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To cite this article: Laith Ali Al-Hakim & Shahizan Hassan (2016) Core requirements of knowledge management implementation, innovation and organizational performance, Journal of Business Economics and Management, 17:1, 109-124, DOI: [10.3846/16111699.2012.720597](https://doi.org/10.3846/16111699.2012.720597)

To link to this article: <http://dx.doi.org/10.3846/16111699.2012.720597>



Published online: 24 Feb 2016.



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## CORE REQUIREMENTS OF KNOWLEDGE MANAGEMENT IMPLEMENTATION, INNOVATION AND ORGANIZATIONAL PERFORMANCE

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*Received 11 February 2012; accepted 06 August 2012*

**Abstract.** The present study aims to examine the relationship among core requirements of knowledge management implementation, innovation, and organizational performance in the Iraqi mobile telecommunications sector. A questionnaire was conducted on mobile companies based on a proportionate stratified random sampling technique. The results indicated that core requirements of knowledge management implementation had a statistically significant and direct positive effect on innovation. The critical success factors of knowledge management and knowledge management strategies had a statistically significant and direct positive effect on organizational performance. Then the direct relationship of knowledge management processes with organizational performance was positively affected, but it was not statistically significant. The results also indicated that the innovation had a positive and statistically significant effect on organizational performance. More importantly, the results indicate that core requirements of knowledge management implementation had a positive and statistically significant effect on organizational performance through the partial mediating effect of innovation.

**Keywords:** core requirements, knowledge management, implementation, innovation, organizational performance, mobile telecommunications sector.

**JEL Classification:** D2, C32, L2, M21, O22.

### Introduction

In today's Mobile Telecommunication Sector (MTS), we see an increasing and fierce competition between companies due to continuous innovation brought by technological development and advancements. In this regard, enhancing innovation has been recognized as an important substance of Organizational Performance (OP) improvement in this sector (Al-hakim, Hassan 2013; Jaspers *et al.* 2007; Oke 2007). However, an intensive review of the literature reveals that only a small number of empirical studies have discussed innovation as an important part of the OP in the MTS (Chong *et al.* 2009; Oke 2007). Thus, there is a need for researchers to identify the practical way to enhance innovation toward improving OP in the MTS. From Resource-Based View (RBV) and

Knowledge-Based View (KBV) theories' perspectives, superior organizations depend more on their knowledge-based resources to survive (Choi *et al.* 2008; Ho 2008; Kim, Gong 2009) and to improve OP (Liao, Wu 2009).

Knowledge Management (KM) is important to increase innovation in new mobile services (Lin 2007; Sáenz *et al.* 2009). Apart from that, KM implementation can help the organization improve its performance by creating knowledge-based innovation (Darroch 2005; Rhodes *et al.* 2008). In short, the main outcome of KM implementation is enhanced innovation and improved OP (Jafari *et al.* 2007). Based on the above, the present study attempts to highlight the significant role of KM implementation in enhancing innovation and improving OP. Thus, based on previous studies on KM (e.g. Asoh *et al.* 2007; Anderson 2009; Choi *et al.* 2008; Chong *et al.* 2009; Kim, Gong 2009; Liao, Wu 2009; Zack *et al.* 2009), the question of how can organisations implement KM successfully, remain unanswered.

Briefly, the Iraqi mobile telecommunications companies have not been able to successfully implement KM due to lack of understanding of the core requirements of KM. This has led to the decline in innovation and OP in the Iraqi MTS. Thus, present study seeks to address the issue of KM implementation from a comprehensive view and investigate it's related to innovation and OP. In particular, present study seeks to examine four aspects of this relationship (i) the direct relation between core requirements of the KM implementation and innovation; (ii) the direct relation between core requirements of the KM implementation and OP; (iii) the direct relation between innovation and OP, and (iv) the indirect relation of the core requirements of the KM implementation with OP through innovation.

## **1. Theoretical background and hypotheses**

### **1.1. The core requirements of KM implementation in the MTS**

Numerous studies have shown that KM implementation is able to help achieve or maintain success of contemporary organizations. KM implementation is said to be the best way to improve organization's ability in various aspects such as innovation (Brachos *et al.* 2007; Chen, Huan 2009; Chang, Lee 2008; Liao, Wu 2010; Sáenz *et al.* 2009) and OP (Asoh *et al.* 2007; Choi *et al.* 2008; Ho 2008; Kim, Gong 2009; Liao, Wu 2009; Zack *et al.* 2009). Therefore, researchers have resorted to the development of several frameworks to achieve successful KM implementation. But these frameworks differ in their orientation depending on the different viewpoints of the researchers (Shahrokhi 2010). The KM framework is defined as a guide to implement knowledge management in an organized way (Elashaheb 2005; Kim 2009). There are a many KM implementation frameworks in the literature. Despite this, many organizations are still not able to implement KM successfully. This may be due to the limited comprehensive framework in this area (Kim 2009; Shahrokhi 2010; Yang *et al.* 2009). Review of literatures identifies 23 frameworks of KM implementation that involves three main elements (i.e. CSFs of KM, KMSs, and KMPs). These three elements have been widely acknowledged in the literature as core requirements of successful KM implementation (Ajmal *et al.* 2010; Jafari *et al.* 2010).

## **1.2. Innovation in the mobile telecommunication sector**

The rapid dissemination of mobile technology is mostly due to technological growth. In this regard, it sets technological innovation at the high-level of the mobile company's strategic goals. Furthermore, the increased number of mobile subscribers and the high competition between mobile companies set the impetus for enhanced technological innovation (Mufioz 2008). Subsequently, these companies are seeking to mandatory achievement of it, through supported administrative, radical, and incremental innovation (Jaspers *et al.* 2007; Oke 2007) in order to survive.

In the MTS context, technological innovation is the knowledge that links methods, components, and techniques with processes to create services (Popadiuk, Choo 2006). Administrative innovation refers to the changes in organisational structure and processes, like the authority, tasks structuring, personnel recruitment, resources allocation and rewards (Lin *et al.* 2010). Radical innovation is a main change that represents a new technological pattern (Pedersen, Dalum 2004), and requires more organisational capabilities and superior profundity of knowledge (Darroch, McNaughton 2005; Roberts 2008). Incremental innovation is defined as cumulative and gradual nature of technological changes in organisation to create services (Pedersen, Dalum 2004). As such, unlike incremental innovation, it does not require much organisational capability (Darroch, McNaughton 2005; Roberts 2008).

## **1.3. Organizational performance in the mobile telecommunication sector**

OP improvement in the MTS depend on many factors such as technology standards (Jho 2007), market, competition, organisational structure (Palcic, Reeves 2010), foreign direct investment (Lin 2008), company management, financial resource and technological development (Caia, Tylecote 2008). But among these factors, the growth of the MTS depends mainly on technological development and innovation, as argued by many scholars (Chen *et al.* 2007; Gao, Rafiq 2009; Lee, Park 2008; Oke 2007). In this regard, Gao and Rafiq (2009) observed that technological innovation has been identified as the critical success factor in the MTS growth in developing countries. He also revealed that creating a new mobile service is closely related to the adoption of technological innovation and that leads to improve the overall OP of MTS. In other words, without technological innovation, accomplishing OP in the MTS will be difficult. Subsequently, the researcher is interested in investigating the relationship between innovation and OP in the Iraqi MTS.

Indeed, the OP indicators (financial, customer, internal process, and learning and growth) have become an important issue in evaluating organizational success (Moullin 2007). It is defined as “comparing the expected results with the actual ones, investigating deviations from plans, assessing individual performance and examining progress made towards meeting the targeted objectives” (Nghah, Ibrahim 2010: 503). Based on this definition, OP indicators can provide assistance for managers to evaluate the organizational activities and maintain the competitive position or superiority over competitors (Visser, Sluiter 2007).

## **1.4. Relationships among the variables of the present study**

### **1.4.1. Knowledge management and innovation**

#### **1.4.1.1. Critical success factors of KM implementation and innovation**

In superior organisations, it is important to determine the CSFs of KM that enhance innovation (Chang, Lee 2008; Chen, Huang 2009). In spite of past investigation, there are very few previous studies that examined the relationship between CSFs of KM and innovation from a comprehensive viewpoint (Brachos *et al.* 2007; Chang, Lee 2008; Chen, Huang 2009; Liao, Wu 2010; Lin 2007; Rhodes *et al.* 2008). Some studies have shown that CSFs of KM do have a significant and positive relationship to innovation. Thus, it is expected that:

**H1:** CSFs of KM have a significant and positive effect on innovation.

#### **1.4.1.2. Knowledge management strategies and innovation**

Even though KMSs are regarded as the best way to enhance innovation (Majchrzak *et al.* 2004; Rhodes *et al.* 2008). There have been few empirical studies that have examined the relationship between KMSs and innovation. However, Majchrzak *et al.* (2004) concluded that explicit knowledge reuse (considered a codification strategy) has a significant and positive relationship to radical innovation. Rhodes *et al.* (2008) found that personalisation strategy has a significant and positive related to product innovation and process innovation. Thus, it is expected that:

**H2:** KMSs have a significant and positive effect on innovation.

#### **1.4.1.3. Knowledge management processes and innovation**

In fact, the effect of KMPs plays a vital role in the continuity of innovation (Darroch, 2005; Wei, Xie 2008). Despite in Darroch and McNaughton's (2002) research identified mixed results in the relationship between KMPs and innovation. A number of recent empirical studies showed a significant and positive relationship of KMPs with innovation, such as Chang and Lee (2008), Darroch (2005), Huang and Li (2009), Ju *et al.* (2006), Liao and Wu (2010), and Wei and Xie (2008). Thus, it is expected that:

**H3:** KMPs have a significant and positive effect on innovation.

### **1.4.2. Knowledge management and organizational performance**

#### **1.4.2.1. Critical success factors of knowledge management and organizational performance**

Even with a large body of literature documenting how CSFs of KM influence OP, no study gathers all the CSFs of KM that may affect OP in one research (Anderson 2009; Asoh *et al.* 2007; Gold *et al.* 2001), particularly in the MTS context (Chong *et al.* 2009). In any case, previous empirical studies have shown that CSFs of KM have a significant and positive relationship with OP. Thus, it is expected that:

**H4:** CSFs of KM have a significant and positive effect on OP.

#### **1.4.2.2. Knowledge management strategies and organizational performance**

KMSs are becoming increasingly important assets for organisations throughout the world (Schulz, Jobe 2001; Yu *et al.* 2006). In simple terms, they lead to perfect OP, particularly in the MTS context (Chong *et al.* 2009). Yet few empirical studies have concentrated on determining the effect of KMSs on different indicators of OP (Bierly, Daly 2007). However, Choi and Lee (2003), Choi *et al.* (2008), and Keskin (2005) demonstrated that KMSs (codification strategy and personalisation strategy) are positively and statistically significantly related to OP. Thus, it is expected that:

**H5:** KMSs have a significant and positive effect on OP.

#### **1.4.2.3. Knowledge management processes and organizational performance**

KMPs are becoming the most valuable activities for any organisation (Chang, Chuang 2011; Darroch 2005; Fugate *et al.* 2009). In specific terms, they lead all organisational efforts to achieve an ideal OP, particularly in the MTS context (Chong *et al.* 2009). However, understanding of how KMPs are related to OP is limited due to the mixed and not significant results in prior studies that examined the relationship between KMPs and OP (Anderson 2009; Darroch 2005; Zack *et al.* 2009). However, a number of recent empirical studies have shown how KMPs are significantly and positively to OP; these studies include Asoh *et al.* (2007), Chang and Chuang (2011), Fugate *et al.* (2009), Gold *et al.* (2001), Ho (2008), Y. C Lee and S. K. Lee (2007), and Liao and Wu (2009). Thus, it is expected that:

**H6:** KMPs have a significant and positive effect on OP.

#### **1.4.3. Innovation and organizational performance**

Prior research provides evidence that effective innovation types are a key instrument for OP (Damanpour *et al.* 2009; García-Morales *et al.* 2008; Li *et al.* 2006). However, more research is needed due to the complex relationship between innovation and OP (Damanpour *et al.* 2009). In this case, some studies have shown that innovation (including technological innovation, administrative innovation, radical innovation, and incremental innovation) is positively related to OP (Chen *et al.* 2009; Damanpour *et al.* 2009; Li *et al.* 2006; Lin, Chen 2007). For instance, Chen *et al.* (2009) found that innovation in technological and administrative have a positive and significant effect on OP. Furthermore, Lin and Chen (2007) argued that radical innovation and incremental innovation have a positive relationship with OP. Thus, it is expected that:

**H7:** Innovation has a significant and positive effect on OP.

#### **1.4.4. Possible mediating role of innovation**

The extant literature reveals that a gap remains in the innovation field, particularly in the determination of the significant factors that have a direct effect on innovation to improve OP (Aragón-Correa *et al.* 2007; García-Morales *et al.* 2007). In this regard, the indirect relationship between core requirements of KM implementation (CSFs of KM, KMSs, and KMPs) and OP (financial perspective, customer perspective, internal process perspective, and learning and growth perspective) through innovation (technological innovation, administrative innovation, radical innovation, and incremental in-

novation) has never been previously explored within a single study. In such conditions, where a relationship has never been previously explored, an indirect hypothesis should be formulated. Therefore, in line with many researchers (Aragón-Correa *et al.* 2007; García-Morales *et al.* 2007), the present study proposes that innovation plays a significant and positive mediating role in the relationship between core requirements of KM implementation and OP, based on RBV and KBV theories' perspectives that provide a theoretical basis for explaining the influence of KM implementation on OP through innovation. Thus, it is expected that:

**H8:** Innovation has a significant and positive mediating effect on the relationship between the CSFs of KM and OP.

**H9:** Innovation has a significant and positive mediating effect on the relationship between KMSs and OP.

**H10:** Innovation has a significant and positive mediating effect on the relationship between KMPs and OP.

### 1.5. Proposed research model

The framework, based on RBV and KBV theories' perspectives, is conceptualized based on a number of previous studies (Anderson 2009; Asoh *et al.* 2007; Chen, Huang 2009; Damanpour *et al.* 2009; Fugate *et al.* 2009; Darroch 2005; Liao, Wu 2009; Li *et al.* 2006; Zack *et al.* 2009). Then, the research framework of the present study is shown in Figure 1.

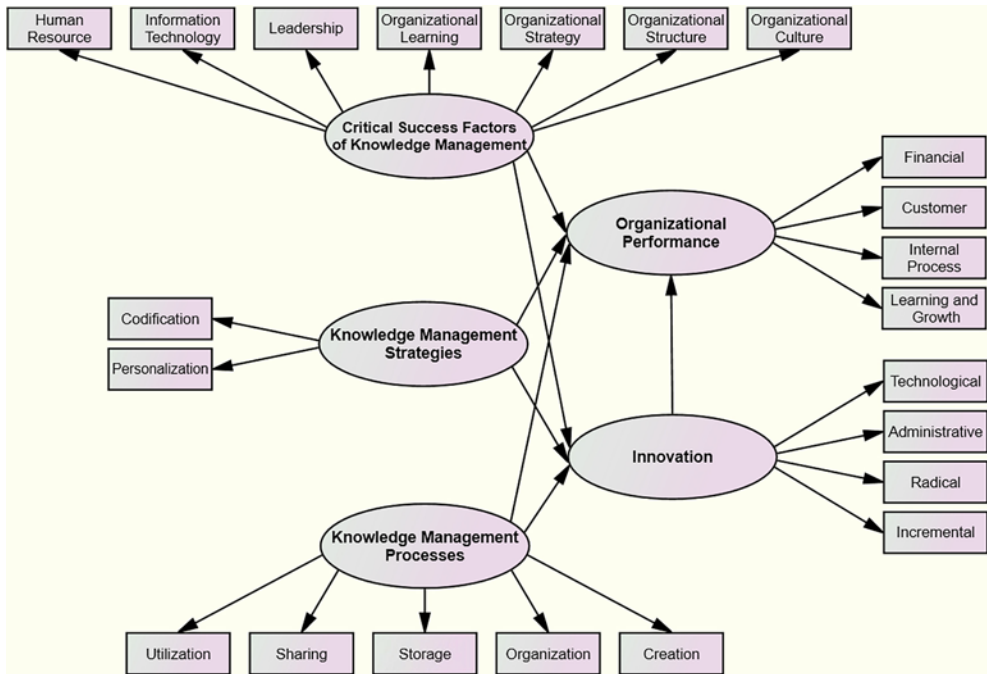


Fig. 1. Theoretical framework of the study

As contributions to the body of knowledge, the proposed theoretical framework shown in Figure 1 describes the causal relationships among five variables of the CSFs of KM, KMSs, KMPs, innovation, and OP. The independent variables in this framework are the CSFs of KM, KMSs, and KMPs. On the other hand, the dependent variable is OP. Innovation acts as the mediating variable between the core requirements of KM implementation and OP. The framework comprehensively takes into account all the pertinent variables that affect OP within the knowledge field in a single study.

## **2. Methodology**

### **2.1. Target population**

In the present study, the population refers to all mid-level managers from different branches and direct sales centers of the private Iraqi mobile companies. In line with previous research, present study chooses mid-level managers of Iraqi MTS as target respondents because of their role in the successful KM implementation (Al-hakim, Hassan 2014).

### **2.2. Sample and procedures**

Based on an application of proportionate stratified random sampling technique, questionnaires were randomly distributed only among 300 mid-level managers of the Iraqi MTS by personal delivery and collection of questionnaires from March to June 2011. From the 300 questionnaires randomly distributed, only 233 questionnaires were returned for a response rate of 77.67%. Out of these responses, 1% of the 3 questionnaires were unusable because the respondents did not complete all of the questions. Thus, 76.67% of the 230 questionnaires were used in the analysis. After screening, 3.33% of 10 questionnaires were found to be outliers. Therefore, the final total usable response rate was 73.34% of the 220 questionnaires.

### **2.3. Measures**

In the present study, most of 110 measurement items were adapted from previous questionnaires, with the exception of one item for KMPs, one item for innovation, and four items from OP, which were developed by researchers (see Table 1). Moreover, present study seeks to measure all variables by using a 5-point Likert scale where survey question is referred to agreement degree (i.e. 1 = strongly disagree, and 5 = strongly agree).



Table 1. Measurement instrument

Variable	Dimension	Original no. of item	Original Cronbach's alpha value	Sources
CSFs of KM	Human Resource (HR)	5	.834	Wong and Aspinwall (2005)
	Information Technology (IT)	5	.956	Chong <i>et al.</i> (2009)
	Leadership (LE)	5	.955	Chong <i>et al.</i> (2009)
	Organisational Learning (OL)	5	.896	Choi (2002)
	Organisational Strategy (OS)	5	.926	Chong <i>et al.</i> (2009)
	Organisational Structure (OT)	5	.912	Hsieh (2007)
	Organisational Culture (OC)	5	.924	Chong <i>et al.</i> (2009)
KMSs	Codification Strategy (CS)	5	.766	Kumar and Ganesh (2011)
	Personalisation Strategy (PS)	5	.712	Kumar and Ganesh (2011)
KMPs	Knowledge Creation (KC)	5	.780	Gómez and Manzanares (2004)
	Knowledge Organization (CO)	4	.861	Lawson (2003)
		1	Developed based on the theoretical study of Bhatt (2000)	
	Knowledge Storage (KS)	4	.879	Lawson (2003)
		1	Developed based on the study of Supyuenyong <i>et al.</i> (2009)	
Knowledge Sharing (KH)	5	.750	Calantone <i>et al.</i> (2002)	
Innovation	Technological Innovation (TI)	5	.730	Li <i>et al.</i> (2006)
	Administrative Innovation (AI)	5	.878	Lin <i>et al.</i> (2010)
	Radical Innovation (RI)	5	.900	Herrmann <i>et al.</i> (2007)
	Incremental Innovation (NI)	4	.860	Darroch (2005), Darroch and McNaughton (2002)
		1	Developed based on the theoretical study of Salavou (2004)	

Variable	Dimension	Original no. of item	Original Cronbach's alpha value	Sources	
OP	Financial Perspective (FP)	4	.970	Gonzalez-Padron <i>et al.</i> (2010)	
		1	Developed based on the theoretical study of Visser and Sluiter (2007)		
	Customer Perspective (CP)	4	.930	Gonzalez-Padron <i>et al.</i> (2010)	
		1	Developed based on the theoretical study of Visser and Sluiter (2007)		
	Internal Process Perspective (IP)	4	.950	Gonzalez-Padron <i>et al.</i> (2010)	
		1	Developed based on the theoretical study of Visser and Sluiter (2007)		
	Learning and Growth Perspective (GP)	4	.960	Gonzalez-Padron <i>et al.</i> (2010)	
		1	Developed based on the theoretical study of Visser and Sluiter (2007)		
	Total instruments	110			

### 3. Analysis and results

#### 3.1. Structural model

In order to test the substantive hypotheses, a final structural model was developed. It was run with 48 items to assess three exogenous latent variables (CSFs of KM, KMSs, and KMPs) and two endogenous latent variables (innovation and OP). Only 45 items of overall exogenous and endogenous latent variables were presented in this model. This is because the overall results presented evidence of a good model fit ( $p = .369$ , GFI = .903, CFI = .995, TLI = .995, and RMSEA = .008) and the Chi-square index was significant ( $\chi^2 = 926.711$ ,  $df = 913$ ,  $\chi^2/df = 1.015$ ). Hence, it can be concluded that these conditions meet the requirement of an acceptable model. The final structural model is shown in Figure 2.

#### 3.2. Hypotheses testing and discussion

SEM analysis was used to test the ten hypotheses proposed in the present study. The result of this analysis is used to accept or reject the hypotheses based on the significance of the standardized path coefficient of the relationships and C.R. value. The test of these hypotheses is presented as follows:

##### 3.2.1. Direct relationships

The direct relationships in SEM are the relations that go directly from one exogenous latent variable to endogenous latent variable. Below, Table 2 shows the status of seven hypotheses in final structural model.

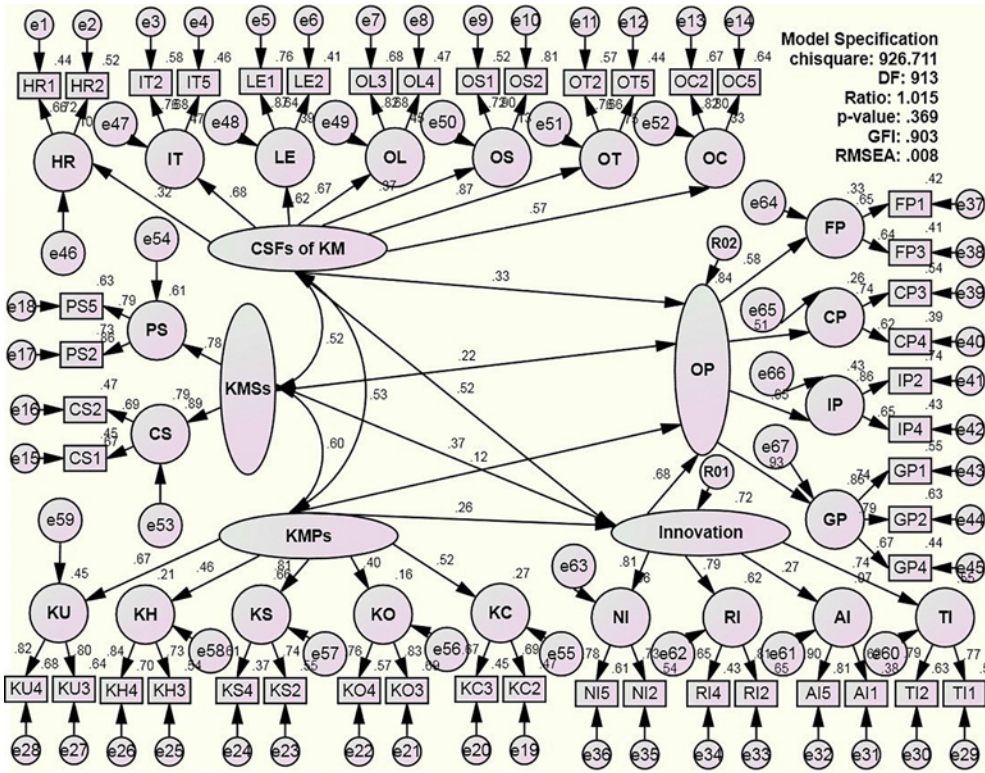


Fig. 2. Final structural model

Table 2. Direct relationships in final structural model

Hypothesis	Causal Path	Sta. Path Coefficient	Estimate	S.E.	C.R.	P	Status
H1	Innovation <--- CSFs of KM	.522	1.169	.212	5.504	.000***	Significantly Positively Related
H2	Innovation <--- KMSs	.371	1.158	.459	2.525	.012**	Significantly Positively Related
H3	Innovation <--- KMPs	.264	.315	.154	2.049	.041**	Significantly Positively Related
H4	OP <--- CSFs of KM	.329	1.448	.618	2.343	.019**	Significantly Positively Related
H5	OP <--- KMSs	.221	.332	.163	2.031	.042**	Significantly Positively Related
H6	OP <--- KMPs	.123	.088	.105	.840	.401	Non-Significantly Positively Related
H7	OP <--- Innovation	.681	.624	.146	4.276	.000***	Significantly Positively Related

Note: \*\*Significant at .05 level and \*\*\* Significant at .001 level.

### 3.2.2. Indirect relationships (mediating relationships)

Indirect relationship or mediating relationship is formed when a third variable mediates between two exogenous latent variables. The mediating effect were tested among CSFs of KM, KMSs, and KMPs mediated by innovation with OP (see Table 3).

Table 3. Indirect relationships of final structural model

Hypothesis	Causal Path	Indirect Relation Estimate	Direct Relation Estimate	Status
H8	CSFs of KM → Innovation → OP	.355	.329	Partial Mediating
H9	KMSs → Innovation → OP	.252	.221	Partial Mediating
H10	KMPs → Innovation → OP	.179	.123	Partial Mediating

### Conclusions, limitations, and future directions

The present study has sought to investigate the mediating role of innovation in the relationships between core requirements of KM implementation and OP in the Iraqi MTS context. It has met all the questions and objectives as outlined in chapter one. Certainly, it augments our understanding of the core requirement of KM implementation (CSFs of KM, KMSs, and KMPs) in enhancing innovation (technological innovation, administrative innovation, radical innovation, and incremental innovation) and improving OP (financial perspective, customer perspective, internal process perspective, and learning and growth perspective). Based on the RBV and KBV theories' perspectives, the results of the present study provided evidence that all the core requirements of KM implementation have a significant and positive effect on innovation and OP, except the KMPs, which has a positive but not significant effect on OP.

Furthermore, the results indicated that innovation has a significant and positive effect on OP. The results also show that the KM implementation (CSFs of KM, KMSs, and KMPs) has a positive and statistically significant effect on OP through the partial mediating role of innovation. Consequently, the present study has contributed to the KM implementation field. The findings of the present study have theoretical, methodological, and practical contributions.

As such, the current attempt has managed to fill in gaps that existed in the KM implementation literature. However, the present study faced methodological and generalisability limitations. In this case, further studies are necessary to confirm these results and incorporate the other variables that may have influenced the results. Therefore, the future is wide open for further empirical research in this area.

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