

CAUSES OF CONSTRUCTION DELAY: A CASE STUDY IN LIBYA

Mr. Ellafi H. Fackroon^{1,2}, Dr. Abdul Hamid Kadir Pakir² & Dr. Abdelnaser Omran²

¹National Oil Corporation (NOC) Building, Jamal Addunnasser Street Floor No 7
Benghazi Libya

² School of Housing, Building and Planning, 11800, Minden, USM
Universiti Sains Malaysia

ABSTRACT: Delays on construction projects are a universal phenomenon. And it is probable that most construction projects will incur some sort of a delay before they are completed. Even though various studies have been considered into the causes affecting delays, these studies seldom discuss common and general causes of delays in construction projects. Thus, comprehensive study on these delays is essential. Since the problems are rather contextual, the study needs to focus on specific causes of delaying like insufficient coordination and ineffective communication between involved parties in construction projects located at Benghazi City in Libya. Literature review and a questionnaire survey targeted at construction projects in the Libya's country and have been used as the tools to carry out this study. This paper presents the findings of a survey aimed for identifying some of the most important causes of delays in construction projects in the above mentioned city. It is hoped that these findings will guide efforts to enhance the performance of the construction Industry. This paper also explores and provides some guidelines and actionable information which can be led to enhance the construction process.

Keywords: Causes of delay, construction projects, Integration mechanism, Benghazi City, Libya.

1.0 Introduction

The Libyan construction industry contributes less to the country's economy than do manufacturing or other services industries. Officially, construction accounted for only 2.1 % of the annual gross domestic product (GDP) (The Economist intelligence, 2003). However, the growth influenced the country's economic development. As defined in developed counties (Hillebrandt, 1985), construction is considered unique in that it can stimulate the growth of other industrial sectors. Hence to consider growth of the construction industry in terms of its contribution to GDP in isolation is somewhat misleading that is ,to do so understates the crucial role played by construction .Therefore ,improving construction efficiency by means of cost-effectiveness and timeliness would certainly contribute to cost saving for the country as a whole .Effort directed to cost and time-effectiveness were associated with managing time and cost, which in this study was approached via investigating causes of delay at construction project in Libya .Like other

developing countries ,such as Nigeria (Okpala and Aniekwu,1988; Elinwa and Buba,1993; Mansfield et al ., 1994) , Saudi Arabia (Assaf et al ., 1995) and_Malaysia (Yong, 1988) , Libya suffers construction time and cost overruns The intentions of this paper therefore are :

1. To identify the major causes of delays in construction project in Benghazi city, Libya.
2. To identify the effects of delays in construction project.
3. To recommend strategies for improving project delivery based on the findings of the study.

The construction industry is large, volatile, and requires tremendous capital outlays .A unique element of risk in the industry is the manner in which disputes and claims are woven through the fiber of the construction process.

Delays occur in every construction project and the significant of these delays varies considerably from project to project. Bramble and Callahan (1987) have defined that ; “ a delay is the time during which some part of the construction project has been extended or not performed due to an unanticipated circumstance. “ An incident of delay can originate from within the contractor’s organization or from any of the other factors interfacing upon construction project. Some projects are only a few days behind the schedule; some are delayed over a year. So it is essential to define the actual causes of delay in order to minimize and avoid the delays in any construction project. Many and various studies were carried to assess the causes of delays in construction projects. Ogunlana *et al.*, (1996) studied the delays in building projects in Thailand, as an example of developing economies. They concluded that the problems of the construction industry in developing economies could be nested in three layers: (1) problem of shortages or inadequacies in industry infrastructure, mainly supply of resources; (2) problems caused by clients and consultants; and (3) problems caused by incompetence of contractors. Kumaraswamy *et al.*, (1998) surveyed the causes of construction delays in Hong Kong as seen by clients, contractors and consultants, and examined the factors affecting productivity. The survey revealed differences in perceptions of the relative significance of factors between the three groups, indicative of their experiences, possible prejudices and lack of effective communication. Mansfield *et al.*, (1994) studied the causes of delay and cost overrun in construction projects in Nigeria. The results showed that the most important factors are financing and payment for completed works, poor contract management, changes in site conditions, shortage of material, and improper

planning. Assaf *et al.*, (1995) studied the causes of delay in large building construction projects in Saudi Arabia. The most important causes of delay included approval of shop drawings, delays in payments to contractors and the resulting cash-flow problems during construction, design changes, conflicts in work schedules of subcontractors, slow decision making and executive bureaucracy in the owners' organizations, design errors, labor shortage and inadequate labor skills. Mezher *et al.*, (1998) conducted a survey of the causes of delays in the construction industry in Lebanon from the viewpoint of owners, contractors and architectural/engineering firms. It was found that owners had more concerns with regard to financial issues; contractors regarded contractual relationships the most important, while consultants considered project management issues to be the most important causes of delays. Abdullah & Battaineh (1999) evaluated the progress reports of 164 building and 28 highway projects constructed during the period 1996-1999 in Jordan. The results indicate that delays are extensive: the average ratio of actual completion time to the planned contract duration is 160.5% for road projects and 120.3% for building projects. Al-Momani (2000) conducted a quantitative analysis of construction delays by examining the records of 130 public building projects constructed in Jordan during the period of 1990-1997. The researcher presented regression models of the relationship between actual and planned project duration for different types of building facilities. The analysis also included the reported frequencies of time extensions for the different causes of delays. The researcher concluded that the main causes of delay in construction projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions, and increase in quantities. Jonathan (2001) presented a paper on method for computing activity delays and assessing their contributions to project delay. The method consisted of a set of equations, which could be easily coded into a computer program that would allow speedy access to project delay information and activity contributions. There has been a considerable and continued interest on the effects of construction delays. The information available is diverse and widespread. Despite the necessity for such research, little work has been described in the literature concerning public projects. The previously proposed factors contributing to construction delay were frequently observed in public projects. The actual frequency and magnitude of these factors is not known, which has proven to be a serious and very expensive problem for the construction industry. The objective of this study is to identify the main causes of delays in

construction projects in Benghazi City, Libya through a survey and recommend procedure to avoid it.

2.0 Delays in Project

Many construction projects suffer from delay. Suspension means stoppage of work directed to the contractor by a form from the client, while delay is a slowing down of work without stopping it entirely (Bartholomew, 1998). Delays give rise to disruption of work and loss of productivity, late completion of project increased time related costs, and third party claims and abandonment or termination of contract. It is important that general management keep track of project progress to reduce the possibility of delay occurrence or identify it at early stages (Martin, 1976). Construction planning has to be a much more decentralized activity to cope with the inherently uncertain nature of task duration. However, Ballard and Howell (1998) argued that construction planners should make only "quality assignments" where tasks not meeting these criterias: (1) sufficiently well defined (to be coordinated with other work and the inputs to be identified and assembled); (2) are ready to start (material, design, and precedent works complete); (3) have priority in the critical path for delivery to the customer; (4) are commensurate in scale with the available labour for the coming week; and (5) are carried out within a system where the causes of incomplete or poor quality assignments are investigated and identified, should be deferred. Monitoring gives early warning of the possibility of contractor's delays and helps in anticipating the consequences of changes that may be needed (Cleland, 1999; Abdul-Rahman and Berawi, 2002a). Young and Jinijoo (1998) explain that top management support is required and this can be defined as the willingness of top management to provide necessary resources, authority, and power. Decision making at the right time is important especially with a fast-trak project in preventing delays because the concept of using fast-tracking can be applied to traditional contract projects whereby construction starts prior to completion of the design/contract document (Ahuja et al., 1994). Decision making process is used as the key to effective project management especially in value and risk analysis (Stuckenburck, 1982).

3. Types of Delay Causes in Construction Projects

There are two categories of delays used in determining delay damages:

3.1 Inexcusable delays (Non- Excusable delay) are caused solely by the contractor or its suppliers. The contractor is generally not entitled to relief and must either make up the lost time through acceleration or compensate the owner. This compensation may come about through either liquidated damages or actual damages, providing there is no liquidated damages clause in the contract. Liquidated damages are generally expressed as a daily rate that is based on a forecast of costs the owner is likely to incur in the event of late completion by the contractor.

3.2. Excusable delays

3.2.1 Non-compensable delays are caused by third parties or incidents beyond the control of both the owner and the contractor. Examples typically include acts of God, unusual weather, strikes, fires, acts of government in its sovereign capacity, etc. In this case, the contractor is normally entitled to a time extension but no compensation for delay damages.

3.2.2 Compensable delays are caused by the owner or the owner's agents. An example of this would be the late release of drawings from the owner's architect. An excusable, compensable delay usually leads to a schedule extension and exposes the owner to financial damages claimed by the contractor. In this case, the contractor incurs additional indirect costs for both extended field office and home office overhead and unabsorbed home office overhead.

4. Methodology

The objectives defined in the preceding section were achieved through the accomplishment of the following tasks: The preliminary data for this research was collected through a literature review and the use of a questionnaire survey targeted at some contractors, clients and consultants in some projects in Libya. The literature review was conducted through books, conference proceedings, the Internet, and international project management journals. In this step, some of the causes for delays that may be encountered in a construction project were identified. The causes of delays are then classified into six broad categories (acts of God, design-related, construction-related, financial/economic, management/ administrative, code-related) depending on their nature and mode of occurrence. The data collected through questionnaire surveys are analyzed and recommendations are made to mitigate the delays.

5.0 Results & Discussion

Table I presents the results of factor analysis of the items of contractor's factors that cause delay in construction projects and their ranking as a whole. Based on the mean value criterion, the first ranking seemed to capture the respondents' general feeling that it is improper planning that are the major factor that causes delay in construction projects in Benghazi city. Followed by "lack of effective communication" as the second ranked factor which caused delays, this finding can be agreed with what found by Frimpong *et al.*, (2003). The factors "Shortage of Supply i.e. steel, concrete, etc." and "Design Errors" seem to be the third-ranked factors that cause delays in construction projects in Libya. Consequently, factors such as "Slow Decision Making" and "Financial Issues" were ranked fourth. Abdul-Rahman *et al.*, (2006) conducted a stud on delay mitigation in the Malaysian construction industry; they proved that a financial problem is confirmed by the survey as the main causes of delay. The next important factor that causes delays in construction projects in Libya is "Shortage of Material", it was ranked as number fifth.

Table 1. Do you have any delay in your project

Factors	Mean	SD
Improper Planning	5.0	0.3
Lack of Effective Communication	4.7	0.4
Design Errors	3.8	0.4
Shortage of Supply i.e. steel, concrete, etc.	3.8	0.4
Slow Decision Making	3.7	0.5
Financial Issues	3.7	0.5
Shortage of Material	3.6	0.9
Cash-Flow Problems During Construction	3.6	0.8
Increase in Quantities	3.5	0.8
Mismanagement by The Contractor (Financial,SupplierSupport,Sub-Contractor)	3.5	0.7
Executive Bureaucracy in The Owners' Organizations	3.4	0.8
Notification of Extra Work	3.4	0.5
Changes in Site Conditions	3.3	0.8
Date of Notice to Proceed	3.3	0.5
Financing Matters	3.2	0.7
Payment for Completed Works	3.2	0.7
Indicative of Experiences	3.1	1.0
Conflicts in Work Schedules of Subcontractors	3.1	1.0

Contractors Regarded Contractual Relationships	3.0	0.6
Late Confirmation from Client and Consultant Regarding Cost, Quality and Time	3.0	0.8
Experience of Project Team	3.0	0.8
Quality Assurance / Control	2.9	1.0
Long Period for Approval of Tests and Inspections	2.9	1.0
Political Influence	2.8	0.8
Social Influence (Feedback From Resident) EIA	2.8	1.0
Failure of RIBA Plan Of Work Application	2.8	0.7
Site Accidents	2.8	0.8
Negligence	2.8	0.9
Project Management Issues	2.7	0.9
Late Deliveries of Materials and Equipments	2.7	0.8
Economic Conditions	2.6	1.2
Changes of Design	2.6	0.6
User Changes	2.6	1.0
Liquated Damage (LAD)	2.3	0.9
Negotiation During Construction	2.2	0.6
Designers	2.2	0.7
Mistakes During Construction	2.0	0.8
Possible Prejudices	1.8	0.4
Changed Orders and Mistakes and Discrepancies in Contract Documents	1.7	0.7
Dispute (Variation Order)	1.6	0.5
Religions Factors		
Weather Condition (<i>Force-Marjue</i>)	1.6	0.0
Conflicts of the Drawing and Specification		

5.2 How to avoid these delays?

Table 2 shows that making risk management is ranked as an important factor to avoid delays in construction projects in Libya. Followed by proper planning as the second factor which need to be considered to avoid delays. A research by Abdelnaser *et al.*, (2005) proved that in order to avoid delays during construction stage, you should make proper planning.

Table2. Avoidance of delays in construction projects

Factors	Rank	Mean	SD
1. Making Risk Management	1	4.9	0.33
2. Proper Planning	2	4.7	0.67
2. Proper Payment from Client	2	4.7	0.48
3. Prepare Insurance Claims	3	4.2	0.58
3. Good Scheduling Programme	3	4.2	0.41
4. Client Representative for Project	4	3.5	0.50
4. Selecting Expert Understand Their Assignment	4	3.5	0.50
5. Clear Contract and BQ	5	3.3	0.48
5. Compute the Amount of Financial Damages	5	3.3	0.48

5.3 Impacts of these delays to these projects

An analysis is needed to identify the impact of delay on time and cost followed by taking the appropriate action to ease delay and minimise the cost required (Clogh, 1981). It is important to improve the estimated activity duration according to the actual skills levels, unexpected events, efficiency of work time, and mistakes and misunderstanding (Lock, 1996). However, from the study which carried out in Benghazi city in Libya, it was clear that "lost of interest by the stakeholder" ranked by the respondents as one of the most important factors which has an impact in construction project delays (Table 3).

Table 3. Impact of delays in construction projects

Factors	Rank	Mean	SD
1. Lost of Interest by the Stakeholder	1	4.9	0.3
2. Blacklist by Authorities	2	4.6	0.8
3. Waste of Money and Time	3	4.3	0.7
4. Declination of Reputation	4	4.1	0.6
5. Other (Please specify):	-	-	-

6.0 CONCLUSION

Construction delay is a critical function in construction projects. Projects investigated in this study exhibit a delay in some construction sites in Benghazi city in Libya. In practice,

this phenomenon is expected to continue unless management actions are taken to control these causes within the planned element of the design and construction works. Thus, good practice in planning, coordination, and the change of the control procedures of the public institutions needs to be recognized and the implications understood. We believe that the arguments and findings presented in this study provide a good guidance for managerial intervention, and provide some guidelines and actionable information that managers can utilize to manage their projects. In summary, this paper summarized some reasons behind the delays caused in these sites and proposes some recommendation, which might enable the contractor organization to develop in house competitiveness for the achievement of one of the major goal in construction of a project, on 'Time' completion. Further research is needed to investigate the limitations and potential improvements to causes of delays within each construction site.

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