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Recognition and Grade Effective Factors in Empowerment with the Technique for Order-Preference by Similarity to Ideal Solution

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Abstract: The objective of this research is to survey and prioritize the effective factors in empowering the staff through Topsis method. Therefore, the Organizations with proper understanding of the nature of the problem(s), recognition the factors affecting the empowerment process, priority factors prioritization and effective implementation, attempts to empower human resources to achieve their organizational objectives and respond to competitive environment as quickly as possible. The effective factors were investigated by a review of the literature for the related concepts in empowerment. A questionnaire was compiled in order to identify the effective factors in the study population. After determination of the main variables with the SPSS 14 software, the most effective factors were identified by constructing a Pareto graph. The validity of the responses was investigated by a re-evaluation method and the TOPSIS method was used to prioritize the factors identified. A second questionnaire was used to study the effects of factors relative to the indices determined A decision matrix was drawn and the results showed that education, employing a participation system, personnel motivation, summation of authority, performance-based reward, teamwork, occupational empowerment and accepting responsibility are priorities for staff empowerment.

Key words: Empowering, empowering indices, factors prioritization, TOPSIS

INTRODUCTION

Empowerment, as an up-to-date method for motivation, has recently become the focus of attention for today's management. In the age of competitive superiority, organizations, researchers and management are eager for empowerment and its related management performance. The view of human resources within organizations has hardly changed in the last two decades. However, a man is not only a worker and his mechanical energy is not the only target. There is a desire to keep and to improve the success of an organization and a belief in human resource helps toward achieving this goal.

It can be said that the man has been discovered once again. Management needs to be equipped with leadership skills and workers must learn to become self-led (Chua and Iyengar, 2006).

In order to achieve these goals, an organization must empower its most important and competitive tool; i.e., human resource. On one hand, classic management techniques tend to inhibit the workers' innovative and creative senses, which increases job stress and imposes limitations. On the other hand, granting workers full freedom of action leads to disorder and poor performance

(Peterson *et al.*, 2004). These two situations are the results of not using financial and human resources efficiently and the organization will not be able to gain the desired level of effectiveness. Empowerment creates a balance between personal and organizational goals and creates the belief that the success and growth of an organization depends heavily on human resources. The reasons for paying proper attention to empowerment is defined as follows:

- Study of management skills reveals that empowering inferiors is a major factor in the effectiveness of an organization and the management (Robbins *et al.*, 2002)
- Power and control analysis in organizations reveals that sharing the power and control with workers leads to increased effectiveness of an organization (Tang *et al.*, 2009)
- Group-forming experiments reveal that workers empowerment goals play important roles in the creation and survival of groups

Empowerment is a concept that deals directly with the future of the trading world but, so far, it has been largely

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taken for granted. Despite a great deal of discussion about the usefulness (profits) of empowerment, few examples of its successful introduction have been reported. Empowerment creates the opportunity for all personnel to make use of their knowledge, skills and experience. Moreover, only a few managers are aware of the concept of empowerment.

The following goals can provide a definition of empowerment:

- All workers are responsible for constantly analysing their jobs and developing effective methods for doing their jobs (Amichai-Hamburger *et al.*, 2008)
- All working groups have the responsibly of creating functional goals, ways of achieving those goals and evaluating their own performance (Tang *et al.*, 2009)
- Empowerment makes an organization responsible for making the most important management decisions, such as development programs and creating example and job programs, for staff
- All workers are directly in charge of analysing any approach that leads to constant improvement in the performance

The descriptions and goals discussed above are involved in the following strategies.

- Maximizing group-forming in order to involve all workers in projects and involving them in all projects performed by the organization
- Providing skills for workers so that they are able to communicate with prospective customers and clients and then can divulge information, conduct research and participate in problem-solving programs

Empowering workers is one of the most effective techniques for increasing workers potential and effective use of their potential and talents in order to achieve organizational goals (Chang and Liu, 2007).

It is clear that in order to achieve desired goals and to contribute to the competitivity of the Iran Tractor Manufacturing Co., it is essential for management to be aware of the effectiveness to make use of empowerment.

Empowerment is a new topic in the human resource literature. Nonetheless, there are several reports of research and studies on this topic and different approaches have been described. Most studies have been focused on the structure of empowerment, so that empowerment is viewed as the result of an approach, which is referred to as a structural approach. The objective of those studies was to determine the tools and facilities needed by management to empower workers.

The objective of this study was to identify the effective factors of empowerment in the Iran Tractor

Manufacturing Co. through the TOPSIS method and to provide suggestions for improving the level of empowerment. The question to be answered is as follows:

- On the basis of the TOPSIS model, which of the effective factors of empowerment has the highest priority?

Empowerment provides more freedom, independence and responsibility for workers in an organization to be involved in decision-making and self-control of tasks (Mullins, 1999).

Empowerment gives responsibility to workers and is a mean for them to improve their career.

Empowerment is an invaluable tool for improving methods that encompass the highest to the lowest staff level. It gives new responsibility to the management and makes him/her improve workers skills and talents (Evans and Lindsay, 2004). Most managers believe that giving decision-making responsibility to all workers is a means of empowerment.

There are many definitions of empowerment, including:

- Recognizing the value of staff and what they can contribute to projects (Compbel and Martinko, 1998)
- Improving and enhancing workers' talents and skills in order to achieve constant improvements in organizational function (Scarpello and Ledvinka, 2006)
- Changing the culture and being brave in creating and leading an organization
- Designing a modern organization in which all workers do their own job to the best of their ability and are ready to accept new responsibility

There are four elements that are essential for management creating methods for empowering the workers.

- **Sharing:** Giving the workers the chance to take part in decision-making, but all of the authority is still with the management
- **Involving workers:** This is when a manager is eager to make use of the workers' talents, skills and experience
- **Undertaking responsibility:** When a worker accepts responsibility, he/she is trying to perform his/her job in the best way possible
- **Constructional flattening:** Reducing the distance between the management and worker levels (Conger and kanungo, 2002)

Empowerment can be summarized in a vector that Robbert Ford and Miron Fotler have designed. It begins from where a worker has no authority and it is only the management that makes decision and finishes where there is full empowerment. Full empowerment is achieved when working groups have the authority to employ and to fire, to enforce disciplinary rules and even to control wages and salaries.

WHY ORGANIZATIONS USE EMPOWERMENT

There are several internal and external reasons that make organizations use empowerment. The most important are:

- Empowerment is an effective way to make the best use of the talents and skills of individual workers and groups of workers

Whenever quality is the main objective, the introduction of empowerment programs is always appropriate. Kanter believes that empowering improves organizational function and the quality of the end product will improve as the skill level increases.

- The need for changes and improvement of an organization makes empowering the workers a necessity. Large organizational changes are rarely successful without the workers aid, but it is not necessary for workers to have any authority. This is the situation where the concept of empowerment is most important (Greenberger *et al.*, 1989)
- The workers' most important worry concerns job security. The main purpose of empowerment is not to provide a lifetime job but to make workers feel safe in their career. Job security is a means to empower workers, so that it is the organization that depends on the worker and in the outside world there is a need for the workers' expert knowledge in an international market

There are several internal and external factors that make it necessary to empower the workers.

- Effect of technology on the workplace: Technology has replaced many repetitive manual tasks and sophisticated complex tools demand significant changes in the workers' skills. In order to have workers expert enough to use these tools, they need to be empowered
- Need for flexibility: The classic structure in which the power focus is at the top of the organization pyramid

is being changed. Most managers believe that by keeping control originating from a focused point, especially in a fiercely competitive zone and involvement of the newest technologies, an organization will have great flexibility. In this case, empowering the workers is recommended (Littrell, 2007)

- Increase in the range of customers. Customers have increased their demands in terms of quality, cost and services and an organization that is unable to provide the expected services it will lose the market and customers will take their business elsewhere. Being aware of customers' needs and providing the expected services is best achieved by empowering staff

ASPECTS OF EMPOWERMENT

We consider five aspects of empowerment. Managers should play close attention to these five aspects if they want to empower workers effectively.

- **Worker merit (self-effecting):** When workers are empowered, they feel that their skills and expert knowledge allow them to perform a job successfully. They are also confident of doing any job they are given responsibility for (Peterson *et al.*, 2004)
- **Right to selection:** When workers have the right to choose their area and/or level of responsibility they will perform the job successfully
- **Being effective:** Empowered workers have control over the results of their work performance. They believe they can make changes by controlling environmental situations and the results of their work performance (Robbins *et al.*, 2002)
- **Being meaningful in performance:** Empowering workers provides an opportunity to make people they are dealing with goals of high value and this meaningful performance creates a feeling of excitement and responsibility for achieving goals (Peterson *et al.*, 2004).
- **Confidence and assurance:** If a worker is confident that management will support him/her, they will feel secure and will perform their job efficiently.

Experiment: This study was done with 137 people with BS and MS degrees in Iran Tractor Manufacturing co in 2009. All experiments and operations have been performed by F. Chakherlouy under supervision of S. Iranzadeh. For obtaining the sample bulk from the Kokran formula we used the following method in which $p = q = 0.5$ and $e = 0.95$, so we have:

Table 1: Pearsons correlation coefficient

Variable	Training	Reward	Team work (group work)	Partnership system	Resigning authority	Job enrichment	Responsibility	Motivation
Pearson's correlation coefficient	0.92	0.71	0.83	0.87	0.801	0.72	0.66	0.91

Table 2: Pearson's correlation coefficient

Variable	Training	Reward	Team work (group work)	Partnership system	Resigning authority	Job enrichment	Responsibility	Motivation
t	9.95	4.27	6.31	7.48	5.67	4.4	3.72	9.31

$$n = \frac{N(Z_{\alpha/2})^2 \times p.q}{e^2(N-1) + (Z_{\alpha/2})^2 \times p.q}$$

$Z_{\alpha/2} = 1.96, N = 137, P = 0.5, q = 0.5, e = 0.095$

$$n = \frac{137(1.96)^2 \times (0.5 \times 0.5)}{(0.095)^2 \times (137-1) + (1.96)^2 \times (0.5 \times 0.5)} = 60.14 \cong 60$$

Two questionnaires were used for collecting information. All the tools thought to be needed were presented to experts and university professors, who were asked to express their ideas about the questionnaires. After studying the results and responses, it was clear that the questionnaires had a high level of clarity. However, the questionnaires were modified in response to the experts' comments and presented to 20 people with expertise in the statistics of organizations. Pearson's correlation coefficient was used for examining the correlation between the results of the two questionnaires. For studying the final results, the second questionnaire was assessed by the same 20 statisticians. The resulting number was 0.9; Table 1 gives the r number achieved for each of the factors of empowerment.

Student's t-test was used to generalize the results from the statistical organization (Table 2).

$$t = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}}$$

- **Null hypothesis:** There is no relation between the two questionnaires
- **Alternative hypothesis:** There is a relation between the two questionnaires.

With a confidence level of 95%, the critical point is w (t =-1/96, t =1/96) because t is involved in the critical point, so the null hypothesis is rejected.

Information analysis: Information analysis was done with the TOPSIS method, which is one of the best models of multi-indicator decision-making methods. Choices or factors are shown by m and will be assessed by the n

indicator. This method is based on the fact that the selected choices must have the shortest distance from the positive ideal solution and the greatest distance from the negative ideal solution.

RESULTS AND DISCUSSION

The information obtained from the questionnaires is dimensionless and so the main factors cannot be identified. After completing the questionnaires, we tried to identify the main factors by using the diagram of pareto, the results are shown in Fig. 1.

The results of the Pareto vector show that eight of the factors cover 67% (Training, Reward based on function, Group work, Partnership system, Job enrichment, Responsibility, Motivation, Authority resigning). We prepared a decision matrix for determining the priority of these factors as the effective and main factors and by using the second questionnaire. The priority stages are given below:

Stage 1: making a quantitative and scaleless decision matrix.

The double-pole distance scale was used for changing the qualitative indicators to quantitative indicators (Table 3).

Table 4 gives the prioritized effective factors for empowerment, in order to neutralize the special indicators for making them comparable, they must be made scaleless and we used the Norem scaleless system in the TOPSIS model. As a result, the amounts of different indicators are dimensionless and add able.

Stage 2: Scaleless matrix (N) is multiplied by the diagnol matrix of weights:

$$V = N\ W_{n \times n}$$

The weight of each indicator was obtained by the Shannon technique (Table 5 and 6).

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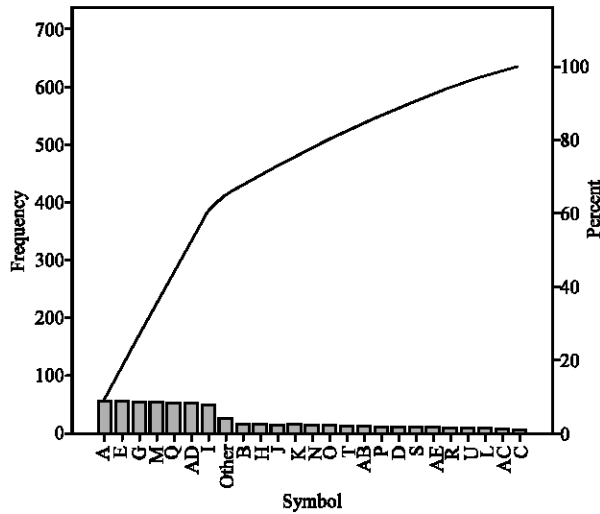
Fig. 1: The Pareto diagram of 8 effective factors in empowerment

Table 3: Double-pole (two-pole) distance scale

Negative	1	3	5	7	9	Positive
-	Very low	Low	Medium	High	Very high	+

Table 4: Decision making matrix for prioritization of factors affecting empowerment process

	Empowerment indicators				
Effective factor	Workers' merit	Right of selection	Feeling of effectiveness	Being valuable	Confidence (reliability)
Training	7.56	6.45	7.78	5.86	5.82
Reward based on function	7.60	4.96	7.30	5.95	4.43
Group work	6.01	5.32	7.42	8.05	6.22
Partnership system	6.37	5.50	5.20	8.31	5.60
Job enrichment	7.23	4.87	5.43	4.60	4.14
Responsibility	5.49	6.00	5.09	4.25	3.66
Motivation	5.09	5.98	8.44	5.50	5.39
Authority resigning	5.30	4.84	5.62	7.33	3.95

Table 5: Reliability of the indexes of empowerment

	Empowerment indicators				
Effective factor	Workers' merit	Right of selection	Feeling of effectiveness	Being valuable	Confidence (reliability)
Sun	2.062	2.070	2.058	2.050	2.056
Ej	0.990	0.994	0.988	0.984	0.987

Table 6: Criteria weights of effective factors in empowerment

	Empowerment indicators				
Effective factor	Workers' merit	Right of selection	Feeling of effectiveness	Being valuable	Confidence (reliability)
Dk = 1-Ej	0.010	0.006	0.012	0.016	0.013
Wj	0.176	0.106	0.210	0.280	0.228

As it was mentioned earlier, five criteria or indicators for prioritization of influential factors were considered. Since, the degrees of importance of these indicators are

Table 7: Scaleless matrix of effective factors in empowerment

	Empowerment indicators				
Effective factor	Workers' merit	Right of selection	Feeling of effectiveness	Being valuable	Confidence (reliability)
Training	0.073	0.044	0.087	0.104	0.094
Reward based on function	0.074	0.034	0.081	0.090	0.071
Group work	0.056	0.037	0.083	0.122	0.100
Partnership system	0.062	0.037	0.058	0.126	0.090
	0.070	0.033	0.060	0.070	0.067
Responsibility	0.053	0.040	0.057	0.064	0.059
Motivation	0.049	0.040	0.094	0.083	0.087
Authority resigning	0.051	0.033	0.062	0.111	0.064

Table 8: Identification of ideal negative and positive solution

	Empowerment indicators				
Effective factor	Workers' merit	Right of selection	Feeling of effectiveness	Being valuable	Confidence (reliability)
V_j^+	0.074	0.044	0.094	0.126	0.100
V_j^-	0.049	0.033	0.057	0.064	0.059

not same, it is required to measure the weight of each indicator distinctively. To do so, the Shannon's Entropy Method was applied.

$$w_i = \frac{dj}{\sum_{j=1}^{m} dj}, \quad \forall j, \quad dj = 1 - Ej, \forall j$$

So, the scaleless matrix (V) is as shown in Table 7, after we identified the weights.

Stage 3: Identifying the ideal negative and positive solution as described in Table 8.

$$V_j^+ = \{(\text{Max } V_{ij} \mid j \in J),(\text{Min } V_{ij} \mid j \in J' \mid i = 1,2,...,m)\} = \{V_1^+, V_2^+,...,V_n^+\}$$

$$V_j^- = \{\text{Min } (V_{ij} \mid j \in J),(\text{Max } V_{ij} \mid j \in J' \mid i = 1,2,...,m)\} = \{V_1^-, V_2^-,...,V_n^-\}$$

Stage 4: Identifying the distance between each factor and the negative and positive ideals.

$$d_i^+ = \sqrt{\sum_{j=1}^{n} (V_{ij} - V_j^+)^2}, i = 1,2,...,m$$

$$d_i^- = \sqrt{\sum_{j=1}^{n} (V_{ij} - V_j^+)^2}, i = 1,2,...,m$$

Stage 5: Identifying the relative closeness of a factor to the ideal solution.

$$CL_i^* = \frac{d_i^-}{d_i^- + d_i^+} \quad 0 \le CL_i^* \le 1, i = 1,2,...,m$$

The results are shown in Table 9.

Table 9: Distance between each factor and the negative and positive ideal

Effective factor	d_i^+	V_i^-	CL_i^*
Training	0.024	0.066	0.733
Reward based on function	0.049	0.032	0.395
Group work	0.022	0.076	0.257
Partnership system	0.040	0.070	0.636
Job enrichment	0.074	0.023	0.237
Responsibility	0.078	0.008	0.093
Motivation	0.051	0.050	0.495
Authority resigning	0.056	0.047	0.456

Table 10: Result of prioritization of effective factors in empowerment

Effective factor	CL_i^*	Priority factors rating
Training	0.733	1
Reward based on function	0.636	2
Group work	0.495	3
Partnership system	0.456	4
	0.395	5
Responsibility	0.257	6
Motivation	0.237	7
Authority resigning	0.093	8

As is clear, training and sharing systems have the greatest importance and priority for empowering workers.

The difference of this research with other investigations is based on evaluation and prioritizing the effective factors on empowerment human resources by using the TOPSIS technique; this method is used in order to determine their degree of importance in improving the organization performance.

CONCLUSIONS

Although, this is the age of empowering staff, there is evidence of several failures of most programs in satisfying managements' expectations. Many organizations have tried to use empowerment while they were not completely aware of all of its aspects or they had used it in an amateur or incorrect way. All of these weak points that accompanied the failed efforts to empower staff have been used as an excuse for some to criticize the whole concept of empowerment. Although, some organizations have been unsuccessful in introducing empowerment programs, it is still subject to attention in most organizations. So, it is essential for organizations to first recognize and study the effective aspects of empowerment programs and then try to introduce it in a professional manner.

So that, by the help of empowerment process they can be able to protect the customers, develop the supply chain capability, maintain organization's stability, acquire profitability and achieve their objectives.

Identification of priority of the factors was done using the TOPSIS model, because it model involves the importance and weights of factors and distances from the negative and the positive ideal (Table 10).

Some suggestions are given below:

- The senior management of an organization must pay close attention to the effective factors, problems and difficult aspects that are included in an empowerment program and should try to eliminate, or at least minimize, these problems
- Having priorities identified by the TOPSIS method in mind, it is best to keep to this order of factors when introducing an empowerment program

- Those responsible for developing strategy in an organization need to pay close attention to the effective factors and strategies for empowering staff must be put into place

NOTATIONS

CL = Identifying the relative closeness
V_{j+} = Ideal positive solution
V_{i+} = Ideal negative solution
N = Sample volume
P = Success ratio
q = Unsuccess ration
e = Error

REFERENCES

Amichai-Hamburger, Y., K.Y.A. McKenna and S. Tal, 2008. E-empowerment: Empowerment by the internet. Comput. Hum. Behav., 24: 1776-1789.

Chang, L. and C. Liu, 2007. Employee empowerment, innovative behavior and job productivity of public health nurses: A cross-sectional questionnaire survey. Int. J. Nurs. Stud., 45: 1442-1448.

Chua, R.Y.J. and S.S. Iyengar, 2006. Empowerment through choice: A critical analysis of the effects of choice in organizations. Res. Org. Behav., 27: 41-79.

Compbel, C.R. and M.J. Martinko, 1998. An Integrative attribution al perspective of empowerment and learned helplessness: Multi method field study. J. Manage., 24: 173-200.

Conger, J.A. and R.N. kanungo, 2002. The Empowerment process, integrating theory and practice. Acad. Manag. Rev., 13: 471-482.

Evans, J. and W.M. Lindsay, 2004. The Management and Control of Quality, 6th Edn., South-Western College Pub., Southern Western, ISBN: 9780324202236.

Greenberger, D.B., S. Strasser, L.L. Cummings and R.B. Dunham, 1989. The impact of personal control on performance and satisfaction. Org. Behav. Hum. Dec. Pro., 43: 29-51.

Littrell, R.F., 2007. Influences on employee preferences for empowerment practices by the ideal manger in chine. Int. J. Intercultural Relat., 31: 87-110.

Mullins, L., 1999. Management and Organizational Behavior. Prentice-hall Publications Ltd., London.

Peterson, N.A., M.A. Zimmerman and A. Marc, 2004. Beyond the individual: Toward a homological network of organizational empowerment. Am. J. Commun. Psychol., 34: 129-145.

Robbins, T.L., M.D. Crino and L.D. Fredendall, 2002. An integrative model of the empowerment process. Hum. Res. Manage. Rev., 12: 419-443.

Scarpello, V.O. and I. Ledvinka, 2006. Personnel/Humen Resource Management: Empowerment and Functions. Pws- Kent Publishing Co., USA., ISBN: 9780534872069.

Tang, T.S., M.M. Funnell, M.B. Brown and J.E. Kurlander, 2009. Self-management support in real-world settings: An empowerment-based intervention. Patient Educ. Couns., 79: 178-184.