

Causes Of Time Delay In Construction Projects In Libya

Mahmoud Mukhtar Ahmad Mukhtar, Mohamed Ali Elghadaffi Mohamed

Higher Institute Of Science And Technology Ajdabiya , Libya.

Higher Institute Of Science And Technology Ajdabiya , Libya.

Abstract:

Time delay in the construction industry is a global problem and considered as one of the most significant problems worldwide. Libyan construction industry is also no exception to it, and it is known that to consider the project successful is complete on time within predicted cost. As a result of many reasons, this is more noticeably in developing countries as time delay is a normal result of poor project performance. In Libyan construction industry, budget overrun and time extension are the main problems facing all project parties including clients, contractors, subcontractors and suppliers. This research aims to determine the main causes that result in construction delays in Libya according to the owners, contractors and consultants participated in the questionnaire. The outcome of this study is that the main significant elements that often lead to time delay in Libyan construction projects are: delay in payment by client, financial difficulties by contractors, corruption, security issues, market inflation and frequent change by client during construction projects implementation.

Keywords: Libya, Delay factors, Construction project.

Date of Submission: 29-11-2024

Date of Acceptance: 09-12-2024

I. Introduction

The failure to deliver construction projects on estimated schedule and cost has become the main challenge for both owners and companies [1]. Time delay is a common problem in developed and developing countries, but it is more challenging in developing countries [2]. In this decade, Libyan economy is growing up speedily which has refreshed the construction industry and the industry is growing in size, But unfortunately most construction project still unable to be completed on planned time. Nevertheless, many challenges have arising during construction projects phase.

The delay when occur will result in extra overheads that cause budget overrun and may lead to disputes amongst the projects parties [3]. In order to make sure that the construction project delivered on planned time and budget, determination of factors of time extension is essential so that once such causes become clear, the project parties can take action to minimize these factors. Thus, understanding the risk of time delay is essential to determine and manage the project effectively to deliver the project on planned time and budget.

This research aims to evaluate and determine the main elements that lead to time delays in construction projects in Libya.

II. Literature Review

A main point of successful project is to finish on deadline and predicted cost [4]. Moreover, time and budget performance is the backbone of a company's profitability and productivity [5]. Project time delay occurs when the project duration exceeds the planned schedule. The Libyan construction industry is often fail to deliver projects on planned time [6].

Several researches have been carried out to find the elements that lead to time delay in construction project. Sweis et al. [7] have done a study to identify factors of time overrun in residential projects in Jordan and found that financial challenges and tasks change by the client are the main factors of time delay in construction projects. A similar study carried out in Egypt by Abd E-LRazeck et al. [8] showed that the significant factors result in time delay: financial difficulties by contractor, late payment by client, design change during construction by the client.

A research was carried out by Assaf and ALHejji [9] about various types of construction projects in Saudi Arabia to identify the factors of time overrun and their importance according to each project parties including client, contractor and consultant. They found 73 elements of time overrun during the study. Change order was the common factor determined by all three parties that cause time delay in construction projects in Saudi Arabia.

Assaf and ALHejji have also conducted a research 11 years earlier [10] to find factors of time delay in big building construction projects in Saudi Arabia. They found 56 causes, and the financing group delays were the main factor ranked by all interviewed participants including, clients, contractors and engineers. In the opinion of contractors, payment progress by client, social and cultural impacts, late in preparing and approving of shop drawings and design changes by client were the most causes of time overruns. According to engineers and architects, the significant factors were, cash flow difficulties during construction, late decision-making by client and relationship between subcontractors' schedule during excavation stages of projects. However, clients indicated that the significant elements of time delays were, design errors, shortage of skilled labours and bureaucracy in organizations.

A study conducted by Al-Momani [11] to determine the top elements of time delay in construction project in Jordan. The study covered 130 building including, medical, schools, residential, office and administration buildings and communication facilities. Findings showed that the key elements are economic condition, designers, weather condition, change user and rising in quality. Odeh and Battaineth [12] identified the top 10 most important elements of time overrun in construction projects in Jordan were, slow decision making, low contractor experience, financial difficulties, shortage of skilled labors, client influence, inadequate planning, increase quality and subcontractors issues.

In Malaysia, a study was conducted by Sambasvian and Soon [13] to identify factors of time delay and their effect on delivering projects on secluded time. They found that the ten most significant causes were, inadequate planning by contractors, late payment process by clients, low contractor experience, lack of communication among parties, poor site management, labour supply, shortage in materials, mistakes during construction, equipment availability and problems with contractors.

A similar study was done by Alaghbari et al. [14] in Malaysia aiming to determine the elements of time delay in Malaysian industry, with findings indicated that the most important reasons of time overruns were deemed to be financial constraints, followed by coordination issues. This was the consensus among contractors, clients, and consultants.

A study in Nigeria, found that the major factors of time delay are: inadequate contract, frequent change in price, weather condition, material supply, design change, and financial capability [15]. Le-Hoai et al. [3] have also conducted a study large projects in Vietnam and indicated payment difficulties by owner and client, design change and poor site management are the main elements of time overrun.

An in-depth literature review determines sixty two factors of project leads to time delays. These causes are restricted into six groups as presented below in Table 1.

Table 1. Frequent causes of time delay determined.

No.	Factors of Time Delay	Group
1	Payment delays by owner	Owner
2	Late in handing out the site to the contractor	Owner
3	Owner interference	Owner
4	Late in approval of design documents	Owner
5	Order changes by the owner	Owner
6	Work suspension by the owner	Owner
7	Late decision making	Owner
8	Weak financial control mechanism	Owner
9	Client's delay in making change orders	Owner
10	Poor coordination and lack of communication project parties	All project parties
11	Financial problems facing contractors	Contractor
12	Inadequate experience of contractors	Contractor
13	Frequent changing sub-contractors	Contractor
14	Construction-related mistake made by contractors	Contractor
15	Poor sub-contractor skills	Contractor
16	Inadequate scheduling and planning	Contractor
17	Lack of contractor's site management	Contractor
18	Design documents delay	Consultant
19	Insufficient inspection plan by consultants	Consultant
20	Inadequate experience of consultants	Consultant
21	Discrepancies and late in design documents	Consultant
22	Insufficient quality control plans and quality assurance	Consultant
23	Slowness in giving instruction	Consultant
24	Late reporting of progress and completed works	Consultant
25	Poor relationship between consultant and other parties	Consultant
26	Poor motivation	Labour
27	Shortage of skilled labour	Labour

No.	Factors of Time Delay	Group
28	Poor relationship between labour	Labour
29	Languages barriers	Labour
30	Labour nationality	Labour
31	Low productivity of workers	Labour
32	Delay in material supply	Supplier
33	Availability of materials in the market	Supplier
34	Inadequate material procurement program	Materials
35	Lack of handling material on site	Materials
36	Low material quality	Materials
37	Inadequate / misuse of material	Materials
38	Failure of equipment	Materials
39	Shortage in construction equipment	Materials
40	Poor equipment productivity	Materials
41	Limit equipment choice	Materials
42	Social and culture effect	External Element
43	Corruption	External Element
44	Land acquisition	External Element
45	Government bureaucracy	External Element
46	Utilities issues	External Element
47	Weather condition	External Element
48	Permits for foreign labour	External Element
49	Security issues	External Element
50	Natural disasters	External Element
51	Regulations changes	External Element
52	Inflation of the market	External Element
53	Currency changes	External Element
54	Delay in dispute settlement	External Element
55	Safety issues during project construction activities	External Element
56	Poor of definition of substantial finishing	External Element
57	Building codes	External Element
58	Inappropriate project	External Element
59	Legal disputes among project parties	External Element
60	Restriction at work site	External Element
61	Demonstration and strikes	External Element
62	Mistakes in contract documents	External Element

III. Material And Methods

The quantitative method was made in this research to assess the opinion of the construction experts in Libya on elements that lead to time delays. A questionnaire was utilized to determine the main factors affecting time delays in Libya. In this questionnaire survey, ordinal scale was conducted to gauge the collected data. The Likert scale was of five from 5 to 1 based on the contribution level used where; 5 indicates extremely high, 4 very high, 3 moderately high, 2 slightly high, 1 low.

Pilot interviews have been done with 11 experts in Libyan construction industry. The interviews mainly were conducted to remove irrelevant questions in the survey. The survey was created after redressing the botches and removing insignificant questions. The questionnaire was delivered to 80 participants (contractors, consultants and clients).

The Relative Importance Index (RII) was used in this research to rate the factors of time delay, and it was calculated with each cause as shown below.

$$RII = \frac{\sum_{i=1}^5 W_i X_i}{(A \times N)} \dots\dots\dots (1)$$

Where:

RII – Relative Importance Index

W – Weight of each element assigned by the participants, which varies from 1 to 5

X – The frequency of each factor's response

A – The greatest weight
 N – Number of responders overall.

IV. Result And Discussion

The survey was conducted by sending 80 questionnaire sets. 58 of the 80 questionnaires distributed were received. Distributed was to 32 contractors, 32 clients and 16 to consultants. 7 of the surveys that were received were deemed invalid for additional data analysis, because they were not completed and. Thus, from 80 questionnaires delivered, only 51 were valid for analysis as showed below in Table 2.

Table 2. Content of questionnaire conducted.

Scope	Values
Questionnaires delivered	80
Questionnaires returned	58
Questionnaire were invalid	7
Valid responses	51
Percentage of questionnaire returned	73.4 (%)
Valid responses for analysis	68.0 (%)

Participants demographic

The survey participants possessed substantial practical experience in carrying out various types of Libyan construction projects. Table 3 shows the characteristics of participants, clients make up the bulk of the respondents (43.14%), then the contractors (39.22%), and consultants (17.64%). The participant’s position indicates that the major number of the participants was construction managers with a percentage of 47.1%, project manager 29.4%, then site engineers 13.7% and the rest (town planner, program manager and development manager) 9.8%.

The participants had a significant experience in implementation of construction projects, such as highways, infrastructure, buildings, and other project types. The size of the majority of these projects were below 7 million (USD) and from 5 to 11 million (USD). 44% of participants have experience above 7-18 years, 34% have experience below 5 years, and 22% have work experience up to 18 years. Overall, the participant’s demographic show that the participants had the ability to take part in this survey.

Rating factors of time delay

The elements that lead to time delay were rated utilizing the relative important index. The RII value was determined for every set of participants, including the contractors, consultants and owners. Table 4 shows the main reasons of time delay which were ranked by the groups of participants. In results, the most significant factors of time delay are delay in payment progress by clients with a RLL value of 0.88, financial difficulties by contractors. This is followed by corruption, security inaccurate design documentation, frequent order changes throughout construction by owner, market inflation and project bidding.

Table 3. Demographics of participants.

Parameters	Frequency	Percentage	Cumulative
Organization type			
Contractor	20	39.22 %	39.2 %
Client	22	43.14 %	82.36 %
Consultant	9	17.64 %	100 %
Participant’s Position			
Construction Manager	24	47.1%	49.1 %
Project Manager	15	29.4 %	76.6 %
Site Engineers	7	13.7 %	90.2 %
Other (Program Manager, Town Planner, Development Manager...)	5	9.8 %	100 %
Type of Projects			
Road Projects	22	43.1 %	43.1 %
Buildings	23	45.1 %	88.2 %
Industrial Projects	6	11.8 %	100 %
Project type			
Below 5 Million	14	27.5 %	33.4 %
4 – 8 Million (USD)	15	29.41 %	56.91%
8 – 20 Million (USD)	10	19.61 %	76.52 %
20 – 40 Million (USD)	8	15.68 %	92.2 %
More than 40 Million (USD)	4	7.8 %	100 %
Working Experience			
Less than 5 years	20	39.22 %	39.22 %
5 – 10 years	21	41.17 %	80.39 %

Parameters	Frequency	Percentage	Cumulative
More than 10 years	10	19.61 %	100 %

The result in Table 4 presents that the four most significant factors of time delay ranked by all three group of participants, and these 4 factors are payment delay process by owners, contractor financing of projects, corruption and challenges with security. These top 4 causes will be evaluated in details in the following section.

Owner payment delay: With a rating of 0.88, this factor is listed as the primary cause of time delay. This factor is frequently happens and it is a crucial element which lead to time delay not in Libya only, but it can be considered as one of the usual main reasons of delays in the majority of developing and developed countries. This result also identified in many places, such as in the UK [5], in Nigeria [15] and also a study conducted in Ghanaian construction industry by Frimpongs et al. [16] also identified Owners payment delay. Thus, it is imperative that owners provide a fast method to expedite the payment process and ensure that payments are issued on schedule. The payment procedure in Libya is also slowed down by bureaucracy in government organizations. Therefore, it is advised that the government create an open plan to expedite the procedure.

Table 4. The main 10 elements of time delay.

Factors of time delay	Overall		Client		Contractor		Consultant		category
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	
Payment delays by owner	0.88	1	0.85	1	0.91	1	0.88	1	Owner
Contractor financial difficulties	0.81	2	0.83	2	0.88	2	0.81	2	Contractor
Corruption	0.79	3	0.80	3	0.76	8	0.79	3	External
Security issues	0.76	4	0.74	4	0.76	8	0.74	6	External
Market inflation	0.74	5	0.69	7	0.80	5	0.75	5	Owner
Inappropriate project type	0.73	6	0.74	4	0.82	3	0.71	8	External
Frequent change by owner during Construction	0.72	7	0.72	5	0.81	4	0.70	8	Consultant
Mistakes in design documents	0.71	8	0.66	11	0.79	6	0.74	6	External
Government bureaucracy	0.72	9	0.64	12	0.74	9	0.76	4	External
Delay in approving design	0.71	10	0.64	12	0.77	7	0.72	7	Client

Difficulties in financing projects by contractors: This factor is one of the main problems that causing time delay in Libyan construction industry. This cause is ranked 2nd factor and agreed by all respondents, including consultants, clients and contractors. Indeed, solving this problem play an essential role in finishing projects on estimated time. The finding is consistent with earlier studies conducted in different countries such as the study of Frimpong and Oluwoye who found this factor is the main element that causes time delay in groundwater projects in Ghana [16]. Difficulties in financing projects have also been found as the first major element leading to time overruns in construction projects in Malaysia [14]. This factor has also been determined as a major problem causing time delay in a research carried out in the Vietnam constructing industry by Le-Hoai et al. [3].

Corruption: With a RII rating of 0.79, corruption is ranked as the 3rd major major cause of time delay. The ability of the construction industry to advance is seriously threatened by corruption since it has a major impact on the rise in projects's schedule. Numerous factors contribute to this problem, including the absence of technical professionals, the weak legal and regulatory framework, the inadequate oversight mechanisms, and the low commitments made by Libyan officials against corruption. The creation of a legislative framework to combat corruption is important in order to address this problem. Libyan leaders must make a strong commitment to altering the corrupt culture within government institutions. Additionally, the Libyan government ought to spend more money developing the technical staff's capabilities and using cutting-edge technological methods to reveal or at least reduce the corruption.

Security: This factor is agreed by all the three group of respondents as a significant agreed that factor cause time overrun. This cause is the 4th factor causing time delay in Libyan construction projects. After Libyan civil war in 2011, most construction projects have not been finished on schedule and estimated budget for more than one decade due to security concerns. The vast majority of projects are delayed as a result of the bad security environment, which is a major concern for construction stakeholders. Fortunately, the security situation in Libya is recovering which will improve the construction sector.

V. Conclusion:

In Libya, time delay in construction projects is a significant challenge. This study focused on time overrun in Libyan construction projects. Thorough analyses of the literature review sixty two factors of time delay were determined. A questionnaire survey distributed to project parties working on different construction projects in Libya. 51 genuine returns were received and examined out of 80 groups of questionnaires that were sent to chosen clients, contractors, and consultants. To rank the factors of time delay, a relative importance index method was used. It was identified that the biggest contributors to time delay in the Libyan construction sector are owner delays in progress payments, contractors financing challenges, corruption, security, owner change order throughout construction phase. Therefore, immediate steps should be done to enhance the Libyan construction industry's capability to reduce time overruns.

References

- [1]. Ahmed, S.M., Azhar, S., Castillo, M. And Kappagantula, P., 2002. Construction Delays In Florida: An Empirical Study. Final Report. Department Of Community Affairs, Florida, US.
- [2]. Ahmed, S., Azhar, N. And Farooqui, R., 2008. Cost Overrun Factors In The Construction Industry Of Pakistan. In The 1st International Conference On Construction In Developing Countries: Advancing & Integrating Construction Education, Research And Practice.
- [3]. Le-Hoai, L., Lee, Y.D. And Lee, J.Y., 2008. Delay And Cost Overruns In Vietnam Large Construction Projects: A Comparison With Other Selected Countries. *KSCE Journal Of Civil Engineering*, 12, Pp.367-377.
- [4]. Flyvbjerg, B., Skamris Holm, M.K. And Buhl, S.L., 2004. What Causes Cost Overrun In Transport Infrastructure Projects?. *Transport Reviews*, 24(1), Pp.3-18.
- [5]. Olawale, Y.A. And Sun, M., 2010. Cost And Time Control Of Construction Projects: Inhibiting Factors And Mitigating Measures In Practice. *Construction Management And Economics*, 28(5), Pp.509-526.
- [6]. Zhu, K. And Lin, L., 2004, October. A Stage-By-Stage Factor Control Frame Work For Cost Estimation Of Construction Projects. In Owners Driving Innovation International Conference.
- [7]. Sweis, G., Sweis, R., Hammad, A.A. And Shboul, A., 2008. Delays In Construction Projects: The Case Of Jordan. *International Journal Of Project Management*, 26(6), Pp.665-674.
- [8]. Abd El-Razek, M.E., Bassioni, H.A. And Mobarak, A.M., 2008. Causes Of Delay In Building Construction Projects In Egypt. *Journal Of Construction Engineering And Management*, 134(11), Pp.831-841.
- [9]. Assaf, S.A. And Al-Hejji, S., 2006. Causes Of Delay In Large Construction Projects. *International Journal Of Project Management*, 24(4), Pp.349-357.
- [10]. Assaf, S.A., Al-Khalil, M. And Al-Hazmi, M., 1995. Causes Of Delay In Large Building Construction Projects. *Journal Of Management In Engineering*, 11(2), Pp.45-50.
- [11]. Al-Momani, A.H., 2000. Construction Delay: A Quantitative Analysis. *International Journal Of Project Management*, 18(1), Pp.51-59.
- [12]. Odeh, A.M. And Battaineh, H.T., 2002. Causes Of Construction Delay: Traditional Contracts. *International Journal Of Project Management*, 20(1), Pp.67-73.
- [13]. Sambasivan, M. And Soon, Y.W., 2007. Causes And Effects Of Delays In Malaysian Construction Industry. *International Journal Of Project Management*, 25(5), Pp.517-526.
- [14]. Alaghbari, W.E., Razali A. Kadir, M., Salim, A. And Ernawati, 2007. The Significant Factors Causing Delay Of Building Construction Projects In Malaysia. *Engineering, Construction And Architectural Management*, 14(2), Pp.192-206.
- [15]. Omoregie, A. And Radford, D., 2006, April. Infrastructure Delays And Cost Escalation: Causes And Effects In Nigeria. In Proceedings Of The 6th International Postgraduate Research Conference In The Built And Human Environment. 923xz.
- [16]. Frimpong, Y., Oluwoye, J. And Crawford, L., 2003. Causes Of Delay And Cost Overruns In Construction Of Groundwater Projects In A Developing Countries; Ghana As A Case Study. *International Journal Of Project Management*, 21(5), Pp.321-326.