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Performance Assessment in Isfahan Municipality via Knowledge Management and Organizational Agility Approach using Data Envelopment Analysis

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A B S T R A C T

Due to the progress of organizations and the increased competition among them, they are paying more attention to supporting factors of their operations. One of the factors that has highly been considered by organizations is enhancement of knowledge level of the organization. In recent years, organizations have found out that they can achieve competitive advantage through enhancement of their knowledge level and thus use its advantages and realize their agility at all dimensions of the organization, because increased level of knowledge management increases agility of employees and clients besides making the organization agile. Given the importance of knowledge management and organizational agility, performance of the Municipality in Isfahan province is evaluated using the above two approaches. To this end, data envelopment analysis is employed. Then, the most important dimensions of organizational agility are determined by means of sensitivity analysis.

1. Introduction

Considering the ever-increasing progress in the world, knowledge management is an interesting topic for many industrial, economic and academic scopes. Knowledge was regarded as an inexhaustible source at the beginning of the 21st century and it became necessary to utilize and control it (Bruno & Liedecker, 1984).

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Human knowledge, expertise and capital are the important resources and properties in any organization that are led to creation and continuity of competitive advantage. Undoubtedly, efficient knowledge management is a strategy which supports the organization in using its resources and properties to achieve better performance (Kowahu et al, 2012). Due to the strategic and important role of knowledge, many companies utilize knowledge management efficiently because of competitive advantage of knowledge and its leverage (Wuly, 2001).

Indeed, knowledge management is leveraging the knowledge strategically towards the purposes of the organization. Today, implementing an efficient knowledge management and converting the organization into a knowledge-based organization is the major condition for success (Bose, 2004). It is important to evaluate efficiency of knowledge management in the organization too. Measuring an organization in comparison with its competitors is led to recognize performance of the organization in the competitive market. On the other hand, it should be noted that the model used for performance assessment is important because designing such model with high precision is not so simple thanks to dynamic characteristics of knowledge management (Kwah et al, 2012).

Today, having a dynamic and flexible organization is highly intended because of development of potential markets, unpredictable environmental changes, increased competition, and enhanced innovation. Continuous change is usually one of the major and functional concepts of organizations in the current century. For this reason, it is very important to recognize the changes. Organizations which operate in a highly active and dynamic environment are always faced with the threats which will undoubtedly avoid their activity and survival in case of not responding to them rapidly (Mun et al, 2009). Normally, organizations which have suitable agility can react better against the changes. Several factors have been recognized as stimulants of change and advancement of the organization towards agility in agility literature. Those factors which have repeatedly been mentioned are the ever-increasing competition due to globalization, broken markets, limitation of skilled human force, dynamic changes in demand, the increasing rate of launching new products, high and increasing speed of innovation, cultural and social factors, increased expectations of customers, information technology advancement and the increasing pressures due to legislation of environmental changes (Zhang & Sharifi, 2007). According to the definition proposed by Sharifi and Zhang (1999), agility means capability of any organization in sensing, perceiving and predicting the existing changes in the business environment.

Given that suitable organizational knowledge management is one of the cases that helps agility of the organization and react against the changes, simultaneous performance assessment of these two can help the organization to perform appropriate executive actions. In this study, data envelopment analysis is employed for performance assessment. It is a nonparametric method of performance assessment that is used to evaluate partial efficiency and performance of a group of comparable existences. The advantage of data envelopment analysis is that the "efficiency border" can be generalized and employed as a model for similar organizations (Kabnurkar, 2001).

Given the importance of performance assessment of knowledge management and organizational agility, performance of the areas of Isfahan Municipality is evaluated in this study using data envelopment analysis. Also, the assessment approach is knowledge management and organizational agility. To this end, the research literature is first studied to measure evaluation indexes and then, performance of Isfahan Municipality is evaluated by composing data envelopment analysis model.

This study is organized as follows. Research background is presented in section 2. Methodology and Shannon's entropy method are mentioned in section 3. In section 4, data envelopment analysis technique is explained and performance assessment of the Municipality in Isfahan province is addressed in section 5. The evaluation indexes are ranked via sensitivity analysis and finally, the conclusion is proposed.

2. Research background

Lee et al (2005) evaluated performance of organizations via Knowledge Management Performance Index approach (KMPI). It was assumed that organizations always consider knowledge absorption and utilization to improve competitive advantage and increase economic value. Also they believed that using Knowledge Circulation Process (KCP) including knowledge creation, knowledge sharing, knowledge utilization, and knowledge domestication was a necessity. When effectiveness of KCPs is increased, KMPIs are improved and the organization can have a knowledge-oriented performance. In order to approve KMPI knowledge performance, the related questionnaires were distributed in 101 market companies. The results disclosed that knowledge management performance is associated with three economic indexes: stock price, PER sales rate, and R&D expenses. The results of statistical analysis showed that KMPIs can have a direct effect on effectiveness of KCPs while the above economic indexes are still used.

Lin et al (2006) evaluated agility using the fuzzy technique. They believed that change is one of the important characteristics of companies in the modern competitive period. Moreover, they consider integration of the information system/technology, employees, business processes and possibilities as the bases of organizational agility. On the other hand, given the definition of ambiguous indexes of agility and inappropriate methods of its evaluation, they used the fuzzy technique that is a helpful tool for decision-making in ambiguous and uncertain phenomena. Finally, they proposed a framework for the evaluation of fuzzy agility and then implemented it in production to develop their approach.

In another study, Othman et al (2011) invented a new statistical method for performance assessment of knowledge management in China. The importance of evaluation of knowledge management in organizations is increasing nowadays. In contrast, few studies have been conducted on performance assessment and effectiveness of knowledge management. In this study, the researchers presented a method to evaluate knowledge management which is based on three stages of implementing the process of knowledge management including analysis of the internal and external environment of the organization, planning of knowledge management activities, and executive decision-makings on knowledge management. The results of regression analysis indicated the positive effect of these three factors on knowledge management. In this regard, the effect of planning of knowledge management activities is the highest and the effect of executive decision-makings on knowledge management is the lowest. These indexes are used to predict and evaluate knowledge management performance.

Zhoe (2011) evaluated knowledge management performance using neural network. Performance assessment of knowledge management in army precisely can help knowledge management effectively and it can also be effective on other issues related to knowledge at various military levels and even implementing and composing of tactics. The method used in this study confirmed that martial commanders can be addressed qualitatively using neural network. The problem of determining weight and limits was eliminated. Besides, learnability and memory of the neural network enhance precision and accuracy of the results.

Tiseng and Lin (2011) developed organizational agility with the help of agility stimulants' improvement, ability of the organization, and effective relationship with suppliers. They believed that agility of organizations in the current instable and changeable business environment is a competitive advantage. On the other hand, they pointed out that an appropriate, certain and effective integrated method that estimates agility capabilities and changes them into competitive strategy in order to invest to achieve agility is essential. They proposed a new method to develop agility using QFD matrix and fuzzy technique. They used fuzzy agility indexes composed of ranking of fuzzy capabilities and total weighted relation of agility stimulants to measure the level of organizational agility. Then they implemented their approach in an IT company in Taiwan. The results showed that the proposed framework and method increases organizational agility and certainty of competitive advantage.

3. Shannon's entropy

Shannon and Weaver (1948) defined the concept of entropy as measuring the uncertainty in the existing information in a problem. Entropy is a very simple and important method to evaluate weights. Weight of indexes is determined based on dispersion in values of an index and displays inconsistency of each criterion for showing the information (Zeleny, 1996).

To this end, the following steps should be fulfilled (Wang & Lee, 2009):

- Normalizing the indexes via direct method

$$P_{ij} = \frac{X_{ij}}{\sum_j X_{ij}}$$

- Obtaining the index E_j for each criterion using the below relation

$E_j = -K \sum P_{ij} \ln(P_{ij})$ $\qquad K = \frac{1}{\ln m}$ $\qquad$ m = number of options

- Obtaining the index D_j

$$D_j = 1 - E_j$$

- Obtaining the final weight of each index

$$W_j = \frac{D_j}{\sum D_j}$$

4. Data envelopment analysis

Data envelopment analysis is a nonparametric method for efficiency evaluation that is used to evaluate partial efficiency and performance of a group of comparable existences. These comparable existences are referred to as decision-making units that are used to convert inputs into outputs. This method is used without assumed determination of the production function and by solving the optimization models. It considers a boundary function surrounding the internal and external factors using the information related to the real inputs and outputs of decision-making units. This boundary includes linear parts that not only provide the most efficient current units but an analysis about inefficient units. The advantage of data envelopment analysis is that the "efficiency border" can be generalized and employed as a model for similar organizations (Kabnurkar, 2001).

In 1957, Farrell measured efficiency using a method that contained one input and one output. Then Charnes, Cooper and Rhoods extended Farrell's viewpoint and proposed a model which could measure efficiency of decision-making units with several common inputs and outputs. This model was referred to as data envelopment analysis and it was used for the first time in Edward Rodes' PhD thesis under Cooper's guidance entitled "evaluation of academic achievement of students in national schools of America" in 1976 in Carnegie University (Tavakoli et al., 2013). Since this model was proposed by Charnes, Cooper and Rhoods, it was known as CCR model and was presented in 1978 in an article entitled "measuring efficiency of decision-making units" (Charnes et al, 1978).

The original DEA model is as follows (Charnes et al, 1978).

$$\max \quad \frac{\sum_{r=1}^{s} u_r y_{rk}}{\sum_{i=1}^{m} v_i x_{ik}}$$

s.t

$$\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1 \qquad j = 1,2,\dots,n$$

$$u_r, v_i \geq 0; \quad r = 1,\dots,s; \; i = 1,\dots,m$$

Here, x_{ij} is equal to input ith and y_{rj} is equal to output rth and v_i and u_r are the weights given to input ith and output rth respectively; k is the number of DMUs whose efficiency is evaluated.

Given that solving a deficit model (the original DEA model) has some complexities, Charnes et al. (1978) proposed CCR model in which the return to scale was constant. Considering that the return to scale is changeable in many cases in reality, Bancker et al. (1984) proposed BCC model in which the return to scale is changeable. This model is shown in output-oriented state below (Bancker et al, 1984):

$$MinZ = \sum_{i=1}^{m} v_i x_{ip} + w$$

s.t

$$\sum_{r=1}^{s} u_r y_{rp} = 1$$

$$\sum_{i=0}^{m} v_i x_{ij} - \sum_{r=1}^{s} u_r y_{rj} + w \geq 0 \quad j = 1 \dots\dots\dots n$$

$$U_r \geq \varepsilon \quad r = 1 \dots\dots\dots s$$

$$V_i \geq \varepsilon \quad i = 1 \dots\dots\dots m$$

Whenever the return to scale is not constant and is changeable (increasing, constant or decreasing) and the input and output can be changed simultaneously, SBM model is used. This model was introduced by Charnes, Cooper, Gollani, Siford and Stons in 1985 (Charnes et al, 1995). Mathematical structure of the above model is introduced below:

$$Min\, Z = -\sum_{r=1}^{S} S_r^{+} - \sum_{i=1}^{m} S_i^{-}$$

$s.t$

$$\sum_{j=1}^{n}\lambda_j x_{ij} + S_i^- = x_{io}$$

$$\sum_{j=1}^{n}\lambda_j y_{ij} - S_r^+ = y_{rp}$$

$$\sum_{j=1}^{n}\lambda_j = 1$$

$$S_i^-, S_r^+, \lambda_j \geq 0$$

5. Performance assessment in Isfahan Municipality using data envelopment analysis

In this stage, performance assessment of areas of Isfahan municipality is done via data envelopment analysis. Thus, the following steps are conducted:

Step one: Determining the evaluation indexes

In order to determine the indexes of performance assessment, the literature review was used and 12 indexes of knowledge management that were adopted from Valmohammadi's survey were used as knowledge management variables. To determine the indexes of organizational agility, 9 agility indexes of service organizations were selected based on Dare Zereshki and Ruzbahani's model as the indexes of organizational agility given that the Municipality is a service organization.

Table 1. Success factors of knowledge management indexes

Leadership and support of senior management	KM1	Processes and activities	KM7
Organizational culture	KM2	Rewarding and motivating	KM8
Information technology	KM3	Elimination of resource limitations	KM9
Knowledge management strategy	KM4	Training and re-training	KM10
Performance measurement	KM5	Human resource management	KM11
Organizational structures' management	KM6	Benchmarking	KM12

Table 2. Indexes of organizational agility

Components	**Agility dimensions**	**Components**	**Agility dimensions**
Individual ability of employees	Organization	Customers (clients)	Organization
	Employees		Employees
	Clients		Clients
Capacity of changeability	Organization	Senior management support	Organization
	Employees		Employees
	Clients		Clients

Table 2. Indexes of organizational agility

Components	**Agility dimensions**	**Components**	**Agility dimensions**
Innovation	Organization Employees Clients	Team work culture	Organization Employees Clients
Information technology skill	Organization Employees Clients	Virtual organization	Organization Employees Clients
Educational plans of employees for the organization	Organization Employees Clients		

Step two: Determining the model of data envelopment analysis

Two points have been considered in choosing the input and output variables of DEA model: first, these 12 knowledge management indexes are used in many studies which have measured knowledge management in service organizations and definitions of each one of these indexes contain relatively most standards that other researchers have used. Second, it has been approved in previous studies that several advantages can be achieved by creating knowledge management among which improvement of organizational agility can be mentioned. Therefore, three dimensions of agility in organization, employees and clients are used for output of DEA model. Data envelopment analysis model of performance assessment data in Isfahan Municipality is shown in Figure 1.

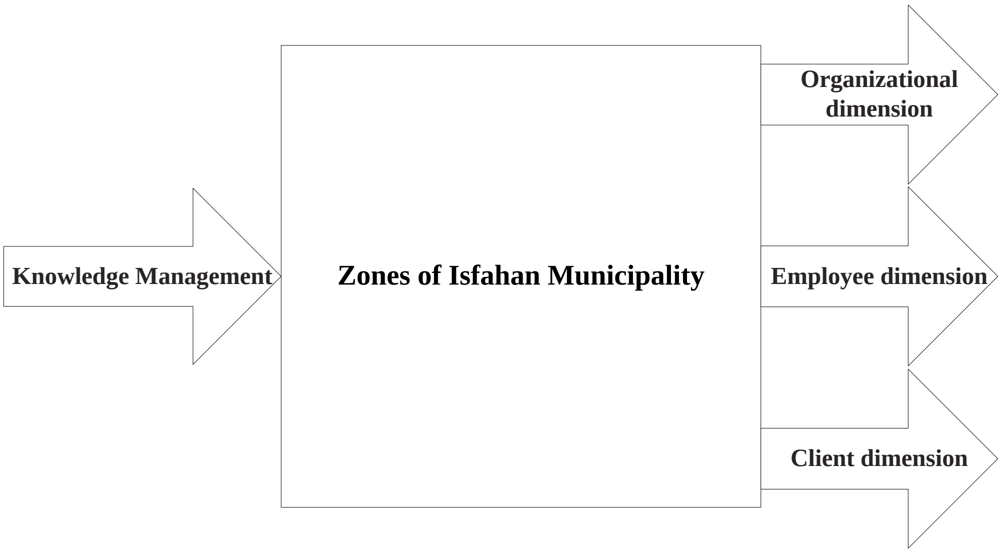

Fig. 1. DEA model

Step three: Data collection

First, mean values of knowledge management indexes and organizational agility that were introduced as research variables is calculated through knowledge management and organizational agility questionnaire. To this end, Valmohammadi's knowledge management questionnaire was domesticated and its indexes were measured. Then, organizational agility questionnaire proposed by Dare Zereshki and Ruzbahani was domesticated. The final questionnaire was designed based on the Likert scale and its validity was confirmed by academic experts and organizational managers. Cronbach's alpha coefficient was used to calculate reliability of the questionnaire which was equal to 0.89 for knowledge management questionnaire and 0.81 for organizational agility questionnaire. In the next stage, questionnaires were distributed among the employees of 15 areas. Level of knowledge management indexes and three dimensions of organizational agility (A1, A2, and A3) for each area of the Municipality were obtained that are displayed in Tables 3 and 4 separately for each area.

Table 3. Mean of data about knowledge management indexes in areas of Isfahan Municipality

	KM1	**KM2**	**KM3**	**KM4**	**KM5**	**KM6**	**KM7**	**KM8**	**KM9**	**KM10**	**KM11**	**KM12**
Mun 1	3.026	3.034	3.303	3.258	3.659	3.2	3.236	2.982	3.036	3.015	2.932	2.939
Mun 2	2.87	3.261	3.045	2.97	3.273	2.764	2.682	2.945	2.8	2.818	3.068	3.273
Mun 3	2.792	2.943	3	3.106	3.341	3.073	2.964	2.927	2.873	2.727	3.136	3.121
Mun 4	3.06	3.406	3.042	3.278	3.604	3.233	2.75	2.733	2.617	2.639	3.021	2.944
Mun 5	2.586	2.75	2.6	2.75	3.3	2.88	2.83	2.92	2.94	2.783	2.75	3.133
Mun 6	2.956	3.029	3.064	3.077	3.288	2.923	3.062	3.015	3.292	2.987	3.481	3.436
Mun 7	3.381	3.073	3.111	3.014	3.292	2.983	3.167	3.1	3.417	3.125	3.396	3.222
Mun 8	2.843	2.863	2.833	2.75	3.2	2.96	3.21	3.24	3.46	3.35	3.375	3.867
Mun 9	3.104	3.114	3.242	3.03	3.5	3.145	3.482	3.273	3.582	3.106	3.318	3.545
Mun 10	3.532	3.443	3.606	3.455	3.955	3.727	3.345	2.873	3.109	3.091	3.129	3.212
Mun 11	3.221	3	2.758	2.788	3	2.891	3.291	2.945	3.327	3.303	3.318	3.576
Mun 12	3.273	3.295	3.455	3.303	3.409	3.291	2.536	2.818	2.855	2.545	2.818	2.758
Mun 13	2.909	3.045	2.833	2.788	2.773	2.709	2.673	2.891	2.818	2.455	3.023	3.333
Mun 14	3.13	3.17	2.879	2.879	3.159	2.745	2.991	2.855	2.945	2.848	3.136	3.606
Mun 15	3.099	3.096	2.949	3	3.019	3.046	2.562	2.708	2.769	2.705	2.577	3.051

Table 4. Mean of data about dimensions of organizational agility in areas of Isfahan Municipality

	A1	A2	A3		A1	A2	A3
Mun 1	3.125	2.95	3.425	Mun 9	3.344	3.41	3.85
Mun 2	3.813	2.817	3.08	Mun 10	3.333	3.1	3.475
Mun 3	2.938	3.18	3.733	Mun 11	3.594	4.05	3.2
Mun 4	2.833	3.4	3.463	Mun 12	2.833	3.775	3.633
Mun 5	3.75	3.45	3.767	Mun 13	3.225	3.54	3.667
Mun 6	3.375	3.367	3.775	Mun 14	3.979	3.933	3.1
Mun 7	3.15	3.413	3.233	Mun 15	3.375	3.363	2.943
Mun 8	3.542	3.625	3.5				

Step four: Determining the weight of knowledge management indexes using Shannon's entropy

Given that knowledge management is the input of DEA model and is composed of 12 indexes which have different weights, weight of knowledge management indexes is determined via Shannon's entropy method. The weight of indexes is obtained according to Table 5.

Table 5. Weight of knowledge management criterions

KM12	KM11	KM10	KM9	KM8	KM7	KM6	KM5	KM4	KM3	KM2	KM1	
0.9986	0.9988	0.9985	0.9984	0.9995	0.9982	0.9988	0.9987	0.9991	0.9987	0.9994	0.9989	Ej
0.0014	0.0012	0.0015	0.0016	0.0005	0.0018	0.0012	0.0013	0.0009	0.0013	0.0006	0.0011	Dj
0.0989	0.0832	0.1014	0.1086	0.0349	0.1224	0.086	0.0908	0.0626	0.0911	0.045	0.0751	Wj

Step five: Determining the knowledge management index

In this stage, values of inputs of DEA model are determined. Therefore, weighted mean of values of knowledge management criterions that are shown in Table 3 is calculated. This is displayed in Table 6.

Table 6. Values of DEA model's input

DMU	Knowledge management	DMU	Knowledge management	DMU	Knowledge management
Mun 1	3.146	Mun 6	3.15	Mun 11	3.155
Mun 2	2.96	Mun 7	3.205	Mun 12	2.992
Mun 3	3.001	Mun 8	3.202	Mun 13	2.837
Mun 4	2.997	Mun 9	3.318	Mun 14	3.035
Mun 5	2.863	Mun 10	3.383	Mun 15	2.864

Step six: Explaining the proposed model and performance assessment

The proposed model in this study is the modified output-oriented model with variable return to scale (BCC) and the hybrid model (SBM). The two models are used because efficiency of areas is measured one time by assuming that the input is constant and another time by assuming that the input and output are variable and the results of both methods are compared. To this end, efficiency is calculated using output-oriented BCC method by assuming that the inputs are constant and it is tried to increase outputs. Similarly, efficiency is calculated through SBM method by assuming that the input and outputs are variable. After normalization of data linearly (division of data into maximum value of each index), the results of efficiency of different zones is shown in Table 7.

Table 7. Problem solving via modified BCC and SBM method

DMU	Efficiency with BCC method	Efficiency with SBM method	DMU	Efficiency with BCC method	Efficiency with SBM method
Mun 1	1.115	0.453	Mun 9	1.000	0.000
Mun 2	1.018	0.335	Mun 10	1.091	0.421
Mun 3	1.016	0.320	Mun 11	1.000	0.000
Mun 4	1.069	0.361	Mun 12	1.000	0.000
Mun 5	1.000	0.000	Mun 13	1.000	0.000
Mun 6	1.012	0.175	Mun 14	1.000	0.000
Mun 7	1.095	0.400	Mun 15	1.048	0.330
Mun 8	1.017	0.162			

In output-oriented BCC method, the efficiency condition of areas of Isfahan Municipality is that their efficiency number is equal to 1. The results of this study reveal that the number of efficient areas in problem solving via output-oriented BCC method is equal to 6 units that include areas 5, 9, 11, 12, 13, and 14. These results illustrate that these 6 units can reach the intended level of three dimensions of organizational agility with the highest output by assuming that the level of inputs is constant.

In hybrid method with variable return to scale, the areas that their efficiency number is equal to zero are efficient. The obtained results disclosed that the number of efficient areas in problem solving via hybrid method with variable return to scale is equal to 6 units that include areas 5, 9, 11, 12, 13, and 14. The important point in solving via BCC and hybrid methods is that the results of efficient units are similar in both methods. This indicates that the results of these units in both methods are stable.

6. Ranking of organizational agility dimensions

In this stage, the effect of each dimension of organizational agility on efficiency of areas and their ranking are explored. Thus, BCC and SBM models are solved again for three times but with the difference that one of the dimensions of organizational agility is omitted at each time. At any state where more difference is observed between the obtained efficiency and efficiency at the original state, the omitted index has a higher effect on efficiency of areas of the Municipality. This shows that the more important index can compose higher percent of the efficiency of areas. Efficiency of areas of the Municipality in BCC and SBM methods is shown in Tables 8 and 9 by omitting each output.

Table 8. Problem solving via omitting each output at any stage through the modified BCC technique

DMU	Efficiency wit general state	Efficiency with organizational dimension omitted	Efficiency with Employees dimension omitted	Efficiency with client dimension omitted
Mun 1	1.115	1.115	1.115	1.27338
Mun 2	1.018	1.227	1.018	1.01763
Mun 3	1.016	1.016	1.016	1.21570
Mun 4	1.069	1.069	1.095	1.13475
Mun 5	1.000	1.000	1.000	1.00000
Mun 6	1.012	1.012	1.012	1.17083
Mun 7	1.095	1.113	1.169	1.17680
Mun 8	1.017	1.039	1.063	1.09386
Mun 9	1.000	1.000	1.000	1.16188
Mun 10	1.091	1.105	1.091	1.19385
Mun 11	1.000	1.000	1.075	1.00000
Mun 12	1.000	1.000	1.043	1.01945
Mun 13	1.000	1.000	1.000	1.00000
Mun 14	1.000	1.000	1.000	1.00000
Mun 15	1.048	1.069	1.112	1.04804

Table 9. Problem solving via omitting each output at any stage through the modified SBM technique

DMU	Efficiency wit general state	Efficiency with organizational dimension omitted	Efficiency with Employees dimension omitted	Efficiency with client dimension omitted
Mun 1	0.453	0.303	0.329	0.490
Mun 2	0.335	0.370	0.146	0.240
Mun 3	0.320	0.118	0.254	0.413
Mun 4	0.361	0.138	0.349	0.381
Mun 5	0.000	0.000	0.000	0.000
Mun 6	0.175	0.091	0.155	0.326
Mun 7	0.400	0.256	0.390	0.387
Mun 8	0.162	0.134	0.222	0.235

Table 9. Problem solving via omitting each output at any stage through the modified SBM technique

DMU	Efficiency wit general state	Efficiency with organizational dimension omitted	Efficiency with Employees dimension omitted	Efficiency with client dimension omitted
Mun 9	0.000	0.000	0.000	0.373
Mun 10	0.421	0.323	0.334	0.471
Mun 11	0.000	0.000	0.273	0.000
Mun 12	0.000	0.000	0.303	0.283
Mun 13	0.000	0.000	0.000	0.000
Mun 14	0.000	0.000	0.000	0.000
Mun 15	0.330	0.240	0.309	0.117

Considering the obtained efficiency for each areas of the Municipality, the distance between the obtained efficiency via modified BCC and SBM techniques at the general state and the obtained efficiency from omitting each dimension of organizational agility is achieved using the below relation. In this way, the most important output in efficiency of areas of the Municipality is calculated. Total difference in each method is shown in Table 10.

$$\sqrt{\sum_{i=1}^{15}\left(x_{\mathrm{i}}-\mathrm{x}_{\mathrm{j}}\right)^{2}}$$

Table 10. Distance between efficiency obtained from the modified BCC and SBM techniques by omitting each output

Non-considered criteria		BCC		SBM	
		Difference of efficiency	Criteria ranking	Difference of efficiency	Criteria ranking
Without considering organizational dimension	$\theta-\theta_1$	0.212429	2	0.400672	3
Without considering Employee dimension	$\theta-\theta_2$	0.140847	3	0.483782	2
Without considering client dimension	$\theta-\theta_3$	0.379835	1	0.561096	1

Table 10 shows the distance between θ obtained from solving the modified BCC and SMB models with θ obtained from omitting each dimension of organizational agility as DEA model output. It seems that the effect of clients' dimension is more than other factors in output variables in BCC technique. The clients' dimension has a higher effect in SMB technique too. Therefore given these results, management of the inefficient areas has to pay more attention to this dimension to enhance efficiency in order to be able to make its unit efficient.

7. Conclusion

Given the advancement of organizations and increased competition among them, the necessity to enhance knowledge level of organizations is highly important and organizations should increase their knowledge level as well as that of their employees against their competitors by suitable knowledge management. In this way, they can improve their status besides creating competitive advantage for themselves. Agility in all dimensions of the organization is one of the dimensions that can be mentioned for creating suitable knowledge management in the organization, because increased level of knowledge management will enhance agility of the organization, employees, and clients.

Performance of Isfahan Municipality was evaluated in the current study via two approaches considering the importance of knowledge management in the organization and also enhancement of organizational agility. To this end, data envelopment analysis was employed. First, knowledge management indexes were determined and measured as the inputs of DEA model. Then, organizational agility was measured at three dimensions of employees, organization and clients. Efficiency was evaluated via BCC and SBM techniques and the results included areas 5, 9, 11, 12, 13, and 14. Afterwards, agility dimensions were prioritized through sensitivity analysis that the clients' dimension ranked first in both BCC and SBM techniques.

The results in this study help managers of inefficient areas to plan to enhance themselves and consider the efficient units as their model for improvement. They should enhance their organizational agility in clients' dimension in order to enhance the level of organizational agility.

The present study had some limitations besides its advantages among which lack of ranking the efficient organizational units can be mentioned. In the same vein, the plan for improvement of inefficient units with the reference units was not shown. Future researchers can offer some plans to improve the inefficient units besides ranking the efficient methods via different techniques and introduce the reference units for them and show how they should be enhanced.

8. References

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