Identifying and Prioritizing Effective Factors on Empowering Staff in Field of Information Technology with Approach of Fuzzy Hierarchical Analysis (Case Study: Staff of Department of Energy)

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Abstract

Background/Objectives: The main purpose of present study is to identify and prioritize effective factors on empowering staff in field of information technology with approach of hierarchical analysis. Research method is descriptive-survey. **Methods/Statistical Analysis:** Population of the present study is the experts of human resources in two span of academic and industrial. 10 members of such experts have participated in this research as sample. We have used paired comparisons questionnaire for data collection. In present study 6 criteria have been identified as effective factors on empowering staffs in field of information technology. For collected data analysis we have used the approach of fuzzy AHP. **Findings:** In this research, Firstly, six factors have been identified for empowering of staffs in field of IT by using the opinions of experts. These factors include control center, structure and leadership method, information access, sense of responsibility and their motivation. Results showed that among criteria, their motivations are identified as the most important one. In fact, if employees have necessity motivation in field of empowering for IT, the project of empowering will be finalized with greater success within organization certainly. In second rank of effective criteria, we can point out the criterion of individuals' control center. Our results demonstrated that individuals who have internal control center are trying to reinforce their assets and knowledge in field of IT to improve individual performance. After such factors the criterion of individuals' knowledge is identified as effective. In fact employees who have adequate knowledge in field of IT are facing with IT issues with less fear. Therefore, motivation, control center and knowledge are having highest impact on empowering staff in field of information technology. **Improvements/Application:** Managers of IT departments by using procedures with justice, meritocracy and bonuses based upon individual performance can improve employee's motivation in doing empowering process.

Keywords: Control Center, Empowering Staff, Fuzzy AHP, Information Technology, Motivation

1. Introduction

In today's world, specifically in countries facing with economic difficulties including problems of production, management and its advanced method have been signified more than anytime. Effectivemanagement according to today's interpretation is indicated in utilizing more, accompany with higher quality of products, such achievements is impossible except through utilizing human resources and human capitals. As we know, regarding to quick changes of human knowledge; all the things are changing fast. Organizations are interacting with environment as an open system and in order to survive they require to response environmental changes[1]. Since human resources is considered as one of the most important factor of an organization; equipping and

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preparation of aforementioned resources for facing with changes is of issues that all the organizations are facing with and all the organizations or any kind of operation shall adopt highest capital; time and plan for training humans in different dimensions[2]. Most of organizations diagnosed the solution of such issue in implementation of empowering plans and they have tried to provide necessity filed for training empowered staff. Empowering as a new method of motivating is considered as one of hottest today's topics[3]. In era of competitive advantage of learning organizations, researchers and managers have increasingly indicated interests in empowering and managerial activities based upon it[4]. On the other hand, in two past decades the attitude of organizations towards human has been dramatically changed. Human in today's organizations is not equivalent with worker and only their mechanical energy is not considered. Organizations in order to maintain and develop their success have achieved a big belief and it is believed in human[5]. Maybe we can declare that human is discovered again within organizations. Such a way that the staffs of professional organizations are turned into the main rulers of job flow and organization partners, therefore, not only the managers shall gain leadership skills, also staffs shall learn methods for self-leading[6]. In order to achieve such features, organization shall empower its most important resource and competitive tool, meaning its human resources. Utilizing traditional method of management causes ignorance of innovation sense of staffs; workload and criterion increase for them[7]. Complete freedom of staffs also causes chaos and failure in affairs. The result of both modes is that material and spiritual resources are not used optimally and the organization does not achieve intended effectiveness. Empowering balances two mentioned dimensions. In fact, empowering is a tool that line up individual and organizational goals with each other and makes staff to believe that the growth and progress of organization includes their interests[2]. Researcher in this research in order to identify indexes and criteria of effective factors has introduced three main factors in organizational empowering plan: these three factors are including technical factors; managerial and organizational[3]. In part related to individual factors we can state that educational background; control canon; self-esteem are the effective factors in improving the process of empowerment since if we imagine that the individuals considers his control canon external and the resource of all the occurrences and his work results the

environmental factors then the process of empowering will face with major problems in the organization. In the discussion about the organizational factors we can consider factors like ambiguity in roles; organizational structure; access to information and as factors that can have significant impacts on the process of empowering. Since if organizational structure is hierarchical and does not change with the process of empowering then the process that individual can have such empowering of freedom will seem to be improbable. At the end, they are the factors relating to managerial factors including advocates and more clarity of work processes and implementation of organizational justice play important role in process of empowering within organization[3]. Ultimately since present study is done in ministry of oil and such ministry in terms of growth and innovation in using new information technologies shall have necessity effectiveness. Effectiveness of such organization requires having empowering, skillful and technical staffs that can use necessarily from available capacities and advanced technologies for doing activities regarding to achieving the organizational goals. Now that empowering plans are introduced as one of organizations' mechanisms in facing with change and environmental changes, present study is trying to identify the effective factors on human resources empowering in field of information technologies within department of oil ministry since implementation of empowering plans first requires identification of tools and factors that may be effective on the feeling of individual's empowerment. Therefore, the main question of this research is: what are the effective factors on empowering staffs in field of IT?

2. Theoretical Foundations

In other words, researcher is trying to answer this fundamental question: What are the factors that can be effective in order to use maximum capacity and staffs strength in area of IT? Environmental changes and work competition increase; have put the issue of staff empowering in the canon of managers' considerations. Since organizations by having empowered staffs; accountable, skillful and motivated can compete and adapt better with the changes[27]. Empowering is the healthiest method of involving other staffs in power[8]. By such method the sense of reliability; extreme energy, pride; commitment and self-reliance will be established within individuals and the sense of participation within

organizational affairs will increase and ultimately it will have the improvement of performance[9]. After 10 years of experience; world concluded if an organization wants be pioneer in its economic and work affairs and not to get behind in competition; it shall have skillful, innovative and motivated manpower. Human resources, form the basis of actual wealth of an organization[7]. There is a direct elation among human capital and productivity within organizations. Important concerns of a world successful business; collecting scholars and intellectual human capital that is able to make change in related organizations. A successful organization is a sum of humans with mutual culture, attitude and goals with a workgroup in flexible system of organization; provide their experiences and knowledge eagerly for managers for increasingly progress of the organization[10]. Therefore, each individual regarding to his organization and what he is doing will have a sense of ownership. Using potential abilities of human resources is considered as a big advantage for each organization. Individual productivity; organization utilizes sum of talents and potential abilities of individuals in order to achieve organizational advance and by practicing potential forces of talents in order to build; causes organizational advance[11]. Therefore, the necessity of achieving organizational goals; is the effective management of such valuable resources. In this regard, growth; progress; flourishing and promotion of staff's empowerments under the title of empowering staffs are considered by experts and specialists. Regarding to the hints presented above about necessity of considering empowerment, there are many researches done in Iran and in the world and most of researchers have identified effective factors on psychological empowering of staffs and the study of relationship among empowering of staffs with concepts like organizational commitment, organizational learning, knowledge management, IT, EQ and etc. there are few studies about effective factors on their empowerment regarding to a specific filed of staffs activity. Since it seems the conditions and different work environments are requiring manpower with specific features and empowerment and skills and some of effective factors are different on staffs empowering. For instance, staffs who are working in environments with high technologies are requiring specific capabilities. Therefore, researcher in this research is trying to identify effective factors on staffs empowering in field of information technologies of oil ministry. The results of this research can be used within all the organizations including public and private organizations, specifically in field of their technologies. Specifically the results of this research can aid human resources managers in order to design and implement training courses for staffs, job analysis and design and revising organizational structure and also making processes effective.

2.1 Information Technology

The term IT is probably used in late of 1970s for mentioning use of computer technology for work with information[12]. Totally we can state that such technology includes all the kinds of computers, both their software and hardware and also communicational networks between two PCs to largest private and public networks. In addition to it, integrated computer and communicational technologies including a system that connects a PC to a supercomputer in an office to worldwide networks are within IT[13].

Quick and severe development of IT that is started years ago and it is continuing causes wide use of it in different dimensions of society and organization[14]. Predictions indicate that such technology will continue its quick growth and its comprehensive usage in all dimensions of human life in future years[28]. In today's organizations, the importance of such technologies is completely perceived for managers and managers are trying to achieve faster their organizational goals and operations by utilizing such technologies. In continue, the capabilities and potentials of IT will be mentioned: information production: new innovations in IT by accessing to high speed networks, provided the possibility of production and management of high quantity of information in accordance with the demand of users and along with goals of development[29].

Providing production opportunities: IT increases manufacturing opportunities for manufacturers[15]. Supporting technical and scientific knowledge sharing: utilizing IT plays important role in doing scientific and technical researches. Nowadays utilizing IT capabilities is the main activities of research and development centers.

Change in economic and social norms: gradually when individuals are using IT and communications, their commercial, social and cultural values and norms will be changed. For instance, the speed of communications and doing electronic analysis causes speed increase of decision makings[30]. Technology, the ability to think and systematic implementation will be transferred to the individual. Systematic thought means that the individual have the ability to perceive a not that different activities of

an organization are depending on each other and change in each one of them will impact other sections as well. The infrastructure of such skill is to have a systematic thought that is established and developed through technology. In other words, by perceiving logical relations among data, individual is getting equipped with such logical thought and gains the power of perception of relations among information and indicators[16].

2.2 Concept of Empowering

The concept of empowering in 1990s has drawn the attention of many researchers, academics, experts and managers and organizational psychology. Until that time there was no clear definition from this term and theorists mostly considered it close to concepts of management like re-engineering of the process and comprehensive quality management[17]. Also some people considered empowering as a contemporary version of participation movement and industrial democracy[18].

Empowering has been quickly considered as an important concept for this reason it potentially impacts on consequences that are useful and beneficial for the individual and organization[31]. Now there is an increasingly interest towards such concept according to theorists and managers [19]. According to researchers, such attractiveness and attention is rooted from factors like the role of empowering in promotion of learning culture, increase of managers' effectiveness and increase of human resources motivation[9]. Empowering human resources is considered as one of surprising approaches of human resources development that leads to scholarship of manpower and ultimately it results organizational development; by such argument that increase of speed and accuracy in building the foundation of practical actions in turning human resources into "powerful driving engine of organizational sublimation" is recommended to leaders and executive managers of organizations[32].

The main meaning of empowering is pointing out "delegation"[12]. Conger and Kanungo have concentrated on power as central point of empowering or for reinforcing such thought or weakening such thought in personal inability. They explained that any kind of strategy or managerial techniques that leads to increase of determining destiny role and also self-competency of staffs will provide their empowering[20]

Empowering is a fact that provides the opportunity for decision-making through extending scope of authority. Empowering causes breakage of traditional

hierarchical structures of organization since line staffs are closer to problems and difficulties and they shall have more authority for solving the problems[21]. Based upon definitions two key dimensions of empowering literature have been identified: first; psychological attitude (organic or motivational) it concentrates on how staffs perceive empowering and second dimension; is multi-dimensional attitude (communicational or mechanical) that studies exactly the role of managers and leaders[18].

Scott and Jafe change of pyramid organization into circular organization change of staffs' considerations, motivating through providing authorities and respect, participative management, settling facilitating leadership and forming empowered groups are the factors of staffs' empowering. Allen Randolv considers three methods for conducting empowering plan: staff participation in information, appropriate organizational structure and forming groups[22].

Parker defines staffs' empowering as a tool for increasing teamwork within organizations and individuals and groups' members in order to act competent within competition shall be empowered[23]. Ketchum and Trist believe that staffs' empowering and workgroups shall be the canon of belief and overall imagination of managers that are in thinking of improvement and promotion of their organization's performance[33].

2.3 Empowerment Requirements

Environmental changes and universal competition increase; have considered the issue of staffs empowering since organizations by having empowered staffs; accountable, skillful and motivated can adapt better with changes and compete[27]. Empowering is the healthiest method of getting involved other staffs in power[8]. By such method, the sense of trust, extreme energy; pride; commitment and self-reliance will be established in the individuals and the sense of participation in organization affairs will be increased and ultimately it leads to performance improvement[9]. After 10 years of experience; world have concluded if an organization wants to be pioneer in economic and work affairs and not to get behind in competition; shall have skillful, creative and motivated human resources. Human resources form the basis of actual wealth of an organization[7]. There is a direct relation between human capital and productivity within organizations. Collecting scholar and intellectual human capital is one of important concerns of world successful businesses that can provide change within

related organizations. A successful organization is sum of humans who are civilized, thoughtful, mutual purposes with teamwork in the flexible system of organization; provides his experiences and knowledge eagerly for managers for increasingly progress of organization[10]. Therefore, each individual, regarding to the task he is doing will experience a sense of ownership. Using potential capabilities of human resources for each organization is considered as a great advantage. Individual productivity; organization uses sum of talents and potential capabilities of individuals for organization progress and by practicing the potential forces of wonderful talents in order to build; provides organizational progress[11]. Therefore the necessity of achieving organizational purposes; is effective management of such valuable resources. In this regard, growth; progress, flourishing and promotion of staffs capabilities under title of staffs' empowering have been considered by experts and specialists.

2.4 Empowerment Approaches

Different and diversity of definitions from empowering causes the establishment of diverse approaches in that use of experts. In fact, approach refers to the way of attitude, assessment and analysis of an issue. In scientific references of universities, empowering includes approaches of rational-structural, motivational and super-motivational[24].

In approach of rational structure, empowering is a process that a leader or a manager shares his authority with his subordinates. In this attitude they emphasize on participation is in authority and organizational authority[25]. While in motivational approach empowering rooted from individuals' motivational preferences. Each strategy that leads to increase of work activity (self-decision-making) and self-competency of staffs, it will provide empowerment for them[26]. Ultimately in approach of super-motivational, empowerment is the process of self-efficacy increase among the members of organization through self-recognition and elimination factors weakening your power[34]. In this approach, empowering is a process established by development of empowering culture.

2.5 Factors Affecting the Sense of Empowerment

In this regard, it means the sense of staffs' empowering in field of technology transfer and etc. Many studies have

been done that each one of them regarding to the type of attitude have identified specific factors about empowering which we will mention below in Table 1 such factors:

Table 1. Indicators of employee empowerment

Names of researchers and year	Names of factors and variables affecting
Kord (2012), Miriand Sbzikaran (2011), Me'marzadeh et al (2010), Sun et al. (2014) Kay et al (2008), Kang (2007) Karen Lawson (2006)	Locus of Control
Farhangi, (2011), Me'marzadeh et al (2010), Iran nejadaparizi (2006) (Hadavand, 2007), boolean and McGee Hay (2014), Abed et al (2009), Scott and Jaffe (1991)	Sense of responsibility
Nezafati and colleagues (2011), Abbasi and Kord (2009), Paktinat and Fathizadeh (2008), Zhang and colleagues (2014)	Knowledge
Iran Zadeh et al., (2010), Rezaeian (2009), Bakhtiari and AhmadiMoghaddam (2009)	Need for self-actualization
Kord (2012), Miri and Sabzikaran (2011), Rezaeian, 2009, Abbasi and Kord, 2009, Tabarsa et al (2008) Alvani et al (2007), Iran Nejad and Parizi 2006, Hersey Blanchard (1996)	Organizational structure
Me'marzadeh (2010), Bakhtiari and AhmadiMoghaddam (2009), Paktinat and Fathizadeh (2008)	Leader and management style
Abbaspoor (2001), Rezaeian (2009),Zhang and colleagues (2014), Abed et al(2009), Lu (2000)	Motivation
Malian and colleagues (2013), KhaefElahi and colleagues (2001), Robert Carey (1996)	Access to information
Kamalian et al (2013), Me'marzadeh et al (2010), KhaefElahi (2001)	Effective communication with employees
Abbaspoor, 2011; Buckingham and Clifton, 2008, Rezaeian, 2009, Beam (2008))	Providing bonuses based on performance
Kamalian and colleagues (2013),Me'marzadeh et al (2010) Tabarsa et al (2008), Gabe and Gabe (2008)	Organizational communication
Nezafati and colleagues (2011),Abbasi and Kord (2009), Paktinat and Fathizadeh (2008), Zhang and colleagues (2014)	Environmental changes

3. Method

Present study is applicable in terms of purpose and it is descriptive-survey in terms of data collection method. Data collection has been done through direct visit and through questionnaire. Population of the research includes 31 experts in research institutions of oil ministry in field of manpower planning. Regarding to required experts for this research for paired comparisons for method of fuzzy AHP that is between 8 to 15 people based upon the opinion of Asgharpour[35], we have invited 15 experts for participation. From 19 invitation letter, 10

determine and rank effective factors on empowering of staffs. Establishing hierarchical structure: determining appropriate structure in order to level the criteria through intended literature. In this study criteria are extracted by studying literature and are leveled by using the opinions of experts. The terms and size of paired comparisons are indicated in Table 3.

Table 3. Linguistic vocabulary and their fuzzy value of paired comparison of criteria

Quite preferable	(9,9,9)
Middle	(9,8,7)
Very strong	(8,7,6)
Middle	(7,6,5)
strong	(6,5,4)
Middle	(5,4,3)
Rather strong	(4,3,2)
Middle	(3,2,1)
Same	(1,1,1)

Table 2. Demographic information of research's experts

Experience of expert	Field of activity	Female	Male	Job position	(Bachelor)	(MA)	(PhD	Sum	Total of Experts
Between 5 and 10 years	Industry	0	2	Supreme manager	0	1	1	2	10
More than 10 years		0	3	Middle managers	1	2	0	3	
More than 10 years	Univer-	1	1	Professor	0	0	2	2	
More than 10 years	sity	1	2	Associate Professor	0	0	3	3	
More than 5 years		0	0	Assistant Professor	0	0	0		

people have accepted to participate in this research. The information of such 10 experts is written in Table 2.

4. Data Analysis Method

4.1 Analytic Hierarchy Process Method

Laarhoven and Pedrycz[36] have recommended the method of analyzing hierarchical process AHP. This method is a usage of AHP and fuzzy logic[35]. Language scale through AHP can be explained with lack of fuzzy reliability, when decision maker decides. Therefore, the method of fuzzy AHP converts the ideas of experts from previous values definitions to fuzzy numbers and membership functions in order to reach to more acceptable assessment. Regarding to recommended method by Laarhoven and Pedrycz it is clarified that many concept are having ambiguous mode in real world. The steps of AHP method are as follows:

Defining the problem; first we determine the issue in order to solve it. In this problem the purpose is to

Paired comparisons: forming sizes of paired comparisons among all the criteria in dimensions of hierarchical system. Allocation of lingual terms to paired comparisons with a question of: Which one of the two criteria is better for forming decision-making matrix ?

$$\tilde{A} = \begin{pmatrix} 1 & \tilde{a_{21}} & ... & \tilde{a_{21}} \\ \tilde{a_{21}} & 1 & ... & \tilde{a_{21}} \\ \tilde{a_{21}} & \tilde{a_{21}} & ... & 1 \end{pmatrix} = \begin{pmatrix} 1 & \tilde{a_{21}} & ... & \tilde{a_{21}} \\ \dfrac{1}{\tilde{a_{21}}} & 1 & ... & \tilde{a_{21}} \\ \dfrac{1}{\tilde{a_{21}}} & \dfrac{1}{\tilde{a_{21}}} & ... & 1 \end{pmatrix}$$

Interval Bipolar scale in fuzzy AHP method:

$$\begin{aligned} i \neq j \\ i = j \end{aligned} ^{\tilde{a}_{ij}} \begin{cases} \tilde{9}^{-1}, \tilde{8}^{-1}, \tilde{7}^{-1}, \tilde{6}^{-1}, \tilde{5}^{-1}, \tilde{4}^{-1}, \tilde{3}^{-1}, \tilde{2}^{-1}, \tilde{1}^{-1}, \tilde{1}, \tilde{2}, \tilde{3}, \tilde{4}, \tilde{5}, \tilde{6}, \tilde{7}, \tilde{8}, \tilde{9} \\ \tilde{1} \end{cases}$$

In order to use geometric average for determining fuzzy geometry and fuzzy weights for each criterion we use a technique introduced by Hessiyeh et al in 2004.

$$\tilde{r}_i = \left(\tilde{a}_{i1} \otimes \tilde{a}_{i2} \otimes .... \otimes \tilde{a}_{in} \right)^{\frac{1}{n}}$$

$$\tilde{w}_i = \tilde{r}_i \otimes \left(\tilde{r}_1 \oplus \tilde{r}_2 \oplus .... \oplus \tilde{r}_n \right)^{-1}$$

In above equation $\tilde{a}_{ij}$ is fuzzy comparison value of criterion i in comparison with j. therefore, $\tilde{r}_i$ is geometric average of the comparisons value of i criterion against other criteria and $\tilde{w}_i$ is the fuzzy weight of criterion that can be indicated as a fuzzy triangular number $\tilde{w}_i = (lw_i, mw_i, uw_i)$. lw_i, mw_i and uw_i are respectively low, median and high values of fuzzy weight of i criterion. In order to determine the de-fuzzy weights we use below Equation:

$$w_j = \frac{lw_i + 4mw_i + uw_i}{6}$$

Table 4. Benchmarks derived from literature of the research

Sign of criteria	Criterion
C1	Motivation
C2	Staff Control center
C3	Sense of responsibility of staffs
C4	Knowledge
C5	Structure and leadership style
C6	Access to information

4.2 Prioritizing Criteria by using the Method of Fuzzy AHP

Regarding to that the number of experts in this method is 10; therefore there are 10 different matrix for comparing such criteria. In method of fuzzy AHP first we turn these matrixes to one matrix. In order to combine the Tables of paired comparisons of all respondents, one of the best methods is to use geometric average. The reason is that paired comparisons establishes data in form of ratio and also reversal being of paired comparisons' matrix justifies using such method since geometric average maintains the feature of reversal being of paired comparisons matrix. If we assume that $\tilde{a}_{ij}^k$ is an indicator relating to K respondent, for comparison of i criterion towards j criterion, geometric average for such indictors are achieved with below Equation:

$$\tilde{a}_{ij} = \left(\prod_{k=1}^{n} \tilde{a}_{ij}^k \right)^{\frac{1}{n}} \quad \tilde{a}_{ij} = \left(\tilde{a}_{i1}^1 \otimes \tilde{a}_{i2}^2 \otimes .... \otimes \tilde{a}_{ij}^{10} \right)^{\frac{1}{10}}$$

By using above formula, the comparison of criteria is as follows in terms of group:

4.3 Calculation of Fuzzy Weights

Regarding to the method of fuzzy AHP the compilation matrix of criteria information will be analyzed as below: first by using geometric average of the value of j criterion in comparison with other criteria we conclude equation mentioned below:

$$\tilde{r}_1 = \left(\tilde{a}_{11} \otimes \tilde{a}_{12} \tilde{a}_{13} \otimes \tilde{a}_{14} \tilde{a}_{15} \otimes \tilde{a}_{16} \right)^{\frac{1}{6}}$$

Table 6. Fuzzy value of paired comparison of criteria

$\tilde{r}_i$	lr_i	mr_i	ur_i
$\tilde{r}_1$	1.778	2.240	2.707
$\tilde{r}_2$	1.632	2.033	2.465
$\tilde{r}_3$	1.012	1.281	1.604
$\tilde{r}_4$	1.204	1.549	1.961
$\tilde{r}_5$	1.080	1.355	1.672
$\tilde{r}_6$	0.858	1.092	1.382

Table 5. Initial matrix of paired comparison of criteria after compilation of experts' opinions

	C1			C2			C3			C4			C5			C6		
C1	1.00	1.00	1.00	0.90	1.22	1.53	1.53	1.83	2.13	1.15	1.57	2.02	1.41	1.89	2.35	1.89	2.51	3.12
C2	0.65	0.82	1.12	1.00	1.00	1.00	1.28	1.68	2.17	1.10	1.57	2.11	1.26	1.61	1.97	1.74	2.45	3.16
C3	0.47	0.55	0.65	0.46	0.60	0.78	1.00	1.00	1.00	0.55	0.75	1.07	0.92	1.16	1.47	0.88	1.12	1.45
C4	0.49	0.64	0.87	0.47	0.64	0.91	0.93	1.34	1.81	1.00	1.00	1.00	1.00	1.23	1.46	1.41	1.86	2.29
C5	0.43	0.53	0.71	0.51	0.62	0.79	0.68	0.92	1.21	0.68	0.81	1.00	1.00	1.00	1.00	0.93	1.13	1.41
C6	0.32	0.40	0.53	0.32	0.41	0.57	0.69	0.90	1.14	0.44	0.58	0.79	0.71	0.88	1.07	1.00	1.00	1.00

Then for determining fuzzy weights of criteria we do as below. The value of each criterion will be multiply in reversal of total fuzzy values of limitations. For instance, in order to achieve fuzzy weight of first criterion we do as follows:

$$\tilde{W}_1 = \tilde{r}_1 \otimes (\tilde{r}_1 \otimes \tilde{r}_2 \otimes \tilde{r}_3 \otimes \tilde{r}_4 \otimes \tilde{r}_5 \otimes \tilde{r}_6)^{-1}$$

Table 7. Fuzzy and deterministic weights of criteria

Criterion	$\tilde{W}_j$	lw_j	mw_j	uw_j	difuzzy weight of criteria	Grade
Motivation	$\tilde{W}_1$	0.102	0.159	0.241	0.163	1
Staff Control center	$\tilde{W}_2$	0.094	0.145	0.220	0.149	2
Sense of responsibility of staffs	$\tilde{W}_3$	0.058	0.091	0.143	0.094	4
Knowledge	$\tilde{W}_4$	0.069	0.110	0.175	0.114	3
Structure and leadership style	$\tilde{W}_5$	0.062	0.096	0.149	0.099	5
Access to information	$\tilde{W}_6$	0.049	0.078	0.123	0.080	6

Regarding to De-fuzzy weights of criteria we can perceive that regarding to experts, the motivation of employees, their control center that means if individuals have higher internal control they will be more responsible towards the process of empowering and on the other hand if the control center of individuals to outer their concentration on empowering plans will be lessened.

After this item, in accordance with experts the criterion of individual's knowledge as an important and effective factor on empowering of staffs is identified in field of capability. It means the more is the knowledge of individuals in field of technology, certainly their tendency to get empowered in field of technology will become better and more.

5. Conclusion

In present era, new and strategic approach to human resources requires to consider human resources of the organization as the most important customers to guarantee the ground of achieving the organizational goals, managers and staffs by providing correct strategies for human resources. The span of environmental changes, specifically in field of science and technology rely the

success of organizations on their human resources capabilities more than ever. Wavy environmental status and technological changes cause more complication of activities; such a way that the content of management thought and usable methods within the organization are severely and deeply changed. Therefore, the success of organization has direct relation with know-how, attempt and empowering of working manpower and any negligence to such important and great resource will have different consequences like losing expert and skillful employees, wasting organizational investments and ultimately efficiency decrease and organization destruction. It seems in field of information technology that nowadays organizations are trying to achieve advantages in this regard, the issue of staffs empowering can help organizations. In this research, researcher by using the opinions of experts has identified 6 factors in empowering of staffs in field of IT, criteria like control center, structure and leadership method, information access, sense of responsibility and their motivation. In this research, researcher concludes that among criteria, their motivations are identified as the most important one in accordance with experts' opinions. In fact, if employees have necessity motivation in field of empowering for IT, the project of empowering will be finalized with greater success within organization certainly. Of course, we shall not neglect the issue that for having motivated employees there are several factors which shall be considered including organizational justice, meritocracy and other factors. In second rank of effective criteria in this research we can point out the criterion of individuals' control center. Individuals who have internal control center will seek every failure and triumph in themselves and they don't consider effective factors of environment on individual performance. We can easily perceive that individuals who have internal control center are trying to reinforce their assets and knowledge infield of IT and their own capability in this field for improving individual performance and vice versa the individuals who have external control center considers failure and triumph relating to factors except their own and they certainly don't do adequate attempt in this field. After such factors the criterion of individuals' knowledge is identified as effective one in field of staff empowering. In fact employees who have adequate knowledge in field of IT are facing with IT issue with less fear since one of the major reasons that individuals are not interested in participating in this field

is the fear of facing with obstacles that people feel they are not capable of. Regarding to the mentioned contents in this part researcher recommends that managers of IT department of oil ministry try to improve the employees' motivation by using procedures with justice, meritocracy and bonuses based upon individual performance that causes the improvement of employee's motivation in doing empowering process.

6. References

1. Sun LY, Zhang Z, Qi J, Chen ZX. Empowerment and creativity: A cross-level investigation. The Leadership Quarterly. 2012 Feb; 23(1):55–65.

2. Iranzadeh S, Heravi S. Identification and prioritization factors contributing in empowering by TOPSIS method. Beyond Management Journal. 2009; 4(13):59–84.

3. Miri A, Rangriz H, Sabzikaran E. The relationship between organisational structure and employee empowerment in National Iranian Oil Products Distribution Company. Kuwait Chapter of Arabian Journal of Business and Management Review. 2011 Sep; 1(1):51–68.

4. Movahedi MM, Motamedi M, Ktal A. Survey the role of information technology on the performance of Mobile Communication Co., Tehran Province. Journal of Management. 2011; 8(21):8–12.

5. Ghani NAA, Bin Raja TABS, Jusoff K. Antecedents of psychological empowerment in the Malaysian private higher education institutions.International Education Studies. 2009; 2(3):161.

6. Boley BB, McGehee NG. Measuring empowerment: developing and validating the Resident Empowerment through Tourism Scale (RETS). Tourism Management. 2014 Dec; 45:85–94.

7. Karakoc N, Yilmaz AK. Employee empowerment and differentiation in companies: A literature review and research agenda. Enterprise Risk Management. 2009; 1(2).

8. Rapp A, Ahearne M, Mathieu J, Schillewaert N. The impact of knowledge and empowerment on working smart and working hard: The moderating role of experience. International Journal of Research in Marketing. 2006; 23(3):279–93.

9. Chavoshi K, Salarrezaei M, Ghasemi J. Role of self-esteem on employee performance according to the moderator of these empowering employees. Panorama of Government Management. 2012; 8(1):41–60.

10. Chua RYJ, Iyengar SS. Empowerment through choice? A critical analysis of the effects of choice in organizations. Research in Organizational Behavior. 2006; 27:41–79.

11. Geisler D. The next level in employee empowerment quality progress. Research Library Core. 2005 Jun; 38(6):48–52.

12. Van Grembergen W. Introduction to the mintmark IT governance and its mechanisms. IEEE Proceedings of the 35th Hawaii International Conference on System Sciences.; 2009.

13. Weill P, Ross JW. IT governance: How top performers manage IT decision rights for superior results? International Journal of Electronic Government Research. 2005; 1(4):63–7.

14. Khamseh A, Azadi A. Evaluation of the success of the technology transfer process and determination of the best method of technology transfer using hierarchical analysis model, Case Study: Azarab Industry. Journal of Parks and Growth Centers. 2011; 26(3): 79–88.

15. Tahmasbi S. Social factors affecting the transfer of technology in the automotive industry [MS thesis]. Tehran: University of Allameh Tabatabai; 2004.

16. Hansen K, Kim JJ, Suffian S, Mehta K. Leveraging informal lending mechanisms to facilitate technology transfer and microenterprise in developing countries. Technology in Society. 2015 May; 41:65–75.

17. Dainty AR, Bryman A, Price AD. Empowerment within the UK construction sector. Leadership & Organization Development Journal. 2002; 23(6):333-42.

18. Greasley K, King N. Employee perceptions of empowerment. Employee Relations; 2005; 27(4):354–68.

19. Moye MJ, Henkin AB. Exploring associations between employee empowerment and interpersonal trust in managers. Journal of Management Development. 2006; 25(2):101–11.

20. Conger JA, Kanungo RN. The empowerment process: Integrating theory and practice. Academy of Management Review. 1988 Jul; 13(3):471–82.

21. Blanchard K, Randolph WA, Carlos JP, tr Cardenas Nannetti J. Empowerment: 3 Claves paralograrque el proceso de facultar a los empleadosfuncione en suempresa. 2002.

22. Quinn RE, Spreitzer GM. The road to empowerment: Seven questions every leader should consider. Organizational Dynamics.1997; 26(2):37–49.

23. Parker GM. Cross-functional teams: Working with allies, enemies and other strangers. John Wiley and Sons; 2003.

24. Hechanova M, Regina M, Alampay RBA, Franco EP. Psychological empowerment, job satisfaction and performance among Filipino service workers. Asian Journal of Social Psychology. 2006; 9(1):72–8.

25. Abtahi SH, Abesi S. Employee empowerment.Institute for Research and Education. 2007; 1(2):41–52.

26. Robbins TL, Crino MD, Fredendall LD. An integrative model of the empowerment process. Human Resource Management Review. 2002; 12(3):419–43.

27. Brown A, Garguilo S, Mehta K. The relentless pursuit of financial capital for micro-enterprises: importance of trust and social capital. International Journal for Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship. 2011; 6(2):78–97.

28. Gilsing V, Bekkers R, Freitas IMB, van der Steen M. Differences in technology transfer between science-based and development-based industries: Transfer mechanisms and barriers. Technovation. 2011 Dec; 31(12):638–47.

29. Mahdizadeh M, Heidari GH, Mirzaei Y. Identifying the factors affecting the transfer of technology. Journal of Parks and Growth Centers. 2010; 25(4):17–29.

30. Han SS, Moon SJ, Yun EK. Empowerment, job satisfaction

and organizational commitment: Comparison of permanent and temporary nurses in Korea. Applied Nursing Research. 2009 Nov; 22(4):e15–e20.

31. Nikulainen T, Palmberg C. Transferring science-based technologies to industry-does nanotechnology make a difference? Technovation. 2010 Jan; 30(1):3–11.

32. Ketchum LD, Trist EL. All teams are not created equal: How employee empowerment really works. Sage Publications Inc.; 1992.

33. Zhang AY, Song LJ, Tsui AS, Fu PP. Employee responses to employment-relationship practices: The role of psychological empowerment and traditionality. Journal of Organizational Behavior. 2014 Apr 22; 35(6):809–30.

34. Ghoseiri K, Szidarovszky F, Asgharpour MJ. A multi-objective train scheduling model and solution. Transportation Research Part B: Methodological. 2004; 38(10):927–52.

35. Van Laarhoven PJM, Pedrycz W. A fuzzy extension of Saaty's priority theory. Fuzzy Sets and Systems. 1983; 11(1): 199–227.