*Original Research*

# Measuring the Maturity of KM for Establishment of KM in Iran Public Libraries Foundation Based on APO Framework

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## Abstract

Measuring the maturity of KM allows the organization to know how to manage its knowledge and provides an infrastructure on which the organization's KM roadmap is created. With libraries and information centers with educational and research environments, the Iran Public Libraries Foundation is one of the most susceptible organizations to establish KM. Requires measuring the maturity of KM to provide necessary grounds for reaching a higher level of maturity in knowledge management development. This study aimed to measure the maturity of KM in the Iran Public Libraries Foundation based on the Asian Productivity Organization framework. The study is an applied survey research. The data was collected using the Asian Productivity Organization (APO) standard questionnaire. The reliability of the questionnaire was 0.9, according to Cronbach's alpha coefficient. The research population consisted of 115 people who were selected by cluster sampling. Excel and SPSS were used to analyze the data. Pearson correlation test, One-sample T-test, and Kolmogorov–Smirnov test were used to measure the mean of the seven knowledge management (KM) maturity criteria, and the Friedman nonparametric test was used to rank the criteria groups. The maturity level of KM in Iran, Public Libraries Foundation, was seven groups below the KM Framework of APO. The readiness of the library for KM was determined the initial stage. The results of ranking the seven groups of KM maturity criteria showed that information technology and leadership stood in the highest and the lowest ranks, respectively. The top-down ranking of other criteria was as follows: knowledge processes, process, learning and innovation, KM results, and staff. Finally, the research proposals were presented based on the results of the studied organization's current situation.

## Introduction

Knowledge is the core of competition in advanced economics, and KM is essential to maintain the competitive advantage of organizations (Hu, Hou, Chien, 2018). In the current competitive market, knowledge is considered capital (Hasanzadeh, 2007), and this capital influences all organizational aspects (Bose, 2004) and is a key source of economics and the main factor of competitive advantage (Drucker, 1995). Compared to other types, this intangible asset has a unique nature, as the more it is used, the more is added to its value (Nirmal, Sundaresan, Ray, Bhargava, Glantz, McHugh, 2004). Organizations can provide better services using effective KM (Hejazinia, 2017). With a knowledge-based economy, countries' economies are integrated by information technology (IT) and become a single global economy. In this economy, knowledge is the most critical factor in gaining an organization's competitive and strategic advantage (Gholipour Tahmoureth, Abedi Jafari, Khatibian, 2009). Therefore, it is essential to find ways to reduce costs and improve quality due to increased pressure on organizations to gain or maintain competitive advantage. Consequently, organizational maturity models are used to evaluate and compare improvements to adopt a conscious approach to increase the capability of specific areas in the organization (Kaur, 2004). Libraries, as educational foundations, are responsible for collecting, processing, storing, and disseminating information and knowledge and play an important role in the knowledge cycle through all stages, from creating to utilizing knowledge.

KM in libraries leads to knowledge identification. So that low-value and repetitive resources are refined and useful information is transmitted to users. Under such conditions, libraries will be able to maintain their place in the epistemological development of society (Yamifirooz, 2003). In other words, libraries and information centers, as knowledge-based organizations, are also aware of the role and importance of KM in creating innovation and improving information services. The number of theses, papers, and scientific conferences in this field affirms this claim and represents the new approach of these centers toward KM and improving knowledge processes. Libraries and information centers collect, organize, and disseminate information and knowledge to various users using various information and knowledge experts' knowledge, expertise, and experience. In these centers, a large amount of knowledge is generated by the implementation of tasks and work processes, part of which is recorded in the form of documents, reports, software, etc., and part of it, which is intangible, including experience, skill, and insight remains hidden in people's minds and has little chance of being transmitted and re-applied. Lack of sharing and reuse of the knowledge generated by these centers results in a waste of resources. In such an environment, KM is proposed to influence the identification, creation, storage, retrieval, transfer, and application of required knowledge (Shafee, Moradi, Jafari, 2020). Many organizations invested and succeeded in developing knowledge at different levels, but many also failed (Chua & Lam, 2005).

The lack of proper mechanisms for evaluating and implementing KM turns this type of investment into an extra cost in the minds of managers, so it is necessary for organizations to have a suitable context before taking any action in KM implementation and to know their knowledge needs and use appropriate methods to meet these needs (Dulipovici & Robey, 2013). Considering the goal of KM, i.e., maximization of the rate of return on capital to the organization, calculating the time and profit to inform managers and stakeholders on the advantages and value of organizational KM innovations depends on proper evaluation of infrastructures and awareness of organizational maturity level from the perspective of KM.

Therefore, the first step in starting knowledge activities and implementing KM is to determine the current situation, measure the organization's readiness for KM, and evaluate its maturity level. Evaluating KM maturity allows organizations implementing KM projects to assess their KM activities, comprehensively and systematically recognize their position in KM, and identify barriers to progress. It also results in collecting valuable information and, accordingly, determining measures that the organization should take to reach a higher level of maturity in terms of KM development (Shafee et al., 2020). In other words, evaluating the maturity of KM provides an infrastructure on which a roadmap for the organization's KM is created (Sepehri, 2017). Therefore, one of the most critical issues in implementing KM in organizations is the lack of assessment of the current status of KM and the organization's uncertain readiness and maturity level in the field of existing knowledge activities and actions. This causes these centers to perform some KM processes without initial evaluation of their readiness to implement KM initiatives, sometimes lacking a clear vision and a coherent and codified program. These activities fail to simplify the continuous flow of organizational knowledge-making, and while presenting an ambiguous future for KM, they do not have the necessary support from senior organizational managers. Since the Iran Public Libraries Foundation is not dissociated from other organizations, implementing KM is particularly important for the Libraries Foundation.

One of the most critical problems of Iran Public Libraries Foundations, as a parent organization affecting the society through awareness-raising, having educational and guidance functions, underlying promoting helpful study, and having committed expert and trained human resources and 3631 public libraries under the supervision of the foundation in Iran for more than two decades, is lack of a suitable model for the establishment of KM, which requires the assessment of the maturity of KM to establish KM in the organization. For a successful implementation of the KM plan, before deciding to develop the KM system, organizational conditions and maturity should be created, so the present study was conducted to identify the level of maturity of the organization and its components in the establishment of the KM system to improve the weaknesses and provide appropriate conditions for the implementation of the project.

## Research Questions

1. What is the status of KM criteria groups (leadership, process, employees, IT, knowledge processes, learning and innovation, and KM results) in Iranian Public Libraries?

2. At what level of KM maturity are Iran's public libraries according to the maturity model of KM of APO?

## Literature Review

In his Ph.D. dissertation, Khansari (2006) studied the use of KM in specialized libraries of Electrical Affairs Company and sought to find a proposed model for implementing KM in the studied libraries. The results showed that the status of the collection of resources was higher than average, but knowledge resources organization, knowledge dissemination, and human resources were evaluated as insignificant and below average. Finally, a proposed model for implementing the KM program was presented. Rafati Shaldehi Hosnavi, Behazin and Banitaba (2009) investigated the KM model at a military research center. Considering the privileges obtained by the organization and the list of problems raised, it seems that the organization needs

to implement projects and knowledge infrastructures infrastructurally. These infrastructures include both human resources, as the most essential part, and technology facilities.

On the other hand, the organization should have appropriate cultural programs for novices and young people to understand the importance of knowledge factors as a crucial organizational capital. Also, through culturalization, the organization's managers should focus on the importance of the organization's knowledge capital. Dashti, Sadeghi, Agha Hassan Shirazi and Khodamoradi (2015) also showed that the maturity of the company's KM was initially evaluated by evaluating KM based on the APO model in Tehran Regional Electricity Company.

Evaluating the maturity level of KM of Hormozgan thermal power plants based on the KM Framework of APO, Arzani and Sayebani (2014) stated that Hormozgan Power Plant Management Company was in the development stage, i.e., the comprehensive implementation phase of KM in the organization, and the variables of technology, learning and innovation, and KM leadership are in the first to third ranks and knowledge processes are in the last place. In their research examining the KM maturity of the top 300 Iranian companies based on the Model of Management and Productivity Center of America, Khadiv and Abbasi (2016) showed that culture, technology, process, leadership, and evaluation in these companies were in a better level than other factors. ImaniKia (2019) studied and ranked factors affecting KM implementation in Golestan province's academic libraries. The results showed that the perception of university library managers ranked first (90%), IT infrastructures ranked second (71%), librarians' familiarity with the concept of KM ranked third (64%), and organizational culture ranked fourth (61%) in terms of affecting KM and implementing it in academic libraries of Golestan province.

Shafee et al. (2020) studied The Measurement of KM Maturity in Libraries and Information Centers (Research Sample: Public Libraries of Kermanshah), and the findings showed that the maturity and readiness of public libraries in Kermanshah to establish KM were at the initial level (understanding the need for KM). The results of ranking KM maturity indicators also showed that IT was ranked the highest, and leadership, learning, and innovation were ranked the lowest. Karimi et al. (2020) assessed The Maturity Level of KM in the National Library and Archives of Iran based on the Siemens Model, and the results showed that the maturity of KM in the organization was at the initial level. The components of KM maturity were evaluated based on experts' viewpoints, and some strategies were proposed to improve it. Farahnaki, Hassan Zarei and Atarnia (2022) identified and prioritized the requirements for establishing KM at Shahab-e-Danesh University. The results showed that transformational leadership, human resource management, organizational memory, and IT were among the requirements of KM establishment, respectively. In this research, the components of social capital targeted organizational amnesia, emotional intelligence, and talent management were not among the requirements of KM establishment at the Shahab-e-Danesh University of Qom.

White (2004) conducted research entitled KM in Academic Library. In this research, with a practical approach, he examined the elements of KM in the university environment with a particular focus on Oxford University library services. This research discussed and analyzed the required tools and methods for implementing KM. The results showed that many elements of KM were in a good situation. In addition, KM, as a management process, enables employees to achieve organizational goals by using KM. In an empirical study, Jain (2007) examined The Status of KM in Libraries in East and South Africa. Besides introducing the differences between information and KM, they also expressed the advantages of using KM in academic libraries and

concluded that most academic libraries in the countries studied implement information management instead of KM. He finally proposed practical strategies for implementing KM in the studied libraries. Using the Kurgar model, Wijetunge (2012) assessed the maturity level of KM in the library of Sri Lankan University in four steps, including initial, repeatable, management, and optimization in six stages of ICT management, information management, codification of KM principles, policy and strategy, KM implementation, and inclusive knowledge and knowledge development. The results indicated that the studied library was promoted from the initial stage to repeatable.

Examining the maturity level of organizational knowledge at Petroleum Technology University of Indonesia using the Asian Productivity Assessment Tool, Ramadhani, Hidajat Tjakraatmadja and Thoha (2012) showed that the maturity level of the knowledge was low. The university faced various issues in the development of KM, such as low investment in KM, lack of encouragement and proper understanding of improving the level of implementation, lack of knowledge sharing, and creation and innovation of knowledge. Arias-Pérez and Durango-Yepes (2015) also examined the maturity of KM in terms of functionalism and pragmatism in their research. They studied the KM maturity level based on the five-step model of initial, awareness, defined, managed, and optimized in the big companies of Mediland and Columbia. The findings showed that only two companies were in the third stage of KM maturity level.

In their research, examining the maturity of KM in terms of functionalism and pragmatism, Arias-Pérez and Durango-Yepes (2015) examined the maturity level of KM based on the five-step model of initial, repeatable, defined, managed, and optimizing in big companies of Mediland and Columbia. The findings showed that only two companies were in the third stage of KM maturity. Elmorshidy (2018) addressed The Impact of KM Systems on Innovation: An Empirical Survey in Kuwait. The results showed that KM systems' system quality, information quality, and service quality have a positive effect on the system's perceived usefulness and ease of use and in turn, a positive impact on the actual use of KM systems, leading to net benefit. In terms of increasing innovation for employees who use KM systems, employees (system users) showed that using the system helps them improve working, find new ways to do work, discover new solutions to solve problems, do more complex tasks in less time, and communicate in a better way.

Ugwu and Ekere (2018) investigated The Role of KM in Providing Innovative Services in The Academic Libraries of Nigeria: Structural Equation Modeling Approach and it was found that KM positively impacts Three criteria of the KM cycle, namely knowledge capture/creation, knowledge sharing/transfer and application/use of knowledge have a positive and significant effect on service innovation in academic libraries in Nigeria. As a result, academic libraries in Nigeria with high activities in knowledge capture, knowledge sharing, and knowledge use are more likely to offer innovative services to their users. Orenga-Roglá and Chalmeta (2019) investigated using Web 2.0 tools and macro data to develop KM systems. They provided a methodology that can help organizations use Web 2.0 tools and macro-data to discover, collect, manage, and apply their knowledge and apply a process of implementing a faster and easier KM system.

Olatokun and Njideaka (2021) examined knowledge-sharing practices among indexers in Nigerian academic libraries. The results showed that knowledge system norms were incompatible and informal, although participants identified the basic need for knowledge systems in their departments. Factors identified as challenges for knowledge systems included

work-related mood and stress, participants who consider knowledge systems a waste of time, "know-it-alls", tribal differences, lack of financial motivation, lack of formal training programs and guidance, willingness to learn, and copy catalogs. Iqbal (2021) investigated the speed and quality of innovation in higher education institutions: The role of KM enablers and the knowledge-sharing process. The results showed that the value of senior management knowledge and knowledge-based rewards positively impact the speed and quality of innovation. Although knowledge-based culture also contributes to the quality of innovation, it does not affect the speed of innovation. Additionally, the knowledge-sharing process mediates the impact of all KM enablers on the speed and quality of innovation.

In general, research results indicate that libraries, like other organizations, realize the importance of KM in the organization. However, KM programs and infrastructures in libraries and information centers are unfavorable, and a large amount of research in this field is conducted on academic and specialized libraries. Yet, in public libraries, KM is a knowledge-based organization where libraries and information centers operate under its supervision. It has not seriously found its place, and no practical solutions have been provided for implementing it in the Libraries Foundation. This study seeks to measure the maturity of KM in the Public Libraries Foundation.

## Materials and Methods

Regarding the present orientation, this study is applied research and uses the survey method as a quantitative strategy. The statistical population of the study included managers, administrative staff, heads of cities, and officials working in the libraries of The Iranian Public Libraries Foundation who were selected through cluster sampling due to the limitation of access around the country, i.e., all the provinces of the country were initially clustered according to the number of libraries from the highest to the lowest number, then from each cluster, a province was randomly selected. Isfahan, West Azerbaijan, Kurdistan, Hormozgan, and South Khorasan were selected from the first, second, third, fourth, and fifth clusters. Tehran was also chosen from the first cluster because of its centrality. The statistical population consisted of one hundred fifteen experts including 44 B. As, 46 M. As, 25 P.h. Ds with 7 to 18 years of experience of working in public libraries.

The data collection tool was the APO standard questionnaire. The overall evaluation score was 210, and the average score of each of the main groups was 30. The questionnaire consisted of seven main groups and 42 questions. The questions were set on a five-point Likert Scale. APO confirmed the validity of the questionnaire in terms of its standard. The reliability of the questionnaire was 0.9, according to Cronbach's alpha coefficient. SPSS and Excel were used to analyze the data. Pearson correlation test, one-sample T-test, and Kolmogorov–Smirnov test were used to measure the mean of the seven criterion groups with the APO KM framework, and the Friedman nonparametric test was used to rank the criteria groups.

## Results

The analysis of KM maturity in the Iranian Public Libraries Foundation is based on the APO model, which includes seven groups of criteria (Karami, 2015):

**1. Leadership:** It evaluates organizational leadership's ability to respond to knowledge-based organizations' issues. KM leadership is considered through KM policies and strategies in the organization. Leadership is also assessed through activities to create an atmosphere related

to KM behaviors in the organization.

**2. Technology:** This criterion assesses the organization's ability to develop and apply knowledge-based solutions, such as collaborative tools and content management systems. It also evaluates reliability and access to tools.

**3. Employees:** It assesses the organization's ability to create and maintain a knowledge-based organization with a learning culture. According to this criterion, the organization's efforts to encourage employees to share, participate, and develop knowledge-based employees are also evaluated.

**4. Process:** It explains how KM is used in managing, implementing, and improving the organization's key processes. It also assesses the extent to which the organization continuously evaluates itself and work processes to achieve better performance.

**5. Knowledge Processes:** This criterion evaluates knowledge formation and the organization's ability to identify, create, record, share, and apply knowledge. It also evaluates sharing the best experiences and knowledge gained from projects to reduce and minimize reinventions and reworkings.

**6. Learning and Innovation:** Knowledge processes enable learning and innovation at all organizational levels and domains. Education is gaining new insights, affirming what is already known, and fulfilling untrained needs. New insights and untrained items can be transformed into innovations, including new products, services, processes, markets, technologies, and business patterns. Learning and innovation resulting from knowledge processes help to create individual and organizational capabilities to transform into social capacities.

**7. KM Results**: The APO's KM Assessment Tool has provided a method for identifying the areas where the organization should focus its KM initiatives. This tool's evaluation results determine the organization's strengths and areas that need improvement.

For this assessment, 42 questions were prepared for seven criteria that evaluate the organization, with a maximum score of 210. Each question can be scored from 1 (poor) to 5 (very good), so each criterion is measured with a maximum score of 30. The scores of each criterion indicate The Iranian Public Libraries Foundation's success rate in each of the criteria and areas that can be improved.

**Question 1.** What is the status of KM criteria groups (leadership, process, staff, information technologies, knowledge processes, learning and innovation, and KM results) in The Iranian Public Libraries Foundation?

At first, Pearson correlation was determined between the criteria groups and the KM Framework of APO. According to Table 1, considering the positive correlation coefficient for all criteria, it can be concluded that there is a positive correlation between them. The significance value of the test was below 0.05, so the null hypothesis of heterogeneity between the variables was rejected at a significant level of 0.05.

*Table 1*
*Pearson correlation coefficient of criteria groups with KM framework of APO*

| Correlation | Leadership | Process | Staff | Technology | Knowledge Processes | Learning and Innovation | KM Results |
|---|---|---|---|---|---|---|---|
| Leadership | 1 | | | | | | |
| Process | 0.76 | 1 | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Staff | 0.61 | 0.19 | 1 | | | |
| Technology | 0.83 | 0.36 | 0.31 | 1 | | |
| Knowledge Processes | 0.51 | 0.52 | 0.58 | 0.41 | 1 | |
| Learning and Innovation | 0.49 | 0.84 | 0.73 | 0.29 | 0.61 | 1 |
| KM Results | 0.75 | 0.57 | 0.41 | 0.71 | 0.34 | 0.87 | 1 |

Then, parametric and nonparametric questions were also determined using the Kolmogorov-Smirnov test. Based on the information in Table 2, Kolmogorov-Smirnov statistics in all variables were calculated as error levels higher than the standard level of 0.05, indicating no significant difference in the levels of all variables and the normality of the relevant data. Therefore, it can be concluded that all the variables used in the study have a normal distribution. Therefore, parametric tests can be used.

*Table 2*
*Results of measuring the normality of research variables*

| | No. | Standard error | Z-test | P. Value |
|---|---|---|---|---|
| Leadership | 115 | 0.638 | 0.734 | 0.655 |
| Process | 115 | 0.612 | 0.812 | 0.526 |
| Staff | 115 | 0.486 | 1.692 | 0.571 |
| Technology | 115 | 0.586 | 1.936 | 0.511 |
| Knowledge Processes | 115 | 0.658 | 1.745 | 0.521 |
| Learning and innovation | 115 | 0.432 | 1.137 | 0.155 |
| KM Achievements | 115 | 0.789 | 0.519 | 0.955 |

In the next step, a one-sample T-test was used to answer the research questions. According to Table 3, the significance level of the one-sample T-test was smaller than 0.05, so the null hypothesis was rejected. Considering the negative value of T-statistics in all groups of KM criteria, six of the seven indicators were lower than the KM framework of APO, and only the technology was in good condition.

*Table 3*
*One-Sample T-test results*

| Criteria | Mean | T-value | Degree of Freedom | Significance | Average difference | Confidence interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower boundary | Upper boundary |
| Leadership | 1.25 | -4.13 | 115 | 0.001 | -0.211 | -0.312 | -0.110 |
| Process | 2.27 | -3.54 | 115 | 0.001 | -0.174 | -0.270 | -0.077 |
| Staff | 1.49 | 6.67 | 115 | 0.001 | 0.259 | 0.183 | 0.337 |
| Technology | 3.48 | 19.72 | 115 | 0.001 | 0.926 | 0.834 | 1.02 |
| Knowledge | 2.51 | 14.98 | 115 | 0.001 | 0.788 | 0.685 | 0.892 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Processes | | | | | | | |
| Learning and Innovation | 1.74 | 3.72 | 115 | 0.001 | 0.130 | 0.061 | 0.197 |
| KM Results | 1.62 | 12.97 | 115 | 0.001 | -0.817 | -.942 | -0.692 |

According to statistical analysis:

✓ The average leadership of 1.25 out of 5 is unfavorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average process of 2.27 out of 5 is not favorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average staff of 1.49 out of 5 is not favorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average technology of 3.48 out of 5 is favorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average knowledge process of 2.51 out of 5 is unfavorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average learning and innovation of 1.74 out of 5 is not favorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

✓ The average KM of 1.62 out of 5 is not favorable from the viewpoint of the heads of the Public Libraries Foundation of Iran.

In general, the Public Libraries Foundation of Iran is not in a good position regarding maturity for implementing KM. Only technology is favorable among the components of maturity.

**Question 2.** What level of KM maturity is the Public Libraries Foundation according to the maturity model of KM of APO?

The APO maturity model was used to measure the maturity status of KM in the Public Libraries Foundation of Iran. This model is one of the most applicable models in the field of KM maturity and is a survey questionnaire that shows the initial and rapid assessment of the organization's readiness to implement KM. According to Table 4 in this model, maturity is classified into five levels: reaction (first), initial (second), development (third), control (fourth), and maturity (fifth). Reaction is at the lower level, which means the organization is not aware of the essence and importance of KM at this level. The highest level, i.e., maturity, shows that KM prevails in the organization. According to their situation, each organization is placed in one of the five levels of KM maturity based on the APO KM maturity model. Accordingly, the organization can define improvement projects and measures to promote KM.

*Table 4*
*Five levels of KM maturity of APO*

| Maturity levels | Score | Details |
|---|---|---|
| 189-210 | Maturity | KM prevails in the organization |
| 147-188 | Control | The implementation of continuous KM in the organization is evaluated and improved. |
| 126-146 | Development | Comprehensive implementation of KM in the organization |

| 84-125 | Initial | Start to understand the need for KM in the organization |
| 24-83 | Reaction | Ignorance of what KM is, and its importance in improving productivity and competitiveness |

Because we wanted to answer this question, the evaluation score for each indicator was calculated and then compared with the evaluation score of the KM Maturity Standard of APO. The total score from the evaluation of the indicators was 101, which was between 84 and 125 (according to Table 4), i.e., the initial stage. At the initial level, the second stage of maturity, the organization's ignorance of KM turned into awareness and understanding of its essence and importance. According to the results, public libraries are at the initial stage of maturity. This means that employees understand KM's importance, which is a strength for these centers. The Public Libraries Foundation can consider this a favorable situation and course toward promotion in the maturity hierarchy through proper planning. Then, the difference between the scores obtained by the Libraries Foundation and the maximum possible score in each of the indicators was determined, the results of which are reported in Table 5.

According to Table 5, the maximum possible score for each main criterion was 30. The highest score difference was leadership, and the lowest was IT. Also, according to the Libraries Foundation scores, the main criteria ranking was performed at this stage, according to which IT ranked the highest and leadership ranked the lowest. The results indicate that, in terms of IT, the Public Libraries Foundation is in a good situation according to the APO indicators. There is an IT infrastructure in these centers, and the organization's intranet (or a similar network) is used as the primary source of communication in the library to support knowledge transfer or information sharing.

*Table 5*
*Scores of the main criteria of the maturity level of KM*

| No. | Main criteria | Cronbach's Alpha | Average score obtained | Maximum score | Score | Ranking |
|---|---|---|---|---|---|---|
| 1 | Leadership | 0.849 | 11.96 | 30 | 1.25 | 7 |
| 2 | Process | 0.851 | 15.21 | 30 | 2.27 | 3 |
| 3 | Manpower (staff) | 0.853 | 12.53 | 30 | 1.49 | 6 |
| 4 | Technology | 0.828 | 22.61 | 30 | 3.48 | 1 |
| 5 | Knowledge Processes | 0.862 | 15.63 | 30 | 2.51 | 2 |
| 6 | Learning and Innovation | 0.844 | 13.18 | 30 | 1.74 | 4 |
| 7 | KM Results | 0.879 | 12.93 | 30 | 1.62 | 5 |
| Total | | 0.921 | 101 | | 2.87 | |

## Discussion

The maturity model of APO was used to measure the maturity and readiness of the Iranian Public Libraries Foundation to implement KM. A questionnaire with reliability of the average value of 0.9 based on Cronbach's alpha coefficient was designed and the chiefs and staff were asked to assess the status of the Foundation from the perspective of KM maturity. The results

showed that the total score of indicators was 101, which was between 84-125, i.e., the initial stage. The results align with the research of Keshavarzi and Radseresht (2018), Shafee et al. (2020), Wijetunge (2012) and Marques, La Falce, Marques, De Muylder and Silva (2019).

According to the analytical statistics of the Iranian Public Libraries Foundation in terms of process, with a score of 15.21 out of 30, the design and presentation of the organization's key products and services and support processes are not systematic or not effectively applied. The results align with the research of (Shafee et al., 2020).  By better applying the existing processes with a KM perspective, it is possible to create new knowledge and achieve excellent performance, providing the grounds for KM implementation.  Therefore, regarding process, it is recommended that systematic work processes begin and are well applied, and the organization reviews the processes and recognizes those that create the most value.

Regarding employees, with a score of 12.53 out of 30, which is moderate to low, people consciously retain their knowledge or share it reluctantly when asked. Sharing knowledge is limited to a small number of people. Individual learning rarely turns into organizational learning. When employees leave an organization, their knowledge is lost. Therefore, considering this level of readiness in this field to improve the level of KM readiness from the individual's perspective, it is suggested that the organization's educational and career development programs, as well as knowledge, skills, and competencies needed for employees, are considered. Also, to familiarize new employees with KM and its benefits, a KM system and tools, a systematic process, an active committee, a counseling system for staff, and coaching and formal process training are developed. Finally, it is suggested that a reliable environment among employees is created. To successfully implement the human resources process, experts should be in their real positions according to their field of study, and managers of the organization should motivate the staff to improve their knowledge.

Regarding technology, with a score of 22.61 out of 30, the necessary capabilities to simplify effective KM and IT infrastructures (such as the internet, intranet, and websites) were created in the library. There is sufficient understanding of the role of IT in KM in the organization, and using the existing IT infrastructure and aligning it with the organization's strategic objectives makes it possible to improve KM implementation in the Public Libraries Foundation of Iran. The technology score is usually higher in Iranian organizations. Also, employees can access computers, the internet, the intranet, and e-mail addresses.  The library's website and intranet are regularly updated, and the organization's intranet (with a similar network) is used as the primary source of communication to support knowledge transfer or information sharing. The results align with the research of (Shafee et al., 2020; Arzani & Sayebani, 2014).

Leadership, with a score of 11.96 out of 30, had the lowest score among the other 7 aspects. Considering this level of readiness in this field, suggestions include sharing the vision, mission, and objectives of the library with staff, establishing a central coordination unit of KM and appointing a high-ranked knowledge manager, organizing IT groups, improving the quality and design of knowledge networks, assigning necessary financial resources for KM initiatives in the organization, encouraging to improve performance, and finally formulating knowledge protection policies such as copyright and knowledge security.

Knowledge processes, with a score of 15.63 out of 30, ranked second, which means the organization should start developing and implementing processes for the production, organization, sharing, and use of knowledge, establish systematic methods for identifying, creating, storing, sharing, and applying knowledge, and prepare existing and available

knowledge maps, knowledgable individuals and units, knowledge application as well as a portray of existing knowledge relationships in the organization for its sub-specialized systems to identify the storage, maintenance and barriers of knowledge in study, administrative, and executive fields.

Learning and innovation was ranked fourth with a 13.18 out of 30. Therefore, it is suggested that the organization apply a systematic approach to evaluating and improving its key processes. The Public Libraries Foundation should continuously explain and strengthen the values related to learning and innovation and pay attention to incentives for people to work together and share information.

KM results: With a score of 12.93 out of 30, ranked fifth, the organization should keep a record of activities related to the successful implementation of KM and other similar initiatives and consider some indicators to evaluate the impact of knowledge initiatives and individuals' contribution to them. The results align with the research of (Shafee et al.,2020).

Based on the research findings, the following proposals are presented:

1. Evaluation of the impact of information technology: Research assessing the effects of information technology (IT) on the growth and development of knowledge management in the Public Libraries Foundation of Iran. This research can examine how information technology is utilized in various knowledge management processes, improve library service quality, and foster innovation capabilities centered around knowledge.

2. Analysis of knowledge management processes: Present a research study on analyzing and improving knowledge management processes in the Public Libraries Foundation of Iran. This research can identify strengths and weaknesses in existing knowledge management processes, provide solutions for process improvement and optimization, and enhance the organization's overall performance towards greater development and utilization of knowledge resources.

3. Evaluation of leadership's role in knowledge management: Research evaluating the role of leadership in knowledge management and its impact on the level of growth and improvement in knowledge management within the Public Libraries Foundation of Iran. This research can contribute to understanding the role of leaders in fostering a knowledge-centric culture, promoting collaboration and knowledge sharing, and creating an environment conducive to knowledge generation and transfer within the organization.

4. Examining factors influencing innovation capabilities: Research the factors influencing innovation capabilities within the Public Libraries Foundation of Iran. This research can identify and analyze the factors within the organization that significantly impact innovation capabilities and provide strategies for strengthening innovation capabilities and elevating the organization's innovation level.

## Conclusions

The maturity model of APO was used to measure the maturity and readiness of the Iranian Public Libraries Foundation to implement KM. A questionnaire with reliability of the average value of 0.9 based on Cronbach's alpha coefficient was designed and the chiefs and staff were asked to assess the status of the Foundation from the perspective of KM maturity. The results showed that the total score of indicators was 101, which was between 84-125, i.e., the initial stage. This means that employees understand KM's importance, which is a strength for these

centers. The Iranian Public Libraries Foundation can consider this situation as positive and take the course toward promotion in the hierarchy of maturity through proper planning.

## Reference

Arias-Pérez, J. E. & Durango-Yepes, C. M. (2015). Exploring knowledge management maturity from functionalist and interpretivist perspectives. *Entramado*,11(1), 94-104. Retrieved from https://www.redalyc.org/pdf/2654/265440664007.pdf

Arzani, A. & Sayebani, N. (2014). Examining the maturity level of knowledge management in power generation companies based on the APO model (case study: Hormozgan Power Generation Management Company). In *The 8th National Conference and the 2nd International Knowledge Management Conference*, Tehran. [in Persian]

Bose, R., (2004). Knowledge management metrics. *Industrial Management & Data Systems*, 104 (6), 457-468. https://doi.org/10.1108/02635570410543771

Chua, A. & Lam, W. (2005). Why KM projects fail: A multi-case analysis. *Journal of Knowledge Management*, 9(3), 6–17. https://psycnet.apa.org/doi/10.1108/13673270510602737

Dashti, A. S., Sadeghi, F., Agha Hassan Shirazi, S. & Khodamoradi, K. (2014). Evaluation of KM based on APO model Case study: Tehran Logics Electricity Company. Presented in *the 8th National Conference and the 2nd International Conference on Knowledge Management*. [in Persian]

Drucker, P. F., (1995). *Managing in a time of great change*. New York: Truman Talley Books/Dutton

Dulipovici, A. & Robey, D. (2013). Strategic alignment and misalignment of knowledge management systems: a social representation perspective. *Journal of Management Information Systems*, 29(4),103–126. http://dx.doi.org/10.2753/MIS0742-1222290404

Elmorshidy, A. (2018). The impact of knowledge management systems on innovation: An empirical investigation in Kuwait. *VINE Journal of Information and Knowledge Management Systems*, 48(3), 388-403. https://doi.org/10.1108/VJIKMS-12-2017-0089

Farahnaki, M., Hassan Zarei, M. & Atarnia, A. (2022). Identifying and prioritizing the requirements of establishing KM in Shahab Danesh University. Master Thesis, Business Management, Marketing Trend, Toloo Mehr Higher Education Institute. [in Persian]

Gholipour Tahmoureth, H., Abedi Jafari, H. & Khatibian, N. (2009). Measuring the level of KM maturity in organizations through an extended KM maturity model. *Iranian Management Sciences*, 4 (14), 121-148. [in Persian]

Hasanzadeh, M. (2007). Knowledge Management, Concepts and Infrastructures. Tehran: Librarian. [in Perasiaan]

Hejazinia, R. (2016). Identifying and ranking the factors affecting the success of KM with the approach of achieving a resilient economy. *Quarterly Journal of Growth and Technology*, 12(47), 12-20. https://doi.org/10.7508/jstpi.2016.03.002 [in Persian]

Hu, Y., Hou, J. & Chien, C. (2018). A UNISON framework for KM of university–industry collaboration and an illustration. *Computers & Industrial Engineering*,129, 31-43. https://doi.org/10.1016/j.cie.2018.12.072

ImaniKia, Z. (2019). Survey and ranking of factors affecting Knowledge Management in university libraries of Golestan province in 2018. Master Thesis. Payame Noor University of Mazandaran, Payame Noor Center Tonekabon. [in Persian]

Iqbal, A. (2021). Innovation speed and quality in higher education institutions: the role of knowledge management enablers and knowledge sharing process. *Journal of Knowledge Management*, 25(9), 2334-2360. https://doi.org/10.1108/JKM-07-2020-0546

Jain, P. (2007). An empirical study of knowledge management in academic libraries in East and Southern Africa. *Library Review*, 56(5), 377-392. https://doi.org/10.1108/00242530710750572

Karami, S. (2015), the need to implement KM based on the APO framework in the electricity industry, *Electronic Journal of Management Studies*, 24و 16-20.  [in Persian]

Karimi, R. & Abbasi, F. (2020). Assessing the level of knowledge management maturity in the National Archives and Library of Iran based on the Siemens model. *National Library and Information Studies*. 3(4) (120),78-92. https://doi.org/10.30484/nastinfo.2019.2155.1825 [in Persian]

Kaur, J. (2004). Comparative study of capability maturity model. *International Journal of Advanced Research in Computer Science & Technology*, 2(1), 47-49.

Keshavarzi, A. H. & Radsarsht, M. (2018). An appraisal of the knowledge management maturity level, and providing improvement plans (Case study: Havanaja). *Scientific Journal of Strategic Management of Organizational Knowledge*, 1(1), 11-47. https://dorl.net/dor/20.1001.1.26454262.1397.1.1.1.7                [In Persian].

Khadivar, A. & Abbasi, F. (2016). Evaluating the maturity of knowledge management in three hundred top Iranian companies. *New Researches in Decision Making*, 1(3), 23-41. Retrieved                                                                                          from https://journal.saim.ir/article_22016_ba43885985bc3637646442628b9bb032.pdf?lang=en [in Persian]

Khansari, J. (2006). Examining the status of KM in the specialized libraries of the Ministry of Energy and presenting a proposed model. PhD Thesis, Islamic Azad University, Science and Research Branch, Faculty of Humanities. [in Persian]

Marques, J. M. R., La Falce, J. L., Marques, F. M. F. R., De Muylder, C. F. & Silva, J. T. M. (2019). The relationship between organizational commitment, knowledge transfer and knowledge management maturity. *Journal of Knowledge Management*, 23(3), 489-507. https://doi.org/10.1108/JKM-03-2018-0199

Nirmal, P., Sundaresan, S., Ray, J., Bhargava, H., Glantz, E., McHugh M.W. (2004). *Knowledge Quotient™ (KQ): A way to measure the knowledge intensity of your team*. The Penn State eBusiness Research Cente.

Olatokun, W. & Njideaka, T. M. A. (2020), Knowledge sharing practices among cataloguers in Nigeria's academic libraries. *Library Management*, 41 (4/5), 295-309. https://doi.org/10.1108/LM-12-2019-0090

Orenga-Roglá, S. & Chalmeta, R. (2019). Methodology for the Implementation of KM Systems 2.0. *Business & Information Systems Engineering,* 61(2), 195-213. https://doi.org/10.1007/s12599-017-0513-1

Rafati Shaldehi, H., Hosnavi, R., Behazin, F. & Banitaba, S. A. (2009). The model of knowledge management   process in a military research center. *Journal of Military Medicine*. 10 (3), 237-252. Retrieved from https://militarymedj.bmsu.ac.ir/article_1000336_dad33e807b6362d42374fdec564120a9.pdf?lang=en [in Persian]

Ramadhani, S., Hidajat Tjakraatmadja, J. & Thoha, N. (2012). Knowledge Management maturity level assessment (case study of PT.XYZ). *The Indonesian Journal of Business Administration*, 1(9), 672-679. Retrieved from https://media.neliti.com/media/publications/68546-EN-knowledge-management-maturity-level-asse.pdf

Sepehari, A. (2017). Evaluating the maturity of knowledge management, what it is and why. *Electronic Journal of Management Studies*, 26, 7-11. Retrieved from https://mta.co.ir/PDF/a4c53fecdff74ba5bbfc77d7b4bed5c2.pdf [in Persian]

Shafee, S. Moradi, M. & Jafari, M. (2020). Assessing the maturity of KM in libraries and information centers (research sample: Kermanshah public libraries). *Strategic Management of Organizational Knowledge*. 2 (6), 109-77. [in Persian]

Ugwu, C.I. & Ekere, J.N. (2018). The role of KM in providing innovative services in university libraries in Nigeria: A structural equation modeling approach. Global *Knowledge, Memory and Communication*, 67 (6/7), 350-376. https://doi.org/10.1108/GKMC-10-2017-0086

White, T. (2004). "Knowledge Management in an academic library" Case study: KM within Oxford University Library Services (OULS). Retrieved From https://ora.ox.ac.uk/objects/uuid:62836c4d-10c1-4636-b97c-07a88890fa8a/download_file?file_format=application/pdf&safe_filename=Item&type_of_work=Conference%20item

Wijetunge, P. (2012). Assessing knowledge management maturity level of a university library: A case study from Sri Lanka. *Qualitative and Quantitative Methods in Libraries (QQML)*,1(3), 349 –356. Retrieved from http://www.qqml.net/index.php/qqml/article/view/70

YaminFirooz, M. (2003). Knowledge and KM in organizations. *Journal of National Library and Information Studies*, 14 (1), 97-108. [in Persian]