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Assessment and ranking directors of the FARS Province municipality using fuzzy multi-criteria decision making approach and 360 degree model

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Abstract. Assessment is one of important and influential tools in management to achieve information required for decision making about performance of employees working in an organization. With applying this tool appropriately, not only organization's missions and targets become effective, but also 30 degree method is one of methods which are being employed to assess personnel. In this method, individual is assessed in viewpoint of people who are working with and also through self-assessment. In this paper, due to sensitivity of assessing directors of FARS Province municipality, some of mentioned directors have been assessed using 360 degree model. Criteria used in assessment have been obtained by competency model of directors in municipality. Criteria's weights were determined via fuzzy analytic hierarchy process. Since, each of evaluator groups (self-assessment, subordinate, manager, and coworker) are not the same, their weights also have been determined using AHP. Then a network is being established for each of directors and fuzzy decision matrix is being formed. Eventually, directors have been ranked using fuzzy TOPSIS. In aforementioned steps due to ambiguity in decision space and inaccuracy of opinions, fuzzy logic in a form of lingual-fuzzy variables have been used.

Keywords: Ranking, Director Assessment, 360 Degree Assessment, Fuzzy Analytic Hierarchy Process, Fuzzy TOPSIS.

1. INTRODUCTİON

In order to evaluate the performance and measure this performance, first this system should be clarified clearly and this system should be shared with workers. Also, to evaluate manager's performance, managers should specify this performance's qualifications and terms. Performance is a concept which qualitatively and quantitatively states what a person, a group or an organization performing a work has reached and has provided for the target aimed with that work. Briefly, it can be expressed as "the level of carrying out a work" or "carrying out a work, a service or a product". In general terms, it is a concept qualitatively and quantitatively determining what is obtained as a result of an aimed or a planned work. Besides, it is said that superb performance is synonymous with the success. The field of performance evaluation represents a critical connection point in the control activities. [1] Performance evaluation is also evaluated on the basis of worker, group, unitary and institutive and even system. No matter what his/her job in the corporation is, the worker performance evaluation is the review of the work, effectiveness, deficiencies, sufficiency, excessiveness, and inadequacy as a whole from all aspects. Furthermore, different performance measurements can be used for dealing with the different dimensions of the system performance; that's why it can be expressed that performance evaluation measurements are multidimensional measurements rather than one-dimensional. [3] Measuring the corporate performance can be expressed as an assistant tool for

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determining how much the corporation makes progress in line with their pre-determined strategy aims and targets, weak and strong sides of the corporation and the priorities of the corporation in the future [4].

2. 360 DEGREE ASSESSMENT

Edwards and Ewen (1997) assert that multi-source appraisal is effective because it derivesperformance information from an entire network of knowledge in which each raterprovides relevant but different information. They also argue that the approach increases thecredibility of performance appraisal, enhances self development opportunities, andincreases accountability to an employee's internal and external customers. Many others,including this reviewer, support these arguments. But, in spite of its growing popularity, little is known about the impact of 360-degreefeedback on individuals and on important organizational outcomes. No research to date hasfocused on whether the espoused incremental value of multi-source feedback over traditional top-down appraisal is real. While recent research indicates some potential for at least a component of the method (i.e., upward appraisal), there is no research with an experimental design which clearly allows for conclusions regarding efficacy. Edwards and Ewen (1997) state that their book "offers a framework for understanding, designing, implementing, and evaluating the 360 degree feedback process" We assume that the authors never intended the book to be an academically-oriented treatment of any of these four areas [13].

3. FUZZY ANALYTİC HİERARCHY PROCESS

The Analytic Hierarchy Process (AHP), first introduced by Saaty (1980), is a method to deal with complex systems with several alternatives, and provides a comparison of the corresponding results. The AHP conducts a reasonable analysis by putting the problem into different layers and helps the decision makers to make some pair wise comparisons. Another significant application of AHP is that offers a preference list of alternations to solve problems.[2]

AHP is a simple, flexible and practical multiple criteria decision making method for analyzing qualitative issues in a quantitative way. It is characterized by the hierarchy of the various factors in a complex problem. AHP connects effectively the expert's knowledge to the objective judgment results, based on certain subjective judgment on the objective reality (mainly pair wise comparisons). AHP uses mathematical methods to rank the weights of each element's relative importance in the same hierarchy. Through the total ranking of all the hierarchies, AHP calculates and ranks the weights of all the elements' importance. Because of its combined process of qualitative and quantitative factors, and the flexible and simple characters, AHP has been used in many social and economic fields, such as political, social and technological applications, for calculating benefits, opportunities, costs, and risks. [5]

But the traditional AHP still cannot exactly reflect human opinions. One of the problems is that when reflecting the decision maker's opinions, the traditional AHP can only use an exact comparison value. Other disadvantages, like an un balanced scale of judgments and its adequacy of inherent uncertainty and imprecision in the pair wise comparison process, is often mentioned by researchers. [7] To overcome all these shortcomings, FAHP was developed for solving these

hierarchical problems. Decision makers usually find that FAHP is more confident in give interval judgments than fixed value judgments, because usually they are unable to express the preference about the fuzzy nature of the comparison process. [8]

AHP methodology

For the pair wise comparison between factors in FAHP, the importance ratio of one factor to the other is quantitatively described with a 0.1-0.9 scale, and then the fuzzy comparison matrix can be found.

Here's how to build a fuzzy judgment matrix, to calculate its weights, and then check its consistency.

(1) Fuzzy reciprocal judgment matrix

A fuzzy judgment matrix (Hou& Wu, 2004)is defined as: for the matrix $R = (r_{ij})_{n\times n}$, if all of which the elements r_{ij} are in the interval $(0,1)$, the matrix is called a fuzzy matrix. For the pairwise comparisons between factors in FAHP, the importance ratio of one factor to the other is quantitatively described and the fuzzy matrix $A = (a_{ij})_{n\times n}$ is formulated. If it has the following properties:

1） $a_{ii} = 0.5, \quad i = 1,2,...,n;$ (1)

2） $a_{ij} + a_{ji} = 1, \quad i, j = 1,2,...,n;$ (2)

then such a judgment matrix is called a fuzzy reciprocal judgment matrix.

The 0.1-0.9scales in Table 1 are often used to quantitatively describe the relative importance of a certain criteria in any two cases.

$a_{ij} = 0.5$ denotes the same importance when the factor is compared with itself. $a_{ij} \in [0.1, 0.5)$ denotes that x_j is more important than x_i. $a_{ij} \in [0.5, 0.9)$ denotes that x_i is more important than x_j.

According to the scales above, pair wise compare the factors $a_1, a_2, \mathrm{L}\ , a_n$, and the following fuzzy judgment matrix can be determined:

$$a = \begin{pmatrix} a_{11} & \mathrm{K} & a_{1n} \\ \mathrm{M} & \mathrm{O} & \mathrm{M} \\ a_{n1} & \mathrm{L} & a_{nn} \end{pmatrix} \tag{3}$$

(2) The weights of fuzzy judgment matrix

As a general formula to calculate the weights of fuzzy judgment matrix, this formula contains the reliable characteristics and the judgment information of the fuzzy consistency judgment matrix. The character of little computation has brought great convenience in the

applications. The formula to calculate the weights of fuzzy judgment matrix is as follows:

$$W_i = \frac{\sum_{j=1}^{n} a_{ij} + \frac{n}{2} - 1}{n(n-1)}, \quad (i = 1, 2, \mathrm{L}\ , n). \tag{4}$$

(3) Consistency of fuzzy judgment matrix method

The consistency should be checked to determine whether the weights are reasonable. But, when the biased consistency is too large, the calculation results of the weight vector are not reliable for decision-making.

Here are the principles to test the consistency of a fuzzy judgment matrix by its compatibility (Zhang, 2000).

Definition 1: Let matrixes $A = (a_{ij})_{n\times n}$ and $B = (b_{ij})_{n\times n}$ be fuzzy judgment matrixes, and refer to

$$I(A, B) = \frac{1}{n^2} \sum_{i=1}^{n} \sum_{j=1}^{n} \left| a_{ji} + b_{ij} - 1 \right| \tag{5}$$

as the compatibility of A and B.

Definition 2: $W = (W_1, W_2, \mathrm{L}\ , W_n)^T$ is the weight vector of a fuzzy judgment matrix, where $\sum_{i=1}^{n} W_i = 1, w_i \geq 0 (i = 1, 2, \mathrm{L}\ \ n)$. Let

$$W_{ij} = \frac{W_i}{W_i + W_j}, \quad (\forall i, j = 1, 2, \mathrm{L}\ , n) \tag{6}$$

then the n-order matrix

$$W^* = (W_{ij})_{n\times n} \tag{7}$$

is referred as the characteristic matrix of Judgment Matrix A.

For the decision maker's opinion a, when the compatibility indicator is $I(A, W) \leq \alpha$, the consistency of the judgment matrix passes the test. The smaller the value of a, the higher the consistency of the Fuzzy Judgment Matrix required by decision-makers. Generally, $\alpha = 0.1$.

For practical problems, usually by a number of experts (letit be $k = 1, 2, \mathrm{L}\ , m$) offer the pairwise comparison judgment matrix $A_k = (a_{ij}^{(k)})_{n\times n} (k = 1, 2, \mathrm{L}\ , m)$ on the same factor set X. The weights sets $W^{(k)} = (w_1^{(k)}, w_2^{(k)}, \mathrm{L}\ , w_n^{(k)}) (k = 1, 2, \mathrm{L}\ , m)$ can be determined. The consistency test of the fuzzy judgment matrix includes:

1) the consistency check of m judgment matrixes:

$$I(A_k, W^{(k)}) \leq \alpha, k = 1, 2, \mathrm{L}\ , m \tag{8}$$

2) the test of the compatibility between the judgment matrixes.

$$I(A_k, A_l) \le \alpha, k \ne l; l, k = 1, 2, \text{L} \ , m. \tag{9}$$

If the consistency of the fuzzy judgment matrix $A_k (k = 1, 2, \text{L} \ , m)$ can pass the test, their comprehensive judgment matrix is also consistent. That is to say, as long as Conditions l) and 2) are met, the mean of m weight sets is reasonable and reliable as the weight allocation vector of factor set X . The weight vector is expressed as

$$W = (W_1, W_2, \text{L} \ W_n), \tag{10}$$

where $W_i = \frac{1}{n} \sum_{k=1}^{n} X_i^{(k)} \quad i = 1, 2, \ldots, n.$ (11)

The consistency of fuzzy judgment matrix reflects that of people's judgments, which is very important in the construction of a fuzzy judgment matrix. [15]

4. FUZZY TOPSIS

The fuzzy MCDM methods which usually applied in operational researches and management sciences are employed for recommendation in this research. TOPSIS, as a classical MCDM method, was developed by Hwang and Yoon in 1981(Hwang et al. 1981). Since then, TOPSIS has been extensively extended to the fuzzy environment.[9]The advantage of introducing fuzzy logic in TOPSIS lies in the fact that we can use fuzzy numbers instead of precise numbers to express users' preference information in our practical life.

The fuzzy TOPSIS (FTOPSIS) method is applied to integrate multi-criteria ratings. The results of FTOPSIS are used as input data of CF recommendation algorithm. The FTOPSIS procedures used in this study is given as the following. [10]

Step 1: Construct user-item rating matrix R by linguistic rating variables, and convert the linguistic evaluation (shown in Tables 3) into TFNs to construct the fuzzy user-item rating matrix $\overline{R}$. A fuzzy user-item rating matrix for single user is shown in Table 5. It should be noted that user-item ratings are not always defined on the whole space. The normalization process can be skipped since the ranges of TFNs for ratings given in Table 3 already belongto [0, 1].Then, construct the weighted normalized fuzzy user-item rating matrix $\hat{R}$, where $\hat{r}_{u,i}$ is also a set of TFNs, where $\hat{r}_{u,i,c_l} = w_l (r_i, s_i, t_i)_{c_l} \ (l = 1, 2, \ldots \ \ldots \ k)$. A weighted normalized fuzzy user-item rating matrix is shown in Table 6.

Table 1. Fuzzy User-Item Rating Matrix for a Random User a					
User a	c_1	c_2	c_3	……	c_k
item 1	$(r_1, s_1, t_1)_{c_1}$	$(r_1, s_1, t_1)_{c_2}$	$(r_1, s_1, t_1)_{c_3}$	……	$(r_1, s_1, t_1)_{c_k}$
item 2	$(r_2, s_2, t_2)_{c_1}$	$(r_2, s_2, t_2)_{c_2}$	$(r_2, s_2, t_2)_{c_3}$	……	$(r_2, s_2, t_2)_{c_k}$
item 3	$(r_3, s_3, t_3)_{c_1}$	$(r_3, s_3, t_3)_{c_2}$	$(r_3, s_3, t_3)_{c_3}$	……	$(r_3, s_3, t_3)_{c_k}$
……	……	……	……	……	……
item n	$(r_n, s_n, t_n)_{c_1}$	$(r_n, s_n, t_n)_{c_2}$	$(r_n, s_n, t_n)_{c_3}$	……	$(r_n, s_n, t_n)_{c_k}$

Step 2: Determine fuzzy positive-ideal solution (FPIS) A^* andfuzzy negative-ideal solution(FNIS) A^-. FPIS represents the most favorite item while FNIS represents the most disliked item. It is important to note that FPIS and FNIS should be identified by users' preference information.

$A^* = (v_1^*, v_2^*, \ldots\ldots v_k^*)$, $A^- = (v_1^-, v_2^-, \ldots\ldots v_k^-)$, where $v_l^* = w_l(1,1,1)$ and $v_l^- = (0,0,0)$, $l = 1, 2, \ldots\ldots k$.

Table 2. Weighted Normalized Fuzzy User-Item Rating Matrix for a Random User a					
User a	c_1	c_2	c_3	……	c_k
item 1	$w_1(r_1, s_1, t_1)_{c_1}$	$w_2(r_1, s_1, t_1)_{c_2}$	$w_3(r_1, s_1, t_1)_{c_3}$	……	$w_k(r_1, s_1, t_1)_{c_k}$
item 2	$w_1(r_2, s_2, t_2)_{c_1}$	$w_2(r_2, s_2, t_2)_{c_2}$	$w_3(r_2, s_2, t_2)_{c_3}$	……	$w_k(r_2, s_2, t_2)_{c_k}$
item 3	$w_1(r_3, s_3, t_3)_{c_1}$	$w_2(r_3, s_3, t_3)_{c_2}$	$w_3(r_3, s_3, t_3)_{c_3}$	……	$w_k(r_3, s_3, t_3)_{c_k}$
……	……	……	……	……	……
item n	$w_1(r_n, s_n, t_n)_{c_1}$	$w_2(r_n, s_n, t_n)_{c_2}$	$w_3(r_n, s_n, t_n)_{c_3}$	……	$w_k(r_n, s_n, t_n)_{c_k}$

Step 3: Calculate the distance of item i' in I' from FPIS and FNIS by Equation 12 and Equation 13, respectively,

$$d_i^* = \sum_{l=1}^{k} d(v_l^*, \hat{r}_{u,i,c_l}), \quad (l = 1, 2, \ldots\ldots k)\ (i = 1, 2, \ldots\ldots N) \tag{12}$$

$$d_i^- = \sum_{l=1}^{k} d(v_l^-, \hat{r}_{u,i,c_l}), (l = 1, 2, \ldots\ldots k)\ (i = 1, 2, \ldots\ldots N) \tag{13}$$

where $d(.,.)$ is the distance measure between two fuzzy numbers.

Step 4: Calculate the closeness coefficient of each item i' in I' by Equation 14.

$$CC_i = \frac{d_i^-}{d_i^* + d_i^-}, (i = 1, 2, \ldots\ldots N) \tag{14}$$

5. PROPOSED METHOD

Recommended method in this paper is according to the following steps:

Step 1: describing leadership competency model for municipality directors: In this step, competencies are determined and based on them, influential criteria are identified and eventually questions are designed.

Step 2: Describing 360 degree assessment network: in this step, a network of respondents to each of directors is determined.

Step3: Determining criteria's weight and evaluator groups: In this step, we take an action to determine weight of each criteria and evaluator group using FAHP and also with distributing questionnaire among organization's experts.

Step 4: Establishing decision matrix for evaluated respondents: Each of respondents (directors) is evaluated using opinions of different groups and decision matrix is established considering weight of each evaluator group.

Step 5: ranking with Fuzzy TOPSIS: Eventually, with employing fuzzy TOPSIS and determining ideal solution and anti-ideal solution and distance of each respondent (directors) with ideal solution and anti-ideal solution, closeness coefficient of each director is determined.

6. RESULTS

In this step, leadership competency model is determined using experts' and scholars' opinions and criteria effective on directors' competency evaluation are determined. Then, the following criteria were determined after holding several meetings:

1. Decision making
2. Cognitive skills
3. Professional ethic
4. Personality
5. Communicative skills
6. Individual management
7. Performance management
8. Team building

Also, a network of evaluators and respondents is according to table 1:

Table1. 360 degree network of municipality directors

Coworkers	Subordinate	Superior	Evaluated director
Director of Statistics and Information office, Director of Management and Budget Office	Directors of respective office	Planning vice president	Director of economic affairs
Director of economic affairs office, Director of Management and Budget Office	Directors of respective office	Planning vice president	Director of Statistics and Information
Director of Statistics and Information office, Director of Management and Budget Office	Directors of respective office	Planning vice president	Director of Management and Budget
Director of Administrative-Financial office, Director of human resources and administrative development	Directors of respective office	human resources and administrative development vice president	Director of education
Director of education office, Director of human resources and administrative development office	Directors of respective office	human resources and administrative development vice president	Director of Administrative-Financial
Director of education office, Director of Administrative-Financial office	Directors of respective office	human resources and administrative development vice president	Director of human resources and administrative development
Director of urban affairs, Director of rural affairs	Directors of respective office	Development vice president	Director of technical office
Director of technical office, Director of rural affairs	Directors of respective office	Development vice president	Director of urban affairs
Director of technical office, Director of urban affairs	Directors of respective office	Development vice president	Director of rural affairs

Then, weights of groups and groups (self-assessment, subordinate and coworker) are determined using FAHP. Mean of experts' opinion about paired comparison matrix of criteria weights is according to table 2 and about groups, and evaluation criteria shown in table3.

Table2. pair wise matrix of groups

	Subordinate	Superior	Coworkers	Self evaluation
Subordinate	1و 1و 1	0.75و 0.6و 0.45	3و 2.5و 2	2.3و 1.8و 1.5
Superior	2.22و 1.67و 1.33	1و 1و 1	0.7و 0.5و 0.3	4و 3و 2
Coworkers	0.5و 0.4و 0.33	3.03و 2و 1.42	1و 1و 1	0.85و 0.75و 0.6
Self evaluation	0.67و 0.55و 0.43	0.5و 0.33و 0.24	1.66و 1.33و 1.18	1و 1و 1

Table 3. Pair wise matrix of criteria.

	Decision making	Cognitive skills	Professional ethic	Personality	Communicative skills	Individual management	Performance management	Team building
Decision making	1 1 1	42.0 67.0 92.0	32.0 58.0 83.0	5.0 75.0 1	58.0 83.0 1	1.72 3.33 3.57	1.63 1.92 2.27	42.0 67.0 92.0
Cognitive skills	1.11 1.55 2.67	1 1 1	0.44 0.58 0.75	0.42 0.67 0.92	0.67 0.92 1	0.42 0.67 0.92	0.33 0.58 0.83	1.33 2 4
Professional ethic	1.22 1.78 3.33	1.33 1.78 2.27	1 1 1	1.38 1.72 2.27	0.33 0.67 0.92	0.25 0.5 0.75	0.19 0.25 0.5	0.18 0.33 0.58
Personality	1 1.33 2	1.11 1.55 2.67	.044 0.58 0.72	1 1 1	0.25 0.5 0.75	0.5 0.75 1	1.1 1.4 2	0.2 0.25 0.5
Communicative skills	1 1.22 1.78	1 1.11 1.55	1.11 1.55 2.67	1.33 2 4	1 1 1	0.5 0.75 0.92	0.5 0.75 1	0.25 0.5 0.75
Individual management	0.28 0.33 0.58	1.11 1.55 2.67	1.33 2 4	1 1.33 2	1.11 1.44 2	1 1 1	0.27 0.42 0.67	0.42 0.67 0.92
Performance management	0.44 0.52 0.61	1.22 1.78 3.33	2 4 5.26	0.5 0.7 0.9	1 1.33 2	1.55 2.66 3.7	1 1 1	0.5 0.75 0.92
Team building	1.11 1.55 2.67	0.25 0.5 0.75	1.78 2.67 5.55	2 4 5	33.1 2 4	1.11 1.55 2.67	1.11 1.33 2	1 1 1

Eventually, non-normalized weights and normalized weights of groups have been displayed in table 4 and 5.

Table 4. Weight of groups.

groups	Un normal weight	Normal weight
Subordinate	0.95	0.35
Superior	1	0.36
Coworkers	0.59	0.21
Self evaluation	0.22	0.08

Table 5. Weight of criteria.

criteria	Un normal weight	Normal weight
Decision making	0.67	0.12
Cognitive skills	0.62	0.11
Professional ethic	0.60	0.10
Personality	0.64	0.11
Communicative skills	0.69	0.12
Individual management	0.69	0.12
Performance management	0.90	0.15
Team building	1	0.17

Option- criterion matrix about directors is being created which is according to table 6.

Table 6. Alternative-criteria matrix.

criteria alternatives	Decision making	Cognitive skills	Professional ethic	Personality	Communicative skills	Individual management	Performance management	Team building
Manager 1	0.33 0.46 0.61	0.43 0.56 0.66	0.48 0.62 0.8	0.5 0.71 0.86	0.54 0.72 0.82	0.28 0.48 0.66	0.45 0.68 0.77	0.36 0.58 0.73
Manager 2	0.28 0.39 0.46	0.55 0.71 0.83	0.44 0.51 0.59	0.38 0.5 0.59	0.41 0.5 0.66	0.2 0.32 0.46	0.52 0.6 0.73	0.41 0.53 0.6
Manager 3	0.74 0.80 0.90	0.63 0.7 0.8	0.2 0.42 0.55	0.44 0.5 0.61	0.54 0.6 0.68	0.33 0.4 0.50	0.47 0.55 0.62	0.26 0.38 0.48
Manager 4	0.24 0.30 0.40	0.52 0.6 0.69	0.18 0.29 0.40	0.35 0.40 0.48	0.53 0.66 0.70	0.23 0.40 0.48	0.34 0.42 0.5	0.68 0.74 0.8
Manager 5	0.42 0.48 0.55	0.35 0.5 0.6	0.4 0.47 0.55	0.47 0.54 0.60	0.52 0.6 0.68	0.34 0.44 0.54	0.57 0.65 0.7	0.52 0.64 0.79
Manager 6	0.38 0.52 0.6	0.23 0.3 0.4	0.28 0.35 0.40	0.42 0.50 0.57	0.46 0.52 0.60	0.2 0.28 0.40	0.44 0.52 0.67	0.37 0.46 0.51
Manager 7	0.69 0.74 0.8	0.44 0.52 0.59	0.40 0.50 0.60	0.54 0.68 0.8	0.21 0.32 0.44	0.48 0.58 0.66	0.4 0.48 0.61	0.51 0.59 0.67
Manager 8	0.5 0.62 0.7	0.40 0.48 0.54	0.25 0.35 0.45	0.25 0.37 0.5	0.41 0.5 0.6	0.5 0.61 0.69	0.41 0.53 0.7	0.62 0.7 0.81
Manager 9	0.34 0.5 0.6	0.44 0.52 0.60	0.27 0.40 0.50	0.62 0.7 0.81	0.29 0.43 0.55	0.33 0.42 0.5	0.52 0.70 0.81	0.31 0.44 0.6

Then, we take an action to normalize fuzzy decision making matrix,

Also, based on obtained weights from FAHP, we take an action to build normalized weighted decision matrix. In the next step, distance from assumed ideal solution and anti-idea solution are being determined and then closeness coefficient and rank of each directors are determined which results have been displayed in table 7.

Table 7. ranking of mamagers.

Managers	Distance from the anti- ideal	Distance from the ideal	closeness coefficient	Rank
1	0.323532	0.245662	0.568404	2
2	0.28027	0.289514	0.491889	5
3	0.329747	0.24597	0.572759	1
4	0.256756	0.334049	0.434586	8
5	0.267238	0.269872	0.497548	4
6	0.182045	0.363101	0.333938	9
7	0.299385	0.259473	0.535708	3
8	0.273583	0.286393	0.488562	6
9	0.250994	0.297778	0.457374	7

7. CONCLUSİON

In this paper, we have evaluated performance of directors of the Markazi Province municipality. As it was expressed in previous parts, performance evaluation is one of the complicated issues in human resource which has remembered as vulnerable point of human resource. Directors' performance evaluation has another kind of especial complexities. Even though, some models are being used to evaluate personnel's performance, but most of these models don't have quite efficiency and accuracy. In this research, 360 degree model has been used to evaluate and rank directors and due to advantage of this model which has been expressed before, this model can be an appropriate model to be used. But, there were some points which had to be taken into consideration is weight of each decision makers group and weight of each respective criterion and also using a method based on mathematic logic for final ranking and to propose a method to extract opinions by verbal words. So, FAHP in a form of paired comparison matrix has been employed to determine weights and weight and ranking of each evaluator groups and criteria were determined. Based on results obtained from chapter 4, the maximum weight of evaluator groups are superiors, subordinates and coworkers, respectively and self-assessment has the minimum weight. Also, due to this issue that directors were assessed through 8 criteria, the most important criteria using FAHP are: cognitive and decision making skills, respectively. In the case of municipality directors due to especial limitations of directors, 3 departments, development department, department of planning and development of human capital were evaluated. Directors were evaluated and ranked in different aspects using fuzzy TOPSIS. Based on results obtained from fuzzy TOPSIS, director 3 has had the best performance and after that director 1 and director 7 has stand. The worst performance of directors is related to director 6 and 4. After studying closeness coefficients, except for director 6, other directors have gained coefficients similar to each other and therefore, it can be concluded that directors' performance is so close together.

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