

---

**Explaining the Entrepreneurial Effect of Customer Knowledge  
Management on Product Innovation of Electronic Businesses**

Babak Ziyae\*, Mehran Rezvani\* and Fahimeh Zareai \*  
*Faculty of Entrepreneurship, University of Tehran\**

---

**Abstract:** In today's world, development of businesses is determined on the basis of existing knowledge of their processes and products, but not based on the volume of their capital goods and tools. The effect of knowledge, particularly in information technology and businesses that are active in this field is more specific. The present study aimed to explain the entrepreneurial effect of customer knowledge management and its dimensions on the innovations in active Electronic businesses (hereafter acronym as E-business) as well as the role of organizational knowledge absorptive capacity in the relationship between these two. The data of the 115 administrators and knowledgeable people in the business of two- star medal in the electronic trust icon were collected using a questionnaire that its validity and reliability have been confirmed. The results of this study show that entrepreneurial effect of customer knowledge management, both generally and in each of its dimensions, positively influences on the product innovation in the E-businesses. In addition, absorptive capacity of knowledge moderates the relationship the entrepreneurial effect of customer knowledge management and product innovation in E-businesses.

**Keywords:** *Customer Knowledge Management; Absorptive Capacity; Innovation; E-Business*

### **Introduction**

E-business, its diverse models, and its effects on the economy of the countries is discussed in the many research and academic circles around the world ((Huang et al., 2014). Due to the range of E-business, this topic is striking from both perspectives of the domestic economy and international trade (Al-Shammari, 2016)). The increasing development of the information and communication technology and the convergence between the processes of the development of information, has created a change and movement called the communications revolution in human societies (Alegre et al., 2013).

Durability in a competitive and open economy depends on efficient actions with high focus on customer knowledge and competitiveness. So, companies should immediately learn the competition rules-of-the-game and the factors affecting competitiveness in E-business system (Stefanou et al., 2013).

In today's digital economy, Knowledge is considered as an asset, and the implementation of knowledge management supports a company in the development of innovative products and is crucial in taking strategic decisions (Meihami & Meihami, 2014). But for a successful presence in the dynamic modern market, another important component called the customer knowledge should be taken into account. Customer knowledge management provides the chance for businesses to be able more likely to detect the opportunities emerged in the market and increases their competitive advantage (Rollins & Halinen, 2005). Customer knowledge management is activities for acquiring, sharing, and the expanding the customer knowledge in order to provide a common benefit to customers and business (Wu et al., 2013).

Dess and Lumpkin (2015) state that among the many kinds of knowledge in a company, the knowledge of the product and the customer knowledge have very important rank, because they have an effect directly on competitive advantage and financial performance of companies.

Product innovation is the answer to customer requirements when it is along with technical capacities and learning process of customer (Darroch, 2015). Until the twenty-first century, competitive advantage was expressed only in the product innovation and brand, but in recent years, this advantage is attained by collecting data from customers (Hong et al., 2004). So far, many studies have been conducted in order to determine the extent of the innovation effect on product acceptance by the customer, but there is little literature conducted in entrepreneurial effect of customer knowledge management and the n product innovation.

In addition to the role of knowledge management in product innovation, the arrival of the knowledge to the business is a function of the absorptive capacity of the business. Escribano et al. (2008) have shown that the absorptive capacity of the business can moderate the impact of the arrival of the knowledge to the business on innovation (Escribano et al., 2009). In the study by Wang and Han (2011), this moderating effect has been found. Hence, in order to achieve a more comprehensive introductory model, there is necessity of investigating this variability in the relationship between the customer knowledge management and business innovation that has been neglected a lot in the field of electronic businesses (Foss et al., 2011).

The present study was aimed to investigate the effects of customer knowledge management on innovation in e-businesses as well as explain the role of absorptive capacity of e-businesses in this respect. Hence, in this study, the stream of research starts by these questions: firstly, what is the entrepreneurial effect of the customer knowledge management on product innovation in E-businesses? And secondly: how the absorptive capacity of E-businesses moderates the relationship between the entrepreneurial effect of the customer knowledge management and product innovation?

## **Literature review**

### **Customer Knowledge Management**

Most of the businesses emphasize on the importance of knowledge as a creator of a competitive advantage (Huang et al., 2014). In today's world the basis of business has been changed and the new rules have affected market activities (Liao & Yu, 2013). These events include items such as more access to knowledge, technology development, the global business and change in the rules, and the customers who have knowledge about their needs, and also about goods and services that can meet their needs (Lin & Ting, 2012). Then, in this regard, this study began the discussion of the concept of knowledge and proceeded to explain the relationships between knowledge management with innovation as well as the position of the absorptive capacity of knowledge in the business.

According to Yang et al., (2014), knowledge is the information that has been mixed with experience, ideas, interpretations and thoughts. Knowledge is classified from different perspectives: for example, private or public knowledge, theoretical or practical knowledge, hard or soft knowledge, internal or external knowledge, and more accepted than all, explicit or implicit knowledge (Darroch & McNaughton, 2003). Cui and Wu (2015) have defined knowledge as a fluid composition of the experiences, textual information, values and professional insight that provides a framework for evaluating and incorporating new experiences and information. In the global economy, knowledge is one of the most important assets of an organization (Huang et al., 2014). In high economic uncertainty, the only way to maintain a competitive advantage is having knowledge (Xu & Walton, 2005)

Knowledge of the organization is retrievable, reusable and shareable through the processes, methodologies, models, and software (Yang et al., 2014).

Customer knowledge is a part of an organization's knowledge (Wang et al., 2010). Taherparvar et al. (2013) believe that customer knowledge is a kind of knowledge where a customer as a

direct or indirect impact on the performance of the organization. Sun et al., (2010) goes one step ahead and suggests that customer knowledge include the collection of customer knowledge, supply chain knowledge, knowledge of the collection of the business partners and the like. This knowledge is as a result of two knowledge entrepreneurial flows that creates value for supplier and buyer and is beyond the information relating to the identification and classification of clients (Yang et al., 2014). It includes a set of knowledge that is obtained outside of the organization and inside the industry and market (Buchnowska, 2011). The examples include customer preferences towards new products and knowledge related to the business environment trends (Darroch & McNaughton, 2003).

Knowledge about the actual and potential customers that can include knowledge in product range, competitors and markets (Rowley, 2002; Xu & Walton, 2005). In addition, customer knowledge can be explicit (structured information in the database) or implicit (knowledge in the minds of employees and customers) (Buchnowska, 2011) as well as customer knowledge can be individual or collective. Finally, customer knowledge can be classified at different levels, ranging from lowest to highest (Al-Shammari, 2009).

Customer data are recorded in the database of the organization, paper documents and the minds of employees (Cui & Wu, 2015). Usually the customer data includes contact information, transaction data, selling data and customer feedbacks (Al-Shammari, 2009). These points include the point of purchase, services and support contact, website visits, surveys of customer satisfaction, interactions and payments by credit cards or market studies (Belbaly et al., 2007). According to Stefanou et al. (2003), knowledge management is a key competitive advantage of collective intelligence and is used in innovation and continuous learning (Sindakis et al., 2015). However, knowledge capturing, sharing and interpreting is important for firm strategic and operational activities (Jiménez-Barrionuevo et al., 2011).

By providing the possibility of data mining and decision tools and technologies to interpretation, information technology facilitates the knowledge management. Of course, the ultimate goal of knowledge management and customer relationship management is close together and both are looking for continuous improvement of processes in order to provide the customer's goals (Alegre et al., 2013).

Some technological advances related to knowledge management systems, and customer relationship management are also similar; for example, data storage, data recovery engines, workflow systems and Web technologies (Stefanou et al., 2003). Knowledge management is usually the support process and due to the inclusive nature of knowledge, every business process can be converted into a "knowledge management process like knowledge creation, knowledge dissemination and the like (Gibbert et al., 2002). Almost every definition of knowledge management involves the storage of knowledge and knowledge management includes the acquisition of knowledge, storage of staff knowledge and to make information available for other databases and the Transformation of implicit knowledge to possible explicit knowledge (Lopez-Nicolas & Molina-Castillo, 2008).

According to Dess and Lumpkin (2015), knowledge management process includes: 1) generating new knowledge; 2) access to knowledge on foreign sources; 3) presenting the data in the documents, databases, software, and so on; 4) embedding knowledge in processes, products or services; 5) transfer of current knowledge throughout the organization; 6) using of accessible knowledge in decision-making; 7) facilitating the growth of knowledge through culture and incentives; and 8) measuring the value of knowledge assets and the impact of knowledge management.

The first step in customer knowledge management is the assimilation of knowledge of the surrounding environment (Sindakis et al., 2015). In such a situation, an understanding of the concept of absorptive capacity of the business seems to be essential. According to Alegre et al. (2013), absorptive capacity means the ability to recognize new information, to integrate and

synchronize it and to use it for commercial purposes (Jiménez-Barrionuevo et al., 2011) Absorptive capacity is one of the basic features of learning that companies can develop it in order to discover the outer organizational information and knowledge(Cui & Wu,2015). This information that can be helpful for companies in the next phase is internalized in the organization and is matched to the specific needs of the organization and ultimately is operated in line with the objectives of the market (Gibbert et al., 2002). This depends on the previous level of knowledge of the company and the knowledge that is done increasingly during the long process of researching and collecting the knowledge in the organization (Yang et al., 2014). Therefore, organizations that have a good knowledge base in a particular area usually have a higher absorptive capacity and will be able to assess and evaluate new information and ideas(Jiménez-Barrionuevo et al., 2011). In fact, the absorptive capacity refers to learning and taking action based on scientific findings and technological activities outside the organization's boundaries(Sun & Anderson, 2010). This capacity enables the organization move to acquire knowledge, handle it effectively, put a powerful impact on the ability of companies to innovate, adapt it to their environment and ultimately be more competitive(Jiménez-Barrionuevo et al., 2011).

Absorptive capacity is defined first as the ability to recognize the value of new information, integrate and internalize this information and use it to produce commercial products(Taherparvar et al.,2013). The capacity to learn is one of the fundamental capabilities of learning that companies can use it in order to discover useful knowledge and information outside the organization and then internalize this knowledge and adapt it with their specific needs and use them for commercial purposes (Jiménez-Barrionuevo et al., 2011).

The absorptive capacity refers to the previous level of knowledge available in the organization, and is developed through a long process of research and collecting the cumulative knowledge (Wang & Han, 2011). So, organizations that have the respectable knowledge base in a specific field, have high absorptive capacity and will be able to assess information or new ideas that are developed in this field of knowledge, and make the necessary measures based on them Stefanou et al.,2013).

### **Absorptive Capacity and Innovation**

Customer Knowledge Management plays an important role in providing benefits such as vision, characteristics, habits, and contact with customers for an organization to establish a close relationship with its customers (Lin et al., 2012). In addition, according to the entrepreneurship literature, innovative activities to be emerged, often take advantage of the knowledge management systems. Innovation is a key element of entrepreneurial strategy (Wang & Han, 2011). Innovation refers to the efforts of a company to find new opportunities and solutions (Sindakis et al., 2015). Innovation employs creativity and experience so that it leads to new products, new services or improved technological processes (Dess & Lumpkin, 2015).

According to Hong et al. (2004), customer knowledge has a direct effect on the success of the products and the business performance. In addition, the knowledge shared by the client have a far higher effect than knowledge of suppliers and knowledge of internal processes on product performance and business performance (Hong et al., 2004).

In a major study, Yang et al. (2006) found that customer knowledge management has a positive impact on the organization's performance and this positive impact on each organizational project is also supported by knowledge management activities.

Wang et al. (2012) showed that the sharing of knowledge, in its explicit form, has a direct and positive impact on the quality and speed of innovation of the business. In addition, they found that sharing of implicit knowledge has a direct and positive effect on the quality of innovation.

Elsewhere, Lai (2014) have shown that knowledge management has a significant and positive impact on product innovation. The results of the study have shown that knowledge acquisition and sharing of knowledge have a significant positive impact on innovation.

In another study, Lin et al. (2012) have shown that customer knowledge management is an important determinant of the performance of product innovation. In addition, the increased capabilities of customer knowledge sharing and its integration lead to better performance of product innovation of the business.

In this vein, Darroch (2015) identified that all dimensions of knowledge management have a positive impact on market and product innovation and organizations with more knowledge, disseminate greater knowledge and better accountability in their activities. In this vein, Taherparvar et al. (2014) have shown that customer knowledge management has a positive impact on innovation.

It is remarkable that some studies also have implicitly addressed the impact of knowledge management dimensions on innovation and they did not have direct claims on the customer knowledge management (e.g., Lai, 2014; Wang & Wang, 2012).

Foss et al. (2011) has found that internal relationships and entrusting to the customer has a large and significant effect on the performance of innovation. In other words, their study has concluded that the impact of dimension of knowledge sharing in business through relationships on innovation is significant. Other studies have examined the customer knowledge management propellers in innovation in business and have found a significant relationship between them. Ngo and O'Cass (2013) have found that the ability to innovate develops the customer partnerships, and in addition.

Therefore, based on the literature review, the main hypothesis of this study is presented as follows:

Hypothesis 1: The entrepreneurial effect of customer knowledge management has an impact on product innovation of E-business.

The current study also considered the effect of customer knowledge management dimensions in the business innovation. Hence:

- Sub-hypothesis 1a: Storage of customer knowledge has an impact on product innovation of E-businesses.
- Sub-hypothesis 1b: Customer knowledge sharing has an impact on product innovation of E-businesses.
- Sub-hypothesis 1c: The customer knowledge acquisition has an impact on product innovation of E-businesses.
- Sub-hypothesis 1d: the customer knowledge Application has an impact on product innovation of E-businesses.

However, the role of absorptive capacity of knowledge in relationship between entrepreneurial effect of knowledge management and innovation cannot be ignored. Wang and Han (2011) have shown that knowledge properties and also absorptive capacity are two integral factors on innovation performance, and absorptive capacity moderates the relationship between the knowledge properties and innovation. Similarly, Escribano et al. (2009) has shown that the absorptive capacity of the business positively moderates the impact of knowledge flows on innovation.

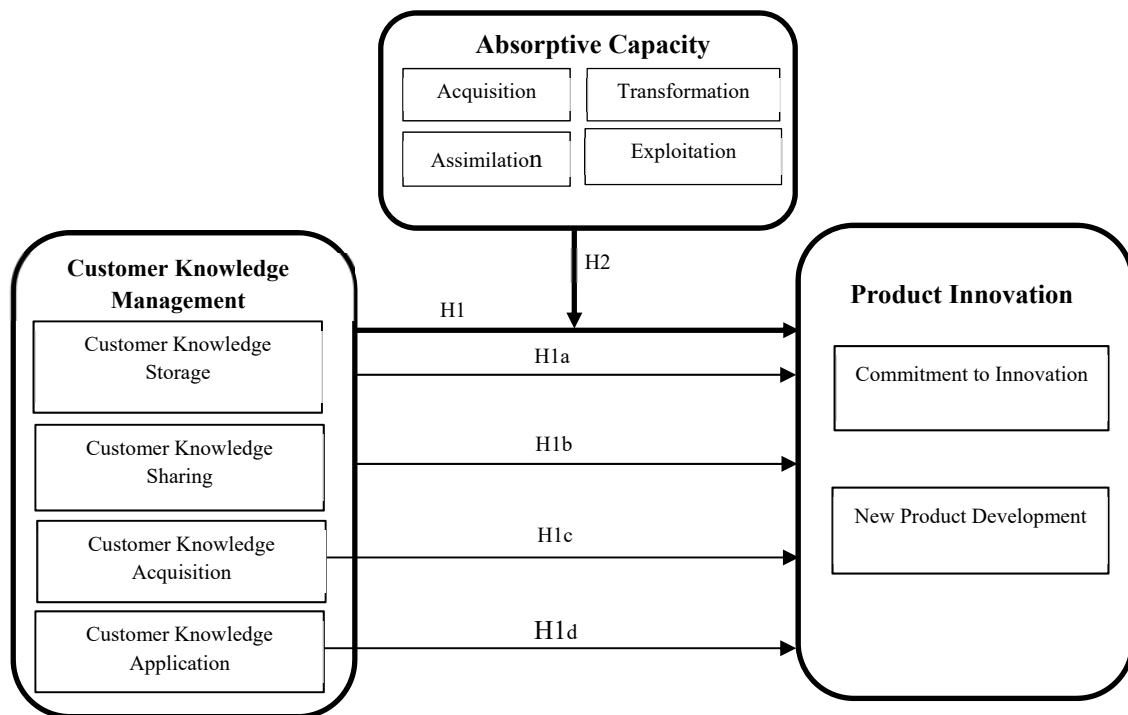
In another major study, Liao and Yu (2013) found that the absorptive capacity of business moderates the relationship between external relations of the business (including the acquisition of knowledge) and innovation. The results showed a moderating effect of the absorptive capacity on the relationship between the local relationships of business is higher than its international relations.

Wang et al. (2010) have found that the acquisition of knowledge, including the outer knowledge of organization, which is a component of the knowledge management activities,

has a positive and significant impact on innovation in business. However, they have been unable to find a necessary statistical support for a moderating effect of the absorptive capacity between the acquisition of knowledge and innovation. This result has also been obtained in studies by Soo et al. (2002). They showed moderating effect of the absorptive capacity in the relationship between entrepreneurial effect of customer knowledge management and innovation is not supported empirically. Hence, since the number of studies that support the moderating effect of the absorptive capacity in the relationship between knowledge management and innovation is more than the studies that did not believe that such a relationship is significant, and also since there is a theoretical contradiction in this area, the second main hypothesis of this study is expressed as follows:

Hypothesis 2: The absorptive capacity of the business moderates the relationship between customer knowledge management and product innovation of E-businesses. Based on the aforementioned discussed literature, the research conceptual framework is shown in the Figure 1.

Figure 1: The Research Conceptual Framework



## Methodology

The current study is a descriptive study aimed to assess the hypotheses by adopting quantitative approaches and to achieve the research objectives. In the present study, statistical population are managers and experts of the marketing and the research and development in the E-businesses in the city of Tehran, Iran.

Due to the specified number of businesses surveyed that was equal to 334, the finite population correction formula for determining the sample size was used (Hulland,1999).

Based on the confidence level of 95%, and assuming normal distribution, the t-level is considered equal to 1.96, allowed error level (d) is equal to 0.05. 115 person were selected, based on using Cochran formula and through stratified random sampling method (as shown as in Equation 1 below).

$$n = \frac{N \times Z \alpha^2 / 2 \times P(1 - P)}{\varepsilon^2 (N - 1) + Z \alpha^2 / 2 \times P(1 - P)} = \frac{334 \times 1.96^2 \times 0.87 \times 0.13}{0.05^2 \times (334 - 1) + 1.96^2 \times 0.87 \times 0.13} = 115 \quad eg(1)$$

In the current study, data were collected using a questionnaire. The main body of the aforementioned questionnaire includes information related to the dimensions of customer knowledge management, innovation in e-business products and the absorptive capacity of business. The customer knowledge management has been measured based on the tools used in the study by Yang et al. (2001), innovation has been measured based on structure expressed by Lee and Jima (2002) and finally, the absorptive capacity of knowledge has been measured based on the structure expressed by Hulland (1999). The questionnaire has been created in the 38-question format and scoring has been set using a scoring method of 5- point Likert scale. In order to determine the quality of the measuring tools, the convergent validity and divergent validity along with composite reliability (CR) indicator and Cronbach's Alpha coefficient have been used, indicating the optimum reliability and validity of the structures. Since these indicators belong to the model analyses, so they have been offered in the data analysis section. In this study, Smart PLS 3 software version 2 was used to check the quality of the structures and presumed relationships between them.

## Results and Discussion

The profiles of respondents are shown in Table 1.

*Table 1: Sample demographic*

Variable	Percentage
<b>Gender</b>	
Male	52%
Female	48%
<b>Age</b>	
20-25	20%
26-31	20%
32-37	30%
38-43	11%
Over 43	19%

According to the adoption of a structural equation modeling approach with a PLS technique, it should be noted that in this approach, the two groups of analysis will be done, which includes: i) Evaluation of the measurement model (Outer model); and ii) evaluation of the structural model (Inner Model). According to Hulland (1999), the adequacy of the measurement model (Outer Model) is measured from the three different dimensions: a) the reliability of the measures and structures, b) convergent validity, and c) divergent validity (Hulland and Business, 1999).

As table 2 shows composite reliability index for each construct is above 0.707. These values indicate the optimal reliability for each of the measures and structures (Akin, Bloemhof et al., 2009). Furthermore, Results suggest that all convergent validity requirements of the measurement model were met.

*Table 2: Convergent validity and CR of the research structures*

<i>Structure</i>	<i>Cronbach's Alpha</i>	<i>Composite Reliability (CR)</i>	<i>Average Variance Extracted (AVE)</i>
<b>Absorptive Capacity</b>	0.86	0.75	0.57
<b>Acquisition</b>	0.81	0.89	0.72
<b>Transformation</b>	0.75	0.84	0.58
<b>Assimilation</b>	0.81	0.88	0.65
<b>Exploitation</b>	0.72	0.84	0.65
<b>Customer Knowledge Management</b>	0.92	0.72	0.72
<b>Customer Knowledge Storage</b>	0.88	0.92	0.74
<b>Customer Knowledge Sharing</b>	0.77	0.90	0.81
<b>Customer Knowledge Acquisition</b>	0.78	0.87	0.70
<b>Customer Knowledge Application</b>	0.74	0.85	0.66
<b>Innovation</b>	0.86	0.91	0.71

In addition, the Cronbach's alpha index is also higher than 0.6 for all structures, which according to Moss et al. (1998) demonstrates a favorable reliability (Moss, Prosser et al., 1998). Also, an average variance extracted for all the structures of this model is higher than 0.5, which indicates a favorable concurrent validity for the structures (Chin, 1998). In examining the measurement model the divergent validity should be investigated for the structures under study. This study is carried out by a comparison the square root of the average variance extracted for every structure with the solidarity of the structure with other structures of the model. The result of this assessment is presented in the table 3.

*Table 3: Divergent validity evaluation matrix*

	1	2	3	4	5	6	7	8	9
<b>1. Acquisition</b>	0.85								
<b>2. Transformation</b>	0.56	0.76							
<b>3. Assimilation</b>	0.32	0.43	0.81						
<b>4. Exploitation</b>	0.40	0.43	0.39	0.80					
<b>5. Customer Knowledge Storage</b>	0.21	0.13	0.08	0.14	0.86				
<b>6. Customer Knowledge Sharing</b>	0.32	0.13	0.15	0.14	0.80	0.90			
<b>7. Customer Knowledge Acquisition</b>	0.17	0.00	0.05	0.06	0.61	0.51	0.83		
<b>8. Customer knowledge Application</b>	-0.06	0.01	0.05	0.06	0.65	0.53	0.67	0.81	
<b>9. Innovation</b>	-0.18	0.02	0.05	0.09	0.75	0.72	0.77	0.68	0.84

The research structural model of the current study is presented in Figure 2 and Figure 3.  
*Figure 2: Path analysis and significance level in the structural model (Main Hypotheses)*



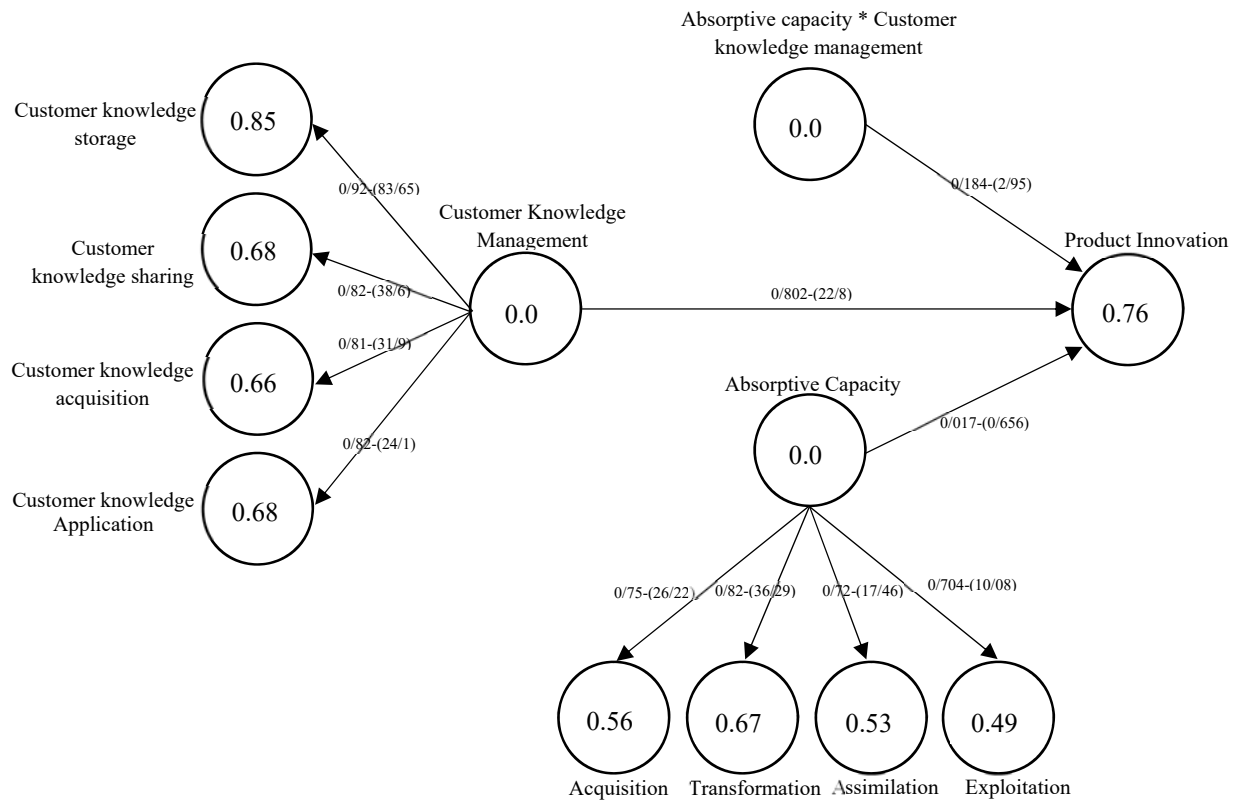
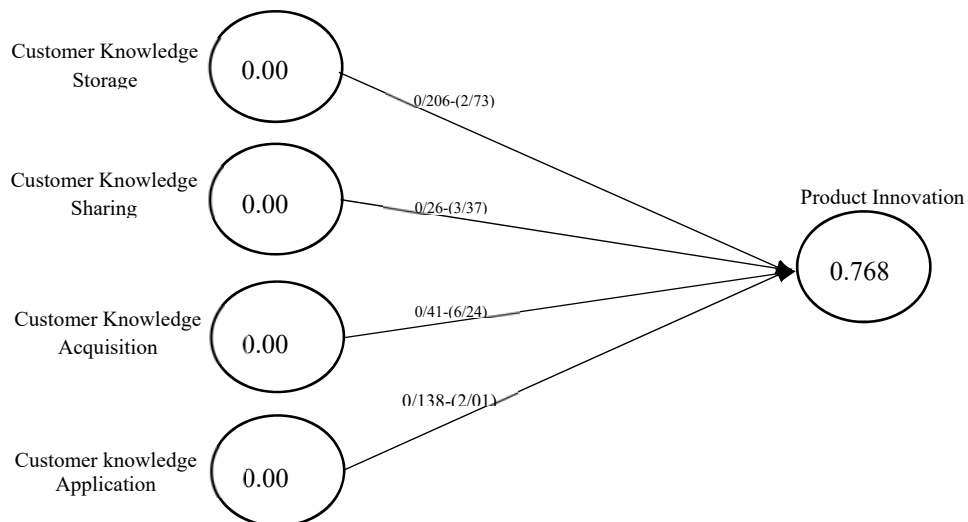


Figure 3: Path analysis and significance level in the structural model (Sub- hypotheses)



As can be seen in Figures 2 and 3 the significance coefficients of T-value (which have been inserted in parentheses) in all paths associated with the research hypotheses is higher than 1.96 and therefore the significance of all questions and relationships between variables can be confirmed with a confidence level 95.0. Furthermore, in the mentioned figures, positive interstructural values reflects the positive impact of independent variables on the dependent variables. The summarized results of the hypothesis testing are presented in table 4. Moreover, in order to check the fitting of both models of the main and subsidiary hypotheses, GOF index has been used, which was equal to 0.63 and 0.74 for the main and subsidiary hypotheses,

respectively; furthermore, since the rate was higher than 0.36, it can be concluded that both proposed models have a strong fit (Hulland,1999)

*Table 4: The Structural Model*

Hypothesis	Independent variable	Dependent variable	Regression coefficient $\gamma$	Critical T value	Result of the hypothesis
<b>Main Hypothesis 1</b>	Customer knowledge management	Product innovation	0.80	22.89	supported
<b>Main Hypothesis 2</b>	Absorptive capacity * Customer knowledge management	Product innovation	0.18	2.95	supported
<b>Sub-hypothesis 1</b>	Customer knowledge storage	Product innovation	0.21	2.81	supported
<b>Sub-hypothesis 2</b>	Customer knowledge sharing	Product innovation	0.27	3.34	supported
<b>Sub-hypothesis3</b>	Customer knowledge acquisition	Product innovation	0.42	6.35	supported
<b>Sub-hypothesis4</b>	Customer knowledge application	Product innovation	0.14	2.02	supported

The results of the test of the hypotheses suggest that knowledge management has a positive ( $\gamma = 0.8$ ) and significant ( $T= 22.89, >1.96$ ) impact on product innovation in the e-businesses in Tehran. Therefore, the main hypothesis of the research is supported. In addition, moderator variable of the absorptive capacity has a positive ( $\gamma=0.18$ ) and significant ( $T=2.95, >1.96$ ) impact on innovation in the e-businesses in Tehran. Therefore, the second research hypothesis is supported. Furthermore, the intensity of the moderating of the variable is equal to 0.13, which shows the average absorptive capacity in terms of customer knowledge management for innovation in this study. Similarly, the customer knowledge Acquisition has a positive ( $\gamma=0.419$ ) and significant ( $T=6.35, >1.96$ ) impact of product innovation in businesses in Tehran. Therefore, the first subsidiary hypothesis research is supported. The results indicated that customer knowledge sharing has a positive ( $\gamma=0.265$ ) and significant ( $T = 3.34, > 1.96$ ) impact on product innovation in the e-businesses in Tehran. Therefore, the second subsidiary hypothesis research is supported. In addition, the customer knowledge Application has a positive ( $\gamma=0.135$ ) and significant ( $T=2.02, >1.96$ ) impact on product innovation in the e-businesses in Tehran, and so the third research hypothesis is supported. Finally, it was found that storage of customer knowledge has a positive ( $\gamma= 0.206$ ) and significant ( $T = 2.81, > 1.96$ ) impact on product innovation in the e-businesses in Tehran. Therefore, the fourth research sub-hypothesis is supported.

## Conclusions

Due to the absence of research literature and an integrated model of the relationships between entrepreneurial effect of customer knowledge management and product innovation, and the moderating effect of absorptive capacity in this respect in E-businesses, the present study was conducted. The results of this study revealed that the entrepreneurial effect of customer knowledge management has a positive impact on product innovation in the E-businesses. This finding was also supported by the research literature (e.g.,Foss et al., 2011;Gibbert et al., 2002;Li et al., 2012;Taherparvar et al., 2014;Verma et al., 2012).

The results of this study also determined that the absorptive capacity moderates the impact of entrepreneurial effect of customer knowledge management on the product innovation in the E-business. In the literature, the finding has been presented contradictory. Some studies ,i.e., Wang and Han (2011) have supported the moderating role of absorptive capacity but other studies did not find a moderating impact absorptive capacity in the relationship between

entrepreneurial effect of customer knowledge management and innovation (e.g.,Soo et al.,2012).

Present study has removed this inconsistency. In evaluating the subsidiary relationships in this study, it was shown that the storage of customer knowledge has a positive impact on E-business product innovations.

Later it was determined that customer knowledge sharing has a positive impact on product innovation in E-business. It has been widely supported by the research literature (e.g.,Hong et al., 2004; Lin et al., 2012;Wang & Wang, 2012).

The current study also revealed that customer knowledge acquisition has a positive impact on product innovation in the E-business. The mentioned finding has been expressed in the research literature (e.g.,Darroch, 2005; Liao & Yu, 2013;Wang & Wang, 2012).

Finally, the last relationship tested in this study showed that the use of E-business customer has a positive impact on product innovation in e-business. This finding also reinforces previous studies in this field(e.g.,Lin et al., 2012).

In general, based on the results of this study, activities of the entrepreneurial effect of customer knowledge management reinforce product innovation in the E-business. In addition, in the E-businesses that have created a higher capacity to absorb knowledge, the impact of activities of knowledge management on innovation is higher. Moreover, quad dimensions of knowledge management, each alone, has a positive impact on the incidence of innovative products in the E-businesses.

According to the results of this study, it is recommended that activities of customer knowledge management be considered in E-businesses, as part of the business's daily operations. In addition, by creating the necessary infrastructure, knowledge absorptive capacity of the business environment can be increased in E-businesses. Moreover, it is better to upgrade environmental knowledge acquisition in the E-businesses by documenting the data of internal and external business environment. Additionally, by improving connections between different organizational parts of the E-businesses, the possibility of the higher sharing the customer knowledge can be provided; in addition, by improving technologies of knowledge storage the proper classification of customer knowledge in the organization can be provided. Furthermore, by establishing a connection between existing knowledge and business activities through the scenario analysis, use of organizational knowledge can be facilitated in the E-businesses; likewise, with the proliferation of connections between the business and the customer and also, business with the governmental and social institutions, a balance can be established between the demands of the customer, community and E-business; because the success of any business activity depends on the mutual consent of the beneficiary groups. Finally, for future studies, it is also suggested a validation of the findings of the current research on the businesses that are doing productive activities or services and their activities are not mainly electronic.

Finally, future studies can investigate the role of other variables such as business entrepreneurial processes as a moderator in the relation between the entrepreneurial effect of customer knowledge management and product innovation. Alternatively, other driving variables that impact on the promotion of product innovation should be identified and their role and models should be examined. Another avenue for further research is to examine the total effects of determinants of product innovation (i.e., customer knowledge storage, customer knowledge sharing, customer knowledge acquisition, and customer knowledge application) on E-businesses

## References

Akin, M., Bloemhof, J.M., Wynstra, F. & van Raaij, E.M. (2014). The Impact of Supply Chain-Related Factors on Environmental Performance of Manufacturing Firms in Turkey. *18 th IPSERA Conference Supply Management–Towards an Academic*.

- Al-Shammari, M. (2016). Customer Knowledge Management: People, Processes, and Technology: IGI Global.
- Alegre, J., Sengupta, K. & Lapiedra, R. (2013). Knowledge management and innovation performance in a high-tech SMEs industry. *International Small Business Journal*, 31(4), pp. 454-470.
- Belbaly, N., Benbya, H. & Meissonier, R. (2007). An empirical investigation of the customer Knowledge creation impact on NPD Performance. System Sciences, 2007. HICSS 2007. 40th Annual Hawaii International Conference on, IEEE.
- Buchnowska, D. (2011). Customer Knowledge Management Models: Assessment and Proposal. Research in Systems Analysis and Design: Models and Methods. Springer. pp. 25-38.
- Cui, A.S. & Wu, F. (2015). Utilizing customer knowledge in innovation: antecedents and impact of customer involvement on new product performance. *Journal of the Academy of Marketing*, 7(4), pp.1-23.
- Darroch, J. (2015). Knowledge management, innovation & firm performance. *Journal of Knowledge Management*, 9(3), pp.101-115.
- Darroch, J. & McNaughton, R. (2003). Beyond market orientation: Knowledge management and the innovativeness of New Zealand firms. *European journal of Marketing*, 37(4), pp. 572-593.
- Escribano, A., Fosfuri, A. & Tribó, J.A. (2009). Managing external knowledge flows: The moderating role of absorptive capacity. *Research policy*, 38(1), pp.96-105.
- Foss, N.J., Laursen, K. & Pedersen, T. (2011). Linking customer interaction and innovation: The mediating role of new organizational practices. *Organization Science*, 22(4), pp. 980-999.
- Gibbert, M., Leibold, M. & Probst, G. (2002). Five styles of customer knowledge management, and how smart companies use them to create value. *European Management Journal*, 20(5), pp.459-469.
- Hong, P., Doll, W.J., Nahm, A.Y. & Li, X. (2004). Knowledge sharing in integrated product development. *European Journal of Innovation Management*, 7(2), pp.102-112.
- Hu, J. et al. 1997. Customer information quality and knowledge management: a case study using knowledge cockpit. *Journal of Knowledge Management*, 1(3), pp.225-236.
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), pp.195-204.
- Jiménez-Barrionuevo, M.M., García-Morales, V.J. and Molina, L.M. (2011). Validation of an instrument to measure absorptive capacity. *Technovation*, 31(5), pp.190-202.
- Lai, Y.L. (2014). The effects of industry cluster knowledge management on innovation performance. *Journal Of Business Research*, 67(5), pp.734-739.
- Liao, T.J. & Yu, C.-M.J. (2013). The impact of local linkages, international linkages, and absorptive capacity on innovation for foreign firms operating in an emerging economy. *The Journal of Technology Transfer*, 38(6), pp.809-827.
- Lin, R.J., Che, R.H. & Ting, C.Y. (2012). Turning knowledge management into innovation in the high-tech industry. *Industrial Management & Data Systems*, 112(1), pp. 42-63.
- Lopez-Nicolas, C. & Molina-Castillo, F.J. (2008). Customer Knowledge Management and E-commerce: The role of customer perceived risk. *International Journal of Information Management*, 28(2), pp.102-113.
- Meihami, B. & Meihami, H. (2014). Knowledge Management a way to gain a competitive advantage in firms (evidence of manufacturing companies). *International Letters of Social and Humanistic Sciences*, 7( 3), pp.80-91.
- Moss, S. et al. (1998). Reliability and validity of the PAS-ADD Checklist for detecting psychiatric disorders in adults with intellectual disability. *Journal of Intellectual Disability Research* 42(2) 173-183.

- Ngo, L.V. & O'Cass, A. (2013). Innovation and business success: The mediating role of customer participation. *Journal of business research*, 66(8),pp.1134-1142.
- Paquette, S. 2011. Customer Knowledge Management.
- Rollins, M. & Halinen, A. (2015). Customer knowledge management competence: Towards a theoretical framework. System Sciences, 2005. HICSS'05. Proceedings of the 38th Annual Hawaii International Conference on, IEEE.
- Rowley, J.E. (2002). Reflections on customer knowledge management in e-business. *Qualitative Market Research: An International Journal* ,5(4),pp. 268-280.
- Sindakis, S., Depeige, A., Anoyrkati, E. & Chase, R. (2015). Customer-centered knowledge management: challenges and implications for knowledge-based innovation in the public transport sector. *Journal of Knowledge Management*, 19(3),pp.90-119.
- Soo, C.W., Midgley, D. & Devinney, T.M.(2002). The process of knowledge creation in organizations. Available at SSRN 376080.
- Stefanou, C.J., Sarmaniotis, C. & Stafyla, A. (2013). CRM and customer-centric knowledge management: an empirical research. *Business Process Management Journal*,9(5),pp.617-634.
- Sun, P.Y. & Anderson, M.H. (2010). An examination of the relationship between absorptive capacity and organizational learning, and a proposed integration. *International Journal of Management Reviews*, 12(2),pp.130-150.
- Taherparvar, N., Esmaeilpour, R. & Dostar, M. (2014). Customer knowledge management, innovation capability and business performance: a case study of the banking industry. *Journal of Knowledge Management*, 18(3),pp. 591-610.
- Verma, R., Gustafsson, A., Kristensson, P. & Witell, L. (2012). Customer co-creation in service innovation: a matter of communication? *Journal of Service Management* ,23(3),pp. 311-327.
- Wang, C. & Han, Y. (2011). Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity. *Journal of Knowledge Management*, 15(5),pp. 802-819.
- Wang, Y.L., Wang, Y.D. & Horng, R.Y. (2010). Learning and innovation in small and medium enterprises. *Industrial Management & Data Systems*, 110(2),pp.175-192.
- Wang, Z. & Wang, N. (2012). Knowledge sharing, innovation and firm performance. Expert systems with applications 39(10) 8899-8908.
- Wu, J., Guo, B. & Shi, Y. (2013). Customer knowledge management and IT-enabled business model innovation: A conceptual framework and a case study from China. *European Management Journal* ,31(4),pp.59-372.
- Xu, M. & Walton, J. (2005). Gaining customer knowledge through analytical CRM. *Industrial Management & Data Systems* ,105(7),pp. 955-971.
- Yang, L.-R., Huang, C.-F. & Hsu, T.-J. (2014). Knowledge leadership to improve project and organizational performance. *International Journal of Project Management*, 32(1),pp. 40-53.

Copyright of Journal of Organisational Studies & Innovation is the property of Management & Business Academy and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.