Organizational learning, knowledge management capability and supply chain management practices in the Saudi food industry

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Abstract

Purpose – *The purpose of this paper is to examine the effect of knowledge management capabilities (KMCs) on organizational learning (OL) and supply chain management practices (SCMPs). In addition, to study the effect of OL, KMC and supply chain management on organizational performance (OP).*

Design/methodology/approach – *To study the relationships between KMC, OL, SCMP and OP, different techniques such as factor analysis, correlation analysis and structural equation modeling were used to verify the validity of the proposed conceptual model, and to test the suggested hypotheses, data collected from 165 companies in the Saudi food industry (representing a response rate of 64.9 per cent) were used.*

Findings – *According to the study's findings, SCMP and OL are positively affected by KMC. Moreover, OP is directly affected by KMC, OL and SCMP.*

Research limitations/implications – *Owing to the specific nature of the sample, the findings of the current research are applicable only to the food industry.*

Originality/value – *The current research introduced a conceptual model, which has been tested and verified in the Saudi food industry. The findings recommend that both KMC and OL as well as SCMP will contribute to improving the OP. In addition, KMC will improve the SCMP and OL.*

Keywords *Organizational learning, Knowledge management, Supply chain management, Organizational performance*

Paper type *Research paper*

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1. Introduction

Organizations are operating in a global business environment characterized by rapid changes, technological advancements, changing customer needs and higher competition (Bolívar-Ramos *et al.*, 2012; Patnaik *et al.*, 2013). For organizations to survive in such a turbulent environment, they must promote their capacity to learn new practices and technologies and consistently improve their performance and long-term organizational success (Weldy and Gillis, 2010; Argote and Miron-Spektor, 2011). In addition, organizations attempt to introduce new business approaches including total quality management, just-in-time approach, business process reengineering and supply chain management to improve their performance and competitive advantage (Saad and Patel, 2006; Ashok *et al.*, 2016).

The resource-based view theory, which originated from the strategic management literature, suggests that firms compete based on their resources and capabilities. A resource is referred to anything tangible or intangible possessed or acquired by a firm, while a

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capability is the ability to utilize resources to perform tasks or activities (Hall, 1993; Yang *et al.*, 2009). Organizations with valuable, rare, inimitable and non-substitutable resources would be able to accomplish value-creating strategies that are not easily duplicated by other competitors, knowledge-based resources and capabilities are the result of outstanding access to and combination of specialized knowledge which would generate superior firm performance as well as sustained competitive advantage among firms (Barney, 1991). According to Nasir Uddin, (2010, p. 27), the knowledge management would enable a firm "to develop rare and valuable knowledge through learning, and subsequently to build upon and spread that rare knowledge throughout the organization for enhancing performance".

In knowledge-based era, knowledge is viewed as the key strategic resource for organizational survival, stability, growth and improvement (Hassan and Al-Hakim, 2011). In addition, knowledge is considered the basis for the development of core competencies that will create competitive advantages as well as improve organizational performance (OP) (Halley and Beaulieu, 2005). Through knowledge organizations can enhance cooperation and information sharing among employees, decision-making, productivity and innovation (Bennet and Tomblin, 2006; King, 2009; Chang and Chuang, 2011; Gharakhani and Mousakhani, 2012). The aim of knowledge management is to develop approaches that facilitate getting the right knowledge at the right time to the right person and in the right format (Halawi *et al.*, 2006). Also, knowledge management would assist organizations to remain competitive, through sharing information with the external partners and knowing their competitors' products, services, strategies and best practices (Kyobe, 2010).

For organizations to compete in the global markets, they need a well-integrated supply chains. Previous studies highlighted the significant role of managing the supply chain within the firm (Ibrahim and Ogunyemi, 2012). Supply chain management is one of the tools used by organizations to improve their business performance as well as to retain their competitive advantage, as competition is among supply chains and not between individual organizations (Li *et al.*, 2006; Ou *et al.*, 2010; Attia, 2015, 2016a, 2016b). Various researchers have proposed different dimensions of supply chain management practice (SCMP), for example, Tan (2002) used the flow of materials and information, mass customization and postponement strategy as SCMP. Tan (2002) suggested other dimensions including supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and just-in-time capability. Min and Mentzer (2004) developed a system approach to identify SCMP including agreed vision and goals, information sharing, risk and reward sharing, cooperation, process integration, long-term relationship and agreed supply chain leadership. Furthermore, Chen and Paulraj (2004) included long-term relationship, communication, cross-functional teams, supplier-base reduction and supplier involvement as measures for SCMP.

Moreover, Li *et al.* (2006) developed and validated a multidimensional model for SCMP consisting of six dimensions for SCMP, including strategic supplier partnership, customer relationship, information sharing and information quality, internal lean practices and postponement. Researchers consider these dimensions as a comprehensive model for SCMP (Sundram *et al.*, 2011), as they cover upstream and downstream aspects of a supply chain, information flow across a supply chain as well as internal supply chain processes. Using these SCMP, Ibrahim and Ogunyemi (2012, p. 445) considered supplier and customer relationship as valuable resources to the organization, while level and quality of information sharing as the main determinant of the ability to acquire knowledge.

Similarly, Robb *et al.* (2008) used customer relationships, supplier relationships, e-commerce and enterprise software to measure SCMP. In addition, Koh *et al.* (2007) and Bayraktar *et al.* (2009) examined 12 SCMP in small and medium-sized enterprises (SMEs) using just-in-time supply, many suppliers, holding safety stock, subcontracting, few

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suppliers, close partnership with suppliers, strategic planning, outsourcing, third-party logistics, close partnership with customers, e-procurement and supply chain benchmarking. Furthermore, Khang *et al.* (2010) investigated SCMP in the service sector using customer orientation, knowledge sharing, information technology (IT) adoption, partnership, leadership and training as dimensions for SCMP.

Yap and Tan (2012) proposed a conceptual framework of service SCMP including, IT management, demand management, customer relationship management, supplier relationship management and capacity and resource management and its relationship on OP in Malaysian public healthcare sector. Also, Jabbour *et al.* (2011) provided a framework with four constructs of SCMPs including, supply chain integration for production planning and control support, information sharing about products and targeting strategies, strategic relationship with customer and supplier, and support customer order. In addition, based on review of previous studies, the following table shows the most common SCMP.

Collaborative relationships between supply chain partners would enable quick response to changing customer requirements as well as facilitate knowledge sharing about products, processes and markets (Li *et al.*, 2012). SCMPs are a set of processes and activities that manage the coordination and information sharing between suppliers and customers with the goal of improving the performance of the whole supply chain (Wong *et al.*, 2005; Koh *et al.*, 2007). In general, the successful integration of a supply chain needs linking of internal processes with external suppliers and customers (Halley and Beaulieu, 2005).

The knowledge-based theory suggest that the intangible resources help the organizations in gaining competitive advantages, but the resource-based theory rely on both tangible and intangible resources in gaining competitive advantages. According to Theriou *et al.* (2009), the resource-based theory and knowledge-based theory are complementary in explaining the sources of competitive advantage through their effects (direct and indirect) on performance; also, the knowledge-based perspective has been emerged from the resource-based theory. In addition, Mitchell and Cohen (2006) compare between the two perspectives as shown in Table I.

The knowledge-based theory is targeting mainly the role of knowledge management in creating competitive advantages; in contrary, the resource-based theory concentrates on measuring the effect of integrating different resources on creating competitive advantages. The current research tests the effect of different resources such as knowledge management capability (KMC) and SCMP on improving the OP; accordingly, the resource-based theory is a more suitable theoretical base for the current study compared to knowledge-based theory.

The current research tests the effect of both knowledge management and supply chain practices (intangible and tangible); accordingly, the resource-based theory will be the main driver for the current research (Xu *et al.*, 2014). Knowledge management is considered complementary to organizational capabilities that contribute to organizational success, and a successful organizational learning (OL) process depends on well-established knowledge management infrastructure, which includes both social and technical enablers. However, previous studies, which examined the relationship between knowledge management and OL, considered knowledge management from a process perspective and not from a socio-technical perspective (Yang and Chen, 2009; Sanz-Valle *et al.*, 2011; Jain and Moreno, 2015).

In addition, for organizations to improve their performance and survive in a competitive environment, they must collaborate and build long-term relationships with upstream and downstream partners in the supply chain, the relationships with external partners in the supply chain enable the organization to diversify the sources of knowledge to enhance the process of innovation (Xu *et al.*, 2014), KMC is viewed as a fundamental strategic asset that facilitates the coordination and integration between supply chain members

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Table I Comparison between resource-based theory and knowledge-based theory

Theory	*Purpose of Theory*	*Reason for Existence of the Firms*	*Scale and Scope*	*Reason for Persistence of the Firms*
Resource-based	Analyze firms from the resource side rather than from the product side	Because the creation of new productive services requires the collection of resources that results in a firm	The indivisibility of the resource bundles that must be collected to satisfy relevant demand for heterogeneous productive services	Resources are rare and non-substitutable; and because of unique historical conditions, causal ambiguity and/or social complexity, are also imperfectly imitable
Knowledge-Based	Explain knowledge creation, sharing and transfer within a firm	Knowledge-based view does not explain why firms exist in lieu of opportunism or moral hazard	What the firm makes and what it buys	Combinative capabilities in the creation of difficult to codify and highly complex embedded knowledge

Source: Adopted from Mitchell and Cohen (2006)

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(Rashed *et al.*, 2010; Abdul Wahab and Sardabi, 2011; Samuel *et al.*, 2011; Tan and Cross, 2012; Xu *et al.*, 2014). However, limited studies have examined the relationship between KMC from a side and OL and SCMP from another side, in addition to their effect on OP (Wong and Wong, 2011).

The academic importance of this study lies in its contribution to the existing literature by linking resource-based organizational capabilities and inter-organizational practices with OP. Few studies investigated the relationship between KMC and OL process from a socio-technical perspective (Noruzy *et al.*, 2013; Sanz-Valle *et al.*, 2011; Yang and Chen, 2009), especially in developing countries (Jain and Moreno, 2015; Nafei, 2014). In addition, limited studies examined the link between resource-based organizational capabilities, including knowledge management and inter-organizational coordination, namely, SCMP (Tan and Cross, 2012; Wong and Wong, 2011; Xu *et al.*, 2014).

In addition, examining KMC, OL and SCMP within a causal model will help in explaining their effect on OP in more detail. From the practical perspective, this research will provide useful information for managers and decision-makers in Saudi food industry to know whether resource-based organizational capabilities and inter-organizational practices contribute in improving the OP of their factories. Owing to the limited studies in the developed countries regarding the KMC and how it affects the OL, in addition to the limited studies in general regarding the relationship between KMC, SCMP and OP, the current study aims to answer the following questions:

Q1. Do KMCs have an impact on the OL process in the Saudi food industry?

Q2. Do KMCs have an impact on SCMP in the Saudi food industry?

Q3. Do KMCs, OL and SCMP have an impact on OP in the Saudi food industry?

The required data to answer the previous research questions collected from Saudi food industry because it is considered as one of the knowledge-intensive sectors explain by its considerable amount of knowledge input, short life cycles of product, high customized products demand and significant production value" (Hui *et al.*, 2013, p. 334). Food industry in Saudi Arabia is one of the Kingdom's leading industries, as it is ranked second in terms of job numbers, accounting for 15 per cent of local employment in 2015. In addition, it is ranked fourth in terms of investment, accounting for 5.2 per cent of total investment in the Kingdom of Saudi Arabia (Ministry of Commerce and Investment, 2016). Saudi food industry is by far the largest market in the Gulf region and the demand for processed and packaged goods among Saudi consumers is set to continue increasing as tastes and preferences evolve and lifestyles become busier. Around 59 per cent of the food companies that are large and well-established are located in five cities (see Table II).

(http://mci.gov.sa/MediaCenter/Reports/Statistics/Pages/stat-075.aspx)

2. Theory and hypothesis development

2.1 Knowledge management capability and supply chain management practices

KMC is ability of an organization to acquire, create, transfer, integrate, share and apply knowledge-related resources and activities across functional boundaries to generate new knowledge (Chuang, 2004; Ju *et al.*, 2006; Liao *et al.*, 2011). SCMP could be defined as the

Table II The geographical distribution of the Saudi food companies

City	*Jeddah*	*Riyadh*	*Dammam*	*Al-Kharj*	*Al-Ahsa*	*Other cities*	*Total*
Number of companies	149	146	59	37	36	305	732
%	20.36	19.95	8.06	5.05	4.92	41.67	100

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set of processes needed to manage the integration and coordination between supply, demand and relationships to satisfy client needs (Wong and Wong, 2011).

Recently, researchers have shown an increased interest in exploring the role of knowledge management in the supply chain management field. Several researchers believed that knowledge is a fundamental strategic asset that would contribute to the improvement and success of supply chains (Halley and Beaulieu, 2005; Chen *et al.*, 2009; Rashed *et al.*, 2010; Abdul Wahab and Sardabi, 2011; Samuel *et al.*, 2011). The rapid change in customers' need and shortening the lead time for the products have made it difficult for organizations to act alone to maintain their competitive advantages; therefore, they are depending on the active participation of members in the supply chain and sharing their needed knowledge (Wu, 2008; Wong and Wong, 2011). In addition, supply chain members are expected to achieve mutual benefits through collaboration, mutual trust, long-term commitment, partnership, frequent communication and information sharing (Maqsood *et al.*, 2007; Sambasivan *et al.*, 2009; Rashed *et al.*, 2010; Prajogo and Olhager, 2012).

Several researchers have argued that sharing, integrating and applying knowledge between supply chain members would lead to considerable benefits for organizations, for example, reducing cost and cycle time, improving quality and customer service levels (Ofek and Sarvary, 2001; Dalpati *et al.*, 2010). Thus, managing knowledge among supply chain members would lead to more effective and efficient supply chain processes (Schoenherr *et al.*, 2014) as well as long-term survival, competitive advantage and higher performance (Sambasivan *et al.*, 2009; Abdul Wahab and Sardabi, 2011).

There has been considerable research on the role of knowledge management in supply chain management, which concluded that knowledge management improves supply chain management in organizations. However, this relationship has been explored from various perspectives. For example, Li *et al.* (2012) provided evidence that collaborative knowledge management practices (including knowledge generation, storage, access, dissemination and application) result in enhanced supply chain integration and supply chain knowledge quality in eight manufacturing industries. Chen *et al.* (2009) investigated the relationship between e-business technology, organizational knowledge, supply chain practices and competitive performance in top manufacturing firms in 24 countries. They concluded that there is a positive relationship between organizational knowledge and supply chain practices which would result in improving competitive performance.

Based on empirical research among 163 Canadian manufacturing organizations, Halley and Beaulieu (2005) confirmed that effective knowledge management processes would enable the integration of internal SCMP with external suppliers and customers. Also, Dalpati *et al.* (2010) provided evidence that knowledge management processes have a significant positive impact on supply chain flexibility performance in 88 Indian manufacturing organizations. They concluded that knowledge sharing among supply chain members would lead to enhanced supply chain practices and thus better performance.

In addition, Sambasivan *et al.* (2009) investigated knowledge acquisition and knowledge application as supply chain knowledge processes and their relationship with supply chain learning and OP in Malaysian manufacturing organizations. They suggested that effective knowledge creation and application requires learning among supply chain members. Recently, Schoenherr *et al.* (2014) examined supply chain KMC in 195 SMEs in the USA. They concluded that supply chain KMC is a dynamic capability, which could lead to an effective decision-making process as well as an improved supply chain performance.

As shown above, previous research has focused on knowledge management processes or organizational capabilities on different supply chain constructs. For example, researchers have examined the relationship between knowledge management and supply chain integration and supply chain knowledge quality (Li *et al.*, 2012); supply chain performance (Schoenherr *et al.*, 2014); supply chain flexibility performance (Dalpati *et al.*, 2010);

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supplier's operational performance (Rashed *et al.*, 2010); supply chain technologies (Collins *et al.*, 2010); supply chain integration (Prajogo and Olhager, 2012); supply chain agility (Liu *et al.*, 2013); and e-business adoption in the supply chain (Chong *et al.*, 2014).

To date, only a few studies have examined the relationship between knowledge management infrastructure capability and SCMP. The most relevant work to this research is the study conducted by Wong and Wong (2011) in Malaysia. They examined the impact of both KMC and SCMP on OP. They argued that SCMP require KMC. KMC model was based on Gold *et al.* (2001), including both knowledge management infrastructure (technology, structure and culture) and knowledge management process capability. They concluded that technological and process capabilities facilitate knowledge sharing as well as building long-term relationships between supply chain partners. In addition, results showed that these KMC have a direct impact on OP as well as an indirect impact through SCMP.

H1. KMC has a positive impact on supply SCMPs.

2.2 Knowledge management capability and organizational learning

During the past decades, researchers have shown an increased interest in exploring the effect of intangible assets on organizational success (Bahrami *et al.*, 2013). Furthermore, previous studies provided evidence that implementing knowledge management or OL systems with other organizational systems and practices, such as innovation, human resource management, culture, IT, structure and leadership would enable organizations to cope with the dynamic and competitive business environment, which would lead to enhanced OP (Yang and Chen, 2009). However, relatively few empirical studies demonstrated the relationship between knowledge management and OL (Bahrami *et al.*, 2013; Nafei, 2014).

OL could be defined as multidimensional and interdisciplinary concept which has been studied from several perspectives including: psychology, sociology, organizational behavior and theory, strategy and management science and information systems (Argote and Miron-Spektor, 2011).

Knowledge management and OL are two complementary concepts; however, previous research is inconsistent in examining the relationship between them. Some researchers have argued that OL is the process that facilitates the creation of new knowledge; i.e. knowledge is the outcome of learning. Other researchers have considered knowledge management as the appropriate infrastructure and enabler that would support and facilitate the OL process (Yang and Chen, 2009; Noruzy *et al.*, 2013).

Previous studies have examined the effect of one or more of knowledge management enablers on OL. For example, López *et al.* (2004) conducted an empirical study among 195 Spanish organizations with more than 200 employees to analyze how the organizational culture affects OP through OL. They provided evidence that a collaborative culture would adjust organizational procedures and conducts to achieve enhanced performance, through the mediation of OL. A similar study was also conducted in the Spanish context by Sanz-Valle *et al.* (2011) and concluded that organizational culture promotes OL and innovation.

Yang and Chen (2009) proposed a framework for the relationship between knowledge management and OL. They suggested that knowledge management includes both social-based and technical-based organizational knowledge capabilities, which affect the OL process. In addition, they implemented the process view of OL using the dimensions of Huber (1991) and López *et al.* (2004): knowledge acquisition; knowledge dissemination; knowledge interpretation; and organizational memory. Moreover, Bahrami *et al.* (2013) provided evidence that some key knowledge management enablers including, human resource management, knowledge-based strategies and policies and IT have an impact on OL in Iranian banks.

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Recently, Nafei (2014) conducted a survey among 310 employees working in the Egyptian commercial banks and concluded that both knowledge management processes and OL improves OP. Similarly, Kafashpoor *et al.* (2014) provided evidence that knowledge management system results in higher OP through the mediating effect of organizational complexity and OL in 89 medium- and large-sized manufacturing companies in Iran.

In addition to the above-mentioned reviewed studies, researchers have considered knowledge management as the result of OL. Several studies documented that OL has a significant effect on knowledge management. For example, Noruzy *et al.* (2013) conducted an empirical study on 106 Iranian manufacturing organizations with more than 50 employees and tested a model interrelating transformational leadership, OL, knowledge management, organizational innovation and OP. The results showed that OL and knowledge management would improve OP in manufacturing firms through innovation. In addition, the findings provided a positive impact of OL on knowledge management.

Similarly, several studies have examined the impact of OL and knowledge management on OP, together with other organizational capabilities and policies: human resource management (Lin and Kuo, 2007; Theriou and Chatzoglou, 2009; Kuo, 2011); self-directed learning (Ho, 2008); organizational innovation (Kuo, 2011); and organizational capabilities (Theriou and Chatzoglou, 2009). These studies concluded that these capabilities and practices enhance OP and that knowledge management is the outcome of OL.

In sum, there is an inconsistency in the literature examining the relationship between OL and knowledge management. Accordingly, it could be concluded that some researchers believe that knowledge management enablers facilitate OL or knowledge management is the result of OL. However, most of the empirical studies have considered knowledge management from the process perspective rather than from the socio-technical perspective. Specifically, little research has been done to investigate the impact of KMC on OL processes from a socio-technical perspective. In addition, most of the studies focused on testing the effect of KMC on the OL; therefore, the current study followed the main stream of the studies in testing the effect of KMC on OL.

H2. KMC has a positive impact on OL.

2.3 Knowledge management capability and organizational performance

According to Pitt and Tucker (2008; p. 243), OP is defined as "a vital sign of the organization, showing how well activities within a process or the outputs of a process achieve a specific goal". Researchers have argued that organizations can enhance their performance or build up competitive advantage through effective management of their valuable as well as rare knowledge resources and capabilities (Tseng and Lee, 2014). Previous research has divided knowledge management into two broad perspectives: knowledge infrastructure capabilities (enablers) and knowledge processes. Numerous studies have examined the relationship between KMC and OP.

Some studies have considered both knowledge management infrastructure capability and knowledge management processes in investigating the relationship between knowledge management and OP. For example, Mills and Smith (2011) adopted Gold *et al.* (2001) KMC measures (including knowledge infrastructure capability and knowledge process capability) using data from both service and manufacturing organizations in Jamaica. The results indicated that some knowledge resources, i.e. organizational structure and knowledge application have a significant effect on OP. However, these studies did not examine the relationship between knowledge management infrastructure and knowledge management processes.

Also, Tanriverdi (2005) applied his research on 250 large, multi-business organizations from both service and manufacturing sectors. He provided evidence that KMC (including

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knowledge management resources and processes) has a significant positive effect on market and financial OP.

Andreeva and Kianto (2012) introduced a framework for knowledge management practices including human resources management and information communication technology (ICT). An empirical study was conducted using a survey data of 234 organizations located in Finland, Russia and China. They demonstrated a significant impact of human resources management and ICT on financial performance and organizational competitiveness. In addition, the results showed that ICT has an effect on financial performance, through human resources management practices.

KMC is considered by other researchers as a set of knowledge processes. They include, for example, knowledge acquisition, sharing and application (Gharakhani and Mousakhani, 2012); knowledge documentation, acquisition and creation (Liang *et al.*, 2007); and knowledge transfer and protection (Tseng and Lee, 2014). These three studies provided evidence that KMC has a significant and direct impact on OP.

In sum, several issues arise from reviewing previous studies that examined the relationship between KMC and OP. First, in the reviewed studies, the term KMC is defined from different perspectives. Specifically, researchers refer to it as knowledge management infrastructure and knowledge management processes (Gold *et al.*, 2001; Tanriverdi, 2005; Mills and Smith, 2011); knowledge management infrastructure or enablers (Chuang, 2004; Lee and Lee, 2007; Chang and Chuang, 2011; Andreeva and Kianto, 2012); or knowledge management processes (Liang *et al.*, 2007; Gharakhani and Mousakhani, 2012; Tseng and Lee, 2014).

Second, previous empirical studies provided evidence that not all knowledge resources influence the OP. Moreover, some knowledge management resources have an indirect effect on performance through other knowledge management capability and processes. Third, most of the reviewed studies have focused on developed countries to examine the relationship between KMC and OP, indicating a need to examine this linkage in developing countries as well.

H3. KMC has a positive impact on OP.

2.4 Supply chain management practices and organizational performance

A considerable amount of literature has been published on the relationship between SCMP and OP. For example, Tan (2002) considered 25 SCMP, which are classified into six factors, including supply chain integration, supply chain characteristics, information sharing, strategic location, customer service management and just-in-time capability. The results indicated that SCMPs have a significant positive impact on OP, including product quality, competitive position and customer service.

Kim (2006) investigated the relationships between SCMP, competitive capability, the level of supply chain integration and OP in small and large manufacturing organizations in Korea and Japan. The results showed that in large organizations, SCMP and competition capability have significant direct impacts on firm performance. However, indirect effects were found in small organizations.

Also, Li *et al.* (2006) examined the relationship between SCMP, competitive advantage and OP in 196 manufacturing firms from six selected industries in the USA. They concluded that effective SCMP can promote competitive advantage and enhance OP. Likewise, Robb *et al.* (2008) demonstrated the positive impact of supply chain practices on operational and financial performance using a one-industry research consisting of 72 furniture manufacturers in China.

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Furthermore, Chow *et al.* (2008) conducted a comparative study to investigate the relationship between supply chain management components and OP. The data were collected through an empirical survey of middle-line managers in the USA and Taiwan. They measured SCMP using Tan's (2002) 25 survey items. The results showed that SCMPs have a direct and positive impact on OP in Taiwan, but no direct relation in the USA. In addition, they found that the most important practices in Taiwan are supply chain features, supply chain integration and customer service management.

Cook *et al.* (2011) provided evidence that the impact of SCMP on OP differs according to the position of the organization within its supply chain, i.e. not all practices are equally effective and important for all supply chain members. They examined the supply chain role of a company as a moderator between SCMP and OP. They found that all SCMP have a significant direct impact on OP; however, information sharing and distribution network structure resulted in the highest positive correlation with OP. In addition, they concluded that each supply chain member should concentrate on SCMP according to its organizational role in the supply chain to increase performance.

Similar results were found in emerging markets. For example, Sundram *et al.* (2011) showed that efficient SCMPs enhance supply chain performance. This study used a convenience sampling of 125 firms in the electronics industry in Malaysia. They used SCMP based on the work of Li *et al.* (2006) and Min and Mentzer (2004). The results showed that all SCMPs have a significant positive effect except a strategic customer relationship and that agreed vision and goals have a superior impact on supply chain performance.

Singh *et al.* (2010) considered the effect of SCMP, which includes the use of technology, supply chain speed, customer satisfaction, supply chain integration and inventory management on OP in India. The results indicated that using SCMP doesn't have an impact on OP. This is due to several factors including location disadvantage, personal relationships, product variety, high operational cost and high employee turnover.

However, Hamister (2012) conducted an empirical study at 79 small retail firms and reported a positive relationship between SCMP and OP at both retail and supplier levels in Upstate New York. Results showed that information sharing and information quality have the highest impact on performance, which is similar to the results of other studies in the manufacturing sector (Li *et al.*, 2006).

The relationship between SCMP and OP was also investigated in the service industry. For example, Khang *et al.* (2010) conducted a study in the Malaysian service industry and provided evidence that customer orientation, IT adoption, leadership and training have significant impact on the performance of the service organization. They concluded that successful implementation of supply chain management depends on several factors. First, top management support and good leadership are necessary for changing business processes and organizational culture to achieve integration between all supply chain partners.

Second, IT adoption is important for internal integration, communication, coordination and long-term commitment between supply chain members. Third, organizations should have a close relationship with customers to understand their needs and to deliver the right products to them. Finally, training is important to ensure that employees have the essential skills needed for integration with other supply chain partners. However, results showed that knowledge sharing and partnership have no significant influence on OP in the service industry.

Chong *et al.* (2011) scrutinized the relationship between SCMP, measured through strategic supplier partnership, customer relationship, information sharing, IT, training and internal operations and operational performance in both manufacturing and service organizations in Malaysia. The results confirmed that SCMP have a direct and significant impact on OP.

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In sum, the results of the reviewed studies on SCMP depend on the context of the study, i.e. SCMP may differ in accordance with the industry, firm size, supply chain length and the position of the firm in the supply chain (Ibrahim and Ogunyemi, 2012). Moreover, there is a lack of studies of SCMP and their effect on OP in developing countries (Saad and Patel, 2006).

H4. SCMPs have a positive impact on OP.

2.5 Organizational learning and organizational performance

It is argued that an organization should learn, through acquiring new knowledge and skills, to cope with the challenging business environment and, as a result, improve its performance (Salim and Sulaiman, 2011). Effective strategies and behaviors of OL can allow an organization to improve its strategic capability to sustain its competitive advantage and improve its overall performance (García-Morales *et al.*, 2012). A large and growing body of literature has investigated the impact of OL on OP (e.g. Bontis *et al.*, 2002; López *et al.*, 2005; Škerlavaj and Dimovski, 2009; Bolívar-Ramos *et al.*, 2012; Cho *et al.*, 2013).

In examining this relationship, researchers have used different approaches to investigate OL, for example, workplace learning, learning capability, knowledge acquisition, knowledge distribution and knowledge interpretation and organizational memory (López *et al.*, 2005; García-Morales *et al.*, 2012; Jiménez-Jiménez and Cegarra-Navarro, 2007; Wang and Ellinger, 2011). Tippins and Sohi (2003) studied 271 manufacturing firms from several industries in the USA. They developed a five-stage model to provide a more comprehensive measure of OL including: information acquisition and information dissemination, shared interpretation, declarative memory and procedural memory. They concluded that OL has a significant direct effect on firm performance.

Škerlavaj *et al.* (2007) examined the effect of OL on OP improvement. They measured OL through information acquisition, information interpretation as well as behavioral and cognitive changes. The results showed that OL has a positive direct effect on non-financial performance measures (employee, customer and supplier perspectives on performance) and a positive indirect impact on financial performance. This study was replicated by Škerlavaj and Dimovski (2009) as a comparative study using data from 203 Slovenian and 202 Croatian companies. The results were consistent with Škerlavaj *et al.* (2007). In addition, they found similar results in both countries, showing that OL is essential for OP apart from the economic development level and the dimensions of the national culture.

López *et al.* (2004) developed an OL scale based on Huber's measures (1991), including knowledge acquisition, knowledge distribution, knowledge interpretation and organizational memory. They conducted two empirical studies among 195 Spanish organizations with more than 200 employees and demonstrated a statistically significant relationship between OL and performance. The overall findings suggested that OL has a significant impact on OP.

Several studies have used the same measurement instrument of López *et al.* (2004) in measuring OL construct, including Jiménez-Jiménez and Cegarra-Navarro (2007) and Wang and Ellinger (2011). Jiménez-Jiménez and Cegarra-Navarro (2007) empirically examined the relationship between market orientation, OL and OP in 451 Spanish organizations with more than 15 employees. Their results showed that the influence of market orientation on performance is only significant through the mediation of OL. In addition, they found that OL has a positive effect on OP.

Furthermore, several studies have examined the mediating effect of innovation on the OL–performance relationship. Jiménez-Jiménez and Sanz-Valle (2011) concluded that for an organization to improve its OP through innovation, it should enhance its OL processes.

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These results are similar to other studies conducted by Bolívar-Ramos *et al.* (2012) and García-Morales *et al.* (2012), who provided evidence that OL has a positive direct and indirect impact on OP through innovation.

In sum, the reviewed studies have provided consistent results, showing that "OL culture facilitates the search for and development of new knowledge, which leads to an increase in organizational innovations that will in turn improve OP" (Bolívar-Ramos *et al.*, 2012, p. 351). Also, Wang and Ellinger (2011) explored this relationship including individual and organizational-level innovation performance in Taiwan. They found that OL has a significant effect on innovation performance at both individual and organizational levels; however, it has a higher contribution at the individual level. In addition, the research finding showed that information distribution is the most important OL process followed by information acquisition.

Most of the previously discussed studies have reported a positive direct or indirect effect of OL on OP. However, some studies have reported no direct impact on financial performance (Škerlavaj *et al.*, 2007). Consequently, it cannot be asserted that an increase in OL always leads to improving OP (Bolívar-Ramos *et al.*, 2012; García-Morales *et al.*, 2012) because empirical studies use different samples and measures for both OL and OP (Jiménez-Jiménez and Sanz-Valle, 2011).

H5. OL has a positive impact on OP.

3. Research model

The interrelationships among variables as represented by the above hypotheses can be displayed in the following proposed research model (Figure 1):

4. Methodology[1]

The research model and hypotheses were tested in the food industry in the Kingdom of Saudi Arabia, which comprises 732 working companies, according to data published by the Ministry of Commerce and Investment (2016). Krejcie and Morgan (1970) developed a table for determining the sample size; by using their table, it was determined that this study's sample size would be 254.[2] Around 59 per cent of the food companies that are large and well established are located in five cities (see Table II). The researcher, therefore, concentrated on collecting data randomly from companies based in these five cities, successfully collecting valid surveys from 165 companies, representing a response rate of 64.9 per cent (see Table III).

Figure 1 Proposed research model

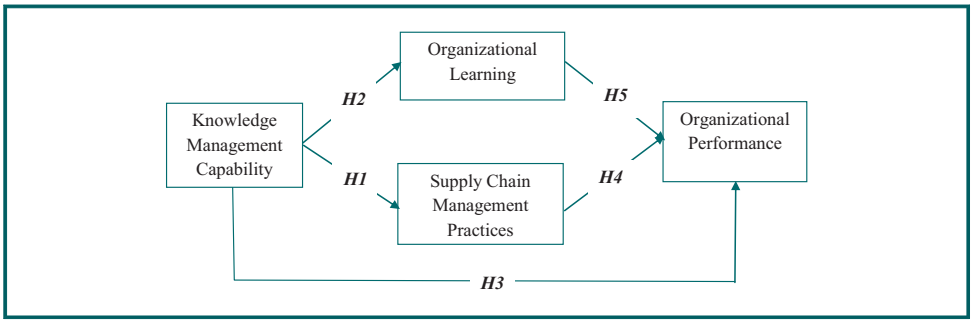

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Table III Summary of the response rate

City	*Response number*	*Response rate (%)*
Jeddah	86	52.12
Riyadh	51	30.9
Dammam	12	7.28
Al-Kharj	8	4.85
Al-Ahsa	8	4.85
Total	165	100

A questionnaire was prepared to test the research model and hypotheses (see Appendix). To collect the data, the questionnaire was posted by mails and emails to 254 companies in the five main industrial cities in Saudi (Jeddah, Riyadh, Dammam, Al-Kharj and Al-Ahsa). The definitions of the constructs presented in Table IV.

5. Results

5.1 Scale validity and reliability

The quality of the research outputs depends mainly on the variables measures; to ensure the achievement of quality outputs, all measures must show predictive, convergent and discriminant validity, in addition to reliability (Garver and Mentzer, 1999; Flake *et al.*, 2017). Moreover, the measurement model must suit the data relatively well (Koufteros, 1999; Ary *et al.*, 2009). A summary of model fit definitions presented in Table V. Convergent validity is measured by the normed-fit index (NFI) coefficient; if the NFI coefficient value is greater than 0.9, there is a strong convergent validity for the measures (Ahire *et al.*, 1996; Flake *et al.*, 2017). The NFI coefficient value was found to be above 0.9 for all of the variables in the research model; accordingly, the variables measures show a strong convergent validity (Table VI). The correlation coefficient is used to measure the discriminant validity: if the correlation coefficient value between any two variables equals either 1 or −1 or is very close either, there is poor discriminant validity (Kenny, 2012). Table VI demonstrates that the range of correlation values of the model is between 0.475 and 0.601, indicating a high discriminant validity.

Predictive validity is the other aspect of the correlation relationship: with a correlation between all the variables, there is predictive validity (Ahire *et al.*, 1996; Garver and Mentzer, 1999; Ary *et al.*, 2009). Accordingly, a correlation matrix was constructed between all of the research variables. Table VII shows that correlations exist between all of the study variables, confirming the existence of predictive validity for the study measures. Moreover, Cronbach's alpha has been used to measure the

Table IV Definitions of the constructs

Construct	*Definition*	*Sources*
KMC	The ability of an organization to acquire, create, transfer, integrate, share and apply knowledge related resources and activities across functional boundaries to generate new knowledge	Gold *et al.* (2001), Lee and Choi (2003), Wong and Wong (2011)
OL	A dynamic process of creation, acquisition, and integration of knowledge aimed at the development of resources and capabilities that contribute to better OP	Huber (1991) and López *et al.* (2005)
SCMP	The set of activities undertaken in an organization to promote effective management of its supply chain	Li *et al.* (2005, 2006)
OP	OP indicates how well an organization achieves its objectives	Li *et al.* (2006), Ho (2008)

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Table V Model fit results

Measure	*Definition*	*Threshold*	*Model results*
Root Mean Square Error of Approximation (RMSEA)	How well the model, with unknown but optimally chosen parameter estimates would fit the populations' covariance matrix	< 0.05 good; 0.05-0.10 moderate; > 0.10 bad	0.094
Chi-square/degrees of freedom	Measure for evaluating overall model fit and assesses the magnitude of discrepancy between the sample and fitted covariance matrices	< 3 good; < 5 sometimes permissible	2.746
Standardized root mean square residual (SRMR)	The square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model	less than 0.08	0.075
Normed-fit index (NFI)	Assesses the model by comparing the χ^2 value of the model to the χ^2 of the null model	> 0.95 great; > 0.90 traditional; > 0.80 sometimes permissible	0.976
Non-Normed Fit Index (NNFI)	Used to avoid the major drawback of NNF which is the sensitivity to sample size.	> 0.95 great; > 0.90 traditional; > 0.80 sometimes permissible	0.915
Incremental fit indices (IFI)	Group of indices that do not use the chi-square in its raw form but compare the chi-square value to a baseline model	> 0.95 great; > 0.90 traditional; > 0.80 sometimes permissible	0.935
Comparative Fit Index (CFI)	Revised form of the NFI which considers sample size	> 0.95 great; > 0.90 traditional; > 0.80 sometimes permissible	0.982

Source: Adopted from Hooper *et al.* (2008)

Table VI Scale validity and reliability results

Scale	*RMSEA*	*NFI*	*NNFI*	*CFI*	*GFI*	*SRMR*	*Relative* χ^2
KMC	0.989	0.95	0.93	0.91	0.88	0.66	3.01
SCMP	0.971	0.94	0.91	0.89	0.87	0.64	2.96
OL	0.966	0.93	0.90	0.88	0.87	0.63	2.94
OP	0.956	0.94	0.91	0.89	0.87	0.64	2.96

Reliability assessment results

Scale	Cronbach's alpha	Construct reliability	Variance extracted
KMC	0.91	0.95	0.93
SCMP	0.93	0.94	0.91
OL	0.95	0.96	0.92
OP	0.91	0.94	0.91

Table VII Correlation results

Scale	*KMC*	*SCMP*	*OL*	*OP*
KMC	1			
SCMP	0.475*	1		
OL	0.526*	0.587*	1	
OP	0.601*	0.492*	0.495*	1

Note: Correlation is significant at *0.01 levels (two-tailed)

reliability of the variables: if the alpha exceeds 0.9 for all the variables, this indicates sufficient reliability (Garver and Mentzer, 1999; Flake *et al.*, 2017). The alpha figures for all of the current study variables are above 0.9, thereby confirming sufficient reliability.

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A confirmatory analysis has been used to evaluate the fit between the measurement model and the collected data. As detailed in Table VIII.

For KMC, a factor analysis was conducted using the 20 items used to measure the variable. The standardized coefficients for all the items are at least 0.886. The SCMP construct was initially represented by 14 items. The factor analysis indicated that all the items of SCMP had standardized coefficients of at least 0.852. Moreover, the OL construct was initially represented by 14 items. The factor analysis indicated that all the items of OL had standardized coefficients of at least 0.831.

In addition, the factor analysis for the seven items used to measure OP indicated that all of these items had standardized coefficients of at least 0.855. According to Kline (1998) and Koufteros (1999) and the previous results, there is a good fit between the measurement model and the data.

5.2 Correlation analysis

To measure the strength and direction of a linear relationship between the different variables of a conceptual model, a correlation analysis could be used. Here, the 99 per cent confidence level produced through the correlation analysis results shows a significant positive relationship between all the research model variables (Table VI). It was found that there are significant positive relationships both between KMC and SCMP and between KMC and OP; moreover, there is also a significant positive relationship between SCMP and OP, in addition to a significant positive relationship between KMC and OL, and between OL and OP.

5.3 Structural relationship model

One of the acceptance standards for a conceptual model is the chi-square, which should be over 2 for the validity of the model to be accepted. In addition, the CFI and NNFI values should also be over 0.9 for the model to be accepted (Garver and Mentzer, 1999; Koufteros, 1999). The chi-square for the suggested study model is 2.746; in addition, the CFI and the NNFI values are 0.982 and 0.915, respectively; accordingly, the suggested research model has been accepted.

According to the previously mentioned results for the current study and the model standardized coefficients shown in Figure 2, the study's five hypotheses were accepted. The relationship between KMC and OP was statistically significant (0.538 at $p < 0.01$); and the relationship between SCMP and OP was also statistically significant (0.527 at $p < 0.01$). In addition, the relationship between KMC and OL was statistically significant (0.581 at $p < 0.01$). Moreover, a statistically significant relationship between KMC and SCMP was found (0.535 at $p < 0.01$). Finally, the relationship between OL and OP was also statistically significant (0.532 at $p < 0.01$). Table IX presents a summary of the final results.

6. Discussion and conclusions

According to the previous results the KMC play a major role in improving the SCMP. Thus, *H1* is accepted. This result is consistent with that of previous studies, for example, Wong and Wong (2011) and Youn *et al.* (2013). KMC are considered a driver and key success factor in supply chains (Rashed *et al.*, 2010; Samuel *et al.*, 2011). Wong and Wong (2011) provided evidence that KMC (including technology and processes) would influence SCMP. They concluded that KMC enables knowledge sharing among the employees as well as between organizations. In addition, they facilitate information sharing, cooperation and long-term relationships among supply chain members, which would result in creating value-added products and services to the customers.

Similarly, Dalpati *et al.* (2010) proposed that sharing knowledge between supply chain members can speed up the flow of knowledge in the supply chain, improve the efficiency

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Table VIII Confirmatory analysis results

Construct/ measures	*t-Value*	*Standardized coefficients*
Knowledge Management Capability		
KMC1	13.661	0.931
KMC2	12.377	0.902
KMC3	12.005	0.882
KMC4	12.711	0.911
KMC5	11.652	0.872
KMC6	12.365	0.925
KMC7	10.986	0.843
KMC8	13.220	0.921
KMC9	13.632	0.931
KMC10	11.417	0.862
KMC11	12.456	0.915
KMC12	12.632	0.911
KMC13	12.417	0.902
KMC14	13.083	0.921
KMC15	11.978	0.879
KMC16	12.658	0.967
KMC17	13.589	0.989
KMC18	10.973	0.849
KMC19	10.868	0.876
KMC20	13.694	0.996
Supply Chain Management Practices		
SCMP1	13.547	0.823
SCMP2	11.238	0.904
SCMP3	12.676	0.922
SCMP4	12.527	0.874
SCMP5	12.645	0.927
SCMP6	13.168	0.954
SCMP7	11.997	0.956
SCMP8	12.662	0.924
SCMP9	13.576	0.987
SCMP10	10.949	0.956
SCMP11	10.789	0.870
SCMP12	13.278	0.949
SCMP13	10.782	0.854
SCMP14	12.378	0.989
Organizational learning		
OL1	13.682	0.831
OL2	11.350	0.913
OL3	12.803	0.931
OL4	12.652	0.883
OL5	12.771	0.936
OL6	13.300	0.964
OL7	12.117	0.966
OL8	12.789	0.933
OL9	13.712	0.997
OL10	11.058	0.966
OL11	10.897	0.879
OL12	13.411	0.958
OL13	10.890	0.863
OL14	12.502	0.990

(*continued*)

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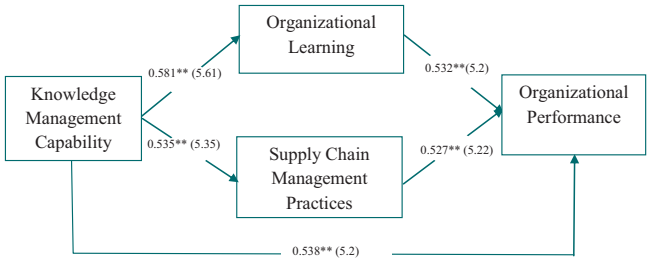
Table VIII

Construct/ measures	*t-Value*	*Standardized coefficients*
Organizational performance		
OP1	13.658	0.953
OP2	12.578	0.911
OP3	10.897	0.864
OP4	11.094	0.921
OP5	12.524	0.976
OP6	12.687	0.981
OP7	10.354	0.893

Notes: RMSEA = 0.094; Chi-square = 2.746; SRMR = 0.075; NFI = 0.976; NNFI = 0.915; IFI = 0.935; CFI = 0.982

Figure 2 Structural relationship model with standardized coefficients and (*t*-value)



Notes: RMSEA = 0.094; Chi-square = 2.746; SRMR = 0.075; NFI = 0.976; NNFI = 0.915; IFI = 0.935; CFI = 0.982; **t* > 1.96 or $p < 0.05$; ***t* > 2.51 or $p < 0.01$

Table IX Summary of the final results

Hypothesis	*Structural Equation Model Results*	*Decision*
H1	0.535 (5.35)	Accepted
H2	0.581 (5.61)	Accepted
H3	0.538 (5.2)	Accepted
H4	0.527 (5.22)	Accepted
H5	0.532 (5.2)	Accepted

and effectiveness of the supply chain, and enable the organizations to respond quickly to customers' changing needs. In addition, Youn *et al.* (2013) argued that effective information sharing among supply chain members requires mutual trust, top management support as well as organizational compatibility.

The second hypothesis tests the effect of KMC on OP. The results of the current research support the acceptance of *H2*. This result is consistent with previous research findings, which provided evidence that consistent has both direct and indirect impacts on OP (Tanriverdi, 2005; Lee and Lee, 2007; Chang and Chuang, 2011; Mills and Smith, 2011; Andreeva and Kianto, 2012). Researchers have argued that consistent is the most important resource of an

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organization that would enable it to innovate, take advantage of business opportunities, manage both internal and external resources, offer new products and services, and cope with the dynamic business environment. Organizations should be able to obtain the right knowledge as well as coordinate internal and external knowledge to enhance its OP (Tseng and Lee, 2014).

The third hypothesis is accepted. This result confirms the effect of KMC on OL. This finding is consistent with the previous studies of Handzic (2011) and Lee *et al.* (2012), who suggested that an integrated socio-technical knowledge management model would help managers in implementing OL process. Direct influence of knowledge management on OL was also confirmed by Bahrami *et al.* (2013), Nafei (2014) and Kafashpoor *et al.* (2014). Bahrami *et al.* (2013) suggested that OL is influenced by KM enablers including knowledge-based strategies and policies, human resources management and IT tools. Successful OL requires effective KM capability, which would enable innovation and introduction of new products and services (Lee *et al.*, 2012).

The fourth hypothesis suggests that SCMP are driver of OP. The current research results recommended the acceptance of *H4*. This result consistent with previous research findings, which reported a direct and significant effect of SCMP on OP (e.g. Kim, 2006; Li *et al.*, 2006; Robb *et al.*, 2008; Chong *et al.*, 2011; Cook *et al.*, 2011; Sundram *et al.*, 2011).

The statistical analysis supports the acceptance of hypothesis five. This finding supports the previous research results (e.g. Huber, 1991; Tippins and Sohi, 2003; López *et al.*, 2004; Theriou and Chatzoglou, 2009). Accordingly, through OL organizations can achieve superior outcomes such as enhanced sales growth, customer satisfaction, financial performance (Tippins and Sohi, 2003), competitive advantage (Jiménez-Jiménez and Sanz-Valle, 2011), customer retention, success of new product developments and superior growth (López *et al.*, 2004).

This research has both academic and practical implications. The academic implication is to the contribution of this study to the growing body of literature linking organizational capabilities and practices with OP. According to the knowledge of the researcher, there is no previous study that examined all these relationships together in one model. In addition to the focus on the Saudi context, where there is a lack of studies on this topic. From the resource-based perspective, the current results support the effect of KMC on OL and not the opposite. The results of the current study could be the base for a series of future studies covering the area of the knowledge management in the Gulf area and Middle East.

With respect to the managerial implications of the research, the most important implication relates to the fact that OP in this study is influenced by variables other than KMC, OL and SCMP. To promote knowledge management and OL in organizations, it is important for managers to realize their importance and try to benefit from their knowledge resources and to encourage their employees to acquire and share knowledge both internally and externally with their supply chain members. Also, the managers need to handle effectively the different activities, which helps in creating and sharing knowledge to promote the OL. In addition, management should value the importance of SCMP that permit the coordination of business process with supply chain members to realize long-term mutual gains. The results of the current study in general developed a better understanding of the role of successful implementation of KMC, OL and SCMP on OP.

7. Limitations and further research

The current study has four principal limitations, all of which present opportunities for future research. First, the current study focused only upon the Saudi food industry; therefore, there is a need to re-study the hypothesized relationships between the variables in different Saudi industrial sectors and in different developed and developing countries. Second, the impact of other internal practices and factors on the hypothesized model need to be considered and tested in different industries and countries. Third, there is a need to collect data from more respondents within the Saudi food industry (the present study collected data from only

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165 respondents from 732 companies in this industry) to generate more representative results. Finally, it would be useful to repeat the study's methodology by collecting data from multiple supply chain partners, rather than only from the buyer or the focal firm, this could be achieved through qualitative method of data collection, including interviews and focus groups, to add further interpretation and meaning to the quantitative findings.

Notes

1. A survey has been used to collect the data, so the measurements are the perceptions of respondents.
2. The formula for calculating the sample size according to Krejcie and Morgan (1970):

$$S = \frac{X^2 \ NP \ (1-P)}{d^2 \ (N-1) + X^2 \ P(1-P)}$$

S: sample size; d: degree of accuracy; P: population size

$$X^2 = Table \ \ Value \ \ of \ \ Chi - Square \ \ @ \ \ d.f$$
$$= 1 \ \ for \ \ the \ \ desired \ \ confidence \ \ level$$

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Appendix

Variables measures contained in the research questionnaire.

For each of the categories explored in this questionnaire, a 5-point Likert scale was used, in which 1 represents "strongly disagree" and 5 "strongly agree".

KMC: The surveyed managers were asked to evaluate the company's current practices. The items used in the questionnaire were as follows:

1. Our organization has clear rules for formatting or categorizing its product knowledge.
2. Our organization has clear rules for formatting or categorizing process knowledge.
3. Our organization members use technology to cooperate with other persons inside the organization.
4. Our organization members use technology to search for new knowledge
5. Our organization members use technology to retrieve knowledge about its products and processes.

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6. Our organization members use technology to retrieve knowledge about its markets and competition.
7. Our organization structure facilitates the discovery of new knowledge.
8. Our organization structure facilitates the creation of new knowledge.
9. Our organization has reward system for sharing knowledge.
10. Our organization facilitates knowledge exchange across functional boundaries.
11. Our organization employees are readily accessible.
12. Our organization members understand the importance of knowledge.
13. Our organization members are valued for their individual expertise.
14. Our organization members are encouraged to interact with other groups.
15. The benefits of sharing knowledge outweigh the costs.
16. Our organization members are encouraged to explore and experiment.
17. Our organization members can understand not only their own tasks but also others' tasks.
18. Our organization members can make suggestion about others' task.
19. Our organization members can communicate well not only with their department members but also with other department members.
20. Our organization members are specialists in their own part.

The KMC scale consists of four dimensions that contains twenty statements selected from (Gold *et al.*, 2001; Wong and Wong, 2011).

SCMP: The surveyed managers were asked to evaluate their company's current practices. The items used in the questionnaire were as follows:

1. We consider quality as our number one criterion in selecting suppliers.
2. We regularly solve problems jointly with our suppliers.
3. We have helped our suppliers to improve their product quality.
4. We have continuous improvement programs that include our key suppliers.
5. We include our key suppliers in our planning and goal-setting activities.
6. We actively involve our key suppliers in new product development processes.
7. We frequently interact with customers to set reliability, responsiveness, and other standards for us.
8. We frequently measure and evaluate customer satisfaction.
9. We frequently determine future customer expectations.
10. We facilitate customers' ability to seek assistance from us.
11. We periodically evaluate the importance of our relationship with our customers.
12. We inform trading partners in advance of changing needs.
13. Our trading partners share proprietary information with us.
14. Our trading partners keep us fully informed about issues that affect our business.

The SCMP scale consists of five dimensions that contains fourteen statements selected from (Li *et al.*, 2006).

OL: The surveyed managers were asked to evaluate their company's current practices. The items used in the questionnaire were as follows:

1. Our organization is in touch with professionals and expert technicians.
2. Our organization members attend fairs and exhibitions regularly.
3. There is a consolidated and resourceful research and development policy in our organization.

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4. New ideas and approaches on work performance are experimented continually.
5. Organizational systems and procedures in our organization support innovation.
6. Meetings are periodically held to inform all the employees about the latest innovations in the organization.
7. Our organization has formal mechanisms to guarantee the sharing of best practices among the different fields of activity.
8. There are individuals within the organization who take part in several teams or divisions and who also act as links between them.
9. All the members of the organization share the same aim, to which they feel committed.
10. Employees share knowledge and experience by talking to each other.
11. Teamwork is a very common practice in the organization.
12. The organization has directories or e-mails filed according to the field they belong to, so as to find an expert on a specific issue at any time.
13. The organization has up-to-date databases of its clients.
14. Databases are always kept up-to-date.

The OL scale consists of four dimensions that contains fourteen statements selected from (Huber, 1991; López *et al.*, 2005).

OP: The surveyed managers were asked to evaluate their company's business performance. The items used in the questionnaire were as follows:

1. Market share.
2. Return on investment.
3. The growth of market share.
4. The growth of sales.
5. Growth in return on investment.
6. Profit margin on sales.
7. Overall competitive position.

The OP scale consists of seven measures selected from (Li *et al.*, 2006; Ho, 2008).

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