

# The Effects of Delay and Time Management Building Construction: A Review

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## ABSTRACT

Risk management helps the key project participants client, contractor or developer, consultant, and supplier to meet their commitments and minimize negative impacts on construction project performance in relation to cost, time, quality and safety. A construction risk is very important the process of construction, whose occurrence results in uncertainty as to the final cost, duration and safety in construction site. The objective of this review includes identification of the causes of delays in Nigerian Construction Projects, the perceptions of the different parties regarding causes of delays, the allocation of responsibilities and the types of delays, and the consequences of delay project management. We also highlight efficient ways of meeting the targeted time management in construction.

**Keywords:** time management building construction; delay building construction; Nigerian construction

## INTRODUCTION

Risk management helps the key project participants - client, contractor or developer, consultant, and supplier - to meet their commitments and minimize negative impacts on construction project performance in relation to cost, time, quality and safety (Banaitiene *et al.*, 2011). A construction risk is very important the process of construction, whose occurrence results in uncertainty as to the final cost, duration and safety in construction site. (Odeyinka *et al.*, 2006). (Smith *et al.*, 2006) asserted that risk exists when a decision is expressed in terms of a range of possible outcomes and when known probabilities can be attached to the outcomes.

Construction delays are the most serious problems which send bad signals to investors thereby slowing down the national development. Delay in construction is a global phenomenon affecting not only the construction industry but the overall economy of countries as well (Sambasivan and Soon, 2007). More so, delays are insidious often resulting in time overrun, cost overrun, disputes, litigation, and complete abandonment of projects Hence, delay is defined as the time overrun, either beyond the date for completion specified by the contract or beyond the extended contract period where an extension of time has been granted.

Sambasivan and Soon (2007) identified the delay factors and their impact on project completion as different causes of delay were:

- (i) Contractor's improper planning
- (ii) Contractor's poor site management
- (iii) Inadequate contractor experience
- (iv) Client's inadequate financial resources and payments for completed work

- (v) Problems with subcontractors
- (vi) Shortage in materials
- (vii) Labour supply
- (viii) Equipment availability and failure
- (ix) Lack of communication between parties
- (x) And mistakes during the construction stage.

Similarly, Alaghbari (2007) indicated thirty-one delay factors: that clients, contractors and consultants agreed that financial problems were the main factors and coordination problems were the second most important factor causing delay in construction projects in Malaysia. Ogunlana (1996) reported three distinctive problems that cause delays in construction. These are classified into three groups:

- (i) Problems of shortage of resources or inadequacies in industry infrastructure (mainly supply of resources)
- (ii) Problems caused by clients and consultants
- (iii) Problems caused by contractor incompetence/inadequacies.

Apart from the opinion from different perspectives, this book uses a paradigm to draw out the consequences of delay in order of sequences. The Contractor should first identify or assume where delay probably may occur in construction projects execution and arrange them in order of preferences and use it as a yardstick when constructing project. From the paradigm in table 23.1-23.3 gives ten influencing factors that causes delay are arranged in descending order of importance as follows:

- (i) Delay in honoring certificates/Evaluation
- (ii) Underestimation of the costs of projects
- (iii) Underestimation of the complexity of projects

- (iv) Difficulty in accessing bank credit
- (v) Poor supervision/bad workmanship
- (vi) Underestimation of time for completion of projects by contractors
- (vii) Shortage of materials
- (viii) Poor professional management
- (ix) Fluctuation of prices/rising cost of materials
- (x) Poor site management.

Source: (Banaitiene et. al., 2011)

**Objectives of the Review**

- (a) To identify the causes of delays in Nigerian construction projects
- (b) To identify the perceptions of the different parties regarding causes of delays
- (c) To identify the allocation of responsibilities and the types of delays.
- (d) To explicit that the consequences of delay project management and highlight efficient ways of meeting the targeted time management in construction.

**Causes of Delay**

The main causes of delay in construction of public projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions, and increase in quantity. The factors that causes delay in construction projects are many and vary from country to country and from one circumstance to another. Delays in construction are caused by several factors. Ahmed (2003) grouped causes of delays into two categories – internal causes and external causes. Internal causes arise from the parties to the contract (e.g. Inexcusable delay - these delays result from a contractor’s own fault or his subcontractor’s consultants or material suppliers.

External causes, on the other hand, arise from events beyond the control of the parties. e.g. Excusable but non-compensable delay -these are delays caused by occurrences which are not attributable to any of the parties. Force major.

Moreover, Toor and Ogunlana (2008) ascertain that the problems faced by the construction industry in developing economies like Thailand were:

- (i) Shortages or inadequacies in industry infrastructure (mainly supply of resources)
- (ii) Caused by clients and consultants
- (iii) Caused by contractor’s incompetence/inadequacies.

However, in Nigeria, lot of thins attributed to the cause of delay which invariably affect the completion time of the building project.

**Effects of Construction Delay**

- (i) Delay in payment of valuation: causes cumulative that drags in the completion time of the project.
- (ii) Delay factors as preparation and approval of shop drawings, delays in contractors, progress payment by owners, and design changes by owners affect the time management as well.
- (iii) Delay in inclement weather: raining for long periods
- (iv) Delay as a result of unavailability of materials mostly on imported goods, artificial or imported material due to architect specification e.g. electrical fittings plumbing fittings fancy blocks steam boilers.
- (v) Delay as a result of circumstances e.g. rock under the ground, lossed soil, low water table and others
- (vi) Change in drawings and specifications and designs: client-initiated variations, as a result of foundation difficulties conditions encountered on site during the project execution, or mistakes in soil investigation and poor design.
- (vii) Lastly, delay has cost consequences for the contractor: standby cost of non – productive workers, supervisors, and equipment, expenses caused by disrupted construction and material delivery schedules and additional overhead costs. Etc.

Source: (Banaitiene et. al., 2011)

The consequences of delay are different for different parties and vary with time. The general consequences are the loss of wealth, time and capacity. For owner, delay means the loss of income and unavailability of facilities. For contractor, delay means the loss of money for extra spending on equipment and materials and hiring the labor and loss of time). (Haseeb et. al., 2011).

The paradigm in tables 1.1-1.3 illustrates the relative importance index and ranks of groups of delay factors by all respondents.

**TABLE 1:** Respondent Professional /Designation

Designation of Respondent	Number of Respondent	Percentage %
Client	37	28%
Contractors	54	42%
Consultants	39	30%
<b>Total</b>	<b>130</b>	<b>100%</b>

Source: (Banaitiene et. al., 2011)

Table 1 show response on the perception of different parties regarding causes of delays in construction projects in Nigeria

**TABLE 2:** Relative Importance Index (RII)

Factors	Clients		Contractor		Consultant		Overall Rank
	RII	Rank	RII	Rank	RII	Rank	
Delay in honouring payment certificates	0.831	1	0.932	1	0.852	1	1
Underestimation of cost of projects	0.824	2	0.845	5	0.792	3	2
Underestimation of complexity of projects	0.784	6	0.824	8	0.792	3	3
Difficulty in accessing	0.797	4	0.858	2	0.755	9	4
Bank credit Poor supervision	0.743	10	0.858	2	0.773	5	4
Underestimation of time for completion by Contractors	0.757	8	0.764	12	0.801	2	6
Shortage of materials	0.696	17	0.851	4	0.759	8	7
Poor Professional Management	0.804	3	0.731	7	0.764	7	8
Fluctuation of prices	0.757	8	0.811	9	0.736	11	8
Poor Site management	0.797	4	0.743	15	0.750	10	10
Construction methods	0.743	10	0.791	10	0.736	11	10

Factors	Clients		Contractor		Consultant		Overall Rank
	RII	Rank	RII	Rank	RII	Rank	
Delay in instructions from consultants	0.709	16	0.831	7	0.708	17	12
Late deliveries of materials	0.655	25	0.838	6	0.731	13	12
Lack of Programme of Works	0.730	12	0.709	20	0.769	6	14
Delay by sub-contractors	0.696	17	0.791	10	0.731	13	14
Poor design	0.730	12	0.757	14	0.727	15	16
Breakdown of equipments	0.764	7	0.743	15	0.704	20	17
Client initiated variations	0.716	14	0.764	12	0.708	17	17
Obtaining permit from municipality	0.689	21	0.723	19	0.676	22	17
Insufficient communication between parties	0.662	23	0.730	17	0.681	21	17
Necessary variations	0.696	17	0.689	22	0.667	23	21
Shortage of skilled labour	0.689	17	0.581	28	0.718	16	21
Legal disputes	0.716	14	0.628	26	0.653	25	23
Unfavourable Site conditions	0.696	17	0.669	23	0.639	27	23
Foundation conditions encountered on site	0.655	25	25	2527	0.708	17	25
Discrepancy between design specification and building code	0.642	27	0.649	24	0.662	24	25
Bad weather conditions	0.635	28	0.709	20	0.597	28	27
Mistakes with soil investigations	0.662	23	0.579	29	0.648	26	28
Unskilled equipment operators	0.601	29	0.635	25	0.588	29	29
Accidents during construction	0.554	30	0.486	30	0.565	30	30
Shortage of unskilled labour	0.473	31	0.446	31	0.468	31	31
Public holidays	0.432	32	0.412	32	0.403	32	32

Source: (Banaitiene et. al., 2011)

Table 2 show perception of different parties regarding causes of delays in construction projects in Nigeria according to Clients, Contractors and Consultants. From the ranking factors in table 1.2, it shows that delay in honouring payment certificates is the first to cause delays of construction projects while public holiday is the least that can cause delay at the early stage of construction projects.

**TABLE 3:** Relative Importance Index and Rank of Delay Factors according to Clients, Contractors and Consultants / Index and Rank of Causes of Groups of Delay Factors

#### IMPORTANCE INDECES

GROUPS	CONT.	RANK	CLIENT	RANK	CONS.	RANK	ALL	RANK
FINANCING	0.867	1	0.795	1	0.781	1	2.802	1
Delay in honouring payment certificates	0.932		0.831		0.852		3.007	
Difficulty in accessing bank credit	0.858		0.797		0.755		2.757	
Fluctuation of prices	0.811		0.757		0.736		2.642	
MATERIALS	0.845	2	0.676	6	0.745	3	2.608	2
Shortage of materials	0.851		0.696		0.759		2.655	
Late deliveries of materials	0.838		0.655		0.731		2.561	
SCHEDULING AND CONTROLLING	0.753	3	0.742	2	0.747	2	2.585	2
Poor supervision	0.858		0.743		0.773		2.730	
Accidents during construction	0.486		0.554		0.565		1.865	
Poor site management	0.743		0.797		0.750		2.635	
Lack of programme of works	0.709		0.730		0.769		2.561	
Construction methods	0.791		0.743		0.736		2.608	
Underestimation of costs of projects	0.845		0.824		0.792		2.824	
Underestimation of complexity of projects	0.824		0.784		0.792		2.764	
Underestimation of time of completion	0.764		0.757		0.801		2.689	
CONTRACTUAL RELATIONSHIP	0.742	4	0.718	3	0.707	4	2.492	4
Poor professional management	0.730		0.804		0.764		2.649	
Legal disputes	0.628		0.716		0.653		2.297	
Insufficient communication between parties	0.730		0.662		0.681		2.385	
Delay in instructions from consultants	0.831		0.709		0.708		2.574	
Delay by subcontractors	0.791		0.696		0.731		2.554	

GROUPS	CONT.	RANK	CLIENT	RANK	CONS.	RANK	ALL	RANK
CHANGES	0.678	7	0.701	4	0.692	5	2.380	5
Client initiated variations	0.764		0.761		0.708		2.514	
Necessary variations	0.689		0.696		0.667		2.358	
Mistakes with soil investigations	0.574		0.662		0.648		2.182	
Foundation conditions encountered on site	0.608		0.655		0.708		2.297	
Poor Design	0.757		0.730		0.727		2.547	
EQUIPMENT	0.690	5	0.683	5	0.646	6	2.315	6
Unskilled equipment operators	0.635		0.601		0.588		2.095	
Breakdown of equipments	0.745		0.764		0.704		2.534	
ENVIRONMENT	0.689	6	0.666	6	0.618	6	2.257	6
Bad weather conditions	0.709		0.635		0.597		2.216	
Unfavorable site conditions	0.669		0.696		0.639		2.297	
GOVERNMENT ACTION	0.595	8	0.588	8	0.580	9	2.029	8
Obtaining permit from municipality	0.723		0.689		0.676		2.399	
Discrepancy between design specification and building code	0.649		0.642		0.662		2.257	
Public holidays	0.412		0.432		0.403		1.432	
MANPOWER	0.514	9	0.581	9	0.593	8	1.960	
Shortage of skilled labour	0.581		0.689		0.718		2.318	
Shortage of unskilled labour	0.446		0.473		0.468		1.601	

Source: (Banaitiene et. al., 2011)

#### Attribute of Delay as Related to Time Management

The causes of project delays fluctuate according to the detail investigation on causes of delay which is due to the faults and weaknesses of the owner and the contractor from table it then needed to know the effect of delay on completion time of project because construction project delay occurs when the completion time of the construction project exceeds the agreed completion time. (Haseeb et. al., 2011.) Delay also occurs due to external factor like change in government, regulation and location etc. (International journal of project management). However, most influencing delay affecting large infrastructures projects in Pakistan are due to government policy, weather: natural disasters other than factors influencing delay in Nigeria. In a nutshell, delay is a universal problem but depending on individual clients, contractors or consultants involved and different locations as well.

As a result of effect of delay in building project, cost and schedule overruns occur due to wide range of factors:

- (i) If project costs or schedules exceed their planned targets, client satisfaction would be compromised.
- (ii) The funding profile no longer matches the budget requirement and further slippage in the schedule could result. (Kaliba et al., 2009).

Invariably, those identified weaknesses or cause of delay are gaps in the project plan which affect time management in building construction project.

#### SUMMARY

Delay is a risk uncertainty and is problematic phenomenon that require knowledge of experts to the unknown circumstances. Project managers have a great responsibility to keep the project success under time of project completion. Hence It becomes necessary to assess the relative important factors causing delay by client and contractors tin order to

over comes time overrun in project management easily. The txt reviewed causes of delay in construction industry which affects time performance of project in general by focusing on the process and parties involved for project management. This would assist those parties concern in project delivery to be conscious of time management and endeavor to overcome time and cost overrun in building construction. delay can be treated as a subject time management in building construction.

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