Significance of knowledge management process and customer relationship management for stimulating innovation capability: empirical analysis, PLS-SEM approach

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Abstract: This article explores the connections between customer relationship management, knowledge management process, and the capacity to create new products and services. This explains firms' precise sequence to successfully integrate CRM and KMP operations. The study investigation conducted regression and mediation analysis on lower-order and higher-order components with SmartPLS 3.2.9. Over 88 businesses in China were involved in gathering these statistics. In this particular research, a total of 287 different questionnaire surveys were investigated. According to the results, it would seem that knowledge management is significantly impacted by customer relationship management (CRM). The customer knowledge management process unites the capacity for innovation with managing customer relationships. The results of this study will be helpful to executives in gaining a better grasp of the interaction between customer, knowledge, and innovation perspectives.

Keywords: customer relationship management; knowledge management process; innovation capability.

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1   Introduction

Businesses consistently concentrate on and understand their customers' requirements to increase their innovation capability (Hikmawati et al., 2020). The information customers provide used by businesses to enhance their capacity for innovation (ElFarmawi, 2019). several experts concluded that the degree of an organisation's innovation potential, which helps businesses boost their market efficiency and competitive advantage, directly relates to its success level (Yang et al., 2018; Chege et al., 2020). In recent years, companies have started to combine their efforts to maintain customer relations (customer relationship management, or CRM) with the data they possess. Many companies have realised that effective information management is essential to excellent innovation (Migdadi, 2021). Also, there is a high relationship between an organisation's capacity for innovation and its market competitiveness (Than et al., 2021).

One of the essential resources for an organisation in the innovation process is customer interaction (Migdadi, 2021). A customer relationship is a commercial relationship between organisations and customers (Karimi and Allameh, 2016). CRM is considered one of the most potent instruments that help to increase innovation (Guerola-Navarro et al., 2021). Customer involvement in knowledge management enhances value creation and plays a vital role in innovation (Mukherji, 2012). KMP is a technical and strategic process to improve business performance, increase market share, and compete with competitors (Mejía Trejo et al., 2016).

It is impossible to have a genuine CRM if it is not paired with knowledge management. This leads to the development of business developments and helps companies evaluate customer satisfaction, profitability, and loyalty (Akhgari et al., 2022). Furthermore, Customer relationship to innovation has a lot of research gap, and still need to evaluate the literature which helps organisations to understand the customer to increase innovation capability (Guerola-Navarro et al., 2021). Due to the importance of knowledge management systems in today's customer-centric business environment, no user-friendly, complete framework integrates standard CRM with customer data storage and usage (Rastgar et al., 2019). The research topic is essential because of the following reasons.

CRM is regarded as one of the most efficient methods for managing client relationships (Mejía Trejo et al., 2016). Effective business plans need the management of the company's knowledge and connections with its clients (Guerola-Navarro et al., 2021). CRM has also been the subject of prior research examining people's knowledge of culture, behaviour, management, and other perspectives (ElFarmawi, 2019; Liew, 2008). In-depth knowledge of a company's customers will become an exceptionally valuable and difficult-to-obtain asset due to firms' increased responsiveness to customer needs and adaptability to changing market conditions (Alshawabkeh et al., 2022). Therefore There is no well-established connection between CRM and the customer knowledge management process (Migdadi, 2021). This study provides a different and direct relationship with a complete customer knowledge management process (acquisition, sharing, and application) KMP. Based on the above arguments, this study will examine the relationship between CRM and KMP. Therefore, the study proposed the first research question.

RQ1   Does CRM positively influence the performance of KMPs?

Secondly, many academics have pointed out that businesses often encounter challenges and barriers while accelerating KMPs and innovation (Ode and Ayavoo, 2020; Shehzad et al., 2021). However, it is still essential to understand how KMP relates to innovation (Costa and Monteiro, 2016). Knowledge management is a critical tool that can be utilised to improve inventive skills and increase market share (Kurniawati et al., 2018). Innovations result from vast knowledge-based activities, such as formulating creative concepts and ideas, creating cutting-edge technologies, manufacturing and marketing unique commodities, and many others (Santouridis and Veraki, 2017; Tseng and Lee, 2014). Therefore, it is important to appreciate and investigate the link between customer knowledge and innovation capability. Based on the given arguments, the study posed the second research question.

RQ2   Do KMPs significantly associate with Products and service innovation?

Innovative ideas make the development of new technologies, infrastructure, goods, and services achievable. Creativity is essential to innovation. By 'using new knowledge,' which is another term for innovation, it is feasible to gain a competitive advantage over your rivals and meet the demands of your consumers (Wang and Xu, 2018). The innovation process is not possible without getting knowledge about the customer (Wang and Xu, 2018). Many organisations increase innovation capability by transforming customer information into useful knowledge. It creates value for the organisation over competitors (Mejía Trejo et al., 2016). Innovation capability can be increased with the help of knowledge about old and new customers (Lin et al., 2012). Organisations gain

many types of information with the help of good customer relationships. Customer relationships and knowledge help companies increase their various types of organisational innovativeness and development. Nowadays, competition has increased, and many organisations are facing the problem of existence. The key point is good relationships, which means getting and storing the right information; this also has several advantages. Companies can gain competitive advantages, improve infrastructure and increase performance in the market (Bose and Sugumaran, 2003). Management of a customer's knowledge of an organisation is not the same as management of an organisation's relationship with a customer. CRM aims to learn as much as possible about the customer to personalise each engagement. Companies can learn and understand their customers, what they exactly want, and how they want, all this possible with the help of customer knowledge management (García-Murillo and Annabi, 2002; Guerola-Navarro et al., 2021). The innovation capability component for companies is a competitive edge. With the help of the right information about customers, it transforms it into knowledge for innovation, defined as customer knowledge management (Guerola-Navarro et al., 2021). Knowledge management can effectively grasp market information by transferring customer knowledge to product and service innovation (Lin et al., 2012). Numerous earlier research has examined the mediating effect of KMP with other variables, and knowledge management has also been employed as an independent variable in certain studies (Ode and Ayavoo, 2020; Migdadi, 2021). There is currently a scarcity of theoretical and practical research investigating the mediating link between CRM and innovation such as product and SI. We presented our third research question based on the preceding reasoning.

RQ3   Do KMPs mediate CRM's effect on innovation capability?

Meeting customer expectations and gaining market share is significantly easier for companies with high innovation tendencies (Chatterjee et al., 2021). Innovation is commonly acknowledged as the most important component in gaining a competitive advantage and assisting firms in attaining sustainable development (Shehzad et al., 2021). No existing study analyses the connection and influence between CRM and product/SI, and the gap between Customer relationship to innovation has also been discussed in the study (Guerola-Navarro et al., 2021). As part of our research, we will investigate the precise meaning of innovation concerning customer interactions and how this concept might assist organisations in enhancing their knowledge infrastructure and inventive capacities. Furthermore, this study also evaluates the literature that helps organisations increase innovation capability and understand the customer to meet their expectations. Hence, we arise our fourth research question from the given arguments.

RQ4   Does CRM significantly affect innovation capability?

The research topic and model have been developed based on the above-given arguments (Figure 1). The study is linked with three main variables. CRM, customer knowledge management process (knowledge acquisition KAS) (knowledge sharing KS) (knowledge application KAP), product innovation (PI), and service innovation (SI)

This study aimed to determine how knowledge management process components impact the interaction between consumers and creative ideas within the provision of products and services. We examine how the innovation capabilities system, CRM, and knowledge management processes interact. Furthermore, this study will benefit firm

leaders in maintaining innovation in their goods and services and creating new values and advantages for their consumer base.

2   Literature review

2.1   *Customer relationship management*

Customer relationship is simply the commercial relationship between organisations and customers (Karimi and Allameh, 2016). CRM aims to accomplish two-way communications through business processes such as marketing, after-sales, customer support, and personal sales activity to increase new customers' value, boost tremendous achievement, realise multi-angular growth, and control costs (Gebert et al., 2002). CRM may help you achieve good sales results by integrating quality control, significantly benefiting your profit margins. If CRM is done correctly can increase customer happiness and helps organisations to improving product quality (ElFarmawi, 2019). CRM is essential for rapid innovation (Guerola-Navarro et al., 2021). CRM is a significant instrument for improving organisational performance and the Innovation Process. In today's world, successful business links with customers and gains information for future use (Guerola-Navarro et al., 2021).

In the early days of CRM, the focus was on capturing customer data and using it to improve the sales process (Baran and Zerres, 2010). However, as technology has advanced, CRM has become a more sophisticated tool that can help organisations manage customer interactions (Bahrami et al., 2012). CRM monitors a company's relationship with its present and potential customers as the key to success for instance Salesforce is the most popular and market leader CRM software because of features, pricing, integration, and customer support (Hair et al., 2020; Sunkari, 2022). A good relationship helps organisations gain information and transform it into knowledge that can be stored and used for innovation (Buchnowska, 2011).

2.2   *Knowledge management process*

Knowledge Management is a discipline that involves capturing, storing, sharing, and using knowledge within an organisation (Mårtensson, 2000; Girard and Girard, 2015). The degree of a company's success is directly related to the amount of customer information and data it holds (Khodakarami and Chan, 2014). Several firms consider customer data a valuable asset (Buchnowska, 2011). Businesses can achieve a competitive advantage as a direct result of the impact that valuable information has on the promotion of innovation and sustainability, as well as the generation of intangible assets (Gaviria-Marin et al., 2019; Lei et al., 2021; Shehzad et al., 2021) and involvement of employees with clear strategy can also deliver expected results for organisation (Lin, 2011). The acquisition, dissemination, and use of knowledge benefit a business's sustainability and continued competitive advantage (Lei et al., 2021). Acquiring new information is the first stage of the Knowledge Management Process (KMP), used to manage existing knowledge (Obeidat et al., 2016; Phong et al., 2018). Knowledge acquisition describes the seeking, gathering, choosing, storing, and arranging the knowledge/information (Pinho et al., 2012).

For the knowledge management process to be valuable, individuals must communicate and exchange information (Shehzad et al., 2021; Lei et al., 2019). Information transfer must be effective for the information management procedure known as the knowledge management procedure to be successful. When workers share their knowledge, they enhance the probability of collaborating effectively and achieving their objectives (Le and Lei, 2017). Organisations share and exchange knowledge between experts and employees, allowing them to support each other and gain innovation (Shehzad et al., 2021).

Knowledge is enhanced in its usefulness and significance by application (Bhatt, 2001). Understanding applications and responding quickly to knowledge may improve a company's ability to accomplish both technological improvement and product evolution. (Nesheim et al., 2011). Applying knowledge is crucial in developing new products and achieving continual improvement (Shin et al., 2001; Hamdoun et al., 2018). An essential objective of applying the knowledge and integrating the acquired information into overall success (Ode and Ayavoo, 2020).

2.3   Innovation capability (products and service)

Developing novel goods, services, and organisational processes demonstrates innovation as a competence. Every company should aim to provide its clients with better goods and services than its rivals (Lei et al., 2019). Innovation is the process of generating new ideas and concepts to improve business results (Taherparvar et al., 2014). Introducing brand-new products and services and significant improvements to existing ones is also considered innovation (Mejía Trejo et al., 2016). The ultimate effect of the exchange of information and knowledge between consumers and businesses is the integration of technology that can be utilised to enhance goods and services (Carr and Pearson, 1999; Zhang and Zhu, 2019). The information we obtain from customers has the potential to aid firms in gaining a more significant degree of an innovative edge over their competitors (Carbonell and Rodriguez-Escudero, 2014).

2.4   Influence of CRM on KMP

The relationship between CRM and knowledge management is very useful and effectively strengthens the whole system (Liew, 2008). Many organisations understand the importance of CRM and KMP, so they integrate them (Migdadi, 2021). mutual trust and KS help organisations gain core competency, sustainability, and competitive advantage (Liew, 2008; McEvily and Marcus, 2005). Organisations must integrate customer relationships with knowledge management and practice it to satisfy customer needs and preferences (Kim et al., 2003). Relationship with customers isn't only sued to acquire knowledge about customer needs but also need to apply this knowledge to continuous improvement in performance (Özgener and İraz, 2006).

H1   CRM is positively connected with KMP

2.5   KMP and innovation

Most businesses think that KMP is a very beneficial tool for their companies. Consequently, they use it to raise corporate performance, expand market share, and

compete with other businesses. The knowledge management process is technical and strategic. In this way, organisations sort out vital information and use it to increase innovation capability (Mejía Trejo et al., 2016). Knowledge management to innovation is crucial for organisations and has been explored by many previous scholars (du Plessis, 2007; Shehzad et al., 2021; Xu et al., 2010). The accumulation, dissemination, and most effective use of knowledge are essential prerequisites for inventiveness (Andreeva and Kianto, 2011). Based on the market, knowledge acquisition turns more useful for innovation (Darroch and McNaughton, 2002). The gathering of fresh information has a huge influence on the creation of brand-new goods and services (Molina-Morales et al., 2014; Lei et al., 2019; Sáenz et al., 2012; Yang et al., 2018) Also discussed was the relationship between KS and innovation. Employee and organisational KS creates opportunities for fresh idea generation and organisational capability improvement (Choi et al., 2016). The exchange and integration of all types of knowledge allow employees to become more competent in organisational development (Yang et al., 2018). Integration and effective knowledge application help organisations improve innovation capability (Migdadi, 2021).

H2 The relationship between KMP and PR is significantly positive.

H3 The relationship between KMP and SI is significantly positive.

2.6 CRM, PR, SR

Many researchers explained that Customer Involvement, communication, and long-term relationship are very important for organisations to integrate CRM and innovation (Brockhoff, 2003; Chen and Paulraj, 2004; Khodakarami and Chan, 2014). More and more companies want to involve their customer in organisational innovation performance (Taghizadeh et al., 2016) to gain innovative ideas. (Saarijärvi et al., 2013) Explored CRM offers direct information about sales and marketing demand to help organisations increase innovation capability (product/service). A good CRM system can increase market and management efficiency and innovation capability (Bose, 2002; Chen and Popovich, 2003). Customer knowledge helps organisations better understand the external situation regarding markets, rivals, products, and services (Taherparvar et al., 2014). Customer Relationship helps organisations gain knowledge that helps generate new ideas and increase innovation capability. Now companies focus on open customer-driven innovation models (Taherparvar et al., 2014). The main priority of today's organisations is to connect and develop because organisations think with the help of connection, they can get more creative information and ideas that can utilise for quality innovation (Taherparvar et al., 2014). CRM is being increasingly acknowledged for its effectiveness and efficiency as a strategy for providing a sustainable competitive advantage and enhancing innovation capacity (ElFarmawi, 2019).

H4 CRM has a direct impact on PI.

H5 CRM has a direct impact on SI.

2.7 Mediation role of the knowledge management process

Knowledge management is crucial for improving organisations (Shehzad et al., 2021; Fierro Moreno et al., 2013). under special circumstances, knowledge can be connected,

collaborated, developed, and used to acquire innovative or existing resources to promote the organisation's capacity. These activities allow management to flow and absorb the knowledge between individuals and employees to generate innovativeness (Chen et al., 2010; Fard and Selseleh, 2010). Knowledge is an important source of innovation and directly affects the discovery of innovative ideas, while customer participants play a vital role and significantly impact the organisation's innovation capability (Harty, 2005). Customer engagement with knowledge enhances innovation (Yi et al., 2011). Businesses growingly want to involve their customers (Taghizadeh et al., 2016) and gain tacit knowledge (Taherparvar et al., 2014). Knowledge management recognises and identifies the nature of knowledge for novelty (Belkahla and Triki, 2011; Falasca et al., 2017). Innovation can be generated with the help of CRM and knowledge management. In service-oriented businesses, the KM approach using models can assist managers in identifying the true value chain. This strategy aids businesses in improving knowledge management performance in their business operations, intending to increase product and SI (Xuelian et al., 2015). Knowledge management has also been mediated (Fierro Moreno et al., 2013; Shehzad et al., 2021) studies. KM is treated as a winning strategy that boosts customer loyalty for organisations. Its ability creates a strong relationship with customers so organisations can judge customers' behaviour related to their products and services. Innovation capability can also be increased with the help of CKM (Kabue, 2021).

Based on the above arguments, we present our fifth hypothesis, KMP can mediate between CRM and innovation capabilities.

H6   The relationship between CRM and SI is mediated by KMP.

H7   KMP mediates the relationship between CRM and PI.

Figure 1   Research model
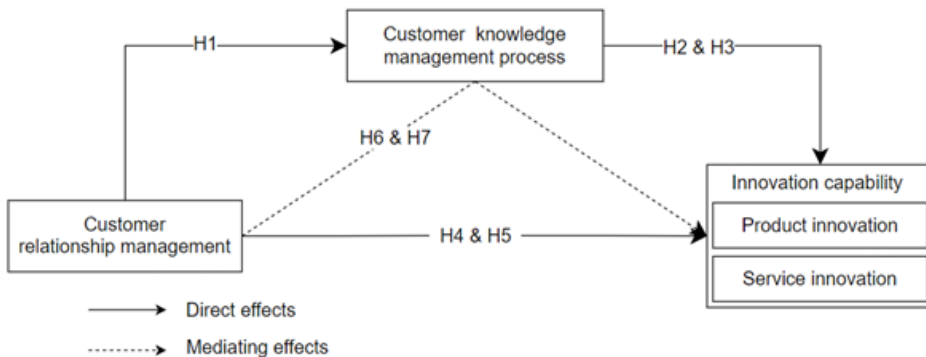
3   Research methodology

We followed the sampling procedure guidelines according to Yang et al. (2018) for SEM research. (Anderson and Gerbing, 1988; Iacobucci, 2010) Suggested that 200 samples are fair and 300 are good for SEM research. After determining the sample firms, we used a simple random questioner-based survey approach and collected primary data for our study. Data has been gathered from 88 firms in China, including manufacturing and

services organisations. Most surveys were distributed through personal visits to these organisations. We also described the goal of our research to some of the groups who participated in the study by personal communication, such as an email or a phone call. Many organisations helped us to gather data from their key employees and major department of the organisation, such as marketing, accounting, sales operation, research, and development. A total of 474 questionnaires were sent randomly to 88 Chinese enterprises to acquire information.

We received 395 feedbacks, and 287 were valid. Protentional non-response bias was measured according to Armstrong and Overton (1977), and the validity rate is 56%. Later on, according to demographic dimensions, we utilised the T-test for the first and last 87 respondents. The T-test examines the substantial variation between the first and last respondents. The results showed no substantial variation between the two respondent categories (p > 0.05). The sample comprises 58.3% male (167 respondents) and 41.7% female (120 respondents).

3.1 Measurement of variables

We designed instruments in four sections and evaluated the demographics, CRM, KMP, PR, and SI. Measurement variables were adopted and formatted from previous studies. Questioners have been developed in different phases, for example, vocabulary, response format, types, and order of questions. Five-point Likert scale has been employed in our study. For evaluating CRM, this study used five elements adopted from the study of (Guerola-Navarro et al., 2021).

Second section is the evaluation of the KMP, and respondents have to evaluate KMP on their firms according to KAC, KS, and Knowledge application. This study adopted 12 questionnaires for KAC and 10 questionnaires for KAP (Ode and Ayavoo, 2020). Furthermore, this study also used 10 items scale for KS from the paper of (Yang et al., 2018). In the last section, this study adapted 5 items for product and SI (Chen et al., 2011; ElFarmawi, 2019).

3.2 Common method bias

Common method bias is used to examine whether or not the gathered data is biased. The CMB is expected to investigate the validity of information collected from shared resources while acquiring data. (Podsakoff et al., 2003). According to a study Kock (2015), if the value of VIF in the inner model is less or equal to 3.3 indicates the free of common method variance.

3.3 Data analysis

This study employed partial least square PLS for analysis of the proposed model. Smart PLS is very suitable for regression analysis in mediation (Preacher and Hayes, 2004). SmartPLS is also very useful for complicated and simple research models and for evaluating the mediation effect correctly (Hair et al., 2014).

3.4   Multicollinearity VIF

Multicollinearity VIF is used to examine the collinearity effect of each factor (Fornell and Bookstein, 1982). If the value of each factor is less than 5, multicollinearity is not an issue (Hair et al., 2019). Table 1 indicates the results of multicollinearity VIF.

Table 1   Multicollinearity VIF

Items	VIF
CRM1	1.903
CRM2	2.138
CRM3	2.028
CRM4	2.469
CRM5	2.382
KAC1	2.128
KAC10	2.121
KAC11	2.551
KAC12	2.202
KAC2	2.692
KAC3	2.943
KAC4	2.408
KAC5	2.543
KAC6	2.788
KAC7	3.130
KAC8	3.140
KAC9	2.534
KAP1	2.470
KAP10	3.173
KAP2	2.636
KAP3	2.527
KAP4	1.990
KAP5	2.680
KAP6	2.913
KAP7	2.795
KAP8	2.589
KAP9	3.246
KS1	1.541
KS10	1.242
KS2	3.122
KS3	3.715
KS4	3.174
KS5	3.008
KS6	2.892
KS7	1.685
KS8	1.468

Table 1   Multicollinearity VIF (continued)

Items	VIF
KS9	1.684
PR1	1.292
PR2	1.662
PR3	1.745
PR4	1.572
PR5	1.757
SR1	1.454
SR2	1.596
SR3	2.097
SR4	2.393
SR5	1.712

3.5 Validity and reliability analysis for lower order constructs

Validity and reliability can be measured with the help of average variance extracted (AVE) Rho, Cronbach alpha, and composite reliability (CR). For establishing validity, the factor value of AVE must be greater or equal to 0.5, and Cronbach alpha, CR and Rho_A must be equal to or greater the 0.7 (Hair et al., 2010; Bagozzi and Yi, 1991). in Table 2, our study established the validity and reliability of lower and higher-order constructs.

Table 2   Validity and reliability

Constructs	Cronbach's alpha	rho_A	C R	(AVE)
CRM	0.844	0.848	0.889	0.616
KMP	0.884	0.894	0.928	0.811
KAC	0.938	0.939	0.946	0.595
KAP	0.919	0.927	0.931	0.575
KS	0.881	0.910	0.905	0.500
PR	0.796	0.808	0.857	0.545
SR	0.751	0.838	0.828	0.508

Table 3   Fornell Larcker criterion

	CRM	KAC	KAP	KS	PR	SR
CRM	0.785					
KAC	0.554	0.771				
KAP	0.408	0.671	0.758			
KS	0.551	0.760	0.721	0.707		
PR	0.287	0.458	0.405	0.480	0.738	
SR	0.171	0.33	0.275	0.193	0.088	0.713

3.6   Discriminate validity for lower-order constructs

Discriminatory validity will be established if the value of the top variable in each column is higher than other constructs (Fornell and Larcker, 1981). HTMT is used to correlate components and check the discriminatory validity. (Kline, 2015; Teo et al., 2008) Suggested if the value of HTMT is 0.85 or 0.90 or less, indicate the established HTMT. This study tested Fornell larker criteria and HTMT To establish discriminatory validity. Results are stated in Tables 3 and 4.

Table 4   Heterotrait-monotrait ratio

	CRM	KAC	KAP	KS	PR	SR
CRM						
KAC	0.614					
KAP	0.44	0.702				
KS	0.633	0.832	0.832			
PR	0.322	0.504	0.403	0.523		
SR	0.227	0.368	0.311	0.256	0.185	

4   Analysing higher-order constructs

4.1   Discriminant validity

4.1.1   Former Larcker criteria

Discriminatory validity for higher-order constructs will be established if the value of the top variable in each column is higher than other constructs (Fornell and Larcker, 1981). Tables 5 and 6 indicate that higher-order constructs' discriminatory validity is established.

Table 5   Former Larcker criteria for higher-order constructs

	CRM	KMP	PR	SR
CRM	0.784			
KMP	0.566	0.901		
PR	0.295	0.502	0.737	
SR	0.179	0.300	0.082	0.712

Table 6   HTMT

	CRM	KMP	PR	SR
CRM				
KMP	0.644			
PR	0.322	0.563		
SR	0.227	0.338	0.185	

## 5 Structural model analysis

5.1 Hypothesis testing

Further, this study examined the significance and relationship of the hypotheses (Table 7). First hypothesis is CRM is positively associated with KMP. CRM -> KMP- β value is 0.566, T value is 10.129, and the P value is 0.000, showing significant results. The second hypothesis is the association between KMP and PI is significantly positive. KMP -> PR- β value is 0.492, T value is 5.285, and P value is less than 0.05 also shows significant results. Third hypothesis is The relationship between KMP and SI is significantly positive. H3. KMP -> SR – β value is 0.292, T value is 2.908, and P value is 0.002 describe the significant results. The fourth hypothesis is The relationship between CRM and PI is significantly positive. H4. CRM -> PR – β value is 0.017, T value is 0.215, and P value is greater than 0.05 describe the insignificant results. The fifth hypothesis is The relationship between CRM and SI is significantly positive. H5. CRM -> SR – β value is 0.013, T value is 0.155, and P value is 0.439, describe the insignificant results.

Table 7   Direct relationship results

		β value	standard deviation (st. dev)	T value	P values
H1	CRM -> KMP	0.566	0.056	10.129	0.000
H2	KMP -> PR	0.492	0.093	5.285	0.000
H3	KMP -> SR	0.292	0.101	2.908	0.002
H4	CRM -> PR	0.017	0.078	0.215	0.415
H5	CRM -> SR	0.013	0.086	0.155	0.439

Figure 4   Structural model with t statistic (see online version for colours)
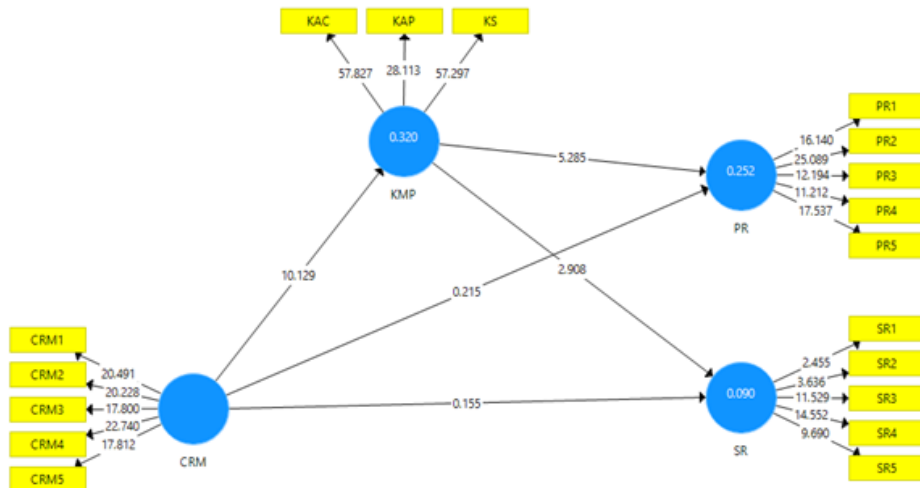
5.2   Mediation analysis

This study also examined the mediation role of KMP between CRM and Innovation capability (PI and SI). In the presence of mediation (KMP), the relationship between CRM and Products Innovation. CRM -> KMP -> PR (β = 0.278, t = 4.730, p = 0.000). Results revealed how the knowledge management process mediated CRM and impacted PI considerably.

H7 KMP mediates the relationship between CRM and SI. CRM -> KMP -> SR (β = 0.165, t = 2.708, p = 0.004) indicates in the presence of a mediator; CRM makes a significant impact on SI (Table 8).

Table 8   Mediation analysis

		β value	(STDEV)	T statistics	P values
H6	CRM -> KMP -> PR	0.278	0.059	4.730	0.000
H7	CRM -> KMP -> SR	0.165	0.061	2.708	0.004

6   Discussion

Innovation in organisations has become considerably more difficult to achieve due to the fast growth of technology and the rising intensity of competition in today's economic climate. (Tamayo-Torres et al., 2016). The ability to innovate is critical for gaining a major edge due to rising consumer expectations, technical improvements, and market competition; innovations are becoming more difficult, time-consuming, and costly (Tamer Cavusgil et al., 2003; Corral de Zubielqui et al., 2019).

The primary goal of this research is to establish a connection between CRM and KMP to better understand organisational innovation. This research created a model to evaluate the connection between CRM, the knowledge management process, and innovative capacity. The findings of this research provide a novel understanding that the success of CRM makes knowledge an important instrument in the pursuit of excellence in Innovation. The success of knowledge management plays a distinct role in the relationship between innovation and customer provision. The importance of the theories, as well as their connection to one another, was investigated in this research (Tables 7 and 8).

First hypothesis is CRM is positively correlated with KMP. CRM -> KMP was showing significant results. A good CRM system makes it possible to realise the potential value of customer information (Migdadi, 2021). It has been revealed that CRM is the primary component that contributes to efficiently managing customer information. Innovation is one of the most important benefits that may be accomplished via appropriately managing customer information. However, Previous studies discussed different forms of knowledge with different forms of innovation (Shehzad et al., 2021, Corral de Zubielqui et al., 2019). Innovation is important for organisational competitive advantage (Liao et al., 2017). Many researchers reveal that any organisation's main source is knowledge and management (Liao et al., 2017; Lei et al., 2019). The second and third hypothesis is the link between KMP and Product and SI showed significantly positive results. This research underlines the significance of customer knowledge and shows a link between it and innovation. and the results found that the knowledge

management process is positively connected with innovation. Results reveal proper acquiring, sharing, and applying knowledge in firms is very important to gain a competitive advantage. Knowledge from customers can help organisations to lead the innovation process.

Moreover, the study uncovers a linkage between customer engagement and innovation. The fourth and fifth hypotheses propose a clear association between managing customer relationships and creating products and services. According to the findings, there is no significant connection between CRM and innovative capacities. CRM may be successful if it is properly used and realises its full potential after integrating Knowledge into CRM, resulting in operational process improvements (Migdadi, 2021). Knowledge integration was ultimately responsible for organisational innovation (Bose and Sugumaran, 2003).

Furthermore, this study also examined KMP's position as a mediator between CRM and inventive ability (product and SI). In mediation, the relationship between customer relationship and Product and SI. According to the results, the customer knowledge management approach bridges CRM and product and SI. (Table 8). Although if companies have access to a huge wave of knowledge about their customers, such as the activities they engage in, organisations must manage this knowledge and gain as much value as possible from it to accomplish the goal of innovation (Migdadi, 2021; Rastgar et al., 2019; Gil-Gomez et al., 2020). According to previous research, CRM outcomes could only be attained via knowledge management, and innovation is one of the key outputs of knowledge management effectiveness (Migdadi, 2021; Bose and Sugumaran, 2003). In contrast, CRM and innovation had no substantial relationship when KMP was not included as a mediator. Moreover, to improve our goods and services, we must transform the information we acquire from clients into knowledge.

CRM, knowledge management, PI, and SI are all critical aspects of running a successful business, and many companies have adopted systems and platforms to help them manage these different areas for example salesforce, Microsoft Dynamic 365, and Zoho. However, it is important to note that the popularity of these platforms may vary depending on various factors, such as the size and type of business, industry, and geographic location (Vincent et al., 2019). Therefore, it is essential to consider these factors when choosing a platform that best suits your business needs (Wu and Chen, 2014; Umble et al., 2003). Better collaborative functions and more flexibility between CRM, knowledge and firm performance enhanced innovation performance.

7   Implications

This study has theoretical and practical implications, making it useful to academics and practitioners. An extensive study on the influence of CRM on the customer knowledge management process in affecting a firm's innovation has been done in the management and strategy literature. Building close relationships with consumers is one of the most successful methods of gathering information that may be used in innovation. This study's findings will assist business executives in maintaining innovation in the goods and services they provide and provide value or competitive advantages for their clients. These may offer managers a strong foundation on which to base their judgments and choices about resource allocation and their decisions regarding innovation. A good CRM system involves in-depth customer information. Therefore, This study has the potential to be a

useful resource not just for managers but also for scholars since it explores the associates among KMP, CRM achievement, and innovation at the same time. The findings are particularly captivating because they demonstrate the precise order in which businesses must correctly deploy CRM and KMP projects while maximising their collaboration potential.

8   Limitations and future direction of studies

Although the study has several contributions, but there are few limitations which should be addressed in subsequent research. This study analysed cross-sectional data on CRM, KMP, and innovation potential in manufacturing firms context; nevertheless, several areas require more exploration from a research standpoint. Different types of industries used different strategies of CRM and KM for innovation purpose. Future research should consider these differences between the firms and evaluate variables according to the nature, pattern and purpose of organisation strategy. Furthermore, knowledge acquisition, sharing and application can be used as single mediating variables in the future research. However, for customer satisfaction, the researcher can use organisation trust as a moderating variable, and explicit, implicit, and tacit knowledge can be utilised as variables. Additionally, there is a connection that can be made between frugal innovation and CRM, as well as customer knowledge management.

9   Conclusions

A conceptual model for CRM, customer knowledge management, and innovation capabilities in products and services is proposed in this study. Many businesses are interested in enhancing their data processing capabilities by using various technologies and solutions to attain success while making the most of available resources. Knowledge management and CRM are closely connected fields that are equally essential to a firm's success. KMP encourages more creative thinking. According to the results, businesses must get, exchange, and use information to maintain their competitive edge. Customers may be the engine that drives innovation. According to the current study findings, KMP substantially influences the invention of CRM products and services. Without KMP, there was a gap between CRM and innovation. It is essential to transform customer data into knowledge to build better goods and services.

References

Akhgari, N., Keshtkar, M. and Ahmadi Sharif, M. (2022) 'Investigating the effect of business intelligence on the success of customer relationship management using knowledge management mediating variable (case study: shipping industry of the Islamic republic of Iran)', *Quarterly Journal of Industrial Technology Development*, Vol. 20, No. 48, pp.35–52.

Alshawabkeh, A., Kharbat, F. and Razmak, J. (2022) 'Knowledge management role in enhancing customer relationship management in hotels industry in the UK', *2022 Ninth International Conference on Social Networks Analysis, Management and Security (SNAMS)*, IEEE, pp.1–8.

Anderson, J.C. and Gerbing, D.W. (1988) 'Structural equation modeling in practice: a review and recommended two-step approach', *Psychological Bulletin*, Vol. 103, No. 3, p.411.

Andreeva, T. and Kianto, A. (2011) 'Knowledge processes, knowledge-intensity and innovation: a moderated mediation analysis', *Journal of Knowledge Management*, Vol. 15, No. 6, pp.1016–1034.

Armstrong, J.S. and Overton, T.S. (1977) 'Estimating nonresponse bias in mail surveys', *Journal of Marketing Research*, Vol. 14, No. 3, pp.396–402.

Bagozzi, R.P. and Yi, Y. (1991) 'Multitrait-multimethod matrices in consumer research', *Journal of Consumer Research*, Vol. 17, No. 4, pp.426–439.

Bahrami, M., Ghorbani, M. and Arabzad, S.M. (2012) 'Information technology (IT) as an improvement tool for customer relationship management (CRM)', *Procedia-Social and Behavioral Sciences*, Vol. 41, pp.59–64.

Baran, R. and Zerres, M. (2010) *Customer Relationship Management*, Bookboon.

Belkahla, W. and Triki, A. (2011) 'Customer knowledge enabled innovation capability: proposing a measurement scale', *Journal of Knowledge Management*, Vol. 15, No. 4, pp.648–674.

Bhatt, G.D. (2001) 'Knowledge management in organizations: examining the interaction between technologies, techniques, and people', *Journal of Knowledge Management*, Vol. 5, No. 1, pp.68–75.

Bose, R. (2002) 'Customer relationship management: key components for IT success', *Industrial Management and Data Systems*, Vol. 102, No. 2, pp.89–97.

Bose, R. and Sugumaran, V. (2003) 'Application of knowledge management technology in customer relationship management', *Knowledge and Process Management*, Vol. 10, No. 1, pp.3–17.

Brockhoff, K. (2003) 'Customers' perspectives of involvement in new product development', *International Journal of Technology Management*, Vol. 26, Nos. 5–6, pp.464–481.

Buchnowska, D. (2011) 'Customer knowledge management models: assessment and proposal', *Research in Systems Analysis and Design: Models and Methods: 4th SIGSAND/PLAIS EuroSymposium 2011*, Gdańsk, Poland, September 29, 2011, Revised Selected Papers 4, 2011, Springer, pp.25–38.

Carbonell, P. and Rodriguez-Escudero, A-I. (2014) 'Antecedents and consequences of using information from customers involved in new service development', *Journal of Business and Industrial Marketing*, Vol. 29, No. 2, pp.112–122.

Carr, A.S. and Pearson, J.N. (1999) 'Strategically managed buyer–supplier relationships and performance outcomes', *Journal of Operations Management*, Vol. 17, No. 5, pp.497–519.

Chatterjee, S., Rana, N. P., Tamilmani, K. and Sharma, A. (2021) 'The effect of AI-based CRM on organization performance and competitive advantage: an empirical analysis in the B2B context', *Industrial Marketing Management*, Vol. 97, pp.205–219.

Chege, S.M., Wang, D. and Suntu, S.L. (2020) 'Impact of information technology innovation on firm performance in Kenya', *Information Technology for Development*, Vol. 26, No. 2, pp.316–345.

Chen, C.J., Huang, J.W. and Hsiao, Y.C. (2010) 'Knowledge management and innovativeness', *International Journal of Manpower*, Vol. 31, No. 8, pp.848–870.

Chen, I.J. and Paulraj, A. (2004) 'Understanding supply chain management: critical research and a theoretical framework', *International Journal of Production Research*, Vol. 42, No. 1, pp.131–163.

Chen, I.J. and Popovich, K. (2003) 'Understanding customer relationship management (CRM)', *Business Process Management Journal*, Vol. 9, No. 5, pp.672–688.

Chen, J-S., Tsou, H-T. and Ching, R.K. (2011) 'Co-production and its effects on service innovation', *Industrial Marketing Management*, Vol. 40, No. 8, pp.1331–1346.

Choi, S.B., Kim, K., Ullah, S.M.E. and Kang, S-W. (2016) 'How transformational leadership facilitates innovative behavior of Korean workers', *Personnel Review*, Vol. 45, No. 3, pp.459–479.

Corral De Zubielqui, G., Lindsay, N., Lindsay, W. and Jones, J. (2019) 'Knowledge quality, innovation and firm performance: a study of knowledge transfer in SMEs', *Small Business Economics*, Vol. 53, pp.145–164.

Costa, V. and Monteiro, S. (2016) 'Key knowledge management processes for innovation: a systematic literature review', *VINE Journal of Information and Knowledge Management Systems*, Vol. 46, No. 3, pp.386–410.

Darroch, J. and Mcnaughton, R. (2002) 'Examining the link between knowledge management practices and types of innovation', *Journal of Intellectual Capital*, Vol. 3, No. 3, pp.210–222.

Du Plessis, M. (2007) 'The role of knowledge management in innovation', *Journal of Knowledge Management*, Vol. 11, No. 4, pp.20–29.

Elfarmawi, W. (2019) 'The relationship between customer relationship management and product innovation', *Journal of Systems Integration,* Vol. 10, No. 4, 1804–2724.

Falasca, M., Zhang, J., Conchar, M. and Li, L. (2017) 'The impact of customer knowledge and marketing dynamic capability on innovation performance: an empirical analysis', *Journal of Business and Industrial Marketing*, Vol. 32, No. 7, pp.901–912.

Fard, H.D. and Selseleh, M. (2010) 'Measuring knowledge management cycle: evidence from Iran', *European Journal of Scientific Research*, Vol. 41, No. 2, pp.297–309.

Fierro Moreno, E., Mercado Salgado, P. and Cernas Ortíz, D.A. (2013) 'The effect of knowledge-centered culture and social interaction on organizational innovation: the mediating effect of knowledge management', *ESIC Market*, Vol. 44, No. 2.

Fornell, C. and Bookstein, F.L. (1982) 'Two structural equation models: LISREL and PLS applied to consumer exit-voice theory', *Journal of Marketing Research*, Vol. 19, No. 4, pp.440–452.

Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, Vol. 18, No. 1, pp.39–50.

García-Murillo, M. and Annabi, H. (2002) 'Customer knowledge management', *Journal of the Operational Research Society*, Vol. 53, pp.875–884.

Gaviria-Marin, M., Merigó, J.M. and Baier-Fuentes, H. (2019) 'Knowledge management: a global examination based on bibliometric analysis', *Technological Forecasting and Social Change*, Vol. 140, pp.194–220.

Gebert, H., Geib, M., Kolbe, L. and Riempp, G. (2002) 'Towards customer knowledge management: integrating customer relationship management and knowledge management concepts', *ICEB 2002 Proceedings*, Taipei, Taiwan, Vol. 86, https://aisel.aisnet.org/iceb2002/86.

Gil-Gomez, H., Guerola-Navarro, V., Oltra-Badenes, R. and Lozano-Quilis, J.A. (2020) 'Customer relationship management: digital transformation and sustainable business model innovation', *Economic Research-Ekonomska Istraživanja*, Vol. 33, No. 1, pp.2733–2750.

Girard, J. and Girard, J. (2015) 'Defining knowledge management: toward an applied compendium', *Online Journal of Applied Knowledge Management*, Vol. 3, No. 1, pp.1–20.

Guerola-Navarro, V., Gil-Gomez, H., Oltra-Badenes, R. and Sendra-García, J. (2021) 'Customer relationship management and its impact on innovation: a literature review', *Journal of Business Research*, Vol. 129, pp.83–87.

Hair JR, F.J., Sarstedt, M., Hopkins, L. and Kuppelwieser, G.V. (2014) 'Partial least squares structural equation modeling (PLS-SEM)', *European Business Review*, Vol. 26, No. 2, pp.106–121.

Hair JR, J.F., Anderson, R., Mehta, R. and Babin, B. (2020) *Sales Force Management*, John Wiley and Sons.

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010) *Multivariate Data Analysis: A Global Perspective*, Pearson Prentice Hall, New Jersey.

Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019) 'When to use and how to report the results of PLS-SEM', *European Business Review*, Vol. 31, No. 1, pp.2–24.

Hamdoun, M., Jabbour, C.J.C. and Othman, H.B. (2018) 'Knowledge transfer and organizational innovation: impacts of quality and environmental management', *Journal of Cleaner Production*, Vol. 193, pp.759–770.

Harty, C. (2005) 'Innovation in construction: a sociology of technology approach', *Building Research and Information*, Vol. 33, No. 6, pp.512–522.

Hikmawati, N. K., Alamsyah, D.P. and Setiadi, A. (2020) 'IT implementation of customer relationship management', *2020 Fifth International Conference on Informatics and Computing (ICIC)*, 3–4 November 2020, pp.1–4.

Iacobucci, D. (2010) 'Structural equations modeling: Fit indices, sample size, and advanced topics', *Journal of Consumer Psychology*, Vol. 20, No. 1, pp.90–98.

Kabue, H.W. (2021) 'Enhancing customer retention: the role of customer knowledge management', *Business Management and Commerce*, Vol. 6, No. 1, pp.2–7.

Karimi, A. and Allameh, S. (2016) 'Investigating the relationship between customer knowledge management and customer loyalty: mediating role of customer value (Case study: Saderat Bank of Khozestan)', *Global Journal on Humanites and Social Sciences*, Vol. 4, pp.48–58.

Khodakarami, F. and Chan, Y.E. (2014) 'Exploring the role of customer relationship management (CRM) systems in customer knowledge creation', *Information and Management*, Vol. 51, No. 1, pp.27–42.

Kim, J., Suh, E. and Hwang, H. (2003) 'A model for evaluating the effectiveness of CRM using the balanced scorecard', *Journal of Interactive Marketing*, Vol. 17, No. 2, pp.5–19.

Kline, R.B. (2015) *Principles and Practice of Structural Equation Modeling*, Guilford Publications.

Kock, N. (2015) 'Common method bias in PLS-SEM: A full collinearity assessment approach', *International Journal of e-Collaboration (IJEC)*, Vol. 11, No. 4, pp.1–10.

Kurniawati, A., Samadhi, M., Wiratmadja, I.I., Sunaryo, I. and Rizana, A.F. (2018) 'Enhancing innovation through knowledge management: a systematic literature review on empirical findings', *International Journal of Knowledge Engineering*, Vol. 4, No. 1, pp.43–49.

Le, P.B. and Lei, H. (2017) 'How transformational leadership supports knowledge sharing', *Chinese Management Studies*, Vol. 11, No. 3, pp.479–497.

Lei, H., Khamkhoutlavong, M. and Le, P.B. (2021) 'Fostering exploitative and exploratory innovation through HRM practices and knowledge management capability: the moderating effect of knowledge-centered culture', *Journal of Knowledge Management*, Vol. 25, No. 8, pp.1926–1946.

Lei, H., Nguyen, T. T. and Le, P. B. 2019. How knowledge sharing connects interpersonal trust and innovation capability. Chinese Management Studies, 13, 276-298.

Liao, S-H., Chen, C-C., Hu, D-C., Chung, Y-C. and Liu, C-L. (2017) 'Assessing the influence of leadership style, organizational learning and organizational innovation', *Leadership and Organization Development Journal*, Vol. 38, No. 5, pp.590–609.

Liew, C.B.A. (2008) 'Strategic integration of knowledge management and customer relationship management', *Journal of Knowledge Management*, Vol. 12, No. 4, pp.131–146.

Lin, H.F. (2011) 'Antecedents of the stage-based knowledge management evolution', *Journal of Knowledge Management*, Vol. 15, No. 1, pp.136–155.

Lin, R.J., Che, R.H. and Ting, C.Y. (2012) 'Turning knowledge management into innovation in the high-tech industry', *Industrial Management and Data Systems*, Vol. 112, No. 1, pp.42–63.

Mårtensson, M. (2000) 'A critical review of knowledge management as a management tool', *Journal of Knowledge Management*, Vol. 4, No. 3, pp.204–216, https://doi.org/10.1108/13673270010350002.

Mcevily, B. and Marcus, A. (2005) 'Embedded ties and the acquisition of competitive capabilities', *Strategic Management Journal*, Vol. 26, No. 11, pp.1033–1055.

Mejía Trejo, J., Sánchez Gutiérrez, J. and Maldonado Guzman, G. (2016) 'The customer knowledge management and innovation', *Contaduría Y Administración*, Vol. 61, No. 3, pp.456–477.

Migdadi, M.M. (2021) 'Knowledge management, customer relationship management and innovation capabilities', *Journal of Business and Industrial Marketing*, Vol. 36, No. 1, pp.111–124.

Molina-Morales, F.X., García-Villaverde, P.M. and Parra-Requena, G. (2014) 'Geographical and cognitive proximity effects on innovation performance in SMEs: a way through knowledge acquisition', *International Entrepreneurship and Management Journal*, Vol. 10, pp.231–251.

Mukherji, S. (2012) 'A framework for managing customer knowledge in retail industry', *IIMB Management Review*, Vol. 24, No. 2, pp.95–103.

Nesheim, T., Olsen, K.M. and Tobiassen, A.E. (2011) 'Knowledge communities in matrix-like organizations: managing knowledge towards application', *Journal of Knowledge Management*, Vol. 15, No. 5, pp.836–850.

Obeidat, B.Y., Al-Suradi, M.M., Masa'deh, R.E. and Tarhini, A. (2016) 'The impact of knowledge management on innovation', *Management Research Review*, Vol. 39, No. 10, pp.1214–1238.

Ode, E. and Ayavoo, R. (2020) 'The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation', *Journal of Innovation and Knowledge*, Vol. 5, No. 3, pp.210–218.

Özgener, Ş. and Iraz, R. (2006) 'Customer relationship management in small–medium enterprises: the case of Turkish tourism industry', *Tourism Management*, Vol. 27, No. 6, pp.1356–1363.

Phong, L.B., Hui, L. and Son, T.T. (2018) 'How leadership and trust in leaders foster employees' behavior toward knowledge sharing', *Social Behavior and Personality: an International Journal*, Vol. 46, No. 5, pp.705–720.

Pinho, I., Rego, A. and Pina E Cunha, M. (2012) 'Improving knowledge management processes: a hybrid positive approach', *Journal of Knowledge Management*, Vol. 16, No. 2, pp.215–242.

Podsakoff, P.M., Mackenzie, S.B., Lee, J-Y. and Podsakoff, N.P. (2003) 'Common method biases in behavioral research: a critical review of the literature and recommended remedies', *Journal of Applied Psychology*, Vol. 88, No. 5, p.879.

Preacher, K.J. and Hayes, A.F. (2004) 'SPSS and SAS procedures for estimating indirect effects in simple mediation models', *Behavior Research Methods, Instruments, And Computers*, Vol. 36, pp.717–731.

Rastgar, A.A., Esmaili, E., Naderi, R. and Hemmati, A. (2019) 'Clarifying the effect of customer knowledge management to improve business performance of banks: considering the role of electronic customer relationship management', *International Journal of Electronic Customer Relationship Management*, Vol. 12, No. 2, pp.108–123.

Saarijärvi, H., Karjaluoto, H. and Kuusela, H. (2013) 'Customer relationship management: the evolving role of customer data', *Marketing Intelligence and Planning*, Vol. 31, No. 6, pp.584–600.

Sáenz, J., Aramburu, N. and Blanco, C.E. (2012) 'Knowledge sharing and innovation in Spanish and Colombian high-tech firms', *Journal of Knowledge Management*, Vol. 16, No. 6, pp.919–933.

Santouridis, I. and Veraki, A. (2017) 'Customer relationship management and customer satisfaction: the mediating role of relationship quality', *Total Quality Management and Business Excellence*, Vol. 28, Nos. 9–10, pp.1122–1133.

Shehzad, M.U., Zhang, J. and Le, P.B. (2021) 'Role of collaborative culture and knowledge management process for stimulating radical and incremental innovation: a comparative moderation approach', *Business Process Management Journal*, Vol. 27, No. 7, pp.2021–2050.

Shin, M., Holden, T. and Schmidt, R.A. (2001) 'From knowledge theory to management practice: towards an integrated approach', *Information Processing and Management*, Vol. 37, No. 2, pp.335–355.

Sunkari, S. (2022) *A Brief Review on CRM, Salesforce and Reasons Stating Salesforce as One of the Top CRM's*, Salesforce and Reasons Stating Salesforce as One of the Top CRM's, June 18, 2022.

Taghizadeh, S.K., Jayaraman, K., Ismail, I. and Rahman, S.A. (2016) 'Scale development and validation for DART model of value co-creation process on innovation strategy', *Journal of Business and Industrial Marketing*, Vol. 31, No. 1, pp.24–35.

Taherparvar, N., Esmaeilpour, R. and Dostar, M. (2014) 'Customer knowledge management, innovation capability and business performance: a case study of the banking industry', *Journal of Knowledge Management*, Vol. 18, No. 3, pp.591–610.

Tamayo-Torres, I., Gutiérrez-Gutiérrez, L.J., Llorens-Montes, F.J. and Martínez-López, F.J. (2016) 'Organizational learning and innovation as sources of strategic fit', *Industrial Management and Data Systems*, Vol. 116, No. 8, pp.1445–1467.

Tamer Cavusgil, S., Calantone, R.J. and Zhao, Y. (2003) 'Tacit knowledge transfer and firm innovation capability', *Journal of Business and Industrial Marketing*, Vol. 18, No. 1, pp.6–21.

Teo, T.S.H., Srivastava, S.C. and Jiang, L. (2008) 'Trust and electronic government success: an empirical study', *Journal of Management Information Systems*, Vol. 25, No. 3, pp.99–132.

Than, S.T., Le, P.B. and Le, T.T. (2021) 'The impacts of high-commitment HRM practices on exploitative and exploratory innovation: the mediating role of knowledge sharing', *VINE Journal of Information and Knowledge Management Systems*, Vol. 53, No. 3, pp.430–449, https://doi.org/10.1108/VJIKMS-10-2020-0196.

Tseng, S-M. and Lee, P-S. (2014) 'The effect of knowledge management capability and dynamic capability on organizational performance', *Journal of Enterprise Information Management*, Vol. 27, No. 2, pp.158–179.

Umble, E.J., Haft, R.R. and Umble, M.M. (2003) 'Enterprise resource planning: implementation procedures and critical success factors', *European Journal of Operational Research*, Vol. 146, No. 2, pp.241–257.

Vincent, P., Iijima, K., Driver, M., Wong, J. and Natis, Y. (2019) *Magic Quadrant for Enterprise Low-Code Application Platforms,* Gartner report.

Wang, X. and Xu, M. (2018) 'Examining the linkage among open innovation, customer knowledge management and radical innovation', *Baltic Journal of Management*, Vol. 13, No. 3, pp.368–389.

Wu, L. and Chen, J-L. (2014) 'Knowledge management driven firm performance: the roles of business process capabilities and organizational learning', *Journal of Knowledge Management.*

Xu, J., Houssin, R., Caillaud, E. and Gardoni, M. (2010) 'Macro process of knowledge management for continuous innovation', *Journal of Knowledge Management*, Vol. 14, No. 4, pp.573–591.

Xuelian, L., Chakpitak, N. and Yodmongkol, P. (2015) 'A novel two-dimension' customer knowledge analysis model', *Asian Social Science*, Vol. 11, No. 16, p.257.

Yang, Z., Nguyen, V.T. and Le, P.B. (2018) 'Knowledge sharing serves as a mediator between collaborative culture and innovation capability: an empirical research', *Journal of Business and Industrial Marketing,* Vol. 33, No. 7, pp.958–969.

Yi, Y., Nataraajan, R. and Gong, T. (2011) 'Customer participation and citizenship behavioral influences on employee performance, satisfaction, commitment, and turnover intention', *Journal of Business Research*, Vol. 64, No. 1, pp.87–95.

Zhang, J. and Zhu, M. (2019) 'When can B2B firms improve product innovation capability (PIC) through customer participation (CP)? The moderating role of inter-organizational relationships?', *Journal of Business and Industrial Marketing*, Vol. 34, No. 1, pp.12–23.