

## **Factors Affecting Knowledge Management in the Ministry of Communications and Information Technology**

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**Abstract:** One of the most important and valuable assets of any organization is the knowledge. Rapid and exponential growth of knowledge and information, make organizations to put all their efforts in knowledge management. Thus, organizations seek to identify factors as well as preparing the development of knowledge management so that they can enjoy their knowledge resources and the environment. Private companies produce goods and services that directly compete with goods and services in public sector. Training, knowledge, safety and science are the including areas of competition between these two sectors. If customers can completely customize and tailor their needs addressed by the private sector, unconsciously same expectations will arise in the public sector. Employees retirement and sending them to different sectors, creates a new challenge for knowledge retention and preservation of institutional memory and providing new staff training. Therefore, this study attempts to identify knowledge management state to develop knowledge management in one of the country's ministry called the Ministry of Communications and Information Technology. In this regard, a review of the literature was conducted. After identifying the factors and indicators related to knowledge management, the framework has been completed which has been mentioned in the questionnaire. The questionnaire were distributed among managers and experts in the Ministry of Communications and Information Technology. In addition, analysis of quantitative research was conducted using SPSS Software. The results showed that all components including information technology, human resources, organizational culture and organizational structure of the Ministry of Communications and Information Technology are at high levels and there is a possibility of implementing knowledge management in there. Among the mentioned components, information technology received the highest score and the lowest score is for the organizational structure. Evaluation of these factors indicate the existence of information technology equipment and efficient communication in Ministry of Communications and Information Technology has the most favorable conditions in terms of respondents.

**Key words:** Knowledge management, ICT, Ministry of Communications and Information Technology, SPSS Software, analysis

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### **INTRODUCTION**

The organizations complexities in the current situation has led the management to use management strategies in order to increase performance and achieve organizational goals. This approach has led managers use knowledge management to enjoy a powerful tool in different sectors of an organization. If managers seek to take advantage of knowledge in their organization they will need to provide adequate infrastructure factors.

Required capacities and infrastructure to deploy and use new systems such as knowledge management is important as implementation of this system regardless of the availability of fundamentals and the strengths and weaknesses are often faced with failure.

Ministry of Communications and IT considered knowledge management as the backbone of management. And almost all organizations that have adopted knowledge management successfully are well aware of the need and importance of a supportive infrastructure to support knowledge management system. The fact that the efficiency and effectiveness of knowledge management requires a strong and appropriate infrastructure is supported.

Today, if organizations want to take advantage of the enormous benefits of knowledge management they should provide key factors and adequate infrastructure for its implementation in the organization, since lack of proper infrastructure will impair the result of a work. Ministry of Communications and Information Technology

of is an important ministry that plays an important role in earning non-oil revenue factor allocated about 4700 million dollars to the country and this could be a proper way to be independent of the oil economy. According the above points, considering the knowledge and implementation of knowledge management in this Ministry is important. The present study attempts to answer the question that to what extent the Ministry of Communications and Information Technology is ready in terms of establishment of a knowledge management infrastructure?

Knowledge management infrastructure in the Ministry of Communications and Information Technology in terms of four dimensions of information technology, organizational culture, organizational structure and human resources is evaluated in this study.

Ministry of Communications and Information Technology is a specialized ministry in which knowledge and expertise are of high importance. These points show the importance of the organization excellence because improving performance can optimize decisions and policies of these organizations, so that desired results are indirectly visible in every aspect of society. In addition as using new methods in the management of an organization will bring excellence; in this study we attempt to assess the factors of implementing knowledge management in the Ministry of Communications and Information Technology.

## LITERATURE REVIEW

In this study, we discuss the definitions and explain important terms discussed in the research and theoretical framework.

**Knowledge management:** In the past, the value of an organization was measured in terms of capital and tangible assets but in the new millennium, intangible assets are considered to be the best assets. Among these assets one can point to knowledge; knowledge is an intangible asset that is more important in the modern era than those of traditional assets. According to Aggestam, knowledge is a valuable asset that needs management, development and operation just like other asset (Aggestam, 2006). Bhatt believes that data are superficial facts that when processed and organized they create information and knowledge is the meaningful information. Data, information and knowledge are different only from consumer's point of view. Four factors are influential in the emergence of knowledge management:

- Intellectual capital domination period
- Extraordinary increase in the volume of information, electronic storage and increasing access to information

- Change in population age pyramid and the risk of loss of institutional knowledge due to retirement
- More specialized activities

Knowledge management is the most appropriate method and model for knowledge-based organizations. In addition, knowledge management makes the dynamics of organizational structure (in terms of creating a system that is flexible, open and communicative) but its practical implementation is highly dependent on technology. Each steps involved in knowledge management can be optimized by information technology and new technical tools. Two comprehensive definition of knowledge management are:

- Knowledge management is to achieve organizational goals through motivating knowledge workers and provide facilities for them according to the company's strategy to increase their ability to interpret data and information (using the results of information, experience, skills, culture, personality, personal characteristics, emotions, etc. by means of data and information (Alavi and Leidner, 2001)
- Knowledge management is explicit and systematic management of vital knowledge and processes related to the creation, organization, dissemination and use of knowledge discovery (Choi and Lee, 2003)

## MATERIALS AND METHODS

**Models of knowledge management:** Knowledge management is series of functions that will help to improve the mechanisms of management in an organization. The mechanisms that their implementing require the proper infrastructure in the organization. Sometimes because of the complexity of IT, people are reluctant to use the new system. Reluctance to work with the IT systems is because of lack of knowledge and lack of experience with this system. The main reason could be the lack of appropriate educational programs to acquaint new employees with IT systems and processes and the lack of notification and disclosure of the benefits of the new IT system compared to existing systems.

Therefore, proposals to improve the IT situation regarding the promotion of technical and professional skills of staff in using IT systems as well as their familiarity with the uses and benefits of any of the information systems through classes, workshops and training seminars will be presented. As well as creating a culture of using information technology to use and share knowledge are always needed as an infrastructure.

Moreover with regard to the role of information technology as a factor for internal and external information communications and group works; the culture of internal networks such as intranets, information

networks, organization portals, e-mail and groupware need to be established vertically and horizontally to facilitate communication among members of the organization. Creating a knowledge map by creating a database system that pinpoints which staff in what and in what part possess the special knowledge are needed to access and can be used to make the organizations solve the problems.

Also, creation of knowledge management unit in the organizational structure, performing the regulatory process and conducting knowledge laws and regulations, changes in organizational structure and turning it into a flexible structure in terms of organizational structure, improving managers knowledge in the field of organizational culture and human resources can be the infrastructures to implement management at the Ministry of Communications and Information Technology.

In the literature, knowledge management models can be divided into two main categories of deployment and process. Meanwhile, the most comprehensive model is Molaei which is shown in Fig. 1.

However, there are not a lot of literature about the establishment of the model. These two models explained the process of implementing knowledge management in general. The other models presented the factors affecting the implementation of knowledge management in organizations. These models are as follows:

**Organizational culture questionnaire OCI:** One of the proposed solutions in knowledge management readiness assessment is OCI questionnaire. This questionnaire is used by many organizations as a reliable economic instrument. It classified 12 norm of 3 types of organizational culture including:

- Structural culture
- Passive/defensive
- Offensive/defensive

Although, this tool is focused on organizational culture influenced by the structure, systems, technology and expertise it can be used as a tool to assess cultural knowledge management and other features.

**Lee and Choi Model:** Lee and Choi approach is formed on KM readiness based on Socio-Technical Systems (STS). They have suggested a framework that consists of the

knowledge management enablers, processes and organizational performance. Factors affecting the readiness of knowledge management is analyzed in relation to organizational culture, structure, people and information technology and introduces these aspects as important criteria in knowledge management readiness.

**Borghoff, Uwe and Pareschi, Remo Model:** Uwe and Remo (1997) introduce three dimensions in the assessment of their organizational readiness for knowledge sharing: organizational climate, processes and infrastructure and implementation strategy. This framework suggests 5 factors and 27 sub-factors to analyze organizational readiness for knowledge sharing in the public sector. The factors are: open leadership atmosphere, lessons from failures, data quality, performance orientation and change satisfaction.

They presented a framework based on knowledge life cycle that includes discovery, capture and use of knowledge and lost knowledge. They have presented 14 steps in which the organization is getting ready to deploy knowledge management. This framework is still in the conceptual stage and have not been verified empirically. In the presented model, some of the factors and processes such as: building trust through leadership, identifying and determining the “knowledge value 10” and the creation of “ownership 11” are considered for knowledge. This framework is not very comprehensive since it ignores some factors such as culture and organizational structure.

**The research model:** The factors affecting the implementation of knowledge management in the Ministry of Communications and Information Technology used the Lee and Choi (2003) Model. Lee and Choi, considered four factors: structure, culture, human resources and information technology as an enabler of knowledge management to study their effects in the process of knowledge creation and organizational performance. For this reason and due to the organizational structure of Parliament Research Center, using this model would satisfy the objectives of the study. In this model, analysis of research stages to describe the relationship between dependent and independent variables is used. As Parliament Research Center has governmental structure, the analytical model is used (Fig. 2).

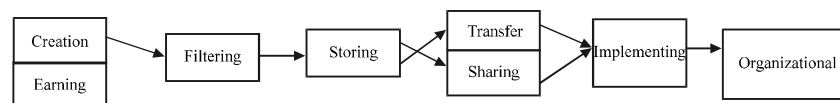


Fig. 1: Knowledge management model (Molaei, 2011)

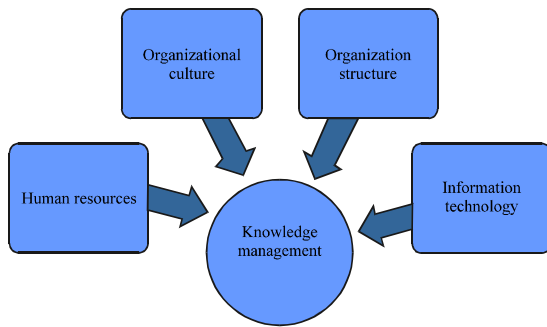


Fig. 2: Research conceptual model

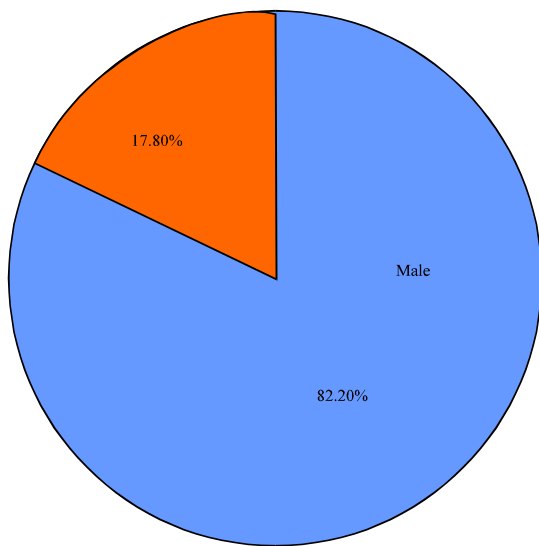


Fig. 3: Distribution of the population based on gender

## RESULTS AND DISCUSSION

The results of data descriptive analysis are as follows: as indicated in the (Fig. 3) above is the ratio of

men to women is about 4 times. This means that about 82% of the respondents were men and about 18% of the respondents are women Table 1.

As indicated in the Fig. 3, the ratio of men to women is about 4 times more. This means that about 82% of the respondents were men and about 18% of the respondents were women.

As can be seen in the Table 2, the highest dispersion of the population is the people who have work experience between 5-10 years, respectively. In this respect, the study population is relatively young in terms of work experience.

**Inferential analysis:** In this type of analysis the researcher calculates the statistics using the sample values. Statistics is a term that is used in conjunction with the sample and examines the characteristics of sample. For example, the mean, variance or sample ratio are statistics. Statistics changes from a sample to another sample. It is a numerical parameter that describes the characteristics of the community such as mean, variance and community mean. Although, parameters are static in community they are unknown. And statistics are used to estimate the parameters according to statistical methods which is called inferential statistics (Table 3).

Table 1: Distribution of population in terms of gender

Genders	Number	Dispersion (%)	Cumulative (%)
Male	74	82.2	82.2
Female	16	17.8	100.0
Sum total	90	100.0	

Table 2: Distribution of population in terms of work experience

Work experience	Number	Dispersion (%)	Cumulative (%)
<5 years	5	5.5	5.5
5-10 years	37	41.0	47.5
Between 10-15 years	23	26.0	73.5
Between 15-20 years	20	22.0	95.5
>20 years	5	5.5	100.0
Sum total		100.0	

Table 3: Frequency of responses on the indices of knowledge management implement components

Components	Question	Very low	Low	Average	High	Very high	Mean
Information technology	1	1	8	19	39	23	3.833
	2	1	8	26	32	23	3.755
	3	2	1	30	37	20	3.800
	4	3	9	24	38	16	3.610
Human resource	5	2	15	23	28	22	3.587
	6	3	11	35	26	15	3.430
	7	5	16	20	29	20	3.480
	8	6	16	27	21	20	3.369
Organizational structure	9	0	14	27	35	14	3.548
	10	3	13	27	30	16	3.440
	11	8	14	27	25	16	3.305
	12	5	12	25	28	20	3.510
Organizational culture	13	1	7	25	34	23	3.790
	14	2	12	34	27	15	3.460
	15	2	14	25	32	16	3.480
	16	1	8	26	33	22	3.740
	17	4	10	28	29	21	3.650

In this part, Kolmogorov-Smirnov test is used for normality of the data and t-test sequence is used in order to test each hypothesis.

**Testing datanormality:** In this part, the data is studied for deciding to use parametric or non-parametric tests. For this purpose, data normality testing is conducted Hypothesis relevant to this section include:

- $H_0$ : data have normal distribution
- $H_1$ : data do not have normal distribution

The above hypothesis for the variables was evaluated through the Kolmogorov-Smirnov test. The result is shown in Table 4.

As can be seen, the significance level (divided by two) in all variables is less the amount of ( $\alpha/2$ , 0.025) on the other hand, the Z statistics is also  $<1.96$ . Thus, there is no strong evidence to reject the hypothesis (0) at significance level of 95% and hypothesis (0) is accepted. Therefore, the 4 components have normal distribution.

**Testing hypotheses:** Since statistical data are of normal distribution, non-parametric statistical tests can be used to analyze the data. In our research we used a sample t-test to evaluate each of the hypothesis. If distribution is not normal, parametric tests can be used when the sample is big. But how big should an example be is different according to statisticians' perspectives. If the variable is not very abnormal, parametric tests can be used in a sample of 30 and above. The only difference between the

Table 4: Kolmogorov-Smirnov test for components'normality

Components	Organizational culture	Human resource	Organizational Structure	Information technology
Quantity	90.000	90.000	90.000	90.000
Z statistics	3.802	2.597	3.572	1.359
The significant level of bilateral	0.000	0.000	0.000	0.020

Table 5: The first hypothesis test ( $\mu = 3$ )

Indicator	Frequency	t-value	df	Significant level	Mean difference	Mean	Confidence interval of 95%	
							Lower limit	Upper limit
Information technology	90	12.805	89	0.000	0.749	3.749	0.6313	0.8659

Table 6: The second hypothesis test ( $\mu=3$ )

Indicator	Frequency	t-value	df	Significant level	Mean difference	Mean	Confidence interval of 95%	
							Lower limit	Upper limit
Human resource	90	9.607	89	0.000	0.482	3.482	0.382	0.5818

Table 7: The third hypothesis test ( $\mu = 3$ )

Indicator	Frequency	t-value	df	Significant level	Mean difference	Mean	Confidence interval of 95%	
							Lower limit	Upper limit
Organizational culture	90	11.895	89	0.000	0.626	3.626	0.5194	0.7333

two types of tests is that non-parametric tests have less accuracy. Therefore, in large samples using both types of tests is not a problem.

#### The first hypothesis analysis:

- Hypothesis  $H_0$ : Ministry of Communications and Information Technology is not at high level to establish knowledge management in terms of information technology capabilities
- Hypothesis  $H_1$ : Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of information technology capabilities

According to the obtained results in the Table 5 test statistics (12.805) is greater than the table statistics (1.96). Therefore as calculated statistics at 0.05 level of error and df of 89 is greater than the table value (805.12<96.1), then we can say that the obtained amount has not been in the critical areaand hypothesis (0) is rejectedand hypothesis (1) is accepted which means Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of information technology capabilities.

#### The second hypothesis analysis:

- Hypothesis  $H_0$ : Ministry of Communications and Information Technology is not at high level to establish knowledge management in terms of human resources
- Hypothesis  $H_1$ : Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of human resources

According to the obtained results in the Table 6 test statistics (9.607) is greater than the table statistics (1.96). Therefore as calculated statistics at 0.05 level of error and

Table 8: The fourth hypothesis test ( $\mu = 3$ )

Indicator	Frequency	t-value	df	Significant level	Mean difference	Mean	Confidence interval of 95%	
							Lower limit	Upper limit
Organizational structure	90	8.835	89	0.000	0.419	3.419	0.3813	0.4559

Table 9: Friedman test on factors affecting the knowledge management

Variables	Statistics Chi-square	df	Significance level	Components average	Ranking
Information technology	217.3	3	0.20	3.75	First
Organizational culture				3.62	Second
Human resource				3.48	Third
Organizational structure				3.42	Fourth

df of 89 is greater than the table value ( $607.9 < 96.1$ ) then we can say that the obtained amount has not been in the critical area and hypothesis (0) is rejected and hypothesis (1) is accepted which means Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of human resources.

#### The third hypothesis analysis:

- Hypothesis  $H_0$ : Ministry of Communications and Information Technology is not at high level to establish knowledge management in terms of organizational culture
- Hypothesis  $H_1$ : Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational culture

According to the obtained results in the Table 7 test statistics (11.895) is greater than the table statistics (1.96). Therefore as calculated statistics at 0.05 level of error and of 89 is greater than the table value ( $895.11 > 96.1$ ) then we can say that the obtained amount has not been in the critical area and hypothesis (0) is rejected and hypothesis (1) is accepted which means Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational culture.

#### The fourth hypothesis analysis:

- Hypothesis  $H_0$ : Ministry of Communications and Information Technology is not at high level to establish knowledge management in terms of organizational structure
- Hypothesis  $H_1$ : Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational structure

According to the obtained results in the Table 8 test statistics (8.835) is greater than the table statistics (1.96). Therefore as calculated statistics at 0.05 level of error and df of 89 is greater than the table value (0.835, 96.1) then we can say that the obtained amount has not been in the

critical area and hypothesis (0) is rejected and hypothesis (1) is accepted which means Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational structure.

#### The fifth hypothesis analysis:

- Fifth hypothesis: there are significant differences between the rankings of factors affecting knowledge management

As can be seen in Table 9, significant amount of Friedman test is equal to 0.200 which is less than the standard significance level of 0.05. Therefore, the hypothesis is confirmed at significance level of 95% as the difference between ranks are significant.

## CONCLUSION

After analyzing the data and the hypothesis in the study, the results of which are listed in this study are explained and discussed.

**First hypothesis:** Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of information technology capabilities.

The results showed that Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of information technology capabilities and according to the obtained average it can be said that the condition of information technology for knowledge management in the organization is confirmed. Reasons can be cultural differences, human resources, strategy, technology and organizational structures. After reviewing the information technology components, one can see that in all the ICT components such as software and electronic systems, familiarity with information technology and according to the average obtained from them, the conditions of the components to establish knowledge management are confirmed. The results are inconsistent with the research

of because of cultural differences, human resources, strategy, technology and organizational structures. Ministry of Communications and Information Technology performance is relatively good in terms of information technology.

Studying hardware and software components revealed same conclusion, after examining means, one can see that components condition to establish knowledge management are confirmed. The reason is that the actions this organizations in environmental conditions and information technology age helps staff to get familiar with hardware. Being in the age of information technology and modern conditions and industrial communities were all factors.

Employees can help realize the value of integrated knowledge of customers by using IT technologies and thus they can provide a more complete service to citizens. In this regard, organizations using advanced electronic systems that require strong IT infrastructure will create new value. Jorna) also insists on the important role of key communications in interaction between the organization and the citizens and other sectors and considered this as a key element in an integrated management approach for customer knowledge. In this regard, Ke and Wei (2008) consider customers' knowledge management in regard to innovation and knowledge development and point out that firms are trying to benefit from maximum customers knowledge by using modern communication technologies. Customer knowledge managers whom seek partnership opportunities are along with and equal to customers of the organization. It is also visible when compared with the intention of retaining and growing customer base in the customer relationship management. Also, mentioned the importance of IT knowledge in the integration of groups and sectors in a customer relationship environment and mentioned facilitated flow of knowledge between working groups as strong benefits of IT equipment.

**Second hypothesis:** Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of human resources.

The results showed that Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of human resources and according to the obtained average it can be said that the condition of human resources for knowledge management in the organization is confirmed. And reasons can be human resources, strategy, technology and organizational structures and also organizational culture differences. It can be said that beliefs and values in an organization and also the way that tasks form organizational. Knowledge management led to changes in

an organization. And since managers are familiar with knowledge management and its advantages; this leads to knowledge management in the organization. After examining the components of organizational culture according to the obtained mean one can say that the components condition for implementing knowledge management in the organization is confirmed. However, its results cannot be generalized. The reasons for not accepting components of work involvement can be lack of encouraging employees to do group and team works (in teams personnel are accountable towards their work just like managers), lack of attention and investment to develop employees skills, lack of using innovation, discretion, ability and ideas and new perspectives to conduct business, not allowing employees to participate in decision-making process (a sense of ownership and responsibility will arise for the organization's staff). There is a kind of beliefs and values shared by the members of the organization which increases coordination and perception and feelings of employees toward themselves and organization. Increasing the ability of managers to reach agreement with workers (even if they have two different views) and influencing their behavior, coordination and coherence between organizational units and employees are for achieving common goals of organizations.

Knowledge management is one of the achievements of the information and knowledge age and according to its characteristics, highly successful organizations need to take advantage of it. Since, the organizational culture change is one of the most important aspects of any knowledge management system, evaluation of organizational culture and its impact on knowledge management is essential.

Researches in line with the findings of the research can be "the feasibility of knowledge management in terms of the necessary infrastructure in the municipality 8 of Tehran" that organizational culture is considered as one of the most important success factors for establishing a knowledge management system. A review of results in previous research indicated that the results of this studies are consistent. For example, Heinz and Love insists on the role of organizational culture which should encourage the distribution of knowledge and information. Moreover, it is mentioned in the literature that the forwarding element of knowledge management is organizational culture that relies on creativity and innovation. In this regard for the development of knowledge management in the organization there should be changes leading to engagement and wisdom; systematically encouraged and supported.. Therefore, identification of organizational

factors in terms of features necessary to implement a knowledge management strategy is an important first step which can provide a firm foundation for further actions in this regard. Ormazdi also believes the establishment of knowledge management in organizations requires adopting a set of tasks and skills in the field of receiving, distribution and use of knowledge and explained that successful organizations are the ones with employees considering knowledge management as a duty. He explained that cultural factors can also have a very important role in the establishment of knowledge management. And if the organizational culture is not a culture of partnership and mutual trust, knowledge management will face harsh challenges. Thus, staff and management should strive to strengthen the culture of the distribution and sharing of knowledge. They have been considered successful implementation of knowledge management factors in several cases: the people, the creativity, leadership, knowledge management tools, structure, organizational culture and knowledge management strategy. Moreover, according to Flynn, the implementation of a knowledge management program requires one to design a suitable model in which include: be in consistence with organization's strategy and its definition, integrated structural aspects and business processes, allocating resources based on a progressive structure, support for the sharing of knowledge and culture.

**Third hypothesis:** Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational culture.

The results showed that Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational culture and according to the obtained average it can be said that the condition of organizational culture for knowledge management in the organization is confirmed. Theoretical foundations review revealed that if a company's workforce be more efficient, more opportunities to provide business services will rise.

**Fourth hypothesis:** Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational structure.

The results showed that the Ministry of Communications and Information Technology is at high level to establish knowledge management in terms of organizational structure and according to the obtained average it can be said that the condition of organizational

culture for knowledge management in the organization is confirmed. And reasons can be cultural differences, human resources, strategy, technology and organizational structures. The organizational structure has always an important impact on the success of the organization's activities in the field of knowledge management. An organization with the appropriate structure can be in close contact with employees and customers to gain knowledge from them. Research and the resources that reflect the customer's voice and finding common points of employees and customers are all needed to have the appropriate organizational structure.

**Fifth hypothesis:** There are significant differences between the rankings of factors affecting knowledge management.

The results showed that there are significant differences between the rankings of factors affecting knowledge management. In comparison with the findings of other studies the results in this part of the research findings are consistent with Asefzade (2006). And after analyzing components it has been observed that information technology has the highest rank. The difference between rating scales in factors affecting knowledge management were investigated. Due to the significant difference between the means, efficient information technology equipment is of the most importance and the least important is organizational formality. Since, the four main priorities in the ranking of IT components are for IT we can conclude that IT is the most important factors affecting the knowledge management in Ministry of Communications and Information Technology. So that in the early stages of establishing a comprehensive plan to create maps and promoting knowledge processes (creating, storing, sharing and applying knowledge), IT and application software is needed and if it is not conducted, problems arise such as increase in cost and reduction in efficiency in the organization. In order to achieve knowledge management and implement it in organizations and also to achieve goals, information technology is needed.

## **SUGGESTIONS**

- Staff empowerment through authority delegation
- Promoting creativity and responsibility
- Encourage and strengthen the spirit of cooperation, partnership and teamwork among employees
- Develop capabilities and skills of individuals through training
- Encourage staff to accept the changes and the new advanced methods of work

- Trying customer orientation and considering the importance of customer feedback
- Encourage innovation and risk-taking and considering learning and promoting it as an important goal of the work day
- Encourage employees to carry out research in related areas of work
- Emphasis on developing a culture of flexibility with regard to developments outside the department
- Provide employees participation in decision making so that the elite are always ready to listen to ideas and new ways of subordinates and encourage them to express their own ideas
- Develop the skills needed to use information systems by employees through holding training requirements
- Training and applying IT tools to facilitate knowledge management and updating knowledge base
- Provide the necessary database and addresses of ministry addresses for all users
- Information Centre of the Ministry of enthusiastic service to all users
- Increase investment to expand the IT infrastructure
- Provide easy access to hardware and software for information sharing
- Provide appropriate information systems to create, store, transfer and exchange knowledge such as the Internet, intranet, extranet, groupware
- Develop the skills needed to use information systems by employees through holding training requirements
- Information Centre service to all users
- Knowledge management development workshops for members, especially managers and experts so that the role of knowledge management in the Ministry can be noticed
- Training requirements in relation to information technology and related training program so that employees learn development of knowledge management faster and its role in the organization will be highlighted

- Form information database to store and distribute information to members and others who need the information by Ministry of Communications

## **RECOMMENDATIONS**

- It is recommended that this comprehensive research also be done in companies and organizations related to Ministry of communications and information technology
- It is recommended to study the strengths and weaknesses in development of knowledge management in the Ministry of Communications and Information Technology
- It is recommended that knowledge management levels at senior levels and the members be compared

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