



The Impact of Knowledge Management Processes on Operational Performance as Mediated by IT Agility

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ABSTRACT

In this study the main goal is to investigate the impact of knowledge management processes (KMPs) on operational performance (OP) as mediated by IT agility (ITA). The data were collected using a questionnaire, as the instrument for the primary data collection, with total collected back responses of 314 from university lecturers and employees have actually participated. Partial least squares regression modeling technique was used to fully analyze the data in order to determine what level of the relationship between KMPs and OP as mediated by IT agility existed. The main findings were related to confirming the four main hypotheses of the research that were related to testing if there were relationships between the KMPs (represented by four surrogate measures, namely, knowledge creation, knowledge storage, knowledge sharing and knowledge application) and OP, as well as if the KMPs was related to the OP as mediated by IT agility.

Keywords: Knowledge Management, Mu'tah University, Operational Performance, Technology, IT Agility, Partial Least Squares Analysis

JEL Classifications: D83, M1

1. INTRODUCTION

The knowledge management (KM) phenomenon has a strategic importance in developing unique capacities of organization and in providing them with sustainable competitive advantage (Shannak, 2010). KM processes (KMPs) is getting more importance as a subject researching due to the potential role of KMPs in contributing to the success of organizations in general and educational institutes in particular.

KM also assists in achieving organizational goals by allowing know-how and expertise to be easily shared and accessed (Mishra and Bhaskar, 2011) as well as promoting the use of available sources of information, skills and experience (López-Nicolás and Meroño-Cerdán, 2011).

Several researchers pointed to three main processes of KM, acquisition, sharing and application (e.g., Lin et al., 2012; Liao

et al., 2011; Singh and Soltani, 2010; Zheng et al., 2010; Alavi and Leidner, 2001). The first process in most KM models is knowledge acquisition through which the organization obtains knowledge from both internal and external sources (Dahiyat and Al-Zu'bi, 2012).

The second process is knowledge sharing, which is related to the transformation or throughput phase that includes disseminating, storing, codifying, and documenting knowledge (Wong and Aspinwall, 2005). The third process is knowledge application, which is considered as the output aspect of KM, knowledge application defined as "the business processes through which effective storage and retrieval mechanisms enable a firm to access knowledge easily" (Lin et al., 2006) Since the operations function plays a strategic role in building and sustaining competitiveness, manufacturing companies need to formulate operations strategies in a way that helps to implement their own corporate competitive

strategies (Al-Sa'di et al., 2017). Manufacturing competitive priorities are the ways in which an organization has the opportunity not only to choose to compete in the marketplace, but also to choose the type of markets it pursues (Mady, 2008).

As well as, operational performance (OP) is a predictor of the effectiveness and efficiency of organizations and reflects the proficiency with which knowledge resources are managed and utilized for facilitating organizational process and achieving organizational goals and objectives as part of the business strategy.

OP is usually measured as a set of several dimensions that reflect the internal operations of an organization in terms of the elements of product, process quality, efficiency, and productivity. In some studies, OP was measured through productivity, effectiveness and efficiency of internal operations (e.g., Abdallah et al., 2014).

Furthermore IT agility is considered as one of the important organizational capability which help of an organization to adapt IT capabilities in the actual changes.

Generically interpret IT agility as the ability to respond to changes in the external environment through appropriate internal adjustments, they implicitly refer to one (or more) of two evaluation criteria to gauge whether a firm possesses this ability. They consider either the extent to which an organization can respond to changes in the external environment - its range of agility - or to the time required to execute this response. agility, as a dynamic capability, reflects an ability to detect and seize competitive opportunities with speed and surprise.

This study is aimed to investigate the impact of KMPs on OP as mediated by IT agility.

The main purpose of this research is to investigate the impact of KMPs on OP as mediated by IT agility.

In addition, the research seeks to achieve the following:

1. Investigate the direct impact of KMPs on OP.
2. Investigate the direct impact of KMPs on IT agility.
3. Provide recommendations to decision makers that will help them about the research topics.

This paper focuses on investigating that the university should apply their KMPs and use knowledge in optimal way for, from and about employees to enhance OP and as well as improve university OP.

2. PROBLEM STATEMENT

KMPs refer to the various knowledge-related activities which embrace knowledge acquisition, creation and generation, utilization and application, storing and updating, sharing and transferring, and protection.

In our study, the major challenges of KM is failure to form and develop a culture that embraces learning and use the IT, sharing, changing and improving of knowledge in an organization to enhance the OP.

According to review of previous researches and literatures there is a lack in studying IT agility in spite of its role in achieve OP and competitive advantage.

The existed gap in our opinion is that the organizational success in sophisticated business environments increasingly needs for IT agility as an important components. However, organizations lack a comprehensive understanding of how IT agility is used in organizations and how to leverage it to improve performance.

Competition between organizations, and globalization and rapid changes, have led organization to use all possibility tools, strategies, and policies that improve OP to achieve the organizational goals.

Agility as one of these strategies refers to a firm's ability to capture the opportunities for competitive action and marshal the necessary resources to positively influences on the OP, entrepreneurial and adaptive agility.

To sum up this research will answer the following main question:

Q. What is the impact of KMP on OP as mediated by IT agility?

3. LITERATURE REVIEW

3.1. KMP

KMPs was represented by its fourth constituting components, namely, knowledge creation, knowledge storage, knowledge sharing and knowledge application. The focus of the study has been on Mu'tah university lecturers and employees. The paper takes its conceptual starting point in the three approaches: KMPs and OP as mediated by IT agility. Subsequent sections develop the hypotheses, and this is followed by a presentation of methods and testing issues using the modeling (partial least squares [PLS]) technique.

KM is a management tool characterized by a set of principles along with a series of practices and techniques through which the principles are introduced, the aim of which is to create, convert, disseminate and utilize knowledge, (Obeidat et al., 2016).

KM could be viewed as a work process, an activity, a technology infrastructure or an operational culture to manage valuable corporate assets and knowledge (Chong et al., 2000; Pauleen et al., 2007). Kör and Maden, (2013. p. 2) defined KM as "business process which relates to creating new knowledge and ensuring usage of knowledge within organization whenever it is necessary." KM has been assuming increased importance due to its role in reducing production cycle time and enhancing operating efficiency (Mishra and Bhaskar, 2011; Abdallah, 2014). Moreover, KM enables organizations to shorten their product development time, enhance employee productivity and performance, improve product quality and customer service, modernize and reengineer business processes, provide innovative products and services, and increase flexibility (Abdallah et al., 2009; Dahiyat and Al-Zu'bi, 2012; Slavković and Babić, 2013).

KM also assists in achieving organizational goals by allowing know-how and expertise to be easily shared and accessed (Mishra

and Bhaskar, 2011) as well as promoting the use of available sources of information, skills and experience (López-Nicolás and Meroño-Cerdán, 2011). KM plays a significant role in facilitating an important process in organizations, namely, learning process. For example, effective KM could increase the amount of knowledge required for organizational members and facilitate the rapid diffusion of knowledge within the organization. Alavi and Leidner (2001) indicated that there is an agreement to treat KM as a group of processes that allow using knowledge as a key factor to add and generate value. There is generally a lack of agreement on the actual components or phases of KM.

3.2. KM Depends on Two Broad Aspects

KM solutions, refer to the ways in which specific aspects of KM (discovery, capture, sharing, and application of knowledge) can be accomplished. KM solutions include KM processes and KM systems. KM foundations, are the broad organizational aspects that support KM in the short- and long-term. They include KM infrastructure, KM mechanisms, and KM technologies as shown in Figure 1.

Sabherwal, R.A.J.I. and Becerra-Fernandez, I. (2010), *KM Systems and Processes*. New York: ME Sharpe.

The explain of the three components of KM foundations and the two components of KM solutions. KM infrastructure reflects the long-term foundation for KM, includes five major components: Organization culture, organization structure, information technology infrastructure, common knowledge, and physical environment. KM technologies are information technologies that

can be used to facilitate KM. Also support KM systems and benefit from the KM infrastructure.

KM mechanisms are organizational or structural means used to promote KM. KM mechanisms and technologies are used in KM systems, with each KM system utilizing a combination of multiple mechanisms and multiple technologies. KM systems enable KM processes, with a KM system focusing on one specific KM process. Therefore, KM processes and KM systems are specific solutions for KM needs whereas KM infrastructure, mechanisms, and technologies are broader support multiple KM solutions, and the KM infrastructure supports all KM solutions.

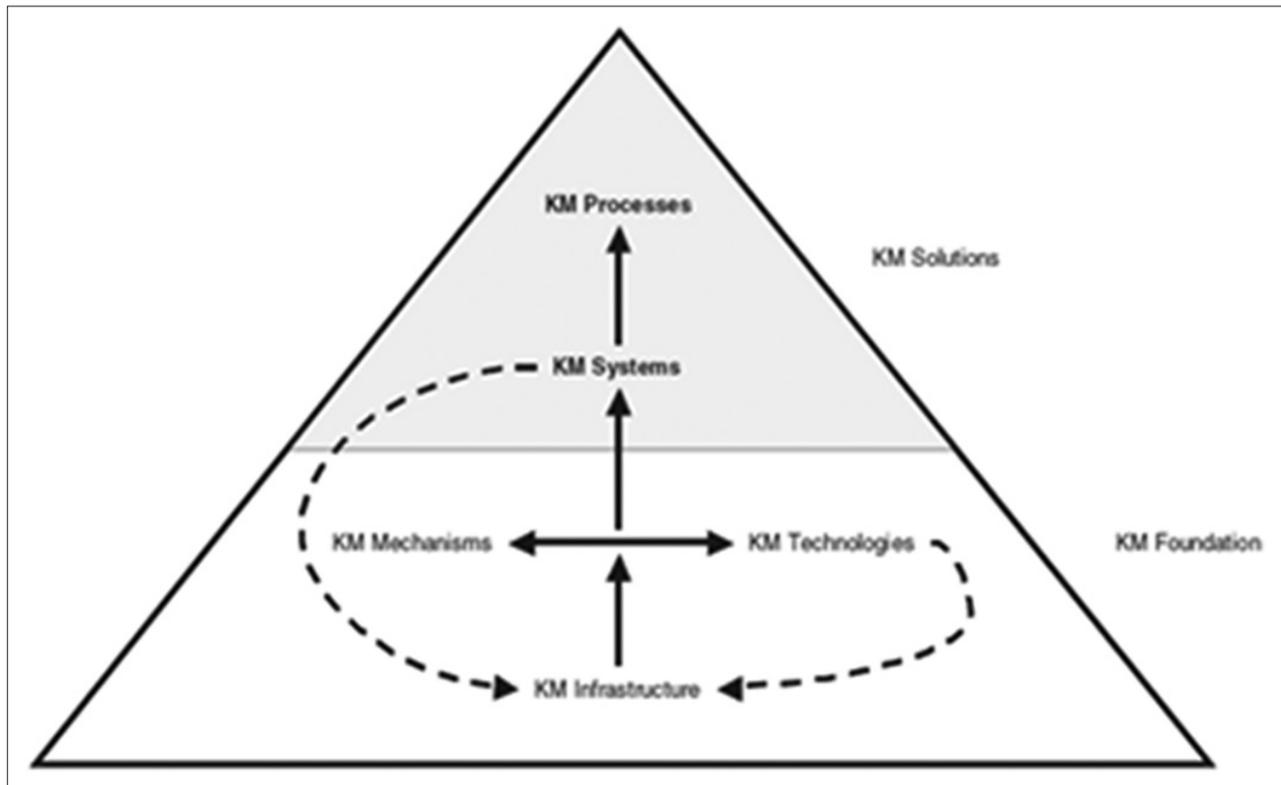
So, KM is a combination of several processes and systems integrated with each other, which ultimately contribute to enhancing the role of knowledge in modern organizations and to achieve and encourage innovation in all forms and thus improve the performance of the organization and its capabilities.

3.2. OP

OP can be defined as “the output or result achieved due to unique operational capabilities” (Tan et al., 2007, p. 5137). Manikas and Terry (2010) argued that OP can be considered as either internal performance or process performance.

Flynn et al. (2010) referred to OP as the improvements in response of an organization to a changing competitive environment. According to Ketokivi and Schroeder (2003), OP is usually measured as a set of several dimensions that reflect the internal operations of an organization in terms of the elements of product,

Figure 1: An overview of knowledge management solutions and foundation



process quality, efficiency, and productivity. In some studies, OP was measured through productivity, effectiveness and efficiency of internal operations (e.g., Abdallah et al., 2014). However, the most widely used measures of OP in the literature are cost, quality, delivery, and flexibility (Abdallah et al., 2016; Al-Abdallah et al., 2014; Ortega et al., 2012; Phan et al., 2011; Flynn et al., 2010; Abdallah and Matsui, 2009). Our approach is to follow such widely used measures of OP using cost, quality, delivery, and flexibility.

Masa'deh et al. (2015) argued that KMPR, particularly knowledge sharing, have been well thought-out as a major practice for all organizations, public and private. In addition, the ways in which such organizations deal and value the richness of their knowledge sharing capabilities which in turn affect their performance are required. Therefore, the researchers suggested a theoretical model by which both transformational and transactional leadership styles influence employees' knowledge sharing practices, and the effect of the latter on JP, and then on firm performance.

Obeidat et al. (2014) investigated the relationship between HR management practices and organizational commitment, and their relationship with KMPR on the other hand. In total, 220 questionnaires were distributed to consultancy firms operating in Jordan. The research that HR practices (recruitment methods, training and development, performance appraisals and reward systems) have a significant influence on organizational commitment (affective commitment, continuance commitment and normative commitment). However, the study did not find a direct relationship between HR practices and KMPR (knowledge acquisition, knowledge distribution, knowledge interpretation and organizational memory). However, more research is needed to consider the specific role of KM processes on business performance.

Masa'deh et al. (2013) focused on knowledge sharing capability which has been labeled as one of the most important segments in the field of KM. The researchers investigated the impact of knowledge sharing enablers on knowledge sharing capability, and firm performance mediated by innovation capability. By applying SEM analysis, the study found that knowledge sharing enablers (i.e., enjoyment in helping others, top management support, organizational rewards and ICT use) had significant influence on employees' knowledge sharing capability; while knowledge self-efficacy did not. Further, the study did not find a direct relationship between knowledge sharing capability and firm performance; whereas causal links were founded between knowledge sharing capability and innovation capability; and innovation capability and firm performance.

3.3. IT Agility

IT competencies are vital for firms to sense and appropriately respond to business opportunities and challenges. However, the volume of information that needs to be processed to understand the intricacies of opportunities and challenges really demands that IT competencies help organize data. In particular, IT-based statistical tools are required to analyze, interpret, and predict how various opportunities and challenges might affect the firm and its competition. Moreover, IT-based communication tools can

organize external information exchanges to support coordinated actions in the face of opportunities and challenges. By enabling real-time feedback from customers, IT-based social media tools offer filtering capabilities that organize customer opinions, leading to better anticipation of changes in market needs. Wixom and Watson (2001) emphasize that IT-based decision support systems and data warehouses help firms monitor data in real time, recognize patterns, and simulate strategic scenarios. Overall, IT competencies enable firms to sense and interpret business opportunities and challenges.

Yet IT competencies also enable firms to respond to opportunities and challenges, whether those responses are proactive or reactive in nature. Proactive responses, which lead to entrepreneurial agility, involve the ability to organize business processes to seize potential opportunities. Several aspects of IT infrastructure (e.g., IT planning capabilities) and IT skills (e.g., IT human resources) help firms foresee a wide range of IT-enabled scenarios and rapidly respond to opportunities, both of which are aspects of entrepreneurial agility. For example, [vertmarkets.com](http://www.vertmarkets.com) proactively built a sense of community in its marketplace by regularly creating and updating downloadable libraries of white papers, electronically disseminating libraries to market participants, and organizing industry event calendars (e.g., www.vertmarkets.com, accessed March, 2009).

Knowledge is the core competence required to face business challenges of firms. Therefore, companies should not only acquire critical knowledge from both the external market and from their own internal organizations (Lee and Sukoco, 2007), but should also effectively and efficiently manage the knowledge stored within both the organization and individuals in order to enable the firm to generate, communicate, and leverage its intellectual properties (Gao et al., 2008). In other words, firms should equip the ability to accumulate critical knowledge resources and manage their assimilation and exploitation (Miranda et al., 2011).

In the presence of hypercompetitive, complex, uncertain and rapidly changing environment, KM becomes one of the most interesting and important concepts in management. Previous research studies (Andreeva and Kianto, 2011; Shannak et al., 2010; Obeidat et al., 2014) showed that knowledge's importance as part of the organizational assets is increasing, as it has a positive effect on gaining competitive advantage and improving innovation that lead the organization to a superior performance.

From our point of view, KM can be defined as the set of techniques, tools and human resources used to create, manage, maintain, disseminate, and invest knowledge at work, which are closely linked to effective decision-making processes in enterprises.

KM can be measured in three dimensions: First: The technological dimension (includes the use of search engines, programs, applications, databases, algorithms and networks), second: (The logistical dimension) includes how to acquire, manage, control, store, publish, promote, and reuse knowledge, thirdly, the social dimension includes knowledge sharing between individuals and groups to contribute to the dissemination of knowledge and experience.

The measurement of OP is a difficult and complex process on the management of the university because it is the means that drives the Department to work actively through the follow-up performance of staff and the university constantly, and there are several elements to help, first: Quality of work includes (accuracy, order, technical ability, and freedom from errors), second: How to work and include (the volume of work completed and the speed of completion), third: Perseverance and reliability, and include (dedication, seriousness of work, and responsibility), fourth: Knowledge of the requirements of the job, including (professional skill, technical knowledge, and areas related to the job).

IT agility is a tool to measure the efficiency and effectiveness of an IT infrastructure used by enterprises, in order to take advantage of opportunities and avoid any threats, and improve the speed of movement and focus in a hybrid IT environment.

The agility of information technology faces many challenges, the most important of which are: First: The balance of using information technology in institutions according to their administrative levels, where excessive use of the level causing problems at another level, second: The standards, processes and applications applied in institutions and their relation to the resistance of institutions to change.

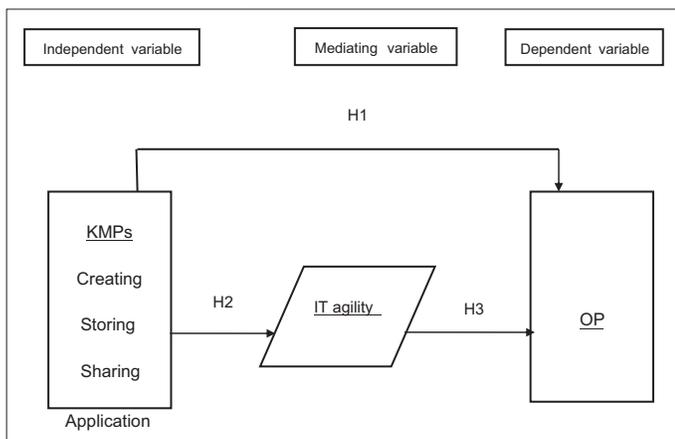
4. RESEARCH MODEL AND HYPOTHESES

Based on the above discussion and review of the available literature, this study proposed the following research model (Figure 2).

H1: KMPs have a direct significant impact on OP. H2: IT agility have a direct significant impact on OP. H3: KMPs have a direct significant impact on IT agility. H4: KMPs have an indirect significant impact on OP as mediated by IT agility.

The hypotheses have been developed based on previous studies examining the relationship between the dependent variable and the independent variable. These variables are present in the previous literature, a mediating variable has been added to explain the relationship between the two variables.

Figure 2: Research model



IT agility variable were considered to explain the relationship between KMPs and OP. This is due to the skills and facilities offered by IT, which have increased the efficiency and effectiveness of the relationship between the two variables, as well as the ability to innovate and innovate.

5. RESEARCH METHODOLOGY

5.1. Data Collection Method and Sampling Framework

Research methodology involves describing, explaining and predicting phenomena in addition to the research plan. It is necessary for the researcher to recognize the research and its contents to be able to identify the type of research. However, this research adopted a descriptive and analytical approach. A quantitative survey was used to collect the necessary data. The study population included all employees of Mutah University. A convenient sampling techniques was used to select the participants. 330 questionnaires were distributed. 314 questionnaires were analyzed. Table 1 outlines the sample characteristics.

5.2. Instrument Design

The research is based on questionnaire that was developed for the purpose of this study. Face validity and contents validity of the questionnaire were made. The answers were classified according to five Likert scale. The questionnaire includes two parts; the first part contains 4 items that related to personal information; the second part contains 24 items related to the research variables.

PLS was chosen for the current study using Smart PLS software. It was used in a two-stage approach, measurement and structural model testing.

6. RESEARCH RESULTS

6.1. Measurement Model

The measurement model can be assessed by examining the reliability, convergent validity and discriminate validity. Specifically, reliability which refers to the internal consistency

Table 1: Sample characteristics

Gender	Frequency (%)
Male	158 (50.3)
Female	156 (49.7)
Age	
<30	45 (14.3)
30–40	134 (42.7)
More than 40	135 (43)
Educational level	
Secondary level	12 (3.8)
Diploma (college) degree	75 (23.9)
Bachelor's degree	133 (42.4)
Higher degree	94 (29.9)
Experience	
<5 years	27 (8.6)
5–10 years	64 (20.4)
11–15 years	94 (29.9)
More than 15	129 (41.1)
Total	314 (100)

Table 2: Result of construct assessment

Constructs	Items	Factor loading	Mean±SD	CR	Cronbach's α	AVE
KMPs	KA3	0.728	3.815±0.926	0.928	0.915	0.517
	KC1	0.718	3.576±1.177			
	KC2	0.749	3.57±1.104			
	KC3	0.768	3.736±0.982			
	KC4	0.777	3.538±1.094			
	KS1	0.723	3.908±0.921			
	KS2	0.707	3.793±0.93			
	KS3	0.79	3.828±0.962			
	KS4	0.789	3.805±1.019			
	SK1	0.74	3.72±1.005			
IT agility	SK2	0.735	3.621±1.062	0.887	0.829	0.662
	SK3	0.795	3.666±1.031			
	ITA1	0.794	3.806±0.887			
	ITA2	0.818	3.895±0.873			
Operational performance	ITA3	0.843	3.975±0.794	0.909	0.874	0.666
	ITA4	0.797	3.962±0.84			
	P1	0.756	3.5±1.224			
	P2	0.829	3.608±1.03			
	P3	0.846	3.71±0.982			
	P4	0.872	3.688±1.002			
	P5	0.773	3.879±0.95			

AVE: Average variance extracted, SD: Standard deviation

of measurement, can be assessed by checking if the value of composite reliability (CR) is more than 0.7, the average variance extracted (AVE) is greater than 0.5 and Cronbach's α is greater than 0.6 (Hair et al., 2006). Table 2 shows that the CR values ranged from 0.88 to 0.92 and the AVE values ranged from 0.51 to 0.66. These values are higher than the acceptance value 0.70 and 0.50 which indicate a good construct reliability. Furthermore, in order to check the convergent validity, loading factor for each item was calculated. All item loadings are larger than 0.6 and t values indicate that all loadings are significant at 0.05 which indicates that the scale has a good convergent validity.

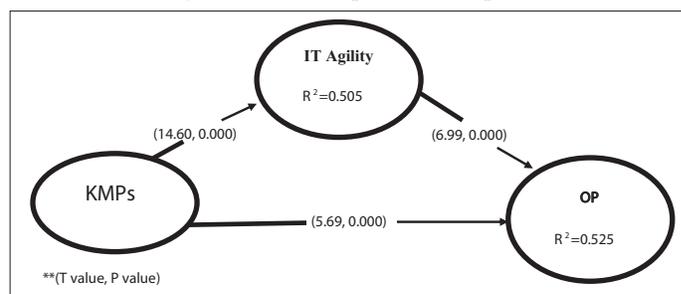
Cronbach's alpha is sensitive to the number of elements you provide. Often fewer elements mean fewer values than alpha, even if the elements are too reliable for each other. There are more robust alternatives to measure internal consistency. I would like to clarify that the questionnaire was carefully judged by many specialists and experts on this subject. We have been given feedback as we have made the necessary adjustments. After the data collection process, it has been analyzed using the smart PLS software by which we excluded a number of elements of the variables in the questionnaire, which reduces the value of alpha, As a result, the value of alpha increased to >0.9.

A mediator variable is used to identify and explain the mechanism or process that underlies an observed relationship between an independent variable and a dependent variable through the inclusion of a third hypothetical variable. Based on the dependent variable and the independent variable in the study, the mediating variable has been added to explain the relationship between them, in the light of the progress in IT due to the lack of sufficient studies on this subject within the Arab countries context.

Bootstrapping method in smart PLS software was used to test the statistical significance of path coefficients. Figure 3 shows the P value for all research variables and the PLS model of the study.

Table 3: Summary of hypothesis testing results

Path (hypothesis)	t	P	Results
KMPs→OP (direct impact) H1	5.69	***	Supported
IT agility→OP (direct impact) H2	6.99	***	Supported
KMPs→IT agility (direct impact) H3	14.6	***	Supported
KMPs→OP (indirect impact) H4	6.22	***	Supported

Figure 3: Result of partial least squares

6.2. Structural Model

The analysis result reveals that the factor KMPs have a direct significant impact on OP ($t = 5.69$, $P \leq 0.001$) which supported H1. As well as, IT agility has a direct significant impact on OP ($t = 6.99$, $P \leq 0.001$) which supported H2. In addition, KMPs and IT agility explained 0.52% of OP variance.

Specifically, KMPs have a significant impact on IT agility with values ($t = 14.60$, $P \leq 0.001$) and can explain 0.50% of IT agility variance. Thus, H3 was supported.

Furthermore, KMPs have a significant indirect impact on OP through mediated variable IT agility with values ($t = 6.22$, $P \leq 0.001$). Thus, H4 was supported. Table 3 summarizes these findings.

7. DISCUSSION, CONCLUSION AND RECOMMENDATION

This research mainly aimed to investigate and clarify the impact of the KMPs on OP as mediated by IT agility in Mu'tah University. Moreover, KMPs was measured by four elements including: Knowledge creation, knowledge storage, knowledge sharing, and knowledge application.

To sum up the research found that there is a significant impact for KMPs on OP and this result consistent with the previous research like: (Masa'deh et al., 2017), (Al-Sa'di et al., 2017), (Tseng, 2016). Furthermore The results also showed that IT agility has a significant impact on OP, and this result support from previous research such as (Chakravarty et al., 2017).

Finally the research revealed that the KMPs have a significant impact on OP as mediated by IT agility. Particularly this research might help Mu'tah University and similar institutions to improve and maintain its performance through applying KMPs. In addition, this applying of KMPs will facilitate develop university strategy and increase corporation between employees. Therefore, the university administration must support, encourage and sharing knowledge at the university, so we recommend the following: First: To identify and eliminate the weaknesses which negatively affect on the overall performance and to benefit from all experiences to support the strengths. Second: Encourage cooperation between management and employees, which is an effective way to solve problems. Third: Increasing attention to adopt modern training that might be enhance employees abilities and skills. Fourth, the university should be using feedback, employee skills and IT reports in order to evaluate employees work.

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