



Delays, What Delays & Classifications and causes in Highway Construction in Libya : A Literature Review

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Abstract

The project delay is become as the most significant problem faces the site management. Also the delay is costly problem in Highway construction projects as well as the quality of project could be effected by delay as a result of repeated attempts to accelerate the wheel of progress by the contractor, regardless of the quality of performance or implementation .

Project delay is one of the most important problems in Highway construction industry around the world; and Libya, of course, is not immune from these problems; but Libyan Highway construction industry is suffered by this problem .

In fact, there are many factors that affect Libyan Highway Construction Industry, and a contractors is one of the mains factor caused to project delay; therefore, this dissertation was mad to investigate this main factor of delay under title (The contractor as factor of delay in Libyan Highway construction industry) in order to define the most significant causes of delay due to a contractor; as well as, to understand the deferent between the solving approving that are taken by Libyan and foreign contractor to improve the effectiveness of his staff to finish a project.

Key words:, Libya, causes of delay, contractor, construction industry Project.

1. Introduction

Construction delay is global phenomenon. And delay into building project can be known as a deferent in project duration inter alia a project compilation's day scheduled in contract and the actually completion date. It typically combined with time and price overrun that means all project stakeholders in any project will be affected by construction delays. Very many surveys

have been covered about this phenomenon in many countries around this word .

In this chapter of research, delay in Highway construction industry will be defined in additional to explain and identify types of construction delay; also an example to each kind of delay will be provided. As well as, the preceding researches' conclusions are going to be summarised in order to give an outline concerning these discussions as well as assess these studied.



Menesi [30] classified the types of delay into two different types according to liability as follows: (1) Excusable delays which are divided into (a) Compensable (Owner) and (b) Non-Compensable; (2) Inexcusable delays; and Concurrent delays. Kraiem and Diekmann [31] mentioned time allowed for construction project performance is usually an important consideration for both the project owner and the project contractor. Yet, it is typical for construction projects to be delayed. Delays may be caused by the owner (compensable delay), by the contractor (nonexcusable delay), by acts of god, or a third party (excusable delay), or several different kinds of delays may happen concurrently.

Ogunlana et al. [19] identified 26 delay causes affecting construction industry in a fast-growing economy in Thailand categorized them into 6 groups, and data were collected by visiting sites and mailing to 17 contractors, 18 consultants and design firms and one project owner. 8 contractors and 6 consultants gave approval of which only 12 projects were selected for visits. Interviews were conducted on site using structured and unstructured interview schedules. A total of 30 persons, representing 2.5 persons per project, were interviewed. The results of the survey have been compared with studies from other developing economies. The results of the study support the view that construction industry problems in developing economies can be nested in three layers: (a) problems of shortages or inadequacies in industry infrastructure (mainly supply of resources); (b) problems caused by clients and consultants and (c) problems caused by contractor incompetence/inadequacies.

Greenwood et al. [9] declared that hospital projects are particularly susceptible to delays, some of which appear to be common to the construction of large hospitals wherever they are built. In a number of surveys of construction professionals, one of the most influential causes of

delay on large public projects has been found to be administrative reasons, and aimed to use these studies as a basis for exploring the impact of administrative delays on the construction of hospitals.

Odeh and Battaineh [2] identified 28 delay causes affecting construction projects with traditional type of contracts in Jordan; first, a survey questionnaire was developed to assess the perceptions of contractors and consultants of the relative importance of construction delay causes. Second, the questionnaire was distributed to a random sample of contractors and consultants working on large projects in Jordan. The Spearman's rank correlation coefficient was then used to test association between the contractors and consultants ranking. The study revealed that Owner interference, inadequate contractor experience, financing and payments, labor productivity, slow decision making, improper planning, and subcontractors are among the ten most important factors, according to contractors, and labor productivity was the most important delay.

2. Definition of construction delay

Faridi, A. S and EL-Sayegh, S.M. [11] defined construction delay as most frequent troubles into the construction manufacturing. The project stakeholders, owner, contractor, designer, user and other, are impacted negatively by construction delay. As well as the main Highway construction project's aims, duration, price, quality and safety, are exposed to risk by it. Sadi A. Assaf [25] submitted that the construction delay is a common problem in construction projects and exceeded the project duration as scheduled into the contract as result of the sliding schedule for each track, also it is deliver the project as beyond the date specified in the contract formula. As well as, the delay is a loss of revenue due to the increase in public



expenditure and salaries because of the increased duration of the project, and a rise in prices of construction materials due to inflation; In additional, a contractor will be unable to involved in other projects

3. Types of construction delay:

The delays in construction industry are categorised according to three main points as following:

- 1- The responsibility of construction parties.
- 2- The delay occurrence.
- 3- Delay consequence.

3.1 The liabilities of construction parties:

Consistent with responsibility, the delay is fall into two major groups; which are justifiable and non-excusable. See shape (1).

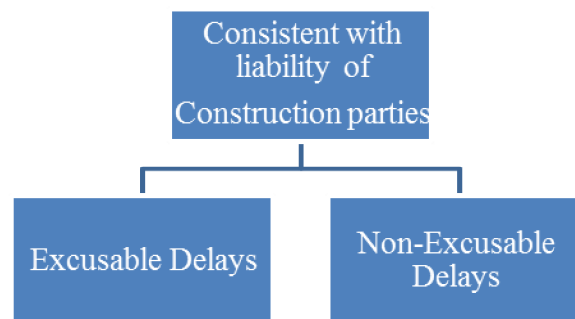


Figure 1 kinds of delay consistent with accountability of construction parties.

Pickavance [21] defined the Excusable delays as “a delay to completion which is caused by matter deemed to the outside the control of the contractor”.

A contractor may have a justification to across the duration of agreement by this kind of delay; as well as extend the time to completion could be given to contractor as result of this kind of delay. Also this tape of delays is able to effect on non-critical bath which needs extra time be completed. In general, whether delays are excusable or non-excusable; the delay depends on terms of a contract. Nevertheless, the god’s powers, outstanding weather condition,

labour disagreements, errors in proprietor design and similar factors might cause an excusable delay.

If the factors Privations of the contractor's ability to manage and foresee that means the consideration should be taken as a main point. In other words, when the delays are caused by the owners or consultants, the delays are generally excusable from the contractor. Also the delays can be excusable if the delays are caused by environmental factors that cannot be controlled or to be forecasted by anyone. Excusable delays are classified into compensable and non-compensable as shown in figure (2).

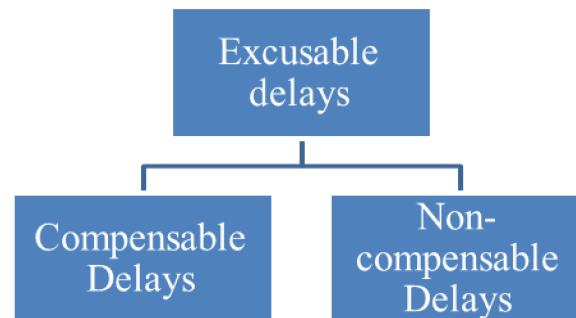


Figure 2 Types of Excusable delay.

3.1.1 Excusable compensable delays.

Callahan [2] reported that the proprietor or the managers of proprietor is the most important causes of justifiable compensable delays. A schedule extension is typically leaded by a compensable delay; also a compensable delay exposes a proprietor to financial compensation claimed by the contractor. On the other hand, a compensable delay, in a number of particular circumstances, does not denote the extra time is due. Brenda M [2] pointed that the time and cost of delay is responsibility of the owner.

There are several cases be able to be taken as cases of this kind of delay such as delay delivery all drawing by an architect of owner, delay the delivery of the project site to the contractor by the owner or chief changes in the work's scope.

3.1.2 Excusable non-compensable delays.

Leon [2] recorded that third party or any incident, which cannot be controlled from both of contactor and owner, cause to excusable non-compensable delays. At this case; it is necessity to all parties to disburse them possess delay's fraction. In addition the contractor is allowed to a period with no a recovery of linked damage's cost. Brenda M [2] pointed that the delays which are typically built-in in power majeure, for example irregular climate, labour strikes, God power, war's acts, be able to be engaged as instances of excusable non-compensable delays.

3.2 The delay according to occurrence:

Delays are graded consistent with occurrence of delays into parts; sovereign and simultaneous delays. Figure (3) shows both of them.

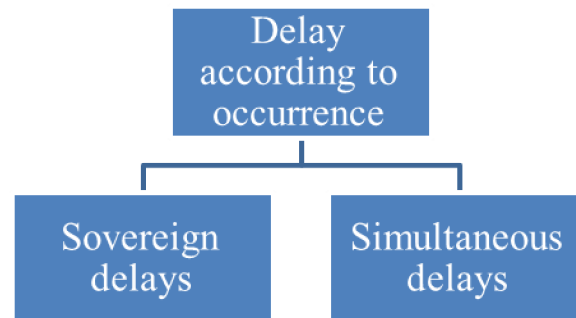


Figure (3): The delay according to occurrence.

3.2.1 Sovereign delays

Delays that are occurred as a consequence of causes happen by each contractual party (contractor or owner) or related to other kind of delay. This kind of delay may be justifiable, non-excusable, compensable or non-compensable. Such as, delays are happen by proprietor as a delay's result that made by an outworker as a result of terrible project organization can be classified as independent delays. Leon [16]

3.2.2 Simultaneous delay

Pickavance [21] mentioned that "Concurrent delay is a delay to completion where at least one of the causes of the events which cause delay is at contractor's risk as to time". Leon [16] explained that simultaneous delays consist of more than one independent delay which is happen in same time as a consequence of dissimilar reasons. In addition, this kind of delays can be excusable, non-excusable, compensable or non-compensable delays.

Rubin [22] summarised the concurrent delays into three main conditions as following bellow:

- 1- If justifiable and non- justifiable delays happen simultaneously, just

an extra time be decided to a contractor.

- 2- If excusable compensable and non-excusable compensable delays occur concurrently, the contractor is entitled to a time extension but not to damages.
- 3- If two excusable compensable delays occur concurrently, the contractor is entitled to a time and damages together .

Though, in this situation a contractor has a right to be given an extension time without receiving delay compensation as well as a holder cannot get liquidated damage.

3.3 The delay according to consequences:

Overall project completion can be effected by a delay which happen in some activities; apically in critical activities, and in other activities; a delay may does not have any impact upon project duration. In other words, a delay could be classified according to its impact on project time schedule into critical and uncritical delay. Look to shape (4).

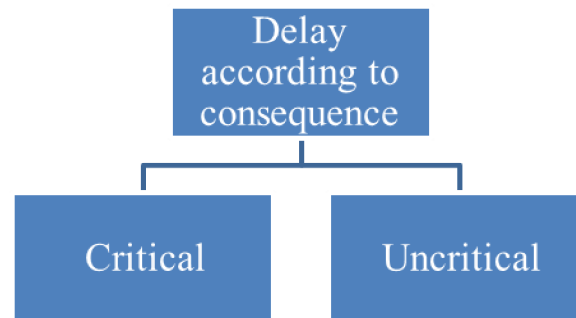


Figure 4 the delay according to consequence.

3.3.1 Critical delays:

Callahan [7] defined a critical delay as a delay causes to extended project achievement. The contractor well normally is due an extra time if the critical delay was justifiable critical delays. The case as that replacement a kind of structural steel members whereas a contractor is erecting structural steel can be taken as obvious instance of critical delays which is probable to in general project duration of stoppage contractor.

3.3.2 Uncritical delays:

Leon [16] recorded that delay that is incurred of critical path without delay project accomplishment are known as non-critical delays. In the event that a delay is justifiable, the overall completion of project is not affected by this kind of delay; therefore, the contractor does not have right to get extra time. Falqi [10] added that the cost performance of contractor can be affected by non-critical delays; in this situation, a contractor is able to be given extra presentation cost.

4 The preceding researchs' results

To complete the requirements of the research paper, it is necessary to study the results of previous researches in the same field inside and outside Libya.

4.1 The delays as problem in construction malfunction around the world

Baldwin, J. ET AL [5] noticed that,. Equal to 1400 questionnaires were included in this study; The survey was returned by these gropes in deferent percentages. The biggest percentage of the survey, which was returned by contractors, was 61%, other 44% of survey was returned by architects and other 30% by engineers.

Al Hazmi, M, Assaf, S and Alkalil, M [14] found out that contractor, consultant and owner have the same opinion on a main position of stoppage issue at delay's causes of big Saudi construction projects. A preparation and approval of shop, drawings, payment delay by owner and design changes were considered as the mainly important reason caused to delay by contractors. An expert considered that the mainly significant delay's causes could be payment problems, poor connection between dissimilar subcontractor timetables in addition to delay in making choice by holder. employment shortages and inadequate manpower skills.

Ogunlana. S, K.Promkuntong and Jearkgirm [20] performed an investigative about the delay knowledgeable as contracting Thailand skyscrapers buildings. From the most sensitive troubles in construction manufacturing was resources



supply problem. As well as, poor supply material and technical personnel were over stretched; therefore. In addition poor management and exceeded time forecasts in numbers of project can be concluded as result of them discussion. Also, problems of shortages or insufficiency within industry communications mainly provide resources' supply. And troubles happen by contractor's lack of skill.

Chan D and Kumaraswamy M [8] offered that the consequence of investigation followed in order to determine and assess the rate of importance of major delay projects' factors into Hong Kong. The most important factor of delay was poor contractor's knowledge in planning and monitoring at the work place.

Kaming P et all [15] researched into thirty one Indonesian skyscrapers building to study the influencing factors on them and detected that cost overruns happen more commonly and stricter than time overruns. The most important factors of exceeded the expected costs are material cost increased by inflation, imprecise material assessment and difficulty's level. While the most significant causes of delay are summarised in few main points such as design change. Low workforce productivity, insufficient planning and lack resource.

Mezher T and Tawil W [18] examined the reasons caused to delay in Lebanese building industry and found out that, into perspective of owner, contractor and consultant, the result was the financial issues was the more concerns by the owner, while contractual relationship was considered to be mainly important delay causes by contractor, while the project management issues was esteemed by consultant as the most sensitive factor of delay.

Sambasivan M and Soon Y W [27] perform examination in order to determine reasons of delay and effect of delay factors on project duration into construction manufacturing in Malaysia. . In finally, they

identified ten mainly important reasons caused to delay, some of them were resulted by the contractor. the mainly reasons caused to delay were ranked as following:

- 1- Inadequate planning of the contractor to the nature of the project.
- 2- Weakness in work site management by a contractor.
- 3- Insufficient experience of the contractor.
- 4- Difficulties in financing the project and payment of dues by the owner
- 5- Troubles between main contractor and subcontractors.
- 6- Lack of material.
- 7- Shortage in manpower.
- 8- Equipment accessibility and Equipment stoppage.
- 9- Poor communication.
- 10- Errors during execution.

4.2 The delays as problem in Libyan construction manufacturing:

Some kinds of delay are found through achievement of different stages are shown by a lot of case studies and reports. In achievement, the delays could be into a stage or more; occasionally this delay can be as reason to discontinue employment in project totally even during some contracts of projects were signed and a payment was paid, but the work in project did not start. In the research, there were number of researches, addressed a delay in construction industry, reviewed during my study. As well as several papers, about Libyan the delay in Libyan construction projects, which were used in this research to get some information.

Table (4.2): delay factor in design stage.

Shebob A, Nashwan D and Qiang X (Undated) submitted a comparative study and risk modelling of causes of delay into Libya and the UK building industry. the total number of posted questionnaire were 300 questionnaires, that send to 116 answers



as of owners, contractors and consultants, 175 questionnaire could be posed or emailed into the UK and 125 questionnaires out the 300 were send by hand in Libya. It was found that the delayed construction projects inside urbanised countries less than developing countries. In addition mainly major delay's factors in Libyan construction manufacturing were:

- 1- Unskilled employment.
- 2- Instability of range of project.
- 3- Delay in issuing the command.
- 4- Poor qualification of consultant.

Also they fund that the percentage of the responsibility of the parties to delay the project for both Libya and UK was 33.60% as shown in figure (5).

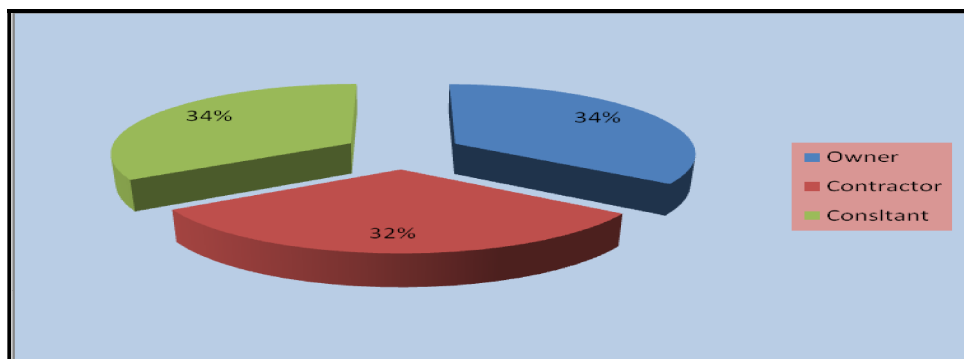


Figure 5 the percentage of the responsibility of the parties to delay the project for both Libya and UK.

4.3 A contractor as factor of delay in Libyan Highway construction manufacturing:

According to previous studies and reports prepared in this area; it was found that the contractor is considered a critical

factor in the delay in construction manufacturing in Libya. Therefore, the major important points, that make the contractor a main factor of delay's projects, will be highlighted in table (1).



Table 1 factors of delay due to a contractor

References	Factor of delay due to a contract
Husain K, (2005)	<ul style="list-style-type: none"> • Poor performance quality and time deficiencies. • Old equipments. • Unskilled workforce. • The mistakes in assessment the quantities and the immediate/non-immediate price.
Bridan A, (2007)	<ul style="list-style-type: none"> • Manage entry project's resources. • Submitted timetable by a contractor. • Contractor's reports on the progress of projects.
Alssosi A, (2007)	<ul style="list-style-type: none"> • Estimate the cost of material, equipment, labours and subcontractor used.
Saleh A, et al (2009)	<ul style="list-style-type: none"> • Poor of supply material and equipment. • Mismanagement by the Contractor. • Disagreement in employment agenda of Subcontractors. • Poor relationship of contractor with project's parties. • Mistakes during construction. • Religions Factors.
Abubaker, A E, et al (2008)	<ul style="list-style-type: none"> • Unproductive planning and scheduling of project by contractor. • Delays in sub-contractors work. • Weakness in qualification of the technological employees of contractor. • Wrong used implementation techniques by contractor.

4. Summary:

Briefly, according to the preceding researches there are many points of risk, which can cause to delay the projects through project implementation, equipment risk, supply material risk, badge estimation risk; soil of ground risk and Labor causes risk. Moreover the causes of delay are categorized according to responsibility parties to Act god, contractor, owner, consultant external, material and design.

In general from preceding studies in this area, it can be found, there is an extensive range of causes leading to the delay in Libyan Highway projects. Moreover the parties that delay's factors in construction projects change from study to another, although the reasons caused to delay in a number of these projects are similar.

Anyway, this discrepancy and the difference in results between previous studies shows the size of the reasons for the delay, so it is going to used as evidence for the manufacture of the questionnaire to complete this search; which will be the contractor as delay's factor in construction manufacturing in Libya.

5. Recommendations for future resaerch:

Construction Site Management has rapidly improved in the last decade, however, with this improvement the site management problems has become more complex.

Although the research used were from different organizations, nationalities, sites



and different type works in order to obtain dealing with these problems, these organizations were working on Libyan construction industry. This means similar kind of work and weather. For instance, the weather is not considered as problem in Libya, therefore problems related to weather are not in this dissertation. Also because of all the sites used in these case studies and questionnaires are in open area and outside the resident areas, the dissertation did not mention to problems of material storage and noises.

Consequently, the findings are not universal and cannot be applied on all the sites in the world, and conclusion cannot be drawn. Therefore, in order to obtain a broader and clearer picture of the problems in terms of managing the construction site, seven below represents set of recommendations which can be very helpful in future research.

1. A large sample sizes may be needed to produce more reliable findings and to validity of data collected.
2. Future research may be done to investigate both private and public sectors.
3. Observation is needed in future research to obtain more types of site problems due to contractor and the used solving approaches.
4. Future research may need to focus on the effect of the construction site management's problems due to contractor on fulfilling a project on the time and on the budget.
5. Future research may be done between two countries or more to compare the types of problems and the used solving approaches.
6. It is important that future research focus on the impact of different culture, religion, and language into the site on the project success.
7. It is important to focus on importance of the communication between the site team and the main office in project success

different problems and different ways in

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