The Influence of Accounting Information Systems, Knowledge Management Capabilities, and Innovation on Organizational Performance in Iraqi SMEs

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ABSTRACT

The aim of this study is to examine Iraqi small and medium enterprises (SMEs) in terms of the relationship between the use of accounting information systems (AIS), knowledge management capabilities (KMC), and organizational performance (OP) mediated by innovation. A total of 312 questionnaires were used for analysis. Partial least squares version 3 was used to analyse the relationships. The results showed that the use of AIS and KMC have a positive significant influence on innovation, while all three constructs have a positive significant influence on the OP of SMEs. Moreover, all the dimensions of the use of AIS (e.g., decision-making, controlling process, operational efficiency, planning process, and financial reporting), and all the dimensions of KMC (e.g., knowledge acquisition, knowledge sharing, and knowledge utilization) were found to have a positive influence on OP. It was also found that innovation partially mediates the relationship between the use of AIS and OP, as well as the relationship between KMC and OP. The results could help SMEs to obtain a competitive advantage.

KEYWORDS

Accounting Information Systems, Innovation, Knowledge Management Capabilities, Organizational Performance, SMEs

INTRODUCTION

Small and medium enterprises (SMEs) remain as one of the drivers in the economic development of any country. However, SMEs now face a double challenge represented by the lack of security, which seriously affects SMEs, and the new players at competitive prices in the business environment of Iraqi SMEs. In addition, 89 percent of SMEs did not have access to capital, and 33 percent experienced low

demand and closed the firm temporarily (IOM, 2018a, 2018b). SMEs still face enormous pressure to remain competitive in domestic and global markets due to the lack of resources required to improve business. Ghobakhloo et al. (2011), and Nugroho et al. (2017) realized that, unfortunately, SMEs have various weaknesses at the managerial, organizational, individual, technological, and environmental levels. The use of high accounting information quality is required to improve the quality of financial reporting that will reduce the risk of making wrong decisions (Bushman & Smith 2001, 2003; Houcinel & Kolsi 2017). Accounting information systems (AIS) are extensively used in making financial and managerial decisions, many of which have considerable cost implications, particularly in developing economies, which leads to annual profits or losses when such decisions are rightly or poorly made (Sallem & Nasir, 2017). In the context of the business environment, the existing literature needs a comprehensive view of the information technology that leads to effective utilization of AIS (Klovienė & Gimzauskiene, 2015; Bachmid, 2016). SMEs need to change and protect themselves as well as recognize the importance of improving knowledge management capabilities (KMC) and keeping abreast of the latest technologies in the current market. Knowledge management represents the process of using accurate steps to acquire and share knowledge by organizations to achieve greater performance. Managers should recognize the importance of improving knowledge management capabilities, as these will help to minimize risks. Therefore, when knowledge is used rather than neglected it can present special characteristics that distinguish it from tangible resources to add creation and sustainability in order to gain competitive advantage (Curado, 2006; Zhang et al., 2018). Nowadays, SMEs are increasingly reliant on information technology because of the rapidly growing business environment. Therefore, in addition to AIS and KMC, SMEs need to be innovative, through internal or external elements, to survive in a competitive market and achieve competitive advantage. Nevertheless, little attention has been paid to this aspect of innovation being necessary for SMEs to achieve sustained performance (Nugroho et al., 2017; Ferreira et al., 2018; Yunis et al., 2018).

SMEs should have organizational policies and procedures in order to exploit their valuable, rare, and costly-to-imitate resources and capabilities. Consequently, the resource-based view of firms could clarify the internal resources and abilities including AIS competency, which can influence performance (Tontiset, 2018). Based on Barney (1991) the firm resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". One of the most significant constructs for strategic management in recent decades is the dynamic capability, where the dynamic capabilities are defined "as the firm's ability to integrate, build, and reconfigure internal and external competencies to treat quickly changing environments" (Teece et al., 1997). Several studies examined information and communication technology in light of the contributions of the dynamic abilities to firm value. This is consistent with the theory of innovation, which holds that the organization can obtain economic benefits as well as gain a competitive advantage by means of introducing successful innovations and manage resources in an innovative way (Croitoru, 2012; Davcik & Sharma, 2016; Yunis et al., 2018). Although SMEs are important, in developing countries they still encounter substantially greater problems and challenges that increase their risk of low performance and failure (Ismail, 2009; Harash et al., 2014). Meanwhile, the low level use of AIS among these SMEs found in previous studies indicates that one possible cause of their poor performance is due to the weakness of SMEs at the technological level due to the lack of new technology (Bachmid, 2016). In addition, despite SMEs having knowledge of their business processes, studies also found that their low capability to share and utilize such knowledge adversely affected their performance (Alawi et al., 2018; Kareem et al., 2019a). Therefore, it is necessary to sustain the performance of SMEs through innovation (Nugroho et al., 2017). The previous studies reported most SMEs in Iraq do not fully use of AIS, KMC, and innovation. In addition, limited studies have looked at the relationship between the use of AIS, KMC, and innovation for enhancing SMEs' organizational performance to meet the challenges represented by rapidly changing technology and increasing competition in the Iraqi SMEs context. Therefore, there is a need to enhance the performance of SMEs through the use

of AIS, KMC, and innovation (White, 2012; Al-Hakim & Hassan, 2013; Harash, 2017; Alawi et al., 2018; Kareem et al., 2019b).

Previous studies looked at how organizational performance was enhanced through AIS, with a focus on systems, and, thus ignored the specific dimensions of AIS use, such as AIS (decision-making, controlling process, operational efficiency, planning process, and financial reporting), and the dimensions of KMC (knowledge acquisition, knowledge sharing, and Knowledge utilization), which are theoretically grounded by means of the RBV and DC theories. This study contributes to the literature, and extends to the role of use AIS, KMC, and innovation as a mediator between the use of AIS, KMC, and organizational performance based on survey approach to collect data from SMEs that use AIS.

In order to understand these relationships, the researchers formulated the following questions:

1. What is the extent of use of AIS, KMC, and innovation?
2. What is the relationship between the use of AIS, KMC, and innovation, and organizational performance?
3. What is the relationship between the use of AIS and KMC, and innovation?
4. What is the relationship between the use of AIS and KMC, and organizational performance mediated by innovation?

The remainder of this paper presents the literature review, research model and hypotheses development, research methodology, results of the data analysis, discussion, and conclusion.

LITERATURE REVIEW

Related Studies

Organizational performance is defined as an ability of the organization to achieve its set objectives by using its resources efficiently and effectively (Kareem et al., 2019b). Prior studies have proposed several models and frameworks to enhance organizational performance (OP) in the business context. Therefore, to obtain an accurate and deep understanding about the organizational performance, in this study, the researchers conducted a literature survey to identify the models/frameworks that were used to enhance OP. For example Daoud and Triki (2013) proposed a conceptual model to examine how AIS influence firm performance in an enterprise resource planning (ERP) environment. The goal of their research was to determine the influences of the implementation of AIS on firm performance in an ERP context and the effects of both the direct factors and the interaction between the AIS contingency factors and firm performance. In their survey of 102 Tunisian firms that had adopted ERP systems, after the adoption of the ERP system they found that using accounting techniques can influence firm performance as well as affect the interaction of accounting staff with the AIS, and has a positive influence on firm performance. Also, Alnajjar (2016) developed an evaluation framework that showed the impact of AIS on OP. The study focused on 74 SMEs in the United Arab Emirates. The findings showed that AIS have an impact on OP and performance management. Soudani (2012) examined the usefulness of AIS for effective OP in the listed companies in Dubai based on 236 questionnaires from 74 firms. The results showed that AIS are very useful and have an impact on OP. Also, Valmohammadi and Ahmadi (2015) proposed a conceptual model to examine the impact of knowledge management practices in terms of critical success factors on OP under the four perspectives of the balanced scorecard. The study was conducted in the national company for petrochemicals in Iran. It used 198 questionnaires distributed among the managers and employees. The results showed that knowledge management practices have a positive impact on OP. Alaarj et al. (2016) discussed the role of trust as a mediating factor and the effects of KMC on OP. They found that KMC can enhance firms' performance in terms of innovation, competitiveness, and new

products. The study was conducted in Malaysia based on 176 questionnaires from senior managers of companies listed on the stock market. Yunis et al. (2018) developed a framework to examine the relationship between the use or adoption of information and communications technology (ICT) and OP. The research was conducted in Lebanon and used 374 questionnaires from employees and middle and senior level managers. The results showed that the use of ICT is positively related to innovation and OP. In addition, the relationship between ICT use and OP is mediated by innovation.

The researchers can conclude that most studies on enhancing OP focused on KMC context as well as the factors concerning the use of information systems. Very few researchers focused on identifying the factors that can be implemented to achieve goals. Thus, this study identified the use of AIS, KMC, and innovation as important variables that influence OP. In addition, previous studies focused on specific areas to achieve specific needs for companies. The models/frameworks were designed for particular conditions and to meet specific environments linked to the needs and contexts for which they were developed. Therefore, more studies are required to generalize and improve performance in the SME sector. This study examined the influence of use AIS, KMC, and innovation on performance of SMEs.

RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

Theoretical Background

The framework of this study is supported by two main theories: resource-based view (RBV) and dynamic capabilities (DC). The RBV contends that companies have the resources, and that the subset of these resources is to enable the achievement of competitive advantage, while the other subset leads to better long-term performance (Eisenhardt & Martin, 2000; Wade & Hulland, 2004). Wernerfelt (1984) argued that the resource-based view explains the relationship between IT and organizational performance. Barney (1991) contended that organizations that have valuable resources, rare resources, imperfectly imitable resources, and that are non-substitutable can gain a resource-based competitive edge performance improvement. Therefore, when used effectively, AIS as one of these resources for data processing will be valuable (Sulaiman & Wickramasinghe, 2018).

Dynamic capabilities are how to develop new skills and procedures for companies that allow them to contend, and determine what senior managers need to develop new procedures (Cepeda & Vera, 2007). Therefore, the features of DC through IT assists decision support, development, integration, generation, and improvement of important resources over time (Teece et al., 1997; Yunis et al., 2018). Whereby managers and owners create new thoughts within the firm that are related to the knowledge creation procedures, in which sophisticated knowledge is necessary for both the effective performance and strategy (Eisenhardt & Martin, 2000).

Hypotheses Development in the AIS Domain

AIS is defined as systems that use for data collection, processing, classifying, and reporting financial events and provides useful information to take decision-making by the organization or external interested parties (Soudani, 2012; Harash, 2017; Kareem et al., 2019b). AIS is one of the modern information system and have great potential to influence organizational performance (Ismail, 2009; Kareem et al., 2019b). In addition, accounting system is to produce accounting information for a diversity of users internal and external. Therefore, the accounting module represents the heart of a business and normally includes "using a general ledger, fixed assets, cash management, cost control, and budgeting, accounts receivable and accounts payable" (Spathis & Constantinides, 2004). Kim et al. (2017) stated that it is necessary to process the transactions correctly and efficiently based on performance data by the coherent implementation of AIS. Grande et al. (2011) found a positive relationship between SMEs that use AIS for fiscal purposes for bank management and better measures for performance. Therefore, the use of AIS has a great impact on the improvement of the decision-

making process, internal control, and performance assessment. Moreover, it has been found that AIS are important and have a highly positive impact on OP (David Naranjo-Gil, 2009; Pierre et al., 2013; Al-dmour et al., 2017; Fadzilah, 2017; Kanakriyah, 2017; Rasit & Ibrahim, 2017; Susanto & Meiryani, 2019). In order to understand the effects of using AIS, the researchers formulated the following hypothesis:

H1: The use of AIS has a positive influence on organizational performance.

Decision-Making

Many studies have used empirical research to appraise the efficacy of AIS in order to take better decisions for management from various perspectives. Therefore, firms that do not use information technology strategically are unable to improve strategic decision-making (DM) (Ismail & King, 2005). Awasthi and Varman (2003) investigated the influence of information technology (IT) on decision-making, and found that information technology improved the rationality and speed of decision-making. Another study reported that the decision-making performance plays a significant mediating role between IS administrative capabilities and firm-performance (Aydiner et al., 2019). In addition, the findings of previous studies showed that the implementation of AIS can help managers make better decisions (Liu et al., 2010; Hanifi & Taleei, 2015). Accordingly, the hypothesis is as follows:

H1a: The use of AIS for decision-making has a positive influence on organizational performance.

Controlling Process

Kerzner (2009) defined the controlling process (CP) as a measure's improvement towards a goal, and for assessing what remains to be done when taking the required corrective action to reach or exceed the goal. Therefore, Lai et al. (2017), and Ittner and Larcker (1997) showed that internal control weaknesses have a negative impact on a firm`s performance. While, Yin (2015) found that, in terms of implementation and control, the executive information system is positively related to the process of competition. Also, Nicolaou (2000) found that the fit and effectiveness of AIS are important factors in terms of the control and the decision-making process in respect of the effectiveness of the output. While another study's findings showed that the control department has a positive effect on businesses performance (Vuko & Ojvan, 2013). Also, Duh et al. (2006) investigated strategic IT applications in terms of planning and control to improve firm performance among 296 Taiwanese companies. The results demonstrated that there was a statistically significant positive relationship between the expansion of IT applications and OP. Accordingly, the hypothesis is as follows:

H1b: The use of AIS for the controlling process has a positive influence on organizational performance.

Operational Efficiency

Information systems allow the execution of additional uses, e.g. support to ensure the reliability of data and to improve the operational efficiency (OE) in organizations (Bagranoff et al., 2010). McDermott and Stock (1999) contended that firms can obtain operational efficiency in terms of improvement flexibility and productivity based on advanced technology. Lausa (2016) revealed a significant relationship between the operational efficiency of IT and OP. Also, Baik et al. (2013) investigated the changes in operational efficiency to predict a firm's performance. They showed that changes in operational efficiency cause positive associated changes in the current and future earnings as well as stock returns.

H1c: The use of AIS for operational efficiency has a positive influence on organizational performance.

Planning Process

If the planning process (PP) is continuously practiced it could represent a roadmap and give direction to the competency integration (Sledgianowski et al., 2017). Duh et al. (2006) found that strategy greatly influenced the extent of IT applications in terms of planning. A significant positive relationship between the expansion of IT applications and OP was also found. Mirchandani and Lederer (2014) considered the planning process to be important to achieve the objectives of the organization, especially when using information systems in such a way that can enhance firm performance. In addition, Mcilquham-schmidt (2010) and Watts et al. (1990) have shown that there is a positive relationship between planning and firm performance. Accordingly, the hypothesis is formulated:

H1d: The use of AIS for the planning process has a positive influence on organizational performance

Financial Reporting

Financial reporting provides fair and accurate information regarding the economic performance and financial position of any entity (Herath & Albarqi, 2017). McChlery et al. (2005) investigated the effects of financial accounting systems in terms of financial reporting (FR), for which the results showed a highly positive reaction to financial reporting with a score of 86.1 percent for the organizations using computerized accounting systems. In addition, Carraher and Van Auken (2013) reported that the use of financial reporting is directly related to the level of revenue, while another study found some significant correlations between the extent and frequency of financial reports and measures of growth and performance of SMEs (McMahon, 2001). Accordingly, the hypothesis is as follows:

H1e: The use of AIS for financial reporting has a positive influence on organizational performance.

Hypotheses Development in KMC Domain

KMC is defined as process of creating, sharing, and using knowledge (Kareem et al., 2019b; Shujahat et al., 2019). Nonaka and Takeuchi (1995) focused on creating explicit and tacit knowledge that could help the organization succeed and survive in the long term, in the context of explicit knowledge, information system can help to archive, documented, and codified. While the tacit knowledge exists inside individuals and is difficult to obtain, assess, share, and leverage. On the other hand, Choo (2000) see that knowledge can result from experiences, participation, and people working together, which in turn is reflected in the growth of organizations through acquiring new information. Therefore, many empirical research have discussed the effect of knowledge management capabilities for example, Rasula et al. (2012) showed that tacit knowledge management both tangibly and intangibly has a significant impact on OP. Alaarj et al. (2016) reported that OP can improve based on contributing to KMC in terms of innovation, competitiveness, and new product development. Other results revealed that knowledge management strategy has a significant positive effect on strategic performance (Yang, 2010). Also, Tseng (2016) found that knowledge management capabilities are a major factor in enhancing firm performance. Accordingly, the hypothesis is as follows:

H2: Knowledge management capabilities have a positive influence on organizational performance.

Knowledge Acquisition

Knowledge acquisition (KA) is acquiring knowledge from internal and external sources to assist in determining the organizational performance (Alaarj et al., 2016). Alaarj et al. (2016), and Li et al. (2010) argued that KMC in terms of knowledge acquisition has a positive effect on OP. Ahmed et al. (2015) investigated the impact of knowledge management practices on OP using a questionnaire. They

received responses from 256 individuals in the banking sector, the results showed that knowledge acquisition can help to increase profits and generally enhance OP. Also, Park et al. (2008) and Tsang et al. (2004) confirmed that the amount of knowledge acquired can contribute significantly to the performance. Accordingly, the hypothesis is as follows:

H2a: Knowledge management capabilities for knowledge acquisition have a positive influence on organizational performance.

Knowledge Sharing

The literature demonstrates many limitations to knowledge sharing (KS) between the providers and recipients of knowledge, and how SMEs use it to achieve a performance advantage. Wang and Wang (2012) reported that the level of associated knowledge shared has an important and significant influence on performance. Also, Monica Hu et al. (2009) and Oyemomi et al. (2019) reported that organizational culture and innovative strategy in terms of knowledge sharing directly contribute to the enhancement of OP. Another study showed a relationship between knowledge management through knowledge sharing and firm performance (Chang & Chuang, 2011). Accordingly, the hypothesis is as follows:

H2b: Knowledge management capabilities for knowledge sharing have a positive influence on organizational performance.

Knowledge Utilization

The lack of knowledge related to the use of new modern systems could leave SMEs open to weak competition and failure (Kareem et al., 2019a). Therefore, many researchers pay more attention to this area. For example, Andreeva and Kianto (2012) examined the association between knowledge management practices and economic performance, and firm`s competitive advantage. They proved that the utilized to administer knowledge, has a significant effect on firm competitiveness and financial performance in three companies in Finland, China, and Russia. Also, Chen and Fong (2012) demonstrated through empirical results that knowledge processes in terms of knowledge utilization (KU) contributed significantly to business performance. Accordingly, the hypothesis is as follows:

H2c: Knowledge management capabilities for knowledge utilization have a positive influence on organizational performance.
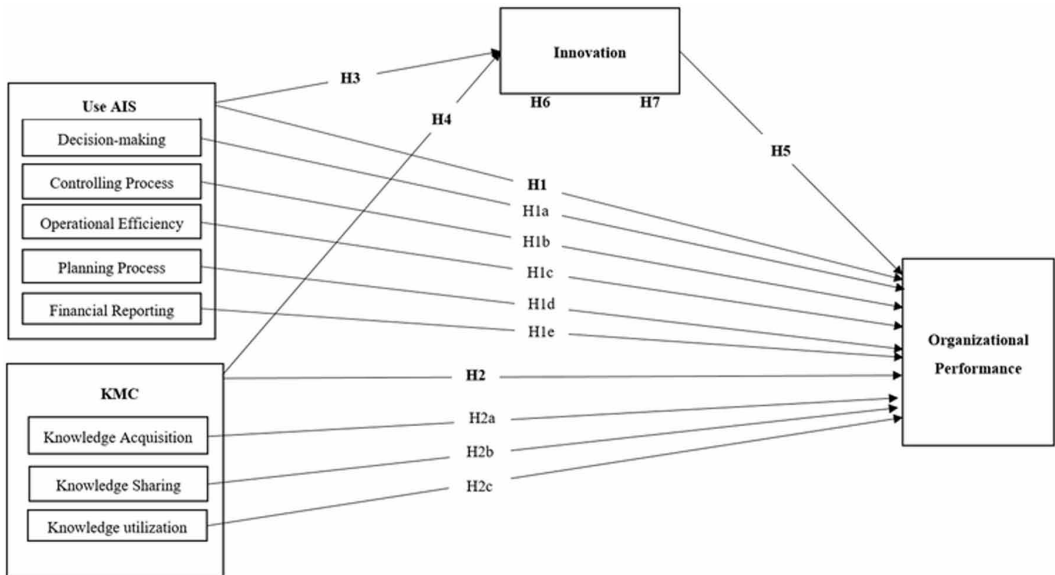
Innovation

Innovation is defined as an idea to develop a process or new product in the organization (Cofriyanti & Hidayanto, 2013; Kareem et al., 2019b). In this case, the required capacities will be new and distinct in terms of management practices, which try to successfully develop innovation and support the competitive edge of SMEs (Rauter et al., 2018). Thus, the results of previous studies showed that using information technology has an important positive impact on both innovation and the performance of firms (Cofriyanti & Hidayanto, 2013). Knowledge management capability showed a significant effect on innovation speed and financial performance (Darroch, 2005; Wang & Wang, 2012). Also, another study found that innovation and firm performance is significant, and that ICT use is positively related to OP and innovation, where innovation mediates between IT/ICT use and OP, (Lyu et al., 2009; Yunis et al., 2018). Accordingly, the hypotheses are as follows:

H3: The use of AIS has a positive influence on innovation.
H4: KMC has a positive influence on innovation.
H5: Innovation has a positive influence on organizational performance.

Figure 1. Research framework and hypothesized proposal

H6: Innovation mediates the relationship between the use of AIS and organizational performance.
H7: Innovation mediates the relationship between KMC and organizational performance.

Figure 1 demonstrates the research framework and hypothesized proposal for use of AIS, KMC, and innovation for this study.

RESEARCH METHODOLOGY

This study explains the implications of the relationships among the use of AIS and KMC through mediating innovations on the firm performance in Iraqi SMEs. The main task of the research design is to find answers for the research questions (Sekaran & Bougie, 2016). The method for this study is quantitative and involves correlation. It also uses a deductive model of the hypothesized relationships (Kumar, 2005, 2010). The questionnaire technique was used to determine the views of managers and owners on the validity of the research variables, the main reason for the selection of the questionnaire was its usefulness in simplifying the data analysis in an objective and scientific way as well as to reduce respondent bias and measurement errors (Creswell, 2013; Sekaran & Bougie, 2016). The design of this study involved instrument validation, pilot study, instrument reliability by Cronbach's Alpha, data preparation by SPSS test, and PLS assessment of the research framework.

Instrument Development

The questionnaire used closed-ended questions to gather data and obtain the participants feedback using five-point Likert scales for the questions to ensure that the respondents replied to each question simply and accurately. The items for the questionnaires were adapted and adopted from prior studies. The questionnaire was first written in English and then translated into Arabic. The questionnaire had five sections; the first section covered questions relating to the demographic information for the respondents, the second section was related to the use of AIS. The third section was related to KMC, the fourth section was related to innovation, and the fifth section was related to OP. The items and the references are shown in Appendix A. This study conducted questionnaire validation using experts

who worked in universities in related fields as well as some of the managers and owners of SMEs. A pilot study was used to identify potential problems that may affect the quality and validity before progressing to the final study. The number of respondents in this study was considered suitable for a pilot study, with 32 questionnaires collected from SMEs, as per the recommendation of Johanson and Brooks (2010). The use of analysis included Cronbach's alpha and exploratory factor analysis (EFA) including the Kaiser-Meyer-Olkin Test (KMO) and Bartlett's test of sphericity. The results of the study indicated that the instrument was reliable and valid as the Cronbach's alpha value was above 0.7, and the exploratory factor analysis was above 0.7 for the KMO and significant constructs (Hair et al., 2016; Ul Hadia et al., 2016).

Data Collection Procedure and Sampling

The total number of SMEs registered with three or more employees was estimated at 622,000 (Nasr, 2011). White (2012) and Kareem et al. (2019b) defined small-sized enterprises as having from 4-10 employees, while medium-sized enterprises have from 11-50 employees. The selected sample of managers/owners are from Iraqi SMEs. A total of 700 SMEs were chosen to ensure reaching the required sample size, a non-probability of purposive sampling technique was adopted, using a judgment sampling, which is consistent with the broad categories of purposive sampling for all SMEs.

The justification for use this technique because it can give a rich information for using AIS (Sekaran, 2003). In total, 568 responses were received, which represents 81.1 percent response rate; however, 174 responses were deleted due to incomplete data, and 82 responses were deleted because they were not associated with SMEs based on the number of employees. Therefore, this study with 312 samples achieved the required number for analysis using smart PLS. Self-administered printed questionnaires were used to collect the data from all the SMEs of Iraq in the different provinces. The questionnaires were distributed between December 2018 and April 2019 to participants who had been using AIS in their firms.
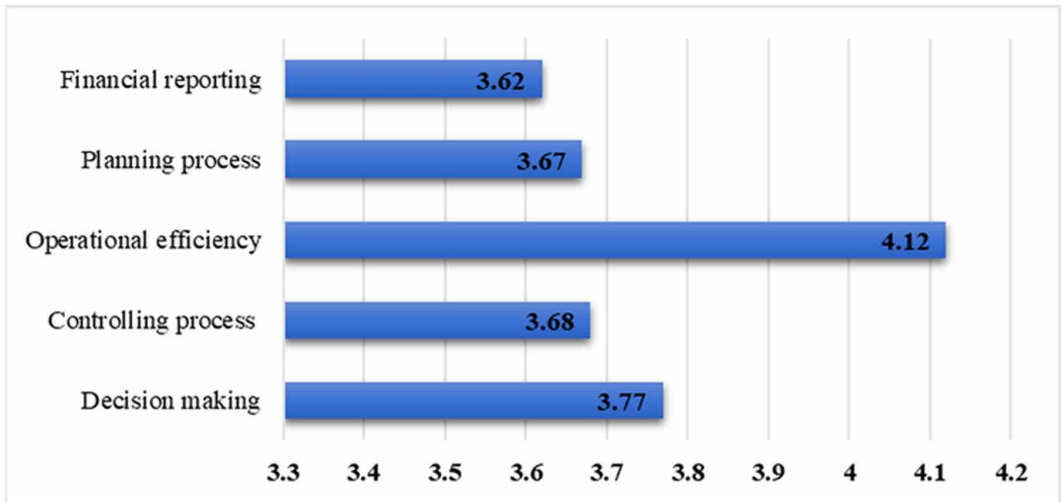
RESULTS

Demographic Features

Based on the demographic information, as shown in Appendix B, the majority of the respondents are within the age group of over 40 years of age with more than 4 years' experience in the current position as manager, owner, or IT. The educational background indicates that the majority have a bachelor's degree 54.5 percent, followed by a diploma degree 24.4 percent. Most SMEs are operated by individuals 53.5 percent, followed by partnership 32.7 percent, and family business 13.8 percent, with the years of firm establishment it was found that the majority of firms 50 percent had been established from 2 to 10 years and 35.3 percent had been established for more than 10 years. The SMEs are divided into small 59.3 percent and medium-sized 40.7 percent enterprises.

Data Preparation

The data were tested for outliers, and the range (Min-Max) of the Z-score for all constructs was 3.897 to 2.475. The results showed that all the Z-scores were in an acceptable range (Tabachnick & Fidell, 2007). The results of the skewness ranged from -1.404 to 0.090, and the kurtosis ranged from -0.659 to 2.088, which are acceptable, and thereby indicate that all the variables are normally distributed (Kline, 2010). The results of common method variance show that it is not likely to have affected the results since it is less than 50 percent with a score of 34.713 percent for the overall variance. Finally, the results of the collinearity test based on the variance inflation factors (VIFs) indicate that there is no multicollinearity problem with any of the constructs; the VIF values were between 1.51 and 2.512, which is far below the cut-off of 10 (Meyers et al., 2005; Tabachnick & Fidell, 2007).

Figure 2. Extent of using AIS

Descriptive Results for Extent of Use of AIS, KMC, and Innovation

Descriptive results demonstrate determine the key importance of each sub-construct in terms of using AIS, KMC, and innovation. For the extent of use of AIS. Figure 2 shows the highest value of the use of AIS was operational efficiency with a mean value of 4.12 followed by decision-making and controlling process with mean scores of 3.77, and 3.68, respectively. The lowest mean value was use AIS for planning process and financial reporting with 3.67 and 3.62, respectively. This means that SMEs in Iraq emphasize the importance of every dimension for using AIS at different levels.

Figure 3 shows the extent of using KMC; the highest value of KMC in SMEs was knowledge utilizing with a mean score of 3.67 followed by knowledge acquisition with a mean score of 3.63. The lowest mean score of 3.54 was related to knowledge sharing, which means that SMEs give priority to using knowledge.

Figure 4 shows that the highest value for innovation in SMEs was the innovation atmosphere with 3.94, while the lowest mean score with 3.88, was innovation opportunities. Therefore, some challenges and obstacles of innovations have been specified in this study, such as hesitate in the pursuit of the opportunities for technology innovations or new knowledge, lack the search for latest technology and cost concerns to upgrade the system. Moreover, all of these issues will lead to limited innovations (Table 1).
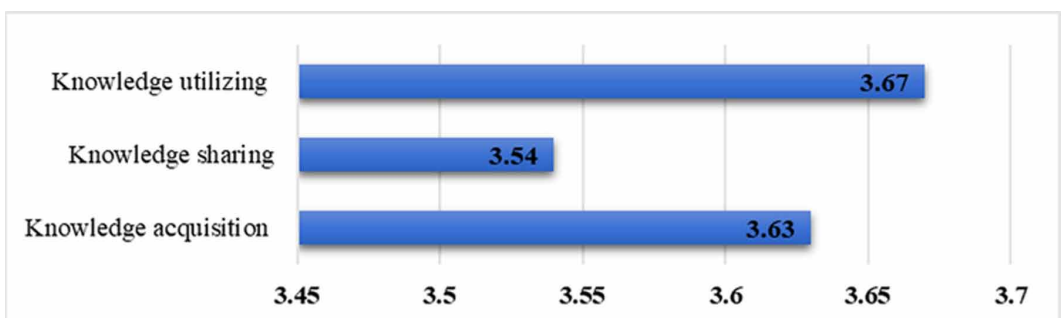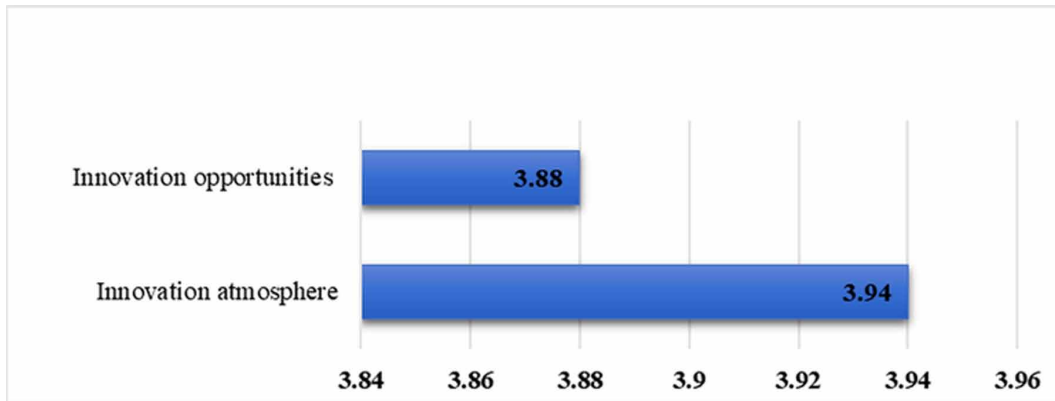
Figure 3. Extent of using KMC

Figure 4. Extent of using innovation

Measurement Model Analysis

The measurement model includes convergent validity, which was evaluated by four measures: outer loading, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). The results show that the AVE are all higher than the accepted level (0.50) (Fornell & Larcker, 1981; Gefen et al., 2000; Hair et al., 2016), and that the CR is above 0.70, which is within the normally recommended range. All the outer loadings (indicator reliability) for the measurement items are higher than 0.70. This means that all the measurements for convergent validity are acceptable (Hair et al., 2016). Also, based on Sekaran (2003), 0.60 is considered to be poor, 0.70 acceptable, and above 0.80 good; the constructs had acceptable reliability in terms of Cronbach's alpha. Accordingly, the internal consistency reliability of the measurement score used can be considered good in this

Table 1. Models/frameworks for organizational performance

Source	AIS	KMC	Innovation
(Yunis et al., 2018)			**x**
(Cofriyanti & Hidayanto, 2013)			x
(Chang & Chuang, 2011)		x	
(Muthuveloo et al., 2017)		x	
(Alaarj et al., 2016)		x	
(Valmohammadi & Ahmadi, 2015)		x	
(Daoud & Triki, 2013)	x		
(Ismail & King, 2005)	x		
(MIM, 2016)	x		
(Soudani, 2012)	x		
(Tseng, 2016)		x	
(Vaccaro et al., 2010)		x	
(Wang & Wang, 2012)		x	x
(Lyu et al., 2009)			x
(López-Nicolás & Meroño-Cerdán, 2011)		x	x

study. As shown in Table 2, the results of all the outer loadings are accepted, except one item related to (CP4) and (PP7) was deleted from the initial measurement model due to the low loading factor, which was less than 0.5.

The next step after assessing the convergent validity measure is the discriminant validity measure, which is designed to discover whether or not two measures are correlated/related. The discriminant validity can be measured through different methods using Fornell Larcker's (1981) criterion and the Hetrotrait-Monotrait ratio of criterion (HTMT). The Fornell-Larcker criterion is a discriminant validity approach, in which the square root of each construct's AVE should be greater than its correlation with any other construct. It is suggested that the HTMT value should be in the range of 0.85 to 0.90, meaning that the two constructs are distinct (Hair et al., 2016). The results in Table 3 for discriminant validity show that all the constructs share more variance with their indicators than with other constructs. The results of HTMT in Table 4 demonstrate that the constructs are more correlated with their respective indicators than the other constructs in this model. Thus, there is adequate discrimination in the constructs (Figure 5).

Second Order Model

Since all three main variables (independent variables and mediator) are second order latent variables, to evaluate the significant contribution of all the first order latent variables they are investigated using the bootstrap approach. Table 5 shows the second order models using bootstrapping. The results for innovation with two subscales, including atmosphere and opportunities, indicate that both atmosphere ($\beta =0.947$, p<0.001) and opportunities ($\beta =0.932$, p<0.001) significantly contribute to innovation as a second order latent variable; the standardized path coefficient (outer loadings) is above 0.7 and significant. The results for KMC with three subscales, KA ($\beta =0.878$, p<0.001), KS ($\beta =0.745$, p<0.001), and KU ($\beta =0.726$, p<0.001), also indicate that all first order variables has a loading above 0.7. For the AIS use, the five first order subscales CP, DM, FR, OE, and PP for the standardized path coefficients (outer loadings) are above 0.7 and significant. The highest outer loading is observed for the PP ($\beta =0.752$, p<0.001) followed by FR ($\beta =0.750$, p<0.001), DM ($\beta =0.734$, p<0.001), OE ($\beta =0.732$, p<0.001), and CP ($\beta =0.670$, p<0.001) (Figure 6).

Structural Model

The first model shows the effects of the use of AIS and KMC in addition to the effect of innovation on OP, and also its mediating effect on the relationship between the use of AIS and KMC with OP. The second path model shows the effect of five subscales of use AIS and three subscales of KMC on OP. Figures 5 and 6 show the standardized path coefficients (β) and p-values; the significance of the paths, and the R^2 for each endogenous construct is tested. The results of the bootstrapping method are shown in Table 6, which demonstrates the p-values for each path. According to the results, the effect of KMC and the use of AIS on innovation are statistically significant (path a). According to these results the effect of KMC on innovation is positive and significant ($\beta =0.296$, p<0.001). Similarly, the use of AIS has a positive and significant ($\beta=0.566$, p<0.001) effect on innovation. The results of bootstrapping also indicate that innovation has a positive and significant ($\beta=0.330$, p<0.001) impact on OP (path b). Finally, these bootstrapping results also show that the direct effect (path c) of both independent variables on OP is statistically significant. Therefore, the direct effect of KMC on OP is positive and significant ($\beta =0.326$, p<0.001), also the use of AIS has a positive and significant effect ($\beta =0.352$, p<0.001) on OP. The adjusted R^2 for this model is 0.599 and 0.776 for innovation and OP, respectively.

On the other hand, the results of the predictive relevance (Q^2) values is 0.372 for innovation and 0.507 for OP, which means that the independent constructs have predictive relevance for both the mediator and dependent constructs under consideration in this study (Hair et al., 2016). Mediation analysis is done based on Hair et al. (2014). Table 7 represents the indirect effect of the use of AIS and KMC on OP through innovation using bootstrapping. According to these results, innovation

Table 2. Results of convergent validity

Construct	Items	Outer loadings		Cronbach's Alpha	CR	AVE
		Initial	Modified			
Controlling Process	CP1	0.803	0.805	0.896	0.92	0.658
	CP2	0.832	0.835			
	CP3	0.828	0.824			
	CP4	0.482	del			
	CP5	0.787	0.792			
	CP6	0.803	0.807			
	CP7	0.795	0.803			
Decision-Making	DM1	0.861	0.861	0.915	0.934	0.703
	DM2	0.833	0.833			
	DM3	0.838	0.839			
	DM4	0.855	0.855			
	DM5	0.813	0.813			
	DM6	0.828	0.827			
Financial Reporting	FR1	0.802	0.802	0.932	0.945	0.712
	FR2	0.862	0.862			
	FR3	0.866	0.866			
	FR4	0.847	0.847			
	FR5	0.86	0.86			
	FR6	0.878	0.878			
	FR7	0.786	0.786			
Innovation atmosphere	INNAT1	0.866	0.866	0.927	0.943	0.733
	INNAT2	0.873	0.873			
	INNAT3	0.872	0.872			
	INNAT4	0.799	0.799			
	INNAT5	0.896	0.896			
	INNAT6	0.828	0.828			
Innovation opportunities	INNOP1	0.901	0.901	0.929	0.946	0.779
	INNOP2	0.918	0.918			
	INNOP3	0.88	0.88			
	INNOP4	0.874	0.874			
	INNOP5	0.838	0.838			
Knowledge Acquisition	KA1	0.788	0.788	0.884	0.912	0.634
	KA2	0.823	0.823			
	KA3	0.787	0.787			
	KA4	0.808	0.808			
	KA5	0.808	0.808			
	KA6	0.762	0.762			

Table 2. Continued

Construct	Items	Outer loadings		Cronbach's Alpha	CR	AVE
		Initial	Modified			
Knowledge Sharing	KS1	0.806	0.806	0.854	0.901	0.696
	KS2	0.862	0.862			
	KS3	0.846	0.846			
	KS4	0.821	0.821			
Knowledge Utilization	KU1	0.862	0.862	0.891	0.925	0.754
	KU2	0.886	0.886			
	KU3	0.89	0.89			
	KU4	0.836	0.836			
Operational Efficiency	OE1	0.795	0.796	0.921	0.937	0.679
	OE2	0.866	0.866			
	OE3	0.864	0.864			
	OE4	0.834	0.834			
	OE5	0.799	0.799			
	OE6	0.807	0.807			
	OE7	0.798	0.798			
Planning Process	PP1	0.713	0.716	0.898	0.917	0.552
	PP10	0.71	0.711			
	PP2	0.764	0.77			
	PP3	0.749	0.754			
	PP4	0.788	0.792			
	PP5	0.711	0.716			
	PP6	0.718	0.715			
	PP7	0.411	del			
	PP8	0.765	0.759			
	PP9	0.754	0.753			
Organizational Performance	PERF1	0.801	0.807	0.916	0.935	0.706
	PERF2	0.863	0.863			
	PERF3	0.872	0.872			
	PERF4	0.88	0.88			
	PERF5	0.848	0.848			
	PERF6	0.774	0.774			

significantly mediates the relationship between the use of AIS and OP ($\beta=0.187$, $p<0.001$). The relationship between KMC and OP is also significantly mediated through innovation ($\beta=-0.098$, $p<0.001$).

The results of the total direct and indirect effect are offered in Table 8. The results confirm that that the use of AIS has a direct and indirect effect on OP and is statistically significant, and that innovation partially mediates the relationship between the use of AIS and OP. Also, these results reveal that both the direct and indirect effects of KMC on OP are statistically significant, and that innovation partially mediates the relationship between KMC and OP.

Table 3. Correlation of latent variables and discriminant validity (Fornell-Larcker)

	1	2	3	4	5	6	7	8	9	10	11
Atmosphere	0.856										
Controlling Process	0.428	0.811									
Decision-making	0.651	0.351	0.838								
Financial Reporting	0.519	0.375	0.487	0.844							
Knowledge Acquisition	0.535	0.322	0.456	0.471	0.796						
Knowledge Sharing	0.447	0.226	0.463	0.336	0.498	0.834					
Knowledge Utilizing	0.446	0.162	0.357	0.337	0.447	0.344	0.868				
Operational Efficiency	0.516	0.347	0.433	0.411	0.359	0.265	0.254	0.824			
Opportunities	0.767	0.418	0.585	0.548	0.506	0.393	0.414	0.522	0.883		
Organizational Performance	0.74	0.44	0.684	0.635	0.652	0.564	0.512	0.572	0.751	0.84	
Planning Process	0.422	0.504	0.396	0.39	0.332	0.314	0.222	0.442	0.422	0.507	0.743

Table 4. Correlation of latent constructs and discriminant validity (HTMT method)

|	1	2	3	4	5	6	7	8	9	10	11
Atmosphere											
Controlling Process	0.468										
Decision-making	0.704	0.383									
Financial Reporting	0.555	0.409	0.522								
Knowledge Acquisition	0.591	0.362	0.504	0.517							
Knowledge Sharing	0.502	0.258	0.524	0.375	0.573						
Knowledge Utilizing	0.489	0.182	0.392	0.367	0.503	0.394					
Operational Efficiency	0.557	0.378	0.47	0.44	0.399	0.299	0.279				
Opportunities	0.825	0.458	0.634	0.588	0.558	0.441	0.453	0.563			
Organizational Performance	0.802	0.484	0.744	0.684	0.725	0.637	0.567	0.619	0.815		
Planning Process	0.461	0.558	0.433	0.421	0.372	0.358	0.249	0.483	0.461	0.558	

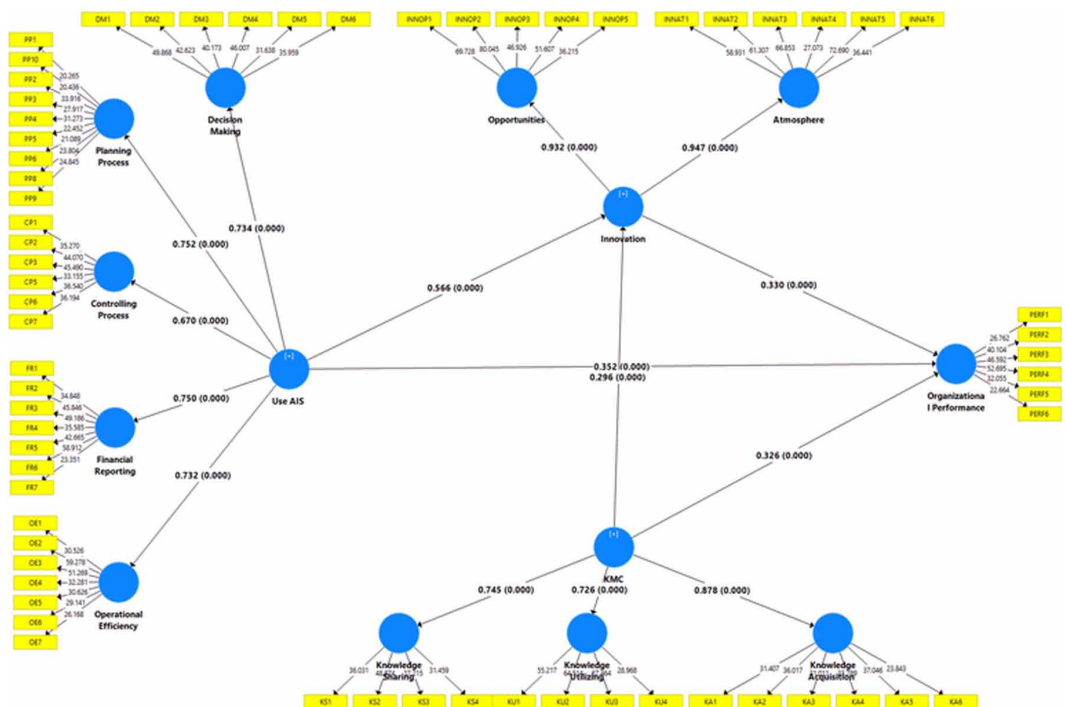**Figure 5. Path model 1 (PLS Algorithm)**
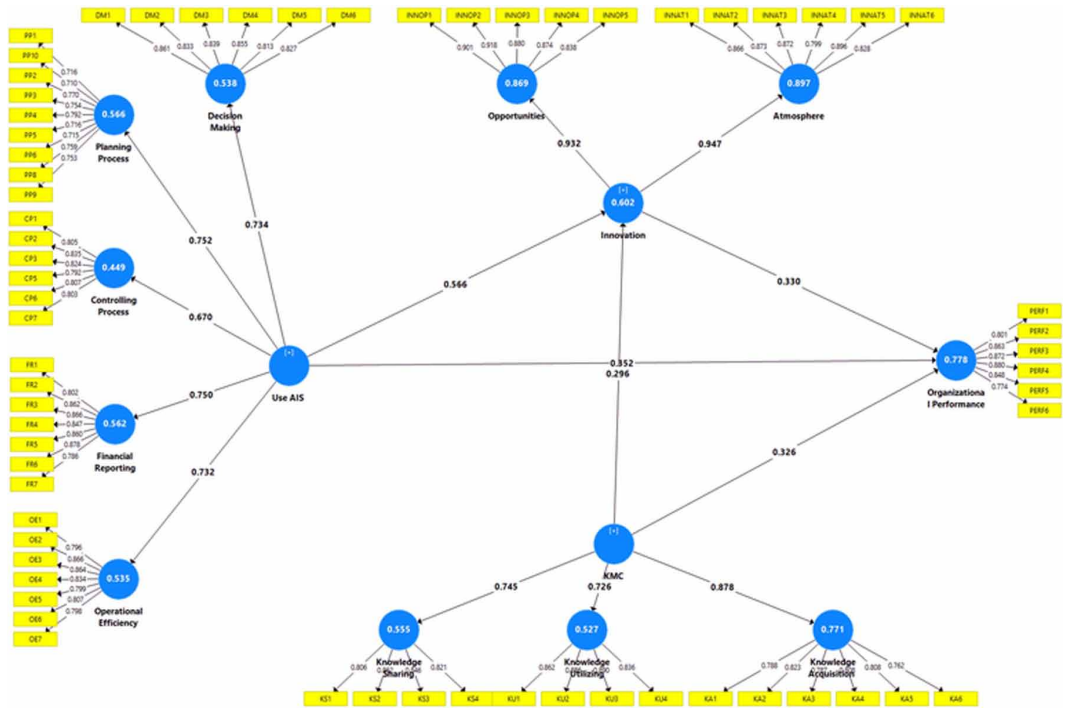
Figure 6. Path model 1 (Bootstrapping)

Table 5. Test of second order models using bootstrapping

Construct	Outer Loading	SE	T Values	P Value
Innovation -> Atmosphere	0.947	0.006	147.266	<0.001
Innovation -> Opportunities	0.932	0.008	110.99	<0.001
KMC -> Knowledge Acquisition	0.878	0.016	55.5	<0.001
KMC -> Knowledge Sharing	0.745	0.031	23.956	<0.001
KMC -> Knowledge Utilizing	0.726	0.034	21.303	<0.001
Use AIS -> Controlling Process	0.670	0.037	18.184	<0.001
Use AIS -> Decision-Making	0.734	0.029	25.553	<0.001
Use AIS -> Financial Reporting	0.750	0.032	23.317	<0.001
Use AIS -> Operational Efficiency	0.732	0.035	20.68	<0.001
Use AIS -> Planning Process	0.752	0.033	22.971	<0.001

The results of bootstrapping in Figure 7 for model 2, show the reveal p-values for each path. Based on the findings, the effects of all the independent variables on OP are statistically significant.

According to these results the effect of using AIS on OP is positive and significant ($\beta=0.352$, p<0.001). The effect of the CP on OP is positive and significant ($\beta =0.054$, p=0.034). Similarly, DM has a positive and significant ($\beta=0.247$, p<0.001) effect on OP. The results also show that FR ($\beta =0.196$, p=0.001) and OE ($\beta =0.182$, p=0.001) have a positive and significant effect on OP. Based on these results the last subscale for using AIS, which is PP, is also has a positive and significant ($\beta =0.081$, p=0.006) effect on OP.

The results of the effect of KMC on OP are positive and significant ($\beta=0.326$, p<0.001). The effect of all three subscales of KMC are statistically significant. KA ($\beta =0.197$, p=0.001) has a

Table 6. List of hypotheses and relative paths for first model

	β	SE	T value	P Values
Path a				
KMC -> Innovation	0.296	0.048	6.116	<0.001
Use AIS -> Innovation	0.566	0.045	12.577	<0.001
Path b				
Innovation -> Organizational Performance	0.330	0.04	8.158	<0.001
Path c				
KMC -> Organizational Performance	0.326	0.036	9.003	<0.001
Use AIS -> Organizational Performance	0.352	0.043	8.125	<0.001

Table 7. Test of indirect effects using bootstrapping

Path	β	SE	t value	p value
Use AIS -> Innovation -> Organizational Performance	0.187	0.028	6.76	<0.001
KMC -> Innovation -> Organizational Performance	0.098	0.02	4.908	<0.001

**Table 8. Total (Direct and Indirect) effects KMC and use AIS on OP**

Path	Total effect	Direct effect	Indirect effect	Results
Use AIS -> Organizational Performance	0.539 (p<0.001)	0.352 (p<0.001)	0.187 (p<0.001)	Partially Mediation
KMC -> Organizational Performance	0.424 (p<0.001)	0.326 (p<0.001)	0.098 (p<0.001)	Partially Mediation

positive and significant effect on OP. Also, KS (β =0.150, p<0.001) and KU (β =0.146, p<0.001) have a significant effect on OP. The adjusted R^2 for OP in this model is 0.745, which indicates that 74.5 percent of OP could be explained by the 8 exogenous variables. The result for the Q^2 value of OP is 0.488, which is larger than zero, and, hence, the independent constructs have predictive relevance for the dependent constructs under consideration in this study (Hair et al., 2016).

DISCUSSION

To answer the questions, hypotheses were established to test the relationships among the factors that can affect organizational performance. These relationships were measured to construct the research framework based on the perceptions of the managers/owners and IT practitioners in SMEs using AIS, KMC, and innovation. The results are shown in Table 9 that the use of AIS has a positive and significant influence on the OP of SMEs (H1). This could be because using AIS appropriately in

Figure 7. Path model 2 (Bootstrapping)
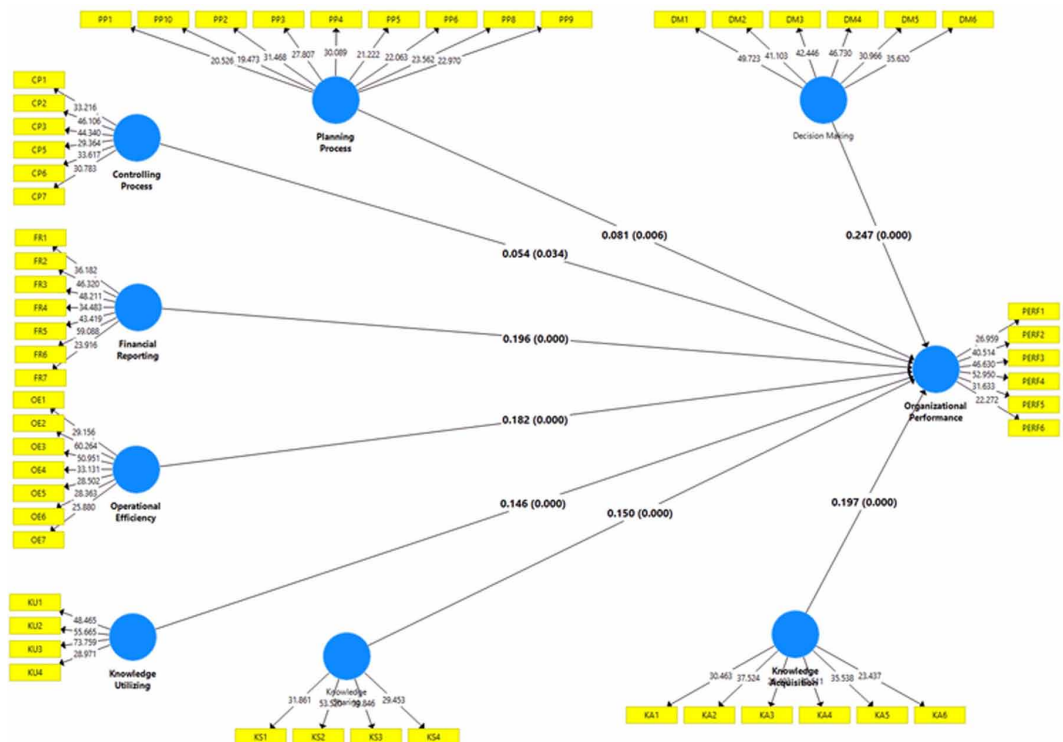
these firms enhanced their performance. Our result extends previous studies, such as Ismail and King (2005), Boulianne (2007), and Soudani (2012), who declare that the appropriate use of AIS in firms influences organizational performance.

As for (H1a) the results of this hypothesis show that the use of AIS for decision-making has a positive and significant influence on organizational performance. From this result, we can understand why managers/owners are interested in using the system. In other words, they seek to identify a better means of decision-making through the use of AIS in their firm. This result is in line with the previous work of Fredrickson (1984) and Hanifi and Taleei (2015). In addition, it extends the efforts of Awasthi and Varman (2003) concerning how the information technology improved the rationality, and speed of decision-making. The results show that the use of AIS for the controlling process (H1b) has a positive influence on organizational performance. Potentially, this could indicate sufficiency at the level of firm strategy or the managers/owners giving interest to this construct, which they consider important in firms. This result is relevant to the work of Vuko and Ojvan (2013) who confirmed the importance of the controlling process to enhance business performance. Also, Duh et al. (2006) investigated the strategy of IT applications for controlling, and firm performance, and found a statistically significant positive relationship between the expansion of IT applications and organizational performance.

The results of (H1c) show that the use of AIS for operational efficiency has a positive relationship and significant influence on organizational performance. This is probably because the managers/owners are more likely to use AIS to increase their efficiency, reliability, and quality, which can improve their ability to enhance the performance of SMEs. The finding is in line with Baik et al. (2013), who studied the changes within operational efficiency and business performance, and extends the study on operational efficiency of information technology and organizational performance by Lausa (2016) who declared that operational efficiency has a significant relationship to firm performance. The results show that the use of AIS for the planning process has a positive relationship and influence on organizational performance (H1d). This is normal as the SME managers/owners try to define the

Table 9. List of hypotheses and relative paths

Hypothesis	Path	B	*p* value	Results
H1	AIS→OP	0.352	<0.001	Supported
H1a	DM→OP	0.247	<0.001	Supported
H1b	CP→OP	0.054	0.034	Supported
H1c	OE→OP	0.182	<0.001	Supported
H1d	PP→OP	0.081	0.006	Supported
H1e	FR-→OP	0.196	<0.001	Supported
H2	KMC→OP	0.326	<0.001	Supported
H2a	KA→OP	0.197	<0.001	Supported
H2b	KS→OP	0.150	<0.001	Supported
H2c	KU→OP	0.146	<0.001	Supported
H3	AIS→INN	0.566	<0.001	Supported
H4	KMC→INN	0.296	<0.001	Supported
H5	INN→OP	0.330	<0.001	Supported
H6	AIS →INN→OP	0.187	<0.001	Supported
H7	KMC→INN→.OP	0.098	<0.001	Supported

* P<0.05, ** P<0.01, *** P<0.001

objectives and resources for a firm's future direction and business needs to align with information technology and the strategic application to achieve these objectives.

It also evident from the previous work of Watts et al. (1990) and Mcilquham-schmidt (2010) who declared that there is a relationship between planning and performance. Also Yang (2017), who studied the planning success within the strategic information systems, reported that planning within IS/IT is particularly significant in any organizational context, and showed a relationship between the expansion of IT applications and organizational performance. As observed, the results for (H1e) show that the use of AIS for financial reporting has a positive influence on organizational performance. This means that this system provides services to do this task and provides an overall good level of information sources at any time for SMEs. This is clear from Imeokparia (2013) and Murungi and Kayigamba (2015) who claimed that information systems and computerized accounting systems make a positive contribution to the generation of financial reports. Another study also found some significant correlations between the extent and frequency of financial reports and the measures of growth and performance of SMEs (McMahon, 2001).

The results show that KMC have a positive influence on organizational performance (H2). This result means that KMC for managers/owners help them to improve their firm's performance. In addition, the usefulness of the implementation of KMC gives them a special ability to improve their competitive business. This is also supported by previous research work, such as Rasula et al. (2012) who claimed that KMC have a positive effect on organizational performance. KMC for Knowledge acquisition with the path coefficient show a positive influence on organizational performance (H2a). This result means that knowledge acquisition is considered to be a significant factor for SMEs. In fact, creating new knowledge in terms of learning current information is part of KA and assists the progress of businesses to reach competitive advantage. The results are in line with some previous studies, such as Park et al. (2008) and Tsang et al. (2004), who confirmed that knowledge acquisition can help make more profit and that the amount of knowledge acquired contributes significantly to the organizational performance.

The results of KMC for knowledge sharing (H2b) show that KS has a positive influence on organizational performance. This was supported by Chang and Chuang (2011) who argued that there is a relationship between knowledge management through KS and firm performance. Many researchers have stated that knowledge sharing improves organizational performance; for example, Monica Hu et al. (2009) and Oyemomi et al. (2019). The results of KMC for knowledge utilization show that KU has a positive influence on organizational performance (H2c). This could be because the managers and owners may be interested in utilizing new ideas due to their willingness to improve performance. Alaarj et al. (2016) proved that when knowledge utilized activities have more profit, and, thus, enhance organizational performance. The results for H3 show that the use of AIS has a positive influence on innovation. The reason for this is that accounting information systems and innovation can be an important motivation for SMEs to survive and improve their business in a strong competitive environment. According to the previous work of Cofriyanti and Hidayanto (2013), it is evident that using information technology has an important positive impact on both innovations and the performance of firms. This is also supported by Lyu et al. (2009) and Yunis et al. (2018) who claimed that the use of information communication technology is positively related to organizational performance.

The results for H4 revealed that KMC has a positive influence on innovation. This is because the managers and owners may be interested in creating new ideas, and pay more attention to important precedents that enhance knowledge management capabilities in improving the atmosphere and opportunity innovation. Previous work supports these results, as Darroch (2005) and Wang and Wang (2012) argued that KMC had a significant effect on innovation speed and financial performance. As shown, the results for H5 present that innovation has a positive influence on organizational performance. This is because of the increasing changes in the business environment, which have given rise to reliance on information technology to gain and sustain competitiveness. The results are in some way consistent with the perspective of López-Nicolás and Meroño-Cerdán (2011), who stated that

innovation has a positive impact on performance in terms of finance and process. According to the results of H6, the coefficient of the indirect path shows that innovation partially mediates between the relationship of using AIS and organizational performance. This means that to make the investment of IT enterprises effective, SMEs should add innovative ideas and activities to help benefit information technology profits and expand firm performance. However, SMEs should think of implementing the concept of innovation for IT activities to enhance their competitive advantage due to the inadequacy of SME resources compared to large enterprises. This result is in line with Lyu et al. (2009) who showed that innovation mediated between IT and firm performance, while Yunis et al. (2018) contended that innovation mediated the relationship of ICT use and organizational performance.

The results for H7 of the indirect path showed that innovation partially mediated between the relationship of KMC and organizational performance. This is because KMC as an activity are the fundamental means through which managers or owners can contribute to utilizing and sharing knowledge, innovating, and ultimately gaining a competitive advantage. This result is supported by other studies (Vaccaro et al., 2010; López-Nicolás & Meroño-Cerdán, 2011; Wang & Wang, 2012; Wisnu et al., 2014). However, to achieve better performance, this study provides a guide to help managers or owners of SMEs to benefit as much as possible by means of the use of AIS, KMC, and innovations.

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

Review of previous studies highlights the gaps in the critical research related to SMEs and narrows it down to improve performance of the SMEs with little attention paid to the use of AIS, KMC, and innovation. This study aims to fill existing gaps in the literature and contributes by examining the use of AIS, KMC, and innovation as variables to enhance organizational performance. This study contribute to the pool of literatures in this field in the context of SMEs in developing country.

The researchers were interested in exploring the relationships between the use of AIS factors, KMC factors, and innovation factors, and organizational performance in Iraqi SMEs. The results provide evidence for the real need to obtain benefits from the use of AIS, KMC, and innovation. Accordingly, the results have shown that the use of AIS and KMC can improve performance of the SMEs through innovation. A unique framework was developed to improve the use of AIS, KMC, and innovation to enhance SMEs performance. This study believes that owners and decision-makers of SMEs can better utilize the AIS and KMC, and incorporate innovation in diverse processes. In other words, the diffusion of innovation could produce a high level of sustainability for SMEs to gain competitive advantage through creating an environment and opportunities for innovation within firms.

Meanwhile, the SMEs in Iraq emphasize the importance of every dimension for using AIS at different levels. Most SMEs are willing to fully use the system for different levels. While the important challenges for managers and owners are the lack of support and finance from the government (Kareem et al., 2019a). This study added more details and a description of the current use of AIS and the state of KMC and innovation orientation in Iraqi SMEs. The challenges and specified issues could assist decision-makers and future research in the area of SMEs to better understand and develop the current systems. In addition, it identified the managers and owners needs in terms of utilizing the system and capabilities of knowledge management and innovation. Hence, government policymakers and regulators channel resources and assistance to strengthen use of AIS, KMC, and innovation practices among SMEs. This study has several limitations that deserve consideration. These limitations could open prospects for more research by future researchers in the same field. This study only investigates the influence of the use of AIS, KMC, and innovation of SMEs in Iraq, which may limit generalization of the results, as there may be significant differences in other geographical settings. Also, the study uses a quantitative research design to examine the relationship among variables, future work could use a qualitative research design to uncover new factors, and gain a deeper understanding of the dynamics of the factors. In addition, the scope of research is confined to SMEs, hence, future researchers could consider the extent of study on large and micro-companies for comparative analyses.

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APPENDIX A

Table 10. Measurement items

Factor and References	Item
Decision-Making (Awasthi and Varman, 2003)	Using AIS helps my firm in the following decision-making output:
	1. Rational decision-making 2. Speed of decision-making 3. Formalization in decision-making 4. Participation in decision-making 5. Influence in decision-making 6. Type of decision-making
Controlling processes (Nicolaou, 2000) (Yin, 2015)	Using AIS helps my firm in the following controlling processes:
	1. Provide control reports frequently on a systematic, regular basis, e.g. daily, weekly reports 2. Provide information useful for ongoing monitoring decisions and actions 3. Use indicators from competitive ability of early warning system to assess success or failure 4. Provide information about the business' reaction strategy 5. Check the validity of the business strategy 6. Provide feedback to enable adjustments to be made 7. Provide feedback about the strategy performance in the market
Operational efficiency (McDermott and Stock, 1999)	Using AIS helps my firm in the following operational efficiency:
	1. Improve workflow 2. Increase output 3. Increase efficiency 4. Increase reliability 5. Increase repeatability 6. Increase quality 7. Increase flexibility
Planning Process (Mirchandani and Lederer, 2014)	Using AIS helps my firm to perform the following planning process:
	1. Align information technology with business needs 2. Gain a competitive advantage from information technology 3. Identify new and higher payback applications 4. Identify strategic applications 5. Increase top management commitment to information technology 6. Improve communication about information technology with users 7. Forecast information technology resource requirements 8. Allocate information technology resources 9. Develop an information architecture 10. Increase visibility of information technology in the organization
Financial reporting (McChlery et al., 2005)	Using AIS helps my firm in the following financial reporting process:
	1. Provide bank balance at any point in time 2. Provide information about debtors at any time 3. Provide information about creditors at any point in time 4. Provide good level of periodic reporting 5. Provide good level of annual budgeting 6. Provide good level of performance reporting 7. Provide good level of overall accounting system
Knowledge Acquisition (Cheng et al., 2016) (De Silva and Rossi, 2018) Knowledge sharing (Cheng et al., 2016)	My firm has processes that can continuously …
	1. Acquire information from customers 2. Acquire information from external partners 3. Use feedback from customers and external partners to improve subsequent services 4. Acquire new basic knowledge 5. Acquire the technology the company needs 6. Acquire intellectual property 1. Exchange information with its customers 2. Exchange information with its external partners 3. Share information effectively throughout the organization 4. Share information between all parties involved in new service development

Table 10. Continued

Factor and References	Item
Knowledge utilization (Chen and Fong, 2012)	My firm…
	1. Uses accumulated knowledge to solve new problems 2. Applies knowledge to changing competitive conditions 3. Uses shared knowledge to improve efficiency 4.Applies knowledge learned from mistakes
Innovation atmosphere (Yunis et al., 2018) Innovation opportunities (Yunis et al., 2018)	The following statements describe the innovation orientation at my firm…
	1. Pursuit of novel knowledge 2. Search for latest technology 3. Investigation in various directions 4. Exploration of new areas 5. Discovery 6. Breakthrough improvements 1. Opportunities for product innovation are abundant in our industry 2. Opportunities for technology innovation are abundant in our industry 3. High research and development spending in industry 4. High research and development spending in company 5. Our products/services require the adoption of new and different methods and procedures
Organizational performance (King et al., 2010)	Over the past 3-year period, compared to key competitors, my firm…
	1. Is more competitive 2. Has more customers 3. Is growing faster 4. Is more profitable 5. Is more innovative 6. Has more employees

APPENDIX B

Table 11. Demographic information

Variable	Level	Frequency	Percent
Age	25-30	76	24.4
	31-35	81	26
	36-40	94	30.1
	>40	61	19.5
Education level	Bachelor's	170	54.5
	Diploma	76	24.4
	Master	44	14.1
	PhD	22	7.1
Position	Manager	141	45.2
	Owner	95	30.4
	Others	76	24.4
Years of experience using Accounting Information System.	Less than 1 year	35	11.2
	1 – 2 years	55	17.6
	3 – 4 years	90	28.8
	More than 4 years	132	42.3
Industry	Agriculture	23	7.4
	Manufacturing	36	11.5
	Construction	70	22.4
	Trade and Retail	88	28.2
	Services	39	12.5
	Others	56	17.9
Number of full-time employees	4 – 10	185	59.3
	11 – 50	127	40.7
Importance of Accounting Information System to your firm	Very important	162	51.9
	Important	88	28.2
	Medium Priority	38	12.2
	Low Priority	16	5.1
	Not a Priority	8	2.5
Years of firm establishment	Less than 2 years	46	14.7
	2–10 years	156	50
	More than 10 years	110	35.3
Firm Structure	Individual	167	53.5
	Partnership	102	32.7
	Family Business	43	13.8

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