

Causes and consequence of delay on project construction delivery time

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Abstract

Delay is one of the major problems frequently experienced on construction project sites. Delays can initiate negative consequences such as increased costs, loss of productivity and revenue many lawsuits between owners and contractors and contract termination. The aim of this project is to investigate the causes and consequences of delay on building construction project delivery time. Random sampling technique was used in this study. Population sample of 80 was used in this work. A total sample of sixty seven (67) was deployed, sixty four (64) numbers of those selected were able to return the questionnaire, while three (3) of the sixty seven (67) were ignored for incorrect entry. A structured questionnaire in Likert scale was used in data collection. There are many factors that cause delay on construction projects, however we identified (15) factors includes 1. Lack of funds to finance the project to completion, 2. Changes in drawings, 3. Lack of communication among the parties involved 4. Lack of adequate information from consultants, 5. Contractor's insolvency, 6. Fluctuation of price 7. Slow decision making 8. Variations 9. Contractor insolvency 10. Project management problem among the other factors, also six main consequences of delay were: 1) time overrun, (2) increase in final cost of the project, (3) Reduced profit (4) Disputes, (5) litigation (6) arbitration, the factors and consequences above could be observed and could be a clue to preventing delay on construction delivery time. This study has also established an experiential relationship between each cause and consequence.

Key Words: *Delay, Construction, Delivery, Construction, Consequences.*

I. Introduction

Construction industry in Nigeria is faced with a lot of problems, along with which is delay in project completion period. It has been researched, that delay is a major hindrance in the building industry in Nigeria. The dilemma of delays in the building industry is a worldwide Phenomenon. In Nigeria, it was practically observed that the performance of the building industry in terms of time was unpitiable (Abdul rahama *et al*, 2009). Remon, (2013) revealed that seven out of ten projects surveyed in Nigeria suffered delays in their completing time. Owolabu *et al*, (2014) studied delays in Hong Kong building industry. They emphasized that timely delivery of projects within financial budget and to the level of quality standard specified by the client is a key of winning project delivery (Chiu 2017). Failure to achieve targeted time, budgeted cost and specified quality result in various unexpected negative

consequences on the projects (Chiu 2017). Normally, when the projects are delayed, they are either extended or accelerated and therefore, attract additional cost Mahamid, (2017). The usual practices normally allow a percentage of the project cost as a contingency allowances in the contract cost and this allowance is usually based on decision. Although the contract parties agreed upon the extra time and cost associated with delay, in several cases there were problems between the owner and contractor as to whether the contractor was entitled to claim the extra cost Aditi, (2014). Such situations, usually involved questioning the facts, causal factors and contract interpretation. Therefore, delays in construction projects result in to increase in displeasure to all the parties involved and the core function of the project manager is to make sure that the projects are finished within the budgeted time and cost (Durdyer *et al*, 2017).

II. Review of past research efforts in causes and consequences of delay in construction project deliveries

In some selected articles presented in this section on causes and consequences of delay on construction works reviewer. Enas *et al* (2013) studied construction delays, the study developed a decision support system for construction delay analysis called (DAS). The main categories of delays in DAS according to the study, includes engineering, equipments, external delays, labour, management, material, owner, subcontractors, and weather. Similarly, Owolabi *et al.*, (2014) 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 Owolebi *et al* (2014). Also, Yogita and Desai (2015) 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 (Yogita and Desai 2015). Likewise, 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 in Mahamid (2013). 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. And 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 (Durdyed 2019).

Understanding the concept of delays in project

Many studies have attempted to identify the causes that put construction projects behind planned schedule. For example, Aditi (2014) investigated delay causes in building projects in the United States. Mohammed and Isah (2012) examined delay causes in large construction projects in the United Kingdom. Arditi *et al.*, (2017) analyses the causes of time and cost overruns in high-rise construction projects in Indonesia; Gonzales *et al* (2014) investigated delay causes in large construction projects in Jordan. The causes identified included design changes, poor labour productivity, and inadequate planning. Furthermore, previous studies showed that delays can be caused by owners, planners/designers, contractors, or acts of God. However, most studies focused mainly on identifying delay causes in the construction phase, rarely emphasizing on the planning and design phases. Wa el, (2012), who evaluated delay causes in architectural construction projects, concluded that many delays manifest during all project phases and primarily occur during the construction phase; however delays that start in the design phase include inadequate schedule control by architects, inability of owners to review design in a timely manner, late incorporation of emerging technologies into a design, and ineffective coordination and/or inclusion of project user groups. Mahamid (2011) identified factors at the start of a project that almost certainly lead to project delays and provided insight into the reasons for the delay and their impact on schedule.

III. Methodology

Random sampling technique was used in this research. Population sample of 80 was used in this work. A total sample of sixty seven (67) was deployed. A structured questionnaire in Likert scale was used in data collection.

Percentage composition of respondents' profession

Table 1.1 Result of profession of respondents

S/N	PARTICULAR	FREQUENCY	PERCENTAGE (%)
1	Quantity surveyor	8	12.5
2	Architect	15	23.4
3	Engineer	20	31.3
4	Builder	15	23.4
5	Other	6	9.4
6	Total	64	100

Source: Field survey (2021)

In this research, purposive sampling was used in selecting the respondents professionals in the building industry were selected and sixty four (64) numbers of those selected were able to return the questionnaire, while three (3) of the sixty seven (67) were ignored for incorrect entry. Based on the response obtained from Table 1.1 (8) 12.5% of the respondents are quantity surveyors, (20)

31.3% of the respondents are Engineers, (15) 23.4% of the respondents are Builders and Architect while (6) 9.4% of the respondents fall on others.

From the analysis above, the engineer had the highest percentage among the respondent while the builder and Architect has 23.4 %. The combination of this professional give sample response to the information been sought which further validate the outcome of the analysis.

Table 1.2 Result of respondent’s education qualification

S/N	PARTICULAR	FREQUENCY	PERCENTAGE (%)
1	OND	8	12.5%
2	HND	12	18.75%
3	BSC	25	39.06%
4	Msc	18	28.13%
5	Phd	1	1.56%
6	TOTAL	64	100%

Source: Field survey (2021)

Table 1.2 shows that (8) 12.5% of the respondents had OND result (12) 18.75% of the respondents are HND holders (25) 39.06 of the respondents are Bsc holders (18) 28.13% of the respondents are Msc holders while (1) 1.56% of the respondents had PHD.

Table 1.3 Percentages of Years of Working Experience of the Respondents

S/N	PARTICULAR	FREQUENCY	PERCENTAGE %
1	Less than 5 years	30	46.9
2	5-10 years	12	18.8
3	11-15 years	9	14.0
4	16-20 years	7	10.9
5	20years and above	6	9.4
6	Total	64	100

Source: Field survey (2021)

From above table 1.3, on the percentage of years of working experience of the respondents (30) 46.9% of the respondents have less than 5 years working experience, (12) 18.8% of the respondents have 5-10 years working experience, (9) 14.0 of the respondents have 11-15 years working experience, (7) 10.9% of the respondents have 16-20 years working experience, (6) 9.4% of the respondents have 20years and above working experience.

Table 1.4 highest percentages of causes of delay

S/N	Particular	frequency	percentage
1	Client	46	71.9
2	Consultant	12	18.8
3	Contractor	6	9.3
4	Total	64	100

Source: Field survey (2021)

From above table 1.4 showing the highest percentage of causes of delay amongst the client, consultant and contractor, (46) 71.9 % of the respondents attested to the fact that the clients are have the highest percentages of the causes of delay, (12) 18.8% of the respondents attested to the fact that the contractor has the second highest percentage of causes of delay. While (6) 9.3% of the respondents attested to the fact that the consultants has the lowest percentage of causes of delay.

Table 1.5 Factors causing delay in construction projects

No	Causes of delay	Strong agreed	agreed	Strong disagreed	disagreed	undecided	MIS	Rank
1	Lack of fund to finance the project.	62.2%	33.3%	0	1.1%	3.3%	0.900	1
2	Slow decision making	25.6%	55.6%	3.3%	3.3%	12.2%	0.785	2
3	Fluctuation of price	12.2%	47.78%	11.1%	14.4%	14.4%	0.658	9
4	Mistake during construction	14.4%	50%	8.89%	6.67%	20%	0.664	11
5	Bad weather	22.2%0	37.8%	12.2%	4.4%	23.3%	0.662	8
6	Lack of communication	30%	48.89%	5.56%	3.3%	12.2%	0.762	4
7	Changes in drawing	27.78%	55.56%	5.56%	0	11.1%	0.780	3
8	Lack adequate information	28.89%	48.89%	7.78%	2.2%	12.2%	0.760	5
9	Contractor insolvency	31.1%	43.3%	8.89%	3.3%	13.3%	0.751	6

10	variation	21.1%	56.67	4.444%	3.333%	14.44%	0.73 3	7
11	Labour strike	11.11%	24.4%	16.67%	26.67%	0.11%	0.55 3	15
12	Equipment availability failure	21.1%	46.67%	5.56%	77.78	21.1%	0.68 2	10
13	Mistake and discrepancies in contract document	20%	50%	7.77%	77.78%	14.4%	0.70 6	9
14	Project management problem	21.1%	55.56%	4.44%	4(4.4%)	14.4%	0.73 0	8
15	Inappropriate overall organizational structure linking to the project	15.56%	46.67%	7.78%	10%	20%	0.65 6	14

Source: field survey (2021)

Note (MIS mean index score)

Factors causing delay in construction project is presented in table 1.5. Lack of funds to finance the project to completion with 0.900 mean index score is suggested as the most preferred factor as causing delay on construction projects. This is closely followed by the changes in drawings having 0.780, and then lack of communication among the parties involved having the MIS value of 0.762. Furthermore lack of adequate information from consultants having the MIS of 0.760 is ranked 3rd, funds is the most essential factor for a project to be executed appropriately. Changes in drawing can incur increase in cost of work and also delay in execution of work and it could also cause slow decision making which ranged 5th with of 0.785, contractors insolvency having MIS of 0.751 could also occur seen his time is been increased and tends to spend more and may run into debt causing there to be variation having MIS of 0.73. , next is fluctuation in prices of building materials' with MIS of 0.65 could either increase cost or decrease depending on the market at the time.

Table 1.6 Consequence of delay on construction projects

No	Consequence of delay	Strongly agreed	agreed	Strongly disagreed	disagreed	undecided	MIS	rank
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				disagreed				
1	Time overrun	58.89%	32.2%	1.1%	4.4%	3.3%	0.877	1
2	Increase in final cost of the project	47.8%	34.4%	3.3%	2.2%	5.6%	0.86	2
3	Reduced profit	40%	33.3%	5.65%	6.7%	14.4%	0.756	4
4	Dispute b/w parties involve	23.3%	54.4%	5.6%	6.7%	18.9%	0.767	3
5	Litigation	31.1%	41.1%	4.4%	3.3%	20%	0.72	5
6	arbitration	27.8%	43.3%	4.4%	2.2%	22.2%	0.70	6

Source: field survey (2021)

Note (MIS mean index score)

Outcome from table 1.6 shows that time overrun ranked the highest with mean index score value of 0.87, while increase in final cost of projects is ranked second with mean index score of 0.86. Time in every phase of life is really essential, when a contract is done and the date is given, the consequence of delay really affect time and as the adage goes time is money. Time affects every other factor, the increase in final cost; more money has to be spent. Litigation and arbitration were ranked the least with MIS values 0.72 and 0.70 respectively. There is a close interrelation among the factors that were ranked least. Dispute among parties involved can induce litigation and arbitration and if the decision of the arbitration panel is not acceptable to either of the parties involved this can lead to big time legal battle which can truncate the progress of the work.

Summary of findings

The result of analysis from this study can be said to be of great significance to the construction industry. Mainstream of the respondents are fully involved in the construction industry with at least 8 years of construction experience, meaning that the respondents have wealth of knowledge and could supply the necessary information on the question set out in the questionnaires.

The professionals represented were the clients having the highest percentage of 51.1% of causes of delay in construction project followed by the contractors having 35.5% then the consultants having the least percentage of 13.3%.

There are many factors that influence delay on construction projects, nevertheless in this study the factors are limited to 9 factors causing delay and they were ranked according to the mean index score. The factors include:

1. Lack of funds to finance the projects to completion,

2. Changes in drawings,
3. Lack of communication among the parties involved,
4. Lack of adequate information from consultants,
5. Slow decision making
6. Contractors insolvency,
7. Variation in price,
8. Bad weather,
9. Fluctuation in prices of building materials.

Investigation was also carried out on the consequence of delay on the project work. Time overrun, increase in final cost of project. Time is factor that is very essential in all activities that has to be carried out, in the contract document a specific time phase is given for delivery of project and if the time is being exceeded more money is often spent which could lead to increase in final cost of project. The client's capital has to be withheld due to non-completion of the project which could result into dispute, litigation and arbitration among the workers and management. Also delay can lead to reduced profit for builder and abandonment of building project by the client.

Conclusion

We investigated the causes and consequence of delays facing the construction industry. A questionnaire was designed and distributed among the three major groups of participants (clients, consultants and contractors). We identified main causes of delay and ten most important causes were 1. Lack of funds to finance the project to completion, 2. Changes in drawings, 3. Lack of communication among the parties involved 4. Lack of adequate information from consultants, 5. Contractor's insolvency, 6. Fluctuation of price 7. Slow decision making 8. Variations 9. Contractor insolvency 10. Project management problem among the other We identified main consequence of delay and they were: (1) time overrun, (2) increase in final cost of the project, (3) Reduced profit (4) Disputes, (5) litigation (6) arbitration. As an important contribution, we also studied the experiential relationships between the causes and consequence of delays. We isolated the causes of delay for each of the six effects. We believe that the results of this study can be of immense help to the practitioners (clients, contractors and consultants) and academicians. The practitioners can better understand the dynamics of project management and make efforts to reduce the incidences of delays. The academicians can conduct similar studies in other parts of world and identify causes and consequence of delays. As mentioned earlier, some causes and consequence may be unique in other part of the world.

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