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Education of Prioritizing Managerial Indices in Urban Projects

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Abstract. The purpose of this study is to evaluate, compare and prioritize the managerial indices in urban projects based on the opinion of their practitioners. It is conducted in Urban Railway Project of Shiraz as a case study. In this study, a questionnaire was designed; and completed by thirty-nine practitioners involved on the project. The responses are assessed and analyzed; and the results are obtained. As a result, it is found that 27 indices out of 45 are in suitable or relatively suitable conditions, however, 18 indices are in unsuitable or relatively unsuitable conditions. In the last section of this article, the results obtained have been discussed.

Keywords: project, managerial indices, management, index, urban railway

1. Introduction

Project and its managerial indices are important issues that have attracted researcher's attention during the recent years. For example, according to Project Management Institute Guidebook (2008); project refers to collection of efforts for creating products, services or unique effects [1]. Javani (2002) stated that project management is the planning, organizing and supervision of the desired project goal with respect to the time, cost and specified quality [2]. According to Rezvanjoo (2008), project success depends significantly on project manager's abilities [3]. Bahman-zangi et al. (2006) express that identifying the reasons of project's delays is an effective step to compensate for the delay and avoid repeating them in future projects [4]. According to Taimoori-nezhad and Partner (2005), having creative human resources is the most important invisible property and a golden key for projects in competition with others [5]. According to Ghaffari (2004), selecting the consultants and contractors, that can plan a program, design and perform project and pay attention to three factors: time, cost and quality of work are very important in each project [6]. Nowrouzian (2005) has expressed that rapid changes in recent years have made organizations face several challenges. However, successful organizations use management tools and new technology for their benefits [7].

The aforementioned statements are parts of the various managerial indices that should be considered in the performance of the management of the projects. In order to prioritize the managerial indices in the urban projects and according to the project's practitioners this research was conducted in Shiraz Urban Railway Project as a case study. A questionnaire was designed which was filled by project managers, experts, consultants and contractors; and the results were analysed afterwards. In this article, a summary of Shiraz Urban Railway Project is presented initially. Subsequently, the methodology of prioritizing managerial indices was presented. Afterwards the priority indices are determined from the ideas of the project's practitioners, and the results are presented. Finally, in the last section of this article the results are discussed.

2. History

The construction of the first phase of Shiraz Metro Project started on 2001; however, this phase is prolonged more than ten years. The project was designed in three phases. The first phase is extended from the southeast to the northwest of Shiraz, and has twenty-one stations. Additionally, the length of each station is over a hundred meters based on the length of the urban trains. The total length of the first phase of the metro path is twenty-four kilometers. Moreover, the second and third phases have not been started yet [8].

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3. Methodology

In order to recognize and compare the priority of indices in this case study, 45 questions with 5 choices were provided in a questioner. Opinions of 39 managers, experts, contractors and consultants were collected. Response to a question was set based on the following five choices: very low, low, average, high and very high. Selecting very high and very low means complete agreement and complete disagreement with the question's concept, respectively. The percentages of all correspondents to the 5 choices are given in Table 1.

Table 1- The percentages of all correspondents to the 5 choices

Row	Index title	very low	low	average	high	very high
1	Satisfaction from project's progress	5	23	55	15	3
2	Existence of a coordinate program among the progress	5	37	37	21	0
3	Prolongation of the project	5	5	34	46	10
4	Adequate feasibility studies	5	13	27	45	10
5	Adequate time for feasibility studies	0	11	41	32	16
6	Correct estimating of the performance period	16	39	32	13	0
7	Considering alternates in programming	10	28	52	10	0
8	Existence of information regarding to similar projects	15	27	33	15	10
9	Considering delay reasons of similar projects	25	27	27	16	5
10	Presence of information bank	5	20	32	28	15
11	Promotion of project staff professional knowledge	0	5	23	46	8
12	Cooperation between planning and construction	0	18	54	26	2
13	Presence of mistakes and faults in planning phase	7	16	46	24	7
14	Repetitious technical changing in plans	5	23	28	39	5
15	Existence of update equipments in project performance	0	21	39	37	3
16	Effects of social pressure on project's progress	0	29	34	37	0
17	Allocation of enough and adequate deposit	3	29	52	13	3
18	Effects of lack of financial sources on project progress	5	10	18	26	41
19	Effect of inflation on increasing costs of project	5	3	24	44	24
20	Clearance and completeness of contractions	3	10	31	51	5
21	Complete notation of contracts aspects	0	3	15	77	56
22	Ambiguity in rules and regulations	10	28	42	20	0
23	Effect of changing rules on project's progress	8	31	37	16	8
24	Updating rules and regulations	0	30	43	22	5
25	Appropriate structure in organization of project	5	13	46	36	0
26	Coordinating management, administrative system and budget	5	22	60	13	0
27	Using of general consultants in project	3	21	13	42	21
28	Lack of expert staffs	13	41	43	8	5
29	Appropriate strategy in keeping expert staff	18	36	28	15	3
30	Appropriate selection of consultants and contractors	5	24	34	24	13
31	Relationship between manager and consultants and contractors	0	0	41	46	13
32	Coordination between project staff	0	20	20	42	18
33	Exact definition of staff responsibilities	3	18	31	43	5
34	Results acquired from staff training	8	24	52	13	3
35	Coordination between staff training and work period	10	15	54	21	0
36	Stability of managers during project	10	26	28	26	10
37	Coordination between legal authority and responsibilities	3	18	39	27	13
38	Supervision of project manager on the project	3	13	38	36	10
39	Usage of update technologies in project management	3	18	40	34	5
40	Using scientific management methods in project	10	10	50	30	0
41	Results of project control systems	0	13	47	32	8
42	Using appropriate soft-wares in project control	0	8	50	34	8
43	Appropriate time and cost controlling among the progress	8	31	40	16	5
44	Comparison between executed and scheduled work	3	23	33	33	8
45	Applicability of project's forms and reports	3	16	32	39	10

3.1. Calculation of index number

An index number was calculated for comparing the above-mentioned indices for each question. For calculating the index number; the following stages were completed:

1. In each row of the table, the percentage number in *average column* was excluded.
2. In each row of the table, the percentage number in *very high column* is multiplied by two and added with the percentage number of *high column*; for example, in the first row of the table: 3×2+15×1= 21.
3. In each row of the table, the percentage number in *very low column* is multiplied by two and added with the percentage number of *low column*; for example, in the first row of the table: 5×2+23×1= 33.
4. Due to the nature of each question, the numerical ratio of negative to positive idea was calculated for each question; for example 33 / 21= 1.57
5. Thus, for each question of the questionnaire, an index number was obtained.

Considering the process of calculating the number, the index number which is greater than one can be considered as an unsuitable item; and the index number which is less than one can be considered as a suitable item. The lower index number indicates *suitability*; and the larger index number indicates *unsuitability.*

3.2. Interpretations

According to the numbers obtained in the above-mentioned method the following interpretations may be assumed:

1. The managerial index may be evaluated as a suitable index; when the index number is less than 0.5.
2. The managerial index may be considered as a relatively suitable index; when the index number is between 0.5 and 1.
3. The managerial index may be evaluated as a relatively unsuitable index; when the index number is between 1 and 2 and;
4. The managerial index may be evaluated as an unsuitable index; when the index number is higher than 2.

4. Results

According to all practitioners' ideas, the prioritized indices are identified and presented in Table 2.D. additionally, the above operations were repeated based on the opinions of managers & experts, consultants and contractors and the results are presented in Tables 2.A to 2.C, respectively.

Table 2- Prioritization of indices based on the opinions of all groups separately and all participants

Row	Opinion of	Status	Situation	Index number
A	managements & experts	Suitable	less than 0.5	-33-32-4-40-41-28-25-10-39-45-27-42-15-31-21 11-12-26-43-44-37-36
		Rel. suitable	between 0.5 and 1	8-5-9-7-22-24-1-35
		Rel. unsuitable	between 1 and 2	16-13-34
		Unsuitable	higher than 2	23-30-29-14-17-6-3-18-20-19-38
B	Consultants	Suitable	less than 0.5	11-28-14-37-39-22-42-4-30-33-32-45-23-5-31-21
		Rel. suitable	between 0.5 and 1	8-13-6-25-40-41-38-17-15-27
		Rel. unsuitable	between 1 and 2	18-14-12
		Unsuitable	higher than 2	29-9-34-44-1-43-10-36-20-16-35-26-7-3-19
C	Contractors	Suitable	less than 0.5	16-23-41-42-30-21-6-5-11-31
		Rel. suitable	between 0.5 and 1	12-20-27-4-44-28-22
		Rel. unsuitable	between 1 and 2	32-10-13-38-17-34
		Unsuitable	higher than 2	-25-24-17-8-19-15-29-18-9-35-1-26-40-39-7-43 45-33-36-3-14
D	All participants	Suitable	less than 0.5	25-33-45-27-4-32-41-28-5-20-42-11-21-31
		Rel. suitable	between 0.5 and 1	36-30-40-14-12-44-23-10-39-22-15-37

		Rel. unsuitable	between 1 and 2	17-34-43-8-1-13-16-35-24
		Unsuitable	higher than 2	26-38-9-29-7-6-18-3-19

5. Discussion on the results

5.1. Suitable indices

According to the managements' & experts' opinions, as seen in Table 3.A, the following indices are in suitable conditions: complete notation of contracts aspects, suitable relationship between manager and consultants and contractors, using update equipments in pro performance, using appropriate software in project control, using general consultants in project, applicability of project forms and reports, usage of update technologies in project management, presence of information bank for future use, appropriate structure in organization of project, presence of expert staffs, presence of project control system, using scientific management methods in project, adequate feasibility studies, coordination between the project factors, exact definition of staff responsibilities, stability of managers during the project, coordination between legal authority and responsibility, comparison between executed and scheduled work, appropriate time and cost controlling among the progress, coordinating management, administrative system and budget, cooperation between planning and construction, and promotion of professional knowledge of project staffs respectively.

Furthermore, based on consultants' opinions, as seen in Table 3.B, the following indices are in suitable conditions: complete notation of contracts aspects, suitable relationship between manager and consultants and contractors, adequate time for feasibility studies, effect of changing rules on project's progress, applicability of project forms and reports, coordination between the project factors, exact definition of staff responsibilities, appropriate selection of consultants and contractors, adequate feasibility studies, using appropriate software in project control, ambiguity in rules and regulations, usage of update technologies in project management, coordination between legal authority and responsibility, repetitious technical changing in plans, presence of expert staffs, promotion of project staff professional knowledge respectively.

Moreover, according to contractors' ideas, as seen in Table 3.C, the following indices are in suitable conditions: suitable relationship between manager and consultants and contractors, promotion of project staff professional knowledge, adequate time for feasibility studies, correct estimating of the performance period, complete notation of contracts aspects, appropriate selection of consultants and contractors, using appropriate software in project control, presence of appropriate project control system, effect of changing rules on project's progress, and effects of social pressure on indices respectively.

5.2. Unsuitable indices

According to the managements' and experts' opinions, as seen in Table 3.A, the following indices are in unsuitable conditions: supervision of project manager on the project, effect of inflation on increasing the costs of project, clearance and completeness of contractions, effects of lack of financial sources on project progress, prolongation of the project, correct estimating of the performance period, allocation of enough and adequate deposit, repetitious technical changing in plans, appropriate strategies in keeping expert staff, appropriate selection of consultants and contractors, and the effect of changing rules on project's progress respectively.

Additionally, based on the consultants' idea, as seen in Table 3.B, the following indices are in unsuitable conditions: effect of inflation on increasing the costs of project, prolongation of the project, considering alternates in programming, coordinating management, administrative system and budget, coordination between staff training and work period, effects of social pressure on indices, clearance and completeness of contractions, stability of managers during the project, presents of information bank, appropriate time and cost controlling among the progress, satisfaction of the project's progress, comparison between executed and scheduled work, results acquired from staff training, considering delay reasons of similar projects, and appropriate strategies in keeping the staff respectively.

In addition, according to contractors' idea, as seen in Table 3.C, the following indices are in unsuitable conditions: appropriate time and cost controlling among the progress, considering alternates in programming, usage of update technologies in project management, using scientific management methods in project,

coordinating management, administrative system and budget, satisfaction of the project's progress, coordination between staff training and work period, considering delay reasons of similar projects, effects of lack of financial sources on project progress, appropriate strategy in keeping expert staff, update equipments in project performance, effect of inflation on increasing the costs of the project, existence of information regarding to similar projects, allocation of enough and adequate deposit, up to dating rules and regulation, appropriate structure in organization of project, repetitious technical changing in plans, prolongation of the project, stability of managers during the project, exact definition of staff responsibilities, and applicability of project forms and reports respectively.

6. Conclusion

A field research was conducted in Shiraz Urban Railway Organization to understand the fundamental principles of project management. The purpose of the research was to evaluate, compare and prioritize the managerial indices in urban projects based on the opinion of their practitioners. Research results show that according to the all correspondents' opinions, the following indices are in suitable conditions: relationship between the manager and consultants and contractors, complete notation of contracts aspects, promotion of the staff's knowledge, using appropriate soft-wares in project control, clearance and completeness of contractions, spending adequate time for feasibility studies, using expert staffs in the project, project control system, coordinating the project staff, using general consultants in the project, applicability of project forms and reports, definition of staff responsibilities, and appropriate structure in project's organization, respectively. However, according to their opinions, the following indices are in unsuitable conditions: effect of inflation on increasing the project's costs, prolongation of the project, effect of lack of financial sources on project progress, correct estimating of the performance period, considering alternates in programming, appropriate strategy in keeping expert staff, considering delay reasons of similar projects, supervision of manager on the project, and coordinating management, administrative system and budget, respectively.

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