



University of Anbar



Identifying key factors affecting of the projects objectives in Baghdad Province by using experts interview technique

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PAPER INFO

Paper history:

Received 07/ 3/ 2022

Revised 18/ 4/ 2022

Accepted 28/ 4/ 2022

Keywords:

Construction projects, objectives, key factors, experts' interview

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ABSTRACT

The performance of the construction industry is regarded as one of the most significant variables in the global economic development success of nations. As a result, it requires focusing on strengths to enhance them and weaknesses to address them. This study aims to identify the key factors affecting the objectives of construction projects. To achieve the study aim, previous records and documents of two completed projects were studied carefully to identify problems that occurred and the impact of these problems on the project objectives. After that, an experts' interview was conducted to identify the key factors affecting the purposes of the construction project. The results of this study identified (33) key factors affecting the achievement of the construction project objectives, where the factor "The financial allocation for the project" was the most important, while the factor "Bad a health and safety plan in the project" was the least important.

1. INTRODUCTION

All over the world, completing each tendered project within a predefined time, cost and quality constraints is a primary aim for both the clients and their project managers. Although all the above three factors play significant roles in the success of a construction project, their importance is ranked according to the specific requirements of each client and project [1]. Private clients may often rank time as the most important of the three criteria; public clients placed historically more importance on quality and secondly on cost. But since nowadays, European Union (EU) and national infrastructure programmes set strict dates for projects completion, at the client's risk of losing funding if deadlines are not met, the time factor has become extremely important for the public sector, too [2]. There are various reasons that lead to failure of the project, Construction delay is one of them [3].

Syedsalehi in 2010 [4] defined three goals that determine the success of a project (Quality, costs and time), also called the iron triangle [5]. There is a consensus among researchers that combining these three measures is the best way to operationalize construction project success [6,7],

A project is an organization of people dedicated to the deployment of a set of resources for a specific purpose or objective [8]. Rumane in (2011) [9] defined the project as follows: "A project is a plan or program performed by the people with assigned resources to achieve an objective within a finite duration". While the common definition of the construction project, as a unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources [10]. Project management is defined as planning, directing, and controlling resources to achieve specific goals and

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objectives of the project [11]. Managers need to ensure delivery of projects to cost, schedule and performance requirement. To achieve this involves identifying and managing the risks to the project at all project stages from the initial assessment of strategic options through the procurement, fabrication, construction and commissioning stage [12,13] Most, if not all, projects go through a life cycle that varies with the size and complexity of the project. Generally, consist of five phases depending on [14-16], as follows:

- A. Brief Phase: In this phase, an organization (client, consultant, contractor, construction manager) initiates the project and evaluates potential alternatives.
- B. Design Phase: Once a decision is made, lines of communication and procedure for work authorization and performance reporting are established in this phase.
- C. Procurement Phase: This phase is also called the contracting phase; it represents the official transition of project from design into construction.
- D. Construction Phase: it is also called the implementation phase; this phase of the project is defined as the actual physical construction phase.
- E. Commissioning Phase: It is also called the Maintenance and Occupation Phase. In this phase, the evaluation of the performance of the construction structure is made and recommendation for the nature of maintenance and repair has been considered.

2. Research Methodology

To achieve the aim of this study, the previous records and documents of two completed projects in Baghdad province were studied carefully for identifying problems that occurred during the construction period, in addition, to identify the impact of these problems on the project objectives, then an interview was conducted with 16 experts who have great experience in planning and implementing construction projects to identify the key factors affecting the objectives of the construction project.

2.1. Identifying The Problems That Occurred

To identify the problems that occurred during the construction phase, the researcher selected two construction projects that completed a few years ago. The general details of these projects are illustrated in Table 1. After studying the previous records and reviewing the drawings and different execution plans and interviewing some of the engineers who worked in these two projects. The

researcher lists the general conditions and problems that occurred in each project and categorized into Four sub-groups as shown in Table 2. The researcher depended on the described problems in deriving the factors affecting the achievement of the project objectives as explained in the next paragraph.

Table 1. Detail information about two projects under study

<i>First project P1</i>	
Project Name	Construction Of Specialized Building For Iraqi Researches And Arabic Codes Project.
Client	Ministry of Construction and Housing
Contractor	Al-Fao General Engineering Company.
The beneficiary	Ministry of Construction and Housing and Municipalities and Public Works.
Location	Baghdad
Contractor Work Sector	Public
Cost of Contract	3,122,387,000 IQD
Total Cost	3,560,000,000 IQD
Duration of Contract	545 Days
Actual date of commencement	17/10/2011
Commencement date according to contract	23/09/2011
Completion date according to contract	21/03/2013
Duration Granted	510 Days
Completion date with duration granted	12/08/2014
Completion Percentage	100 %
<i>Second Project P2</i>	
Project Name	Implementation of treatment plants and pumping stations in Latifiya
Client	Baghdad Governorate
Contractor	Al-marafed General Contracting Company
The beneficiary	Baghdad Governorate
Location	Baghdad
Contractor Work Sector	Private
Cost of Contract	59,755,815,000 IQD
Duration of Contract	660 Days
Actual date of commencement	06/11/2012

Commencement date according to contract	06/11/2012
Completion date according to contract	28/08/2014
Duration Granted	700 Days
Completion date with duration granted	28/07/2016
Completion Percentage	100 %

Table 2. A list of problems occurred in each project under study

No.	The problems that occurred	Their Impact	Project
Client or Designer / Consultant or both			
1.	Delayed delivery of the work site to the contractor, because there are remnants of old buildings on the site	- Time	P1
2.	Errors in the surveying engineering work at the site for reasons related to the employer.	- Time - Cost - Quality	P2
3.	Change the specifications in BOQ (e.g. the design power of pump and pump gates).	- Time - Cost - Quality	P2
4.	Implementation of new paragraphs in the project according to client request.	- Time - Cost	P2
5.	The diameter of reinforcement bar used in the structural design is not available in local markets.	- Time - Cost - Quality	P1
6.	There is a difference between the drawings and BOQ for the lengths of the pipes and the quantities of reinforced concrete and cable lengths with large differences exceeding 20% of the contractual quantities.	- Time - Cost - Quality	P2
7.	There is mismatch between the drawing design	- Time - Cost - Quality	P1+P2
Contractor			
8.	Poor of financial liquidity by the contractor	- Time - Quality	P1
9.	Errors in the surveying engineering work at the site for reasons related to the contractor.	- Time - Cost - Quality	P1

No.	The problems that occurred	Their Impact	Project
10.	There are paragraphs in the Bill of Quantities has been priced incorrectly so that they cannot be executed at this price.	- Time - Cost - Quality	P1
11.	Demolition the excavation sides as a result of the high level of groundwater.	- Time - Cost - Quality	P2
12.	Executing a lot of additional works by the contractor	- Time - Cost	P2
13.	Contractor's dissatisfaction on the granted durations	- Time - Cost - Quality	P2
14.	Bad scheduling in the supplying process of construction materials at the site	- Time - Cost	P2
15.	Use of bad subcontractors and unskilled labor in the implementation of project activities	- Time - Cost - Quality	P1+P2
16.	There are highly materials waste generated	- Cost	P1
17.	Bad materials storage.	- Time - Cost - Quality	P1+P2
18.	Rework due to use unskilled labor in the implementation of project activities.	- Time - Cost - Quality	P1
19.	Materials supplied non matching the required specification.	- Time - Cost - Quality	P1+P2
20.	Bad planning for the required resources.	- Time - Cost - Quality	P1+P2
21.	An occurrence of accidents for workers as a result of working in hazardous conditions.	- Time - Cost - Quality	P1+P2
External conditions			
22.	Frequent stopping in the project due to religious events, public holidays, bad weather and bad security conditions.	- Time - Cost - Quality	P1+ P2
23.	The existence of groundwater at a high level during the excavation works of the foundations	- Time - Cost	P1+ P2
24.	Change the paths of some network lines due to illegal buildings and obstacles that cannot be easily removed	- Time - Cost - Quality	P2



Figure 1. Experts from Work Sector.

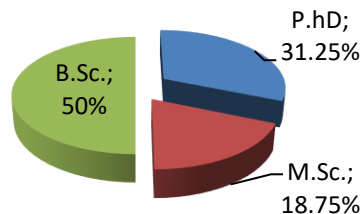


Figure 2. Experts Academics Degree.

2.2. Identifying of key factors affecting the objectives of the construction project

Depended on list of problems which mentioned in previous paragraph, the researcher derived some of the factors affecting on construction projects objectives. Then conducted an interview with experts who have experience in planning and implementing the construction projects, for identifying the key factors affecting the construction project objectives. The researcher made interviews with sixteen experts. The work sector of experts, academics degree of experts who participated in these techniques are illustrated in Fig 1,2 respectively.

Face to face interviews was conducted by using the applications of social media, often. The form of interview is formalized as questions with the possibility of answer by using a five-scale Likert. in addition, the possibility to add factors that considered important by experts. Once the interviews are completed, the statistical analysis process began to rank the key factors. SPSS program was used to calculate the mean and the standard deviation. The researcher also conducted the validity and reliability test, for the experts' answers by extracting the alpha coefficient - Cronbach by using (SPSS) program, the value of alpha was (0.888), this indicates the answers of experts in this technique have high stability (the value of Cronbach alpha should not be less than 0.70). The results of this technique represented as a list of key factors affecting the achievement of the objectives of construction projects, as shown in Table 3.

Table 3. A list of key factors affecting the achievement of the objectives of construction projects

No.	The key factors	Mean	Standard Deviation	Effect Level
1-	The financial allocation for the project.	4.375	0.5	Very high
2-	Design Revisions during construction phase	4.3125	0.70415	Very high
3-	Delay in the approval process of the designs and materials specifications by the client.	4.3125	0.60208	Very high
4-	Delay the contractor's payments by the client	4.3125	0.60208	Very high
5-	the inaccuracy of the reports of soil investigations test, in terms of the number of test points and the depth of the point.	4.3125	0.70415	Very high
6-	The Subcontractor is not good enough.	4.25	0.68234	Very high
7-	Execution Mistakes	4.25	0.68313	Very high
8-	Supplying of construction materials non-conform to the specifications.	4.25	0.57735	Very high
9-	Improving the traditional design and construction process.	4.25	0.57735	Very high
10-	Design mistakes	4.25	0.68313	Very high
11-	Accuracy in the preparation of the contract documents.	4.25	0.44721	Very high
12-	Poor management and supervision	4.1875	0.54391	High
13-	Lack of technical workers experience	4.1875	0.75	High
14-	Select a qualified project manager.	4.1875	0.40311	High
15-	Bad storage for construction materials	4.1875	0.54391	High
16-	An inaccurate Planning	4.1875	0.54391	High
17-	Absence of quality control (Q.C)	4.1875	0.75	High

No.	The key factors	Mean	Standard Deviation	Effect Level
18-	Delays in approvals related to the official bodies to work on the project.	4.1875	0.75	High
19-	There is no schedule to supply the construction materials.	4.125	0.5	High
20-	Choose the design team who does not have efficiency.	4.125	0.5	High
21-	The existence of disputes in the land of the project.	4.125	0.7188	High
22-	The multitude of official holidays and public events.	4.1245	0.61914	High
23-	Lack of materials at the site or the market.	4.0625	0.68007	High
24-	The supervision system of the construction waste on-site	4.0625	0.85391	High
25-	The change in materials, specifications and type during execution of the project.	4.0625	0.85391	High
26-	lack of accuracy for topographic surveys of the project site	4.0625	0.57373	High

3. Conclusion

According to the results of this study, the researcher concluded that there are a large number of Iraqi construction projects suffered from the delay in completion and cost overrun together with the bad performance, all these problems due to reasons related with client, contractor, and external conditions. So, there are thirty-three key factors have the highest effect on achievement of the objectives in the Iraqi construction projects, where the factor of "the financial allocation for the project" has the highest effect with mean value of 4.375, followed by the factor of "design revisions during the construction phase" with mean value of 4.3125, then the factor of "delay in the approval process of the designs and materials specifications by the client" with mean value of 4.3125, and followed by the remained factors. These key factors enable the top management and project managers to

Table 3. Continued

27-	An occurrence of economic crises in the country during the execution of the project.	4.0625	0.44253	High
28-	Bad the planning for the quantities required materials in the implementation, as well as sequence work activities.	3.9375	0.57373	High
29-	Delay in the project location delivery to the contractor	3.875	0.80623	High
30-	Not conduct the necessary laboratory tests for construction materials before use.	3.8125	0.75	High
31-	The employer does not have an adequate experience.	3.75	0.68313	High
32-	Stop the work in the project due to causes related to the employer.	3.4375	0.62915	High
33-	Bad a health and safety plan in the project	3.4275	0.62335	High

identify the weak points that need for correction in the current projects by set up procedures to treat each factor. In addition, these key factors can be a database for the future construction projects and studies.

Acknowledgements

This paper produced in copereation with Building Directorate / Ministry of Housing and Construction.

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Authors are responsible for the authenticity and completeness of all references.

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