



## Effect of Building Delay on Construction Project Delivery in Minna, Nigeria

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### ABSTRACT

Delays in construction projects are highly expensive and often lead to disputes and claims. Therefore, monitoring project progress is crucial to prevent delays or detect them early. This study investigated the impact of building delays on construction project delivery in Minna, aiming to minimize future delays. Data were gathered from construction professionals, with 184 questionnaires distributed and 156 returned, yielding an 85% response rate. The data were analyzed using percentages and mean item scores (MIS). The study identified ten key causes of delays in building construction, with the most significant being a lack of funds (MIS = 4.85), inaccurate material estimates (MIS = 4.76), and insufficient worker motivation (MIS = 4.56). Overall, all causes were deemed significant (average MIS = 3.91). It also highlighted eight effects of building delays, with time overruns (MIS = 4.85) and increased project costs (MIS = 4.61) being the most severe, while project abandonment was the least significant (MIS = 2.80). On average, all the effects of delays were considered significant (average MIS = 3.69). The most effective strategies to minimize or eliminate delays included securing reliable funding and ensuring timely payments (MIS = 4.90), proper material procurement (MIS = 4.66), and strategic planning with systematic controls (MIS = 4.52). All strategies were found to be effective (average MIS = 3.76). Building delays have a significant impact on project delivery. To reduce delays and their effects, the study recommended thorough planning, ensuring adequate funding from project inception, and engaging competent professionals to manage the design and cost control throughout the project. The study also identified eight major effects of building delays, with time overruns (MIS = 4.85) and cost increases (MIS = 4.61) being the most notable. Abandonment of projects (MIS = 2.80) was the least significant effect. On average, the effects of delays were significant (average MIS = 3.69). To mitigate delays, the most effective strategies identified were securing reliable funding and timely payment of interim certificates (MIS = 4.90), proper material procurement (MIS = 4.66), and effective planning and control (MIS = 4.52). The average effectiveness of the strategies was rated at 3.76. The study concluded that delays significantly affect project delivery, and recommended that clients ensure proper planning, secure sufficient funding, and engage qualified professionals from the project's inception to minimize delays and their impacts.

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### INTRODUCTION

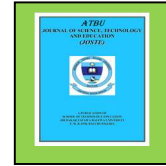
When construction projects experience delay, the effects are frequently detrimental to

the stakeholders (Fashina *et al.*, 2020). Delays in construction projects simply mean project slip-over, time overrun, and the inability of the PET to

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achieve definite milestones or complete a part of or deliver the whole project on schedule (Yalini and Alan, 2015; Turkarand Apte, 2016). This happens in small and large construction projects in developed and developing economies. Nevertheless, the level, the causes, and the severity of delays vary from project to project and between project types (Durdyev and Hosseini, 2020).

Delays have varied effects on different project stakeholders, i.e., the client, end-user, and contractor. To the client, it means the delayed realisation of project objectives; immense capital is tied down, resulting in the loss of revenue, cost overruns, and failure to receive value for money (Yalini and Alan, 2015). In the case of end-users, any delay in completing a planned construction project has multi-dimensional effects on their operations. It means stunted growth, the inability to implement planned expansions, new products or programmes, low productivity, and downsizing in extreme cases (Turkar and Apte, 2016). Amoatey *et al.* (2015), in their study on the analysis of delay causes and effects in Ghanaian state housing construction projects, identified the critical effects of delays as cost overruns, time overruns, litigation, lack of continuity by clients, and arbitration.

In 2016, Santoso and Soeng (2016) carried out research work in Cambodia, where the top ten factors were found to be related to the contractor. They further show that rain and flood factors were also found to be significantly influencing the key objectives of construction projects, which are time, cost, and quality (Santoso and Soeng, 2016).

In addition, out of the 21 identified effects of poor communication in construction projects, Gamil and Abdul Rahman (2018) found time overrun to be the effect that occurs recurrently. Pinamang *et al.* (2018), in a recent study, found that the major effects of a lack of scheduling in construction projects are delays and disruptions.

Delays are very costly and always result in disputes and claims. Therefore, it is important to keep track of project progress to

avoid the possibility of delay or identify it at early stages (Ghazali, 2017). Therefore, to control the delay in the project, it takes the responsibility of all parties to review, analyse, identify problems, and find a solution in the latest renewal of the methods and strategies for planning and implementing the project. Hence, this study assessed the effect of building delays on construction project delivery.

## LITERATURE REVIEW

### Construction Industry

Construction encompasses civil engineering and building projects as well as the maintenance and repairs of existing facilities (Dosumu and Aigbavboa, 2017). More so, Radosavljevic and Bennett (2012) defined construction as a series of activities undertaken by construction companies that produce or alter buildings and infrastructure. Therefore, construction simply means an act of building or erecting structured products to a prepared shape using appropriate resources and machineries.

Zakaria *et al.* (2012) identified construction industry as a sector consists of housing, commercial and infrastructure development. Dinakar (2014) defined construction industry as the subdivision of manufacture and trade based on the building, maintaining, and repairing structures. Building and construction industry is the industry of erecting, analyzing, restructuring, renovating, changing, demolishing, relocating, maintaining or repairing any form of building constructed weather on or off site (Zakari *et al.*, 2012). The functions that construction has make it to be big, lively and difficult industry division that plays a vital role in the Nation's economy. Building houses, places of works, markets, and places of worships; roads, and repairing and maintaining nation's physical infrastructure are part of the functions of construction industry.

Therefore, construction industry is one of the biggest industries that contributed to the economic growth of nations. This statement was justified by Mahamid *et al.* (2012) stated that construction industry is one of the industries that provides important ingredients for the development of an economy. Rao *et al.*, (2016)

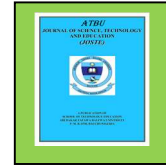
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defines construction industry as a subdivision of the economy that is responsible for the planning, design, construction, maintenance and sometimes demolition of buildings. The definition further states that it is basically service industry, which obtains its inputs and outputs from the subdivisions of economy that they are interrelated and inter-linked. Therefore, looking at the importance of construction industry in the economic development of nations, it becomes necessary to study the activities of the industry and also to be very much vigilant upon all the impediments that will affect the output and quality of the product facilities.

### The Nigerian Construction Industry

Aibinu and Jagboro (2002) stated that the Nigerian construction industry remains the position of occupying a very important place in the nation's economy. Despite that, the construction industry suffered severe effects of delays. Oladinrin, *et al.* (2012) identified that, the Nigerian construction industry shows an important part in the economy, and the activities of the industry are also vital to the accomplishment of national socio-economic development goals of providing shelter, infrastructure and employment. Furthermore, it is clear that construction activities affect nearly every aspect of the economy and that the industry is vital to the continued growth of the economy.

The influence of the construction industry to national economic growth requires improved efficiency in the industry by means of cost effectiveness and timeliness, and would surely contribute in savings cost for the country entirely (Fashina *et al.*, 2020). Construction industry in Nigeria is like any other construction industry in the world in terms of the economic growth and also in problems facing. Oyewobi *et al.* (2016) justifies that Nigeria is like most developing countries where construction industry plays a dominant role in the economic activities of the country.

### Delays in Construction

Delay is a term that being referred to as time and cost overrun in construction projects

(Memon *et al.*, 2011). This definition is similar to Hamzah *et al.* (2012) as delay is time and cost in construction projects. They stated that delay is time overrun or extension of time for accomplishment of a project. Construction delay is the action or situation that fallouts in finishing the project later than agreed in the contract. A delay can also affect to starting or finishing a specific activity later than planned (Gamil and Rahman, 2017). However, the definitions above captured time and cost but has to be related to the one agreed in the contract or in the inception stage.

Pinamang *et al.* (2018) defines project delay as the accumulated effect of the delays in the individual activities. Definition of project delay given here lacks some terms. Budgeted cost and contract initial period are the most important terms that supposed to be mentioned, because the factors of delay affect cost and time first before anything else in the construction industry. Amongst the key players of the industry, contractor normally became the prime victim of delay factors for the fact that contractor is responsible for all the acts and omissions of the contractor's employees, subcontractors, their agents and employees, and any other person performing work under a contract with the contractor (Frank, 2012). Upon all the research conducted, different perceptions on definitions were given to delay.

The definitions given mostly consider the inability of the contractor to finished project as planned. Ashraf and Ghanim(2016) gave the definition as loss of output and revenue in construction projects. This clearly include cost overrun as the way Memon *et al.* (2011) and Hamzah *et al.* (2012) defined delay. According to the gathered definitions, delay in construction project is any situation that can lead to extension of scheduled project period or increase on initially budgeted cost of the project due to human or natural causes during design and construction processes.

### Effects of Delay Factors

Based on the research conducted by Mehdi Riazi and Lamari (2013) it identifies time

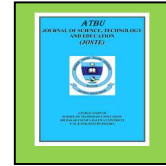
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frame extension, increase in cost due the extension of time, government periodic budget and plan execution, and cost overrun as effects of delays in construction projects. Furthermore, they said the reputation is always at stake in delay cases and the government risks losing public confidence, also the depressing condition is subject to litigation and arbitration. Mehdi Riaz *et al.* (2011) stated in their research that delays have serious effect on construction organizations, which results to increase in cost of the project, loss of opportunity cost, damage in reputation, arbitration, litigation and even to the worse situation of abandonment of the project. However, scholars concerned on the effects of delays on construction organization in general, but there is need to look at the effects on the reputation of the organizations since reputation is an intangible asset and it affects future business.

#### **Delay factors in the Nigerian Construction Industry**

Factors responsible for construction delays varied into many perspectives and approaches. Aibinu and Odeyinka, (2006) listed 44 causes of delay from their literature review which form part the questionnaire they distributed. They used concordance analysis to see the prioritization of these factors. However, they used chi-square to test the prioritized time influencing factor in construction projects. By relating the Pareto principle to study the distribution pattern of the delay factors, the work has been able to observe old and frequent problem from a fresh angle. It has also delivered some indication of the input of 44 delay factors to overall project delays. The result of Pareto analysis established the interdependent nature of building activities and roles. The research said that, disputes may arise from questions relating to causal factors, contract interpretation, and quantum of the claims. Therefore, delays represent an area of leakages in the construction industry. In Nigeria, the problem of delays is more, especially when one considers the present economic condition of the country (Sunjika and Jacob, 2013)

According to Mohammed and Isah (2012) delay factors in the Nigerian construction industry particularly contractor's related are improper planning, lack of effective communication, , shortage of supply like steel, financial issues, shortage of material, cash flow problems during construction, increase in quantities and mismanagement by the contractor, conflicts in work schedules of subcontractors, contractors regarded contractual relationships, site accidents, negligence, late deliveries of materials and equipment, liquidated damage and disputes.

#### **Effects of Construction Delay in the Nigerian Construction Industry**

According to Akinsiku and Akinsulire (2012) effects of delay are always unbearable on construction projects. They also stated that the effects are cost and time overruns, interest accumulation on capital to finance, wastage and under-utilization of man power resources and claims. It further stated that under-utilization of equipment, loss of confidence on the contract (therefore jeopardizing the reputation of contractor in the case of future tendering chances) and late returns of income are effects of delay. Among the effects also include reduction of employment opportunities, dispute between parties involved, aids the decrease in the tempo of economic activities in the nation, additional insurance charges, extra taxes and dues due to delay.

Aibinu and Jagboro (2002) conducted a research on effects of construction delay on project delivery and discovered the followings as effects such as, time overrun, cost overrun, dispute, arbitration, litigation and total abandonment. Also Olushegun and Michael (2011) investigated on abandonment of construction projects in Nigeria: causes and effects and revealed that, inadequate planning, inadequate finance, inflation, bankruptcy of contractor, variation of project scope, political factor, death of client, incompetent project manager, wrong estimate, inadequate cost control, faulty design, delay in payment by the client, disappointment of the populace, lowering

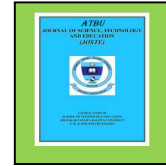
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of living standard, wastage/ underutilization of resources, reduction of employment opportunities, decrease in the tempo of economic activities, decrease in the revenue accruing to government and difficulties in attracting foreign loan.

However, Akinsiku and Akinsulere (2012) conducted a research on stakeholders perception of the causes and effects of construction delay on project delivery and concludes that, cost and time overruns interest accumulation on capital to finance, wastage and underutilization of man power resources, claims, underutilization of equipment, loss of confidence on the contract, late returns of income, reduction of employment opportunities, dispute between parties involved, aids the decrease in the tempo of economic activities in the nation, additional insurance charges, extra taxes and due to delay and arbitration/ litigation and total abandonments. Also Mohammed and Isah (2012) conducted research on causes of delay in Nigeria construction industry and revealed that , improper planning, lack of effective communication, design errors, shortage of supply like steel, slow decision making, finance issues, shortage of material, cash flow problem during construction, increase in quantities and mismanagement by the contractor, loss of interest by the stake holders, blacklist by authorities, waste of money and time and declination of reputation. Furthermore, Sujkaand Jacob (2013) carried out research on significant causes and effects of project delay in the Niger delta region and concludes that, time overrun and budget overrun, disputes and claims are the major effects of project delays.

Others include insolvency of the contractor, inability to meet the living standard, arbitration/litigation and total abandonments as effects of delays in Nigerian construction industry.

Ibironkeet *al.* (2013) conducted research titled as “analysis of non-excusable delay factors influencing contractor’s performance in Lagos state, Nigeria”. The research states that, the Nigerian construction industry has a very poor reputation for coping

with delays. Therefore, it is significantly clear that delay affects the contractors’ performance as well as their reputation in the construction industry.

## METHODOLOGY

The study employed a quantitative survey design to gather data from construction professionals in Minna, Nigeria, using a questionnaire. The research population included professionals directly involved in building projects, with a sample frame created from registered construction firms in the area (Flick, 2018). A simple random sampling technique yielded a sample size of just over 380 participants.

The questionnaire aimed to collect demographic data and information pertinent to the study’s objectives. Data analysis was conducted using IBM’s SPSS version 25 and Microsoft Excel 2016, presenting findings through tables and graphs, and utilizing percentiles to assess the significance of various factors. Cronbach’s Alpha Reliability Test was used to evaluate the reliability of the results. This is in line with the assertion of Santos (1999)

The mean score (MS) was calculated to rank the causes, effects, and strategies concerning lateness and non-payment in public client construction projects, while standard deviation measured the dispersion of the responses.

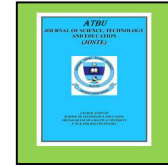
## RESULTS AND DISCUSSIONS

The section explains the questionnaire data used for analysis including accurate interpretation of the analysis results which is then followed by a discussion of the results obtained from the analysis.

### Data Preparation and Reliability

Table 1 shows the summary of data preparation and reliability. One hundred eighty-four (184) questionnaires were administered to the research population and one hundred and fifty-six (156) were retrieved representing a response rate of 85%.





After that, the data was imported into SPSS for analysis to assess its reliability. The main purpose of the reliability test is to assess the reliability and internal consistency of the overall

research data. Generally, the reliability in terms of Cronbach's Alpha for the entire data (0.784) is good because it is greater than 0.500.

**Table 1:** Summary of Data Preparation and Reliability

Sent	Total Responses		Cronbach Alpha
	Received	Response Rate	
187	156	85%	0.784

**Demographic Characteristics**

Table 2 shows the demographic characteristics of respondents. As regards educational qualification, 46.15% have Bachelor Degree, 8.97% have a Higher National Diploma (HND), 7.05% have Postgraduate Diploma, and 37.18% have Master Degree, while 0.68% has Doctorate Qualification. This revealed that the respondents are adequately educated to provide meaningful information for this research.

As regards the professional background of the respondents, 41.67% were Architect having a majority, followed by Quantity Surveyor with 32.05%, Engineers with 16%, Estate Surveyor with 5.77% while Builder having minority with 4.49%. The major professions in the

Nigerian construction industry are well represented.

For the age group, 44.87% of the respondents were between 21 and 30 years old, 32.05% were between 31 and 40 years old, 10.90% were between 41 and 50 years old and 12.18% were 50 years and above. This shows that almost all age groups are well represented. Lastly, in the case of years of experience, 2.56% of the respondents have 10-15 years of working experience, 21.15% have 15-20 years working experience, 54.49% had 5–10 years, 1.92% had less than 5 years working experience while 19.87% have working experience of 20 years and above. This connotes that the respondents are well experienced to provide valuable information for this research.

**Table 2:** Demographics Characteristics of Respondents

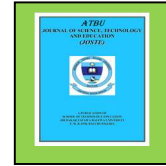
Variables	Frequency	Percentage (%)	
Highest Academic Qualification	Higher National Diploma	14	8.97
	Bachelor Degree	72	46.15
	Post Graduate Diploma	11	7.05
	Master Degree	58	37.18
	Doctorate Degree	1	0.64
	<b>Total</b>	<b>156</b>	<b>100.00</b>
Profession	Architect	65	41.67
	Builder	7	4.49
	Engineer	25	16.03
	Estate Surveyor	9	5.77
	Quantity Surveyor	50	32.05
	<b>Total</b>	<b>156</b>	<b>100.00</b>
Age Group	21-30	70	44.87
	31-40	50	32.05
	41-50	17	10.90
	50 above	19	12.18
	<b>Total</b>	<b>156</b>	<b>100.00</b>
Years of Experience	10-15 years	4	2.56

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15-20 years	33	21.15
20 years above	31	19.87
5-10 years	85	54.49
Less than 5 years	3	1.92
<b>Total</b>	<b>156</b>	<b>100.00</b>

### Causes of Delay in Building Construction Projects in Minna

In order of importance, the study arranged the mean index score (MIS) of the causes of delay in building construction projects in Minna. Table 4.3 shows that the most common causes of delay in building construction projects in Minna are: unavailability of funds (MIS = 4.85); inaccuracy of material estimation (MIS = 4.76); and lack of incentive motivation among workers (MIS = 4.56). Other causes of delay in building construction projects are also significant and moderately significant. These range from poor site management and supervision (MIS = 4.37) to

lack of coordination of project team activities (2.94). Averagely, all the causes of delay in building construction projects in Minna are significant (average MIS = 3.91).

In support of this study findings, *Fashina et al., 2020; Santoso and Soeng, 2020; Durdyev and Hosseini, 2020; and Yalini and Alan, 2015*, identified unavailability of funds, inaccuracy of material estimating, lack of incentive motivation of workers, poor site management and supervision, and inaccuracy of material estimating as the causes of delay in building construction projects.

**Table 3:** Causes of delay in building construction projects in Minna

S/No.	Causes	MIS	Rank	Decision
1	Unavailability of funds	4.85	1 <sup>st</sup>	Very significant
2	Inaccuracy of materials estimating	4.76	2 <sup>nd</sup>	Very significant
3	Lack of incentive motivation of workers	4.56	3 <sup>rd</sup>	Very significant
4	Poor site management and supervision	4.37	4 <sup>th</sup>	Significant
5	Inaccuracy of materials estimating	4.23	5 <sup>th</sup>	Significant
6	Lack of coordination of project team activities	3.83	6 <sup>th</sup>	Significant
7	Poor estimation of project cost	3.48	7 <sup>th</sup>	Moderately significant
8	Delays of required documentation needed to full-fill payment	3.04	8 <sup>th</sup>	Moderately significant
9	Consultant failure in treating claims	2.95	9 <sup>th</sup>	Moderately significant
10	Lack of coordination of project team activities	2.94	10 <sup>th</sup>	Moderately significant
<b>Average MIS</b>		<b>3.90</b>		<b>Significant</b>

### Effect of Building Delay on Construction Project Delivery in Minna

The use of MIS to explain the effect of building delays on construction project delivery in Minna in order of significance Table 4.4 reveals the result of MIS for the eight effects of building delays on construction project delivery in

construction firms. It was shown that the most significant effects are time overruns, increases in the final cost of the project, and under-utilization of equipment and plants purchased for the project, with MIS values of 4.85, 4.61, and 4.18, respectively. While abandonment of the building project was identified as insignificant with MIS

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values of 2.47, on average, all the identified effects of building delays on construction project delivery in Minna were significant (average MIS = 3.69).

This study's findings are in line with the findings of previous research that confirmed various effects of delay in the construction

industry. Cost overruns, time overruns, disputes, arbitration, litigation, and accumulations of interest rates on the capital to finance the project were the effects of delay in the construction industry (Motaleb and Kishk, 2010; Abedi *et al.*, 2011; and Mehdi Riaz *et al.*, 2011).

**Table 4:** Effect of building delay on construction project delivery in Minna

S/No.	Effect	MIS	Rank	Decision
1	Time overrun	4.85	1 <sup>st</sup>	Very significant
2	Increase in final cost of project	4.61	2 <sup>nd</sup>	Very significant
3	Under-utilization of equipment and plant purchased for the project.	4.18	3 <sup>rd</sup>	Significant
4	Accumulations of interest rate on the capital to finance the project.	3.86	4 <sup>th</sup>	Significant
5	Tying down of client capital due to non-completion of the project	3.52	5 <sup>th</sup>	Significant
6	Dispute/Disagreement between parties	3.27	6 <sup>th</sup>	Significant
7	Negative Social Impacts	2.80	7 <sup>th</sup>	Moderately Significant
8	Abandonment of building project	2.47	8 <sup>th</sup>	Less Significant
<b>Average MIS</b>		<b>3.69</b>		<b>Significant</b>

**Suggest measures could be taken to minimize or eradicate building delays in Minna**

This section shows the result of the analysis undertaken on the suggested measures that could be taken to minimise or eradicate building delays in Minna. Table 5 shows that of the twelve (12) strategies to minimise or eradicate building delays in building construction projects, reliable sources of funding for the project and consistent payment of interim certificates as and when due (MIS = 4.90); proper material procurement and availability of resources (MIS = 4.66); and effective strategic planning and systematic control mechanisms (MIS = 4.52) are the most effective strategies. On

average, all the identified strategies for minimising or eradicating building delays are effective (average MIS = 3.76).

The results of the mitigating measures for the effects of delay reveal that, although some mitigation measures have been suggested in the CIRC report. The stakeholders' perceptions of the most effective means of mitigating delay are the provision of reliable sources of funding for the project and the consistent payment of interim certificates as and when they are due. Effective strategic planning and systematic control mechanisms are in line with the previous studies of Owolabi *et al.* (2014) and closely related to the studies of Fashina *et al.* (2020).

**Table 5:** Suggest measures could be taken to minimize or eradicate building delays in Minna

S/No	measures	MIS	Rank	Decision
1	Reliable sources of funding for the project and consistent payment of interim certificates as and when due.	4.90	1 <sup>st</sup>	Very effective
2	Proper material procurement and availability of resources.	4.66	2 <sup>nd</sup>	Very effective
3	Effective strategic planning and systematic control mechanism.	4.52	3 <sup>rd</sup>	Very effective

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4	Provision of infrastructure for efficient project management by all stakeholders through Engineering.	Value 4.17	4 <sup>th</sup>	Effective
5	Construction Contracts should be awarded to competent and experienced contractors who must have registered builders in his employ.	4.13	5 <sup>th</sup>	Effective
6	Adopting different procurement methods such as design-Build or construction management type of contract.	4.02	6 <sup>th</sup>	Effective
7	Provision of contract auditing team to prevent corruption and entrench transparency, probity and accountability between the contractor and consultants.	3.64	7 <sup>th</sup>	Effective
8	Effective communication must be maintained among all the groups involved in the execution of the project.	3.56	8 <sup>th</sup>	Effective
9	Excessive variation should be discouraged throughout the project execution period.	3.02	9 <sup>th</sup>	Fairly Effective
10	Accelerations of site activities	3.01	10 <sup>th</sup>	Fairly Effective
11	Adopting new approach to contract award procedure by giving less weight to prices and more weight to capabilities and past performance of contractors	2.83	11 <sup>th</sup>	Fairly Effective
12	Increases in the contingencies allowed.	2.76	12 <sup>th</sup>	Fairly Effective
<b>Average MIS</b>		<b>3.78</b>		<b>Effective</b>

#### CONCLUSION AND RECOMMENDATIONS

This study assessed the effect of building delays on construction project delivery in Minna with a view to minimising future occurrences of building delays. Data were collected from building construction professionals. One hundred eighty-four (184) questionnaires were administered to the research population, and one hundred and fifty-six (156) were retrieved, representing a response rate of 85%. The analysis of the data was carried out with the use of percentages and mean item scores. The results of the analysis carried out led to the conclusions reached in this chapter.

The most significant causes of delay in building construction projects are the unavailability of funds, inaccuracy of material estimation, and lack of incentive motivation among workers. On average, all the causes of delay in building construction projects in Minna are significant.

The most significant effects of building delays on construction project delivery in Minna are time overruns and increases in the final cost of the project. The least significant effect of

building delay on construction project delivery is abandonment of the building project. On average, all the identified effects of building delays on construction project delivery in Minna are significant. The most effective strategies to minimise or eradicate building delays in building construction projects are reliable sources of funding for the project and consistent payment of interim certificates as and when they are due; proper material procurement and availability of resources; and effective strategic planning and systematic control mechanisms. On average, all the identified strategies for minimising or eradicating building delays are effective. It can therefore be concluded that building delays have a significant effect on construction project delivery.

As a result of the conclusions made in this study, the following were recommended:

- i. Proper communication and coordination with contracting parties must be encouraged by the building owners i.e. good communication channel should be utilized by the

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- contracting parties to avoid delays and its effects
- ii. In order to ensure that projects are delivered within the specified time, to the required quality, and most importantly to the estimated cost, contractors should manage financial resources and plan cash flow by progressively paying workers and suppliers and manage the budget contingency
  - iii. Furthermore, in ensuring that delay in building construction projects are considerably reduce and the effects minimized, clients should undertake an adequate planning for the project at inception and make enough fund available based on reliable estimate made by the Quantity Surveyor at the inception. The client should engage services of competent construction professionals; the Architect should at once and at inception produce economic design as dictated by cost plan prepared by the Quantity Surveyor who also controls cost from inception and throughout the duration of the contract.
  - iv. All stakeholders should ensure that proper planning must be done to cater for unforeseen events that may prolong the construction period, increase cost and cause damage to property and injury to project participants. Such risks should be transferred to competent stakeholders like insurance companies so as to help reduce the effect of costs in the event of delay occurrence.

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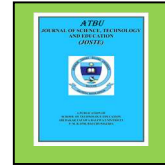
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