Designing the fit Model for selection and promotion of managers by Fuzzy AHP approach: A Case study (Mazandaran universities)

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Abstract

In this study, we reviewed designing of the fit Model for selection and promotion of managers by FAHP approach. The Statistical population of this research included all of the units in the various levels of codes in the University of Mazandaran. This research is done based on data collecting from August 91 to January 91. In this study, for data analysis, identification and ranking of each one of the agents FAHP approach is used. In addition based on AHP-FUZZY Test to rank agents and options, the degree of importance of technical skills acquired 0.44 0.5 which means it has crucial importance in selecting managers. And human skills and conceptual skills respectively got 0.3926 and 0.1668, degree of importance located on second and third level. As it is noted, human skills variables have crucial importance in selecting management, so, designers and decision-makers in taking decision should have more consideration to these factors.

Keywords: Selecting, promoting, management, FAHP

Introduction

Nowadays organizations have great emphasis on the selection of managers at all levels from first- level supervising to the highest executive levels. Industrial / organizational psychologist realized that the success or failure of an organization widely depends on its management quality .The basic difference between a successful and unsuccessful organization often is defined in terms of management. The stronger management of the organization will lead to the success of the goals. Since management is not only a similar and repetitive activity, but it is a complex and dynamic mixture of systematic techniques, it is necessary to take great consideration on the authority of selected managers (e.g.Rowley, 2003).To the same time, office in Centennial Council meeting dated 12.24.81 on the proposal of the Management and Planning Organization to enhance the efficiency and effectiveness of human resource and management of executive agencies and the establishment of favorable community for selecting and assigning expert and committed managers and setting stability in managements and increasing in employees' motivation for career promotion has approved selection criteria and appointment of managers.

Nowadays, much of the inefficiency and lack of reaching to the organizational goals depend highly on the choice of incompetent managers. So, the model which is capable of identifying and selecting competent managers in management issues can help the organization to achieve its goals, as the lack of competent and suitable management in the mentioned organization destroys the seriousness and passion sprit of members (e.g. Raiisy, 2003). To determine whether a person has the ability to manage the office or not is a hard work. The Dilemma lays here that on the one hand what features or criteria indicate a good manager and how we can recognize people have got those features?

Mazandaran universities as one of the poles of training can provide a thriving economy, flourishing and development field of this country. The goals and mission of the organization cannot be achieved unless under the shelter of competent and skilled management.

AHP Technique is a structured and robust approach which takes into consideration the preferences of decision makers and simplifies complex and unorganized problems into a set of simple hierarchical organized components. With regard to

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the above scientific field, and the importance of the subject, the present study aims to provide an efficient model for selecting and promoting managers through using fuzzy analysis of hierarchical process.

Therefore this research approach based on fuzzy approach analytic hierarchy process tries to define the variable groups and identify the most important and influential variables in the selection and promotion of managers in organizations.

Literature

Afshin Jahanbazi Gojani (2003) in his thesis entitled "To design a decision making model for selecting managers in transportation terminals of the country (Fuzzy approach)" designed a model that can be used in identifying potential people who are capable in appointing as competent managers. Thus candidates for management posts in every work scopes when necessary (lack of key positions and management) were prioritized. Mohammad Reza Shah Alizadeh *et al.* (2008) have conducted an article on model for selecting management with AHP-DEMATEL methodology... the present Research has sought to extract the selection criteria and its analytical construction with the reserve of nomological constraints, determining the weight of criteria by using a new mathematical approach "improved analytic hierarchy process", and group decision-making methods, develop a new method for Managers selection. Latifi (2010) in his thesis entitled identifying and weighting selection and appointments criteria of HR managers in the public sector, along with literature review relating to duties of directors (Fayol) manager skills (Katz Kuntz Griffin) managers' roles (Mintzberg Dyzs and Yogi) managers' competencies (Spencer Schroeder Bvyatzys Vaspnsr) and the concept of effective managers (Luthans) has selected a model based on a combination of models of Gyolik and doctor Asemi Pour in selecting managers, as the selecting criteria for the selection and appointment of directors as a part of HR managers in public unit. In the designed model, five main criteria of the individual's characteristics (including five individual sub-scale and motivation, perception and learning abilities, and values and ethical issues) , management skills (including sub-seven criteria; technical skills ,cognitive skill , human skill, skills Analyzing and identifying personal skills and identification of communication, group interaction and computer skills), interpersonal skills (including six sub- standard criteria. education, experience, gender, age, physical ability, mental ability) the method of assessment and interacting of superiors and the rate of acceptance and collaboration among employees were identified as Effective selection criteria in selecting and appointing of managers in the public sector. Iynger Boyt (1996) stated the Characteristics of a University principal as flexibility, independence, knowledge, problem solving ability, imaginative ability, hardworking, having a political sense, risk taking ability, ability to lead changes, the ability of network setting. Rantz (2002), in a study, to clarify the requirements of the university principal and established organizational values and ethical principles and playing role considered as a moral director in setting balance , connecting, diplomats and conflict management roles,. Rowley and Sherman (2003) have considered six core skills of leadership and management in university, university management, network management, policy management and policy, crisis management, preparation and development of future managers and knowledge management.

Research objectives

To derive analytical criteria for selection and promotion of managers

To determine the weight of criteria and their priorities via mathematical model of FAHP

Research questions

What are those effectual Factors in designing and promotion of manager's model? What are those Ranking factors in designing and promotion of manager's model?

Methodology

This is a descriptive study from analytical type. Also, since the results of this research can be used practically, so it can be considered as a functional research as well .In the present research for data collection, library and questionnaire method were used.

Population

Research population includes all managers at various levels in the academic units, since the population of this research is limited, it was decided to consider all of the population and sampling was avoided.

Data analysis method

After gathering the necessary information and questionnaires, all of them encoded, and then were put in the SPSS software. Then data were analyzed as follows.

Alpha test is used to determine the reliability of questionnaire. AHP-FUZZY Test is used for Ranking factors and options.

Development of evaluation criteria

Evaluation criteria of the study are shown in the following table.

Evaluation of structures weight via AHP-FUZZY

In this phase, through connoisseur and experts' idea which are collected as the geometric mean, the paired comparisons matrix for each phase (conceptual skills, human, and technical) and main table (main influential factors of selecting managers) are plotted.

Evaluation of conceptual skills variables weight

After constructing the Paired comparisons Triangular Fuzzy Numbers table, through using EA, the magnitude proportion of indices to each other was calculated based on which the weight of the non-normalized (w') of Each index is achieved. Non-normalized weight, normalized weight and normal (W) has been achieved.

Table 1. Criteria for evaluating research

Name	Criteria	Options
Q1	Conceptual skills	System approach
Q2		General Management
Q3		Leadership Skills
Q4		Creative Thinking
Q5		Analytical skills and decision-making
Q6	Human skills	Teamwork
Q7		Moral Values
Q8		Effective Communication
Q9	Technical skills	Time Management
Q10		Relevant expertise
Q11		Experience
Q12		The ability to monitor and control
Q13		Planning and organization

Table 2. Triangular fuzzy numbers of Conceptual skill variables

options	Q1	Q2	Q3	Q4	Q5
Q1	$(1,1,1)$	$\left(\frac{1}{2},\frac{2}{3},1\right)$	$\left(\frac{1}{2},1,\frac{3}{2}\right)$	$\left(\frac{1}{2},1,\frac{3}{2}\right)$	$\left(\frac{2}{3},1,2\right)$
Q2	$\left(1,\frac{3}{2},2\right)$	$(1,1,1)$	$\left(\frac{2}{3},1,2\right)$	$\left(\frac{1}{2},\frac{2}{3},1\right)$	$\left(\frac{2}{3},1,2\right)$
Q3	$(1,1,1)$	$\left(\frac{1}{2},1,\frac{3}{2}\right)$	$(1,1,1)$	$\left(\frac{2}{3},1,2\right)$	$\left(\frac{1}{2},1,\frac{3}{2}\right)$
Q4	$\left(\frac{2}{3},1,2\right)$	$\left(1,\frac{3}{2},2\right)$	$\left(\frac{1}{2},1,\frac{3}{2}\right)$	$(1,1,1)$	$\left(\frac{2}{3},1,2\right)$
Q5	$\left(\frac{1}{2},\frac{1}{2},1\right)$	$\left(\frac{1}{2},\frac{1}{2},1\right)$	$\left(\frac{2}{3},1,2\right)$	$\left(\frac{1}{2},\frac{1}{2},1\right)$	$(1,1,1)$

Calculating the weight of human skill variables

After constructing the Paired comparisons Triangular Fuzzy Numbers table, through using EA As described in Chapter III, the magnitude proportion of indices to each other were calculated based on which the weight of the non-normalized (w ') of Each index is achieved. Non-normalized weight, normalized weight and normal (W) has been achieved.

Method of calculation is as follows.

Table 3. Triangular fuzzy numbers variables of human skill

options	Q6	Q7	Q8
Q6	$(1,1,1)$	$\left(1, \frac{3}{2}, 2\right)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$
Q7	$\left(\frac{1}{2}, \frac{2}{3}, 1\right)$	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$
Q8	$\left(\frac{2}{3}, 1, 2\right)$	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$

Table 4. Results of Paired comparisons Triangular Fuzzy Numbers table

							L	M	U
S1	2,500	3,500	4,500	0.077	0.109	0.146	0.192	0.382	0.659
S2	2.000	2.667	3,500	0.077	0.109	0.146	0.154	0.291	0.512
S3	2.333	3000	5000	0.077	0.109	0.146	0.179	0.327	0.732
S1> = S2	1.0000		S2> = S1	0.7787	S3>	= S1	0.9082		
S1> =	S3 1.0000		S2> = S3	0.9015	S3>	= S2	1.0000		
w '=	1.0000		0.7787		0.9082				

	w1	w2	w3
w	0.3722	0.2898	0.3380

W1. Normalized weight of team working = 0.3722

W2. Normalized weight of moral values options = 0.2898

W3. Normalized weight of effective communicative options = 0.3380

Calculating the technical skills variable weights

After constructing the Paired comparisons Triangular Fuzzy Numbers table, through using EA As described in Chapter III, the magnitude proportion of indices to each other were calculated based on which the weight of the non-normalized (w ') of Each index is achieved. Non-normalized weight, normalized weight and normal (W) has been achieved.

Method of calculation is as follows.

Table 5. triangular fuzzy numbers variables of Technical skill

options	Q9	Q10	Q11	Q12	Q13
Q9	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$	$\left(1, \frac{3}{2}, 2\right)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$	$(1,1,1)$
Q10	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$
Q11	$\left(\frac{1}{2}\frac{2}{3}, 1\right)$	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$
Q12	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$
Q13	$(1,1,1)$	$\left(\frac{2}{3}, 1, 2\right)$	$\left(\frac{2}{3}, 1, 2\right)$	$\left(\frac{2}{3}, 1, 2\right)$	$(1,1,1)$

Table 6. Results of Paired comparisons Triangular Fuzzy Numbers table

							L	M	U
S1	4000	5.500	7.000	0.027	0.040	0.054	0.110	0.219	0.375
S2	3.667	5000	7.000	0.027	0.040	0.054	0.100	0.199	0.375
S3	3.167	4.667	7.000	0.027	0.040	0.054	0.087	0.185	0.375
S4	3.833	5000	7.500	0.027	0.040	0.054	0.105	0.199	0.402
S5	4000	5000	8000	0.027	0.040	0.054	0.110	0.199	0.429

Table 7. Wight of the non-normalized (w ')

S1>= S2	1.0000	S2>= S1	0.9304	S3>= S1	0.8891	S4>= S1	0.9363	S5>= S1	0.9414
S1>= S3	1.0000	S2>= S3	1.0000	S3>= S2	0.9540	S4>= S2	1.0000	S5>= S2	1.0000
S1>= S4	1.0000	S2>= S4	1.0000	S3>= S4	0.9532	S4>= S3	1.0000	S5>= S3	1.0000
S1>= S5	1.0000	S2>=S5	1.0000	S3>=S5	0.9525	S4>=S5	1.0000	S5>=S4	1.0000

Table 8. Weight of the non-normalized (w ')

w '=	1.0000	0.9304	0.8891	0.9363	0.9414

Table 9. Weight of the non-normalized

	w1	w2	w3	w4	w5
w	0.2129	0.1981	0.1893	0.1993	0.2004

W1. Normalized weight of time management = 0.2129

W2. Normalized weight of relative expertise = 0.1981

W3. Normalized weight of experience options = 0.1893

W4. normalized Weight of control and plan ability options = 0.1993

W5. normalized Weight of scheduling and organizing options = 0.2004

Calculating the weights of criteria

In this phase, through connoisseur and experts' idea which are collected as the geometric mean, the paired comparisons matrix for each phase is plotted in fuzzy shape.

Verbal Term of paired comparisons, turned into the triangular fuzzy numbers. (Table 10-12).

Table10. Triangular fuzzy numbers of the main criteria

Factors affecting the selection of managers	Fundamental	Technical	Emotional
Conceptual skills	$(1,1,1)$	$\left(\frac{1}{2\,3}, \frac{2}{}, 1\right)$	$\left(\frac{2\,1\,2}{5\,2\,3}\right)$
Human skills	$\left(1, \frac{3}{2}, 2\right)$	$(1,1,1)$	$\left(\frac{2}{3}, 1, 2\right)$
Technical skills	$\left(\frac{3}{2}, \frac{5}{2}, 2\right)$	$\left(\frac{1}{2}, 1, \frac{3}{2}\right)$	$(1,1,1)$

After constructing the Paired comparisons Triangular Fuzzy Numbers table, through using EA, the magnitude proportion of indices to each other were calculated based on which the weight of the non-normalized (w ') of Each index is achieved. Non-normalized weight, normalized weight and normal (W) has been achieved.

Method of calculation is as follows.

Table 11. Results of Paired comparisons Triangular Fuzzy Numbers table

							L	M	U
S1	1.900	2.167	2.667	0.079	0.103	0.132	0.150	0.224	0.352
S2	2.667	3,500	5000	0.079	0.103	0.132	0.211	0.362	0.661
S3	3000	4000	5000	0.079	0.103	0.132	0.237	0.414	0.661
S1> = S2	0.5071		S2> = S1	1.0000	S	3> = S1	1.0000		
S1> = S3	0.3787		S2> = S3	0.8913	S	3> = S2	1.0000		

Table 12. Weight of the non-normalized (w ')

w '=	0.3787	0.8913	1.0000

	w1	w2	w3
w	0.1668	0.3926	0.4405

W1. Normalized weight of conceptual skills options = 0.1668

W2. Normalized weight of human skills options = 0.3926

W3. Normalized weight of technical skills options = 0.4405

Weight calculation options

Due to the advantages of the structures, points and alternatives Scores related to each structure by multiplying each structure points to the related Scores of that options is calculated as follows.

In scoring and prioritizing conceptual skills variables, creative thinking, public management and analytical skills and decision-making, acquired first to third ranking respectively.

In Rating and prioritizing options, human skills variables, teamwork, effective communication and ethical values acquired the first to third in the degree of their importance respectively.

In ranking and prioritizing options, technical skills variable, marketing management, planning and organizing, monitoring and controlling abilities, acquired the first to third in the degree of their importance respectively.

In the next table, the rating and ranking of all related options to influential factors in selecting managers come together, from Table (13-16) one can easily realize score and rank of each questions, such as teamwork got the first rank, Effective communication got the second and moral values got the third among other options and analytical skills and decision-making, leadership skills, and systematic approach acquired the eleventh to thirteenth place of ranking respectively.

Table 13. Scores and prioritizing of conceptual skills variables inquiries

More Options	Prioritize	The final ranking of conceptual variables options		weight of concept Variable		primary weight of Conceptual variable options
System approach	5	0.0312	=	0.1668	×	0.1876
General Manager	2	0.0339				0.2038
Leadership Skills	4	0.0330				0.1979
Creative Thinking	1	0.0353				0.2117
Analytical skills and decision-making	3	0.0332				0.1991

Table 14. Scores and prioritizing human skills variables inquiries

More Options	Prioritize	The final ranking of human variable		Human factors weigh		Primary weight of human variable options
Teamwork	1	0.1461	=	0.3926	×	0.3722
Moral Values	3	0.1137				0.2898
Effective Communication	2	0.1326				0.3380

Table 15. Scores and prioritizing technical skills variables inquiries

More Options	Prioritize	the final ranking of options of Technical variables		Weigh technical variables		primary weighing of Technical parameters options
Time Management	1	0.0937	=	0.4405	×	0.2129
Relevant expertise	4	0.0872				0.1981
Experience	5	0.0833				0.1893
The ability to monitor and control	3	0.0877				0.1993
Planning and organization	2	0.0882				0.2004

Table 16. Scores and prioritizing all options regarding the affecting factors to the selection of managers

Row	Options	Rate	Priority	Row	Options	Rate	Priority
1	Systematic approach	0.0312	13,	8	Effective Communication	0.1326	2
2	General Manager	0.0339	10th	9	Time Management	0.0937	4
3	Leadership Skills	0.0330	12,	10th	Relevant expertise	0.0872	7
4	Creative Thinking	0.0353	9	11,	Experience	0.0833	8
5	Analytical skills and decision-making	0.0332	11,	12,	The ability to monitor and control	0.0877	6
6	Teamwork	0.1461	1	13,	Planning and organization	0.0882	5
7	Moral Values	0.1137	3				

Conclusions

Due to the fact that in nowadays changing world, managing of any organization is considered as the most important and determining factor which according to some experts, the reason for the success and failure of any organization is laid in differences of their success. So, the scholars of the present study attempted to design a model for selecting and promoting of managements in Islamic Azad university. In this study, Fuzzy hierarchical analysis process was used in order to take advantage of expert opinions and combine them to identify and priority of the influential factors of selection and promotion model of managers. Fuzzy hierarchical analysis process is a useful and valuable method in helping executives and decision makers in making strategic decisions. For answering secondary research questions including. 1 - What are the influential factors in selection and promotion Model of managers of the studied organization? 2 -how are the rate and the weight of these factors. It is said that the indices of the conceptual skills variables including systematic approach, general management, leadership skills, creative thinking, analytical skills through which creative thinking among other options stands for the first place of importance and systematic approach ranked as the fifth. Indicator related to human skills variables including team-working, moral values, and effective communication, among other options team-working got the first place of importance and moral value ranked as the third. Indicators related to technical skills variables including, time management, relevant expertise, experience, ability to control, plan and organizing, among other options time management got the first place of importance and experience ranked as the fifth. The AHP-FUZZY test was used to rank the factors and options, technical skills are with 0.4405 degree of importance and human and conceptual skills have degree of importance of

0.1668 and 0.3926 and are at the second and third place. As it is known human skills variables play an important role in the selection managers in organization, so, designers and decision-makers in taken decision should have more consideration for these factors.

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