An Empirical Study of Antecedents and Outcomes of Knowledge Sharing Capability in Jordanian Telecommunication Firms: A Structural Equation Modeling Approach

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Abstract: Knowledge sharing capability has been labeled as one of the most important segments in the field of knowledge management (KM). Also, there is little empirical evidence to indicate how firms value the richness of knowledge sharing and their business performance. This research aims to investigate the impact of knowledge sharing enablers on knowledge sharing capability, and firm performance mediated by innovation capability. A theoretical model was proposed and tested using structural equation modeling (SEM). Results confirm the proposed model, and SEM analysis indicates that knowledge sharing enablers (i.e. enjoyment in helping others, top management support, organizational rewards, and ICT use) have significant influence on employees' knowledge sharing capability; while knowledge self-efficacy does not. Furthermore, the study did not find a direct relationship between knowledge sharing capability and firm performance. However, causal links were founded between knowledge sharing capability and innovation capability; and innovation capability and firm performance.

1. Introduction

Some researchers defined knowledge management as doing what is needed to get the most out of knowledge resources and viewed as a discipline that promotes the creation, sharing, and leveraging the corporation's knowledge. Further, knowledge management performs several activities as conducting, discovering, capturing, sharing, and applying knowledge. Indeed, the concept of knowledge sharing defined as the process by which explicit or tacit knowledge can be flow between individuals, or utilize from others as well groups, departments, or organizations (Alavi and Leidner, 2001; Becerra-Fernandez and Sabherwal, 2010). Also, several researchers (e.g. Rivera-Vazquez et al. 2009; Mishra and Bhaskar, 2011; Pinho et al. 2012) called for further research to identify the antecedents that enhance the occurrence of knowledge sharing, while others (e.g. Kamasak and Bulutlar, 2010; Mills and Smith, 2011; Wu et al. 2012; Gharaibeh, 2013; Kannan et al., 2013) stressed the need to study the effect of knowledge sharing on innovation and firm performance. Therefore, in order to respond to such scholars' calls for further research in the field, and since no previous research has investigated the

associations between knowledge sharing antecedents, knowledge sharing capability, innovation, and firm performance; this study comes to examine the relationships among them. Moreover, the current research is one of the first to investigate such associations in Jordan. This is to say that the study is one of the foremost studies that is expected to enrich the knowledge when it comes to the concept of knowledge sharing for assessing the impact of knowledge sharing antecedents on firm performance through the mediating variables of knowledge sharing capability and innovation. It is also expected that the results of this study will be valuable for companies and could be considered as a guideline to enhance what companies in Jordan seek to provide knowledge sharing between knowledge workers that suit the needs, requirements, and expectations of the employees and regulators on a competitive base.

The rest of this paper is organized as follows. It begins with the literature review regarding knowledge sharing enablers, knowledge sharing capability, innovation, and firm performance. Then, the research theoretical model and hypotheses development are described. Next, the methodology used for the study is provided. It then presents the

analyses and results. The discussion and conclusion are then addressed and areas for future research are also provided.

2. Theoretical Background

Some scholars (e.g. Shannak et al., 2010; Masa'deh and Shannak, 2012; Shannak et al., 2012; Shannak, Masa'deh, and Alkour, 2012) emphasize the need for large firms to integrate their IT systems with their KM strategies and processes in order to survive in their highly competitive business environments; besides several researchers who consider the IT and its flexibility as an enabler to achieve the desired competitive advantages, considered as a strategic weapon, and as a crucial support to operational and strategic business processes (Altamony et al. 2012; Masa'deh, 2012; Masa'deh, 2013). However, reviewing the literature that relates knowledge sharing antecedents, knowledge sharing capability, innovation, and firm performance offers the conceptual bases for this research. Indeed, Becerra-Fernandez and Sabherwal (2010) defined knowledge management as performing the activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance, in a cost-effective fashion, the impact of knowledge on the unit's goal achievement. Therefore, knowledge management depends on four main types of KM processes these include the processes through which knowledge is discovered or captured and processes through which knowledge is shared and applied. Indeed, discovering knowledge defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge while capturing knowledge defined as the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities and knowledge reside outside the organizational boundaries including consultants, competitors, customers, suppliers, and prior employers of the organization's new employees.

According to Friesl et al. (2011), knowledge sharing considered as a process through which one unit is affected by the knowledge and expertise of another unit. Also, they consider the extent to which they use and build on each other's knowledge an important part of knowledge sharing which may occur through formal collaboration or in informal everyday interaction. However, according to Wu and Zhu (2012), there is no all-round definition of knowledge sharing; therefore many researchers have defined knowledge sharing from their own point of view, some of them considered it as knowledge flows and knowledge transfer as exchangeable terms. Others depicts knowledge sharing to knowledge transfer and defined it as the process of disseminating knowledge throughout the organization, in which the dissemination can happen between individuals, groups or organizations using any type or number of communication channels. In addition, knowledge flows including five elements: value of the source knowledge, willingness of the source to share knowledge, media richness of the communication channel, willingness of the recipient to acquire knowledge, and the absorptive capacity of the recipient.

Moreover, some researchers argued that a firm that adopts KM practices can obtain superior firm performance. For example, an empirical study was led by McKeen et al. (2006) to exam the effect of KM on organizational performance. They defined KM practices as observable organizational activities that are related to knowledge management. They focused on the extent of KM practices and the relationship with the outcomes. The researchers identified four dimensions of KM practices that are related to performance: the ability to locate and share existing knowledge; the ability to experiment and create new knowledge; a culture that encourages knowledge creation and sharing; and a regard for the strategic value of knowledge and learning. Based on 90 Canadian, US, and Australian firms, representing ten different industry sectors, they found that KM practices correlate directly with several intermediate measures of organizational performance, such as customer intimacy (formed by merging customer satisfaction and customer retention); product leadership (formed by merging innovation and rate of new product development); and operational excellence, which in turn is directly related to firm performance indicators like ROA, ROE, and profitability. Therefore, they encouraged practitioners to concentrate on specific intermediate endings and the timing of KM initiative launches. They concluded, yet, that more research is required to validate their results.

3. Research Model and Hypotheses Development

This research aimed to investigate how knowledge sharing enablers' impact knowledge sharing capability directly and then firm performance indirectly through innovation processes. Figure 1 displays the research's proposed model.

Kumar and Rose (2012) examined the factors that contribute to knowledge sharing behavior and subsequently examined the combined effects of IWE (Islamic Work Ethics) on innovation capability in the Malaysian public sector organizations. They defined knowledge sharing as a human behavior which apprehends activities such as exchanging explicit and/or implicit experiences, embedding ideas and skills that facilitate knowledge for innovation at workplace. They focused on the knowledge sharing enablers and its impacts on knowledge sharing capability and innovation. The researchers identified

seven antecedents of knowledge sharing enjoyment in helping others, reciprocity, self-image, knowledge self-efficacy, pro-sharing norms, generalized trust and reward systems. Based on 472 Administrative and Diplomatic Service Officers from the Malaysian public sector organizations participated in the survey, the empirical results indicate that the intrinsic motivation to share knowledge is significant in the public sector organizations. The relationship between knowledge sharing capability and innovation capability of employees in the public sector organizations was found to be contingent on IWE, they found the intrinsic motivation to share

knowledge was significant in the public sector organizations, such as enjoyment in helping others, self-efficacy and generalized trust. Therefore, the sense of belongingness and pledge of the Administrative and Diplomatic Service officers perhaps be a prerequisite to engage in knowledge sharing activities. They proved that the relationship between knowledge sharing capability and innovation capability was moderately influenced by IWE. Greater innovation means public sector organizations will be more resilient in responding to changing environments and arrive to the desired outcomes.
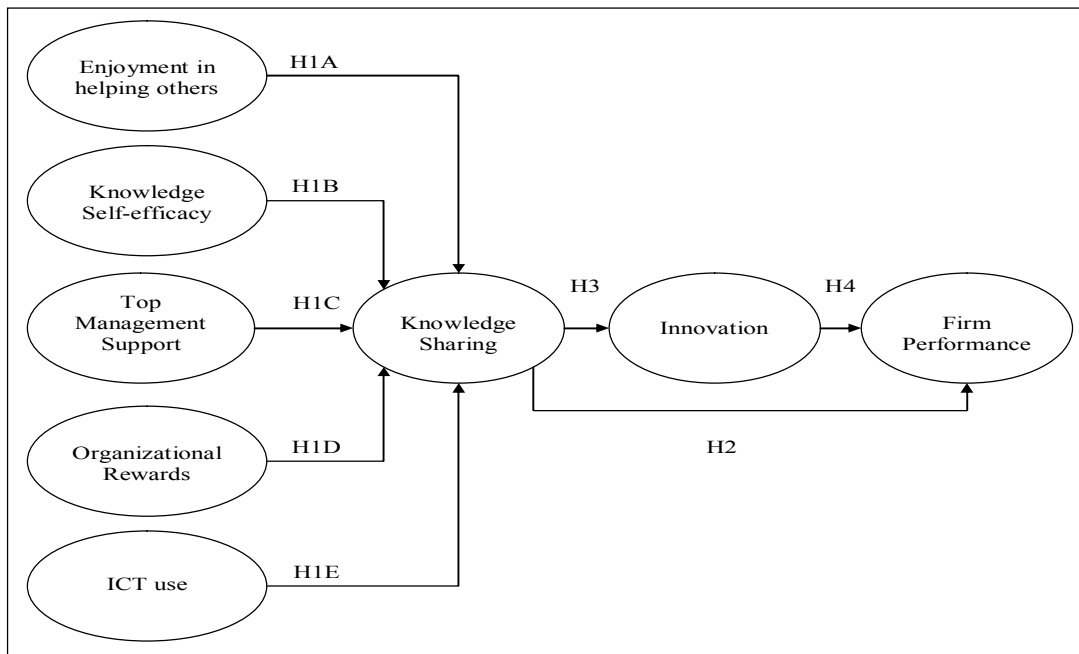

Figure 1. The Research Model

A recent research conducted by Lavanya (2012) to analyze the antecedents of knowledge sharing. 750 questionnaires were distributed, and only 516 fulfilled the condition of the study. The researcher argued that many companies are identifying, managing and sharing the experience of employees to accelerate the knowledge sharing market; and is useful only when it is put in to action. Lavanya (2012) found that knowledge sharing was affected by the following factors: attitude, trust, perceived time pressure, organizational knowledge ownership, organizational culture, knowledge management initiative and absorptive capacity. Moreover, the study concluded that before developing information and communication technology solutions for knowledge management; companies need to understand what knowledge they have, what knowledge they need, and

who knows about what, and apply the technology appropriately.

Mueller (2012) aimed to study Knowledge sharing between project teams and its cultural antecedents. The research design used a triangulation of methods (interviews, observations, company data and group discussions) to receive detailed results for the study. The researcher found that knowledge sharing between project teams took place even though top management did not include these processes in the formal work organization. The researcher found that project team leaders and members share knowledge with other project teams by transferring boundary objects, interchanging team members and directly interacting. In addition, the study approved some elements of a knowledge culture, and also discovered new cultural elements to knowledge sharing between teams, such as personal responsibility, intrinsic

motivation, top management's trust in employees, and output orientation. This leads to the following hypotheses:

H1A: Enjoyment in helping others affects knowledge sharing capability positively.

H1B: Knowledge self-efficacy affects knowledge sharing capability positively.

H1C: Top management support affects knowledge sharing capability positively.

H1D: Organizational rewards affect knowledge sharing capability positively.

H1E: ICT use affects knowledge sharing capability positively.

Choi and Lee (2003) found that explicit KM (relating to knowledge codification, acquisition and sharing in codifies forms and documentation) and tacit KM (relating to the knowledge acquisition from experts and knowledge sharing by one-to-one connections) could lead to differences in firm performance. In other words, an explicit KM strategy can result in growth and productivity, while a tacit KM strategy is crucial for innovation. In addition, Keskin (2005) tested the associations among explicit-orientated KM strategy, tacit-oriented KM strategy, and firm performance. These associations were moderated by the environmental hostility factor, which entails environmental turbulence (i.e. unexpected changes in environmental conditions) and the intensity of market competition. Explicit and tacit knowledge management strategies were found to be positively and significantly associated with firm performance. Furthermore, the study revealed that the more the environmental hostility, the greater association between explicit and tacit-orientated KM strategies, and firm performance.

Wu et al. (2012) examined the relationship between adventure recreation, knowledge sharing, and firm performance. They tested the influence of knowledge sharing on the performance of information system R&D personnel by introducing adventure recreation as a mediating variable to find out the association. They found that the sharing of system structure and task knowledge positively and significantly influence task performance and group performance, whereas interpersonal relationship knowledge sharing positively and significantly influences group performance. Furthermore, adventure recreation was a mediating variable between knowledge sharing and performance, members' sharing of task and system structure-related knowledge positively influenced performance. Based on the above discussion, the researchers formulate the following hypothesis:

H2: Knowledge sharing capability affects firm performance positively.

A research conducted by Lin (2007) to analyze Knowledge sharing and firm innovation capability. 172 surveys were distributed on employees from 50 large organizations in Taiwan; the structural equation modeling (SEM) was used to investigate the research model. The researcher argued that the relationships among knowledge-sharing enablers, processes, and firm innovation capability may provide a clue regarding how firms can promote knowledge-sharing culture to sustain their innovation performance. Lin (2007) found that knowledge sharing processes was influenced by the individual factors (enjoyment in helping others and knowledge self-efficacy), organizational factors (top management support and organizational rewards) and technology factors (information and communication technology use) and whether more leads to superior firm innovation capability. Moreover, firm innovation capability was found to be strongly positively associated with employee willingness to donate and collect knowledge. They recommended that more research can examine how personal traits (such as age, level of education, and working experiences) and organizational characteristics (such as firm size and industry type) may moderate the relationships between knowledge enablers and processes.

Kamasak and Bulutlar (2010) explored the effects of knowledge sharing on innovation. They examined two forms of knowledge sharing, knowledge donating and knowledge collecting. Further, the effects of knowledge donating and collecting on ambidexterity in organizations are also studied, in which ambidexterity defined as the simultaneous achievement of exploratory and exploitative innovation. A questionnaire was used to collect data from 246 middle and top-level managers in Turkey designed to measure the relationship between knowledge sharing and innovation. They found that knowledge collecting had a significant effect on all types of innovation and ambidexterity, while knowledge donating, involving donating inside and outside the group, did not have any effect on exploratory innovation. Therefore, this research formulates the following hypothesis:

H3: Knowledge sharing capability affects innovation positively.

According to Sáenz et al. (2012), to make knowledge sharing possible, there are different mechanisms and initiatives used as facilitators. Many of these mechanisms take advantage of information and communication technologies (on-line discussion forums, blogs, intranets and knowledge repositories) whereas, in other cases, personal interaction between individuals is the key (communities of practice, coaching, mentoring and employee functional rotation, to name but a few), this does not mean that

all knowledge is shared through them for example: knowledge exchange can take place naturally, as a part of daily management processes. Therefore, the researcher investigated the influence of each type of knowledge sharing mechanism (ICT-based, personal interaction-based and embedded in management processes) on innovation capability. Indeed, innovation lies at the core of what is known as ''dynamic capabilities'', Sáenz et al. (2012) tested empirically the degree of influence of different knowledge sharing mechanisms (ICT-based, personal interaction-based, and embedded in management processes) on innovation capability, as well as the influence of each first-level innovation capacity on company performance. Sáenz et al. (2012) found that knowledge sharing was a key issue in order to enhance innovation capability, and in turn company performance. This leads to the fourth hypothesis:

H4: Innovation capability affects firm performance positively.

4. Research Methodology
4.1. Measures

In this study, the researchers developed a field study for employees. That is as a basis for data collection and analysis, respondents answered all items on five point Likert-scales ranging from "1" meaning "very low" to "5" meaning "very high". Further, elements used to consider each of the constructs were primarily obtained from prior research. These elements provided a valued source for data gathering and measurement as their reliability and validity have been verified through previous research and peer review. The five independent variables of Knowledge sharing antecedents (i.e. enjoyment in helping others, knowledge self-efficacy, top management support, organizational rewards, and ICT use) were adapted from Lin (2007); Knowledge sharing capability was identified from Kim and Lee

(2006) and validated by Kumar and Rose (2012); innovation variable was measured using five items which were adapted from Lee and Choi (2003) and validated by Kumar and Rose (2012); and firm performance was measured using three items which were identified from Sáenz et al. (2012). Moreover, Table (1) defines the constructs, and Table (2) shows the measured constructs and the items measuring each construct.

4.2. Research Sample and Data Collection

The preliminary instrument was pre-tested in four semi structured interviews with employees and five MIS academic professors. This is to improve its understandability, relevance, completeness, length, and overall appearance of the survey. Changes and modifications were made to the final version of the questionnaire. Also, in order to develop an appropriate sample from the population selected for this study, stratified sample type has been used. Indeed, the population of this study consists of telecommunication employees in Jordan (Orange, and Umniah), which counts of 3500 employees. Furthermore, since the researchers were not allowed to contact directly the employees in the two companies, Human Resource (HR) managers were informed in which they could choose the respondents randomly from all managerial levels (i.e. senior management, middle management, operational management, and staff). Consequently, questionnaires were distributed to the HR managers who then gave them to potential respondents. Moreover, this method of sampling entails selecting randomly the cases and continuing this process until the required sample size is reached (Saunders et al, 2007). Further, this strategy has been used by researchers such as Jarvenpa and Staples (2000), and Al-Faouri et al. (2009).

Table 1. Components and Definitions

Components	Definition
Enjoyment in helping others	The degree to which employees are motivated by relative altruism owing to their desire to help others.
Knowledge self-efficacy	The degree to which employees believe that their knowledge can help to solve job-rotated problems and improve work efficacy.
Top management support	The degree to which top management support occur to create a supportive climate and providing sufficient resources.
Organizational rewards	The degree to which organizations values shape employee behaviors.
ICT use	The degree to which ICT enhance rapid search, access and retrieval of information, and support communication and collaboration among organizational employees.
Knowledge sharing	The ability of employees to share their work-related experience, expertise, know-how, and contextual information with other employees through informal and formal interactions within or across teams or work units.
Innovation	The degree of belief that the organizations produce novel ideas to enhance the provision of different services or establishment of new products.
Firm performance	The degree to which organizations achieve financial and market performance compared to their key competitors.

Table 2. Constructs and Measurement Items

Construct	Measurement Items
Enjoyment in helping others (EHO)	EHO1: I enjoy sharing my knowledge with colleagues. EHO2: I enjoy helping colleagues by sharing my knowledge. EHO3: It feels good to help someone by sharing my knowledge. EHO4: Sharing my knowledge with colleagues is pleasurable.
Knowledge self-efficacy (KSE)	KSE1: I am confident in my ability to provide knowledge that others in my company consider valuable. KSE2: I have the expertise required to provide valuable knowledge for my company. KSE3: It does really make differences whether I share my knowledge with colleagues. KSE4: Most other employees cannot provide more valuable knowledge than I can.
Top management support (TMS)	TMS1: Top managers think that encouraging knowledge sharing with colleagues is beneficial. TMS2: Top managers always support and encourage employees to share their knowledge with colleagues. TMS3: Top managers provide most of the necessary help and resources to enable employees to share knowledge. TMS4: Top managers are keen to see that the employees are happy to share their knowledge with colleagues.
Organizational rewards (ORR)	ORR1: Sharing my knowledge with colleagues should be rewarded with a higher salary. ORR2: Sharing my knowledge with colleagues should be rewarded with a higher bonus. ORR3: Sharing my knowledge with colleagues should be rewarded with a promotion. ORR4: Sharing my knowledge with colleagues should be rewarded with an increased job security.
ICT use (ICT)	ICT1: Employees make extensive use of electronic storage (such as online databases and data warehousing) to access knowledge. ICT2: Employees use knowledge networks (such as groupware, intranet, virtual communities, etc.) to communicate with colleagues. ICT3: My company uses technology that allows employees to share knowledge with other persons inside the organization. ICT4: My company uses technology that allows employees to share knowledge with other persons outside the organization.
Knowledge sharing (KSC)	KSC1: I voluntarily share my know-how, information, and knowledge with other employees. KSC2: I cooperate or communicate with other employees in teams or groups for sharing information and knowledge. KSC3: I can freely access documents, information, and knowledge held by other divisions within the organization.
Innovation (INN)	INN1: My company has produced many novel and useful ideas (services/products). INN2: My company fosters an environment that is conducive to our own ability to produce novel and useful ideas (services/products). INN3: My company spends much time in producing novel and useful ideas. INN4: My company considers producing novel and useful ideas as being important activities. INN5: My company actively produces novel and useful ideas (services/products).
Firm performance (FPR)	FPR1: Compared to my key competitors over the last five years, innovation outcomes have had a very positive impact on the company's income statement. FPR2: Compared to my key competitors over the last five years, innovation outcomes have had a very positive impact on the company's competitive position. FPR3: Compared to my key competitors over the last five years, innovation outcomes have allowed the company to grow and improve its market share.

Moreover, in order to ensure a high response rate, a cover letter accompanied each questionnaire to respondents explaining the research objectives with the assurance of the confidentiality of the information they provided. Each cover letter was sent directly to the firms' employees, and they were asked to fill in

the survey. Also, in order to increase the response rate of the drop-and-collect surveys, they were distributed to the HR manager after providing a letter from the department of MIS at the University of Jordan. This letter offered a brief introduction to the research and its objectives, and requested permission to conduct the research. Indeed, 367 surveys were returned. However, whether the sample size is sufficient for the estimation of regression analysis is a debatable issue. While Hair et al. (1995) recommended that a feasible sample size should be between 100 and 200, in order to be adequate for the data analysis, Krejcie and Morgan (1970) who provided guidelines for sample size decision, required 346 for a population of 3500. Thus, 367 returned surveys indicate an adequate representation.

5. Data Analysis

Indeed, the total number of respondents was 367 employees, 61% were male and 39% females, most of them holding a bachelor degree, about 54% of them are of ages between 20-less than 30 years old, and about 34% between 30-less than 40 years old. The data also revealed that about 71% of them have experience up to 10 years. Also, in order to examine the research hypotheses, the current study employed Structural Equation Modeling (SEM) techniques with Analysis of Moment Structures (AMOS) 6 software for data analysis. SEM can be divided into two sub-models: a measurement model and a structural model. While the measurement model defines relationships between the observed and unobserved variables, the structural model identifies relationships among the unobserved/latent

variables by specifying which latent variables directly or indirectly influence changes in other latent variables in the model (Byrne, 2001). Furthermore, the structural equation modeling process consists of two components: validating the measurement model and fitting the structural model. While the former is accomplished through confirmatory factor analysis, the latter is accomplished by path analysis with latent variables (Kline, 2005).

Table 3 demonstrates different types of goodness of fit indices in assessing this study initial specified model. It displays that the research constructs fits the data according to the absolute, incremental, and parsimonious model fit measures, comprising chi-square per degree of freedom ratio (x^2/df), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Furthermore, the researchers examined the standardized regression weights for the research's indicators and found that some indicators had a low loading towards the latent variables. In particular (KSC3 = 0.480, INN3 = 0.421). Moreover, since both items did not meet the minimum recommended value of factor loadings of 0.50 (Newkirk and Lederer, 2006), and because the initial fit indices were fit the sample data, then they were removed and excluded from further analysis. Therefore, the measurement model was modified and showed a better fit to the data (as shown in Table 3). For instance, x^2/df and RMSEA did change for the final model, the IFI = 0.921, TLI = 0.907, and CFI = 0.920 indicated better fit to the data after removing the low factor loading items.

Table 3. Measurement Model Fit Indices

Model	x^2	df	p	x^2/df	IFI	TLI	CFI	RMSEA
Initial Estimation	1032.869	406	0.000	2.544	0.906	0.891	0.905	0.065
Final Model	856.118	349	0.000	2.453	0.921	0.907	0.920	0.063

5.1. Measurement Model

Once modifying the final measurement model for all constructs, the next phase is to evaluate them for unidimensionality, reliability, and validity. Indeed, the outcomes of the measurement model are presented in Table 4, encapsulates the standardized factor loadings, measures of reliabilities and validity for the final measurement model.

5.1.1. Unidimensionality

Unidimensionality states to the extent to which the study indicators form their latent variable. An examination of the unidimensionality of the research constructs is essential and an important prerequisite for establishing construct reliability and validity analysis (Chou et al., 2007). Also, in line with Byrne (2001), this research assessed

unidimensionality using the factor loading of items of their respected constructs. Table 4 shows solid evidence for the unidimensionality of all the constructs that specified in the measurement model. All loadings (except KSC3, and INN3) were above 0.50, the criterion value recommended by Newkirk and Lederer (2006). These loadings confirmed that 29 (out of 31) items were loaded satisfactory on their constructs.

5.1.2. Reliability

Reliability analysis is related to the assessment of the degree of consistency between multiple measurements of a variable, and could be measured by Cronbach alpha coefficient and composite reliability (Hair et al., 1998). Furthermore, some scholars (e.g. Bagozzi and Yi, 1988) suggested

that the values of all indicators or dimensional scales should be above the recommended value of 0.60. Table 4 indicates that all cronbach alpha values for the eight constructs exceeded the recommended value of 0.60 (Bagozzi and Yi, 1988) demonstrating that the instrument is reliable. Also, as shown in Table 4, composite reliability values ranged from 0.93 to 0.98,

and were all greater than the recommended value of more than 0.60 (Bagozzi and Yi, 1988) or greater than 0.70 as suggested by Holmes-Smith (2001). Consequently, according to the above two tests, all the research constructs in this study are considered reliable.

Table 4. Properties of the Final Measurement Model

Constructs and Indicators	Std. Loading	Std. Error	Square Multiple Correlation	Error Variance	Cronbach Alpha	Composite Reliability	AVE
Enjoyment in helping others					0.915	0.98	0.97
EHO1	0.880	0.040	0.774	0.020			
EHO2	0.918	0.039	0.843	0.015			
EHO3	0.825	0.044	0.681	0.023			
EHO4	0.799	0.045	0.638	0.025			
Knowledge self-efficacy					0.804	0.97	0.93
KSE1	0.766	0.075	0.586	0.029			
KSE2	0.754	0.071	0.568	0.028			
KSE3	0.749	0.072	0.561	0.029			
KSE4	0.601	0.084	0.361	0.049			
Top management support					0.900	0.98	0.95
TMS1	0.781	0.066	0.610	0.038			
TMS2	0.849	0.063	0.721	0.032			
TMS3	0.865	0.064	0.748	0.032			
TMS4	0.836	0.067	0.699	0.038			
Organizational rewards					0.864	0.98	0.92
ORR1	0.861	0.047	0.741	0.044			
ORR2	0.925	0.045	0.855	0.035			
ORR3	0.809	0.048	0.654	0.046			
ORR4	0.535	0.051	0.287	0.067			
ICT use					0.755	0.96	0.87
ICT1	0.524	0.074	0.275	0.064			
ICT2	0.659	0.075	0.435	0.054			
ICT3	0.793	0.087	0.629	0.057			
ICT4	0.694	0.081	0.481	0.077			
Knowledge sharing					0.631	0.93	0.88
KSC1	0.713	0.131	0.509	0.061			
KSC2	0.647	0.129	0.418	0.060			
Innovation					0.863	0.98	0.93
INN1	0.741	0.068	0.549	0.046			
INN2	0.834	0.067	0.696	0.036			
INN4	0.764	0.069	0.583	0.044			
INN5	0.797	0.072	0.635	0.047			
Firm performance					0.913	0.98	0.96
FPR1	0.831	0.042	0.691	0.033			
FPR2	0.927	0.040	0.860	0.022			
FPR3	0.896	0.038	0.803	0.026			

5.1.3. Content, Convergent, and Discriminant Validity

Although reliability is considered as a necessary condition of the test of goodness of the

measure used in research, it is not sufficient (Sekaran, 2003), thus validity is another condition used to measure the goodness of a measure. Validity refers to which an instrument measures is expected to measure or what the researcher wishes to measure (Blumberg, et al., 2005). Indeed, the items selected to measure the five antecedent variables (enjoyment in helping others, knowledge self-efficacy, top management support, organizational rewards, ICT use) besides the other variables (i.e. knowledge sharing capability, innovation, and firm performance) were validated and reused from previous researches. Therefore, the researchers relied upon in enhancing the validity of the scale was to benefit from a pre-used scale that is developed from other researchers. Also, the questionnaire items were reviewed by five instructors of the Business Faculty at the University of Jordan. The feedback from the chosen group for the pre-test contributed to enhanced content validity of the instrument. Moreover, in order to enhance the content validity of the instrument, four employees from the telecommunication industry were asked to give their feedback about the questionnaire, thus confirming that the knowledge presented in the content of each question was relevant to the studied topic.

In addition, as convergent validity test is necessary in the measurement model to determine if the indicators in a scale load together on a single construct; discriminant validity test is another main one to verify if the items that developed to measure

different constructs are certainly evaluating different constructs. As shown in Table 4, all items were significant and had loadings more than 0.50 on their underlying constructs. Moreover, the standard errors for the items ranged from 0.038 to 0.131 and all the item loadings were more than twice their standard error. Further, discriminant validity was considered using several tests. First, it could be examined in the measurement model by investigating the shared average variance extracted (AVE) by the latent constructs. Also, the correlations among the research constructs could be used to assess discriminant validity by examining if there is any extreme large correlations among them which imply that the model have a problem of discriminant validity. Also, if the AVE for each construct exceeds the square correlation between that construct and any other constructs then discriminant validity is occurred (Fronell and Larcker, 1981). As shown in Table 4, this study showed that the AVEs of all the constructs were above the suggested level of 0.50, implying that all the constructs that ranged from 0.87 to 0.97 were responsible for more than 50 percent of the variance in their respected measurement items, which met the recommendation that AVE values should be at least 0.50 for each construct (Bagozzi and Yi, 1988; Holmes- Smith, 2001). Moreover, as shown in Table 5, discriminant validity was confirmed as the AVE values were more than the squared correlations for each set of constructs. Thus, the measures significantly discriminate between the constructs.

Table 5. AVE and Square of Correlations between Constructs

Constructs	EHO	KSE	TMS	ORR	ICT	KSC	INN	FPR
Enjoyment in helping others (EHO)	0.97							
Knowledge self-efficacy (KSE)	0.63	0.93						
Top management support (TMS)	0.34	0.37	0.95					
Organizational rewards (ORR)	0.46	0.16	0.67	0.92				
ICT use (ICT)	0.29	0.36	0.44	0.15	0.87			
Knowledge sharing (KSC)	0.56	0.50	0.38	0.23	0.45	0.88		
Innovation (INN)	0.23	0.37	0.66	0.55	0.49	0.41	0.93	
Firm performance (FPR)	0.31	0.37	0.49	0.56	0.29	0.34	0.71	0.96

5.2. Structural Model

Following the two-phase SEM technique, the measurement model results were used to test the structural model, including paths representing the proposed associations among research constructs.

Furthermore, in order to examine the structural model it is essential to investigate the statistical significance of the standardized regression weights (i.e. t-value) of the research hypotheses (i.e. the path estimations) at 0.05 level (see Table 6); and the coefficient of

determination (R²) for the research endogenous variables as well. Indeed, the coefficient of determination for knowledge sharing capability, innovation, and firm performance were 0. 181, 0.193,

and 0.417 respectively, indicates that the model moderately accounts for the variation of the proposed model.

Table 6. Summary of Proposed Results for the Theoretical Model

Research Proposed Paths	Coefficient Value	t-value	p-value	Empirical Evidence
H1A: Enjoyment in helping others → Knowledge sharing capability	0.296	6.439	0.000	Supported
H1B: Knowledge self-efficacy → Knowledge sharing capability	0.100	1.835	0.067	Not supported
H1C: Top management support → Knowledge sharing capability	0.090	2.326	0.020	Supported
H1D: Organizational rewards → Knowledge sharing capability	0.125	3.380	0.000	Supported
H1E: ICT use → Knowledge sharing capability	0.192	4.364	0.000	Supported
H2: Knowledge sharing capability→ Firm performance	0.077	1.458	0.145	Not supported
H3: Knowledge sharing capability → Innovation	0.362	6.135	0.000	Supported
H4: Innovation → Firm performance	0.660	14.898	0.000	Supported

6. Discussion and Conclusion

This study aimed to evaluate the impact of knowledge sharing enablers in terms of enjoyment in helping others, knowledge self-efficacy, top management support, organizational rewards, and ICT use on knowledge sharing capability, and then on innovation and firm performance among employees of telecommunication firms in Jordan. The result of the structural equation modeling analysis for the first hypotheses set (i.e. there is a statistically significant impact of knowledge sharing enablers in terms of enjoyment in helping others, knowledge self-efficacy, top management support, organizational rewards, and ICT use on knowledge sharing capability) presented in Table (6), and provided acceptance of most of the hypotheses meaning that knowledge sharing capability was influenced by the dimensions of knowledge sharing enablers. Indeed, this research contributed to the literature by assuming that knowledge sharing capability is a function of knowledge sharing enablers. High levels of knowledge sharing enablers will guarantee high levels of knowledge sharing, where high levels of knowledge sharing enablers will also be related with high levels of enjoyment in helping others, top management support, organizational rewards, and ICT use. This study is consistent with what have been evidenced in the literature. This is to say that it has been found in previous studies that knowledge sharing enablers impact knowledge sharing capability. Consequently, hypotheses H1A, H1C, H1D, and H1E were supported. All in all, it is inferred that what have been found in this study are consistent with the literature. That is, knowledge sharing enablers impact empirically knowledge sharing capability.

Indeed, the results revealed that enjoyment in helping others found to be positively and significantly correlated with knowledge sharing capability. This supports the argument of Lin, (2007); Kumar and

Rose (2012); and Lavanya (2012), who argued that a mechanism for enjoyment efforts by and for employees is required in order to facilitate knowledge sharing. This is by focusing on improving the positive mood state of employees concerning social exchange. However, knowledge self-efficacy is found not to have an influential impact over knowledge sharing capability. Thus, not consistent with Kumar and Rose (2012) and Lavanya (2012), it is suggested that in order to ensure a sense of the competence and confidence of employees, which is required to engage in knowledge sharing, top management should pay attention to offer useful feedback to boost employee knowledge self-efficacy. For example, an extremely self-efficacious staff can be established being by recruiting and selecting employees; who are proactive and motivated, have high cognitive aptitude and self-esteem, and possess high interpersonal skills. The results also showed that there is a statistically significant relationship between organizational rewards and knowledge sharing capability which is consistent with the results of Kim and Lee (2006), and Kumar and Rose (2012) who agreed that knowledge sharing depends on individual characteristics, including experience, values, motivation, and beliefs. The researchers found that employees are motivated when they think that knowledge sharing behaviors will be worth the effort and able to help others. Therefore, the expectation of individual benefits can promote employees to share knowledge with colleagues. In addition, the findings also revealed that top management support had a significant impact on knowledge sharing capability. This finding is consistent with the discoveries of Lin (2007), Rivera-Vazquez et al. (2009), Kumar and Rose (2012), and Mueller (2012), which were that the support and encouragement made by the managers were found to be positively correlated with the degree of knowledge sharing in a firm. Also, this finding in line with

Mueller (2012) who reported that top management's trust in employees could facilitate knowledge sharing capability especially in a decentralized firm's structure. Further, Sharma et al. (2012) reported that top management's commitment and their understanding towards the concept of knowledge management play a major role as the main driver in the successful implementation of knowledge sharing. In addition, the results revealed that ICT use found to be positively and significantly correlated with knowledge sharing capability. This finding is line with Kim and Lee (2006), Lin (2007), Sa´enz et al. (2012), and Sharma et al. (2012), who argued that ICT can be effectively used to facilitate the codification, integration, and dissemination of organizational knowledge; and also on-line discussion forums, blogs, intranets and knowledge repositories, were found to be considered as facilitators of knowledge sharing capability.

Surprisingly, although great attention was made by several researchers (Choi and Lee, 2003; Keskin, 2005; and Wu et al. 2012) regarding the correlation between knowledge management capabilities and firm performance, there was no relationship between them, indicating that hypothesis 2 was not empirically supported. Indeed, the current research failed to show that firms experiencing high level knowledge sharing capability could impact their firm performance directly. Initially, the causal relationships between knowledge management capabilities and firm performance were found to be elusive and mixed due to the exclusion of some organizational factors such as IT-business partnership, and IT innovations (Chan and Reich, 2007). This is in line with Shannak et al. (2010), and Masa'deh (2013) who frankly declared that the lack of the significant relation between knowledge management investments and firm performance could be due to the fact that managers, business executives, and decision makers do not recognize the importance and value of such association. Thus, more research is needed to clarify and explain the lack of support of this hypothesis bearing in mind that the research field based on the country of Jordan, thus, cultural context could be occurring. However, hypotheses H3 and H4 were supported.

Indeed, hypothesis 3 and hypothesis 4 were supported in the structural model, underlying that employees should be aware that without improved knowledge sharing capability cannot effectively increase innovation capability. This is to confirm that the more the employees know and ensure a high degree of knowledge sharing existence; then the more they would engage in applying innovation initiatives. This hypothesis thus contributes and supports the arguments of Lin (2007), Kamasak and Bulutlar

(2010), and Kumar and Rose (2012). This is by confirming that employees who voluntarily share their know-how, information, and knowledge with other employees, and cooperate or communicate with other employees in teams or groups for sharing information and knowledge; would generate more innovations in terms of producing many novel and useful ideas, fostering an environment that is conductive to their own ability to produce novel and useful ideas, and spending much time in producing such novel and useful ideas. Also, in line with Sáenz et al. (2012), innovation capability found to be positively and significantly correlated with firm performance. Furthermore, once innovativeness is being practiced to generate competitive advantage, this directly impacted a firm's performance.

While this study has provided several valuable insights, the mixed empirical support for the hypotheses in this study has identified future research avenues. Indeed, although this study was conducted based on existing literature, each of the previous researches was done in a different country with different setting. Consequently, although this research contributes in enabling others to understand the impact of knowledge sharing enablers on knowledge sharing capability and performance in telecommunication firms in Jordan since limited efforts were done to study this topic in this particular industry and in this particular country, further research is needed with regards to several countries since this would help to advance understanding of the knowledge sharing capability issue and the conditions and outcomes of achieving it from different nationwide origins in different contexts. In addition, the impact of moderating variables was not examined in this study. Therefore, future studies may include some moderating variables such as organization's size; employees' gender, age, experience, and their educational level, in order to exam their moderating effects over knowledge sharing capability. Further, since organizational culture has been defined as the specific collection of values and norms that are shared by people and groups in an organization and that control the way they interact with each other and with stakeholders outside the organization (Al Azmi et al., 2012; Alkalha et al., 2012; Obeidat et al. 2012; Shannak, Obeidat, and Masa'deh, 2012); future studies may consider the impact of organizational culture on knowledge sharing capability.

Moreover, although the response rate of this study was sufficient for the condition of statistical analysis, the percentage of those who did not respond was still obvious. In other words, even though the research results could be representative, it is reasonable to be watchful in its generalization. Thus, to increase statistical validity, then further research

should consider higher response rates. Additionally, it might be possible that examining the main constructs in this study over a longer period yield more insights into the relations between the research variables on firm performance. Furthermore, since the value of R2 for innovation and firm performance were 19% and 41% respectively, further research is needed to test the applicability and impact of knowledge sharing enablers used in this study on another industry to assess and improve the generalizability of the findings. Therefore, future work might consider other knowledge sharing enablers and test their effect over knowledge sharing, innovation and firm performance.

All in all, from the industry practitioner's point view, this study hopes to be valuable to executives, managers, and employees in terms of their real relationships with each other, and to achieve the best practices for managing their know-how in the firms they work for. Top management also needs to recognize the mechanisms in which they may well transform their information preferences into operational decision making. Therefore, the present findings may provide useful and practical guidelines to managers to walk through their knowledge sharing decisions, and understand the resources and conditions needed to recognise the potential values of their knowledge sharing.

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