The Impact of Information Technology on Knowledge Management Practices

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Abstract

The purpose of the study was to investigate the influence of Technology Information (IT) on Knowledge Management Practices (KMP) in Jordanian Industrial Companies (JICs). Practical data were collected from 206 companies out of 1242 companies by means of a questionnaire. Cronbach's Alpha was used to test reliability, and multiple regressions analysis was employed to test hypotheses. The results of the study indicated that there was a positive significant relationship between information technology and knowledge management practices. Information technology and knowledge management practices are important source of organizations' wealth and therefore it should be taken into serious consideration when formulating the company's strategy. The results can provide the reference for further researches about the relationship between information technology and knowledge management practices.

Key Words: Information Technology (IT), Knowledge Management (KM), Knowledge Management Practices (KMP), Jordanian Industrial Companies (JICs).

1. Introduction

1.1 Introduction and Literature Review

Through the literatures review, we find different definitions for the concept of knowledge management. Fernandez et. al. (2004) defined knowledge management as "do what is necessary to get the maximum benefit from the sources of knowledge". Jashapara (2004) described knowledge management as an effective learning processes associated with the exploration and exploitation of human and knowledge sharing that use technology and appropriate environment to enhance performance and intellectual capital. While, Hester (2009) referred knowledge to information that has been processed, organized and restructured to be ready for use. Zhang (2008) divided knowledge management into two tracks: "IT-Track KM = Management of Information. People-Track KM = Management of People." In the IT track, the emphasis is on using software and the Internet to capture information in databases. In the people track, emphasis is on creating an environment that fosters innovation and the highest possible level of skill utilization.

Eppler and Mengis (2003) stated: The development of IT helped to increase the amount of information. Bawden and Robinson (2008) said: The new technology in the field of communications and information designed to facilitate quick access to information. Filippov and Lastrebov (2010) stated that information and communication technology have increased access to information and increase ability to produce it.

Almost all reviewed literatures indicated that there is a strong relationship between information technology and knowledge management, and between knowledge management and business performance. Song et. al. (2006) stated: The development of many technological applications enhanced organizational capacity and caused a massive influx of information and their use in organizations. Singh et. al. (2006) said that: information technology has a significant effect on knowledge management. Zhang (2008) stated that it has almost become a consensus that with the development of information and communication technologies, human society has evolved into a knowledge era.

While, Huang and Wang (2008) clarified that it's only due to the advances in information technology did people begin to feel the pressure of learning. Lopez et. al. (2009) said that the past two decades have seen growing interest in knowledge management and the use of information technologies. Lopez et. al. (2009) found that information technology competency has a direct effect on the processes of knowledge management: knowledge generation, knowledge transfer, and knowledge codification and storage.

Kasim (2010) stated information technology investment had a significant relationship in developing knowledge management. Whelan & Teigland (2010) concluded that technology caused the explosion of information, because of lower cost of multimedia technology, which simplified the process of access to information and helped to spread information. Furthermore, Safarzadeh, et. al. (2011) showed that there is a significant relation between information technology and knowledge management. Moreover, Paghaleh, et. al. (2011) indicated that information technology grants knowledge management two major abilities: the ability to disclose knowledge and the ability to create fast connections among knowledge channels. Finally, Fernandez et. al. (2004) found that organizing knowledge management has contributed to knowledge generation, which seeks to improve the organizations' performance. Kasim (2008) indicated that there is a strong relationship between knowledge management practices and organization's performance.

At the end, Banes (2011) stated that the challenge of knowledge management is to determine what information within an organization qualifies as "valuable." All information is not knowledge, and all knowledge is not valuable. The key is to find the worthwhile knowledge within a vast sea of information. Furthermore, Sebastian and Korrapati (2007) said: Ineffective or inappropriate information technology can result in incalculable losses through reduced information technology team productivity and substandard organizational output. Moreover, Albers (2012) stated that knowledge may be spread throughout the organization and not be available where it might best be put to use.

1.2 Study Problem and Questions

Previous studies have indicated that there is a strong relationship between information technology and knowledge management practices, at the same time; they indicated that there is a strong correlation between knowledge management practices and business performance. So this research is an attempt to investigate the effect of information technology on knowledge management practices. So, the study problem can be perceived by having detailed and scientific answers to the following questions:

1. Does Information Technology (Technology Type and Technical Capabilities) impact Knowledge Management Practices?
2. Does Technology Type impact Knowledge Management Practices?
3. Does Technical Capabilities impact Knowledge Management Practices?

1.3 Study Hypotheses

Based on the above-mentioned questions about the problem statement and its elements, and according to the study model the following hypotheses can be developed:

H0.1: Information Technology (Technology Type and Technical Capabilities) does not impact on Knowledge Management Practices, at ($\alpha \leq 0.05$).
H0.2: Technology Type does not impact on Knowledge Management Practices, at ($\alpha \leq 0.05$).
H0.3: Technical Capabilities does not impact on Knowledge Management Practices, at ($\alpha \leq 0.05$).

1.4 Study Purpose and Objective

This study investigates the effect of information technology on knowledge management practices. The main objective of this research is to provide sound recommendations about knowledge management practices within information technology context by identifying and defining the main attributes of knowledge management practices, i.e. to point out critical factors of knowledge management practices and find suitable management ways in that context.
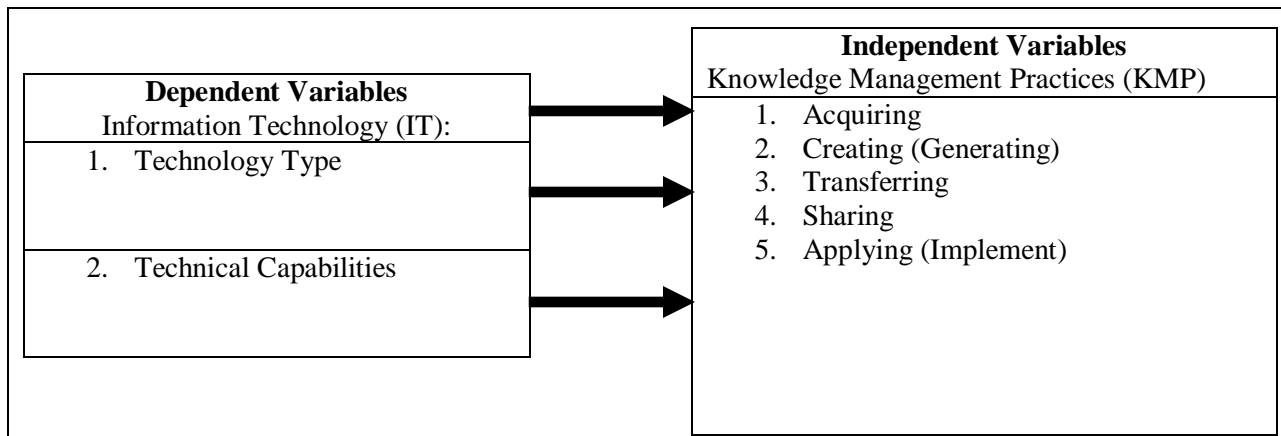
1.5 Study Importance and Scope

The current study presents the necessary components of knowledge management practices. It partially focuses on managerial norms, and partially on social norms. A better understanding of the effect of information technology on knowledge management practices draws conclusions that can be beneficial not only for Jordanian industrial companies but also to other organizations, institutions and policy makers. The content also may be of an interest to academic studies related to the reporting and decision making concerning knowledge management practices.

1.6 Research Model

In the light of the research problem elements and hypotheses, the researchers can draw the following model:

Model (1): Study Model

Dependent Variables Information Technology (IT): 1. Technology Type 2. Technical Capabilities	→	Independent Variables Knowledge Management Practices (KMP) 1. Acquiring 2. Creating (Generating) 3. Transferring 4. Sharing 5. Applying (Implement)

2. Methods and Procedures

2.1 Population and Sample: At the time of study, there were about 1242 Industrial Companies listed in Amman Stock Exchange Market. The research sample is selected by random sampling method which resulted in 373 companies (30%). The researchers received 206 out of 373 (55%) responses which used for analysis. Unit of Analysis: The survey unit of analysis is composed of all top (General Managers, General Manager Assistants, and General Manager Deputies) and middle managers (Main Section Managers Directors and Head of Departments) drawn from Jordanian industrial companies listed in Amman Stock Exchange Market.

2.2 The Questionnaire: The main tool for actualizing a research project is the questionnaire. Initial items to measure various constructs were developed depending on prior researches. Then the questionnaire was validated through expert interviews and a panel of judges. Independent Variables (Information Technology): Through literature review, the researchers have identified two important independent variables that contribute to knowledge management practices: Technology Type and Technical Capabilities. Independent variables are tested through 13 questions: 5 for Technology Type, and 8 for Technical Capabilities. Dependent variable (Knowledge Management Practices): Dependent variable of the study is related to knowledge management practices, and tested through 25 questions included: 5 questions for each component: acquiring, creating, transferring, sharing and applying knowledge. All variables were measured by five-point Likert-type scale to tap into the individual's perceptions, ranging from value 1 (strongly disagree) to value 5 (strongly agree) used throughout the questionnaire.

2.3 Validity: To confirm content validity (construct validity): Multiple sources of data (literature, expert interviews and panel of judges) were used to develop and refine the model and measures.

2.4 Reliability Test (Cronbach's Alpha): Almost all studies mentioned that Cronbach's Alpha coefficients above 0.6 are accepted (Sekaran, 2003). Table (1) shows that the Cronbach's alpha for the study were above 0.75, which registered acceptable.

Table (1): Cronbach's Alpha for Research Variables:

Variable	No. of Items	Alpha
Technology Type	5	0.812
Technical Capabilities	8	0.905
Knowledge Acquiring	5	0.799
Knowledge Creating	5	0.847
Knowledge Transferring	5	0.760
Knowledge Sharing	5	0.802
Knowledge Applying	5	0.830

3. Data Analysis, Discussion and Conclusion

3.1 Hypotheses Testing

Multiple Regressions

H$_{0-1}$: Information Technology (Technology Type and Technical Capabilities) does not impact Knowledge Management Practices, at (α≤0.05).

Table (2) result shows that this variable alone explained 38.2 percent of the variance, where (R^2=0.382, F=126.324, Sig.=0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the information technology affects knowledge management practices, at (α≤0.05). Beta β also supports the above result, which shows that the relationship between information technology and knowledge management practices is 58.1%, where (β=0.581, t=11.239, sig.≤0.05). The results also indicated that information technology can affect all knowledge management practices components, where R^2 between 0.248 and 0.361, and F= between 67.182 and 81.733, sig.=0.000. Beta (β) also indicated that there is strong relationship between information technology and each component of knowledge management practices, where β= (between 0.510 and 0.678), t= (between 8.196 and 10.739), at sig.=0.000.

Table (2): Results of Multiple Regressions Analysis: Regressing Information Technology against Knowledge Management Practices.

Independent Variable	R	R²	F	DF	Regressions Coefficient				
					Dependent	β	Stand. Error	t Calculated	Sig.
Acquiring	0.535	0.286	81.709	(204,1)	IT	0.572	0.063	9.039	0.000
Creating	0.601	0.361	115.331	(204,1)	IT	0.678	0.063	10.739	0.000
Transferring	0.535	0.286	81.733	(204,1)	IT	0.577	0.064	9.041	0.000
Sharing	0.498	0.248	67.182	(204,1)	IT	0.569	0.069	8.196	0.000
Applying	0.515	0.266	73.790	(204,1)	IT	0.510	0.059	8.590	0.000
KMP	0.618	0.382	126.324	(204,1)	IT	0.581	0.052	11.239	0.000

*sig. α<0.05
**sig. α<0.01

The table (3) shows that the information technology variables together have significant effect on knowledge management practices, where (R^2=0.383, F=63.088, Sig.=0.000).

H0.2: Technology Type does not impact Knowledge Management Practices, at (α≤0.05).

The table (3) shows that the relationship between technology type and knowledge management practices is moderate, where β=0.180, t=2.166, sig≤0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the Technology Type affects knowledge management practices, at (α≤0.05). It shows that technology type significantly affect knowledge management practices where (β=0.269, t=2.625, sig≤0.05), and knowledge applying, where (β=0.269, t=2.821, sig≤0.05). Whereas, the result shows that there is no significant effect of technology type on other components of knowledge management practices, where (sig>0.05).

H0.3: Technical Capabilities does not impact Knowledge Management Practices, at (α≤0.05).

The table (3) shows that the relationship between technical capabilities and knowledge management practices is strong where, (β=0.389, t=5.861, sig≤0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the technical capabilities affect knowledge management practices, at (α≤0.05). It shows that the technical capabilities significantly and positively affects all knowledge management practices components, where (β between 0.261 - 0.549, t (between 3.431 - 6.835, sig≤0.05).

Table (3): Results of Multiple Regressions Analysis: Regressing Information Technology Variables against Knowledge Management Practices.

Independent Variable	R	R²	F	DF	Sig.	Regressions Coefficient				
						Dependent	β	Stand. Error	t Calculated	Sig.
Acquiring	0.540	0.292	41.850	(203,2)	.000	Technology Type	.091	.079	.901	.368
						Technical Capabilities	.445	.480	5.495	.000
Creating	0.610	.3720	60.137	(203,2)	.000	Technology Type	.077	.101	.769	.443
						Technical Capabilities	.549	.080	6.835	.000
Transferring	0.536	0.287	40.825	(203,2)	.000	Technology Type	.269	.103	2.625	.009
						Technical Capabilities	.321	.082	3.916	.000
Sharing	0.498	0.248	33.464	(203,2)	.000	Technology Type	.193	.112	1.729	.085
						Technical Capabilities	.369	.089	4.136	.000
Applying	0.518	0.268	37.137	(203,2)	.000	Technology Type	.269	.095	2.821	.005
						Technical Capabilities	.261	.076	3.431	.001
KMP	0.619	0.383	63.088	(203,2)	.000	Technology Type	.180	.083	2.166	.031
						Technical Capabilities	.389	.066	5.861	.000

*sig. α<0.05
**sig. α<0.01

3.2 Conclusions

1. The research results showed that there is a strong relationship between information technology and knowledge management practices, Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the information technology affects knowledge management practices, at (α≤0.05). Beta (β) also indicated that there is strong relationship between information technology and each component of knowledge management practices. This result has been supported by Singh et. al. (2006), Lopez et. al. (2009), Kasim (2010), Safarzadeh, et. al. (2011), and Paghaleh, et. al. (2011).

2. The research results also found that there is a strong relationship between technology type and knowledge management practices. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the technology type affects knowledge management practices, at (α≤0.05). Also it showed that the relationship between technical capabilities and knowledge management practices is strong. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the technical capabilities affect knowledge management practices, at (α≤0.05).

3. The results indicated that technical capabilities affect the knowledge management practices more than technology type. It seems that the Jordanian industrial companies are concerned about ability to acquire an infrastructure which supports technical capabilities more than the technology type.

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