furthermore, the evolution or moving tacit knowledge to new platforms or levels of

awareness is the explicit knowledge. Hence, the value of recognizing tacit knowledge can be seen as being related to making explicit knowledge comprehensible.

Based on Nonaka and Takeuchi's theory, a knowledge construction model will be conducted within a re-examination phase due to the structural frameworks of tacit knowledge. Specifically, during the conversion of tacit knowledge to overt and explicit dimensions, it is understood as a procedure in exposing and utilizing subjective knowledge at personal level at mutually shared knowledge. However, it could be argued that this process suffers some loss of precision. By using some types of symbol and analogy, translation of the images within an individual's mind can be easily carried out. Metaphor and analogy are not always necessarily the inevitable result of an implicit to explicit transformation although they are significant methods to express ideas. Despite the structural, and at times complex, relation between implicit and explicit, implicit knowledge does not necessarily consist in images. Linguistically expressible beliefs can be a form where implicit knowledge could exist. According to Polanyi (1969) in one's mind, the way the covert implicit knowledge leads to overt explicit knowledge is unrecoverable subject element. Other academic fields like AI debate this contention.

Remarkably, the structural distinction of tacit/explicit applies to individual processes of the individual. Tacit knowledge is implied by any explicit knowledge. As described about the knowledge creation within the theoretical framework of Nonaka and Takeuchi, the conversion of tacit to explicit knowledge initiates from personal level to organizational level. At personal level, the explicit knowledge is transferred to organization via outsourcing. However, the ability and contribution of the individual

with such knowledge to the organization may already be explicit. There can be other ways the individual or the organization can know which is yet to be captured in the first place. An individual cannot work with tacit knowledge by him/herself. Without effort, the tacit knowledge may not have any significant value. It lies behind explicit knowledge and enables it.

Due to the aforementioned struggle, the tacit to tacit transfer of both covert and indirect nature were affected. The transfer between tacit and tacit may be possible if an intrinsic alteration been applied to the tacit knowledge from a perspective of definitive knowledge with a requirement to be transformed. This knowledge transfer can be thought to bypasses explicitness completely. The flow of tacit knowledge occurs through a detached vehicle. Many KM researches considered this as a key idea. According to Von Krogh *et al*. (2000), this idea is related to the concepts and functions of teams, communities of practice and knowledge. But the literature does not characterize the involved transfer mechanisms well.

Seemingly, when individuals work together in small teams and collectively communicate, exchange in thoughts and ideas, brainstorm on whiteboards and perform other collectively related activities together, the exchange of tacit knowledge occurs. Issues arise when the discussion turns out to be an instance of explicit knowledge similarly to drawing out the ideas. The use of linguistic computer aided technologies in voice capturing and translation might replace the practical approach of speaking and writing. Explicit knowledge should also include showing others how to do things which can be recorded by non semiotic images.

Tacit knowledge plays an important role in teams and communities. This role is applicable for all individual and group members. However, knowledge that is communicated cannot be applied by the concept of tacit knowledge. It can be applied by the thinking processes of individuals. Knowledge is exchanged and created when groups get together. The challenges and opportunities created by the informal character of these groups are different from what are created by formal group activities. Example formal group activities include training sessions, collective business process meetings and activities, etc. However, the differences that occur during the knowledge transfer by tacit to tacit may be confusing and might be impossible to visually or theoretically conceptualize, as averse to both explicit to explicit and explicit to implicit mode of transfers.

The insignificant variation within the approach and perspective of covert tacit knowledge from explicit or overt knowledge, supported by Nissen and others, has its drawbacks as well. This approach ignores the structural and functional relationship that essentially describes the knowledge base on tacit and explicit. It is rather straightforward in expressing tacit knowledge, though time absorbing, if it is just the knowledge in the head. The processes of debriefing, documenting, or decanting need to be allocated proper time by the managers. However, since tacit knowledge rests in the background of our cognitive minds which makes thinking possible, it is not always easy to recover. The explanatory power of tacit knowledge as a concept in the transfer of knowledge is reduced by a weak sense of tacit knowledge. This reduction can underpin the success or downfall of attempted transfers.

Based on previous discussions on the theory of knowledge management, it is observed that there are different views among authors on the role of tacit knowledge. For instant Nonaka and Takeuchi (1995) describe it as subjective and endogenous. Therefore, they treat the obscurely opaque reserve as having various chemical compounds and structures or as they point out, in an altered physical state and this helps them to continue the reserve metaphor. However, Nissen (2005) considers the visible surface pool the same as whatever is buried. Like a hidden reserve of underground water in a limestone hollow mountain, tacit knowledge is, not different from the surface pools, however it is more complex to access and extract due to its placement and surrounding environment.

2.3 Knowledge Sharing

During the knowledge sharing process, the steps that are involved are the exchange of information; relative know how, appropriate skills, proficiency and expertise with others on various product or procedure (Myers & Cheung, 2008). Knowledge can create competitive advantages; can improve organizational performance through active knowledge exchange of the employees. This is why Willem & Buelens, (2007) point out that knowledge has got its recognition as an invaluable advantage to the organization. The extent to which both synchronous and asynchronous sharing of knowledge and information is more important now due to the increase of knowledge related tasks and the amount of knowledge workers in the organization (Patrick & Dotsika, 2007).

In order to capture the tangible and effective functions of explicit knowledge and to assist the transfer of tacit knowledge between employees, organizations now are widely incorporating knowledge management systems into daily operations. As a part of organizational and individual learning, the knowledge sharing activities become key components of knowledge management system (Riege, 2005). However, only the implementation of knowledge sharing tools is necessarily enough to drive the employees to pass on their knowledge to others. Some other factors as suggested by Nicolas and Castillo (2008) are; lack of confidence and knowledge sharing. Such factors can demotivate the knowledge sharing efforts among coworkers within an organization. According to Lin (2007), the familiarity with co-workers, and the presence of mutual support, information exchange, and common ground for shared experience are important factors that promote effective knowledge sharing.

In many cases, employees consider a level of ownership, rights and title over the knowledge that they have and according to Michailova and Husted (2003), Ardichvili and Dirani, (2005), Von Hippel and Von Krogh (2006), this is an obstacle to knowledge sharing. Without the achievement of newer knowledge, the past knowledge can become outdated. Also, the present knowledge developed within the organization, which is usually held by the employees, cannot be represented with a direct ownership of the organization due to its intangible nature (Riege, 2005). The knowledge held by employees can also be lost when the employee leave the organization. According to Jarvenpaa and Staples (2001), values and standards of the organization regarding knowledge sharing can generate the knowledge ownership idea as well as the tendency to share information.

As reported by Alavi, Kayworth, and Leidner (2006), understanding on organizational ownership and rights of knowledge as well as the trend to share knowledge can lead to an increased use of inter-collaborative platform to share information. In the interview of one group of respondents asked to share their very expertise and experience, Mackinlay (2002) found them to respond with expressions like, *"I'm being asked to give myself away*"(p. 81). Moreover, according to Singh, Dilnutt, and Lakomski (2008), the knowledge sharing as well as the operation of the organization can also be affected by the organizational climate. If the organizational climate supports the idea of the personal ownership of knowledge, as a means of employment security, this climate would result the employees to be reluctant to share.

However, Bock, Zmud, Kim, and Lee (2005) have given some offsetting viewpoints. They recommended assuring the employees about the compensation for knowledge sharing activities with other staff and with the organization as a whole. To encourage and foster innovation and discovery, organization often needs to remove the cultural barriers may be through further endeavors like the promotion of organizational trust. A successful knowledge sharing demands an organizational culture that encourages and rewards that sharing (Forstenlechner & Lettice, 2007).

2.3.1 The Need for Knowledge Sharing

Changing employees' behaviours and attitudes about knowledge sharing is a common challenge for the organizations (Bock & Kim, 2002; Connelly & Kelloway, 2003; Ford, 2005; Mckeen & Staples, 2001; Ruggles, 1998). Knowledge hoarding or keeping knowledge to oneself is the reverse of knowledge sharing. This opposite situation is often prevalent in many industries and organizations (Davenport &

Prusak, 1998; Hibbard & Carrillo, 1998; Husted & Michailova, 2002). Despite the prevalence of this opposite situation, the building block of gathering knowledge and innovation is knowledge sharing (Nonaka & Takeuchi, 1995). The value of systematic management of knowledge sharing is widely recognized by both the researchers and practitioners.

Knowledge sharing is one knowledge-centered activity. This activity is the essential means for the contribution on methods of applying knowledge, producing innovative steps, and ultimately initiating the competitive edge within an organization by the employees (Batra, 2010; Jackson *et al*. 2006). Organizations can capitalize on knowledge-based resources if the knowledge sharing between employees and teams is possible in the organization (Cabrera & Cabrera, 2005; Davenport & Prusak, 1998). There empirical supported that knowledge sharing improve the organization performance in terms of costs of production, efficient completion of innovative and unique product development projects, performance of teams, innovation capabilities of the firm, and its development such as sales growth and revenue and profit accruing from new products along with new product designs and excellence in services from resulting revenue (Arthur & Huntley, 2005; Collins & Smith, 2006; Hansen, 2002; Mesmer-Magnus & DeChurch, 2009). These are the most significant feasible benefits from knowledge sharing.

Knowledge sharing has a lot of potential realizable benefits. This is why many organizations invest a lot for knowledge management. This investment includes the initiation and outward growth of knowledge management systems (KMS). In a KMS system, state-of-the-art method is applied to motivate, facilitate and promote the

selection, repository, and sharing of knowledge (Wang & Noe, 2010). Yet, despite these attributes, many companies fail to share knowledge to acceptable degree. As an example, the Fortune 500 companies lost at least $31.5 billion per year due to failure in knowledge sharing (Babcock, 2004). The influence of all the organizational context, interpersonal context, and individual characteristics is important on knowledge sharing. The lack in recognizing these influences is an important and significant cause for the failure of KMS in facilitating knowledge spreading (Carter & Scarbrough, 2001; Voelpel, Dous, & Davenport, 2005).

2.3.2 Explicit vs. Tacit Knowledge Sharing

A commonly agreed fact about explicit knowledge is that it is used by disseminating and communicating and it is easier than the sharing of tacit knowledge (Ipe, 2003). That is why the focus of most of the KM studies is either general knowledge sharing behaviour (Galletta, McCoy, Marks & Polak, 2003; Hong, Doll, Nahm & Li, 2004) or specific tacit knowledge sharing behavior (Koskinen, 2001; Evans & Kersh, 2004; Koskinen, *et al*., 2003; Selamat & Choudrie, 2004; Jones, 2005; Lin, 2007b). On the other hand, explicit knowledge sharing is possible by means of books, manuals, video clips, databases and expert systems. This sharing is also possible by formal training. Therefore, not much encouragement is necessary for the sharing of explicit knowledge and this sharing is comparatively easier (Hirschheim, Heinzl & Dibbern, 2009). Still, none should ignore the necessity of explicit knowledge sharing. This sharing can benefit the organization by improving the time efficiency of the employees (Hansen & Haas, 2001).

As opposed to explicit knowledge, the challenge of sharing is more for tacit knowledge (Hendriks, 1999). One of the reasons behind this challenge is, the basis of the tacit knowledge is human experience (Koskinen *et al*., 2003). The form of expressing of the tacit knowledge is found in human actions. The human actions like evaluations, attitudes, points of view, motivation, etc. are the outcomes of tacit knowledge. Direct expression through words is difficult for tacit knowledge. The only way of expressing this knowledge is often through metaphors. Therefore, often the use of different methods of expression other than formal language is useful. In an organization, the tacit-ness can be considered as the natural obstacle for knowledge sharing among the coworkers (Ipe, 2003). This fact made it a more appealing area of research.

The dialectic debate among employees and the socialization among them can produce tacit knowledge sharing (Fernie, Green, Weller, & Newcombe, 2003). This sharing requires face-to-face interaction (Fernie, *et al*., 2003; Koskinen, *et al*., 2003). In addition, according to Selamat and Choudrie (2004), the encouragement for the development of individual's meta-abilities can help the diffusion of tacit knowledge. Thus, when knowledge will be practiced within the organization is determined by the personal and acquired abilities. Hence, tacit knowledge sharing necessitates a lot effort and determination.

The importance of tacit knowledge sharing is also supported by Hansen and Haas (2001). They revealed in their study that the quality of the employee work outcomes improves with the sharing of tacit knowledge. It also can signal the clients about the competence of the company. The literature review of Selamat and Choudrie (2004) described that without the augmentation from tacit knowledge, the presence of

explicit knowledge is meaningless. Hence, the practical utilization of explicit knowledge is possible by sharing and utilizing tacit knowledge properly.

2.4 Theories Related to Knowledge Sharing

Different theoretical perspectives are possible to study the sharing and integration of knowledge across boundaries. The adoption of technology based concepts and models or even the information processing framework are among such theories. Literature related to knowledge management emphasizes on externalizing tacit knowledge (Nonaka & Takeuchi, 1995), by applying boundary oriented objects (Bechky, 2003; Sapsed & Salter, 2004), or through knowledge agents and brokers (Levina & Vaast, 2005).

2.4.1 Social Capital Theory

The literature about capital is superfluous in the realm of political ideology, sociology, the science of economics, and organizational knowledge. In the economic context, the term “capital” is generally used to indicate assets generating some sort of value. The appropriable and convertible assets are considered as capital (Coleman, 1988). The relevance of financial capital is most recognized. Still, many forms of capital are there. Physical and human capitals are two forms among them.

Physical capital physically facilitates the production process and consists of items like tools and machines. On the other hand, human capital and their intangible assets consist of individuals’ abilities and other innate capabilities. These include the education, training and experience. These intangible capabilities can be leveraged and

used to create value. One of the main characteristics of the physical capital is tangibility. Physical capitals are created by converting various materials which later are used to make other productions possible. In contrast, human capital is less tangible and is more complex by nature. The development within humans is realized by the self advancement, which is possible for an individual by the embodiment of skills and abilities acquired from various functions and sources (Coleman, 1988). The similarity of these two capitals is their essentiality as tools and structures in creating intrinsic and extrinsic value for the owner.

Considering social capital as an additional form of capital is also important. This form has a peculiarity. Individuals do not possess or own social capital. This capital resides within the relationships among the individuals. Mentioning the multiple purposes of using various capitals, Coleman (1988) argues for the close relationship among social and other grounds of capital. Multipurpose used of financial capital include, but are not limited to: purchases, investments, social and political influence. Similarly, illustrations on the physical capital include possibility of heat generation from coal in heating plants, transportation vehicles which have the prospect of travel services, and surgical equipment with prospective medical services supply from them (Robison, Schmid, & Siles, 2002). Likewise, some value creating activities as examples of using the social capital can be: seeking advice, exchanging information, or becoming normalization group or sub-culture.

Social capital requires maintenance as is needed for human capital. Periodic renewal can sustain the Social bonds. Without renewal, social bonds may become fruitless. Continuous use can facilitate the growth and development of both human and social capital (Adler & Kwon, 2002). As physical and human capital does, social capital also

aids in the creation of productive activity. Social capital can be treated as appropriable and convertible. This capital may be possessed by an individual, group or even an organization. It also can be exchanged for other valuable resources. There is also an added social value attributed to social capital like financial capital, physical capital, or human capital does.

Although social capital is appropriately worked with by individuals, it can nevertheless be owned by them. This is the most basic and fundamental difference of social capital in relation to other forms of capital. Besides, relationship among individuals can create and leverage the social capital. Scholars agree about the importance of social capital. However, the appropriate definition of this form of capital could not get the consensus of the scholars (Adler & Kwon, 2002).

2.4.1.1 Theoretical Basis of Social Capital

Various scholars from various disciplines such as sociology, political science, economics, and organization science have conducted in depth theoretical and analytical investigations on the concept of social capital (Adler & Kwon, 2002). Table 2.2 provides a summary of these studies. Portes (1998) highlights that two scholars in the field of sociology, James Coleman and Pierre Bourdieu, who together independently reinvented the term 'social capital; in the early 1980's.

However, the credit for the modern redefinition of the concept of social capital goes to Bourdieu. As reported by Bourdieu (1986), the description of social capital is *"the accumulation of the genuine or potential assets which are connected to owning a*

solid system with more or less standardized connections of common colleague or acknowledgment" (p. 405). The existence of social networks, groups and the resources available to individual members of these networks or groups are considered in Bourdieu's definition. He further focuses on the necessity of securing benefits through the participation of social groups and other social structures, pointing out that this is important facilitating action.

Several theorists note James Coleman's interpretation of social capital as the most influential one. Economist Glen Loury is credited by Coleman as he used the term (in 1977) to express resources and social functional processes belonging to the families and social organizations which contribute to the social maturity of children (Coleman, 1990). Yet, Coleman (1990) reports that social capital is *"a combination of substances having two qualities in a similar manner: they all comprise of some part of social structures, and they encourage certain activities of people who are embodied in the structure"* (p. 302). Coleman's (1988) theoretical framework on social capital conceptualizes how the nature of social structures within a group can operate as a resource for each individual in that group. The scheme of Coleman states that, for the purposes of gaining an advantage, the social structure itself becomes evident out of implemented interactions. Thus, the composition of a social network of relations creates the social capital.

Table 2-2
Definitions of Social Capital (adapted from Adler & Kwon, 2002)

Citation	Definition of Social Capital
Bourdieu (1986, p. 405)	Social capital is "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or

	recognition."
Coleman (1988, p. S98)	"Social capital is defined by its function. It is not a single entity but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of actors who are within the structure."
Baker (1990, p. 619)	Social capital is " a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationships among actors."
Fukuyama (1995, p. 10)	"Social capital can be defined as the existence of a certain set of informal values or norms shared among members of a group that permit cooperation among them."
Putnam (1995, p. 67)	"Social capital refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit."
Source: adapted from Adler and Kwon (2002, p. 23)	"Social capital is a resource for individual and collective actors created by the configuration and content of the network of their more or less durable social relations."

In a nutshell, interactions create relationships and relationships are the residing place for social capital. There are two building blocks of social capital. These are (i) the nature of interactions and social relationships in a network or group and (ii) the functions or attributes of the relationships themselves that have been established in the network.

2.4.2 Socio-Cognitive Theory

Social cognitive theory (Bandura, 1997) defines human behavior as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the social

network (environment). Accordingly, outcomes of knowledge sharing behavior (e.g., high-quality knowledge) would affect personal cognition.

The Social Cognitive Theory argues that a person's behavior is partially shaped and controlled by the influences of social network (i.e., social systems) and the person's cognition (e.g., expectations, beliefs) (Bandura, 1989). Bandura advances two types of expectation beliefs as the major cognitive forces guiding behavior: outcome expectations and self-efficacy. According to Bandura (1982) if individuals were not confident in their ability to share knowledge, then they would be unlikely to perform the behavior, especially when knowledge sharing is voluntary.

Garud and Rappa (1994) propose a socio cognitive model; it still grasps a generalization of learning that empowers antiques to dictate measures of appreciation. This methodology incorporates an "externalization" of imparted social models among participating individuals. This makes it pointless for the writers to further explore whether different variables underlie the apparent externalization of learning. Lastly, Garud and Rappa (1994) recommend that social input ensures the solidifying, improving, change, and/or tearing down of existing information structures in an anticipated manner.

2.4.3 Social Representation Theory

Moscovici (1984) defines social representation as the means of transferring the disturbances and threats in our universe. Separation of normally linked concepts and perceptions affect this transfer. Also, mounting them in a contextual framework where the irregular transforms to normal, where the undetectable gets to be obvious, where

the obscure can be incorporated in a recognized classification canhelp the transfer. In the words, as defined by Moscovici (1963), the initial description of social representation was: *"the elaborating of a social object by the community for the purpose of behaving and communicating"*(p.251). The subsequent refinement of this definition was done by Wagner *et al*., (1999: p.96) as follows: *"the ensemble of thoughts and feelings being expressed in verbal and overt behaviour of actors which constitutes an object for a social group"*

According to Moscovici (2001), the social representation theory has some remarkable strength. The strongest strength is its functions in reducing the unfamiliarity, providing guidance, providing an identity, and mitigating the actions. The familiar or recognizable is made unfamiliar or unrecognizable by the knowledge function. According to Abric (1994a), this process is employed in crucial role in social communication and Jaspars and Fraser (1984) further point out that it also organizes, manages, and codifies the social world. Individual actions and behaviors are guided by the orientation (or the guidance) role (Moscovici, 1984).

However, there are some critics of the social representation theories (Voelklein & Howarth, 2005; Potter & Edwards, 1999). The critique most commonly attributed to social representation theory is that it is essentially too broad, opaque and vague. For this reason, the difference between the concept of social representation and other theoretical frameworks, including non-tangible functions related to attitude, norms, values, belief, stereotyping, or social cognition is not clear. Moscovici (1998) replied to such criticism arguing both individual (i.e. cognitive process) and collective (i.e. social process) representations are covered within the social element.

Finally, many of previous studies used those theories in studying knowledge sharing such as (Aslam, Shahzad, Syed, & Ramish; 2013; Isa, Abdullah & Senik, 2010; Mu, Peng, & Love, 2008; Chiu et al., 2006; Wasko & Faraj, 2005; Lang, 2004; Nahapiet & Ghoshal, 1998).

2.5 Knowledge Sharing in Arab Cultures

A huge portion of literature is beginning to acknowledge the impact of national culture and heritage upon the sharing and distribution of knowledge (Jaw, Ling, Wang, & Chang, 2007; Hong; Wilkesmann, Fischer, & Wilkesmann, 2009; Fong, 2005). As a consequence, knowledge management is now considered as a global norm which can be transferred from one country to another. Nevertheless, most of the studies concerning the topic are confined to Far Eastern cultures, values, norms and beliefs (e.g. Fong, 2005; Wilkesmann *et al*., 2009; Chow, Deng, & Ho, 2000). According to the study conducted by Seba, Rowley, and Lambert (2012), there are incomplete studies related to sharing and exchanging the awareness of culture pertaining to Middle East.

Yet, there are two exclusions to the lack of studies, namely with Weir and Hutchings's (2005) and Sabri's (2005) works. The former expounds on the cultural embodying of knowledge sharing in the culture of Arabs and Chinese people while the latter emphasizes on the way Arab bureaucracies are transformed into knowledge creation cultures through the development of a suitable organizational structure.

Moreover, Weir and Hutchings (2005) stress that the secret to business, trade and commerce in the Arab world is the growth, development and widespread adoption of social networks as predominant business activities take place around them and hence, the business's success hinges on the relationship of the manager or the businessman with the community. The scenario is such that if the commercial trader develops a strong inter-linking relationship with the community, he will in turn become the most successful individual in the country.

The Arab community treat this relationship with respect and even some business in Arab countries are controlled by two values namely reliance and respect with the basis of the relationship founded in Islamic teachings. The Quran, the Muslims' holy book, lays down the rules and guidelines regarding respecting relationships and Prophet Mohammad, the Prophet of Islam, recommends to every Muslim to take care of their relationships with other people, even with non-Muslims. The Arab Muslim people respect Prophet Mohammad's teachings and try their best to follow them. Among these teachings is sharing with others even if the object shared is needed by the person himself; this act is called altruism. According to Seba, Rowley, and Lambert (2012), in Arab countries, the expectations is such that if the person maintains good relationship with another then both exchange knowledge without expecting rewards.

2.6 Tacit Knowledge Sharing Success Factors

This section shows the factors that affect tacit knowledge sharing, namely are Individual, interpersonal and organizational factors.

2.6.1 Individual Factors

There are many individual factors that have been found to affect knowledge sharing. Some of these factors include individual attitudes (Bock et al,. 2005; Huang, Davision & Gu, 2008; Lin, 2007a,b), self efficacy (Endres et al,. 2007; Tohidinia & Mosakhani, 2010; Wasko and Faraj, 2005), and organizational commitment (Meyer, Stanley, Herscovitch & Topolnytsky, 2002; Storey & Quintas, 2001; McKenzie, Truch & Winkelen, 2001).

Regardless, the focus of the current study is tacit knowledge sharing. Studies that focus on tacit knowledge sharing are not many; most of previous studies investigated knowledge sharing in general (e.g., Judge & Bono, 2001; Cabrera et al., 2006; Jarvenpaa & Staples, 2000; Wasko and Faraj, 2005; Lin, 2007c,d; Bock & Kim, 2002; Ryu, Ho, & Han, 2003; Lin and Lee, 2004).However, it is argued here that individual attitudes, knowledge self-efficacy, and organizational commitment could have a significant influence on employees tendency to share tacit knowledge sharing.

2.6.1.1 Individual attitudes

Individual attitudes to knowledge sharing are defined as the degree of one's favourable or positive feeling about sharing one's knowledge (Hutchings & Michailova, 2004; Requena; 2003). Fishbein and Ajzen (1975) and Davis (1989) suggested that researches on a person's attitude are totally dependent upon the logical and rational action theories, followed by acceptance model of the adapted technology. These theories illustrate the way individual behaviors are influenced

by beliefs, norms, values and attitudes. Positive knowledge sharing attitude leading to intentions and behaviors that can influence individuals' acquired knowledge (Bock & Kim, 2002). Ryu, Ho, & Han (2003), based on a study, argued that physicians from a hospital in Korea unveiled that the relationship among subjective norms and values, and the possibility of physicians' to exchange information is mediated by physician's attitude.

Lee and Lin (2004) focused on higher managements' views and ideas of mediating and support knowledge sharing between coworkers, and did not consider individual sharers. What their research found was a positive correlation between managers' intention of support and encouragement and workers sharing behaviors. Additionally, investigations shown that knowledge sharing is also fostered by an organization's attitudes commitment, including job satisfaction (De Vries, Van Den Hooff, & De Ridder, 2006; Lin, 2007a,b).

Bock *et al*. (2005) and Lin (2007c) point out that on the whole, knowledge sharing appears to have a significant influence from job and organizational attitudes. Both direct and indirect effects are expected from attitudes toward knowledge sharing on reported self sharing behavior via positively impacting propositions to share.

2.6.1.2 Organizational Commitment

According to Porter, Steers, Mowday, and Boulian (1974), organizational commitment defines as the strength of an individual’s identification with and involvement in a particular organization. Organizational commitment consolidates the

quality of a worker's recognizable identity and contribution in a specific organization(Porter, Steers, Mowday, & Boulian, 1974). This is also regarded as a positive response towards employees who form the organization and its structure (Becker, 1992). Effective and efficient response to the organization as an entity rather than to any specific function or context is frequently emphasized by various views of organizational commitment (Farmer, Beehr, & Love, 2003).

A number of studies related to the organization theory report organizational commitment as a significant role in carrying out sharing of knowledge (Jarvenpaa &Staples, 2001; Van *et al.,* 2004). Organizational commitment is positively related to individual willingness of committing extra effort (Meyer & Allen, 1997). As such, Van den Hooff & Van Weenen (2004) noted that there are expectations that organizational commitment is inter connected with willingness to exchange knowledge.

Several studies supported individual commitment to immediate organization influences in relation to the extent and pattern of their knowledge sharing characteristics (O'Reilly & Chatman, 1986; Van den Hooff & Van Weenen, 2004). According to commentators such as Hall (2001) as well as Van *et al.,* (2004), individuals with the feeling of emotional attachment to their organization are likely to share their knowledge. This sharing is linked with their realization that the sharing is recognized, followed by being utilized and eventually benefit the organization. Strongly committed individuals generally provide concentration to their organizational membership and as well as to the relationship among colleagues (O'Reilly & Chatman, 1986). This attachment may drive individual organizational

commitment to facilitate their tacit knowledge sharing intension, which may provide long run benefit to their organization. For instance, MacKenzie, Podsakoff, and Ahearn, (1998) point out that organizational commitment is reported to have strong link with sales force contexts with supportive spirits like tacit knowledge sharing, that is in-turn directed to co-workers. This indicates significant liaison between the commitment within organization and the sharing of tacit knowledge.

Jarvenpaa and Staples (2001) further supported this phenomenon. They contend that strong organizational loyalty and commitment creates the beliefs on the right of the organization to the knowledge created or acquired by the organizational members.

2.6.1.3 Knowledge Self-Efficacy

Knowledge self-efficacy defines as the judgments of individuals regarding their capabilities to organize and execute courses of action required to achieve specific levels of performance (Lin, 2007d; Bandura, 1986). Self efficacy provides important prospect whereby tacit knowledge sharing would be studied. This construct has been analyzed and clarified in order to predict attitude as well as actions in several types (Dulebohn, 2002; Kuhn & Yockey, 2003). Hence, it can be interpreted that self-efficacy in enabling the possibility of sharing the complicated tacit knowledge could actually become a knowledge sharing platform.

Bandura (1997) documented that the procedures of self-efficacy can provide such helpful as well as useful information into how people might make a decision to share tacit, complex knowledge. In other words, the perception of self-efficacy are

constructed through a judgment process that people participate in deciding whether they can carry out an action based on the effect of personal and contextual factors (Bandura, 1997).

Mitchell (1992) studied tacit knowledge sharing context and self-efficacy in distributing the complexity. The author documented that under certain conditions; there will be an increment in tacit knowledge. These conditions includes understanding others like ourselves results in providing encouraging knowledge sharing platform (vicarious experience); creating ways to exchange knowledge in a successful way (enactive mastery); and/or receiving support or praise from others to share knowledge (persuasion). Another way to increase self-efficacy to distribute the complexity is through the past experiences of people. According to Das (2003) who illustrated that the organizations can easily encourage employees based on their past experiences to share knowledge.

Wasko and Faraj (2005) who documented several ways to increase tacit knowledge sharing is through persuasion, appreciation, performance evaluations with consideration of the behaviors that attempted knowledge sharing, and motivation. Wasko and Faraj (2005) examined social capital and contribution to knowledge in the manner of electronic networks of practice in the United States. They revealed that the interest of sharing expertise without monetary involvement will increase the social respect and reputation as a professional individual.

A study by Lin and Lee (2006) disclosed factors that cover socio-technicality which actually affect the objectivity of encouraging knowledge sharing within Taiwan. Based on their results, they found that there is a positive effect from an encouraging

superior and his/her perception toward behavior of knowledge sharing on aims to empower knowledge sharing. There are research outputs which unveils that top management within an organization should encourage knowledge sharing (Gupta and Govindarajan, 2000; Macneil, 2001; Hislop, 2003).

A study by Yang and Farn (2010) who studied the relationship between self efficacy and tacit knowledge sharing in Taiwan. A questionnaire design was distributed on 279 respondents participating in 93 work groups across 58 organizations in Taiwan. Based on their results, they found that there the self-efficacy has a positive effect on tacit knowledge sharing.

2.6.2 Organizational Factors

Organizational factors are also important in ensuring that tacit knowledge sharing can occur. Previous studies have emphasized that some of the organizational factors that affect knowledge sharing include organizational climate (Reyes & Zapata, 2014; Seba et al., 2012; Yang, 2010; Tohidinia & Mosakhani, 2010), organizational culture (Alotaibi et al.,2014; Kim & Lee; 2006; Lin & Lee; 2006), organizational structure (Seba et al., 2012; Joia & Lemos; 2010; Kim & Lee; 2006; Han & Anantatmula, 2008; Kim and Lee; 2006; Lin & Lee; 2006), management support (Seba et al., 2012; Han & Anantatmula; 2008; Connelly & Kelloway, 2003; Lin, 2007d), rewards system (Bock et al., 2005; Hansen, Nohria, & Tierney, 1999; Liebowitz, 2003; Nelson, Sabatier, & Nelson, 2006), and environment influence (Cabrera et al., 2006).

Nonetheless, most of previous studies investigated knowledge sharing in general (e.g., De Long and Fahey, 2000; Schepers & Van den Berg, 2007; Wang, 2004; Willem &

Scarbrough, 2006; Bock, et., 2005; McKinnon, Harrison, Chow, &Wu, 2003; Connelly & Kelloway, 2003; Lin, 2007d; Hansen, Nohria & Tierney, 1999; Liebowitz, 2003; Nelson, Sabatier, & Nelson, 2006; Kim & Lee, 2006). Therefore, the focus of the current study is tacit knowledge sharing. Studies that focus on tacit knowledge sharing are not many (Jones, 2005); however, in this study the influence of four factors, specifically organizational climate, management support, rewards systems, and organizational structure (centralization and formalization) are examined.

2.6.2.1 Organizational Climate

Organizational climate is somehow associated to culture. However, by taking the differences between culture and climate, the culture is defined as "how an organization can meet its missions as well as goals, how an organization can easily find a solutions for problems (Sanchez, 2004). The climate is defined as the degree of perceptions and feelings of organizational members regarding knowledge sharing (Lin & Lee, 2006).

Gray (2008) documented that the climate is also illustrates some mechanisms of any organization from the viewpoint of the individual participant. He also revealed that the climate can be referred to the feeling and perception of organizational participants based on the environment of their work.

According to Lin and Lee (2006) organizational climate includes several parts such as reward systems associated to knowledge sharing, encouragement from higher

management, motivation towards new innovations, and employee involvement. Furthermore, Zarraga (2003) documented that organizational climate is the viewpoint of the organization's employees regarding the situation of knowledge-sharing within the organizations. It reflects knowledge-sharing association among employees in the organizations. In this concept, the employees have a good level of positive sentiment in other members, and knowledge is free flow (Zarraga, 2003).

2.6.2.2 Management Support

According to Tan and Zhao (2003) management support defines as the degree of the top management supports the employees to share the knowledge. Positive association is found between management support for knowledge sharing, the perceptions of the employees of the culture of knowledge sharing, and their inclination to share knowledge (Connelly & Kelloway, 2003; Lin, 2007d). Such influence is found in factors such as employee trust, experts' inclination to help others, among others. In addition, effect of top management support was found by Lee *et al*. (2006) through the influence of employee commitment to KM on knowledge sharing quality and level. Encouragement and perceived support from the supervisor and co-workers for knowledge sharing can contribute to the increase of knowledge-exchange of employees and their perceptions of its value (Cabrera *et al*., 2006; Kulkarni, Ravindran, & Freeze, 2006).

However, upon experiencing the satisfactory and completely utilizable nature of KMS, King and Marks (2008) did not reveal the influence of perceived organizational support. Apparently, employee knowledge sharing is more affected by management

support and facilitation of knowledge sharing. Moreover, supervisory control was revealed to significantly predict individual effort for frequent knowledge sharing. Supervisory control is measured by the role of a supervisor over applying the KMS in an organization. Likewise, based on Liao's (2008) study, the two factors that positively contributes to employees self-initiated knowledge sharing are the manager's willingness in providing rewards for exemplary behavior (i.e., reward power) and the employees' perception that the manager's expertise is suitable for his position (i.e., expert power). French and Raven's (1959) provided the classification of social power as discussed earlier within their study. Both social exchange and agency theories were applied in the framework of investigating the management support–knowledge sharing relationship. Taken as a whole, these studies show the possible influence of management support on knowledge sharing.

2.6.2.3 Rewards System

Rewards system define as the degree to which one believes that one can have extrinsic incentives due to one's knowledge sharing (Cho, Li, & Su, 2007; Bock & Kim, 2002; Ko*et al*., 2005).Yao, Kam, and Chan (2007) suggested a lack of incentives. This lacking is considered a hindrance preventing cross-culture knowledge sharing. Certain incentives are recommended, namely company wide recognition and performance rewards to enable the facilitation of knowledge sharing by aiding the supportive culture (Hansen, Nohria, & Tierney, 1999; Liebowitz, 2003; Nelson, Sabatier, & Nelson, 2006). Although the incentives related to knowledge sharing provided positive contribution, however, a conclusion could not be drawn from its effects.

Apart from this, rewards that relies on performance, namely increased salary, bonus and promotion seem to empirically have positive influence on the knowledge contribution frequency made to KMSs (Kankanhalli *et al*., 2005). This result is supported by social exchange theory as well as social capital theories and is proven to be true particularly when workers identify with the company they work in. Similarly, employees with a likelihood of higher requirement of incentives to share and utilize knowledge are highly likely to consider KMS as advantageous (Cabrera *et al*., 2006; Kulkarni *et al*., 2006). In the context of Korea, Kim and Lee (2006) revealed that employing performance-based systems in companies facilitated knowledge sharing.

Bock and Kim (2002), and Bock *et al.* (2005) revealed expected extrinsic rewards to negatively impact knowledge sharing attitudes. This result is inconsistent to the expected positive effect of rewards. Several studies even found no relationship between these two (Kwok & Gao, 2005; Lin, 2007c, d). For instance, in Chang, Yeh, and Yeh (2007), among product development team members, both outcome-based rewards and sufficient rewards for effort failed to support knowledge sharing.

Research that depends on rewards for knowledge sharing highly likely to be considered for lack of internal validity. The reason is all measured variables in these studies were gathered from a single survey which makes it impossible to delete alternative causal directions for the observed relations. The results may be attributed to common method variables. In addition, the possibility of the presence of moderators at work, such as personal attitude or situational conditions was also suggested in the inconsistent findings.

The ways that various rewards schemes, irrespective of having or not having a scheme, are influencing knowledge sharing, which is also of researchers' area of investigation. Ferrin and Dirks (2003), made use of a dyadic decision-making scenario, and revealed that a joint reward scheme contributes positively to information-sharing between partners in the context of a lab experiment. They revealed competitive systems to have a contrasting impact. Along the same line, general findings of the group-based incentives were positive. This is different from the results that reported on personal level incentives, piece-rate, and incentives related to competition (Quigley, Tesluk, Locke, & Bartol, 2007; Taylor, 2006).

An interactive effect was found by Siemsen, Balasubramanian, and Roth (2007) in incentives related to individual and group levels and a more significant positive relationship in individual based reward in comparison to group based reward. The requirement of aligning incentives to knowledge sharing was stressed by Weiss (1999). For majority of professional jobs like consultants/lawyers, the billable hour system, according to him, is works as a discouragement for knowledge sharing. Since clients are not willing to spend for services from which they do not receive advantages from, consultants/lawyers neglect the charges related to the time spent on knowledge sharing. Therefore, sharing knowledge is not supported by the incentive, as compared to the service provided.

As the field studies cannot manipulate the reward systems, majority of studies were carried out using student samples/experiments. The experiments more often use scenarios/narratives in an attempt to develop various incentive conditions. A notable exception is Arthur and Aiman-Smith (2001) who investigated a design of gain-

sharing plan that concentrated on encouraging employees to provide suggestions. After the implementation of the aforementioned design, a surge in the suggestions volume was observed. Over time, a declining pattern emerged on the volume. In terms of the suggestions, the second-order learning (i.e. tough routines and thoughts) experienced inclining pattern compared to first-order learning (i.e. suggestions of saving material).

2.6.2.4 Organizational Structure

Organizational structure is usually categorized into formalization, and centralization (Andrews & Kacmar, 2001). Formalization refers to the degree to which jobs within the organization are standardized and the extent to which employee behavior is guided by rules and procedures (Andrews & Kacmar, 2001; Robbins & Decenzo, 2001). In organizations with high formalization, there are explicit rules and procedures which are likely to impede the spontaneity and flexibility needed for internal innovation (Bidault & Cummings, 1994). Standardization would eliminate the possibility that members engage in alternative behaviors and remove the willingness for members to discussions on considering alternatives (Robbins & Decenzo, 2001). As tasks are preprogrammed by the organization, there is less need for organizational members to discuss how work is done.

Conversely, in organizations with low formalization, job behaviors are relatively unstructured and members have greater freedom in dealing with the demands of their relevant tasks (Sivadas & Dwyer, 2000). In this case, social interactions among organizational members are more frequent and intensive for implementing the tasks.

Therefore, the less formalized work process is likely to stimulate the social interactions among organizational members.

Centralization refers to the locus of decision-making authority lying in the higher levels of a hierarchical relationship (Robbins & Decenzo, 2001; Tsai, 2002). Centralization creates a non-participatory environment that reduces communication, commitment, and involvement with tasks and projects among participants (Damanpour, 1991; Sivadas &Dwyer, 2000). However, under the increasingly dynamic and competitive pressure, knowledge workers who have wider skills, expertise, and work responsibilities would need greater autonomy and self-regulation. If individuals have freedom, independence, and discretion to determine what actions are required and how best to execute them (Janz et al., 1997), they will accept the resulting decision because they have the opportunity to provide inputs and further communicate their ideas during the decision making process (Yap, Foo, Wong, & Singh, 1998). The more autonomy organizational members possess, the more responsibility they will feel for the work role and context (Janz et al., 1997; Spreitzer, 1995).

2.6.3 Interpersonal Factors

In essence, interpersonal factors are factors that relate to individual's relationship with the people around him or her. Some of the interpersonal factors that have been studied previously are personal influence (Lin, 2007b; Cabrera et al., 2006), interpersonal influence (Lin, 2007b), anticipated reciprocal relationships (Bock et al., 2005), trust (Holste & Fields, 2010; Wu, Hsu, & Yeh, 2007; Chowdhury, 2005), and social network (Cross & Cummings, 2004; Hansen, 1999; Reagans & McEvily, 2003).

Nonetheless, most of previous studies investigated knowledge sharing in general (e.g., Cabrera et al., 2006; Bock et al., 2005; Abrams, Cross, Lesser, & Levin, 2003; Butler, 1999; Chowdhury, 2005; Mooradian, Renzl, & Matzler, 2006; Wu et al., 2007). Therefore, the focus of the current study is tacit knowledge sharing. Studies that focus on tacit knowledge sharing are not many (e.g., Lin, 2007b; Holste & Fields, 2010); however, in this study, interpersonal trust and social networking are the interpersonal factors that are argued to have a significant impact on tacit knowledge sharing.

2.6.3.1 Interpersonal Trust

Interpersonal trust means the willingness to rely on the word, action, and decisions of other party" (McAllister, 1995).Organ (1990) as well as Robinson (1996) argued that trust and integrity are the two key factors in interpersonal relationships. Social exchange theory is used by the researchers to investigate the relationship between the aforementioned elements and knowledge sharing. The examination of trust and integrity is important; reason being is that knowledge sharing is done both individually and collectively in cooperative manner (Wu, Hsu, & Yeh, 2007).

Abrams, Cross, Lesser, and Levin (2003) conducted interviews in 20 organizations and identified ten behavioral traits that promote interpersonal trust and loyalty in the context of knowledge sharing. One method of promoting confidence development is by engaging in collective communication and discloses one's own expertise and limitations. They noted that features of the organization determine the effectiveness of

these “trust builders”. Some researchers including Butler (1999) and Lin (2007b) also examined trust as a facilitator of knowledge sharing.

Researchers have highlighted that if the trust is affect-based as well as cognition-based, it will positively impact and constructively contribute to knowledge sharing (Mooradian, Renzl, & Matzler, 2006; Chowdhury, 2005). Furthermore, according to Bakker, Leenders, Gabbay, Kratzer, & Van Engelen (2006), there are three factors relating of trustworthiness; those being capability, integrity, and benevolence or goodwill. They found individuals tend to share less knowledge with capable team members than sharing more knowledge amongst honest team members who were fair and ethical. However, knowledge sharing was not found related to whether or not a member in an organization had good-will to the trust or not. Thus, one can deduce that this area of research generally is for a positive relationship between both interpersonal trust and knowledge sharing.

In any case, Sondergaard, Kerr, and Clegg (2007) suggest that trust could go both ways, where a potential client could cease from scrutinizing the convenience of the information and its applicability owing to unjustified trust. This can lead to a misunderstanding or misuse of the knowledge. Mooradian *et al*., (2006), including commentary from Renzl, (2008) suggested that mixed results were found from two studies which focused on employees' trust in management rather than trust of other employees.

Rupp & Cropanzano (2002) concluded that investigations and studies pertaining to association among justice and knowledge sharing are scant although justice affects the

nature and extent of social exchange interactions between employers. Furthermore, analysis from Schepers and Berg (2007), noted systematic impartiality confidently influences the employees concept towards knowledge sharing. Lin (2007b) points to his research of Taiwan based business administration student in part-time study mode, where he found that the effect of both distributive and systematic justice had a positive and indirect effect on students. Organizational commitment combined with distributive justice may influence knowledge sharing through trust.

2.6.3.2 Social Networking

Social networking defines as the degree of contact and accessibility of one with other people (Nahapiet, & Ghoshal. 1998; Wong, Wong, Hui, & Law, 2001). In order to analyze the structural patterns of social relationships, social networking analysis is considered (Wasserman and Faust, 1994). This assumes several ways and methods to analyze, identify, and visualize the informal personal networks between and within organizations. Therefore, organized techniques would be provided by social network analysis to examine, identify, and support procedures or processes of knowledge sharing within the aforementioned network (Muller-Prothmann, 2006).

Kanter (2001) documented that organizations are able to deal with knowledge in an effective way when they develop and improve the networks whether internal or external. In knowledge sharing, the role networks principally stress the necessary of informal networks. Moreover, networks always give emphasis to the outcome of an activity (Seufert et al., 1999).

According to Muller-Prothmann (2005), supporting knowledge sharing can be assessed or helped by the analysis of social network through concentrating on several functions of knowledge sharing, for instants, distinguishing the competency and knowledge of an individual, investigation into the exchange and continuous preservation of tacit knowledge, and exploration of chances to enhance the communication procedure and productivity.

According to Ramírez Ortiz, Caballero Hoyos, and Ramírez Lopez (2004) the social network consists of a set of actors among whom there is a system of relationships. Cross and Cummings, (2004), Reagans and McEvily (2003) illustrated that based on the relationships among individuals, social networking and integration could encourage and can facilitate the growth in knowledge sharing. Specifically, there is a positive relationship between the quantity and perceived usefulness of the shared knowledge and the direct ties and personal relationships among individuals within social networks in the organization (Chiu *et al.*, 2006; Wasko & Faraj, 2005). In addition, there is a positive relationship between the knowledge sharing and the strength and cohesion of social relations Reagans and McEvily (2003).

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social networks in the organization (Chiu *et al.*, 2006; Wasko & Faraj, 2005). In addition, a positive connection can be realized between the knowledge sharing, and firm and cohesion nature of social relations (Reagans and McEvily (2003).

2.6.4 Technological Factor (ICT Usage)

Knowledge sharing is not only a people or organizational issue but it also poses as a technological challenge. Advancement in the area of information and communication technology (ICT) also plays a role in encouraging knowledge sharing among employees. ICT usage defines as the degree of technological usability and capability regarding knowledge sharing (Lin & Lee, 2006). The terminology, “hybrid solutions” is described as the required interactions between people and technology for the facilitation of practices-sharing (Davenport, 1996). In addition, Ruddy (2000, p.38) contended that in order to improve knowledge sharing, a "fragile marriage of innovation with a sharp feeling of social or behavioral awareness" should be realized. Majority of firms are challenged in their attempts to develop an environment where in people are inclined to give and take knowledge and learn from what others know.

Technology facilitates instantaneous access to significant amount of information that enables collaboration irrespective of distances, and directly motivates teamwork between business functions and branches. For example, majority (79%) of the executives included in the 150 Fortune 1000, who took part in a survey, stated that self-managed teams lead to the improvement of the productivity of the firm (TMA Journal, 1999). Along the same line, Riege & O’Keefe (2003) contended that this holds true for the purpose of increasing knowledge-sharing practices in the processes involved in international new product development. It is clear that technology plays a

key role in facilitating the encouragement and support of knowledge sharing process by facilitating their ease and effectiveness.

The primary issue lies in the selection and implementation of an appropriate technology providing an effective fit between the firm and its people. Effective technology in some organization may be ineffective in others. According to Riege (2005), some well known hurdles to knowledge sharing are; mismatching combination of IT systems and processes that prevent achievement of tasks, minimum technical support (external or internal), untimely maintenance of combined IT systems preventing work routines and communication flows, and many different aspects.

Regardless of the firm size, majority of the practices of formal knowledge-sharing depends on an IT infrastructure including specific shares from among the providers like Fuji-Xerox, IBM, or Microsoft. There are several kinds of infrastructure providing support in the processes of acquiring data, organizing data, storing data, retrieving data, presenting data, distributing and producing data. According to Sarvary (1999), it is not merely developing a KM and offering methodology taking into account a thorough database or a refined framework. Along a similar line, Hendriks (1999) brings forward the use of novel systems stating that they may improve motivation of individuals to share knowledge and it frequently eradicates barriers in terms of temporal, physical and social distance through process improvement and pinpointing knowledge carriers and seekers. According to him, even though the only solution or the driver of knowledge-sharing strategy is technology, technology still has to be integrated.

It is evident that majority of technologies including the web, and Intranet, e-mail, groupware based software enormously contribute to the minimization of barriers to formal communication. Technology has many facets which makes it necessary for the firm to develop an infrastructure that reinforces many different communication types. Technology is also multi-dimensional; e.g. business intelligence technology for the appraisal of natural and monetary surroundings; the relationship and penetration of training technologies to counteract auxiliary and geographic boundaries; information exploration technologies to focus new inward and outside information; information mapping technologies to stay up to date and to recognize knowledge platform related to workers, suppliers, merchants, outsourcing contractors, and customers; and new innovations for security (Gold *et al*., 2001).

Misalignment of employees may also lead to the development of barriers. In other words, software systems should be able to be supportive of work-related process of employees who are the key decision makers of information access, storage, and dissemination to others. Extant and new technologies often support effective knowledge sharing process although even with a consistency between employee's need requirements, technology may be a barrier in itself. This barrier stems from actual problem solutions that are mismatched with employees' need requirements (O'Dell & Grayson, 1998). Another hindrance to the development and maintenance of a suitable IT infrastructure is the technology compatibility, the combination of the extant and current systems. This stems from the situation where in the current hardware and software components for one purpose is required to be used with new systems or different systems are needed for other situations.

It appears that the system choice that is suitable for all functional areas in global companies is not always possible. Technology is the main driver in organizations and industrial sectors as evidenced by their great dependence on it for everyday activities. Accordingly, more complex technology has a key role in aligning business processes while simultaneously increasing outputs. Both organizations and employees need to embark on solving this complex workplace issue, where in certain scenarios, may lead to their disinclination to utilize modified or new systems. Despite most people's inclination to technology-use, the familiarity or lack thereof of the systems of IS/IT may lead to sharing barrier. Furthermore, some individuals may have overestimated technology role which may lead to ambiguities of what technology is capable of doing. These unrealistic expectations are often present and they eventually lead to the reluctance to system-use. Hence, it is important that users are involved in the design and choice of new systems and the modification of existing ones.

Another issue for majority of system operators is the perception of a trouble-free application and technology operation for daily tasks and communication. Every hardware and software packages comes with its own problems and systems sometimes crash which involves expense and time-consumption. This calls for timely technical support maintenance, whether internal or external to the company, which provides solutions and expects potential problems and pitfalls. The huge market catering to outsource software services and remote maintenance guarantee that technical problems are resolved in a timely and effective manner. This will avoid the creation of sharing barriers stemming from system crash or non-functioning technology.

2.7 Research Framework

The research framework of this study depends on social capital theory. Social capital is described as the social company's characteristics like social networks, values, norms and interpersonal trust that help in the coordination and collaboration activities to bring about joint advantage. Besides, relationship among individuals can create and leverage the social capital. In a nutshell, interactions create relationships and relationships are the residing place for social capital.

The tacit knowledge sharing among employees considers an important role in any organizations to leveraging its most valuable asset (Jarvenpaa & Staple, 2000). Therefore, the result in shared intellectual capital, an important resource in today's modern organization is based on the important of tacit knowledge sharing (Liao Fei & Chen, 2007).

Previous studies showed several factors that influencing knowledge sharing from social networking issues to employee characteristics (Bock & Kim, 2002; Connelly & Kelloway, 2003). The social networking appears to be well matched to knowledge sharing (Chow & Chan, 2008).

Polanyi (1966) mentioned that tacit knowledge sharing requires direct experience, the employees should have interactions frequently through discussion and brainstorming. For example, they can share and obtain tacit knowledge. In view of the fact that tacit

knowledge is embedded in the human brains, for example, when the employees work together in any organizational task, the tacit knowledge is shared.

Based on previous studies, it is observed that interpersonal trust and social networking are the key factors in social capital theory (Leana & Van Buren, 1999; Cross, Lesser, & Levin, 2003; Chowdhury, 2005; Mooradian, Renzl, & Matzler, 2006; Bakker, Leenders, Gabbay, Kratzer, & Van Engelen, 2006; Flap & Volker, 2001; Müller-Prothmann, 2006; Cross & Cummings, 2004; Reagans & McEvily, 2003; Yli-Renko, Autio, & Sapienza, 2001). Figure 2.4 shows the framework used in this study.

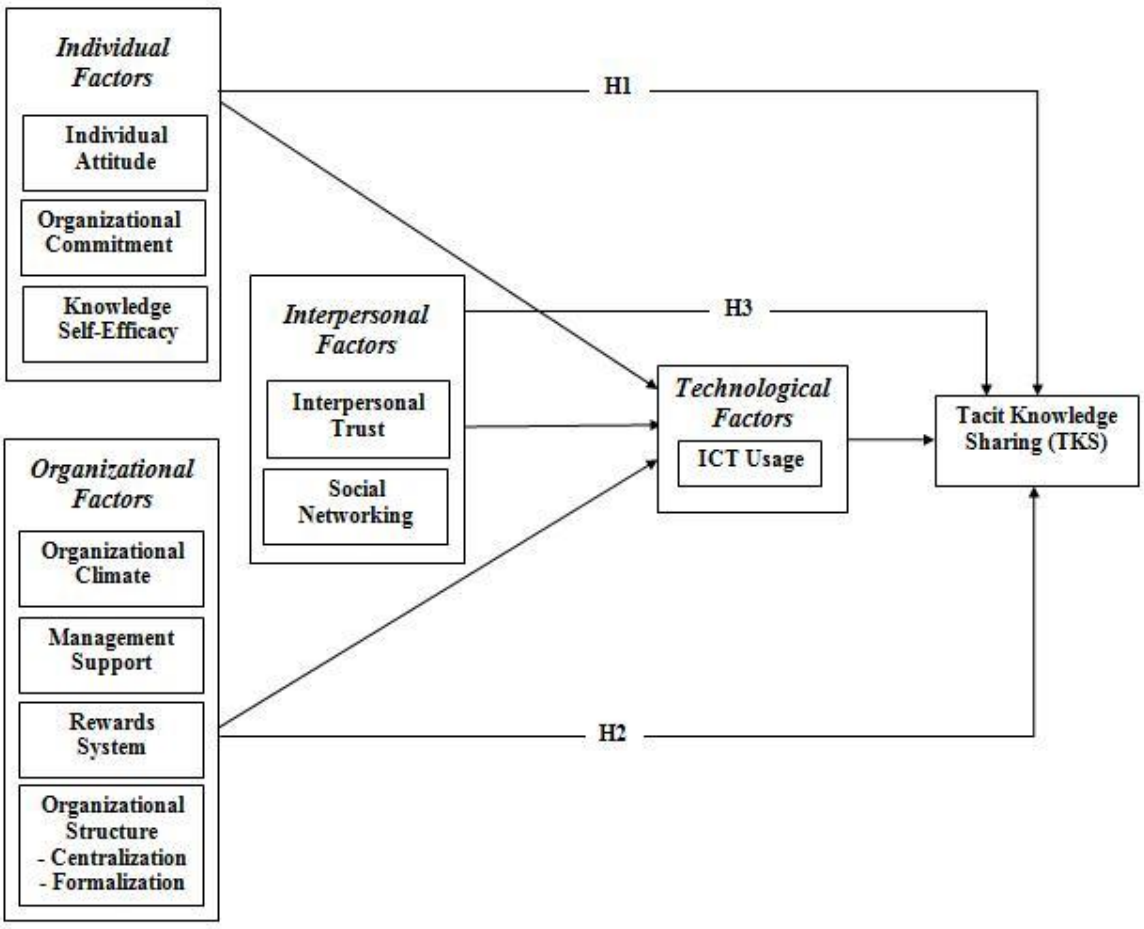

Figure 2-1
Research Framework

2.8 Hypothesis Development

'Hence the hypotheses of this study are as follows:

2.8.1 Individual Factors and Tacit Knowledge Sharing

2.8.1.1 Individual Attitude

A number of earlier studies have successfully considered attitude toward knowledge sharing (Bock *et al*., 2005; Lin and Lee, 2004). An attitude affects an individual's perception towards a specific behavior (Blue, Wilbur, & Marston Scott, 2001). Moreover, attitudes are considered as a key part of the cognitive system. They enjoy the potential to influence the intention in order to divide knowledge (Sun & Scott, 2005). Thus, this study suggests the following hypothesis:

H1a: *There is a significant and positive relationship between individual attitude and tacit knowledge sharing.*

2.8.1.2 Organizational Commitment

According to Ulrich (1998), organizational commitment may be a critical element of an organization's intellectual capital and it has become a hot topic in the field of human resources and organizational behavior. Organizational commitment is defined as the degree and type of psychological attachment that a worker feels to its company. On the basis of several studies (Kelman, 1958; Mowday *et al*., 1982; Allen & Meyer,

1990; O'Reilly & Chatman, 1986), organizational responsibility may be categorized into three perception of differing magnitude of connections, including conformity, recognization and internalization. The element of internalization is considered as the congruence between the employee's values and the organization's values while the component of identification is considered as commitment on the basis of the employee's desire to be attached with the organization, and finally, the normative component is considered as the employee's involvement on the basis of the attainment of specific extrinsic rewards.

Researchers highlighted the relation of organizational commitment to the variables within an organization, namely payment for a job, job fulfillment, responsibility and aiding coworkers (Meyer *et al*., 1993; O'Reilly & Chatman, 1986). The aforementioned three categories of organizational commitment are linked to the organization sharing of knowledge. On the basis of O'Reilly and Chatman's (1986) findings with regards to the extra role of pro-social behaviour along with Kalman's (1999) opinion concerning knowledge sharing, it may be stated that contribution of knowledge sharing may be sensitive to the level of the internalization attachment of the employee. From previous literature, the relationship between the responsibility of an organization and appropriate behavior and conduct of an organization (e.g. revenue, term, job fulfillment) resulted in the following conclusion:

H1c: *There is a significant and positive relationship between organizational commitment and tacit knowledge sharing.*

2.8.1.3 Knowledge Self-efficacy

As a matter of fact, Self-efficiency is regarded as the person's ideas and beliefs about his/her capabilities to produce the looked-for effects (Bandura, 1994). Perceived self-efficiency results in the obtaining the aforementioned skills that may lead to related behaviour samples (Bandura, 1986). Depending on the target decided by individuals, self-competence will be recognized as one of the most significantly encouraging forecasters of people's performance (Heslin & Klehe, 2006). According to a knowledge sharing context and based on previous studies, self-competence and tacit knowledge sharing exhibits positive relation. So, this study proposes the H1b as follows:

H1b:*There is a significant and positive relationship between knowledge self-efficacy and tacit knowledge sharing.*

2.8.2 Organizational Factors and Tacit Knowledge Sharing

2.8.2.1 Organizational Climate

According to Schneider *et al*. (1996), the climate of an organization finding are based on the feeling of its staffs; such assumptions are constructed via practices, protocols, procedures and motives that individuals face in organizations. In this sense, the main theme of an organization's atmosphere is the general perception of its staffs regarding the entire organization (Ashkanasy, 2008). The kind of evaluated behavior, a similar notion with organizational climate, is likely to influence employees' performance

(Hofmann, Morgeson, & Gerras, 2003). As reported by Hoegl, Parboteeah, and Munson (2003), an institution's climate has a positive effect on awareness sharing activities (Hoegl *et al*., 2003); accordingly, this study suggests the following hypothesis:

H2a: *There is a significant and positive relationship between organizational climate and tacit knowledge sharing*

2.8.2.2 Management Support

One of the important potential factors in understanding an organization is the support from the top management (Connelly & Kelloway, 2003). The support of top management for knowledge sharing is through establishing a supportive environment and caters necessary resources, as indicated by numerous studies (Lin, 2006; MacNeil, 2004). Moreover, as proposed by Lin and Lee (2004), the idea of complete encouragement from top management in creating and providing a positive knowledge sharing environment is necessary. Therefore, top management support is expected to contribute towards the knowledge sharing attempt positively among employees. Hence, we conclude as the following:

H2b: *There is a significant and positive relationship between management support and tacit knowledge sharing.*

2.8.2.3 Rewards System

The pattern of organization values shaping employee behaviors is indicated by the rewards system (Cabrera & Bonache, 1999). Reward can be in the form of monetary or non-monetary incentives (Davenport & Prusak, 1998; Hargadon, 1998). The introduction of reward systems to encourage employee knowledge sharing is not uncommon. One of the example is Buckman Laboratories whereby its 100 top contributors to knowledge are widely recognized, followed by Lotus Development, a department within IBM, allocates 25% of customer support workers KPI for knowledge sharing exercises (Bartol & Srivastava, 2002). Hence, this investigation will reveal that employee belief of receiving knowledge sharing rewards would develop greater positive willingness of tacit knowledge sharing. Thus, the following conclusion has been drawn:

H2c: *There is a significant and positive relationship between rewards systems and tacit knowledge sharing.*

2.8.2.4 Organizational Structure

Albeit a few researchers, for example, (Kim & Lee, 2006) broke down the effect of hierarchical structure and IT on workers' view of knowledge imparting abilities in private industry organizations within South Korea. They dedicated their work to the importance of organizational structure with regards to knowledge-sharing activities; there is still a notable lack of studies examining the impact from the structure of organization towards employee's knowledge sharing.

In view of the study by Creed and Miles (1996), the stratified structure of most government associations gives a point of confinement to knowledge imparting exercises and communications among coworkers and their superiors.

Additionally, centralization is revealed to minimize the initiatives that a unit may take within organizational units (Tsai, 2002). Accordingly, O'Dell & Grayson (1998) suggested flexibility to be introduced to organizational structures in order to encourage stakeholders' collaboration and sharing. Similarly, Wagner (1994) recommends participatory management practices to balance the relationship between management and their subordinates and to facilitate information-processing, decision-making, or problem solving. Two variables are used in the present study to consider the organizational structure dimension of tacit knowledge sharing: centralization, and formalization. So, this study proposes the last two hypotheses as follows:

H2d: *There is a significant and positive relationship between organizational structure and tacit knowledge sharing.*

2.8.3 Interpersonal Factors and Tacit Knowledge Sharing

2.8.3.1 Interpersonal Trust

As being important part of the moral aspect (Garcı´a- Marza´, 2003), trust is defined as a representation of confidence and certainty that an individual or an establishment will be reasonable, honest, trustworthy, decent, experienced, and is not dangerous (Caldwell & Clapham, 2003; Carnevale, 1995). Hence, an individual's trust in his

colleagues originates from his awareness of interactions with them like ethics, morality, integrity, faith, honesty and competence (Garcı´a-Marza´, 2005; Morgan & Hunt, 1994).

Accordingly, in organizational relationships, trust has increasingly been developed as a field in the context of organizational theory (Brockner, 1996). So, majority of studies in this field are concerned with trust's facilitation of inter- and intra-organizational collaboration with the inclusion of knowledge sharing (McAllister, 1995). Moreover, trust is considered to be a requirement in knowledge sharing (Nonaka, 1991), and it develops when people accept that their partners at work share the advantages of trustworthiness and they are convinced that their co-workers would return the favor through knowledge imparting with the rest.

Imparting suggested that knowledge is a kind of energy distribution among them; this is the reason it takes trust for people to consent to impart their tacit knowledge with their colleagues as trust normally reduces the apparent instability of both sides, ease risk-taking behaviors, and encourage a productive direction (Morgan and Hunt, 1994), improving the willingness of employees to share tacit knowledge. Therefore, the organizational commitment, trust and employee motivation's development signifies the most important issues relating to the employees' knowledge management employees (Storey & Quintas, 2001). This is because employees that display solid organizational responsibility and great levels of faith in their peers are more likely to exert increased attempt and always willing to share tacit knowledge within an organization (Hislop, 2003). Furthermore, Van den Hooff and Van Weenen (2004) claimed that employees who are loyal and committed are more likely to trust their

colleagues and willing share knowledge with them. Therefore, this study postulates the following connection between trust in co-workers and tacit knowledge sharing;

H3a: *There is a significant and positive relationship between interpersonal trust and tacit knowledge sharing.*

2.8.3.2 Social Networking

The different methods of network sharing incorporate communication, dialog, and individual or team cooperation that bolster and urge exercises pandered to information (Leonard & Sensiper 1998; Levinthal & March 1993). According to O' Dell & Grayson (1998), formal as well as information associations and networks among employees are highly important for knowledge sharing within an organization.

Despite the key role of formal relationships, like development courses and organized working group, according to Truran (1998), knowledge sharing among employees should be conducted and actually happens to be more effective during informal interactions. Similarly, Stevenson and Gilly's (1991) findings also reflect the same result by stating that when appropriated communication channels are present within the organization, individuals are inclined to depend highly on information relationships when it comes to communication. Furthermore, Constant, Sproull, and Kiesler (1996) provided insight into the key part of practice groups like forums involved in voluntary employment that focused on a specific topic, namely knowledge sharing network. These social mediums that are developed within the communities of practice lead to the improvement of communication among employees and affect

knowledge-sharing capabilities. Based on the above discussion, the following hypothesis is postulated regarding the effect of social networks upon tacit knowledge-sharing:

H3b: *There is a significant and positive relationship between social networking and tacit knowledge sharing*

2.8.4 ICT Usage and Tacit Knowledge Sharing

In their studies, researchers (Kim & Lee, 2006; Davenport 1997; Grant 1996; Leonard 1995; Teece 1998) highlighted the significance of IT platform and its applicability in organizational information with knowledge assimilation. Alavi & Leidneer (2001) noted the IT's expansion of knowledge transfer through the extension of the individual's ability over communication via formal channels; for instance, through computer media, electronic forums, learning online mediated forums and discussion groups assist and enable contact between knowledge seekers and those controlling knowledge access. In addition, both Davis and Riggs (1999); and Wiig (1999) broadened the list of IT applications for knowledge imparting to exemplify web based system frameworks, intranets, databases, e-information administration frameworks, and knowledge administration information systems.

An additional fundamental element of IT relating to knowledge-sharing is the extent to which the user ease is considered in the development of information systems. No matter what technology they create, program and software developers must keep into consideration the user-friendliness of their products for their recognition and utilization (Branscomb & Thomas 1984; Davis 1989; King 1999).

According to Davis (1989, p. 320), perceived use of technology based information framework is "the extent to which an individual accepts that utilizing a specific framework would be free of exertion" and it is related to current use and future use in a significant way. In a related study, King (1999) reveals that the design and delivery of knowledge management system that accurately deals with user needs is one of the most important concerns that impact on the system's success. However, the present study examines the role of ICT usage in the relationship between individual, organizational and interpersonal factors and tacit knowledge sharing.

It is evident that ICT's role is more than just providing storage for data and its retrieval (Tsui, 2005). According to Hendriks (1999) through the improvement and upgrade of knowledge access and eradication of temporal and spatial barriers between knowledge workers, information and communication technology (ICT), the level of knowledge sharing may be reinforced. Moreover, Coakes (2006) provided that ICT along with its ability to disseminate knowledge throughout varying organizational units may enable a more superior perception of the complex organizational environment. Hence this study offers the last three hypotheses as follows:

H4a: *ICT usage mediates the relationship between individual attitude and tacit knowledge sharing.*

H4b: *ICT usage mediates the relationship between organizational commitment and tacit knowledge sharing.*

H4c: *ICT usage mediates the relationship between knowledge self-efficacy and tacit knowledge sharing.*

H5a: *ICT usage mediates the relationship between organizational climate and tacit knowledge sharing.*

H5b: *ICT usage mediates the relationship between management support and tacit knowledge sharing.*

H5c: *ICT usage mediates the relationship between rewards systems and tacit knowledge sharing.*

H5d: *ICT usage mediates the relationship between organizational structure and tacit knowledge sharing.*

H6a: *ICT usage mediates the relationship between interpersonal trust and tacit knowledge sharing.*

H6b: *ICT usage mediates the relationship between social networking and tacit knowledge sharing.*

2.9 Summary

In summary, this chapter highlighted an analysis and evaluation of the literature on tacit knowledge sharing, in the formation of seven parts. The initial portion of this

chapter reviews the concept of tacit knowledge. In the second part, notes on the literature regarding knowledge sharing. Subsequently, the third part discussed the theories related to knowledge sharing. In the four parts, knowledge sharing in Arab cultures was detailed out. After that, a literature review on knowledge sharing success factors was provided. Finally, the research framework and hypothesis were discussed.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter describes the research method for the study, including the research design, the sampling design, survey materials used in this study, procedure for collecting data and the research measures. The chapter ends with strategies for analyzing the data.

3.2 Research Design

The study adopted quantitative research design as it enable the researcher to test the relationship between the research variables (Kreuger &Neuman, 2006); can reliably determine if one idea or concept is better than the alternatives (Anderson, Sweeney & Williams, 2000); and is able to answer questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomena (Leedy & Ormrod, 2005). This corresponds with the primary objective of this study, which is to examine the direct relationship between individual attitude, organizational commitment and knowledge self-efficacy, organizational climate, management support, rewards system, and organizational structure, interpersonal trust, social networking and tacit knowledge sharing. Also, to test the mediating effect of ICT usage on the relationship between the individual attitude, organizational commitment and knowledge self-efficacy, organizational climate, management support, rewards

system, and organizational structure, interpersonal trust, social networking and tacit knowledge sharing. This research design also allows the analysis to be carried out on a large sample which can be generalized to the whole population and permits the use of standard and formal sets of questionnaire to be distributed to every respondent.

Apart from that, this study is conducted in the natural environment of the organization where the researcher interference is minimal. As argued by Hair, Jr, Money, Samouel and Page (2007) and Zikmund (2000), conducting a study in a natural environment will create high external validity and the findings will be more robust, relevant and comprehensive.

For this study, the unit of analysis is at the individual level (technical staff in ICT organizations). Respondents' perceptions about the individual attitude, organizational commitment and knowledge self-efficacy, organizational climate, management support, rewards system, and organizational structure, interpersonal trust, and social networking become the basis for understanding their influence on tacit knowledge sharing. Therefore, it is suitable to use individual as a unit of analysis to test all the variables shown in the research framework.

The primary data for this study was collected through distribution of questionnaire and was collected at one point of time. A cross-sectional design is simple, inexpensive and allows for the collection of data in a relatively short period.

3.3 Sampling Design

The sampling frame for organizations in this study includes Jordanian technical employees who are employed in ICT organizations in Amman, Jordan. The selection of firms was based on Information Technology Association website (www.intaj.net). Only technical employees in each ICT organizations are relevant to this study. ICT organization is chosen for this study as it has been considered to be one of the largest and fast growing sector that contribute to Jordan's economy. This sector alone has created more than 84,000 jobs. Thus, job hopping might be high among the technical staff as the demand for such employees increased. This makes such setting more appropriate to test tacit knowledge sharing.

3.3.1 Study Population

Population for this study includes all technical staffs at ICT organization. These include the programmers, software developer, system analyst and developer, database specialist (administrator, architect and design), web design and network engineer (intaj.org). Technical staffs are chosen as they represent the largest section of the employment in the ICT organization. According to Information Technology Association website, there are 170 ICT organizations located in Amman, Jordan with a total of 5645 technical staffs.

3.3.2 Sample Size

Due to a large number of study population, it is not practical to collect data from the whole population (Zikmund, 2003).Therefore, sampling process need to be done to

determine the sampling size. In general, sampling process involved three steps which are identifying the population, identifying sample size and choosing the sample. As mentioned earlier, the total population is 5645. Based on the sample size table by Krejcie and Morgan (1970), the sample size for this study is 361. This means 361 technical staffs are needed to represent the whole study population. This sample size fit with Roscoe's rule of thumb where a sample that is larger than 30 and less than 500 is appropriate for most research. However, the researcher has decided to distribute 400 questionnaires with the intention to receive higher response rate. Hair, Black, Babin, Anderson and Tatham (2006) have argued that a large sample size is needed to be able to generalize to the whole population.

3.3.3 Sampling Technique

All the 170 ICT companies listed under Information Technology Association website, were personally contacted either through email or telephone call. Out of 170 ICT companies contacted, only 56 of them agreed to participate in the study. Since the exact number of technical employees from each of the 56 companies was not known to researcher, the distribution of questionnaire was depending on the HR representative. Thus, the sampling technique of proportionate sampling could not be conducted. Table 3-1 summarized the total number of distributed questionnaire for each of the 56 ICT companies.

Table 3-1
Distribution of respondents for each ICT companies

Num	ICT companies	Total survey distributed
1	Abdali Communications Company	10
2	Abu Ghazaleh & Co	7
3	Accelerator Technology Holdings	7
4	Access to Arabia	7
5	United Technology Solutions	7
6	Akhtaboot	18
7	Quality Business Solutions (QBS)	4
8	Wizards Productions	5
9	Pinnacle Business and Marketing Consulting	6
10	NewTek Solutions	7
11	Arab Advisors Group	3
12	Arab Web Directory	15
13	Arabian Office Automation Company	6
14	Arabic Pearl Internet Portal	6
15	Beecell-Al-Mutatwera for Mobile Applica	6
16	Believe Soft	10
17	Blink Communications	4
18	Blue Energy for Advanced Technologies BEAT	5
19	BluNet Marketing and Communication Services	7
20	Business Application of Computational Intelligence/Ciapple	17
21	Convergence Consulting & Technology	7
22	Systems & Electronic Development FZCO(SEDCO)	7
23	CrysTelCall	12
24	Dakessian Consulting	8
25	Dama Max	9
26	Pioneers Information Technologies Co	8

Num	ICT companies	Total survey distributed
27	Pixels Media	6
28	E-tech Systems	14
29	Eastern Networks	5
30	EDATA Technology and Consulting	7
31	Electronic Health Solutions	6
32	Electronic Source Solutions (eSource)	6
33	Focus Solutions	6
34	Foursan Group	7
35	Fourth Dimention Systems	7
36	Gate2Play	7
37	General Computers & Electronics	7
38	GK Information and Communication Technologies (GK Tech)	3
39	Global Technology	7
40	Globitel	2
41	HR2O	2
42	Quality Business Solutions (QBS)	3
43	International Turnkey Systems	7
44	Intracom Jordan	7
45	Iris Guard	5
46	Jabbar Internet Group	6
47	Javna Wireless Software Solutions	3
48	Jeeran for Software Development	4
49	Jordan Business Systems JBS	9
50	Jordan Data Systems	7
51	Jordan Scientific Company for Tech dev	7
52	Ketab Technologies Ltd.v	10
53	KeySoft	8
54	Khalifeh & Partners	7

Num	ICT companies	Total survey distributed
55	Kinz for Information Technology	10
56	Kulacom	7
	TOTAL	**400**

3.4 Operational Definition and Measurements

3.4.1 Measures for Tacit Knowledge Sharing

Tacit knowledge sharing is the dependent variable. In this study, tacit knowledge sharing is operationalized as the as a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organization (Bock & Kim, 2002).As shown in Table 3-2, tacit knowledge sharing was measured by 5 items developed by Bock and Kim (2002). This 5-item tacit knowledge sharing instrument has been shown to be both reliable and valid for measuring tacit knowledge sharing. Past studies have reported that the scale has adequate internal consistency (the Cronbach alphas ranging from .87 to .88) (Bock & Kim, 2002; Lin & Lee, 2006). Based on a five-point scale whereby, 1 = strongly disagree, and 5 = strongly agree, participants rated their degree of agreement with the tacit knowledge sharing statement.

Table 3-2
Tacit knowledge sharing items

Variables	Operational definition	Items	Authors
Tacit knowledge sharing	A social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the	1. I share my job experience with my co-workers. 2. I share my expertise at the request of my co-workers. (reverse	Bock and Kim (2002)

whole department or organization	coded)	
	3.	I share my ideas about jobs with my co-workers.
	4.	I talk about my tips on jobs with my co-workers.
	5.	I often provide my personal working experience and knowledge to our team members.

3.4.2 Measures for Individual Factor

Individual factors are the first independent variable. In this study, individual factors are measured by three components, namely individual attitudes, organizational commitment and knowledge self-efficacy. Individual attitude is operationalized as the degree of one's favorable or positive feeling about sharing one's knowledge (Bock, Zmud, Kim, & Lee, 2005).Individual attitude was measured using 5 items adapted from Bock, Zmud, Kim, & Lee (2005). This 5-item of individual attitude has been shown to be both reliable and valid for measuring individual attitude. Several studies have reported that the instrument has adequate internal consistency (the Cronbach alphas ranging from .88 to .92) (Tohidinia & Mosakhani, 2010; Bock et al., 2005). Originally, the items were used to measure individuals' attitude in sharing explicit and tacit knowledge. Therefore, some modifications were made to the items to reflect individuals' attitude toward tacit knowledge sharing. For this purpose, the word "tacit" was added. The original and adapted versions of the 5 items are shown in Table 3-3.

Table 3-3
Original and adapted versions of individual attitude items

Original version	Adapted version
1. My knowledge sharing with other organizational members is good.	1. My tacit knowledge sharing with other organizational members is good.
2. My knowledge sharing with other organizational members is harmful.	2. My tacit knowledge sharing with other organizational members is harmful (reverse coded).
3. My knowledge sharing with other organizational members is an	3. My tacit knowledge sharing with other organizational members is an enjoyable experience.
4. My knowledge sharing with other organizational members is valuable to me.	4. My tacit knowledge sharing with other organizational members is valuable to me.
5. My knowledge sharing with other organizational members is a wise move.	5. My tacit knowledge sharing with other organizational members is a wise move.

The second component of individual factor, organizational commitment is operationalized as the strength of an individual's identification with and involvement in a particular organization (Porter, Steers, Mowday, & Boulian, 1974). In this study, a 7-item of organizational commitment developed by Wayne, Shore, and Liden (1997) was adapted. Several studies have reported that the adapted instrument has adequate internal consistency (the Cronbach alphas ranging from .87 to .89) (Cabrera, Collins, & Salgado, 2006;Lin, 2007b; Wayne, Shore& Liden, 1997).

The last component of individual factor, knowledge self-efficacy is operationalized as the judgments of individuals regarding their capabilities to organize and execute courses of action required to achieve specific levels of performance (Lin, 2007d). The 4-items of knowledge self-efficacy were adapted from Lin (2007d). Past studies have reported that the adapted instrument has adequate internal consistency (the Cronbach alphas ranging from 0.76 to 0.86) (Lin, 2007d; Cabrera, Collins, & Salgado,

2006).Some modifications have been made to the original items by adding the word tacit. The original and adapted versions of the 4 items are shown in Table 3-4.

Table 3-4
Original and adapted versions of knowledge self-efficacy items

Original version	Adapted version
1. I am confident in my ability to provide knowledge that others in my company consider valuable	1. I am confident in my ability to provide tacit knowledge that others in my company consider valuable
2. I have the expertise required to provide valuable knowledge for my company	2. I have the expertise required to provide valuable tacit knowledge for my company
3. It does not really make any difference whether I share my knowledge with colleagues (reversed coded)	3. It does not really make any difference whether I share my tacit knowledge with colleagues (reversed coded)
4. Most other employees can provide more valuable knowledge than I can (reversed coded)	4. Most other employees can provide more valuable tacit knowledge than I can (reversed coded)

Based on a five-point scale whereby, 1 = strongly disagree, and 5 = strongly agree, participants rated their degree of agreement with the individual attitude, organizational commitment and knowledge self-efficacy statement. Table 3-5 summarized the measurement for the individual factors.

Table 3-5
Individual attitude, organizational commitment and knowledge self-efficacy items

Variable	Components	Operational definition	Items	Authors
Individual factor	Individual attitude	The degree of one's favorable or positive feeling about sharing one's knowledge	1. My tacit knowledge sharing with other organizational members is good 2. My tacit knowledge sharing with other organizational members is harmful (reverse coded) 3. My tacit knowlege sharing with other organizational members is an enjoyable experience 4. My tacit knowledge sharing with other organizational members is valuable to me	Bock, Zmud, Kim & Lee (2005)

			5. My tacit knowledge sharing with other organizational members is a wise move	
	Organizational commitment	The strength of an individual's identification with and involvement in a particular organization	1. I am willing to put in a great deal of effort beyond that normally expected in order to help htis company be successful 2. I really care about the fate of this company 3. I am extremely glad that I choose this company for which to work, over others I was considering at the time I joined 4. I talk up this company to my friends as a great organization for which to work 5. I am proud to tell others that I am part of this organization 6. I find that my values and the organization's values are very similar 7. For me this is the best of all possible organizations for which to work	Wayne, Shore & Liden (1997)
	Knowledge self-efficacy	The judgments of individuals regarding their capabilities to organize and execute courses of action required to achieve specific levels of performance	1. I am confident in my ability to provide knowledge that others in my company consider valuable 2. I have the expertise required to provide valuable knowledge for my company 3. It does not really make any difference whether I share my knowledge with colleagues (reverse coded) 4. Most other employees can proved more valuable knowledge than I can (reverse coded)	Lin (2007d)

3.4.3 Measures for Organizational Factor

In this study, organizational factor was measured by organizational climate, management support, rewards system, and organizational structure. Organizational

climate is operationalized as the employee'spositive or negative feeling regarding organizational environment (Tohidinia & Mosakhani, 2010). Organizational climate was measured using 5 items developed by Tohidinia and Mosakhani (2010). In their study, the 5 items has adequate internal consistency (the Cronbach alphaof .93).

The second component of organizational factor, management support, is operationalized as the extent to which the top management supports employees who share the knowledge (Tan & Zhao, 2003). Four items from Tan and Zhao (2003) were adapted to measure management support. In their study, these 4 items has adequate internal consistency (the Cronbach alphaof .79). Some modifications were made to the original version where the word tacit was added to the adapted version. Both, the original and adapted version were shown in Table 3-6.

Table 3-6
Original and adapted versions of management support

Original version	Adapted version
1. Top managers think that encouraging knowledge sharing with colleagues is beneficial.	1. Top managers think that encouraging tacit knowledge sharing with colleagues is beneficial.
2. Top managers always support and encourage employees to share their knowledge with colleagues.	2. Top managers always support and encourage employees to share their tacit knowledge with colleagues.
3. Top managers provide most of the necessary help and resources to enable employees to share knowledge.	3. Top managers provide most of the necessary help and resources to enable employees to share tacit knowledge.
4. Top managers are keen to see that the employees are happy to share their knowledge with colleagues.	4. Top managers are keen to see that the employees are happy to share their tacit knowledge with colleagues.

The third component, rewards system, is operationalized as the extent to which employees believe that they will receive extrinsic incentives (such as salary, bonus, promotion, or job security) for sharing knowledge with colleagues (Davenport &

Prusak, 1998).Four items developed by Lin (2007d) were adapted to measure rewards system and these items have adequate internal consistency (the Cronbach alpha of .75).Some modifications were made to the original version where in the adapted version, the work tacit was added. Both, the original and adapted version were shown in Table 3-7.

Table 3-7
Original and adapted versions of rewards system

Original version	Adapted version
1. Sharing my knowledge with colleagues should be rewarded with a higher salary.	1. Sharing my tacit knowledge with colleagues should be rewarded with a higher salary.
2. Sharing my knowledge with colleagues should be rewarded with a higher bonus.	2. Sharing my tacit knowledge with colleagues should be rewarded with a higher bonus.
3. Sharing my knowledge with colleagues should be rewarded with a promotion.	3. Sharing my tacit knowledge with colleagues should be rewarded with a promotion.
4. Sharing my knowledge with colleagues should be rewarded with an increased job security.	4. Sharing my tacit knowledge with colleagues should be rewarded with an increased job security.

The last component of organizational factor, organizational structure is operationalized as the formal allocation of work roles and administrative mechanism to control and integrate work activities (Ghania, Jayabalanb, & Sugumarc, 2002). Organizational structure was measured using six-item developed by Chen and Huang (2007). The adapted instrument has adequate internal consistency (the Cronbach alpha of .79).

In this study, each of the adapted questions asked how strongly the respondents agreed or disagreed with the organizational climate, management support, rewards system and organizational structure statements, whereby 1 = strongly disagree, and 5 = strongly agree. Table 3-8summarized the overall items for organizational factors.

Table 3-8

Organizational climate, management support rewards system and organizational structure items

Variable	Components	Operational definition	Items	Authors
Organizational factor	Organizational climate	The employee's positive or negative feeling regarding organizational environment	1. Members in my organization cooperate well with each other 2. Members in my organization have a strong feeling of one team 3. My organization encourages suggesting ideas for new opportunities 4. My organization appreciates knowledge sharing with an appropriate rewards system 5. My organization provides open communication among colleagues	Tohidinia & Mosakhani (2010)
	Management support	The extent to which the top management supports employees who share the knowledge	1. Top managers think that encouraging tacit knowledge sharing with colleagues 2. Top managers always support and encourage employees to share their tacit knowledge with colleagues 3. Top managers provide most of the necessary help and resources to enable employees to share tacit knowledge 4. Top managers are keen to see that the employees are happy to share their tacit knowledge with colleagues	Tan & Zhao (2003)
	Rewards system	The extent to which employees believe that they will receive extrinsic incentives (such as salary, bonus, promotion, or job security) for sharing knowledge	1. Sharing my tacit knowledge with colleagues should be rewarded with higher salary 2. Sharing my tacit knowledge with colleagues should be rewarded with a higher bonus 3. Sharing my tacit knowledge with colleagues should be rewarded with a promotion 4. Sharing my tacit knowledge with colleagues should be	Lin (2007d)

	with colleagues	rewarded with an increased job security	
Organizational structure	The formal allocation of work roles and administrative mechanism to control and integrate work activities	1. The firm has a large number of explicit work rules and policies 2. Employees follow the clearly defined task procedures made by the firm 3. The firm relies on strict supervision in controlling day-to-day operation 4. Employees have autonomy to do their work 5. Employees participate in the decision-making process 6. Employees search for problem solutions from many channels	Chen & Huang (2007)

3.4.4 Measures for Interpersonal Factor

Interpersonal factors are the third independent variable in this study and consist of two components, namely interpersonal trust and social networking. Interpersonal trust is operationalized as the willingness to rely on the word, action, and decisions of other party (Yilmaz & Hunt, 2001).To measure interpersonal trust, a 5-item measure is adapted from Yilmaz and Hunt (2001). In previous study, this measure has been reported to have adequate internal consistency (the Cronbach alpha ranging from .89 to .95) (Lin, 2007b; Yilmaz & Hunt, 2001)

The second component of interpersonal factor is social networking. Social networking is conceptualized as modes of sharing within networks which include communication, dialogue, and individual or group interactions that support and encourage knowledge-related employee activities (Kim & Lee, 2006). To measure social networking, three

items from Kim and Lee (2006) were adapted. In their study, these items have been reported to have adequate internal consistency (the Cronbach alpha of .85)

Each of the adapted questions asked how strongly the respondents agreed or disagreed with the interpersonal trust and social networking statements, whereby 1 = strongly disagree, and 5 = strongly agree. Table 3-9 summarized the overall items for organizational factors.

Table 3-9
Interpersonal trust and social networking items

Variable	Components	Operational definition	Items	Authors
Interpersonal factor	Interpersonal trust	The willingness to rely on the word, action, and decisions of other party	1. I consider my coworkers as people who can be trusted 2. I consider my coworkers as people who can counted on to do what is right 3. I consider my coworkers as people who can be counted on to get the job done right 4. I consider my coworkers as people whom are always faithful 5. I consider my coworkers as people whom I have great confidence in	Yilmaz & Hunt (2001)
	Social networking	Modes of sharing within networks which include communication, dialogue, and individual or group interactions that support and encourage knowledge-related employee activities	1. I communicate with other employees through informal meetings within the organization 2. I interact and communicate with other people or groups outside the organization 3. I actively participate in communities of practice	Kim & Lee (2003)

3.4.5 Technological Factor Measures

In this study, technological factor was measured by ICT usage which is operationalized as the degree of technological usability and capability regarding knowledge sharing (Lin & Lee, 2006). ICT usage was measured by 4-item adopted from Lee and Choi (2003). These items have been reported to have adequate internal consistency (the Cronbach alpha ranging from .83 to .92) in studies conducted by Lee and Choi (2003). Originally, the items were used to measure the use of technology in sharing knowledge. Therefore, the 2 items were rephrased by adding the work tacit from the original version to suit the study.

Table 3-10
Original and adapted versions of ICT usage

Original Version	Adapted Version
1. My company uses technology that allows employees to share knowledge with other persons inside the organization.	1. My company uses technology that allows employees to share tacit knowledge with other persons inside the organization.
2. My company uses technology that allows employees to share knowledge with other persons outside the organization.	2. My company uses technology that allows employees to share tacit knowledge with other persons outside the organization.

In this study, each of the adapted questions asked how strongly the respondents agreed or disagreed with the ICT usage statements, whereby 1 = strongly disagree, and 5 = strongly agree. Table 3-11 summarized the overall items for technological factors.

Table 3-11
ICT usage items

Variables	Operational Definition	Items	Author
ICT Usage	The degree of technological usability	1. My company uses technology that allows employees to share	Lee & Choi

and capability regarding knowledge sharing	tacit knowledge with other persons inside the organization. 2. My company uses technology that allows employees to share tacit knowledge with other persons outside the organization. 3. My company uses technology that allows employees to share knowledge with other persons inside the organization. 4. My company uses technology that allows employees to share knowledge with other persons outside the organization.	(2003)

3.5 Layout of the Questionnaire

All the survey materials were prepared both in English and Arabic. The Arabic version was translated by Sukaina Authorized Translation Office (Amman, Jordan). Each participant in this survey received a 5 page questionnaire (with cover letter attached). The survey materials used in this study are shown in Appendix A, and Appendix B. In this study, a total of 100 respondents have chosen the English version and 275 respondents chose the Arabic version.

The five page questionnaire consisted of two main sections. Section A asked about respondents' intention to share tacit knowledge, and their perceptions about individual, interpersonal, organizational and technological factors that influence tacit knowledge sharing. The second section, Section B covered the demographic information of the respondents.

3.6 Pilot Study

Prior to actual data collection, a pilot study was conducted on 40 technical staff from 3 ICT companies in Jordan. The pilot study was conducted from 25 June to 27 June 2011. The main reason for conducting a pilot study is to test the adequacy of the adapted research instrument and to determine whether the instrument is suitable to be used in the context of Jordan.

Out of 40 questionnaires distributed, 28 of them were returned. There were no changes required to the questionnaire. The internal consistency reliabilities (Cronbach's Alpha) of the research measures from the pilot study are reported in Table 3-12. As shown in Table 3-12, all variables have satisfactory reliability values ranging from.75 to .94.

Table 3-12
The Cronbach's Alpha for each research measures from the pilot study(n = 30)

Variable	No. of items	Cronbach's Alpha
Individual attitude	5	.94
Organizational commitment	7	.86
Knowledge self-efficacy	4	.830
Organizational climate	5	.881
Management support	4	.802
Rewards system	4	.851
Organizational structure	6	.752
Interpersonal trust	5	.753
Social networking	3	.77
ICT	4	.84

Tacit knowledge sharing	5	.89

3.7 Data Collection Procedure

Potential organizations listed under Information Technology Association website were contacted personally by telephone or email. Through the initial contact, I introduced myself, explained the purpose of the call and asked for permission to conduct the study at their organizations. Once the permission was granted, I set an appointment with the representative of the organization to distribute the questionnaire. During the survey sessions with respondents, I personally administered and collected the completed questionnaire. Each respondent was first be briefed about the purpose and nature of the survey. Respondents were assured that all the information given will remain confidential at all times and will be used for the study only. They were not requested to identify themselves in that they do not put their names on the survey forms. Respondents were allowed ample time to answer the question. For respondents who did not have time to complete the questionnaire at work or preferred not to answer the questionnaire at work, a pre-addressed and postage-paid envelope were given. For respondents who are not able to fill out the questionnaire during the meeting, a follow-up telephone call reminder was used to remind respondents about returning the questionnaire.

3.8 Technique of Data Analysis

Data collected for this study were analyzed using the SPSS (version 15.0) program for Windows. Several statistical techniques such as descriptive statistics, factor analysis,

correlation analysis and regression analysis were conducted. These statistical techniques are discussed next.

3.8.1 Descriptive Statistics

Frequencies and percentages will help for understanding the demographic characteristics of the sample. Some of the demographic characteristics included in the survey are respondents' gender, marital status, level of education, job position, and level of income.

3.8.2 Factor Analysis

For determining construct validity, the most popular method found in the literature is factor analysis. Basically, there are two types of factor analysis: exploratory and confirmatory. Exploratory factor analysis is used to discover the nature of the constructs influencing a set of responses, while confirmatory analysis is used to test a specified set of constructs influencing in a predicated way (DeCoster, 1998). Uncovering the latent structure of the variables requires exploratory factor analysis on all variables in this study.

Principal axis analysis (PCA) is employed in this study. This analysis can find a combination of variables. Then the maximum variance is extracted from the variables. Therefore, the determination of the linkage among the items used to measure tacit knowledge sharing, individual factor, and organizational factor will be done by using PCA with oblimin rotation.

The appropriateness of factor analysis will be verified by observing several statistical properties including Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. A minimum acceptable value 0.50 of KMO is acceptable (Hair, Anderson, Tatham, & Black, 1998). In addition, the Bartlett's test of sphericity is another test which should produce a significant chi-square value.

The next step will be to decide about the number of factors to extract using several criteria. The latent root criteria is one of them, based on which only factors with latent roots or eigenvalues greater than 1 are considered significant. In addition, in determining the number of factors to be extracted, the theory pertaining to the certain variable will also be considered. According to Hair et al. (1998), as the rule of thumb, the factor loading of ± 0.50 and above is preferable.

3.8.3 Correlation Analysis

Correlation analysis shows the strength of association between involved variables. Using Pearson's product Moment, inter-correlation coefficients (r) among the variables are calculated. The value of r ranging from +0.10 to +0.29 is considered to indicate a low degree of correlation, r ranging from +0.30 to 0.49 is considered to indicate a moderate degree of correlation, and r ranging from +0.50 to +1.00 is considered to indicate high degree of correlation (Cohen, 1998).

3.8.4 Regression Analysis

Both simple and multiple regressions analyses were used to predict the tacit knowledge sharing explained by the individual, interpersonal, and organizational

factors. However, the four assumptions of multiple regression must be met as precondition for this procedure (Hair et al., 1998). These assumptions are: linearity of the relationship, constant variance of the error term, normality of the error term distribution, and independence of the error term.

Partial regression plots can examine the linearity of the relationship (Hair et al., 1998). The distribution of the residuals should roughly be rectangular, with most of the scores concentrated in the center. If the pattern of the scatter plot is randomized, it indicates that the linearity assumption is met. Next required assumption is the constant variance of the error term, which is most commonly violated (Hair et al., 1998). In case of this violation, the variances are unequal which is termed as heteroscedasticity. Heteroscedasticity is diagnosed using the residual plot. If there is no pattern of increasing or decreasing residuals in the residual scatterplot, it indicates that there is no violation of this assumption. A visual examination of the normal probability plot of the residuals is used to evaluate the normality of the error term. All points of this plot of the regression standardized residuals should lie in a reasonably straight diagonal line from bottom left to top right to exhibit a normal distribution.

3.8.5 Test of Mediation

The bootstrapping method developed by Preacher and Hayes (2008) was adopted to test the mediation hypotheses. Preacher and Hayes (2008) argued that this mediation testing procedure has more advantages than other techniques, such as the causal steps approach by Baron and Kenny (1986). Apart from that, this method can be applied to small samples. Since the bootstrapping method is based on 5,000 bootstrap samples, testing multivariate normality is not needed. This method also employs only a single

analysis to test the multiple mediator models. Thus, the risk of making type I error is reduced. Moreover, the bootstrapping method is a non-parametric resampling procedure where the data set is repeatedly sampled and then indirect effect is estimated in each resampling data set. For this study, SPSS was mainly used to analyze the data and the macro, the indirect macro, developed by Preacher and Hayes (2008) was used to analyze the mediator effect. The analysis is based on 5,000 bootstrap samples and a 95 percent confidence interval.

3.9 Conclusion

This chapter has explained the research method and strategy of the study. It described how the sample of organizations was obtained, the selection of respondents, development of the questionnaire, the research materials, and the survey procedure. This chapter has also briefly explains the adoption of correlation and regression analysis to test the research hypotheses.

CHAPTER FOUR
FINDINGS

4.1 Introduction

Chapter 4 reports results of the study. The chapter begins by reporting the response rate. It then presents the demographic characteristics of the participants. The discussions continue with a report on factor analysis, correlation analysis and regression analysis. The chapter ends with a discussion on mediating analysis.

4.2 Response Rate

As discussed in Chapter 3, data for this study was collected through questionnaire. A total of 400 questionnaires were distributed between June 27th 2011 and 3rdSeptember 2011. Respondents were given a week to complete the questionnaire. At the end of the survey period, a total of 375 were returned, yielding a return rate of 93.75%. Out of 375 questionnaires, ten cases were deleted with four were due to missing data and six were deleted due to outliers. Therefore, data from 365participants are potentially available for further analysis. Table 4-1 presents the summary of respondents' response rate.

Table 4-1
Respondent's response rate

Num	ICT companies	Total survey distributed	Total survey received
1	Abdali Communications Company	10	9
2	Abu Ghazaleh & Co	7	7
3	Accelerator Technology Holdings	7	7
4	Access to Arabia	7	5
5	United Technology Solutions	7	6
6	Akhtaboot	18	16
7	Quality Business Solutions (QBS)	4	4
8	Wizards Productions	5	4
9	Pinnacle Business and Marketing Consulting	6	6
10	NewTek Solutions	7	5
11	Arab Advisors Group	3	1
12	Arab Web Directory	15	15
13	Arabian Office Automation Company	6	6
14	Arabic Pearl Internet Portal	6	6
15	Beecell-Al-Mutatwera for Mobile Applica	6	6
16	Believe Soft	10	10
17	Blink Communications	4	4
18	Blue Energy for Advanced Technologies BEAT	5	5
19	BluNet Marketing and Communication Services	7	7
20	Business Application of Computational Intelligence/Ciapple	17	16
21	Convergence Consulting & Technology	7	5
22	Systems & Electronic Development FZCO(SEDCO)	7	5
23	CrysTelCall	12	12
24	Dakessian Consulting	8	8

Num	ICT companies	Total survey distributed	Total survey received
25	Dama Max	9	9
26	Pioneers Information Technologies Co	8	8
27	Pixels Media	6	5
28	E-tech Systems	14	13
29	Eastern Networks	5	5
30	EDATA Technology and Consulting	7	7
31	Electronic Health Solutions	6	6
32	Electronic Source Solutions (eSource)	6	5
33	Focus Solutions	6	6
34	Foursan Group	7	7
35	Fourth Dimention Systems	7	7
36	Gate2Play	7	7
37	General Computers & Electronics	7	7
38	GK Information and Communication Technologies (GK Tech)	3	3
39	Global Technology	7	7
40	Globitel	2	2
41	HR2O	2	2
42	Quality Business Solutions (QBS)	3	1
43	International Turnkey Systems	7	7
44	Intracom Jordan	7	7
45	Iris Guard	5	5
46	Jabbar Internet Group	6	6
47	Javna Wireless Software Solutions	3	3
48	Jeeran for Software Development	4	4
49	Jordan Business Systems JBS	9	6
50	Jordan Data Systems	7	7
51	Jordan Scientific Company for Tech dev	7	7
52	Ketab Technologies Ltd.v	10	10

Num	ICT companies	Total survey distributed	Total survey received
53	KeySoft	8	8
54	Khalifeh & Partners	7	7
55	Kinz for Information Technology	10	10
56	Kulacom	7	6
	TOTAL	**400**	**375**

4.3 Demographic Characteristics of the Participants

Detailed descriptive statistics of the participants' demographic characteristics are presented in Table 4-2. It is noted that 58.1% of the 365 participants in this survey were between the age of 20 and 35 years old. The majority of the participant in this survey (88.2%) had higher academic qualifications of either a first degree or second degree and above. The remainder of the participants had either college degree or certificate. Male participants made up of 70.7% of the total participants. Majority of the participants (54%) were married. Most of the participants (24.1%) had 6 to 10 years of working experience. Out of 365 participants, 34.2% have served their organization between 3 to 5 years and 32.9% have been in their present position between 3 to 5 years. Most of the respondents (36.2%) in this study were non-managerial and earned more than 600JD per month (33.2%). In terms of position, most of the respondents were Web designer (46.2%), Web developer (46.2%), database architect (33.3%), database designer (33.3%), project manager (30%) and quality engineer (30%).

Table 4-2
Demographic characteristics of the participants (n = 365)

Description	Frequency	%
Age:		
Under 20	6	1.6
20 – 35	212	58.1
36 – 50	116	31.8
51 - 65	26	7.1
Over 65	5	1.4
Highest education level:		
Certificate	6	1.6
College degree	37	10.1
Bachelor degree	234	64.1
Master degree	62	17.0
Doctorate	26	7.1
Gender:		
Male	258	70.7
Female	107	29.3
Marital status		
Married	197	54.0
Single	157	43.0
Widowed	4	1.1
Divorced or separated	7	1.9
Total working experience		
Less than 1	20	5.5
1-2	45	12.3
3-5	77	21.1
6-10	88	24.1
Over 10	135	37.0

Description	Frequency	%
No. of years in current org		
Less than 1	36	9.9
1-2	63	17.3
3-5	125	34.2
6-10	76	20.8
Over 10	65	17.8
No. of years in present position		
Less than 1	53	14.5
1-2	95	26.0
3-5	120	32.9
6-10	50	13.7
Over 10	47	12.9
Job level		
Top management	42	11.5
Middle management	101	27.7
First level supervisor	90	24.7
Non-managerial	132	36.2
Monthly income		
200JD-300JD	49	13.4
301JD-400JD	59	16.2
401JD-500JD	66	18.1
501JD-600JD	70	19.2
Over 600JD	121	33.2
Position: Web		
Web Architect	1	7.7
Web Designer	6	46.2
Web Developer	6	46.2
Position: Data base		

Description	Frequency	%
Database Administrator	2	13.3
Database architect	5	33.3
Database designer	5	33.3
Senior Oracle database Administrator	3	20.0
Position: Maintenance		
Computer System Specialist	8	7.9
Data Control Clerk	6	5.9
Enterprise solution Architect	26	25.7
Help disk	4	4.0
Service Disk	2	2.0
SOA architect	2	2.0
IT Consultant	2	2.0
IT Security officer	25	24.8
IT Support Supervisor	14	13.9
Solution architect	6	5.9
Technical Support	6	5.9
Position: Network		
Network Administrator	3	7.7
Network Engineer	3	7.7
Network Engineer Security	4	10.3
Computer Network Specialist	7	17.9
Computer Operations Supervisor	11	28.2
Computer Operator	6	15.4
Network Engineer	5	12.8
Position: Administration		
Business Development Manager	3	3.3
Chief Information Officer	21	23.3
Chief Technology officer	22	24.4

Description	Frequency	%
System Administrator	6	6.7
IT Manager	2	2.2
Management Information Consultant	3	3.3
Operation Manager	4	4.4
Portal Administrator	26	28.9
Professional Service Manager	3	3.3
Position: Programming		
Software Developer	11	12.6
Software Engineer	6	6.9
Junior Programmer Analyst	6	6.9
Portal developer	6	6.9
Programmer Analyst Supervisor	16	18.4
Senior Programmer Analyst	13	14.9
Analyst Developer	7	8.0
Business Analyst	7	8.0
System Analyst	15	17.2
Position: Project Management		
Project Coordinator	6	30.0
Project Manager	4	20.0
Project Manager office manager (PMO)	1	5.0
Quality and Business Manager	3	15.0
Quality Engineer	6	30.0

4.4 Data screening

Before conducting the primary analyses, the data were examined for data entry accuracy, outliers, and distributional properties. Data screening was conducted by examining basic descriptive statistics and frequency distributions. Data screening is

significant in the earlier steps as it affects the decisions taken in the steps that follow. The procedures comprise four assumptions: identification of missing data, outliers, normality, linearity and homoscedasticity.

The data were carefully examined for missing information. Descriptive data results showed that out of 375 returned questionnaires, 4 had missing information. Malhorta (1988) suggested that using case wise deletion method is the preferred method in dealing with missing data. Therefore, these responses were deleted from the data file.

Six cases were found to be outlier (284, 366, 216, 371, 269, 123).According to Hair et al., (2006) these cases must be deleted from the data file. Therefore, these cases were deleted from the data file.

Normality test is conducted using histograms, skewness and kurtosis. For this study, it was found that none of the variables had skewness greater than 2 or a kurtosis index greater than 2. Therefore, the data appeared to have a normal distribution. In addition, all histograms used for checking normality showed that the scores to be reasonably normally distributed, implying that data was approximated for all variables at a normal curve.

Finally, results of linearity and homoscedasticity for all variables through the scatter plot diagrams indicates no evidence of nonlinear patterns and a visual inspection of the distribution of residuals suggested an absence of heteroscedasticity for the variables.

Concerning to multicollinearity, the results showed that the tolerance values were between 0.337 and 0.755, and the variance inflation factor (VIF) value ranged from 1.324 to 2.971. Given that the tolerance value is substantially greater than 0.10 and the VIF value is less than 10, indicates the multicollinearity was not a problem.

4.5 Factor Analysis

Confirmatory factor analysis (CFA) was utilized to ascertain whether the survey questions loaded on the respective dimensions for measurement of tacit knowledge sharing, individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, and social networking. Principal axis analysis with a oblimin rotation was used for identifying the variables associated with a specific factor used in this study and for data reduction to eliminate those questions that did not load significantly on any factor.

In this study, two steps of validation processes were conducted: checking the KMO and the Bartlett's Test table, and inspecting the component matrix table and rotated component matrix table. According to Pallant (2011), the data is suitable for factor analysis if the KMO value is 0.6 and above and Bartlett's Test of Sphericity significant value should be 0.05 or smaller. Pallant (2011) also suggests that the value of the correlation in component matrix is 0.3 or greater. In this study, if the value less were less than 0.4, the item will be deleted.

4.5.1 Tacit Knowledge Sharing Measures

Table 4-3and Table 4-4 show the factor analysis results for tacit knowledge sharing.Result in Table 4-3shows the value of KMO was 0.830, which was more than 0.60 and the Bartlett's test was highly significant (p=0.000). Therefore, factor analysis was appropriate for this data.

Table 4-3
KMO and Bartlett's test of tacit knowledge sharing

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of Sphericity	Approx. Chi-Square	1048.497
	df	10
	Sig.	.000

Oblimin rotated principal axis factor was conducted on the 5-items for the tacit knowledge sharing scale and revealed that the factor explained a total variance of about 62.3%.Factor analysis results in Table 4-4 shows that all 5 items in the tacit knowledge sharing were greater than 0.4 and could be retained for further analysis.

Table 4-4
Rotated structure matrix of tacit knowledge sharing

	Factor
	1
2. I share my expertise at the request of my coworkers (reverse coded)	.847
1. I share my job experience with my coworkers	.805
5. I often provide my personal working experience and knowledge to our team members	.803
4. I talk about my tips on jobs with my coworkers	.754
3. I share my ideas about jobs with my coworkers	.733

4.5.2 Individual Factors Measurement

Table 4-5 and Table 4-6 show the factor analysis results for individual factor.Result in Table 4-5shows the value of KMO was 0.745, which was more than 0.60 and the Bartlett's test was highly significant (p=0.000). Therefore, factor analysis was appropriate for this data.

Table 4-5
KMO and Bartlett's test of individual factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.745
Bartlett's Test of Sphericity	Approx. Chi-Square	4453.779
	df	120
	Sig.	.000

The oblimin rotated principal axis factoring was then conducted on the 16-item of individual factor. It revealed three structural factors. The correlation matrix also revealed that most items coefficients were 0.4 and above. The 16 items loaded on three factors were labeled as individual factor. All the 16 items are retained for further study.The items were seven (7) for organizational commitment with loadings between 0.440 and 0.855, five (5) for individual attitude with recorded loadings between -0.816 and -0.937, and four (4) for knowledge self-efficacy with recorded loadings of between 0.450 and 0.994.

Table 4-6
Rotated component matrix of individual factor

	Factor		
	F1	**F2**	**F3**
F1: Organizational commitment			
3. I am extremely glad that I chose this company for which to work, over others I was considering at the time I joined	.855		
4. I talk up this company to my friends as a great organization for which to work	.730		
2. I really care about the fate of this company	.727		
5. I am proud to tell others that I am part of this organization	.683		
6. I find that my values and the organization's values are very similar	.624		
7. For me this is the best of all possible organizations for which to work	.621		
F2: Individual attitude			
1. I am willing to put in a great deal of effort beyond that normally expected in order to help this company be successful	.440		
2. My tacit knowledge sharing with other organizational members is harmful (reverse coded)		-.937	
5. My tacit knowledge sharing with other organizational members is a wise move		-.886	
3. My tacit knowledge sharing with other organizational members is an enjoyable experience		-.880	
4. My tacit knowledge sharing with other organizational members is valuable to me		-.873	
1. My tacit knowledge sharing with other organizational members is good		-.816	
F3: Knowledge self-efficacy			
4. Most other employees can provide more valuable knowledge than I can (reverse coded)			.994
2. I have the expertise required to provide valuable knowledge for my company			.853
1. I am confident in my ability to provide knowledge that others in my company consider valuable			.719
3. It does not really make any difference whether I share my knowledge with colleagues(reverse coded)			.450

4.5.3 Organizational Factor Measurement

Table 4-7 and Table 4-8show the factor analysis results for organizational factor. Result in Table 4-7shows the value of KMO was 0.745, which was more than 0.60 and the Bartlett's test was highly significant (p=0.000). Therefore, factor analysis was appropriate for this data.

Table 4-7
KMO and Bartlett's test of organizational factor

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.839
Bartlett's Test of Sphericity	Approx. Chi-Square	3125.937
	df	171
	Sig.	.000

The obliminrotated principal axis factoring was then conducted on the 19-items of organizational factor. It revealed four structural factors. The correlation matrix also revealed that most items coefficients were 0.4 and above. The 8 items loaded on two factors were labeled as interpersonal factor. Factor analysis results from Table 4-8 show that all the items were above 0.4 and were retained for further study. The items were six (6) for organizational structure with loadings between 0.492and 0.549, four (4) for reward system with recorded loadings of between 0.713 and 0.832, five (5) for organizational climate with loadings between -0.575 and -0.992, four (4) for management support with recorded loadings of between -0.498 and -0.803.

Table 4-8*Rotated structure matrix of organizational factors*

	Factor			
	1	**2**	**3**	**4**
2. Employees follow the clearly defined task procedures made by the firm	.549			
5. Employees participate in the decision-making process	.544			
4. Employees have autonomy to do their work	.515			
3. The firm relies on strict supervision in controlling day-to-day operation	.515			
1. The firm has a large number of explicit work rules and policies	.497			
6. Employees search for problem solutions from many channels	.492			
F2: Reward System				
3. Sharing my tacit knowledge with colleagues should be rewarded with a promotion		.832		
1. Sharing my tacit knowledge with colleagues should be rewarded with higher salary		.780		
4. Sharing my tacit knowledge with colleagues should be rewarded with an increased job security		.714		
2. Sharing my tacit knowledge with colleagues should be rewarded with a higher bonus		.713		
F3: Organizational climate				
1. Members in my organization cooperate well with each other			-.992	
5.My organization provides open communication among colleagues			-.896	
3. My organization encourages suggesting ideas for new opportunities			-.591	
4. My organization appreciates knowledge sharing with an appropriate rewards system			-.580	
2. Members in my organization have a strong feeling of one team			-.575	
F4: Management support				
3. Top managers provide most of the necessary help and resources to enable employees to share tacit knowledge				-.803
2. Top managers always support and encourage employees to share their tacit knowledge with colleagues				-.790
4. Top managers are keen to see that the employees are happy to share their tacit knowledge with colleagues				-.581
1.Top managers think that encouraging tacit knowledge sharing with colleagues is beneficial.				-.498

4.5.4 Interpersonal Factor Measurement

Table 4-9 and Table 4-10 show the factor analysis results for interpersonal factor. Result in Table 4-9shows the value of KMO was 0.743, which was more than 0.60 and the Bartlett's test was highly significant (p=0.000). Therefore, factor analysis was appropriate for this data.

Table 4-9
KMO and Bartlett's test of interpersonal factor

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.743
Bartlett's Test of Sphericity	Approx. Chi-Square	634.761
	df	28
	Sig.	.000

The obliminrotated principal axis factoring was then conducted on the 8-item of interpersonal factor. It revealed two structural factors. The correlation matrix also revealed that most items coefficients were 0.4 and above. The 8 items loaded on two factors were labeled as interpersonal factor. Factor analysis results from Table 4-10 show that all the items were above 0.4 and were retained for further study. The items were five (5) for interpersonal trust with loadings between 0.501and 0.669, and three (3) for social networking with recorded loadings of between 0.575 and 0.858.

Table 4-10
Rotated structure matrix of interpersonal factor

	Factor	
	1	**2**
F1: Interpersonal trust		
1. I consider my coworkers as people who can be trusted	.669	
2. I consider my coworkers as people who can be counted on to do what is right	.662	
4. I consider my coworkers as people whom are always faithful	.632	
3. I consider my coworkers as people who can be counted on to get the job done right	.567	
5. I consider my coworkers as people whom I have great confidence in	.501	
F2: Social networking		
2. I interact and communicate with other people or groups outside the organization		.858
1. I communicate with other employees through informal meetings within the organization		.612
3. I actively participate in communities of practice		.575

4.5.5 Technological Factor Measurement

Table 4-11and Table 4-12 show the factor analysis results for technological factor. Result in Table 4-11shows the value of KMO was 0.778, which was more than 0.60 and the Bartlett's test was highly significant (p=0.000). Therefore, factor analysis was appropriate for this data.

Table 4-11
KMO and Bartlett's test of technological factor

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.778
Bartlett's Test of Sphericity	Approx. Chi-Square	586.740
	df	6
	Sig.	.000

In this study, oblimin rotated principal axis factor was conducted on the 4- item and revealed a one-factor structure that explained a total variance of about 56.82%. The factor loading had values between 0.673 and 0.811. Given that all the items extracted were recorded a level of above 0.4, none of the items were deleted. All the 4 items were loaded on a single factor and labeled as ICT usage.

Table 4-12
Rotated component matrix of technological factor

Component Matrix of ICT usage	
	Factor
	1
3. My company uses technology that allows employees to share knowledge with other persons inside the organization	.811
1. My company uses technology that allows employees to share tacit knowledge with other persons inside the organization	.796
4. My company uses technology that allows employees to share knowledge with other persons outside the organization	.727
2. My company uses technology that allows employees to share tacit knowledge with other persons outside the organization	.673

4.6 Correlation Analysis

Table 4-13presents the means, standard deviations, and Pearson correlations of variables for the 365 participants. The internal consistency reliabilities (Cronbach's Alpha) of the research measures are reported in parenthesis along the diagonal of the correlation table. As shown in Table 4.8, the Cronbach's alpha for tacit knowledge sharing was .89, and ICT usage was .84. For the individual factors, the Cronbach's alpha for the three components (individual attitude, organizational commitment, and knowledge self-efficacy) have satisfactory reliability values ranging from .82 to .94.

The Cronbach's alpha for the organizational factors, the three components (organizational climate, management support, rewards system, and organizational structure) have also satisfactory reliability values ranging from .73 to .88. For the interpersonal factors, the two components (interpersonal trust and social networking) have satisfactory reliability values of .74 and .72.

Table 4-13revealed significant positive relationships between all of individual factor components (individual attitude, organizational commitment and knowledge self-efficacy) and tacit knowledge sharing, with correlation coefficients between .34 and .40.This result indicates that participants who report higher and positive attitude, higher commitment towards their organization and have higher knowledge self-efficacy, tend to report a higher tacit knowledge sharing.

Also, there were significant positive relationships between all organizational factor components (organizational climate, management support, reward system and organizational structure) and tacit knowledge sharing, with correlation coefficients between .20 and .42. These results imply that the more participants received positive organizational climate, management support, good rewards system and organizational structure, the more they will share their tacit knowledge.

There were also significant positive correlations between all interpersonal factor components (interpersonal trust and social networking) and tacit knowledge sharing, with correlation coefficient between .29 and .48. Hence, the more participants report they had higher interpersonal trust and social networking, the more they will share their tacit knowledge.

Table 4-13also shows significant positive relationships between all of individual factor components (individual attitude, organizational commitment and knowledge self-efficacy) and ICT usage, with correlation coefficients between .14 and .38.This result indicates that participants who report higher and positive attitude, higher commitment towards their organization and have higher knowledge self-efficacy, tend to report a higher usage of ICT.

Also, there were significant positive relationships between all organizational factor components (organizational climate, management support, rewards system and organizational structure) and ICT usage, with correlation coefficients between .20 and .40. These results imply that the more participants received positive organizational climate, management support, good rewards system and organizational structure, the more they will use ICT.

There were also significant positive correlations between all interpersonal factor components (interpersonal trust and social networking) and ICT usage, with correlation coefficient between .29 and .45. Hence, the more participants report they had higher interpersonal trust and social networking, the more they will use ICT.

Lastly, participants' rating of ICT usage was significantly positively correlated with the tacit knowledge sharing ($r = .74$, $p<.01$), suggesting that the more participants used ICT, the more the will share their tacit knowledge.

Table 4-13
Descriptive statistics, scale reliabilities, and correlation of variables

	N	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Individual attitude	365	3.90	.80	(.94)										
2. Organizational commitment	365	3.92	.76	.26**	(.85)									
3. Knowledge self-efficacy	365	3.86	.75	.25**	.36**	(.82)								
4. Organizational climate	365	3.58	.91	.22**	.45**	.19**	(.88)							
5. Management support	365	3.64	.83	.21**	.55**	.24**	.50**	(.80)						
6. Rewards system	365	3.78	.89	.20**	.25**	.33**	.16**	.28**	(.85)					
7. Organizational structure	365	3.57	.68	.20**	.43**	.22**	.50**	.54**	.26**	(.73)				
8. Interpersonal trust	365	3.79	.68	.28**	.31**	.30**	.28**	.30**	.19**	.34**	(.74			
9. Social networking	365	3.78	.79	.24**	.42**	.26**	.32**	.39**	.32**	.42**	.27**	(.72)		
10. ICT usage	365	3.78	.85	.14**	.38**	.34**	.20**	.36**	.38**	.40**	.45**	.29**	(.84)	
11. Tacit knowledge sharing	365	3.88	.857	.40**	.34**	.34**	.20**	.38**	.24**	.42**	.48**	.29**	.74**	(.89)

*Note:**Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

4.7 Multiple Regression Analysis

4.7.1 Relationship between Individual, Organizational, Interpersonal Factors and Tacit Knowledge Sharing

As shown in Table 4-14, 40% (R^2 = .40, F = 26.83, p < .01) of the variance in tacit knowledge sharing was significantly explained by individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, and social networking.

Table 4-14
Regression results of independent variables and tacit knowledge sharing

Independent variables	Dependent variable Tacit knowledge sharing (Std Beta)	t	Sig.	Tolerance	VIF
Individual attitude	.237**	5.34	.000	.85	1.17
Organizational commitment	.040	.73	.464	.58	1.73
Knowledge self-efficacy	.113*	2.42	.016	.77	1.30
Organizational climate	.154*	-3.01	.003	.64	1.56
Management support	.148*	2.64	.009	.54	1.86
Rewards system	.021	.455	.650	.81	1.24
Organizational structure	.224**	4.17	.000	.58	1.72
Interpersonal trust	.284**	6.15	.000	.78	1.27
Social networking	-.001	-.014	.989	.71	1.41
F value	26.83				
R^2	0.40				
Adj. R^2	0.39				
Durbin Watson	1.97				

*Note: *p < 0.05; **p < 0.01*

In the model, individual attitude ($\beta = 0.237$, $p<0.01$), knowledge self-efficacy ($\beta = 0.113$, $p<0.01$), organizational climate ($\beta = 0.154$, $p<0.01$), management support ($\beta = 0.148$, $p<0.01$), organizational structure ($\beta = 0.224$, $p<0.01$) and interpersonal trust ($\beta = 0.284$, $p<0.01$) were positively related to tacit knowledge sharing. Therefore, Hypotheses H1a, H1c, H2a, H2b, H2d and H3a were supported. The results suggest that tacit knowledge sharing tend to increase when the technical staff are provided with positive organizational climate, good management support, and organizational structure and have positive attitude, have knowledge self-efficacy and interpersonal trust.

4.7.2 Mediating Effect of ICT Usage

The mediating effect of ICT usage in the relationship between individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, social networking and tacit knowledge sharing were tested using bootstrapping method developed by Preacher and Hayes (2008). However, before testing the mediating effect of ICT usage, multiple regressions were first conducted to check whether the independent variables were related to ICT usage, and ICT usage was related to tacit knowledge sharing.

Table 4-15shows that 37% ($R^2 = .37$, $F = 23.31$, $p < .01$) of the variance in ICT usage was significantly explained by individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, and social

networking. In the model, organizational commitment (β = 0.237, p<0.05), knowledge self-efficacy (β = 0.107, p<0.05), rewards system (β = 0.209, p<0.01), organizational structure (β = 0.184, p<0.01) and interpersonal trust (β = 0.303, p<0.01) were found to positively related to ICT use, except for organizational climate (β = -0.111, p<0.05). Therefore, only knowledge self- efficacy, organizational climate, organizational structure and interpersonal trust were considered for the mediating analysis.

Table 4-15
Regression results of independent variables and ICT usage

Independent variables	Dependent variable ICT usage (Std Beta)	t	Sig.	Tolerance	VIF
Individual attitude	-.074	-1.62	.106	.85	1.17
Organizational commitment	.137*	2.48	.014	.58	1.73
Knowledge self-efficacy	.107*	2.24	.026	.768	1.30
Organizational climate	-.111*	-2.11	.036	.641	1.56
Management support	.075	1.31	.190	.538	1.86
Rewards system	.209**	4.45	.000	.806	1.24
Organizational structure	.184**	3.34	.094	.583	1.72
Interpersonal trust	.303**	6.38	.000	.78	1.27
Social networking	.005	0.109	.913	.71	1.41
F value	23.31				
R^2	.37				
Adj. R^2	.36				
Durbin Watson	1.78				

*Note: *p < 0.05; **p < 0.01*

Results in Table 4-16 shows that 54% (R^2 = .54, F = 428.89, p < .01) of the variance in tacit knowledge sharing was significantly explained by ICT usage. In the model, ICT usage (β = 0.736, p<0.01) was found positively related to tacit knowledge sharing.

Table 4-16
Regression results of ICT usage and tacit knowledge sharing

Independent variables	Dependent variable Tacit knowledge sharing (Std Beta)	t	Sig.	Tolerance	VIF
ICT usage	.736**	20.71	.000	1.00	1.00
F value	428.89				
R^2	0.54				
Adj. R^2	0.54				
Durbin Watson	1.96				

*Note: *p < 0.05; **p < 0.01*

In this study, SPSS was mainly used to analyze the data, while the macro developed by Preacher and Hayes (2008), also known as the indirect macro, was used to analyze the mediator effect. The analysis was based on 5,000 bootstrap samples and a 95 percent confidence interval.

Results presented in Table 4-17 were based on 5000 bootstrapped samples using bias-corrected and accelerated 95% confidence intervals suggested by Preacher and Hayes (2008) and showed that the indirect effect of ICT usage is indeed significantly different from zero at p < .01. Table 4.12 also showed that the indirect effect of knowledge self-efficacy (β = .27, p < .01), organizational climate (β = .14, p < .01), organizational structure (β = .34, p < .01) and

interpersonal trust (β = .37, p < .01) on tacit knowledge sharing through ICT usage was positive and significant. Since a # b # c is positive, the type of mediation is classified as partial mediation. Therefore, Hypothesis 6a, 6b, 7a, 7b and 7c are partially supported.

Table 4-17
Mediation of the effect of ICT usage on tacit knowledge sharing through knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust

Variable							Bootstrap results for indirect effects			
IV	**M**	**DV**	**Effect of IV on M (a)**	**Direct effect of M on DV (b)**	**Total Effect IV on DV (c)**	**Direct effect of IV on DV (c')**	**Indirect effect**	**SE**	**BCa 95% CI (5000 bootstraps)**	
									Lower	**Upper**
Knowledge self-efficacy	ICT use	TKS	.38**	.71**	.38**	.11**	.27**	.04	.18	.37
Organizational climate	ICT use	TKS	.19**	.73**	.19	.05**	.14**	.04	.07	.22
Organizational structure	ICT use	TKS	.49**	.68**	.52**	.18**	.34**	.04	.23	.45
Interpersonal trust	ICT use	TKS	.56**	.66**	.60**	.23**	.37**	.04	.27	.49

*IV = Independent Variable, M = Mediating Variable, DV = Dependent Variable, SE = Standard Error, TKS = Tacit knowledge sharing, BCa = Bias corrected and accelerated, CI = confidence interval **p<.01*

In conclusion, the analysis techniques used in this study such as multiple regression, have able to answer the research objectives and test the proposed hypotheses. Table 4-18 presents the summary of the hypotheses testing.

Table 4-18
Summary of hypotheses testing

Hypotheses	Statement	Findings
H1a	Individual attitude is positively related to tacit knowledge sharing	Supported
H1b	Organizational commitment is positively related to tacit knowledge sharing	Not Supported
H1c	Knowledge self-efficacy is positively related to tacit knowledge sharing	Supported
H2a	Organizational climate is positively related to tacit knowledge sharing	Supported
H2b	Management support is positively related to tacit knowledge sharing	Supported
H2c	Rewards system is positively related to tacit knowledge sharing	Not Supported
H2d	Organizational structure is positively related to tacit knowledge sharing	Supported
H3a	Interpersonal trust is positively related to tacit knowledge sharing	Supported
H3b	Social networking is positively related to tacit knowledge sharing	Not Supported
H4a	ICT usage mediate the relationship between individual attitude and tacit knowledge sharing	Not Supported
H4b	ICT usage mediate the relationship between organizational commitment and tacit knowledge sharing	Not Supported
H4c	ICT usage mediate the relationship between knowledge self-efficacy and tacit knowledge sharing	Partially Supported
H5a	ICT usage mediate the relationship between organizational climate and tacit knowledge sharing	Partially Supported
H5b	ICT usage mediate the relationship between management support and tacit knowledge sharing	Not Supported
H5c	ICT usage mediate the relationship between rewards system and tacit knowledge sharing	Not Supported
H5d	ICT usage mediate the relationship between organizational structure and tacit knowledge sharing	Partially Supported
H6a	ICT usage mediate the relationship between interpersonal trust and tacit knowledge sharing	Partially Supported
H6b	ICT usage mediate the relationship between social networking	Not Supported

4.8 Conclusions

This chapter described the demographic characteristics of the 365 participants, the results of the correlation, and regression analyses. The research hypotheses were considered in the light of those results. The results for direct relationship indicate that individual attitude, knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust were positively related to tacit knowledge sharing. The results also imply that the ICT usage partially mediate the relationship between knowledge self-efficacy, organizational climate, organizational structure, interpersonal trust and tacit knowledge sharing. These research findings are discussed in the next chapter, Chapter 5.

CHAPTER FIVE
DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, findings as presented in Chapter 4 are discussed in light of the literature reviewed on tacit knowledge sharing and the hypotheses developed in Chapter 2. The study elaborates and extends prior research on tacit knowledge sharing. There are several contributions that can be drawn from the study.

5.2 Summary of the Research

The main purpose of this study is to investigate the relationship between individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, social networking tacit knowledge sharing. The study also interested to examine the role of ICT use as a mediator in the relationship between individual attitude, organizational commitment, knowledge self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, social networking and tacit knowledge sharing.

To test the research hypotheses involving direct effects, specifically the direct relationship between individual attitude, organizational commitment, knowledge

self-efficacy, organizational climate, management support, rewards system, organizational structure, interpersonal trust, and social networking, and tacit knowledge sharing. The findings revealed that individual attitude, knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust were positively related to tacit knowledge sharing. Hence, only these variables were tested further for the mediating effect of ICT usage.

However, before conducting the mediating test, these variables were regressed to ICT usage, to determine their relationships. Based on the findings, it was concluded that only four variables can be tested for the mediation effect of ICT usage, mainly knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust. In testing for the mediation effect, the macro developed by Preacher and Hayes (2008) were used. And the findings indicated that ICT usage partially mediate the relationship between all four tested variables and tacit knowledge sharing.

5.3 Individual Factors and Tacit Knowledge Sharing

The first objective of the research is related to the association between individual factors, specifically individual attitudes, organizational commitment, and knowledge self-efficacy, and tacit knowledge sharing. The findings indicated only individual attitude and knowledge self-efficacy have a significant impact on tacit knowledge sharing, but not organizational commitment.

5.3.1 Relationship between Individual Attitude and Tacit Knowledge Sharing

In general, this study indicated that individual attitude is an important predictor of tacit knowledge sharing. This result is consistent with previous evidence which illustrate a strong relationship between individual attitudes and knowledge sharing (Seba, Rowley, & Lambert, 2012), Bock et al. (2005) and Joseph and Jacob (2011). Researchers such as (Gottschalk, 2007; Yang, 2009) have specifically emphasized the role of attitude in the effectiveness of knowledge sharing practices. Moreover, the results of this study are also consistent with studies by Mahmood, Qureshi, and Shahbaz (2011) and Mongkolajala, Panichpathom and Ngarmyarn (2012) they found that there is compelling connection between individual attitude and sharing of tacit knowledge.

Individual attitude within this context is described as the individual's positive feeling regarding sharing his knowledge (Hutchings & Michailova, 2004). Indeed, in order to share knowledge, one must have positive feelings towards sharing. In other words, one have to like sharing their knowledge. In fact, Hislop (2002) highlighted that the previous decade has witnessed the development of a 'practice-based perspective' in knowledge sharing literature, and this phenomenon could possibly be explained by the fact that employees nowadays have more positive perception related to knowledge sharing. Consequently, knowledge sharing is voluntarily done stemming from an innate motivation for sharing, which is positive attitude towards knowledge sharing.

5.3.2 Relationship between Organizational Commitment and Tacit Knowledge Sharing

Most surprising is the relationship between organizational commitment and tacit knowledge sharing. Unlike the finding of Pangil and Mohd Nasurdin (2009), this study found that organizational commitment is not a predictor of tacit knowledge sharing. In fact, this finding is in contrast to other findings that relate to knowledge sharing in general (Bock et al., 2005; O'Reilly & Chatman, 1986; Cabrera, et al., 2006; Lin, 2007d). The inconsistency of this finding, could be explained based on the fact that most of the previous studies investigated in knowledge sharing in general, but this study investigate tacit knowledge specially. Still, for these technical employees, to share tacit knowledge, organizational commitment is not required. What is more important is positive attitude and self-efficacy. In other words, regardless of organizational commitment, when these technical employees love sharing knowledge, and have the confidence to share due to their self-efficacy, tacit knowledge sharing will happen.

5.3.3 Relationship between Knowledge Self-Efficacy and Tacit Knowledge Sharing

Besides individual attitude, the findings of this study uncovered the existence of strong relationship between knowledge self-efficacy and tacit knowledge sharing. The results are consistent with studies, such as those by Lin (2007c) and Cabrera et al. (2006) who report a strong relationship between knowledge self-efficacy and tacit knowledge sharing. It can be deduced that the understanding of individual efficacy and certainty may be a prerequisite for an individual to take

part in the tacit knowledge sharing. This means that technical workers within the Jordanian ICT sector, who possess self-efficacy to provide valuable knowledge, and with most of them holding university bachelor degree, are more likely to share their tacit knowledge with others.

5.4 Organizational Factors and Tacit Knowledge Sharing

The second research objective is concerned with the relationship between organizational factors such as (organizational climate, management support, rewards system, centralization, and formalization) and tacit knowledge sharing. The findings showed that only organizational climate, management support and organizational structure were found to predict tacit knowledge sharing.

5.4.1 Relationship between Organizational Climate and Tacit Knowledge Sharing

When discussing the "organizational climate", what is meant here is the employee's positive or negative feeling regarding organizational knowledge sharing environment (Tohidinia & Mosakhani, 2010).The investigation performed herein unveiled that there was significant and negative relationship between organizational climate and tacit knowledge sharing. The results of this study regarding organizational climate variable is inconsistent with previous studies (Bock et al., 2005, Chin-Yen, Tsung- Hsien, Li-An, Yen-Ku & Yen-Lin, 2008; Roodt, 2008; Wasko & Faraj, 2005).

With a negative relationship, it means that the more organizations tries to inculcate a knowledge sharing environment, the less people will want to share

their knowledge. This makes sense if organizational efforts were seen by the employees, in this case technical employees, as a way for the organization to manipulate them or to take their knowledge, which could make them dispensable to the organization. In such a situation, it is no wonder why people becomes reluctant to share their knowledge.

5.4.2 Relationship between Management Support and Tacit Knowledge Sharing

In relation to management support, it was revealed that the connection between management support and tacit knowledge sharing is significant. This finding is consistent with the studies by Rivera-Vazquez (2009), Cong, et al. (2007), Sandhu, et al. (2011), Bircham-Connolley, Corner, and Bowden (2005), Politis (2001), and Crawford (2005). This demonstrates the importance of the underlying role played by higher management in terms of ensuring these technical employees to share tacit knowledge. Top management must provide whatever support needed by these employees, together with providing all means, potentials, and instruments which will facilitate and support sharing in tacit knowledge.

The importance of management support in influencing knowledge sharing has been discussed in many other literatures. For example, Bircham-Connolley, Corner, and Bowden (2005) reported that employees need to receive guidance and direction from superiors where knowledge sharing is concerned. Similarly, Kazi (2005), Lee, Gillespie, Mann, and Wearing (2010) observed that leadership,

which is a form of management support, is one important factor in impacting the motivation and perception toward knowledge sharing.

5.4.3 Relationship between Reward System and Tacit Knowledge Sharing

The research investigated the relationship between rewards systems and tacit knowledge sharing. As discussed in the literature review, the role of reward and reward system in relation to knowledge sharing is not consistent. Although, it was predicted that reward system is important for tacit knowledge sharing, the findings is consistent with the finding of Bock and Kim (2002) and Bock et al. (2005), where by the relationship between this two variables is not significant. This finding could be explained based on the sample of this study. The current study were conducted in Jordan, where most of the technical staff in ICT sector in this country received a relatively high salary. In such a condition, i.e. high salary, giving more money to reward tacit knowledge sharing, will not necessarily encourage more tacit knowledge sharing.

5.4.4 Relationship between Organizational Structure and Tacit Knowledge Sharing

With regards to organizational structure, this study predicts that a more structured organization, especially in terms of being centralized and formalized (Chen & Huang, 2007; Lee & Choi, 2003; Menon & Varadarajan, 1992), would encourage employees to share their tacit knowledge. Indeed the findings showed that organizational structure do have an impact on knowledge sharing. This findings confirm previous discussion on the relationship between organizational structure and tacit knowledge sharing (Al-Alawi et al., 2007; Gorry, 2008; Grevesen &

Damanpour, 2007; Jennex, 2005; Rowley, Seba, & Delbridge, 2012).They all deduced from their research that organizational structure is widely acknowledged to influence interpersonal and inter-departmental communication opportunities. They recognized that recently, both organizational culture and structure should not hinder knowledge sharing but instead the practices and applications of knowledge sharing should be modified to make them appropriate particular organizational situations (Jennex, 2005; Willem & Buelens, 2009). Furthermore, in an investigation performed by an independent sector, it was found that facility (e.g. office layout), and reporting are two aspects of organizational structure that were found to impact on the effectiveness of knowledge sharing.

Researchers have shown that knowledge sharing may be facilitated by organizational structure (Kim & Lee, 2006). Creating a work environment that encourages interaction among employees is important for tacit knowledge sharing, and this can be achieve through the use of open workspace (Jones, 2005), use of fluid job descriptions and job rotation (Kubo, Saka, & Pam, 2001), and encouraging communication across departments and informal meetings (Liebowitz, 2003; Liebowitz & Megbolugbe, 2003; Yang & Chen, 2007). Overall, the results of these studies suggest that organizations should create opportunities for employee interactions to occur and employees' rank, position in the organizational hierarchy, and seniority should be deemphasized to facilitate knowledge sharing.

In a bigger picture, the outcome of this study proposes that organizations ought to generate environments that motivate the interactions among employees. It is

additionally suggested that workers' position within the organization ladder, and experience should utilized as an advantage to encourage tacit knowledge sharing.

5.5 Interpersonal Factors and Tacit Knowledge Sharing

The third research objective is concerned with the relationship between interpersonal factors (interpersonal trust and social networking) and tacit knowledge sharing. Referring to multi regressions results as a platform, the results of this study exhibits significant relationship between interpersonal trust and tacit knowledge sharing. In addition, the results showed no significant relationship between social networking and tacit knowledge sharing.

5.5.1 Relationship between Interpersonal Trust and Tacit Knowledge Sharing

In relation to interpersonal trust, the result was consistent with previous studies by Ribiere and Sitar (2003), Prusak and Cohen (2001), Alder (2001), Damodaran and Olphert (2000) Cabrera and Cabrera (2005), Kouzes and Posner (1995), Yang (2004), Davenport and Prusak (1998), Wasko and Faraj (2001), Robertson and O'Malley (2000).Furthermore, authors (Al-Alawi et al., 2007; Butler, 1999; Coakes, 2006; Lee et al., 2010; Lin, 2007) have identified trust as a preliminary requirement for knowledge sharing, while Ardichvili (2008) classified trust within two segments, namely trust related to individual knowledge and trust related to institution. Chow and Chan (2008), Ringberg and Reihlen (2008), Staples and Webster (2008) assert that inter-personal trust develops on the basis of recurrent social interactions between individuals, and its role in knowledge

sharing has often been studied using the theoretical lens of social exchange theory or social cognition.

When there is element of trust, staffs are willing to concurrently listen and absorb knowledge from colleagues.(Bakker, Engelen, Gabbay, & Leenders, 2006). They affirm that trust is an important factor in emphasizing knowledge sharing and works not only with colleagues; but also with managers. Therefore, the goals of this factor it to investigate the implication of the connection of trust among employees that expedite tacit knowledge sharing within the organization. Bakker, Engelen, Gabbay, & Leenders, (2006) ascertained that trust arises when individuals believe that their co-workers have qualities of trustworthiness, and that they would return the favour by sharing their knowledge with others.

5.5.2 Relationship between Social Networking and Tacit Knowledge Sharing

In connection with the result of this study, the relationship between social networking and tacit knowledge sharing is not significant. The results of this study regarding social networking variable is inconsistent with previous studies (Kim & Lee 2006; Connelly & Kelloway, 2003; Yang, 2004; Wiig, 1999; O'Dell & Grayson, 1998). The inconsistency of this finding, could be justified based on the fact that this study surveyed technical employees in the ICT sector. These type of employees are not exactly a social being. Their does not require them to be social, but most of them do contact each other to discuss about their work and how to do it best. Therefore, to share tacit knowledge they do not need social

networking. They could do it even if they do not know each other, and over the internet.

5.6 ICT Use as a Mediator

This study also aimed at determining the role of ICT usage as a mediator between all the independent variable and tacit knowledge sharing. The findings however, found that ICT usage only partially mediates the relationship between knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust, and tacit knowledge sharing. What this means is that, with these four variables, both the direct and indirect relationships were important. This confirms the arguments made by several previous researchers (Harris and Lecturer, 2009; Hildrum, 2009; Alavi and Leidner, 2001; Stenmark, 2000; Falconer, 2006; Lopez-Nicolas and Soto-Acosta, 2010; Marwick, 2001; Sarkiunaite and Kriksc iuniene , 2005; Chatti et al., 2007; Selamat and Choudrie, 2004; Murray and Peyrefitte, 2007). ICT usage mediates the relationships, and at the same time, knowledge self-efficacy, organizational climate, organizational structure and organizational commitment also had a direct effect on tacit knowledge sharing. Nevertheless, the study suggested that ICT usage of an individual would have a mediating effect on the tacit knowledge sharing, because ICT usage was described as an enabler for knowledge sharing in much of the available literature (Davenport, 1997).

There is a major debate among researchers about whether ICT usage can have a role in tacit knowledge sharing. Some, particularly those who conducted their

study before introduction of social web tools, insist that tacit knowledge sharing through using ICT is too limited, if not absolutely impossible to achieve (Flanagin, 2002; Johannessen et al., 2001; Hislop, 2001; Haldin-Herrgard, 2000). Others argue that ICT usage can facilitate tacit knowledge sharing, although it may not be as rich as face-to-face interactions (Harris and Lecturer, 2009; Hildrum, 2009; Alavi and Leidner, 2001; Stenmark, 2000; Falconer, 2006; Lopez-Nicolas and Soto-Acosta, 2010; Marwick, 2001; Sarkiunaite and Kriksc iuniene , 2005; Chatti et al., 2007; Selamat and Choudrie, 2004; Murray and Peyrefitte, 2007). Each school has its own reasons and explanations.

Advocates of the first school of thought implicitly/explicitly are advocates of viewing knowledge as a category, i.e. absolutely tacit or absolutely explicit (Mohamed et al., 2006; Johannessen et al., 2001; Hislop, 2001). They believe that the nature of tacit knowledge as a highly personal knowledge that resides in human brains makes it impossible to be shared not only by language but also by ICT. They view tacit knowledge as that which is not expressible and articulable by using common language or even that which is not always accessible to the holder of knowledge. In view of this school, this type of knowledge can only be acquired through personal experience at the workplace and can only be shared as tacit without even being converted to explicit. It can only be shared through active and direct communication, mechanisms such as observing, mentoring, apprenticeship, mutual involvement, participation, story-telling, etc. Therefore, this school observes a minimum level for ICT usage to have a role in tacit knowledge sharing. For example, Johannessen et al. (2001) assert that tacit

knowledge cannot be digitalized and shared by means of the internet, e-mails, or groupware applications.

In contrast, the second school of thought admits that ICT usage can contribute to tacit knowledge sharing, although this may not be as rich as face-to-face tacit knowledge sharing. This school views knowledge as being on a continuum that can have a different degree of tacitness (Jasimuddin et al., 2005; Chennamaneni and Teng, 2011). In their perspective, ICT usage can easily facilitate sharing of knowledge with a low to medium degree of tacitness and fairly support the sharing of knowledge with a high degree of tacitness.

Advocates of ICT-mediated tacit knowledge sharing demonstrate that ICT usage can facilitate tacit knowledge sharing processes through supporting various conversions of tacit-explicit knowledge, although it may not be as rich as face-to-face interactions. ICT usage can support tacit knowledge creation and sharing by providing a field that people freely express their personal new ideas, perspectives, and arguments; by establishing a positive dialog among experts; by making information more available and then enabling people to arrive at new insights, better interpretations, etc. (Alavi and Leidner, 2001). For instance, McDermott (1999) notes that ICT usage can facilitate conversion of tacit-to-explicit knowledge. Stenmark (2000) argues that tacit knowledge sharing is not outside the reach of ICT support. He suggests that instead of trying to capture and manage tacit knowledge, ICT solutions should be designed to provide an environment in which experts can be located, communicate with each other, and sustain social interactions. The results of this social interaction over ICT will be

better flow and exchange of tacit knowledge. By providing evidence from ICT and e-leaning research domains, Falconer (2006) also refuted previous studies asserted that tacit knowledge sharing cannot be facilitated by ICT, and strongly emphasised the significant potential of ICT in the effective communication of tacit knowledge. Marwick (2001) reflected that at the time he was writing, ICT's contribution to tacit knowledge sharing was less efficient than face-to-face meetings and weaker than explicit knowledge sharing.

Among the existing schools of thoughts discussed above, the perspectives of the second school (advocators of ICT usage-mediated tacit knowledge sharing) seem more reasonable and acceptable than those of the first school. Tacit knowledge cannot be regarded as a binary digit (0 or 1), either purely tacit or purely explicit. The notion of the ''degree of tacitness'' or ''the degree of explicitness'' is more meaningful when examining the type of knowledge shared in a specific context (Chua, 2001; Chilton and Bloodgood, 2010).

Apart from the theoretical issues discussed above, there are also practical issues in tacit knowledge sharing. For example, it is argued that face-to-face communication is no longer the principal way of sharing tacit knowledge, particularly where experts are not always geographically co-located, but must change their experiential tacit knowledge. Therefore, today the use and optimization of ICT for facilitating tacit knowledge sharing is almost inevitable (Sarkiunaite and Kriksciuniene, 2005). ICT usage can certainly enable individuals to share their tacit knowledge by providing better mechanisms for the processing, delivery and exchanging of their valuable knowledge as well as by

building an environment that allows experts to locate each other and interact socially about their job-related issues (Selamat and Choudrie, 2004; Marwick, 2001; Falconer, 2006).

Researchers have suggested a variety of ICT usage tools for facilitating tacit knowledge sharing, ranging from communication tools (e.g. instant messaging and discussion forums) to collaborative systems, multimedia sharing tools, video conferencing, online communities and Web 2.0 tools such as blogs, wikis, and social networks (Song, 2009; Marwick, 2001; Lai, 2005; Wan and Zhao, 2007; Harris and Lecturer, 2009; Hildrum, 2009; Mitri, 2003; Murray and Peyrefitte, 2007; Smith, 2001; Khan and Jones, 2011; Yi, 2006; Nilmanat, 2009; Ardichvili et al., 2003; Parker, 2011; Mayfield, 2010; Davidaviciene and Raudeliuniene, 2010; Murphy and Salomone, 2013).

5.7 Research Implications

Overall, the outcome of this study unfolds several fundamental and empirical impacts. These impacts can be clarified in the following sessions.

5.7.1 Theoretical Implication

This investigation provides the platform for enhancing the theory of tacit knowledge sharing. This study provides empirical evidence in relation to the linkage between the individual, interpersonal, and organizational factors with the tacit knowledge sharing. This study proposed a framework that relates the individual, organizational, and interpersonal factors to the tacit knowledge

sharing and suggests that ICT usage as a mediator between these factors and the tacit knowledge sharing.

In fact, previous studies discussed mainly individual and organizational factors affecting the tacit knowledge sharing separately (Lin, 2006). This study differs in the combination of the studying of the individual and organizational factors in relation to the sharing of tacit knowledge. Specifically, this study focused on investigating the influence of the individual factors on tacit knowledge sharing and this is the major contribution of the study. Besides that, there are inadequate studies that focus on individual and interpersonal and intangible factors (human dimensions) that influence on tacit knowledge sharing. Existing empirical research on tacit knowledge has been technologically and organizationally driven (Wang & Noe, 2010). Therefore, there is a need to explore the human dimension in greater depth (McAdam, Mason et al. 2007). These are the factors retained among some key properties that have to be taken in account during investigation on knowledge sharing (Nonaka, 1994; Constant et al., 1994; Jarvenpaa and Staples, 2000; Bock et al., 2005; Wasko and Faraj, 2005; Kankanhalli et al., 2005; Kuo and Young, 2008).

Similarly, there are insufficient studies that investigate tacit knowledge sharing specifically. Many studies investigated knowledge sharing in general; however the general agreement among the literature is that the complexity of tacit knowledge sharing is greater than explicit knowledge sharing (Nonaka and Takeuchi 1995; Leonard and Sensiper 1998; Nonaka and Konno 1998; Zack 1999; Haldin-Herrgard 2000; Wasonga and Murphy 2006; McAdam, Mason et

al. 2007). While investigating and analyzing the academic literature on tacit knowledge, it should be noted that the importance of tacit knowledge is still largely unexplored and not fully understood, compared to work on explicit knowledge at the group or individual level (Zack, 1999; Davenport & Prusak, 1998, Alwis & Hartmann 2008). Therefore, this study investigates in tacit knowledge sharing.

In relation to the research methodology, there are few academic studies that have empirically investigated tacit knowledge sharing. Researchers such as (Jennex & Zakharova 2005; Wang & Noe, 2010; Woo, 2005) claimed that insufficient studies employ a quantitative approach in investigating the success factors of knowledge sharing. Therefore, this study follows the quantitative methodology to add something new to the literature of knowledge sharing area.

Yet, while many studies have focused on the civilization of Far Eastern regions (Chow, Deng, & Ho, 2000; Fong, 2005; Wilkesmann et al., 2009), and it is understood that insufficient investigation had been done on the knowledge sharing within the Middle Eastern regions (Seba, Rowley, & Lambert, 2012). Boumarafi & Jabnoun, (2008) as well as Eftekharzadeh (2008) highlight those studies on knowledge sharing, particularly tacit knowledge, are rare in developing countries like Jordan. This point is supported by Hijazi (2005) who point out the lack of tacit knowledge research in Jordan. Therefore, findings from previous literatures (e.g. American and European studies) could not be generalized in Jordan in knowledge sharing, due to the many differences between Jordan and other countries, such as culture, personal traits, the working

environment, customs and traditions, lack of natural and economic resources, individual perception of knowledge sharing and so forth.

By the same token, in relation to the organizational factors, the study found that there was a lack of focus on organizational climate and incentives related to knowledge sharing in the technological environment (Smoyer, 2009). Moreover, there are limited empirical researches that have investigated the impact of organizational structure on knowledge sharing (Kim & Lee, 2006).

Nevertheless, within this study, major contribution is focused towards ICT sector. It revealed that there existed a general lack of empirical research present in the field concerning knowledge sharing in technology based industries (Smoyer, 2009) and recognition of the significance of the knowledge sharing process to the organization (Lin, 2007c; Skjølsvik, Løwendahl, Kvålshaugen, & Fosstenløkken, 2007). According to Wang and Zhang (2012) in ICT organizations, tacit knowledge covers a very wide scope from highly individual programming skills, development experience, to team collaboration and communication skill and the culture and values of organizations, etc. Likewise, the finding of this study enhances the Social Capital Theory, especially, the interpersonal factors (interpersonal trust and social networking). Trust is a crucial segment of social capital, and trust empowers collaboration. Within an organization, if the level of trust is significant, then the collaboration would be highly likely to occur, where collaboration indirectly initiates trust. As the study had exhibited, positive connection among the social media and tacit knowledge sharing can be observed.

In addition, the results of this study reinforce the social capital theory which emphasizes that the social capital constitutes an individual asset of relations and values that will enable such individual to lay down grounds for relations within the organization and to build prospects and objectives. By the same token, the qualities and features which constitute an asset within the organization are also determined as social trust, asserting that enjoying the positive aspects of such qualities and features will enable the community to perform its functions better and in a more efficient manner.

In addition, this study includes some additions to the Social Capital Theory as clearly indicated through stressing the importance of support by higher management for creating an environment conducive to cooperation and enhancing relations. Such support creates cooperative environment include adopting an organizational structure which will help individuals to get together easily and smoothly.

5.7.2 Practical Implications

This study comes out with a set of guidelines for improving tacit knowledge sharing. These guidelines take into consideration the most important and most influencing factors on the tacit knowledge sharing within the organization. It provides insights for the decision makers toward better decision making. In addition, these guidelines could be in the form of recommendations, requirements, best practices, and opportunities or challenges for increasing the effectiveness and efficiency of tacit knowledge sharing.

5.7.2.1 The Organizational Level

At the employees level this study helps increase the sharing of tacit knowledge among technical employees in the ICT sector. With knowledge sharing, it could enhance the knowledge and skills capabilities of employees in problem solving. In addition, the responsiveness of employees to customers will be improved. It also enables the employees to do more work and perform their work more efficiently and effectively. Research carried out in this study was unique to the population sampled and in the study's focus on technical employees, who are required to process, and recall complex data as a requisite of their job responsibilities. Though the study presents data concerning employees operating in technology positions, results may also be useful to leaders in other non-technical fields wishing to apply the principles found here within other environments in an attempt to benefit from improved tacit knowledge sharing. According to Borges (2013) the sharing of tacit knowledge is crucial to organizations to ensure that individual expertise will be passed throughout a team or department, rather than centered in one employee. It is especially important among technical staff in ICT organizations because, in addition to technical knowledge, they deal considerably with a combination of cognition and previous experience to solve daily problems, and implement and develop new systems (Borges, 2013).

Any organization could benefit from this study through enabling the organization to share tacit knowledge effectively. Among the benefits are ensuring the delivery of knowledge at the right time and its availability at the right place and

in the right form. It enables the continuous improvement business process effectiveness, improves the decision making process, decreases the operational costs, and enhances the delivery of better quality of products and services. In addition, the sharing of tacit knowledge maintains the intellectual capital in organizations. That contributes in boosting the economic value of an organization in the environment of knowledge economy. All that will lead to achieving the competitive advantage of organization in the market place.

This study has many implications for leaders considering programs and policies for the promotion of tacit knowledge sharing activities and the development of a learning organization climate. Recommendations to top management of organizations highlight that while the process of sharing knowledge can be time consuming, when considering alternative activities that could be pursued by employees who hold valuable tacit knowledge, management support and development could be interpreted by whether a program supports and facilitates sharing between workers through the provision of necessary resources or promotes an increased level of trust and social interactions among employees.

Further initiatives in the promotion of tacit knowledge sharing activities include the understanding and an increased attention towards the concept tacit knowledge in itself, i.e. the concept, benefits, goals, and methods, from the organizational level to the individual level. This can be achieved through the activation of knowledge creation, capturing, organizing, sharing, and storage, while simultaneously bearing in mind that the implementation of the ideas, experience

and skills available to individuals are stored in and documented in a manner for easy reference. Making good use of knowledge, the development of the organizational and the provision of intellectual capital and implementing a directed program on the training needs for staff, may indeed provide an unparalleled asset to organizations. By focusing on change management aspects of any knowledge sharing initiative, inevitably increases the chance of success in manifold. Creating a regulatory environment that encourages each individual to participate in the organization, with the awareness to raise the level of knowledge of others, may also facilitate effective tacit knowledge sharing. Even the importance of collecting innovative ideas of the organization and sharing of best practices in the level of the organization will endure in the effective evolution of tacit knowledge sharing. This can be supported by the creation of a department that is responsible for managing and sharing knowledge through a 'team of knowledge management' in organizations. Such teams would determine the methods, techniques and methodologies appropriate to activate the management and sharing of knowledge and choice of programs, projects and regulations appropriate for the nature of the work in the organization and its strategic objectives. These points may undoubtedly promote tacit knowledge sharing on a multi-platform basis.

Nevertheless, one must realize the importance of supporting senior management in promoting and supporting tacit knowledge. Senior executives can aid through a review of their organizational strategies and policies, including supporting, participating and contributing to tacit knowledge sharing. By restructuring management strategies, they would assist in promoting for example, interpersonal

trust between staff. This can be achieved through the establishment of trips and outdoor activities for the staff. Even addressing the organization's design and interior facilities it provides to the needs of its staff, may further encourage tacit knowledge sharing through dialogue and in chat rooms during personal time or lunch breaks.

Likewise, using all of electronic devices available as well as facilitating access to databases in all organizations, from the mere tools to print text to the various transactions needed to connect these devices to the internal networking would help in the sharing of knowledge, experience, and skills in quick, effective and productive sharing of knowledge.

Similarly, making the most out of internet usage to share and sharing tacit knowledge and experiences among staff in the field of specialization and to encourage self-learning and continuous learning among individuals would also greatly facilitate tacit knowledge growth and use in an organization. It could be argued that applying internet usage effectively and the preparation of training programs to increase staff awareness of the importance of tacit knowledge sharing, may also encourage staff participation in tacit knowledge which would consequently even promote creativity among employees, through the sharing of tacit knowledge.

However, more attention has to provide for the sharing of tacit knowledge because it will lead to the success of the organization and will enable it to achieve its objectives. This will consequently impact on improving the status of the

employee. Sharing in the tacit knowledge with other colleagues at work will give employees at work the opportunity to sharing experiences, skills, and ideas. It would also empower employees to focus on the building and strengthening of interpersonal trust between other co-workers, which would also lead to the increase of tacit knowledge sharing as a result of effectively taking advantage of the information technology tools in the organization.

5.7.2.2 The Country Level

It can be noted that Jordan will benefit from this study especially, since it suffers from a scarcity of economic and natural resources which makes it very important to invest in knowledge resources. Unfortunately, these knowledge resources are being attracted by the regional markets such as Arab Gulf countries. Obviously, that causes the 'brain drain' problem which, on the other hand, could be solved by the effective tacit knowledge sharing. Another benefit for the country is increasing the competitiveness of the Jordanian organizations which reflects on the economic growth and the quality of life of the Jordanian citizens.

Recommendations to decision makers in the Jordanian government include the importance of increasing awareness of the significant part of knowledge in institutional accomplishment results in incredible chance to diminish cost and raise the institution's resources to create new income. Likewise, highlighting the importance of the realization that knowledge assets represent the most important scholarly capital in academic establishments, as a platform for positive challenges, and even being on an equal platform to traditional sources of business

wealth and financial power, such as land, capital and labor, is fundamentally significant.

Nevertheless, illustration of ensuring the effectiveness of converting tacit knowledge in an institution to explicit knowledge and additionally increasing the profit of intellectual property via inventions and knowledge in its possession and trading innovations is also fundamental to the promotion of tacit knowledge transfer and growth. Institutions need to shift from traditional economy to the new global economy (knowledge economy), where the transition would be to contribute to the broad economic networks and electronic commerce. This could be achieved by developing a national plan undertaken by the official authorities and the private sector, while being supported by all available means to establish the concept of sharing tacit knowledge, illustrating its importance, its programs and its applications to those working in the public and private sectors, through training programs and seminars, symposiums and conferences. The need to change the methods and patterns of traditional management, which are not consistent with applications of knowledge sharing, and adopt modern management methods promote teamwork, cooperation and sharing of experiences and the sharing of decision-making, goal-setting and preparation of plans and strategies is key to such a national plan. The establishment of a governmental body concerned with the affairs of management and knowledge sharing, policy mission is related to the launch of management initiatives and knowledge sharing at the country level, by providing consultation, advice and expertise to both public and private sector organizations.

By opening channels of joint work among various sectors, including public and private with a view to strengthening relationships and partnerships between them, contribute to strengthening the generation and sharing of knowledge. This can be facilitated by the preparation of an official guide to knowledge management initiatives and their applications, to be a reference upon which the organization, at any initiative, can implement management and knowledge sharing. Implementing such a strategy would then encourage an organizational climate in organizations that promote the sharing and development of knowledge that would create appropriate mechanisms to overcome the manifestations of resistance to change by some staff.

Similarly, by focusing on the infrastructure of information and communication technology and the allocation of financial and technical resources necessary to establish networks active in organizations, both intranet or extranet, and design of knowledge bases, and activating the role of management information systems, would perhaps play a prominent role in the success of any initiative to implement programs and management systems and the participation of knowledge. By even Focusing more on teaching the management courses and highlighting the importance of knowledge sharing knowledge in Jordanian universities, would not only increase the awareness among students about the concept, objectives and the methods of knowledge sharing, but also highlight its benefits, too, thus enhancing and contributing to students' implementation of knowledge management initiatives before joining the labour market. Hence, the importance of noting and making use of the Jordanian e-government initiative to encourage knowledge sharing should be realised.

5.8 Limitation and Directions for Future Research

There are limitations in the design of this study that might influence the interpretations and generalizations of these findings. First, the study was aimed to understand the influence of on employees' tacit knowledge sharing, but the study was conducted on technical staff in ICT organizations only. The study does not include non-technical employees from other types of organizations or employees from the public sectors. Thus, the findings only captured perceptions of technical staffs from ICT organizations regarding factors that might influence their tacit knowledge sharing. Therefore, there is a need for future research to extend the exploration of the influence of individual, organizational and interpersonal factors on other types of organizations which might offers greater understanding on the issues of work engagement among the academicians. Other types of organizations might have different kind of organizational culture and structure that can lead to different findings.

Apart from that this study only tests few components of individual, organizational and interpersonal factors and ICT use. Other component of individual, organizational and interpersonal factors that beyond the scope of this study such as personal resources and personality trait was not included in this study. This provides another direction for future research.

In summary, while there are some limitations associated with the approach used here and given the exploratory nature of the study, the results of this study

provide useful findings that should be of interest both researchers and practitioners.

5.9 Conclusions

In conclusion, this research reported new findings to the existing literature on the aspects of individual, organizational, interpersonal, and technological factors on tacit knowledge sharing. Primary data was collected to enhance the conceptual model that links individual, organizational, and interpersonal with ICT usage and tacit knowledge sharing. This study specifically focuses on the factors that completely involved with the sharing of tacit knowledge, the elements that were associated with ICT usage, and the relationships between these three groups of variables.

Further, the study showed that factors, specifically individual attitude, knowledge self-efficacy, management support, organizational structure, and interpersonal trust, contributed positively towards tacit knowledge sharing. Furthermore, ICT usage was a partial mediator in the relationship between knowledge self-efficacy, organizational climate, organizational structure and interpersonal trust, and sharing of tacit knowledge. Hence, organizations in Jordan should focus on these variables if they wanted to encourage knowledge sharing among technical employees in the ICT sector.

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