The Analysis Of The Role Of Knowledge Management On Product Life Cycle (PLC) Of Commercial Organizations In Target Market, Case Study: Pishraneh Productive-Commercial Company (Electrical And Electronically Industry- Mazandaran Province)

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Abstract

The present paper describes the concept and process of product life cycle in target market of the present commercial organizations. The results of the present study shows that the organization be familiar in target market via knowledge management with the concept and product life cycle of the goods, requires a good planning about the relationship of these two factors. The research population includes electrical and electronically industries of Mazandaran province, Pishraneh Productive-commercial Company. The sample size by Kergesi and Morgan table was 10 people who were selected by simple random sampling. The data collection tool is questionnaire. The content validity of the questionnaire was positive from the view of lecturers and experts. The reliability of the questionnaire was calculated 0.82 by Cronbach’s alpha. By mathematical method (TOPSIS), the data were analyzed.

Keywords: Knowledge management; product life cycle; target market; market knowledge

Introduction

In the present world, considerable changes are observed with development of competition and technology in different fields namely in goods market and services. “Change” is a familiar word that all the companies are faced with opportunities and threats. Thus, the present commercial organizations are considerably changed regarding structure, performance and management styles. The present enterprises give more importance to understanding, consistency and management of the changes of the surrounding environment and in using up-to-date knowledge compete with each other to improve operation and giving services and best products to the client. Such organizations require taking a new style of management called
“knowledge management”. The companies with the aim of dynamics, to achieve development, choose the change. Thus, the companies by considering the above issue and to be successful in the market arrange their marketing strategies according to the market conditions and customer to have useful presence in the market. They should attempt that by a good marketing mix (4p), namely product element, provide the conditions to give products with advanced technology based on the requirements of the customer in competitive market of the present era.

What is the product life cycle in commercial organizations and what is the degree of importance in terms of management in different kinds of present commercial organizations and institutions? One of the scientific and reliable ways is establishment of knowledge management in marketing management of the present commercial organizations. How is the role of knowledge management in the organization in facilitating the establishment process of marketing management system in the present commercial organizations? In the present paper, the above issues are discussed.

Research purpose

The most important purpose of this study is applying knowledge management in different kinds of institutions for rapid consistency with the changes of surrounding environment and improving more efficiency and profitability. Knowledge management refers to the creation, gaining, propagation and using knowledge in the organization. Knowledge management field includes the concepts and principles improving the capability of using and sharing knowledge in the institution (e.g. specializations, skills and experiences of staffs) and key role in development and improvement of creativity, efficiency and profitability of the organization.

Research questions

1. What is the influence of knowledge management on different parts of product life cycle of active companies in electrical and electronic industries?
2. Is there a significant relationship between knowledge management and product development and new services of the company?
3. Is there a significant relationship between knowledge management and introduction of products and services of the company?
4. Is there a significant relationship between knowledge management and growth of services and products in the target market?
5. Is there a significant relationship between knowledge management and maturity of services and products in the target market?
6. What is the influence of knowledge management on reducing customer’s satisfaction of purchasing products and services of the company?

Theoretical framework of research

Adelson believes:” People always had knowledge and used it. “But what is exactly knowledge? Knowledge exist in experiences, skills, capabilities, abilities, talents, thoughts, beliefs, attitudes,
inspirations and imaginations of people and is revealed as tangible things, work processes and routine affairs of a company.

Knowledge is of two types: Explicit and implicit. Explicit knowledge is the one that is arranged or given in a special format. Explicit knowledge can be in the form of handwritten letter, written works, methods, commercial archives, magazine or articles of magazine, books, web pages, data banks, intranets, e-mail, notes, graphical presentation or audio-visual resources. When knowledge is encoded, artifact of the knowledge is produced and this artifact is a knowledge that can be managed. Latent knowledge is personal and unexpressed knowledge of a person. Subjective knowledge, being informed of the manner of something, delicate techniques, attitude and issues than can be useful. More simple, we can say that it is knowledge and experience that a person gains via experience, interaction with others and trial and error over time. This knowledge exists only in the mind of people or personal notes, computer files or their desks. The knowledge that is not documented totally and completely for others. According to estimations, 80% of the most important knowledge is implicit knowledge.

The knowledge and its role in the organization management

As it was said, we can find the role, importance and position of knowledge management in marketing management system of the present commercial organization in development of a new product. Now the method of applying knowledge management in this system is explained:

Knowledge management in commercial organizations of 21st century: Knowledge economy is the knowledge-based economy. Indeed, in knowledge economy era, the management refers to the identification, gaining, development, experience, using, storing and sharing knowledge-attitude to change and sharing implied and explicit knowledge-and increasing progress facilities by collective wisdom.

Knowledge management: The term “knowledge management” is more common in recent years. Although today knowledge management is widely used in different kinds of enterprises and organizations, giving a unified definition of it is very difficult.

Knowledge management: Via investigation of various definitions of knowledge management, it is defined as “the process of creation, gaining, propagation and using knowledge to achieve organizational goals.

Knowledge management definition from the perspective of Gertin: Knowledge management is “a philosophy including a set of principles, processes, organizational structures and applied technologies helping people to share and use their knowledge to face with their goals” (Gertin, 1999, Vol. 4, p 235).

The main components of knowledge management: Down Port [4], the main components of knowledge management are as follows:
Culture: Including values and beliefs of the members of the organization related to the concepts of information and knowledge.

Action process: Indeed how people used information and knowledge in their institutions.

Policies: Including the barriers generated in the process of knowledge and information share in the organization.

Technology: What are the information systems in the institution?

Knowledge management is including the process of optimized combination of knowledge and information in the organization and creating a good environment to produce, share and using knowledge and educating creative human resources. The researchers determined the highest use of different organizations of knowledge management as the followings: gaining and sharing knowledge (77.7%), learning skill and organizational learning (62.4%), optimized relation with customers (58%), creating competition advantage (55.7%) (Dyer, McDonough, 2001).

![Chart 5: The applications of various institutions of knowledge management](image)

Indeed, efficient knowledge management leads into the reduction of errors and repetitions, increasing the problems solution speed and decisions, reduction of costs, giving more authority to the members and effective relations and good services to client (Becerra, Fernandez, 1999, Vol. 8, p 187).

**Knowledge management process model**

Bukowitz & Williams model divided knowledge management processes into two parts as:
1. Knowledge management processes in strategic section
2. Knowledge management processes in tactic section
Tactic section includes the process of gaining the required knowledge for activities, using knowledge in creating value, learning, interaction and sharing the existing knowledge among people. Strategic process is getting value of tactic process where the organization strategy is used with organizational goals (Smith, 2001, Vol. 4, P 17-23) the factors helping that processes (or avoid it), are recognized as stimulators. These stimulators include strategy, leadership, culture, measurement (criterion) and technology.

![Knowledge management process model](image)

Figure 1: Knowledge management process model (Bukowitz & Williams, 2002: 11)

The establishment of knowledge management

Today, applying knowledge management in all the organizations including educational institutions, health, industrial and commercial is necessary. Despite the development of knowledge management in recent years, most of the institutions in optimized use of it fell hopeless. These organizations are searching to find a good answered for the following questions:

- How the knowledge is produced, stored and distributed in the organization?
- How the concepts and principles of knowledge management are performed in the organization?
- How we are ensured that the staffs share the knowledge capital in the organization?
The organizations for useful application of knowledge management, the necessity of creating the culture of knowledge share among the staffs understand via a process called “establishment of knowledge management”. The importance of establishment of knowledge management in the institution is because first, the wrong assumption of the staffs of knowledge management should be corrected and second, it helps them to understand the advantages of knowledge share in the organization. Knowledge management discusses about making the knowledge available for the people being in need of it.

The main reasons of the failure of knowledge management in different kinds of institutions are as follow:

- The lack of organizational learning due to weak relationship between the staffs (20%)
- The failure of good application of knowledge management in all daily activities (19%)
- The lack of attributing good time to learn the method of good application of knowledge management and understanding its complexities (18%).
- The lack of training staffs (15%).
- Wrong perception of the staffs indicating that knowledge management gives fewer advantages to the users (13%).

Knowledge management theory is applied in various fields. In this paper, it was attempted to concentrate on the role of knowledge management on product life cycle in commercial organizations in target market. The present paper introduced “product life cycle in commercial organizations in target market” as the most important index for information analysts, strategists and determiners of future path of the organization that understood well the necessity and importance of knowledge management and its effective performance in the organization. The paper explained the scientific definition of product life cycle as to keep the position of the organization by giving product based on scientific methods and fundamental knowledge in complex and unpredictable environments. The existing cultural barriers should be eliminated but in this relationship, the staffs should be ensure that first, the knowledge is the most important capital, second the best way to achieve this power is sharing knowledge in the organization.

**Executive steps of investment and operation of organizational knowledge**

- Integration of the concepts of knowledge management with advanced technologies of commercial process and human performances.
- Creating a good environment for knowledge sharing.
- Creating the culture of knowledge share in the institutions via creating effective team works of basic knowledge among staffs and managers of different levels of the organization.
- Elaboration and definition of added-value and considerable advantages of knowledge on improving services or the presented productions to the client by managers of different levels of the organization.
• Establishment of knowledge management by the aid of organizational leaders and emphasis on their key role in convincing the subordinates in relation to the advantages of knowledge including the development of occupational skills and professional growth.

• Creating the structure of wide social communications among the staffs and managers of different levels of organization via communicating with others being informed of their knowledge, beliefs and their mental ambiguities.

Earl and Scott in 2001 referred to the most important role of The chief Knowledge officer as:

• The role of entrepreneurship (accepting risk in new works)
• Counseling (the ability of adaptability of new ideas of the members of the organization with environmental conditions)
• Technology (mastering advanced technologies)
• Commitment to protecting environment (the design ability and performing some processes to maximize their knowledge to protect the surrounding environment)

What is knowledge management? Knowledge management is an internal systematic business model emerged recently in sciences and organizations and investigates a wide scientific range with all its aspects. This wide range can include production, knowledge, formulation of scientific rules and scientific participation and finally leads into improvement of learning and innovation.

Why knowledge management is important? All famous theorists of economy and business science in today world know the defined knowledge final code and competition advantage for modern companies. Thus, each method or model that can keep knowledge improvement and forms its distribution is considered as success secret of today world companies.

Creating knowledge: creating knowledge is referred to the ability of the organizations in creating new ideas and solutions (Maracas, 1999, Vol. 12, p 268). The organizations by development and renovation of the structure of the previous and present knowledge by various methods create new realities and concepts. Validating knowledge: Validating knowledge is referred to the ranges assigned by the companies on the previous knowledge and its effects on organizational environment.

Presenting knowledge: presenting knowledge is the methods by which the knowledge is presented to the members of the organization. Generally, the organizations can take different positions in creating their knowledge. However, organizational knowledge is distributed in different positions and includes different trends and is stored in different print and electronic media.

Distribution of knowledge: It is necessary that the knowledge is shared before its operation in organization level inside the organization. The interaction between the organization technologies, techniques and people can have direct effect on knowledge.
The culture of creating knowledge: The organizations should provide an environment with share, transfer of knowledge among members (Nonakavtakuchi, 1995, Vol. 5, p. 64) and train people for the concept of their interactions. To extend “set knowledge” each activity should be directed toward logical interaction development among performances. Briefly, knowledge management is referred to changing collaboration culture and commercial processes to make information sharing possible.

Knowledge-based staffs: The experts and specialists have major role in the success of knowledge management, but the activities and attitudes of people who are paid to do non-knowledge management works have more important role on the success of this type of management. Planning managers, commercial analysts, plan and production engineers and even secretaries and servants are the most important knowledge managers. All of them need creating, searching, share and using knowledge in their daily works.

Top manager of knowledge: Recently, most of the American companies and some of European companies employed top knowledge managers to guide knowledge management affairs. In some of these companies, some positions such as top authorities of training are created. These responsibilities are some roles of these discussions and include knowledge management and propagating organizational learning. These positions are management positions at top information management, the head of human resources centers and leadership of commercial and operational units.

**Knowledge management and product life cycle in target market of commercial organization**

Knowledge management is a new scientific field created of some fields including librarian and information. Its application is started in general services and educational organizations sectors. Commercial and production organizations can use knowledge management to achieve organizations goals.

Knowledge management can include most of the activities of productive and commercial and even service companies to improve the effectiveness. In addition, it provides an opportunity to develop the role of companies and it results into that fact that stable relations can be established with other units inside or outside of the companies with shareholders, customers, loan giver banks, competitors, etc.

**The effective factors on presentation of the new product to the market**

The important factors that companies should take into attention in presenting new products are as follows:
1. Product life cycle
2. The design strategies of the product
3. Development process of the product
4. New product management
Marketing principles in product life cycle steps

If a company intends to introduce a new product in initial steps of life cycle to new markets, should try to be familiar with the propagation of knowledge and innovation in that market. This process helps the marketing manager to find that who the first people are accepting the new product and what aspects of advertisement or distribution should be emphasized more.

The phases of product life cycle

Product life cycle is consisted of 5 phases as:
- Product development
- Introduction
- Growth
- Maturity
- Decline

Figure 2- Product life cycle

1. Product development: Product development phase begins when a company finds and develops a new product idea. During the product development phase, sales are zero and investment of the company is high.
2. Introduction: It is the phase; the product is presented to the market. In this phase, sale trend is slow and due to heavy costs, production and marketing, there is no profit.
3. Growth: It is the phase in which the product acceptance is rapid and profitability is high. In other words, growth phase is the phase in which the goods is accepted rapidly and profit is increased.
4. Maturity: It is a phase in which sale growth is reduced due to the acceptance of the product by most of the potential purchasers. The profit is reduced due to marketing costs performed to cope with the competitors.
5. Decline: It is a phase in which sale and profit is reduced. If the company introduces a new product in the initial phases of its life cycle to new markets, this issue helps the marketing manager to find that who are the first people accepts the new product and which aspects of the product, advertisement, pricing or distribution should be emphasized more. Marketing managers can use the concept of product life cycle as a good framework to describe the method of action of production in market. The application of product life cycle to provide marketing policy is very difficult. Thus, it should be investigated by the related experts. Because the prediction of sale for each phase of product life cycle and estimation of time duration of each stage considering the shape of product life cycle is important for analysis of market conditions. Pioneer companies of the market should be careful about the selection of policy of giving new product and to achieve an acceptable cycle of goods life, they should renew the pricing, formulation method of advertisement campaign and marketing policies of their product and to keep the leadership of market consider a true strategy.

Product development process

Product development process is including the following steps:

- Idea generation
- Idea screening
- Concept development & testing
- Marketing strategy development

- Commercialization
- Test marketing
- Product development
- Business analysis

Figure 4- The major steps in creating the new product

Conceptual model of research

In this section, we explain the conceptual model of research and its components. As it is shown, in this model, independent variables, the dimensions of knowledge management including knowledge creation, knowledge gaining, knowledge propagation, using knowledge as general and the components of each of the activities are as partial. Indices of research variables are shown in the following table. In this model, the effects of applying the activities of knowledge...
management on different parts of product life cycle is investigated. The dependent variables in this research are including development of product, introduction, growth, maturity and decline.

**Table 1- Conceptual model of research**

<table>
<thead>
<tr>
<th>Different parts of decision making for Product Life Cycle (PLC) of organization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variables</td>
<td>Moderating variables</td>
</tr>
<tr>
<td>Knowledge management activities</td>
<td>Supporting activities</td>
</tr>
<tr>
<td>Knowledge creation</td>
<td>Inner logistic</td>
</tr>
<tr>
<td>Knowledge gaining</td>
<td>Processing process</td>
</tr>
<tr>
<td>Knowledge propagation</td>
<td>External logistic</td>
</tr>
<tr>
<td>Applying knowledge</td>
<td></td>
</tr>
<tr>
<td>The main activities of the organization</td>
<td></td>
</tr>
</tbody>
</table>

**Research methodology**

In the present study, two approaches of quality and quantity research are used (Doas, 2003, p23) considering the type of data and conditions. At first, by gaining quality data via interviews, documents study, and the effectiveness method of knowledge management in main, important sectors of product life cycle were analyzed. This result of this step was the design of research hypotheses. Then, research questions were analyzed via distribution of questionnaire. The present study is of applied type and we were attempting to search the evaluation of the effect of knowledge management on product life cycle in industry via analyzing main, important and different parts of product life cycle in target market of commercial organizations (case study of Pishraneh Productive-commercial Company in Mazandaran province).

**Population study and research sample:**

The investigation population was active companies in electronics industry- case study of Pishraneh Productive-commercial Company. The main field of the activity of this company is the production of electrical and electronic industrial parts. This company is one of the sample companies in Iran and their activities are investigated as periodically. Due to the definite number of population size, the population size is considered as a limited population. The sample size was calculated by Kergesi and Morgan table as 10 people that were selected as simple random sampling method and a questionnaire was sent to them (high management, human resources management, sale and marketing management, research and development management and procurement management). Return rate of the questionnaires was 100 percent indicating suitable collaboration of the managers of the mentioned organization.
Data collection method

In most cases, the organizations keep their mission, goals and work fields as documented that their evaluation is necessary and useful (Doas, 1997: pp 42-45). Data collection is the starting point of a process during which the research collects field and library findings and then classifies and analyze them and evaluates the formulated hypotheses (Hafeznia, 1998, Vol. 3, p 53) the information in this research is divided into two groups: Library information, archive and field information (Alvani, 1998, Vol. 4, p. 153-166). In this research three kinds of interviews are used considering the conditions.

Information collection tool

The applied tool in this study is questionnaire of close type. Survey questionnaire of the manager about the role of knowledge management in different sections of the organization, questionnaires of measuring specialized skills of staffs, questionnaire of measuring the satisfaction of the customers and innovation measurement questionnaire are researcher-built tools. However, the questionnaire of measuring knowledge management is of standard type proposed by Bukowitz & Williams in 1999 and it was used in many countries and its results were supported.

Validity and reliability of questionnaire

The content validity of questionnaire was analyzed positive from the view of experts and lecturers. The reliability of questionnaire was calculated as 0.82 by Cronbach’s alpha.

Data analysis

In this research, Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) mathematical method was used for data analysis. The selection of TOPSIS method was done by interviewing with experts and collecting their comments about differ different models. Thus, for quality and quantity investigation of data, multi-criteria and compensation decision making technique (TOPSIS) was used for prioritization of decision choices considering decision matrix indices. Decision matrix indices ($DM_{ij}$) denoted by ($x_{ij}$) were as:

1. Presenting good after sale services of the company to customers that an index with positive aspect of desirability is considered.
2. Increasing the speed and precision of services to customers that an index with positive aspect of desirability is considered.
3. Reduction of marketing costs and giving services to customers an index with negatives aspect of desirability is considered.
4. Increasing market share to give services to customers an index with positive aspect of desirability is considered.
5. Increasing the quality of company to give services to customers an index with positive aspect of desirability is considered.
Decision matrix choices \((DM_i)\) denoted by \((A_i)\) are as the followings:

1. The activities of knowledge management ("creating knowledge" and "product life cycle in a commercial organization")
2. The activities of knowledge management ("gaining knowledge" and "product life cycle in a commercial organization")
3. The activities of knowledge management ("propagating knowledge" and "product life cycle in a commercial organization")
4. The activities of knowledge management ("propagating knowledge" and "product life cycle in a commercial organization")
5. The activities of knowledge management ("using knowledge" and "product life cycle in a commercial organization")

Thus, considering the above issues, the general form of indices and Decision matrix choices \((DM_i)\) is as the followings:

Table 11- The determination of Shanon’s importance coefficient of general management of the organization

| WJ      | 0.306111 | 0.499315 | 0.538238 | 0.494883 | -0.83855 |

Table 12- The determination of Shanon’s importance coefficient of human resources management of the organization

| WJ      | 0.497761 | 0.028529 | 0.088566 | 0.094439 | 0.290705 |

Table 13- The determination of Shanon’s importance coefficient of marketing management and sale of the organization

| WJ      | 0.195362 | 0.068825 | 0.106716 | 0.528997 | 0.1001   |

Table 14- The determination of Shanon’s importance coefficient of Research and Development (R&D) management of the organization

| WJ      | 0.096059 | 0.269182 | 0.058434 | 0.204269 | 0.372055 |

Table 15- The determination of Shanon’s importance coefficient of procurement and support management of the organization

| WJ      | 0.096824 | 0.300763 | 0.086144 | 0.161496 | 0.354774 |

Weighted decision matrix \((DM_{wi})\) (Weighted normalized matrix) of general management organization:

\[
V_{DM_{wi}} = \begin{bmatrix}
0.1518132 & 0.3556586 & 0.2797887 & 0.3313633 & -0.3654367 \\
0.2645889 & 0.3556586 & 0.3856545 & 0.2692327 & -0.6293628 \\
0.1388006 & 0.1692438 & 0.2117316 & 0.2278125 & -0.2842282 \\
0.1344633 & 0.1587762 & 0.1209895 & 0.1035508 & -0.3045303
\end{bmatrix}
\]

Weighted decision matrix \((DM_{wi})\) (Weighted normalized matrix) of human resources management organization:
\[ V_{DM(2)} = \begin{bmatrix} 0.4341307 & 0.1431337 & 0.0538491 & 0.0360086 & 0.1840125 \\ 0.3647145 & 0.1431337 & 0.0269245 & 64515.247 & 0.2728528 \\ 0.1161759 & 0.1472232 & 0.0477299 & 0.0465102 & 0.1349426 \\ 0.1712064 & 0.1104175 & 0.0440568 & 0.0360086 & 0.1390317 \end{bmatrix} \]

Weighted decision matrix \((DM_i)\) (Weighted normalized matrix) of marketing and sale management of organization:

\[ V_{DM(3)} = \begin{bmatrix} 0.0741991 & 0.0412529 & 0.0483368 & 0.4503452 & 0.0740816 \\ 0.1033486 & 0.0412529 & 0.0395483 & 0.1667964 & 0.0612381 \\ 0.0609492 & 0.0343775 & 0.0717728 & 0.1612365 & 0.0237061 \\ 0.1351483 & 0.0245553 & 0.0483368 & 0.1556766 & 0.0148163 \end{bmatrix} \]

Weighted decision matrix \((DM_i)\) (Weighted normalized matrix) of Research and Development (R&D) management of the organization:

\[ V_{DM(4)} = \begin{bmatrix} 0.0518308 & 0.2096373 & 0.513511 & 0.0970169 & 0.2454075 \\ 0.032676 & 0.2096373 & 0.3749897 & 0.1633274 & 0.2103491 \\ 0.04169 & 0.0790437 & 0.2632907 & 0.0790437 & 0.04169 \\ 0.0619716 & 0.0970169 & 0.513511 & 0.2096373 \end{bmatrix} \]

Weighted decision matrix \((DM_i)\) (Weighted normalized matrix) of procurement and support management of organization:

\[ V_{DM(5)} = \begin{bmatrix} 0.0521956 & 0.2238341 & 0.0437578 & 0.0809933 & 0.4110279 \\ 0.0631839 & 0.2238341 & 0.0414113 & 0.0593527 & 0.1940966 \\ 0.0384598 & 0.0639527 & 0.0391729 & 0.0639527 & 0.2238341 \\ 0.0343391 & 0.1527759 & 0.0302191 & 0.0302191 & 0.1655528 \end{bmatrix} \]

Ideal positive choice \((A^+_i)\) and negative ideal choice \((A^-_i)\)

\((A^+_i) = \{ \max(V_{ij}) \mid j \in J, \min(V_{ij}) \mid j \in J \} = \{ \frac{V^*_{1}, V^*_{2}, \ldots, V^*_{m}}{j=1,2,\ldots,m} \}

\((A^-_i) = \{ \min(V_{ij}) \mid j \in J, \max(V_{ij}) \mid j \in J \} = \{ \frac{V^-_{1}, V^-_{2}, \ldots, V^-_{m}}{j=1,2,\ldots,m} \}

The calculation of ideal positive choice \((A^+_i)\) and negative ideal choice \((A^-_i)\) of general management of organization

\((A^+_i) = \{ 0.264589,0.355659,0.120989,0.331363,-0.28423 \}

\((A^-_i) = \{ 0.134463,0.158776,0.385655,0.103551,-0.62936 \}

\]
The calculation of Ideal positive choice \((A_i^+\)) and negative ideal choice \((A_i^-)\) of human resources organization 
\[
(A_i^+) = \{0.434131, 0.147223, 0.026925, 0.64515, 0.25, 0.272853\}
\[
(A_i^-) = \{0.116176, 0.111048, 0.053849, 0.036009, 0.134943\}
\]

The calculation of Ideal positive choice \((A_i^+\)) and negative ideal choice \((A_i^-)\) of marketing and sale management of organization 
\[
(A_i^+) = \{0.135148, 0.041253, 0.039548, 0.450345, 0.074082\}
\[
(A_i^-) = \{0.060949, 0.024555, 0.071773, 0.155677, 0.023706\}
\]

The calculation of Ideal positive choice \((A_i^+\)) and negative ideal choice \((A_i^-)\) of Research and Development (R&D) of organization 
\[
(A_i^+) = \{0.061972, 0.209637, 0.263291, 0.163327, 0.245407\}
\[
(A_i^-) = \{0.032676, 0.079044, 0.513511, 0.060636, 0.078881\}
\]

The calculation of Ideal positive choice \((A_i^+\)) and negative ideal choice \((A_i^-)\) of procurement and support of organization 
\[
(A_i^+) = \{0.063184, 0.223834, 0.030219, 0.115191, 0.411028\}
\[
(A_i^-) = \{0.03846, 0.063953, 0.043758, 0.052196, 0.165553\}
\]

**Ranking the choices**

**Table 17- The formation of combination matrices of ranking the choices**

<table>
<thead>
<tr>
<th>No.</th>
<th>The unit of organizacional units</th>
<th>Relative approximati on index score in organizational units</th>
<th>Ranking the choices based on organizational units</th>
<th>Ranking the choices ((A_i))</th>
<th>Index ((x_j))</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General management</td>
<td>0.9875045</td>
<td>0.9875045</td>
<td>((A_1))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8086896</td>
<td>0.935472</td>
<td>((A_4))</td>
<td>((x_5))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.922837</td>
<td>0.922837</td>
<td>((A_3))</td>
<td>((x_5))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.935472</td>
<td>0.8086896</td>
<td>((A_2))</td>
<td>((x_5))</td>
</tr>
<tr>
<td>2</td>
<td>Human resources management</td>
<td>0.27327723</td>
<td>0.4216013</td>
<td>((A_2))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.4216013</td>
<td>0.27327723</td>
<td>((A_1))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.2635213</td>
<td>0.265838</td>
<td>((A_4))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.265838</td>
<td>0.2635213</td>
<td>((A_3))</td>
<td>((x_1))</td>
</tr>
<tr>
<td>3</td>
<td>Marketing and sale management</td>
<td>0.63603</td>
<td>0.7345301</td>
<td>((A_2))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7345301</td>
<td>0.70822</td>
<td>((A_4))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.69002</td>
<td>0.69002</td>
<td>((A_3))</td>
<td>((x_1))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.70822</td>
<td>0.63603</td>
<td>((A_1))</td>
<td>((x_1))</td>
</tr>
<tr>
<td>4</td>
<td>Research and</td>
<td>0.7426814</td>
<td>0.893859</td>
<td>((A_4))</td>
<td>((x_1))</td>
</tr>
</tbody>
</table>
Decision making rule

Quantity decision-making rule: As it was said before, to calculate normalized weighted matrix, 5 scenarios were used. Based on the first scenario, the scores were 0.9875045, 0.8086896, 0.922837, 0.935472, respectively. The second scenario scores were 0.27327723, 04216013, 0.265838, 0.2635213, respectively. The third scenario scores were 0.63603, 0.7345301, 0.69002, 0.70822, respectively and the fourth scenario scores were 0.7426814, 0.6571435, 0.441463, 0.893859, respectively and finally the fifth scenario scores were 0.1816555, 0.8977383, 0.485107, 0.684142.

Quality rule of decision-making: But as it was said in quality rule of decision making, in this section quality decision making rule- we interpret the data based on numerical value as: Based on the first scenario in which the scores were 0.9875045, 0.8086896, 0.922837, 0.935472, respectively. Decision interpretation rule is as in this scenario- it means that the first scenario in terms of general management of organization, decision choices \((A_i)\) are \((A_1)\), \((A_2)\), \((A_3)\), \((A_4)\), respectively based on decision indices \((x_j)\) are \((x_1)\), \((x_2)\), \((x_3)\), \((x_4)\), \((x_5)\). Based on second scenario in which the scores are by order 0.27327723, 04216013, 0.265838, 0.2635213, Decision interpretation rule is as in this scenario- it means that the second scenario in terms of human resources management of organization, decision choices \((A_i)\) are \((A_1)\), \((A_2)\), \((A_3)\), \((A_4)\), respectively based on decision indices \((x_j)\) as \((x_1)\), \((x_2)\), \((x_3)\), \((x_4)\), \((x_5)\). Based on the third scenario in which the scores are .63603, 0.7345301, 0.69002, 0.70822, respectively, decision interpretation rule is as in this scenario- it means that the third scenario in terms of marketing and sale management, decision choices \((A_i)\) are \((A_2)\), \((A_4)\), \((A_1)\), \((A_3)\), respectively based on decision indices \((x_j)\) as \((x_1)\), \((x_2)\), \((x_3)\), \((x_4)\), \((x_5)\). Based on the fourth scenario the scores are 0.7426814, 0.6571435, 0.441463, 0.893859 respectively, decision interpretation rule is as in this scenario- it means that the fourth scenario in terms of Research and Development management of organization, decision choices \((A_i)\) are \((A_1)\), \((A_2)\), \((A_4)\), \((A_3)\), respectively based on decision indices \((x_j)\) are as \((x_1)\), \((x_2)\), \((x_3)\), \((x_4)\), \((x_5)\), based on the fifth scenario in which the
scores are 0.1816555, 0.8977383, 0.485107, 0.684142 respectively, decision interpretation rule is as in this scenario- it means that the fifth scenario in terms of procurement and support management of organization, decision choices \((A_i)\) are \((A_2)\), \((A_4)\), \((A_1)\), \((A_3)\) respectively based on decision indices \((x_j)\) are \((x_1)\), \((x_2)\), \((x_3)\), \((x_4)\), \((x_5)\).

**Discussion and conclusion**

Knowledge is considered as a strategically tool to react against the increasing changes of the surrounding environment and the existing institutions. The change in management performances is a necessary and unavoidable issue. Different kinds of institutions to their development and being consistent with the changes require the effective performance of knowledge management strategy. Various methods are proposed for performing knowledge management in the institutions, the most common of them is “top to down” model. Thus, American Productivity and Quality Center (APQC) proposes, one of the most effective methods of successful performance of knowledge management and reducing wrong perception of the staffs is establishment of knowledge management in the organization. However, this question is raised that how establishment of knowledge management is performed as effective in the organization? The present paper recommends that the institutions instead of using legal authorities to perform the cultural changes among the stags by emphasizing the role and performances of organization leaders perform the process of establishment of knowledge management in the organization.

**References**

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management on different parts of product life cycle are investigated. The dependent variables in this research are including development of product, introduction, growth, maturity and decline.

**Table 1- Conceptual model of research** Different parts of decision making for Product Life Cycle (PLC) of organization

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Moderating variables</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge management</td>
<td>Supporting activities</td>
<td>Product life cycle factors</td>
</tr>
<tr>
<td>Knowledge creation</td>
<td></td>
<td>Product development</td>
</tr>
<tr>
<td>Knowledge gaining</td>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>Knowledge propagation</td>
<td></td>
<td>Growth</td>
</tr>
<tr>
<td>Applying knowledge</td>
<td></td>
<td>Maturity</td>
</tr>
<tr>
<td>Inner logistic</td>
<td>Processing process</td>
<td>Decline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External logistic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After-sale services</td>
</tr>
</tbody>
</table>

The main activities of the organization