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Identification of Effective Indexes and Prioritization of Performance on the Increase of Productivity by Using Model Integrating Ahp and Topsis

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Abstract: In the ever changing and complex condition of the present day prevailing over the economic, social and political environment, one of the factors which can help organization's survival is the issue of productivity. For this reason, in this research, we have tried to identify the most important factors associated to productivity and in the next step we have prioritized electrical power plants of Tehran Province. After study of the literature and prior research on productivity and decision making techniques as well as interview with experts and university professors, a questionnaire was prepared which included determinants of productivity. After analysis of the initial questionnaire, the final criteria were indentified. To find importance degree of each criterion, the second questionnaire containing tables of criteria paired comparisons was set up. The third questionnaire was used to obtain the required data for the electrical power plants ranking based on their weaknesses and strengths. In the end, the criterion planning was found the most important factor and Rajaee Electrical Power Plant was ranked with the best performance.

Key words: Productivity · Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) · Analysis Hierarchical Process (AHP) · Multiple Attribute Decision Making (MADM) · Electrical Power Plants in Tehran Province

INTRODUCTION

In today's competitive environment, the survival of the economic enterprises depends on the continuous improvement of performance in order to increase the competitive ability and maximize the profit. This important can be achieved through setting goals and planning and consequently evaluate the performance to be aware of the rate of success in achieving predetermined goals [1]. Monitoring and evaluation is a subject that has been raised, since the classic theories of management have been raised. In other words, all opinions of management, in somehow, has paid attention to the monitoring, control and evaluation and has bade them as one of the basic tasks of management knowledge [2]. Recent studies show this reality that, traditional measures of the performance which have been based on management accounting systems are not enough [3].

Today, the productivity is the most common and the most efficient mechanism to evaluate and measurement of an enterprise's performance. So, in the last few decades, examination of the different economic sectors or enterprises and economic units at the level of microeconomics through the measurement and estimation of productivity has been always considered for different fields of social science researchers in particular, the economics and management [4]. The efficiency is a general and comprehensive concept. Increase in efficiency as a requirement to upgrade the level of life, well-being and relaxation and comfort always has been considered by economists and politicians [5].

In the different organizations and companies, the profitability represents the financial position at the present and productivity represents the future status. Therefore, an organization or company just can be hopeful to continue profitability, as long as that considers

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the productivity issues. Because in the long term, increase in the productivity causes decrease in the costs and increases amount of profitability. But improving productivity in an organization, in addition to the listed items, will improve the performance of various parts in that organization and also causes the development and progress of the organization in the competitive market [6].

Regarding to the country's macroeconomic, increased productivity leads to *1*) increased economic growth, *2*) control inflation, *3*) increased economic competitiveness, *4*) increase per capita income, *5)*cost reduction, *6*) increase profitability, *7)* optimum use of resources, *8*) increase the GDP and etc. So the economic development in any country is depended on improvement in the productivity of that country [7].

In the past, productivity in electrical power plants was not enough in attention, due to the price of electricity, distribution process and the low benefit. But in recent years, the price of electricity at a reasonable price has increased under the supervision of the government and therefore, the productivity in electrical energy section has been increasingly important for electrical power plants [8]. Therefore, increase of productivity in the power sector can have significant impact on various industries of the country. Generally, with respect to the foregoing and sensitivity in the power industry, in this research three objectives have been considered. The primary purpose, is the identifying the effective criteria for increasing the productivity of the Electrical power plants in Tehran Province and the second objective, is determination of the amount of relative importance of effective criteria on performance measurement of electrical power plants by AHP technique. And the third objective is ranking of the electrical power plants on the base of identified criteria by TOPSIS technique.

Literature Review: In this research in order to assessment and derive the appropriate parameters and indicators, extensive library study has been done and various models has been considered [9].

In a study entitled "identification and prioritization of effective factors on productivity of human resources by using Multiple Attribute Decision Making (MADM) techniques", first, identified the most important factors of productivity of human resources in one of the clothing jeans procreative companies in Yazd provision and then prioritized these factors in next step. Research concluded to this result that, managing factors were recognized as the most important factor and then, consequently, personal, cultural, social-psychological and environment in end (Tavari Mojtaba et al., 2008). [10] in the master's thesis entitled "identification and prioritization of effective factors on productivity of PARS refractory products by using Multiple Attribute Decision Making (MADM) techniques, has identified and prioritized the effective factors on productivity in the PARS YAZD refractory products corporation by using techniques fuzzy environments. The techniques that he has employed include the Analysis Hierarchical Process (AHP), MT series, TOPSIS. Respectively the quality of row materials and short term and long term planning have recognized as the most important factors affecting the productivity [10].

Zarei, 2000 in his master thesis entitled "Designing the Multiple Attribute Decision Making (MADM), to specify and determine the factors affecting the productivity in branches of Refah e Kargaran Bank"; the researcher has identified and prioritized the effective factors on productivity in Refah e Kargaran bank. He has employed the TOPSIS model and the Analysis Hierarchical Process (AHP). In his research management factor has recognized as the most important factor [11].

Kahraman and Colleagues, 2009 in a study entitled "evaluation of the performance of the Turkish banks by using a Integrating model of Analysis Hierarchical Process (AHP) and fuzzy TOPSIS method, the research has offered a decision-making model with a Non-deterministic Multiple Attribute Decision Making (MADM) in order to performance evaluation of Turkish banks. Five big banks in the Turkish banking sector in terms of financial and Non-financial indicators were evaluated. On the based on some specialist's opinion that, have employed the Analysis Hierarchical Process (AHP), the importance of some criteria was cleared and these opinions were employed as useful information for TOPSIS in order to ranking the banks. The results show that, not only the financial performance but also Non-financial performance should be considered in the competitive environment [12].

Chia Chi S., [13] in a study entitled "A Performance Evaluation Model by Integrating Fuzzy Analysis Hierarchical Process (AHP) and Fuzzy TOPSIS Methods", has offered a evaluation model on the based on Non-deterministic analytical and also on the based on sequential and technical to achieve an ideal solution as well as TOPSIS. He helps the industrial researchers to evaluate in an unknown environment i.e. where the ambiguity and mentality are run by the help of theological values. Proposed method makes the analyst able to have better understanding of the comprehensive evaluation process and disposal the tools to support adopted decision more accurate, more effectively and more regularly [13].

Analysis Hierarchical Process (AHP) Method: The Analysis Hierarchical Process (AHP) Method" as one of Multiple Attribute Decision Making (MADM) Methods, is presented by professor Saati. This method has taken into consideration by researchers from 1980. And so far so many research have been done in this field [14-17].

Analysis Hierarchical Process (AHP) Method is applicable to solve the problems without the structure in variety of decision-making situations, ranging from simple personal decisions to vital complicated compressed decisions [15]. This is one the Multiple Attribute Decision Making (MADM).This method helps us to take suitable decision to complicated topics by simplifying and guiding the decision-making process.AHP is a method that a complex situation has decomposed to smaller parts, then these components fall in a hierarchical structure and finally in a process the order of priority of the variables will be determined [18].

Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) Method: The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), technique will be employed to performance measurement and ranking. This technique is determined as a Multiple Attribute Decision Making (MADM).The TOPSIS technique is presented by Huang and Ions in 1982. This technique is one the customary and famous methods in the field of Attribute Decision Making (MADM) approach, That is the most widely recognized in literature relating to the Multiple Attribute Decision Making (MADM) [19, 20, 21, 22, 23, 24].

The TOPSIS method can be fitted to determine optimum solving among several options. This technique is based on this premise that, the chosen option must be in at least distance with positive solution and maximum distance with negative solution Gumus A.T., [25]; Jahanshahloo G.R. *et al*. [26]; Kim G. *et al*. [22].

In this method "m" options will be assessed by "n" indexes and any issue in MADM style, with "m" options and "n" indexes can be used as a geometric system includes the "n" points in "n" dimension space. And on this basis of, the best and the worst possible situation for each indicator will be determined. This technique is based on this concept that, the selected option should be in at least distance with the best possible situation and also should be in at most distance with the worst possible situation. It should be noted that, it is assumed that, the desirability of each indicator is reduction or incremental uniformly (Qodsipoor H, 2007).

Research Questions:

- What are the effective criterions to increase the productivity of electrical power plants in Tehran provision?
- What extent is the relative importance of each of the criteria using the AHP technique?
- How is the ranking of electrical power plants in Tehran province on the basis of determined criteria by using TOPSIS technique?

MATERIALS AND METHODS

In general the aim of research methodology is that, the researcher determines which materials and methods should be chosen to access the possible responses more accurate and faster. This applies the target and nature of the subject of research and executive facilities. The present study according to the nature of the subject and determined targets is applied research and according to the nature of implementation is descriptive- surveying, which is fitted to special abilities. In this study, in order to prepare and formulate the theoretical basics and history of research, tools such as plug research, the Internet and databases that include books, articles has been used, which are related to the subject. In fact the method of data collection in order to collect literature and history research has been library studies. As well as the information and data collection about research questions has been field method and exploratory interviews has used in order to determination of criteria, sub-criteria and certified individuals as respondents. Existing documentation and three questionnaires designed to obtain data and information to assess performance of electrical power plants. The *first* questionnaire was designed to identify the factors influencing the performance of electrical power plants in Tehran province with the productivity approach, the *second* questionnaire was used to determine the amount of the importance of each of the identified criteria and sub-criteria and the *third* questionnaire was used for data collection in order to prioritize. To assess the validity of the questionnaires, tools of measurement were authorized to a number of experts and university professors; they were requested to read the questions precisely and state their comments. The results of expressed ideas indicated that, questions were in a high validity. Also to determine the reliability of the questionnaire as well as the coefficient of "Cronbach's Alpha" was used. After collecting questionnaires

coefficient of "Cronbach's Alpha" was calculated by "SPSS Statistic 17.0" that the results presented in Table 1 [27].

As the Table 1 indicates, the coefficient of Cronbach's Alpha in both questionnaires are more than 0.7.which it can be concluded that, the reliability of both questionnaires is acceptable. The first step in choosing the respondents is the definition and identification of the target community (Statistical Society). The first statistical survey is made up 509 people from all community managers, experts and consultants in the "Organization and Planning" office and electrical power plant experts in Tehran province. The sample size is 294 choices which was calculated by sample size formula:

Equation 1: Sample Size Formula

$$\frac{N\,(z\frac{\alpha}{2})^2\sigma^2}{(e)^2\,(N-1)+(Z\frac{\alpha}{2})^2(\sigma^2)}$$

The statistical community is selected in order to identify the ultimate criteria of effective factors on increasing productivity. Second statistical society is determined in order to weight to the identified criteria and sub-criteria with use of paired comparison tables. The statistical community includes 20 experts in the field of productivity who have the necessary expertise in the assessment of the productivity. These 20 certified persons have been selected by asking of managers who were conducted by interview. Another statistical society, as well as, was determined in order to, collect data and information to assess and prioritize the criteria and the sub-criteria in electrical power plants. This is a log of all community managers, administrators, experts and employees of electrical power plants in Tehran province. The statistical society was 509 people. The sample size determined by using "sample size formula" that included choosing 293 people. Documents and information available in the organization was used, In order to collect information for two quantitative criteria included "Return on Sale" and "Receipt of Claims".

Data Analysis: in order to select the final criteria and important, in order to increase the productivity, the questionnaire "A" which was available to members of the statistical community was collected.293 out of 300 contributed questionnaires were returned. And obtained data analyzed by "t-test". This test was carried out at the 95% Confidence level and whilst tested cases determined 3. Therefore, assumption H0 is equal to μ x = 5 and assumption H1is equal to μ x 5 > SPSS output in Table 2 [28].

As the Table 2 shows that, of 37 chosen criteria which were selected by studying relevant books and texts and also interview with managers and experts, 27 criteria were finalized in order to prioritize the electrical power plants in Tehran province. In this research just those criteria will be approved that, in which assumption H0 is rejected and assumption H1 is accepted. In order to prioritize the performance of electrical power plants in Tehran province with the productivity approach, the weight and importance rate of each of the components should be determined. Because of this, the basis of the questionnaire "B" is on the paired comparison matrixes in the different levels of the decision tree, compiled the assertion of the respondents feedback about the final criteria (resulting from the processing of questionnaire "A"). This questionnaire was sent for 20 experts in electrical power plants in Tehran province. On the main part of this questionnaire, on the base of the guide to the completion of the questionnaire, by using an example, was described, how to vote the house of the paired comparison matrix. Respondents provided their opinion to this questionnaire and finally the completed questionnaires were collected. As the Analysis Hierarchical Process (AHP) technique is on the base of the group decision-making, therefore, it was necessary that, the collected data through 20 questionnaires be into integrated. In other words, the all of the paired comparison matrixes of each respondent must be combined into the group conflated matrix. But, in Analysis Hierarchical Process (AHP) technique to perform this action, the compatible condition of paired comparison matrixes of every single respondent is necessary. Therefore, first of all, for all the collected paired comparison matrixes the rate of compatibility of matrixes was controlled by using "Expert Choice Software". The result indicated the compatibility of all matrixes in all levels of tree of Analysis Hierarchical Process (AHP). Then, in the next step; compatible corresponding matrixes were integration on the base of geometric mean. First of all, the calculations and the results of this integration obtained by the "Excel Software", then "EC software" was employed for combining all matrixes and composed final tree levels according to the weight of the tree, which is made up from the beginning. That its results completely below Table 3 and Table 4.

Table 1: Coefficient of Cronbach's Alpha in Questionnaires

Questionnaires	Coefficient of "Cronbach's Alpha
The Final Criteria Identified Affecting Productivity	0.799
Prioritization of Performance	0.789

Table 2: Perceived Results by t-Test

					95% confidence level		
Criteria	The amount of t-statistics	Degrees of freedom	Mean level	The mean difference with the amount of test cases	Higher limit	Lower limit	Situation
Short Term And Long Term Planning	12.905	293	0.000	1.303	1.51	1.11	Accepted
The Mechanized Processes	9.085	293	0.000	0.946	1.15	0.74	Accepted
Recruiting And Hiring Human Resources	17.470	293	0.000	1.429	1.59	1.27	Accepted
The Type of Management	14.398	293	0.000	1.544	1.79	1.33	Accepted
Pay Attention To Research And Development	17.470	293	0.000	1.429	1.48	1.14	Accepted
Entrusting	6.253	293	0.000	0.565	0.74	0.39	Accepted
The Organizational Structure	1.474	293	0.142	1.184	0.43	0.06-	Rejected
Make Full Use of Existing Resources	22.965	293	0.000	1.714	1.86	1.57	Accepted
Amenities	1.130	293	0.260	0.156	0.43	0.12-	Rejected
Performance Evaluation Methods	1.624	293	0.105	0.238	0.53	0.05-	Rejected
Modification Methods And The Production Process	17.470	293	0.000	1.429	1.75	1.41	Accepted
Waste Management of Electrical power plant	6.701	293	0.000	0.646	0.84	0.46	Accepted
Reducing Air, Soil, Water and Audio Pollutants	6.919	293	0.000	0.694	0.89	0.50	Accepted
The Green Space Created	0.164-	293	0.870	0.020-	0.23	0.27-	Rejected
The Coefficient of Plant's Readiness	0.353	293	0.724	0.41	0.27	0.19-	Rejected
Having International Standards	1.152	293	0.250	1.29	0.35	0.09-	Rejected
The Quality of The Raw Materials	22.644	293	0.000	2	2.17	1.83	Accepted
The Price of Raw Material	17.470	293	0.000	1.429	1.39	1.01	Accepted
Transportation of Raw Materials and Storage	6.763	293	0.000	0.483	0.62	0.34	Accepted
The Availability of Raw Material Is at Any Time	14.618	293	0.000	1.190	1.35	1.03	Accepted
Period of Receipt of Claims	6.870	293	0.000	0.537	0.69	0.38	Accepted
Return on Sales	21.775	293	0.000	1.939	2.11	1.76	Accepted
Type of Investment Mix	1.014	293	0.312	0.102	0.30	0.10-	Rejected
The Rate of Return on Investment	2.150-	293	0.032	0.177-	0.01-	0.34-	Rejected
Equipment And Machinery	22.491	293	0.000	1.986	2.16	1.81	Accepted
Training of Human Resources	10.510	293	0.000	0.959	1.14	0.78	Accepted
Discipline	17.010	293	0.000	1.313	1.46	1.16	Accepted
The Incidence of Creativity	13.561	293	0.000	1.082	1.24	0.92	Accepted
Conscience Thing	16.322	293	0.000	1.510	1.69	1.33	Accepted
Job Security	17.014	293	0.000	1.197	1.34	1.06	Accepted
Job Turnover	0.961-	293	0.338	0.082-	0.09	0.25-	Rejected
Salary And Wage on The Bases on Performance	17.470	293	0.000	1.429	1.59	1.27	Accepted
Reward Cash And Non-Cash	22.644	293	0.000	2	2.17	1.83	Accepted
Education Level	1.856	293	0.064	0.170	0.35	0.01-	Rejected
Non-Discrimination	17.470	293	0.000	1.429	1.13	0.73	Accepted
The Physical Work Environment Conditions	19.219	293	0.000	1.755	1.93	1.58	Accepted
The Safety of The Working Environment	8.849	293	0.000	0.894	1.09	0.70	Accepted

Table 3: Compatible Corresponding Matrixes

No.	The Matrix Name	The Rate Of Incompatibility
1	Paired Comparison Matrix Among The productivity Criteria	0.07
2	Paired Comparison Matrixes Among Sub-Criteria of The Human Resource Criteria	0.05
3	Paired Comparison Matrixes Among Sub-Criteria of The Management Criteria	0.08
4	Paired Comparison Matrixes Among Sub-Criteria of The Investment Criteria	0.01
5	Paired Comparison Matrixes Among Sub-Criteria of The Environment Criteria	0.00
6	Paired Comparison Matrixes Among Sub-Criteria of The Material Criteria	0.01

In order to classifying the electrical power plants in Tehran province, at the first step and for more convenience, the information regarding to partitioning the criteria and options has shown in Table 5.

Decision Making Matrix: On the basis of results obtained by questionnaire "C", the decision making matrix after obtaining the average responses, can be formed. Results in Table 6 are presented.

Determination of Positive Ideal and Negative Ideal: After forming the tunable matrix without a scale, in the next step the positive ideal and negative ideal should be determined. Achieved results are shown in Tables 7 (Positive Ideal) and Table 8 (Negative Ideal).

Table 4: Final Weight and Final Grade of Each Factor

Factor	Weight of Factor	Criteria	Weight of Criteria In Sub-Group	Final Weight	Final Grade
Management	0.257	Short Term And Long Term Planning	0.162	0.054	1
		The Mechanized Processes	0.105	0.035	10
		Recruiting And Hiring Human Resources	0.132	0.044	5
		The Type of Management	0.099	0.033	12
		Pay Attention To Research And Development	0.125	0.041	8
		Make Full Use of Existing Resources	0.135	0.045	4
		Entrusting	0.087	0.029	14
		Modification Methods And The Production Process	0.155	0.051	2
Human Resource	0.243	Training of Human Resources	0.086	0.035	10
		Discipline	0.064	0.026	16
		The Incidence of Creativity	0.106	0.043	6
		Conscience Thing	0.126	0.049	3
		Job Security	0.085	0.051	2
		Non-Discrimination	0.085	0.034	11
		Salary And Wage on The Bases on Performance	0.122	0.049	3
		Reward Cash And Non-Cash	0.108	0.043	6
		The Physical Work Environment Conditions	0.068	0.028	15
		The Safety of The Working Environment	0.112	0.045	4
Material	0.201	The Quality of The Raw Materials	0.325	0.042	15
		The Price of Raw Material	0.312	0.040	7
		Transportation of Raw Materials and Storage	0.131	0.017	10
		The Availability of Raw Material Is at Any Time	0.232	0.030	7
Investment	0.201	Period of Receipt of Claims	0.262	0.028	9
		Return on Sales	0.401	0.042	18
		Equipment And Machinery	0.337	0.035	13
Environment	0.099	Waste Management of Electrical power plant	0.313	0.009	19
		Reducing Air, Soil, Water and Audio Pollutants	0.688	0.021	17

Table 5: Partitioning the Criteria and Options

Code	Criteria	Code	Criteria	Code	Criteria
C1	Short Term And Long Term Planning	C10	Discipline	C19	The Quality of The Raw Materials
C2	The Mechanized Processes	C11	The Incidence of Creativity	C20	The Price of Raw Material
C3	Recruiting And Hiring Human Resources	C12	Conscience Thing	C21	The Availability of Raw Material Is at Any Time
C4	The Type of Management	C13	Job Security	C22	Transportation of Raw Materials and Storage
C5	Make Full Use of Existing Resources	C14	Non-Discrimination	C23	Waste Management of Electrical power plant
C6	Entrusting	C15	Salary And Wage on The Bases on Performance	C24	Reducing Air, Soil, Water and Audio Pollutants
C7	Modification Methods And The Production Process	C16	Reward Cash And Non-Cash	C25	Equipment And Machinery
C8	Pay Attention To Research And Development	C17	The Physical Work Environment Conditions	C26	Period of Receipt of Claims
C9	Training of Human Resources	C18	The Safety of The Working Environment	C27	Return on Sales

Obtaining the Distance of Each Option from Positive Ideal Solution and from Negative Ideal Solution: Distance of each option from positive ideal solution and negative ideal solution has shown in Table 9 and Table 10.

The Calculation of the Amount of the Relative Affinity of Each Option to Ideal Solution: The amount of relative affinity of each option to ideal solution has shown in Table 11.

According to Table 11 amount of the relative affinity of each option to ideal solution, now it can be ranked the electrical power plants in Tehran province. The final result on the basis of the TOPSIS method has shown in Table 12.

According to Table 12 final ranking of electrical power plants in Tehran province are as follows:

- Shahid Rajaee Electrical Power Plant
- Damavand Electrical Power Plant
- Rey Electrical Power Plant
- Qom Electrical Power Plant
- Besat Electrical Power Plant
- Tarasht Electrical Power Plant

Table 6 (a): Decision Making Matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9
A1	5.236	4.12	5.754	6.666	4.54	5.077	4.995	4.158	4.336
A2	4.987	5.01	6.368	6.874	4.33	5.841	5.08	4.665	4.856
A3	6.112	4.45	5.852	6.454	4.874	5.265	5.14	5.451	4.666
A4	6.658	5.53	6.333	7.45	5.04	5.228	5.2	4.885	5.21
A5	6.294	4.764	6.411	7.142	5.32	5.658	4.998	5	5.1
A6	5.124	4.235	5.631	6.125	5.111	6.12	5.222	4.556	4.558

Table 6 (b): Decision Making Matrix

	C10	C11	C12	C13	C14	C15	C16	C17	C18
A1	5.685	5.415	4.741	6.11	4.125	5.102	5.321	6.874	6.874
A2	5.995	5.12	4.526	6.24	5.14	5.68	5.584	6.158	7.654
A3	6.48	4.115	5.102	6.489	4.625	5.145	5.441	6.415	7.42
A4	6.841	5.23	4.258	6.558	5.085	5.421	5.268	7.15	7.145
A5	6.659	4.854	4.852	6.87	4.754	5.684	5.458	7.458	7.02
A6	6.21	4.774	5.2	5.887	4.874	4.984	5.128	7.254	7.658

Table 6 (c): Decision Making Matrix

	C19	C20	C21	C22	C23	C24	C25	C26	C27
A1	4.232	4.321	4.754	6.874	6.447	4.258	5.987	150	3.58
A2	4.578	4.125	4.985	6.547	6.28	4.356	5.852	170	7.45
A3	4.874	4.854	5.102	5.987	5.589	4.985	5.123	180	4.74
A4	4.455	5	4.998	6.332	6.123	4.654	5.245	150	11.1
A5	4.654	4.654	5.085	6.415	6.258	4.852	5.333	170	10.47
A6	4.412	4.225	4.87	6.385	5.859	5.025	5.745	210	6.43

Table 7: Positive Ideal

Criteria	Positive Ideal	Criteria	Positive Ideal	Criteria	Positive Ideal
C1	0.0254	C10	0.0115	C19	0.0184
C2	0.0168	C11	0.0193	C20	0.0180
C3	0.0190	C12	0.0217	C21	0.0126
C4	0.0148	C13	0.0225	C22	0.0074
C5	0.0200	C14	0.0149	C23	0.0039
C6	0.0131	C15	0.0213	C24	0.0092
C7	0.0213	C16	0.0183	C25	0.0154
C8	0.0190	C17	0.0124	C26	0.0099
C9	0.0155	C18	0.0193	C27	0.0244

Table 8: Negative Ideal

Criteria	Negative Ideal	Criteria	Negative Ideal	Criteria	Negative Ideal
C1	0.0190	C10	0.0095	C19	0.0160
C2	0.0125	C11	0.0146	C20	0.0148
C3	0.0167	C12	0.0178	C21	0.0117
C4	0.0121	C13	0.0193	C22	0.0065
C5	0.0163	C14	0.0120	C23	0.0034
C6	0.0108	C15	0.0187	C24	0.0078
C7	0.0204	C16	0.0168	C25	0.0132
C8	0.0145	C17	0.0102	C26	0.0139
C9	0.0129	C18	0.0173	C27	0.0079

Table 9: Distance from Positive Ideal

Option	d_1^+	d_2^+	d_3^+	d_4^+	d_5^+	d_6^+
Distance From Positive Ideal	0.000416	0.000167	0.000270	0.0000367	0.0000314	0.0002357

Table 10: Distance from Negative Distance

Option	d_1^-	d_2^-	d_3^-	d_4^-	d_5^-	d_6^-
Distance From Negative Ideal	0.0000531	0.0001453	0.0000957	0.0004305	0.0003547	0.0000956

Table 11: The Amount of Relative Affinity of Each Option to Ideal Solution

CC1	CC2	CC3	CC4	CC5	CC6
0.2633	0.4827	0.3733	0.7741	0.7708	0.3890

Table 12: Final Result on The Basis of the TOPSIS Method

Option	Grade
A1	Sixth
A2	Third
A3	Fifth
A4	First
A5	Second
A6	Forth

CONCLUSION

The first step to assess the performance with productivity approach, is the identifying its effective factors. Although there are several different factors which can have impact on this, but in the present investigation, after careful consideration of the previous research and interviews with knowledgeable managers and experts, 37 influential criteria which affect on productivity were identified. Then “t-test” was employed to choose 27 effective criteria to assess performance of electrical power plants in Tehran province. In the second question, especially as the results of study on productivity show, the criteria for long term and short term planning is the most important factor's hence this factor has the greatest impact on productivity. And this indicates that, planning plays a very important role to create and increase productivity in the organization. Therefore, managers should pay special attention to planning. After planning sub-criteria, two other sub-criteria include “job security” and “modification the methods of the production process” have the most important rate that can increase productivity. And so to the end of the following, can be determined the role of criteria on increasing the productivity of electrical power plants. It is recommended that, after the productivity these factors to be considered and put this attention that these factors must be considered in combination, but the only thing that should take into consideration is the severity and weaknesses of consideration to these factors. It is recommended that, this matter, on the basis of achieved rates of importance should be considered. According to another research question that how is the ranking of electrical power plants in Tehran province on the basis of determined criteria by using TOPSIS technique? In this research by ranking the electrical power plants, it is tried to identify their strengths and weaknesses. To find appropriate strategy to increase productivity in the electrical power plants and thus increase the productivity in the whole system. The results indicate the position of the electrical power plants on each criterion. Electrical power plants on the basis of amount of obtained rating in each criterion can assess the rate of their performance and achieving objectives. And in attempting to fix the weaknesses and reinforce their strengths. In this regard, the electrical power plant Shahid Rajaee compared to other electrical power plants in Tehran province, earned best performance and has the highest rate of achieving increased productivity. And so the electrical power plants of Damavand electrical power plant, Rey electrical power plant, Qom electrical power plant, Besat electrical power plant and Tarasht electrical power plant were supposed to the later rank of important.

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