Study and Assessment of the Reasons for Project Delay or Stalled from Project Management View

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***Abstract*—As a result of new development in most of Arab countries, there is a need for more construction projects. These projects are costs more and needs a highly experience engineering and contracting companies. Also, of the highly experience companies and the importance of the projects, high percentages of the project numbers are started and delayed or not completed on time scheduled to them. Therefore, the present study is prepared to evaluate and analysis the reasons for that matter from the project management view. The study was performed as a collective data achieved from different projects in different places as a model for the study. The percentage of the effect of each of project activities was explained. According to the present study, the most significant reasons for the project delay or not complete is presented and discussed.**

Keywords-construction; project; managment; delay

I. INTRODUCTION

The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depend on a methodology that requires sound engineering judgment [2]. To the dislike of owners, contractors and consultants, however many projects experience extensive delays and thereby exceed initial time and cost estimates. Although the construction industry in the Arab countries and especially in the Gulf area which is recently needs for more developments and thus growth of construction projects which is under establish from the Gulf war till now.

The region is in desperate need for development projects in many areas, especially in the fields of water collection and distributions, roads and its pavements, housings and their infra structures, tourism projects, towers, and huge shopping malls. As a result, an unprecedented number of large-scale projects are currently under construction and in the planning and contract awarding stages. Factors which cause delay in the construction projects also have some effects on the overall project [11]. When there is delay in construction projects, they are either expedited or the scheduled time for the completion of project, is extended. The result is cost overrun in both the cases. Main reason of cost overrun in the construction projects are the delays in the delivery of materials to the project sites in the developing countries [6].

Other major factors which are responsible for time overrun in the construction projects are revision and approving of design documents, delay in getting approval for major changes during the project, delay in sub-contractor work and the conflicts in sub-contractor schedule in project execution [4].Low communication between the project parties, changes made by the owners, contractor's inadequacy during work and poor planning are the main causes of cost overrun [5]. During the construction projects there are some factors which cause disputes among the project parties. Recently, there have surfaced studies on the methods for analysis, quantification and accountability for delays, as well as on the deployment of measures to control causes of delay in the design and construction stages [1], [3], and [10].

There are several studies that single out delays as the main cause for claims in construction [9]. Perhaps for that very reason, there have been papers published on the prevention and resolution of claims, on the processing of claims due to delays, on the interpretation of the law and about the importance of contract clauses pertaining to delays in the resolution of conflicts [7], [8] and [9].

II. PRESENT STUDY GOAL

The previous section has shown that it is important to scale up anti-delay controls, which will certainly help improve the performance of everyone involved in the construction process. In this study's goal to look into and evaluate the aspects pertaining to causes for delays that have an impact on the output of construction companies. According to that, the present analysis was undertaken bearing in mind the following aims to:

- Catalogue and analyze the factors, reasons and motives for delays discussed in extant bibliography.
- Glean information on classification of, as well as methodologies to evaluate, delays, claims and related issues.
- Understand, compare and draw out the specific traits of the causes specific to our sector and contrast what is found in international data.

To make this possible, not only did we collect bibliographical information and proceed with the analysis of the traits found in the national construction sector but we also asked a number of people for their opinions. These people were promoters, company owners, construction owners, public institutions, contractors, designers and other relevant construction personnel. They were asked to provide a data set that would validate our current concern and allow for a more realistic insight into the problem, and increase our knowledge and understanding of the reasons behind overruns. A nation-wide survey was administered.

III. RESEARCH METHOD

In this section we outline the research methodology employed with a view to achieving the aims of this study. For us to reach our goal, we need a research methodology that will set off the fundamental stages of our investigative procedures:
a) Bibliographical research and analysis; b) Discussion with relevant professionals and construction management specialists; c) Implementing a questionnaire; and finally d) Analysis of the data collected.

Having studied the bibliography and complemented, double-checked and contrasted the data therein against a number of opinions published by several relevant parties in the sector, and following an intuitive analysis by the researchers, drafted a map that breaks down causes for delay in construction projects into 12 origin-related categories as shown in table I.

TABLE I. CATOGERIES OF CAUSES OF DELAY

Causes for Delay			
1	Contract and contractual relationships	7	Equipment
2	Financial management of project	8	Labor
3	Owner	9	Project manager and inspection
4	Project specificity	10	Contractor management
5	Design team	11	Institutional relationships
6	Material	12	Outside factors

According to that, we consulted a few national specialists, consultants and researchers in construction management about the adequacy of these causes, and then elicited opinions from national and specialists about the importance and meaning of studies of this kind to the delay control and competitiveness in the construction sector. This cooperative effort was important. It helped us adjust the main cause map to the actual characteristics of the national construction sector. It would be apposite to say that the whole process evolved as we conducted our survey.

Once defined the cause map, we drafted a questionnaire based on it. The map now featured an analysis of the relationship between delays and accidents in the workplace, as well as an analysis of the legal framework for delays in construction projects in the chosen projects in gulf area. 90 questionnaires were sent out to contractors, 85 to consultants and project designers and 70 to construction owners. On stage two, we contacted the respondents who did not get back to us within the prearranged response time, proposing an interview as an alternative. The latter suggestion was gladly accepted by these respondents.

During our interviews we spoke openly about the problem and related areas. The main intent was to ask questions that would clarify the causes mentioned in the survey and observe procedures so as to resolve them.

The answers were provided by administrative personnel or technical staff in management positions then working with construction companies, as well as public owners, consultancy and engineering firms, design firms, management directors, project directors and managers and senior engineers.
80 answers by contractors, 76 by consultants and 62 by owners answered to questionnaire.

IV. RESULT OF THE STUDY

Taking into account what prior studies recommended as we drafted the questionnaire. It was shared in four sections. The goal in the first section is to obtain general information on the institution or company that is taking the survey. In the second section a list of possible causes for delays was present, built according to the results of our investigation and our own experience. The list was divided by categories. The respondents were asked to attribute to each cause degrees of frequency, impact on workflow and the types of construction project where they are most likely to occur. The aim is to establish a classification and consequently rank the several causes.

Section three, serve the purpose of identifying the indicators that may best evaluate and assess potential delay-causing problems. Finally, in last section we intended to gather a set of complementary data relating to construction delays, especially for current projects.

The results have revealed that responsibility for delay can be ascribed to all parties involved. Using statistical and mathematical analysis the following results from the data are predicted.
Of the high causes contemplated in the survey, an extract of the ten causes that were most highly ranked on a scale of relevance by the four groups involved in the construction sector (Public or Privative owners, Contractors, Designers or Consultants) is presented.

To determine the ranking of the different causes from the point of view of contractors, consultants, and owners, the relative importance index (I) was computed as:

$$I = \sum W_i X_i / \sum X_i \quad (1)$$

Where,

i= response category index, equal to 1, 2, 3 and 4 for not, slightly, moderately, and very important, respectively.

W_i = the weight assign to the *ith* response = 0, 1, 2, 3 and 4, respectively.

X_i = frequency of the *ith* response given as percentage of the total response for each cause.

The indexes were then ranked, and the final results are shown in table II. From this table it was obvious that the inadequate details and design are the main causes for the construction delay followed by the difficulty in obtaining the licenses and permits from the authority. While the low productivity and the difficulty and the delay of the drafting and submitting requests are the lowest cause reason for the construction project delay. Figure 1 shows the relative important index (I) for the major ten cases of construction projects depending on the questionnaires data collected from the contractors, consultants or designers, and owners, while figure 2 represents the average of the relative important index from all collected data. Causes of the study gives a relative importance index less of two or less omitted from the causes of delay in construction project which reduces the causes to ten as shown in table II.

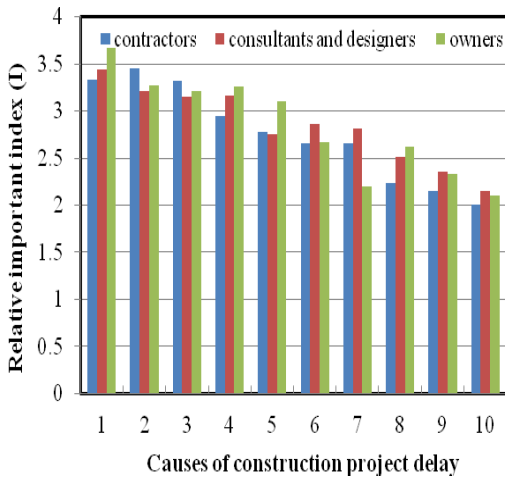

Fig.1 Relative important index (I) for causes of project delay

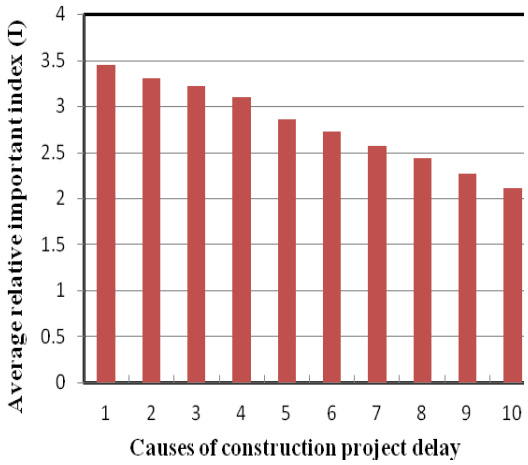

Fig.2 Average relative important index (I) for causes of project delay

TABLE II. RANKING OF THE MOST RELEVANT CAUSES

Causes for Delay in construction Projects	Average ranking	Average Relative importance index(I)
Inadequate details and inadequate design, etc.	1	3.45
Difficulties in obtaining licenses and permits from authorities	2	3.3
Deficient of planning, activity, material, labor and equipment management	3	3.22
Shortage of skilled laborers	4	3.10
Delays in preparation of technical documentation by project designers while construction is in progress	5	2.85
Neglect of critical activities	6	2.72
Frequent change orders during construction	7	2.57
Deficient coordination among participants	8	2.43
Low productivity	9	2.26
Difficulty and delay in the drafting and submitting of requests for institutional opinions and authorizations	10	2.11

V. CONCLUSION

Based on the opinions provided by the respondents, specialists, associations and institutes involved in the construction sector, as well as prior studies conducted by prvious researches, it is our purpose to prepare a comprehensive file on preventative measures and recommendations, guided by strict criteria, which will help clarify the problems for the causes of construction projects delay.

The ranking method for the collected data achieved fron our study concluded that there is a ten major important causes for

the project delay. The major ten causes of according to their ranking from the highest to the lowest are as follow:

1- Inadequate details and inadequate design, etc.
2- Difficulties in obtaining licenses and permits from authorities.
3- Deficient of planning, activity, material, labor and equipment management.
4- Shortage of skilled laborers
5- Delays in preparation of technical documentation by project designers while construction is in progress
6- Neglect of critical activities
7- Frequent change orders during construction
8- Deficient coordination among participants
9- Low productivity
10- Difficulty and delay in the drafting and submitting of requests for institutional opinions and authorizations.

The recommendations are many and target every single participant. Our conclusion from the present study can be sumarized as in the following :

1. The need to implement a national database with the quantity works list for different construction projects.
2. Implementing more appropriate and efficient organizational systems within design teams;
3. A need for greater care on the part of the owners when they prepare their schedules and preliminary programmes;
4. A need for greater precision when preparing viability studies.
5. Raising awareness with those involved about the risks inherent to construction.
6. A need to optimize management with a basis on qualification and the use of more adequate techniques.
7. A need to update some inadequate legislation so as to clearly define and segregate responsibility and liability, and so on.

ACKNOWLEDGMENT

The authors acknowledge all contractors, consultants, and owners of the different construction projects who helped us to collect the data from the questionnaires sent to them.

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