

Impact of Knowledge Management on Technological Innovation:

(A Field study in Islamic Jordanian Banks)

Khaled Mahmoud Al-Shawabkeh [1] & [2] Qasem Ibrahim Al.Sha'ar
[1+2] Business and Finance Faculty
The World Islamic Science and Education University (WISE)
P.O Box (1101), Postal Code (11947), Amman, Jordan.

* E-mail of the corresponding author: kaled_ high@yahoo.com

Abstract

Purpose – The purpose of this paper is to examine the impact of Knowledge Management (KM) on Technological Innovation. ***Design/methodology/approach*** – The paper develop a research model based on current literature and then tests this model in (3) Islamic Jordanian Banks. Statistics society consists of 55 persons from the higher and middle of management.
Findings – The Study revealed that KM had a significant effect at level (P≤ 0.05) on Technological Innovation in Islamic Jordanian Banks. ***Research limitations/implications*** – This study could benefit from a large sample, from banks. ***Practical implications*** – The paper offers suggestions to the banking industry and management in general on how KM processes effect on Technological Innovation.
Originality/value – This paper has tried to provide an inclusive understanding about the KM processes effect on Technological Innovation in the banking industry.

Keywords: Knowledge Management (KM), Technological Innovation, Islamic Jordanian Banks.

1. Introduction:

Today, the Banking Sector has become a fast-paced sector. Global competition, technological advancement, greater customer expectations, and shorter service life cycles, have increased the need for banking sector to create and deliver value to its stakeholders, particularly its customers.
Knowledge success factors are vital in diffusing knowledge from individuals to the entire organization which strengthens the organizational knowledge culture. In order to pace up the innovation process, organizations must implement the innovation determinants which are actually the cause of innovation. This study seeks to examine the ways in which KM is manifested across Islamic banking sector, with a view to determining more clearly the relationship between KM and innovation.

2. Research Objectives:

This study explores the impact of (KM) on Technological Innovation in Islamic Jordanian Banks. The question to address in this study therefore is (what is the impact of KM Technological Innovation in Islamic Jordanian Banks?).

3. Literature Review:

3.1. Technological Innovation:

Innovation as a main source of competitive advantage, has attracted considerable attention in academia and practice. In recent years, a wide range of effort has been made to examine the factors that affect Innovation in organization (Honarpour, Jusoh & Nor, 2012). Innovation plays a significant role in helping business to attain a sustainable competitive advantages (Ooi, Lin, Teh &Chong, 2012) The main reason for the importance of innovation is that it allows companies to react to changes quickly, to be able to find and exploit a new products and markets, and, lastly, to be protected from an unstable environment (Costa & Lorente, 2008).
Innovation is a process of transforming the new ideas, new knowledge into new products and service (Ramadani & Gerguri, 2011). Innovation is defined as "the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order (Ooi, Lin, Teh &Chong, 2012). Innovation is defined as 'the first or early use of an idea by one of a set of organisations with similar goal (Wu &Hsieh, 2011).

Technological Innovation defined as brand new products and processes in adopted technology and products or processes with significant technological improvement (Lai & Lin, 2012). Technological innovation is the application of idea related to applied sciences and it makes changes to the production process (Grulke & Silber, 2002). It focuses in technology-led changes and improvement which also resulting in technology-led outcomes (Seng, Yusof & Abidin, 2011).
Product innovations are outputs or services that are introduced for the benefit of customers or clients, while process innovations are tools, devices and knowledge in through- put technology that mediate between inputs and outputs (Ettlie, 1990). Additionally product innovations are usually aligned with a differentiation strategy, while process innovations aid the effective implementation of a low-cost strategy (Hung, Lien, Fang & McLean, 2010).

Product Innovation and Process Innovation as Types of Technological Innovation Innovation generally implies the adoption of an idea or behavior which is new for the organization (Tan & Nasurdi, 2010). Product innovation Activities including creation of new markets and (or) customers, and development of new product (service) or improvement of preexisting product (service) to raise market shar (Choi, Jang & Hyun, 2009).

Product innovation reflects the change in the end product or services for the benefit of the customer or clients (Seng, Yusof & Abidin, 2011). product innovation covers either physical or intangible products, and process innovation includes technological or organizational aspect (Ooi, Lin, Teh & Chong, 2012)

3.2. Knowledge management:
Knowledge management processes can be thought of as a structured coordination for managing knowledge effectively. Knowledge management processes are broad processes that help in discovering, capturing, sharing, and applying knowledge. Knowledge discovery may be defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge. Knowledge capture is the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities. Knowledge sharing is the process through which explicit or tacit knowledge is communicated to other individuals. Knowledge application is the process through which some individuals utilize knowledge possessed by other individuals without actually acquiring, or learning, that knowledge.(Tissayakorn, Akagi, & Song, 2013, 616)
Knowledge management is the planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed. Knowledge-related assets include knowledge in the form of printed documents such as patents and manuals, knowledge stored in electronic repositories such as a "best-practices" database, employees' knowledge about the best way to do their jobs, knowledge that is held by teams who have been working on focused problems and knowledge that is embedded in the organization's products, processes and relationships.
The processes of KM involve knowledge acquisition, creation, refinement, storage, transfer, sharing, and utilization. The KM function in the organization operates these processes, develops methodologies and systems to support them, and motivates people to participate in them.
Although individuals certainly can personally perform each of the KM processes, KM is largely an organizational activity that focuses on what managers can do to enable KM's goals to be achieved, how they can motivate individuals to participate in achieving them and how they can create social processes that will facilitate KM success. (King, 2009).
Messa and Testa (2004) stated that organizations must develop the receptors that gain or absorb the external knowledge and this activity is strongly correlated to the innovation capability. Further, they said that through the benchmarking, organizations can acquire explicit and tacit knowledge from external sources. These external sources of knowledge can be integrated with the organizational internal explicit and tacit knowledge and if knowledge gap prevails that can be filled through the new knowledge acquisition which will helpful to bring innovation.
Ju et..al., (2006) argued that in order to get competitive advantage organizations should continuously learn from outside sources. Through the proper knowledge distribution and sharing, organizations can bring the innovation. So, organizations must develop such channels within the organizations through which employees share their knowledge with one another. Plessis (2007) stated that innovation depends upon knowledge. So, to bring innovation, organizations must identify knowledge capability, and richness.
Majchrazk, Cooper and Neece (2004) developed an approach to reuse the knowledge for innovation by making better understanding of knowledge reuse process when innovation is expected. They pointed out the problems and approach, including decide to search for other's ideas to reuse, search and evaluate other's ideas to reuse and developed ideas to find out the performance gap which could fill by the using other's knowledge.
Marina du Plessis (2007) characteristics and features of knowledge management in the innovation process is expressed as follows:

1- Knowledge management provides unique integrated structure for knowledge base.
2- Knowledge management guarantees flow and smooth knowledge used in innovation.
3- Knowledge management provides policies, tools and processes to ensure integration organizational knowledge base.
4- Knowledge management help to identify gaps in the knowledge base and provide processes for fill these gaps to help innovation.
5- Knowledge management has participate in create qualifications and competencies required in the innovation process.
6- Knowledge management provides organizational framework for establishment a set knowledge in organization.

4. Proposed Research Model & Hypotheses:
The study developed a conceptual framework that consists of two parts which simulate the study model as shown in figure (1). The first part of the model represents the Knowledge Management processes, while the second part represents on Technological Innovation.

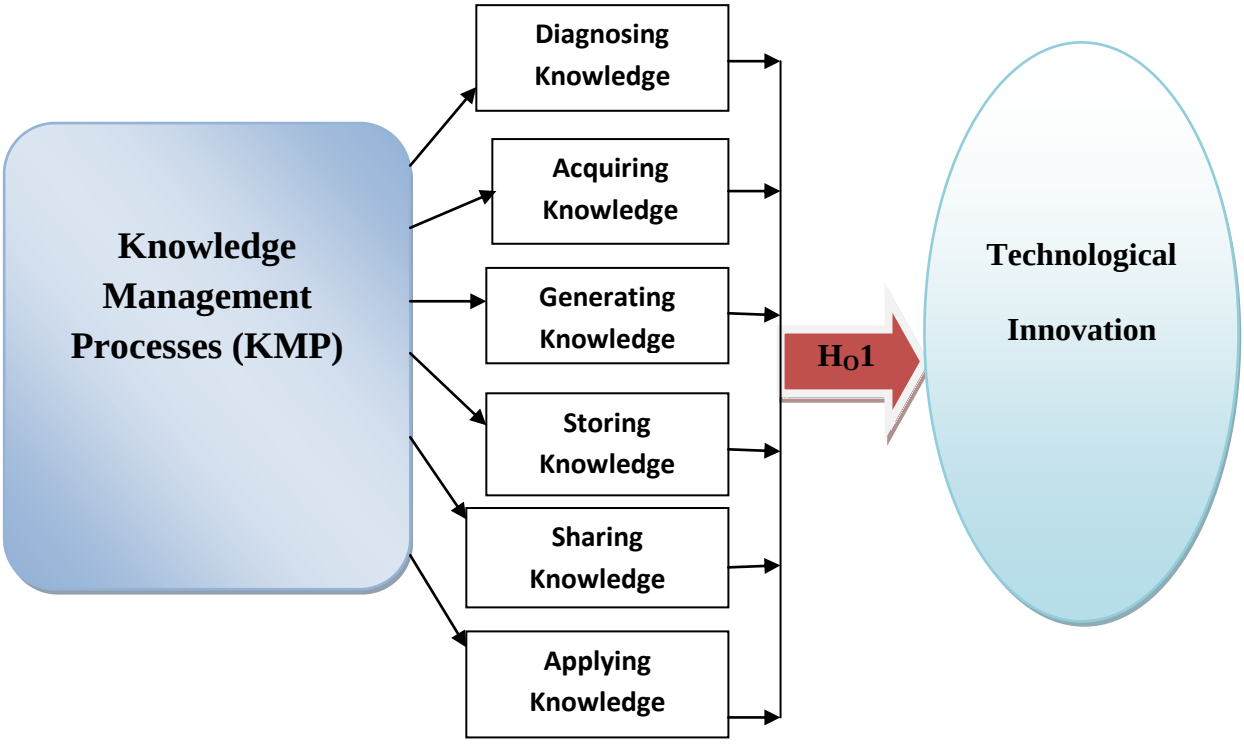

Figure 1. Model of the study

H_o1: There is no significant impact of Knowledge Management Processes on Technological Innovation in Islamic Jordanian Banks.

H_o1.1: There is no significant impact of Diagnosing knowledge on Technological Innovation in Islamic Jordanian Banks.

H_o1.2: There is no significant impact of Acquiring knowledge on Technological Innovation in Islamic Jordanian Banks.

H_o1.3: There is no significant impact of Generating knowledge on Technological Innovation in Islamic Jordanian Banks.

H_o1.4: There is no significant impact of Storing knowledge on Technological Innovation in Islamic Jordanian Banks.

H_O1.5: There is no significant impact of sharing knowledge on Technological Innovation in Islamic Jordanian Banks.

H_O1.6: There is no significant impact of Applying knowledge on Technological Innovation in Islamic Jordanian Banks.

5. Methodology:

5.1 Purpose:

This study is designed to investigate the impact of Knowledge management processes on Technological Innovation in Islamic Jordanian Banks. The results of this study should help Islamic Jordanian Banks managers determine the importance of KM in enhancing Technological Innovation.

5.2. Populations and the study sample:

The target population of the study comprised of all Managers at high and middle level in Islamic Jordanian Banks. Indicated total number of (3) banks (Islamic International Arab Bank, Jordan Islamic Bank, and Dubai Islamic Bank). A simple random sampling of (3) bank was choosen. (65) Questionnaires were distributed (60) surveys were included in the analysis.

5.3. Unit of analysis: All Managers at high and middle level in Islamic Jordanian Banks.

5.4 Study Instrument:

A questionnaire was used to collect the data. It included closed questions and was organized into three sections. Section one consisted of 5 questions concerning responder demographics. Section two focused on information about usage of KM Processes. Section three focused on Technological Innovation.

5.5 Validity and Reliability:

To ensure the validity of the instrument tool, the questionnaire was given to seven expert reviewers from Jordanian Universities. The reviewers displayed their constructive comments and suggestions, which were taken into consideration. However, the reliability test was conducted to Cronbach alpha correlation in each of the variables in the questionnaire. Cronbach alpha for Independent Variable = (0.707), while for dependent Variable = (0.795).

6. Analysis and Results:

The following tools were used to test the hypothesis: frequencies, means, percentages and standard deviation were used as descriptive analysis to meet the study questions, while simple regression (enter) was used to test the main hypothesis and its sub- hypotheses.

$H_0$1: There is no significant impact of Knowledge Management Processes on Technological Innovation in Islamic Jordanian Banks.

Table 1. Simple regression (enter) of KMP on Technological Innovation:

Coefficients				**ANOVA/Analysis of variance**			**Model summary**	
sig	t	beta		Sig	F	DF	**R^2**	R
.0000	14.897	0.789	KMP	0.000	124.811	1	0.630	.789

The value of R2 for KMP model is (0.63) and (f= 124.811, P= 000) which explain (63%) of variance in Technological Innovation. Therefore, KMP was found to have a significant and positive effect on Technological Innovation, the regression coefficient for KMP (β =0.789, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of KMP on Technological Innovation in Islamic Jordanian Banks at level of ($P \leq 0.05$).

H_O1.1: There is no significant impact of Diagnosing Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 2. Simple regression (enter) of Diagnosing Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	T	beta		Sig	F	DF	r^2	r
0.000	13.528	0.606	Diagnosing Knowledge	0.000	172.889	1	0.512	0.606

The value of r2 for Diagnosing Knowledge model is (0.512) and (f= 172.889, P= 000) which explain (51.2%) of variance in Technological Innovation. Therefore, Diagnosing Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Diagnosing Knowledge (β =0.606, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Diagnosing Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).

H_O1.2: There is no significant impact of Acquiring Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 3. Simple regression (enter) of Acquiring Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	t	beta		Sig	F	DF	r^2	r
0.000	9.558	0.617	Acquiring Knowledge	0.000	107.103	1	0.606	0.617

The value of r2 for Acquiring Knowledge model is (0.606) and (f= 107.103, P= 000) which explain (60.6%) of variance in Technological Innovation. Therefore, Acquiring Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Acquiring Knowledge (β =0.617, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Acquiring Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).

H_O1.3: There is no significant impact of generating Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 4. Simple regression (enter) of Generating Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	t	beta		Sig	F	DF	r^2	r
0.000	9.447	0.509	Generating Knowledge	0.000	107.897	1	0.555	0.559

The value of r2 for Generating Knowledge model is (0.555) and (f= 107.897, P= 000) which explain (55.5%) of variance in Technological Innovation. Therefore, Generating Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Generating Knowledge (β =0.509, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Generating Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).

H_O1.4: There is no significant impact of Storing Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 5. Simple regression (enter) of Storing Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	t	beta		Sig	F	DF	r^2	r
0.000	9.578	0.574	Storing Knowledge	0.000	111.114	1	0.466	0.574

The value of r2 for Storing Knowledge model is (0.466) and (f= 111.114, P= 000) which explain (46.6%) of variance in Technological Innovation. Therefore, Storing Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Storing Knowledge (β =0.574, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Storing Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).
There is no significant impact of Storing Knowledge on Technological Innovation in Islamic Jordanian Banks.

H_O1.5: There is no significant impact of Sharing Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 6. Simple regression (enter) of Sharing Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	t	beta		Sig	F	DF	r^2	r
0.000	9.447	0.625	Sharing Knowledge	0.000	98.857	1	0.393	0.625

The value of r2 for Sharing Knowledge model is (0.393) and (f= 98.857, P= 000) which explain (39.3%) of variance in Technological Innovation. Therefore, Sharing Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Sharing Knowledge (β =0.625, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Sharing Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).
H_O1.6: There is no significant impact of Applying Knowledge on Technological Innovation in Islamic Jordanian Banks.

Table 7. Simple regression (enter) of Applying Knowledge on Technological Innovation.

Coefficients				ANOVA/Analysis of variance			Model summary	
sig	t	beta		Sig	F	DF	r^2	r
0.000	9.433	0.685	Applying Knowledge	0.000	111.241	1	0.397	0.685

The value of r2 for Applying Knowledge model is (0.397) and (f= 111.241, P= 000) which explain (39.7%) of variance in Technological Innovation. Therefore, Applying Knowledge was found to have a significant and positive effect on Technological Innovation, the regression coefficient for Applying Knowledge (β =0.685, P= 000). Based on the result we can't accept the null hypothesis and accept the research hypothesis that indicates a significant impact of Applying Knowledge on Technological Innovation in Islamic Jordanian Banks at level of (P≤ 0.05).

7. Conclusions:

This study investigated the apparent impact of KM Processes on Technological Innovation in Islamic Jordanian Banks. The analysis of research results showed the overall consistency of findings with the model. This study makes a key contribution to the literature.

The study found a statistically significant impact at level (P≤ 0.05) of (Diagnosing knowledge, Acquiring Knowledge, Generating Knowledge, Storing Knowledge, Sharing Knowledge, and Applying Knowledge) on Technological Innovation in Islamic Jordanian Banks. The study found a statistically significant impact at level (P≤ 0.05) of KMP on Technological Innovation in Islamic Jordanian Banks.

References:

Choi, Seokin, Jang, Hyounseung, & Hyun, Joonsik (2009). Correlation between innovation and performance of construction firms. ***Journal NRC Research Press***, (36), 1722 - 1731.

Costa, Micaela, & Lorente, Angel (2008). Does quality management foster or hinder innovation? An empirical study of Spanish companies. ***Journal Total Quality Management***, 19(3), 209 - 221.

Honarpour, Amir, Jusoh, Ahmad & Nor, Khalil (2012). Knowledge Management, Total Quality Management and Innovation: A New Look. Journal of Technology Management & Innovation, 7(3), 22 – 33.

Hung, Richard, Lien, Bella, Fang, Shih-chieh, & Mclean, Gary (2010). Knowledge as a facilitator for enhancing innovation performance through total quality management. ***Total Quality Management***, 21(4), 425 - 438.

Ju, T.L., Li, C.Y. and Lee, T.S. (2006), A Contingency Model for Knowledge Management Capability and Innovation, ***Industrial Management and Data System***. 106(6), 855-877.

King, W. R. (2009). Playing an integral role in Knowledge Management, ***Information Systems Management***, 17, 1-3.

Lai, Yung-Lung & Lin, Feng-Jyh (2012). The Effects of Knowledge Management and Technology Innovation on New Product Development Performance -An Empirical Study of Taiwanese Machine Tools Industry. ***Journal Business Innovation and Technology Management***, 40, 157 – 164.

Majchrzak, A., Cooper, L.P. and Neece., O.E. (2004), Knowledge Reuse for Innovation, ***Journal of Knowledge Management Sciences***, 55 (2), 174-188.

Messa, S. and Testa, S. (2004), Innovation or Imitation? Benchmarking: A Knowledge Management Process to Innovate Services, ***Benchmarking: An International Journal***, 11 (6), 610-620.

Ooi, Keng-Boon, Lin, Binshan, Teh, Pei-Lee, & Chong, Alain (2012). Does TQM support innovation performance in malaysia manufacturing industry. ***Journal of Business Economics and Management.*** 13(2), 366 - 396.

Ramadani, Veland, & Gerguri, Shqipe (2011). Theoretical framework of innovation and competitiveness and innovation program in Macedonia. ***European Journal of Social Sciences***, 23(2), 268 - 276.

Seng, Laikong, Yusof, Noraini, & Abidin, Nazirah (2011). Types of innovation implemented by housing developers in developing country. ***International Journal Of Academic Research***, 3(3), 614 - 618.

Tan, Cheng Ling & Nasurdin, Aizzat Mohd (2010). Knowledge Management Effectiveness and Technological Innovation: An Empirical Study in the Malaysian Manufacturing Industry. ***Journal of Mobile Technologies, Knowledge and Society***, 20(34), 2 13.

Tissayakorn, Akagi & Song (2013). A Model of Organization Knowledge Management Maturity. ***International Journal of Bioscience, Biochemistry and Bioinformatics***, 3(6).

Wu, Ing-Long & Hsieh, Pi-Jung (2011). Understanding hospital innovation enabled customer-perceived quality of structure, process, and outcome care. ***Total Quality Management***, 22(2), 227 – 244.