Creación de una ventaja competitiva sostenible para las organizaciones a través de la implementación de la gestión del conocimiento con la ayuda de la moderna tecnología de la información

Creating a sustainable competitive advantage for organizations through the implementation of knowledge management with the help of modern information technology

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RESUMEN.
Hoy, los rápidos cambios ambientales, organizativos y tecnológicos han creado un entorno competitivo complejo para las organizaciones. La tecnología de la información es una herramienta y una estrategia para que las organizaciones interactúen con estas complejidades y cambios. El presente estudio evalúa el papel mediador de la tecnología de la información moderna en relación con la gestión del conocimiento y la ventaja competitiva sostenible. Para verificar las hipótesis, se utilizaron dos valores críticos (CR y P) sustentado en el modelo de ecuación estructural. Basado en el nivel de significancia del 5%, el valor crítico debe ser mayor que 1.96. De acuerdo, con los resultados, para todas las hipótesis de investigación, este valor fue más de 1.96 y el valor de P fue menor al 5%. Se puede concluir que la tecnología de la información y la gestión del conocimiento tienen un impacto positivo y significativo en la creación y el desarrollo de una ventaja competitiva sostenible para las organizaciones. Por último, se encontró que la tecnología de la información moderna es un importante papel mediador en la relación entre la gestión del conocimiento y la ventaja competitiva sostenible.

PALABRAS CLAVE.
Gestión del conocimiento, ventaja competitiva sostenible, tecnología moderna de la información, modelo de ecuación estructural.
ABSTRACT.

Today, rapid environmental, organizational and technological changes have created a complex competitive environment for organizations. Information technology is a tool and strategy for organizations to deal with these complexities and changes. The present study Creating a sustainable competitive advantage for organizations through the implementation of knowledge management with the help of modern information technology. In fact, this study assesses the mediating role of modern information technology on the relationship between knowledge management and sustainable competitive advantage. To test the significance of the hypotheses, two critical value (CR and P) in Structural equation model was used. Based on the 5% significance level, the critical value must be greater than 1.96. According to the results, for all the research hypotheses, this value was more than 1.96 and the P value was less than 5%. It can be concluded that information technology and knowledge management have a positive and significant impact on the creation and development of a sustainable competitive advantage for organizations. It was also found that modern information technology an important mediating role on the relationship between knowledge management and sustainable competitive advantage.

KEY WORDS.
Implementation of Knowledge Management, Sustainable Competitive Advantage, Modern Information Technology, Structural Equation Model.

1. Introduction.

Today’s rapid environmental, organizational and technological changes have created a complex competitive environment for organizations. Such an environment, creates business incentives for organizations. Organizations need to be able to respond in dynamic environments and use appropriate mechanisms for increasing opportunities and reducing threats and use their capabilities as much as possible. Information technology is a tool used by organizations to deal with these pressures and threats. IT not only do business operations, Workgroup tasks, collaborations and business decisions, but also changes the way businesses compete. (Rusly, Sun & Corner, 2014). Therefore, Information Technology policies and strategies should be consistent with the organization’s vision, important activities, and mission to include targeted goals (Ziraba & Okolo, 2018). In recent years, rapid development of information technology helped staff, customers, Suppliers and business partners to interact with each other. In addition, inter-professional partnerships have been effective in product development, marketing, distribution, and customer service (Tseng, 2014). It is believed that high productivity and efficiency in organizations requires investment in IT components such as the Internet, office automation and management information systems (Coltman, Dolnicar & Sharma, 2015). Many companies have used KM to survive and to continue working in their industry. Knowledge management is defined as managing the knowledge of company’s employees and stakeholders. Many companies through the use of knowledge management, have been able to survive in current economic situation and gain sustainable competitive advantage (Sultan, 2013). Todays, in addition to using the knowledge of their employees, Companies should consider the idea of using the
knowledge of customers as well. The most important tools used by companies to communicate with their customers is the customer relationship management tool, which is a kind of Simultaneous management tool (Lin & Kozhikode, 2008).

From the perspective of strategic knowledge management, the synergy between technological and human issues is essential for organizational survival. This synergy is based on the distinction between the past business ways and the networking of global knowledge (Naveed Baqir, 2004). The aim of the study is to investigate the role of information technology in creating and developing a sustainable competitive advantage for organizations through the implementation of knowledge management. To measure the relationship among information technology, knowledge management and the sustainable competitive advantage and the impact of information technology on the sustainable competitive advantage through the mediating role of knowledge management, the conceptual model of will be used.

![Conceptual model of research](image)

**2. Literature review.**

**2.1. Implementation of Knowledge Management.**

The rapid development of new technologies and digital communications has led to an increase in the importance of knowledge management as a vital source for gaining competitive advantage by organizations (Donate & Pablo, 2015). Malhotra (2000) defines knowledge management as: Knowledge management is the process by which organizations obtain skills in internalizing (learning) and externalizing knowledge (coding), and knowledge distribution and transfer (Malhotra, 2000). Sveiby believes that knowledge management is the creation of value-added through the use of intellectual capital (Sveiby, 1997). Hasan Ali (2002) defines knowledge management as a set of emerging strategies To create, maintain, and use knowledge assets (including individuals and information) that enables knowledge flow at the right time to those who need it, So that they can use these assets to create greater value for the company. Knowledge management is the transfer of skills related to
specific task and the transfer of conventional and empirical knowledge, including appropriate organizational behavior and comprehensive decision-making skills. (i.e. cultural considerations, organizational politics, and acceptable leadership styles) (Sprinkle & Urick, 2016). Knowledge management includes the process of optimized combination of knowledge and information within organization and creating an appropriate environment to produce, share and apply knowledge and to develop creative and innovative human forces. The purpose of knowledge management is to create an ever-learning organization and to facilitate the flow of Knowledge created by individuals in different parts of the company (financial, performance, competitive intelligence, etc.), and to facilitate their collaboration with each other. In other words, the ultimate goal of knowledge management is to enhance the value-added of knowledge to develop and improve creativity, productivity, and competitive advantage of the organization (Nilsen, 2003).

2.2 Modern Information technology.
Despite the relatively short history of information technology and its rapid expansion, various definitions and perceptions have been presented for it; which with a thorough and deep look, there are also inconsistencies between them (Tanui, 2016). The term “information technology” was first used by Lewitt and Weisler in 1985 to express the role of computer in supporting decision making and information processing in organizations. In the early years, IT was only seen as a supportive tool in the overall corporate strategy. But with the successful implementation of IT innovations, these beliefs have changed. As we can see today, information technology plays an important role in organizational processes, creating new needs, developing new products and in the advent of new procedures (Chang, 2005). On the one hand, information technology refers to an aspect of information system technology that includes hardware, databases, software, networks, and other tools. on the other hand, information technology refers to a set of information systems, users, and managers (Turban, 2004). An IT infrastructure is the basis for computer technology, communications and the basic information system in a technical framework that directs organizational tasks toward meeting management needs (Jabbouri, et al, 2016).

2.3 Sustainable competitive advantage.
Most of organizations focus mainly on solving the problems and weakness points in their systems and processes so that they can enhance their efficiency and finally sustain in competitive environment of world trade (Bazrkar & Iranzadeh). Competitive advantage is the value delivered by organization to its customers, so that at that time this value is not delivered by potential and actual competitors (Chuang, 2004). Competitive advantage is the customer's value for company, so that these values are higher than customer's costs (Porter, 1991). The above definitions and other definitions of competitive advantage suggest that the concept of competitive advantage is directly related to The customer's values; so that in a comparative spectrum, the more the values delivered by an organization are closer to the values of customers, it can be said that the organization has superiority and advantage over its competitors in one or several competitive areas. This concept is one of the basic concepts in the international business that determines the competitive position of the organization and gives the organization the ability to create a defensive position against...
its rivals (Bhatt et al, 2010). Most researchers emphasize on two dimensions of competitive advantage: flexibility and responsiveness. The flexibility, is the willingness and ability of companies to create new configurations or re-configurations in terms of customer values. Responsiveness refers to the ability of companies to respond quickly to the needs and demands of customers (Christmann, 2000). In order to obtain the competitive advantage, three general strategies have been proposed: cost advantage, differentiation advantage, time advantage, which are described below (Bhatt et al, 2010):

1) Cost Advantage: the industrial production with the least cost enables the company to provide similar services at a lower price compared to competitors.

2) Differentiation Advantage: differentiation Advantage takes place Whenever a company offers a wider range of services or more value added to its customers compared to competitors. So that, in spite of competitive prices of competitors, customers will choose the company's services. These types of advantages are called "competitive advantage" because they stabilize the position of a company in an industry as a leader.

3) Time Advantage: through Time advantage, the company can obtain the leadership of the industry, and because of its ability, the company quickly adapts to environmental changes.

For dynamic competitive advantage, innovation is a key factor that is based on the production, distribution and use of knowledge. Therefore, those governments that expand knowledge and creativity in their community will have the chance to have a dynamic competitive advantage. In general, knowledge is the main driver for gaining a dynamic competitive advantage in today's world. In developing countries, dynamic competitive advantage can only be achieved by the internalization of science and technology and a set of knowledge to increase competitive advantage for entry to new markets (Shannak, 2010).

3. Methodology.
This study is considered to be an applied research. At the same time, it is a survey research because the research data are collected through questionnaires from the real environment. in addition, it’s a descriptive study, because the research variables are not manipulated. Furthermore, the correlation method is used in this study because the relationships of the variables are examined. The statistical population of this study consists of 45 managers from Iranian insurance agencies in Tehran. In order to collect data, library studies were carried out for collecting information about theoretical basis of research and questionnaire were used for collecting field information. Considering that the population of the statistical population was 45, the same number of questionnaires were distributed among them. of these, 32 questionnaires (0.71 return rate) were obtained. The research questionnaire consisted of 61 questions. it comprised of three questionnaires. Lewitt and Wiesler's Information Technology Questionnaire (1958), Knowledge Management Questionnaire (Tike Uchi 1995), and the Sustainable Competitive Advantage Questionnaire (Hill & Jones, 2010).
In this questionnaire, the Five-point Likert scale was used. Cronbach's alpha coefficient was used to calculate the reliability of the questionnaires. The results of this test are shown in Table 1.

<table>
<thead>
<tr>
<th>Components</th>
<th>Cronbach's alpha coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>knowledge management</td>
<td>0.81</td>
</tr>
<tr>
<td>Modern Information technology</td>
<td>0.79</td>
</tr>
<tr>
<td>Sustainable competitive advantage</td>
<td>0.92</td>
</tr>
</tbody>
</table>

The results showed that Cronbach's alpha coefficients of all components were higher than 0.7 and reliability was confirmed. According to the main objective and conceptual model of the research, the hypotheses of this research are defined as follows:

H1: Implementation of Knowledge Management has a positive and significant impact on Sustained Competitive Advantage.
H2: Implementation of Knowledge Management has a positive and significant impact on Modern Information Technology.
H3: Modern Information Technology has a positive and significant impact on Sustainable Competitive Advantage.
H4: Modern Information technology has a mediating role in the relationship between Implementation of Knowledge Management and Sustainable Competitive Advantage.

In this research, descriptive statistics is used to test the research hypotheses. In the meanwhile, inferential statistics is used to determine the effect of independent variables on the dependent variable (structural equation modeling) via AMOS software.

4. Analysis of data.

4.1. The Normality of Data.
It is necessary to first determine the normality of the distribution of variables. The Kolmogorov-Smirnov test (K-S) is used to test the normality of the distribution of variables. In this test, the null hypothesis is the normality of the distribution, and if the significance level is less than 5% and at the same time, the critical value Z is greater than 1.96, the normality of the variables (the null hypothesis) is not confirmed (Table 2).

<table>
<thead>
<tr>
<th>Implementation of Knowledge Management</th>
<th>Sustainable Competitive Advantage</th>
<th>Modern Information Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.98</td>
<td>1.36</td>
<td>1.06</td>
</tr>
<tr>
<td>0.079</td>
<td>0.072</td>
<td>0.071</td>
</tr>
</tbody>
</table>
According to the results of the test, since Sig is more than 5% and z is less than 1.96, so the data are normal. Therefore, the variables are reliable to estimate the unknown parameters.

4.2. Model Estimation.
Each variable in structural equations model can be considered as an endogenous variable as well as an exogenous variable. An endogenous variable is a variable that is affected by other variables in the model. In contrast, an exogenous variable is a variable that is not affected by other variables in the model but affects other variables by itself. In the present study, the "Implementation of Knowledge Management" variable is an exogenous variable, and the "Modern Information Technology" and "sustainable competitive advantage" are endogenous variables.

In structural equations model, the coefficients are divided into two groups. The first category is measurement equation (the relationships between hidden variables and explicit variables), and are used to test assumptions. These coefficients are called path coefficients. According to the model, these coefficients can be used to estimate the factor loads and path coefficients. In our case study, since the model has two hidden variables (Modern Information Technology and sustainable competitive advantage), the goodness-of-fit for hidden variables must first be evaluated and, if confirmed, the goodness-of-fit for the whole model must be evaluated.

4.2.1 Fit indices of the hidden variables of the research model.
Modern Information Technology:

![Figure 1: Fit index of Modern Information Technology (hidden variable).](image-url)
Sustainable Competitive Advantage:

Figure 2: Fit index of Sustainable competitive advantage (hidden variable).

Given that the goodness of fit for two hidden variables (Modern Information Technology and sustainable competitive advantage) is acceptable, the conceptual model of the research is tested.

Figure 3. Fit index of conceptual research model.
4.3 Interpretation of the model test.

In the analysis of the structural model, if both the Chi-square test and the secondary fit tests show that the model fit is acceptable, we will move towards identifying the best-fit model factors and focus on them. In the following, the Fit indices of hidden variables and the Fit index of conceptual research model are presented.

Table 3. The fit index of the Modern Information Technology.

<table>
<thead>
<tr>
<th>Fit index</th>
<th>obtained values</th>
<th>Acceptable values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN / DF (chi-square / degrees of freedom)</td>
<td>1.988</td>
<td>&lt;3</td>
</tr>
<tr>
<td>IFI</td>
<td>0.985</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RMSEA (Root Mean Squares Error of approximation)</td>
<td>0.061</td>
<td>≤0.09</td>
</tr>
<tr>
<td>CFI (comparative fit index)</td>
<td>0.952</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>NFI (normed fit index)</td>
<td>0.989</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RFI (relative fit index)</td>
<td>0.991</td>
<td>&gt;0.9</td>
</tr>
</tbody>
</table>

Table 4. The fit index of the Sustainable Competitive Advantage.

<table>
<thead>
<tr>
<th>Fit index</th>
<th>obtained values</th>
<th>Acceptable values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN / DF (chi-square / degrees of freedom)</td>
<td>1.910</td>
<td>&lt;3</td>
</tr>
<tr>
<td>IFI</td>
<td>0.971</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RMSEA (Root Mean Squares Error of approximation)</td>
<td>0.054</td>
<td>≤0.09</td>
</tr>
<tr>
<td>CFI (comparative fit index)</td>
<td>0.942</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>NFI (normed fit index)</td>
<td>0.991</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RFI (relative fit index)</td>
<td>0.986</td>
<td>&gt;0.9</td>
</tr>
</tbody>
</table>

Table 5. The fit index of the Conceptual Model of Research.

<table>
<thead>
<tr>
<th>Fit index</th>
<th>obtained values</th>
<th>Acceptable values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN / DF (chi-square / degrees of freedom)</td>
<td>1.899</td>
<td>&lt;3</td>
</tr>
<tr>
<td>IFI</td>
<td>0.991</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RMSEA (Root Mean Squares Error of approximation)</td>
<td>0.028</td>
<td>≤0.09</td>
</tr>
<tr>
<td>CFI (comparative fit index)</td>
<td>0.997</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>NFI (normed fit index)</td>
<td>0.994</td>
<td>&gt;0.9</td>
</tr>
<tr>
<td>RFI (relative fit index)</td>
<td>0.992</td>
<td>&gt;0.992</td>
</tr>
</tbody>
</table>

According to the results presented in the above tables, both hidden variables and conceptual model have an acceptable fit index.
4.4. **The assessment of Correlation among Hidden Variables via Covariance Matrix**.

Correlation is a relation (non-directional) between two variables in a model and the nature of this relationship is evaluated by correlation analysis. Table 6 presents Pearson correlation coefficients for the relationship between hidden variables. In Covariance Matrix, the main diagonal elements are equal to 1, which means that each variable is completely correlated with itself.

<table>
<thead>
<tr>
<th>Variable</th>
<th>IKM</th>
<th>SCA</th>
<th>MIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>IKM</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCA</td>
<td>0.831</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MIT</td>
<td>0.825</td>
<td>0.901</td>
<td>1</td>
</tr>
</tbody>
</table>

Through covariance matrix (according to the Pearson correlation index), the correlation is confirmed if Sig is less than 1% at the significant level of 0.99, and less than 5% at the significant level of 0.95. According to the Table 6, the correlation between the variables of the conceptual model of the research is confirmed at the significant level of 0.99.

4.5. **Test of research hypotheses through structural equation model**.

To measure the relationships between variables and test the hypotheses of the research, according to the results obtained from the AMOS software, we will calculate the regression coefficients. The results of this test are presented in Table 7.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Regression Coefficient</th>
<th>CR</th>
<th>P</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The positive impact of Implementation of Knowledge Management on the sustainable competitive advantage</td>
<td>0.44</td>
<td>8.21</td>
<td>*</td>
<td>accept</td>
</tr>
<tr>
<td>The positive impact of Implementation of Knowledge Management on Modern Information Technology</td>
<td>0.48</td>
<td>5.26</td>
<td>*</td>
<td>accept</td>
</tr>
<tr>
<td>The positive impact of Modern Information Technology on the sustainable competitive advantage</td>
<td>0.38</td>
<td>8.75</td>
<td>*</td>
<td>accept</td>
</tr>
<tr>
<td>The mediating role of Modern Information Technology on the relationship between Implementation of Knowledge Management and sustainable competitive advantage</td>
<td>0.18</td>
<td>-</td>
<td>-</td>
<td>accept</td>
</tr>
</tbody>
</table>

In this study, CR and P critical values were used to test the significance of hypotheses. Based on a significant level of 5%, CR should be greater than 1.96. According to Table 7, for all research hypotheses, CR value was more than 1.96 and at the same time P was less than 5%. Therefore, it can be concluded that all the hypotheses of the research are acceptable. In relation to calculating the CR value for the fourth hypothesis, which assesses
the mediating role of modern information technology on the relationship between Implementation of KM and sustainable competitive advantage, the path coefficients of the second and third hypotheses were multiplied and reached a value of 0.18, so that The mediating role of MIT was confirmed.

5. Conclusions and suggestions.
The purpose of this research was to Creating a sustainable competitive advantage for organizations through the implementation of knowledge management with the help of modern information technology. In fact, the mediating role of Modern Information Technology on the relationship between Implementation of Knowledge Management and sustainable competitive advantage has been evaluated in this research. The results of the structural equation test confirmed all four research hypotheses. Based on the first hypothesis, it can be concluded that the Implementation of Knowledge Management positively and significantly affects the Creating an of sustainable competitive advantage for organizations. The results are consistent with the results of Lohrke et al. (2016), Gupta et al. (2018). For the second hypothesis, we investigated the relationship between Implementation of Knowledge Management and Modern information technology. The results of the hypothesis test showed that the CR value is 5.6. Because this value is greater than 1.96, there is a significant relationship between the organization's information technology and knowledge management. The results of this hypothesis are consistent with the results of Masadeh et al. (2017) and Kasemsap (2015). In the third hypothesis, the relationship between Modern Information Technology and the competitive advantage of the organization was tested. The value obtained for CR was 8.75, and since this was more than 1.96, we concluded that there is a positive and significant relationship between Modern Information Technology and the creation and development of competitive advantage in the organization. The results of the third hypothesis of the research were consistent with the results of Torres et al. (2018), Guimaraes et al. (2018), and Yassen et al. (2016). for the fourth hypothesis of the research, we sought to test the mediating role of Modern Information Technology on the relationship between Implementation of Knowledge Management and sustainable competitive advantage. To this end, we multiplied the regression coefficients of the second hypothesis (the impact of Implementation of Knowledge Management on Modern Information Technology) and the third hypothesis (the impact of Modern Information Technology on the sustainable competitive advantage). Given the 0.18 value for it, this hypothesis was confirmed (the mediating role of Modern Information Technology was confirmed). The results obtained for this hypothesis test are consistent with Masadeh et al. (2017). According to the literature, Implementation of Knowledge Management has the potential to create and develop the sustainable competitive advantage for organizations. Moreover, in addition to Modern Information Technology, implementation of the principles of knowledge management in the organization leads to increased efficiency, effectiveness and capabilities and reduced costs and improved services which in turn increase the competitive advantage of the organization. As the findings of the research showed, IT has a significant relationship with knowledge management. In addition, Implementation of Knowledge Management has a positive impact on Modern Information Technology, and this increases the organization's attention to customer, financial issues, human resources and productivity.
According to the results of this research, it is recommended that organizations pay attention to the important role of Modern Information Technology in advancing their goals. The use of modern information technology helps the organization to implement the principles of knowledge management well in the organization, thereby making it possible to achieve a sustainable competitive advantage. It is recommended that researchers in future research consider the impact of modern IT on organizational performance and sustainable development of the organization.

References


