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Research Paper

Construction Project Management in the Niger-Delta: Delays and Consequences

[1]Ofem Patrick E, [2]Wofai Ewa, George Stephen U[3]
[1,2,3] *Department of Civil Engineering, Cross River University of Technology, P. M. B. 1123, Calabar, Nigeria*

ABSTRACT
The efficient management and delivery of construction projects in a constantly changing and fast developing construction industry have become the prime focus of most construction companies, estate developers and project managers globally. The factors that impede the successful and timely delivery of infrastructure projects differ from country to country, therefore this research investigates the causes of delays in delivering construction projects in a rapidly developing third world countries, like Nigeria. The objective of this paper is to identify the causes of delays, severity, appraise the effect in the Nigerian construction industry and evaluate their relevance to timely construction project delivery. A Bristol Online Survey (BOS) tool was used to collect the data sample of construction practitioners which includes 7 construction practitioner namely: Nigeria Institute of Civil Engineers (NICE),Nigeria Society of Engineers (NSE), Council for Regulation of Engineering in Nigeria(COREN),Nigerian Association of Project Management(NAPM), Nigeria Institute of Architects (NIA), Nigerian Institute of Quantity Surveyors (NIQS), Nigerian Institution of Surveyors (NIS) . A comprehensive literature review identified Eighteen (18) causes of construction project delays, five (5) consequences and Seven (7) mitigating factors. The projected survey aimed at 350 professionals but only 144 responded within the given timeframe. SPSS was used to analyze the data with Relative Importance Index (RII) used to rank the variables. The Results showed that poor project planning was the leading cause of delays, followed by cash-related causes such as diversion of funds, corruption and misappropriation of funds, whereas, time and budget overruns were established as core issues resulting from project delays. The research also revealed that lack of design knowledge and stakeholder's interference are the most crucial cause of delay. The findings of this study can be used to serve as a benchmark, it implementation into Civil engineering construction will help engineers adequately handle various project management methodologies in the delivery of construction projects and its recommendations for timely delivery of construction projects in Nigeria. Additionally, these findings seek to bridge the knowledge gap on the relevance in implementation of project management methodologies and delivery systems with a focus on Nigeria.

KEYWORDS: *Stakeholder Interference, Construction Industry, Construction Project Management, Construction Delays, Nigeria, Niger-Delta region.*

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I. INTRODUCTION

The dilemma of construction projects delays in Nigeria deserves a holistic overview. Several projects have encountered prolonged and unnecessary delays which often exceed the set scheduled time and cost of completion dues to risk (Ramanathan et al. 2012). Risk is generally known to be an integral part of cosntrcution projects. Practical experience has revealed that risk can be managed, minimized, shared, transferred or accepted, but cannot be ignored. (Fan and Stevenson 2018.). delay is a prevalent risk in project construction and most time a severe one. Delay is frequently the outcome of an event which must be managed by a suitable method in order to lessen its effect. Efficient management of delay during project construction certify that the cause of delay is known and documented at the initiation of the project. Delay is detrimental for the client and engineer. For the client, delay results to loss of expected incomes from the use of the project milestones, and an increased overhead expense connected to project management and project supervision. For the contractor, delay results similarly to increased costs due to prolonged work schedules, inflation on materials, labour and overheads expenses. Delays is experienced in project construction due to several factors and variables ensuing from many causes. These causes include the stakeholder interference and management, dissemination of information and the project environment Ninan, Mahalingam and Clegg, 2019). Even though the construction industry has been

confronted with persistent problem of project delays and cost increase. Such development has unfavorably affected infrastructure provision in Sub-Saharan African countries with a specific indication to Nigeria (Omoregie and Radford 2006). The relatively large funds committed to construction makes the industry a principal source of demand generation. The effect of rendering employment, income and expenditure in other sectors of the economy adds peculiarly to the general economy (Mansfield et al. 1994). Construction often delays accountability for turning profitable projects into losing endeavors (Sweis et al. 2008). This has given rise to new project initiation such as dams, building of houses, highways, irrigation and public utility centers. Unfortunately, one of the crucial setbacks encountered in these projects is the recurrent, extensive and abandonment for which will not help the construction industry of Nigeria to achieve its social economic and infrastructural development of which he pledged.

Furthermore, several research has been carried out on constriction delays in developing countries like Ghana, Malaysia, South Africa, such as the works of Zidane and Anderson (2018); Hussain et al. (2018), and Panova and Hilletofth (2018) but the studies failed to compare the reasons in various project types namely: infrastructure or mega project. It also did not consider the interdependencies between the several project factors to gain more profound insights on the design change dynamic in construction. According to Fan and Stevenson (2018), the literatures used to draw a conclusion on delays was subjective instead of objective this could have validated the data and results used in construction project implementation and adoption. This studies also failed to identify the essence of benchmarking, simulation of construction delays to a real-life project and integrating stakeholders from the inception of the project to the closing stage. This study will focus on proposing strategies for timely construction project delivery in Nigeria, will enhance the delivery of future construction projects in Nigeria this will bridge the knowledge gap on the relevance in implementation of project management methodologies and delivery systems with a focus on Nigeria Additionally, as a civil engineer, I strongly believe that the knowledge detailed in this work will enable fellow engineers to adequately adopt various project management methodologies in the delivery of construction projects and its professional practice in Nigeria. Benchmarking is also another important aspect this research proposed as precedence for construction companies who see these tools as not applicable to their organization, most times due to the size of their project. When adopted in delivery projects the percentage of the project performance will increase reasonably. However, using this will help those who may read this paper will be able to apply its practical enumerated recommendations from diverse cosntrcution practitioners in their respective construction projects for an effective benchmarking and projects outcome, especially when dealing with project delivery.

It is vital to comprehend the fundamental sources of such delays to aid formulate suitable response strategy. The core objective of this research is:

- To Critically review literature on the causes of delays in timely delivery of construction project in Nigeria;
- To evaluate the severity of delays of construction projects as a result of construction delivery risks;
- To Appraise the effects of delays on various construction projects in Nigeria
- To Provide recommendation for improving timely construction projects delivery in Nigeria

II. LITERATURE REVIEW

According to Ahmed et al (2002), Trauner (2009), and Ochoa (2013) categorize delays as excusable (i.e. compensable and non-compensable), non-excusable and concurrent delays. For a nation to accomplish its social and economic sustainable developmental objectives, it needs to construct infrastructural, industrial, educational, medical and residential projects that meet society's needs and requirements (Othman, 2012; Khan, 2008). The construction industry is not only there to give infrastructure and solutions to problems of shelter, but likewise as a potentially leading sector in the change process which stimulates the economy and alleviates unemployment. To be precise, construction is both contributory and responsive to development pressures, and government policy should be framed in line with it (Field and Ofori 1988). Sadly, many projects are faced with extensive delays and exceeding the initially scheduled completion times, resulting in cost overrun and extensions of time (Ramanathan et al. 2012). It is pertinent to identify the reasons for delays which are colossal in nature because of stakeholder interference, engineering problems, human development issues, managerial problems and sustainability challenges.

In South Africa, Mthalene et al., (2008) identified the causes of delays to be the frequent occurrence of site accidents, which are also like the ones that occur in Nigeria's construction industry due to lack of implementation of health and safety regulations. Furthermore, the causes of site accidents have had economic impacts and delays on construction companies, which are a loss of productivity, disruption of current work, damages to plants, equipment, completed work, costs of workman's compensation insurance and downtimes in operations while accident causes are determined.

Evaluation of past construction projects implemented in the Niger Delta region shows that externally related origins typically influence the causes of delays as a result of stakeholder's interference, communal

clashes, poor weather, topography issue, lack of infrastructure, lack of project delivery systems, continuity problems, new selection of contractors and consultants (Jia et al. 2011). Furthermore poor material selection, financial and delay in payments, bureaucracy, lack of skilled manpower, sustainability challenges, lack of proper project management planning techniques, poor material selection, site-related factors, scheduling and control related cause, unwillingness to compensate communities and indigenes of lands demolished along proposed construction area have also been known to cause delays in construction projects namely, leading to time and cost overrun (Sunkja and Jacob, 2013; Othman 2012, Khan 2008, Mthalene et al. 2007, Field and Ofori 1988; Hussin and Omran, 2011).

Zuofa and Ochieng (2014) added that qualitative research was a most favorable approach for identifying project failures in the Nigerian construction industry. However, Nigeria has numerous construction industry players within the varied regions where construction activities occur, thus, accepting the information from a focus group might not be a true representation of the entire construction sector. Thus, the factors identified by Zuofa and Ochieng (2014) agree with Odeh and Battaineh (2002), thus making it a genuine point of comparison and adoption. Furthermore, the present condition and performance of the Nigerian construction industry may not be commendable. Still, it needs to be stress that this is not an exceptional case.

Ofori (1993) revealed that the underlying challenges of the construction sector in other developing nations are more fundamental, severe, complicated, and much more critical than those been faced by developed countries. The study also recognized common issues affecting the construction sector in many developing nations, which are the lack of management skills, shortage of skilled labour, low productivity, unavailability of supplies, bad quality of supplies and lack of equipment. In addition to the problems listed above, Kasimu et al. (2013) indicated that lack of Knowledge Management in construction setting has cause project delays. Although, Knowledge Management (KM) activities are still in the developmental phase in the Nigerian construction sector. Nevertheless, KM is vital for enhanced construction project delivery and facilitate delays, since lessons learned from one project can be transferred onto future projects, leading to continuous improvement (Carrillo et al., 2012).

The problem of delays in the construction industry does not only occur in developing countries but is a global phenomenon (Sambasivan and Soon, 2007; Majid, 2006). In Nigerian construction industry, Arjanlekoko (1987) noted that the performance of the construction sector as regards to time was poor. On the other hand, Odeyinka and Yusif (1997) discovered that seven out of ten projects surveyed in Nigeria encountered delays in their execution. In broader reference to the Saudi Arabia construction industry, Assaf and Al-Hejji (2006) found that only 30% of construction projects were completed and delivered within the scheduled completion dates and that the average time overrun was between 10% and 30%. Hence, from the foregoing, it can be argued that delays in construction projects is one of the reoccurring problem stalling the development of construction sector globally (Faridi and El-Sayegh 2006). Also, it is now a universal problem (Enshassi et al. 2009; Majid, 2006) having a pivotal role to play in the socio- economic activities of any country. The causes of delays were also identified by the researcher as owner base, client base, economic base, engineers based and stakeholder's interference and management based.

Additionally, despite the significance growth experience in the construction industry, stakeholders' interference has become one of the contributing factors which influences the way contractors, sponsors, and consultants embarked on project execution without adherence to engineering laid down principles. According to Gambo, Said and Ismali (2016), the appropriate implementation and project management tools and technique could produce good result leading to reduced delays caused due to stakeholders' interference and other related factors which differs from various management expectations among stakeholders. To measure the gravity of stakeholder's interference, results from past researchers has analyzed issues related to consultant, clients and contractor's role played which culminated in delays in the construction sectors as paramount reason for delays. In other words, political entities have greater influence in these projects since some of them are a loyalist to the men in authority, this has over time affected construction project delivery (Verdon 2014 et al.). However, transition in government leadership and policies has resulted to variation (Sunkja and Jacob 2013). Furthermore, Sunjka and Jacob (2013), study in the Niger Delta of Nigeria identified several causes and effects of project delays. It is important to state that some of the problems being faced in the Niger Delta region would not be the same with the ones encountered in the northern, Southern and Western part of Nigeria.

Though, some causes and effects of construction project delays could be unique to a country. According to Sambasivan and Soon (2007), main causes of delays were identified and categorised as client-related, contractor-related, consultant-related, material-related, labor-related, contractor-related, contract relationship-related and external factors. Likewise, major effects of delay have been identified as: cost overrun, dispute, arbitration, litigation, time overrun, and total abandonment (Sambasivan and Soon 2007).

However, according to Mahdavinejad, Hussin and Omran (2011), opined that failure to complete a project either by the original planned time or budget, or both, ultimately result in project delays. Furthermore, Lo, Fung and Tung (2006), construction delays lessen the speed of work without completely halting construction

activities, which may result to time overrun exceeding scheduled period for project completion or exceeding the projected project delivery date agreed by the parties involved.

It is observed by Odeyinka and Yusuf (1997), that a ratio of 7 out of every 10 projects executed in Nigeria are faced with delays or complete neglect. Hence, the results of this delays are: dispute, arbitration, litigation, cost overrun and total abandonment. This often result to stress on stakeholders' vision for the project, therefore, they employ strategies for minimizing the effects of delays by considering a contingency plan or extending the project duration (Aibinu and Jagboro 2002; Shubham 2013; Salunkhe and Patil (2014). Moreover, according to Mohammed and Isah (2012) studies on delays of construction project, the study shows that delays are always dependent on the early phase of the construction project (i.e. initiation stage). However, this might be a regular occurrence, since even after initiation stage there may be risk that may flag up which will need to be addressed appropriately.

Gambo et al. (2016), opined that appropriate implementation and project management tools and techniques could produce good results leading to reduced delays caused due to stakeholder interference and other related factors which differ from various management expectations among stakeholders. To measure the gravity of stakeholder interference, results from past researchers have analyzed issues related to consultants', clients' and contractors' roles played which culminated in delays in the construction sector as paramount reason for delays. In other words, political entities have greater influence in these projects since some of them are loyalists to the men in authority, this has over time affected construction project delivery (Verdon et al. 2014).

However, transition in government leadership and policies has also resulted in variations and project delays (Sunkja and Jacob 2013). The study of Sunjka and Jacob (2013) in the Southern part of Nigeria identified several causes and effects of project delays. The study's results revealed 10 main causes of delay such as; youth conflict, communal clashes, contractor inadequate planning, neglect or refusal of payment for compensation of affected persons, wrong selection of contractors and consultants by owner, poor weather issues, poor contract management by the consultants, delays in producing drawings, correction of issues, specification errors, omissions by the consultant, lack community engagement, poor coordination of subcontractors by the contractor. Furthermore, according to Sunjka (2013) classification of the causes for delays which are: Clients' related issues, Contractor-related issues, Labour and equipment related issues, material-related issues, Consultant-related issues, community related issues, Contractual relationship related issues, External issues. Thus, to an extent, the factors identified in this study are only peculiar to Nigeria. According to Sambasivan and Soon (2007), major causes of delay were identified and categorized as client- related, contractor-related, consultant-related, material-related, labour-related, contract relationship-related and external factors. Likewise, major effects of delays were identified as cost overruns, disputes, arbitration, litigation, time overruns, and total abandonment (Sambasivan and Soon, 2007). On the other hand, Locatelli and Giorgio (2017), observed in Italy, that crime is most likely to be experienced in large construction projects, which result in delays of construction project delivery. Hence, the result would be increase in corruption for both quality, cost, time performance and the benefits delivered. Furthermore, Kaliba and Chabota (2009), studies in Zambia discovered the prevalence of cost escalation, inclement weather due to torrential rains and floods, scope changes, strikes, inflation as primary causes of delays in road construction project which affects timely project delivery.

CONSEQUENCES ENSUING FROM CONSTRUCTION PROJECT DELAYS (Panova and Hilletofth 2019)

Time overruns: All construction projects have stipulated completion time. Hence, when the completion time is extended then the project is said to have faced time overrun. Sadly, it is rare to see projects that are finish promptly, this is a result of time extension accompanied by several factors. *Budget Overrun:* Every project has a specified budget (cost). There is exceptional situation that could warrant projects going beyond their stipulated budget. Thus, when project is finish at a sum higher than the actual project cost, then it is believed to have experienced budget overrun. *Quality of completed work:* Sub-standard or low-quality materials and low-grade workmanship, can result to problems of project poor quality which often emanate from dishonest contractor who uses cheap construction materials for project execution. *Structural failures:* Structural failures could occur due to the use of sub-standard materials and not adhering to structural design drawings and incompetent engineers handling the construction project. Inability to interpret structural drawings can causes failures giving rise to delays and rework, which could affect time, cost of the project work. *Total Abandonment:* If problems such as failure to purchase construction materials or payment of workers' wages, arise which are not address promptly, it could lead to abandonment of project which will result in project delays. *Bad Public Relations:* When project is delayed the contractors, consultants and client's reputation may be affected. Thus, they may not be able to be awarded contract again in the future, since client will view them as not been reliable.

SIGNIFICANT FACTORS THAT MITIGATES THE CAUSES OF CONSTRUCTION PROJECT DELAYS *(Zidane and Anderson, 2018)*

This segment focuses on previous studies on significant factors that minimizes the causes of delays due to stakeholder interference and other related factors. The discussions of their results and the gaps from this research carried out is outlined (See: Section 4). The factors listed below were established from past research studies by these researchers. Othman and Ahmed (2013); Sweis et al (2007); Ujene, Idoro and Odesola (2013). *Prompt decision making prevent project delays*: Prompt decision making could be an effective way of handling project issues appropriately. Thus, when changes in project are initiated, they should be done in line with the change request procedures and inform all parties concern timely, in order to minimize the impact, it might have on project accomplishment (Mansfield, Ugwu and Doran 1994). *Precise estimation of time/ Cost estimation:* Precise time and budget estimate are very essential in all construction project so as to prevent disputes of evaluation throughout the project performance phase. Therefore, the effect of this on the contractor would be to terminate the work, making sure that all necessary actions are employed to determine the real cost of the project. Hence, the use of qualified expert is mandatory for costing and estimating of all project to avert delays afterward (Sambasivan and Soon 2006; Ibironke et al 2013). *Reducing the bureaucratic logjam*: Several projects experience bureaucratic logjam and unnecessary meddling without considering the effect this will have on the project. Nevertheless, the lukewarm attitude and lack of commitment by representatives of the government causes extreme waste of public resources. Therefore, it is important to curtail the level of interfering in project construction to ensure successful project delivery (Assaf and Al-Hejji 2005). Also, all teams should be integrated or collaborate to help aligned with project objectives. *Implementation of Project Management tools and Techniques*: Project management tools and techniques are very essential in construction project delivery. The PM tools assist all stakeholders in achieving and aligning to project objectives. Hence, the various tools and techniques available should be employed for each facet of the project duration to facilitate appropriate project implementation. *Coordinate and Determine Problem Prone Areas before Awarding Contract*: Sorting out and resolving issues in places of disputes before approving jobs and mobilizing to site, since this proactive action could prevent risk of delays which might flag up subsequently. Thus, stakeholders' need to take necessary steps to consult with project beneficiaries, communities and others concern to ascertain their level of cooperativeness, before project begins to ensure everyone has the same aligned project objectives, which will result in successful project delivery. *Awarding of contract to competent/qualified contractor and not to least bid*: Awarding contract to the lowest bidders is risky to the project, this should be avoided in amid the construction environment. However, those in charge of the project know project budget cost. Hence, if bidders' tender amount lower than what is budgeted, that should inform the stakeholders concern intended deceits from the contractor during project execution. *Implementation of Project delivery Methods:* There are various project delivery systems such as: partnering (Carolynn, Akintola and Eamon 2000), fast-track construction, engineer-procure-construction (EPC), Construction Management –Risk contracts, design-Bid-Build and relational contracting/lean design construction by utilizing any of these delivery methods in the Nigerian construction industry, will enhance future project delivery. Foster and Pushak (2011) illustrated the key achievement and challenges in Nigeria's major infrastructure sectors in **Table 1**.

Table 1: Achievements and Challenges in Nigeria's infrastructure sectors (Foster and Pushak (2011)

Sectors	Achievements	Challenges
Air transport	- Recent expansion of domestic market. - Emergence of important regional carriers. - New routes to Europe and the US. - Significant improvements in safety oversight.	- Developing potential as regional air transport hub. - Concessioning of airport terminals.
Information and communication technology (ICT)	- Extensive low-cost GSM (Global System for Mobile Communication) coverage. - Vibrant, competitive fixed line sector. - Extensive private fibre-optic backbones.	- Increasing penetration of ICT services. - Reducing cost of internet services. - Addressing market efficiency gap.
Ports	- Adoption of modern landlord model. Award of numerous concessions.	- Improving customs performance. - Improving land and marine access. - Planning for new capacity additions.
Power	- High rates of electrification. - Sector restructuring and tariff hikes in progress.	- Investing to improve service reliability. - Addressing huge sector

			inefficiencies.
Railways	-	Extensive national rail network.	- Impr oving performance to recapture traffic
Roads	-	Extensive national road network.	- Incr easing funding for road maintenance. Improving rural access.
Water resources	-	Progress on institutional framework.	- Dev eloping huge high- return irrigation potential.

A research study conducted by Aibinu and Jagboro (2002) stated that "In Nigeria, 5-10% of pre-contract costing is usually set aside as contingency fee''. Conversely, Jimoh and Adama (2014) and Maddex and William (2012) highlighted the above finding, but the assertion in other studies did not cite any other authors.

However, in Saudi Assaf et al. (1995) identified preparation and approval of drawings, delays in contractor's progress, payment by clients and design changes, finance, slow decision-making process and inadequate skilled workforce as the important delay factors. Logically, a simple methodology could have guided the planning process, informing the parties involved of what to do at a certain time but because this implementation is overlooked, delays often resurface. Hence, if project management methodologies are incorporated during planning, these could have helped to solve some issues which cause delays.

Furthermore, in Thailand, Ogunlana et al. (1996) identified the problems encountered by the construction industry in developing countries such as: shortages in industry infrastructure (i.e. supply of resources), causes by clients and consultants and causes by contractor's incompetence/inadequacies. The issue here is a lack of effective project management infrastructural implementation which could have assisted for the problems mentioned above. From the above-mentioned, the study deduced that overall, many construction industries and stakeholders neglect the ethics governing project management which often result in delays and failures over time.

The construction industry is complicated because of the engagement of several stakeholders' namely; contractors, clients, consultants, suppliers and engineer's engagement (Haughey, 2010; Ghoddousi and Hosseini 2012). The construction industry universally is vulnerable to several risks emanating from various stakeholder engagement, whose concern is in the managerial decision- making process to minimize negative project outcomes on project success (Taillandier et al. 2015). According to Olander and Landin (2005), stakeholder interference in project implementation often lead to delays due to conflicts in application and approval of project design. Nevertheless, it is essential for project managers to possess a very robust stakeholder obligation and the capability to manage project scope. However, the management of project scope is very critical, so, it is essential to explain and establish the boundary of scope for the project during initiation stage and control any changes that may arise by demanding for change request documentation (Kerzner 2013). Though when a change is made towards the end of the project, it is usually expensive, and that may result in delays in delivery the project. Furthermore, the matter of setting aside funds for contingency, Xie et al. (2011) and Khamooshi and Golasfshani (2014) argued that the contingency fund is insufficient, disapproving and arbitrary. Hence, the allocation of contingency funds could diminish or be used to address the risk of delays in an arbitrary way, if it is apportioned and utilized well in the project. In some cases, when there is need to utilize this contingency fund the management or client resists the release, which results in a delay of executing variations of the construction projects.

Al-Humaidi and Hadipriono (2010) and Yang and Wei (2010) identified that delays most times are experienced at the pre-contract phase which entails; preliminary route, budget estimation, value engineering tendering of documents and tendering of analysis reports while others happen during pre-construction and execution phase. However, study by Odeh and Battaineh (2002) on causes of delays revealed that the top 10 ranked causes of delays in construction projects were; client's/owner's interference, wrong selection of new consultant and contractor, inadequate financing, low labour output, slow decision-making and lack of project management implementation. Conversely, Scott et al. (2004) revealed that construction projects tend to experience delays which pose a possible risk for all stakeholders. Thus, this risk possibly may have an adverse impact on owners through inflated cost, protracted appearance on the site, loss of trust from stakeholders.

Feeney and Bozeman (2009) demonstrated that bureaucratic or "red tape'' relates to the public sector as one of the principal causes of delays in the constructions industry. According to Jamison and Mark (2009), bureaucratic problems are a result from the type of public sector which weaken the decision-making process and complete power bestowed on the top management. **Table 2** presents a list of causes of delays and consequences due to stakeholder interference on the construction industry, identified in a survey of various research works.

Table 2: Classification of Previous Studies on Causes and Consequences of Construction Project Delays in the Industry Globally

Study	Location	Leading Causes of Delays	Consequences of Delays
Ibironke et al., (2013)	Nigeria	- Inadequate equipment - Imprecise time estimations - Imprecise cost estimation - Change orders - Interim Payment issues	- Imprecise time forecast - Imprecise cost estimate
Mansfield et al., (1994)	Nigeria	- Design alterations - Poor Contract Management - Errors during construction - Errors and inconsistencies in contract document - Subcontractor and selected supplier - Wrong cost estimates - Unavailability of materials - Funds and payment of finished work	- Imprecise estimate - Variation in price - Errors during construction - Wrong cost estimates - Dishonest practices and setbacks - Reduction of contract duration
Aniekwu and Okapala (1998)	**Nigeria**	- Time overruns - Cost overruns - Unavailability of materials - Alteration in designs - Poor contract management - Imprecise estimates - Labour-related issues - Errors during construction - Reduction of project duration - Negotiations and collecting - of contract award - Not sticking to contract conditions	- Dishonest practices and setbacks - Not sticking to contract conditions - Time overrun - Cost
Sunjka and Jacob (2013)	Nigeria	- Weather issues - Working drawing problems - Poor contract management - Youth clashes - Inappropriate planning - Choosing problem by client - Lack of community buy-in - Communal upheavals - Compensation delay issue - Stakeholders Interference - Compensation delays or non-payment - Errors during construction - Poor quality of materials - Incorrect or error in design	- Total abandonment - Bad quality of finished work - Time overruns - Cost overruns - Errors during construction - Low quality of material used - Incorrect or error in design
- **Garemo et al., (2015)**	- USA	- Technological Sublime - Weakness in organizational design and capabilities - Optimism bias - Strategic misinterpretation - Corruption	- Undermine performance of projects
- **Kasimu and Abubarkar (2012)**	- Nigeria	- Error in Design - Inappropriate planning - Lack of free flow of communication - Cost overruns - Unavailability of materials - Lingering in making decisions	

III. RESEARCH METHODOLOGY

This research adopted field survey methodology through questionnaires, to investigate and evaluate the attitude of clients, contractors, consultants, drafters and designers, licensing bodies and public authorities, sponsors and others (comprising of engineers, architects, project managers, surveyors and builders) of the relative importance of causes of project construction delays with the subsequent ranking of identified factors. This was carried out by means of literature review and interfacing with experts from various categories involved in project cosntrcution. A comprehensive number of 67 causes of delay was developed. Table 2 shows the identified causes. For easy understanding and presentation of the results analysis, we categorize each party and ranking the causes according to response rate.

3.1 Study Area

The results were obtained from all six (6) states that make up the militancy-prone oil- rich Niger Delta region of the South-South geopolitical zone of Nigeria. The instrument used for this study was questionnaires through the Bristol Online Survey and ordinal scales were employed based on 5-point bipolar Likert scale, with responses between *strongly agree* and *strongly disagree*. Based on the Likert scale, **Table 3** below indicates values assigned to the different options as used in the questionnaire.

Table 3: Ordinal scales for data measurement

Responses	Scales
Strongly Agree	5
Agree	4
Neither	3
Disagree	2
Strongly Disagree	1

3.3 Method of Analysis

3.3.1 Cronbach's Alpha Coefficient

The survey questionnaire data was verified for dependability using Cronbach's alpha coefficient using the following formula;

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K-1)\bar{c})} \quad \text{.. (1)}$$

Where

α = Cronbach Alpha

$\bar{C}$ = Average Variance

Cronbach's Alpha dependability coefficient usually falls around 0 and 1.

Table 4: Cronbach's Alpha table for Reliability Analysis (Gliem and Gliem 2003).

Cronbach's Alpha Value (α)	Data Reliability
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha > 0.8$	Good
$0.8 > \alpha > 0.7$	Acceptable
$0.7 > \alpha > 0.6$	Poor
$0.6 > \alpha > 0.5$	Questionable
$0.5 \geq \alpha$	Discard the Data

Using the Statistical Package for Social Sciences (SPSS) to determine the reliability of the data collected, an alpha value was obtained as in **Table 5**.

Table 5: Data Reliability

Cronbach's Alpha Value	Cronbach's Alpha Based on Standardized Items	K = Number of Items
0.861	0.870	9

The last score of reliability is 0.861 which is within the range of good test results that falls between 0.8 and 0.9, hence, the data received was usable and dependable.

3.3.2 Relative Importance Index (RII)

The procedure used in the analysis of this work was Relative Importance Index, which is a measure of determining the relative importance of factors considered in this study. To do respondents. The Relative Importance Index, as given by [10, 11], is computed using Equation (2)

$$\text{RII (\%)} = \frac{\sum W}{A*N} \quad \text{....................................... (2)}$$

Where

W = weighted value of each of the factors, chosen by the respondents which range from 1 to 5, (where 1= Strongly Disagree and 5 = Strongly Agree as adopted in the survey);

A = maximum weight (which is 5 in this context)
N = Total Number of Respondents in a given group
This expression is shown in the formula as;

$$\text{RII} = \frac{\mathbf{5(n5) + 4(n4) + 3(n3) + 2(n2) + n1}}{\mathbf{5(n1+n2+n3+n4+n5)}} * \mathbf{100} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

Where, n5, n4, n3, n2 n1 represent the total number of the respondents who selected "1"- Strongly disagree, 2 – Disagree, 3- Neither, 4 – Agree, 5 – Strongly Agree. Also, the value of RII falls between 0 to 1 and the greater the RII value, the greater the most significant of the delay factors in the construction industry.

IV. DATA ANALYSIS APPROACH

To aid determine the ranking of the various delay's factors from different perspectives, the gathered the data were analyzed in order to calculate the relative importance index of each factor. Response rate (RR) stand for number of persons who filled the questionnaire survey divided by the overall projected number of responses multiplied by 100% (Onemehebhor 2006).

$$RR = \frac{Total\ Number\ of\ completed\ online\ questionniare\ recieved}{Total\ number\ of\ \text{poejcted}\ questionniare\ response} \times 100\% \ldots\ldots\ldots \text{(4.1)}$$

$$RR = \frac{144}{350} \times 100\%$$

$$RR = 41.1\% \approx 41\%$$

Hence, the valid response rate of the online survey is 41%. Likewise, to help validate the result of the research, Fellows and Liu (20156), some response to questionnaire surveys are sometimes small. Thus, according to Yong and Mustaffa (2011), the usual response rate in research of construction that is acceptable for analysis is between 20% -30% onwards.
The RII is determine with the aid of this expression shown below:

$$\text{RII (\%)} = \frac{\mathbf{\Sigma W}}{\mathbf{A*N}} (\mathbf{0 \leq RII \leq 1}) \text{ ---------- (1)}$$

Where:
W = weighted value of each of the factors, choices by the respondents which range from 1 to 5, (where 1= Strongly Disagree and 5 = Strongly Agree as adopted in the survey). A = maximum weight (which is 5 in this context). N = Total Number of Respondents
This expression is shown in the formula as;

$$\text{RII} = \frac{\mathbf{5(n5) + 4(n4) + 3(n3) + 2(n2) + n1}}{\mathbf{5(n1+n2+n3+n4+n5)}} * \mathbf{100} \text{ ---------- (2)}$$

Where, n5, n4, n3, n2 n1 represent the total number of respondents who selected "1"- Strongly disagree, 2 – Agree, 3- Neither Agree, 4 – Disagree, 5 – Strongly Disagree. Also, the value of RII falls between 0 to 1and the greater the RII value, this will show the most significant of the delay factors in the construction industry. The data receive was extracted to MS Excel to rank the factors causing project delays.

In addition, to help determine Cronbach alpha coefficient for causes of delays SPSS IBM version 24 to calculate the Cronbach's alpha from the questionnaire results. The reason for this selection is that with SPSS, Cronbach's Alpha is just a click of a button the data obtained were analyzed by the aid of SPSS IBM version 24 to calculate the Cronbach's alpha from the questionnaire results. The reason for this selection is that with SPSS, Cronbach's Alpha is just a click of a button. Past studies conducted by Wong and Yeng (2008), Abdullah et al (2010) made use of Cronbach's α value to determine the reliability of data collected in their studies. Cronbach's alpha is a measurement for internal or ratio-level data that is used to respond to the reliability of respondents when numeric results are utilized to a set of variables. It is also known as reliability coefficient. For this research study, the variable different respondent is vital for correlation to determine their relationship and uniqueness in terms of dependability and adoption.
The survey questionnaire data received were verified for its dependability by determining Cronbach's Alpha with this formula below:

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K-1)\bar{c})}$$

Where,

α = Cronbach Alpha, v = Average Inter-Term Covariance among the items, N = Number of items, $\bar{C}$ = Average Variance. Cronbach's Alpha dependability coefficient usually falls around 0 and 1. From the studies of Gliem (2003), the under listed relationships can be adopted for research analysis.

Finally, With the aid of SPSS data reliability was determined, the outcome is Cronbach's Alpha: 0.861, Cronbach's Alpha Based on Standardized Items: 0.870, Number of Items (**N**): 9. However, the last score of reliability is 0.861 which is within the range of good test result that falls from 08 to 0.9. Hence, from the reliability record, a total figure of 5 missing data was observed from the result analyzed. Thus, the result shows that the data received was usable and dependable. The Cronbach's alpha value proves good which range greater than 0.6 (Meepol and Ogunlan 2006). Similarly, it shows that the data was dependable compared to the benchmark values of 0.7 used by George and Mallery (2003); Wong and Cheung (2005).

V. ANALYSIS AND DISCUSSION OF RESULTS

A total of 350 questionnaires were distributed to 120 Clients, 100 Contractor, 100 Consultant and 30 Engineering professionals. Form these distributed questionnaire 144 were completed representing a response rate of 41%. Five eight percent of respondent were actively involved in highway transportation projects while 42% of others were involved in building, dams, and irrigation and water erosion control works.

Based on the overall data gathered by the respondents, the study population consisted of project managers, civil engineers, architects, Quantity surveyors. Quality control personnel, project site supervisors. All respondent either have a bachelor degree or higher national diploma in the University. The result indicate that they are all expertise and their various responsibilities are all stated therein. Their level of experience indicate that their response can be adopted for practice in future construction activities (**Table 6).** Thus, the result portrays that majority of those who participated in the survey, had 28(20.1%) had 0-5Years of Experience, 16(11.5%) had 6-10 Years, 47(33.8%) had 11-15 Years of Experience and 48(34.5%) had more than 15 Years of experience in the Nigerian construction sector. **Table 7** gives a vivid summary of proportions of distributed and received questionnaire. The profile and experiences of the respondents indicate adequate knowledge to give dependable information.

Table 6. Respondent characteristics

Respondents

Category of Stakeholders	**Years of experience**	**No. of respondents**	**Estimated delay in projects**
Client		47	80%-100%
		38	0% - 40%
		31	40% - 100%
		116	
Contractor		30	40%-100%
		40	0% - 70%
		46	20% - 60%
		116	
Consultant	>30	60	10% - 90%
	20-29	45	30% - 100%
	10-19	11	500% - 60%
	Total	116	
Total of respondents	**>30**	**144**	
Distributed questionnaires	**20-29**	**350**	
Percentage of respondents	**10-19**	**41%**	
	Total		

Table 7. Categories of the respondent's organization, number and rate of received and valid responses.

Type of Project	**Highways**			**Irrigation and Reservoirs**			
Category respondent have worked for	**Client**	**Contractor**	**Consultant**	**Client**	**Contractor**	**Consultant**	**Total**
Questionnaires distributed	34	40	50	56	56	90	350
Questionnaires completed	24	29	48	19	14	10	144
Response rate	63.2%	54.1%	60.8%	59.9%	88.5%	71.3%	41%

Analysis of delay causes

The ranking factors of frequency, severity and relative importance were utilized to rank delay causes from the perspective of the clients, contractors and consultants. An overall ranking of the most crucial factor is also carried out. This section presents the results and analyses of the delay factors and consequences. **Table 6** presents the ranking for delay factors identified in the investigation, **Table 7** presents the ranking of consequences of delay factors and **Table 8** presents the ranking of delay mitigating factors.

Table 8: Relative Importance Index and Ranking for Delay Factors

Delay factors	Relative Importance Index (RII)	Ranking
Poor project planning	0.9319	1
Weak business case	0.7481	18
Stakeholders Interference	0.8613	9
Lack of design Knowledge	0.8176	14
Low technology	0.8731	6
Bureaucracy/Corruption	0.8823	3
Lack of political support	0.8341	12
Lack of financial resources	0.8759	5
Change in Government	0.8652	7
Lack of team integration	0.8102	16
Scope creep	0.8121	15
Misappropriation of funds	0.8818	4
Diversion of funds	0.8926	2
Variation in contract	0.8544	10
Lack of good communication plan	0.8232	13
Lack of community buy-in (engagement)	0.7826	17
Wrong selection of contractor/consultant	0.8511	11
Inconsistency in government policies	0.8642	8

Ranked 1^{st} in the factors causing delay in the Nigerian Construction Industry is *Poor Project Planning*. This may be due to the fact that no construction works can begin without proper planning, which is evident in first having a proper plan and schedule of works showing how works are to be coordinated and managed throughout the project life cycle. This validate the study of Tyson (2018), which establish that uncertainty, risk and rework make it really difficult to attain goals and deliver expected value in mega projects which often Cause project delays. *Diversion of funds, Bureaucracy and corruption, misappropriation of funds and lack of financial resources* are all ranked 2^{nd}, 3^{rd}, 4^{th} and 5^{th} respectively, given the massive effect of funds on construction projects whereby funds are central to construction works in terms of mobilization to site, hiring of equipment and personnel, payment of sub-contractors and other financial obligations. *Lack of Community engagement*, though very important towards fulfilling Corporate Social Responsibility, is ranked 17^{th} while *weak business case* is ranked last in terms of factors that cause delay to successful delivery of construction projects.

Lack of design knowledge indicates that the design knowledge is the major cause of delays. Thus, due to lack of practitioners not been committed to acquire this knowledge through study and practicing experience this leads to delays. This agrees with Sunjka and Jacob (2013) work, which identified that employment of unskilled site personnel at site hinders execution of work to specification and results to error or mistakes during construction. Hence, alterations and corrections are being made which often consumes time.

Lack of good communication indicates that information is either not made available, or not disseminated properly or the means of disseminating is not being accessible to the stakeholders involved in construction projects. Also, this shows that it is vital that stakeholders precisely communicate all task tom prevent disputes of interest to avoid misinterpretation and distortion of information. This agrees with Sunjka and Jacob (2013); Frimpong et al (2003) studies, which states that lack of communication between workers result in misunderstanding and misrepresentation of figures, which often grow disputes and subsequently obstructs project progress.

Scope creep indicates that changes were made uncontrolled or continuous in project scope during the project duration without proper definition, documentation or controlled in such projects.

Low technology, this denote that machineries such as earth moving equipment are not readily available, or are available but inefficient in operation. Thus, the work that could be done for one week would now be extended to three weeks, the result culminates in delays in project delivery. This agrees with Sunjka and Jacob (2013) studies on delay of incorrect equipment which increases activities whereas faulty equipment results to delays due to the time spent to rectify faults. *Lack of political support* indicates that top government officials

who are stakeholders in certain project use their vested power to interfere with projects. This agrees with Sunjka and Jacob (2013) studies which reveals that some political leaders interfere by demanding for extra scope requests not included in the contract document, thus if not accepted that project will suffer setbacks of und release. *Wrong selection of Contractor /Consultant*, this portray the fact that projects are not been awarded to qualified personnel, instead they are awarded to those who belong to a cadre or may have supported one political party or the other. This agrees with Sunjka and Jacob (2013) studies which reveals that some political leaders interfere by imposing unqualified contractors /subcontractors on the client. Thus, it often results to poor project performance.

Lack of team integration indicates that most stakeholders in a construction team prefer working independently instead of working as a team which could assist in identifying issues and minimizes their effects on project performance. Also, team members could learn from the experience of other colleague as they work together as project teams, and not individuals working in isolation. This agrees with Baiden, Price and Dainty (2001) studies on construction projects revealed that construction sectors must surmount organizational and behavioral barriers of team integration if project performance are to be fully realized.

Table 9: Relative Importance Index for Consequences of Delay

CONSEQUENCES OF DELAY	Relative Importance Index (RII)	Ranking
Time Overrun	0.9373	1
Budget Overrun	0.9098	2
Poor quality of completed works	0.8887	4
Structural failure	0.8955	3
Total Abandonment	0.8785	5

As a consequence of delays in the execution of construction projects, *Time overrun* was identified as the most important and highest ranked consequence. This explains why most projects experience time lags and are never completed on schedule, with extensions of time (EOT) always discussed and requested in project meetings and in most cases, never discussed professionally as an anticipated consequence. However, it is essential to incorporate project management tools and techniques to help in project scheduling and which could also be used to monitor project progress and time tracking. This confirms the findings of Aibinu and Jabgoro (2002) which reveals that delay had major effects of delay on actual project duration. Closely ranked 2nd is *Budget overrun* which is a clear consequence of delays, showing that when funds are misappropriated or diverted due to corruption, there is a possibility of shooting up the budget in terms of variations, in order to acquire more funds to fulfil contractual obligations of the construction projects. Therefore, many projects are completed at additionally cost thus, exceeding project cost budget. This attest to the findings of Aibinu and Jabgoro (2002); Sunjka and Jacob (2013) studies which states reveals that elongation of project time could cause budget overrun. Thus, these two recurrent effects of delays are experienced in the Nigerian construction sector. *Structural failure* just precedes *poor quality of completed works* and this explains the various cases of collapse currently being investigated by some state governments in conjunction with the Council for the regulation of Engineering (COREN) and the Nigerian Society of Engineers (NSE). Mistakes form design could also lead to structural failure. Also, proper investigation should be carried out before embarking on resuming work on failed project, to avert future failure. This agrees with studies from Sunjka and Jacob (2013) which shows that inferior quality materials can affect the quality of project and cause failures to infrastructures. This result is therefore not startling. Ranked 5th in Table 7 is *total abandonment* of construction projects which is the last consequence of delays and has been rampant all over Nigeria, with new governments re-awarding abandoned projects to new contractors or cronies of government and having same projects included in succeeding annual budgets. This validates the findings of Sunjka and Jacob (2013) that total abandonment could arise if issues relating to project are not settled promptly.

Table 10: Relative Importance Index for Delay Mitigating Factors

DELAY MITIGATING FACTORS	RELATIVE IMPORTANCE INDEX (RII)	RANKING
Consultants should be proactive in approving, reviewing and Checking engineering drawings.	0.931387	2
The Construction industry should be left autonomous with least government interference.	0.878519	7

All Engineers, Architect and Surveyor should endeavor to produce drawings on time.	0.913235	3
Awarding of contracts to capable and qualified contractors/Consultants	0.938686	1
The use of Project Management methodologies.	0.9	6
The use of Project management tools and techniques to control funds and schedule.	0.904412	5
Accurate calculation of time and estimate.	0.905882	4

All Engineers, Architect and Surveyor should endeavor to produce drawings on time to correct mistakes promptly if any before construction commence was ranked the 1st with a RII of 0.76. This indicates that there is need for parties involved in construction projects to produce drawings early enough and correct mistakes when they arise. This can be through iteration process, where other personnel are given the opportunity to make input through reviewing already produced drawings to check for quality and reliability of work.

The Construction industry should be left autonomous with least government interference is ranked 4th with 0.73 RII value. This indicates that if construction work is left with unnecessary meddling by stakeholders, then there is bound to be good project performance and delivery of construction project will increase. This validates the findings of Zuofa and Ochieng (2014), which reveals that Government and establishment should acknowledge the reality, that there are qualified project management professionals who play a significant role in timely project delivery. As a result, only such professionals should be allowed to manage projects based on skill acquired.

The use of Project Management methodologies has a RII value of 0.75. This shows high agreement between rankings. Also. It indicates the importance of implementing PM methodologies in construction project execution. The use of Project management tools and techniques in controlling funds and plan have a RII value of 0.74. This indicate how essential its PM tools and techniques in controlling budget and scheduling. Also, this help in effective management of project of complex process and allocation of resources, hence, failure to adopt these tools would leads to setbacks and failures in delivery project promptly. Accurate calculation of time and estimate have a RII value of 0.74, indicating the importance of thorough and accurate calculate to prevent delays or additional variation which will involve a long process. Consultant should be proactive in approving, reviewing and checking engineering drawings have a RII value of 0.73 this shows a high agreement between ranking respondents. Therefore, it is vital for consultant to keep drawings unattended to, especially if they know the project start date. Awarding of contracts to capable and qualified Contractors/Consultants instead of basing awards on the ground of lower bid or political influence was also ranked 4th with RII value of 0.73, Showing a high agreement between rankings. This also indicate that the trend has contributed enormously to failed or abandoned projects in Nigeria. This validates the study of Wilson (2011).

VALIDATION TEST AND ANALYSIS OF RESULT

The reason for this correlation is to determine the relationship between the score of delays and successful implementation of project management tools and techniques in construction project execution within the South-South region of Nigeria. Table 11 and 12 summaries the correlation between these two variables created by Spearman's correlation coefficient analysis and the ranking category.

Also, some cases were observed to have had a moderate to high positive correlation with project delays and delivery of construction projects. These characteristics are identified such as; poor project planning, low technology, lack of design knowledge, lack of financial resources and misappropriation of funds. Similarly, the evaluation shows several delay characteristics possessing high negative correlation with project delays and delivery of construction projects, which includes stakeholders' interference, diversion of funds, lack of financial resources, bureaucracy and corruption practices, also including: being Calm (r = - 0.309), Agreement (r = - 0.205), and Strength (r = - 0.155).

Table 11: POSITIVE CORRELATION BETWEEN CONSTRUCTION PROJECTS DELAYS

CHARACTERISTICS OF DELAYS	CORRELATION COEFFICIENT	Ranking
Poor project planning.	0.100	**17**
Weak business case	0.453**	**6**
Low technology	0.605	**1**

Stakeholder's interference	0.199	**15**
Lack of design knowledge	0.508	**3**
Bureaucracy/Corruption Practices	0.102	**16**
Lack of political support	0.358	**9**
Lack of financial resources	0.331	**10**
Change in Government	0.264	**13**
Lack of team integration	0.459	**5**
Scope creep	0.496	**4**
Misappropriation of funds	0.272	**12**
Diversion of funds	0.233	**14**
Variation in contract	0.400	**8**
Lack of good communication plan	0.534	**2**
Lack of community buy-in (engagement)	0.432	**7**
Wrong selection of contractor/consultant	0.290	**11**
Inconsistency in government policies	0.000	**17**

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 12: NEGATIVE CORRELATION BETWEEN CONSTRUCTION PROJECTS DELAYS

CHARACTERISTICS OF DELAYS	CORRELATION COEFFICIENT
Poor project planning.	-
Weak business case	-
Low technology	-
Stakeholder's interference	-0.155
Lack of design knowledge	-0.309**
Bureaucracy/Corruption Practices	-0.187
Lack of political support	-0.150
Lack of financial resources	-0.205
Change in Government	-0.018
Lack of team integration	-0.074
Scope creep	-0.135
Misappropriation of funds	-0.014
Diversion of funds	-0.001
Variation in contract	-0.090
Lack of good communication plan	-
Lack of community buy-in (engagement)	-
Wrong selection of contractor/consultant	-0.033
Inconsistency in government policies	-0.058

***. Correlation is significant at the 0.01 level (2-tailed).*

From this relationship which States that P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.453, between poor project planning and weak business case. Conclusively, based on the data from this study, there appear to be an evidence to suggest a moderate positive linear relationship between respondents as regards to poor project planning and weak business case. Therefore, the Spearman's correlation coefficient is $r_s = 0.453$, but is again significant since P>0.05. I.e. P<0.001 < 0.05, but if P>0.05. The variable would be ignored based on Spearman's correlation coefficient relationship. Hence, from the results of the data analysis revealed satisfactory indication to establish a correlation between poor project planning and weak business in project implementation as vital. Thus, before embarking on construction project stakeholders should plan thoroughly, by means of interfacing with the various stakeholders involved in the project, making sure all necessary resources are available and sufficient to avert future delays and risk.

S*econdly*, from the relationship that P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.605, between poor project planning and low technology. Finally, based on the data from this study, there appear to be an evidence to suggest a positive linear relationship between respondents about poor project planning and low technology. Therefore, the Spearman's correlation coefficient is $r_s = 0.605$, but is again significant since P>0.05. I.e. P<0.001 < 0.05, but if P>0.05 then, the variable would be ignored based on Spearman's correlation coefficient relationship. Thus, from result gathered from 91% respondents agreed to the fact that poor planning and low technology occur very often which causes delays, hence, the researcher opined that good planning is fundamental for a successful project delivery.

Thirdly, from the relationship that P<0.05, the researcher rejects the Null Assumption and conclude that there is a positive relationship, r = 0.199, between poor project planning and Stakeholders interference. Categorically, based on the data from this study, there appear to `be an evidence to suggest a positive linear relationship between respondents about to poor project planning and Stakeholders interference. This validates Sunjka and Jacob (2013) studies on inadequate planning which causes delays. Therefore, the Spearman's correlation coefficient is $r_s = 0.199$, indicating a strong level of agreement between respondents.

Fourthly, from the relationship showing P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.239, between weak business case and low technology. Hence, based on the data from this study, there appear to be an evidence to suggest a positive linear relationship between respondents about to poor project planning and low technology. Therefore, the Spearman's correlation coefficient is $r_s = 0.239$, is in an indicative fact that respondent's opinion toward these two causes of delays is valid and logically. However, many respondents disagree with the factor weak business as a cause for project delays, thus, the researcher conclude that weak business case might sometimes affect project performance, especially when it's no more viable.

Fifth, from the relationship indicating P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.533, between lack of design knowledge and low technology. Conclusively, based on the data from this study, there appear to be an evidence to suggest a moderate positive linear relationship between respondents about to lack of design knowledge and low technology. Therefore, the Spearman's correlation coefficient is $r_s = 0.533$, but is again significant since P>0.05. I.e. P<0.001 < 0.05. Therefore, it is logical to conclude that design knowledge and technology are interrelated and are relevant in effective project delivery.

Sixth, from the relationship of P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.55, between bureaucracy/corruption practices and Stakeholders interference. Thus, based on the data from this study, there appear to be an evidence to suggest a positive linear relationship between respondents about to bureaucracy/corruption practices and Stakeholders interference. Therefore, the Spearman's correlation coefficient is $r_s = 0.55$, but is again significant since P>0.05. I.e. P<0.001 < 0.05. Hence, it validates the fact that majority of respondents ranking was strongly agree with a rate of 49.6% agreeing that stakeholders' interference occur always during project execution, this attest to Sunjka and Jacob (2013) studies on construction delays.

Seventh, from the range of P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.358, between lack of political support and Bureaucracy/corruption practices. Conclusively, based on the data from this study, there appear to be an evidence to suggest a positive linear relationship between respondents about to political support and Bureaucracy/corruption practices. Therefore, the Spearman's correlation coefficient is $r_s = 0.358$, but is again significant since P>0.05. I.e. P<0.001 < 0.05, but if P>0.05. Hence, it was observed that bribery and corruption is apparently popular across all sectors the correlation value of $r_s = 0.358$ support this Notion. Thus, this attest to Locatelli et al (2016), research studies on corruption in public projects that corruption decreases public revenue and increases spending, contribute to

fiscal deficit, falsifies incentives, acts as arbitrary tax and minimizes the legitimacy of the market economy and a democracy Locatelli et al (2016).

Finally, from the relationship of P<0.05, the researcher rejects the Null Assumption and conclude that there is positive relationship, r = 0.017, between lack of misappropriation of funds and change in government. However, based on the data collected from this study, there appear to be an evidence to suggest a positive linear relationship between respondents about misappropriation of funds and change in government. Therefore, the Spearman's correlation coefficient is $r_s = 0.017$, but is again significant since P>0.05. I.e. P<0.001 < 0.05, but if P>0.05.

Hence, when awarding contracts or planning for infrastructural project the attributes in figure 1 should be considered and weighed by all stakeholders involve. This attributes and characteristics below have moderate to high correlations with regards to each other as can be seen in figure 1.

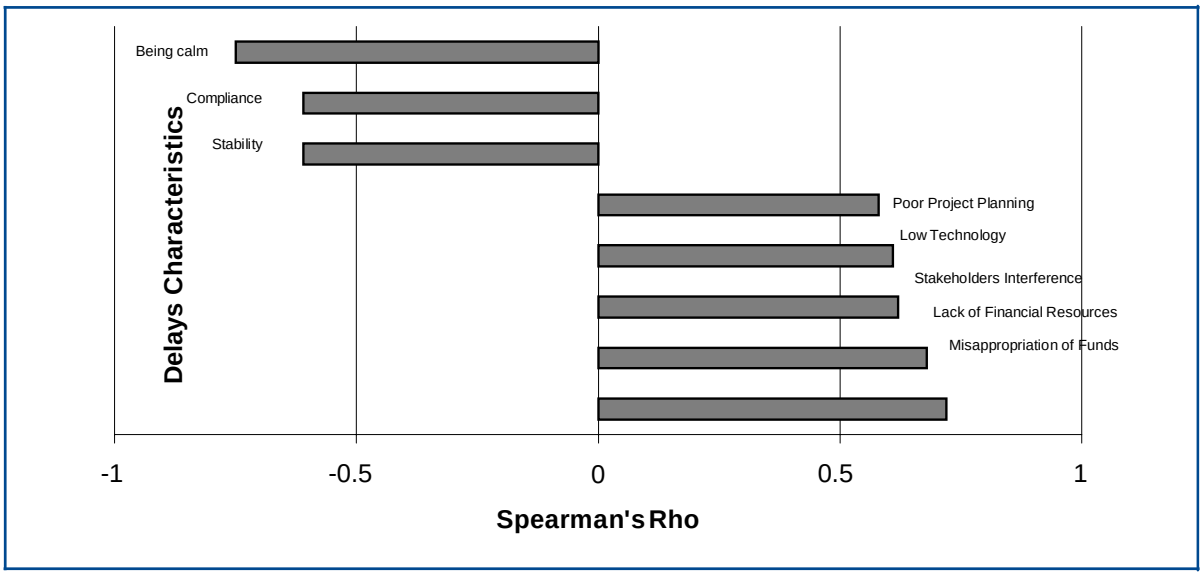

Figure 1: Characteristics Contributing to Construction Project Delays (Park, Ribiere and Schulte 2004).

VI. CONCLUSION AND RECOMMENDATION

It is clear from the research that delays in construction projects are best managed by proactive steps by key stakeholders and the avoidance of corrupt practices. As the success of any construction project is primarily attributed to its ability to meet project objectives in terms of cost, time and quality, especially in a very dynamic project environment as is the Nigerian construction industry, the following conclusions have been drawn.

- In terms of delays, the major delays are attributed to poor project planning. As planning is a prerequisite to contract mobilization, no construction works can occur where plans and schedules are lacking to guide project managers on site. Cash related issues play significant roles in the stagnation and failure of construction projects. Where funds are either diverted or misappropriated, the delivery of construction projects will definitely stall, closely related to corruption, inconsistency in government policies, stakeholder interference, change in government and contract variations.
- Where factors of delay have been triggered by project stakeholders and the government, the effect is far reaching. Consequences can affect project schedules, leading to extension of time for delivery of construction projects and the subsequent overshoot of budgetary requirements and funds initially budgeted. Poor quality of work packages becomes a consequence of delays which most times lead to failure and collapse of structural elements that have been poorly designed, further leading to fatalities and expensive government inquests.

5.1 Recommendations

The management of construction projects is greatly influenced by clients, contractors, sub-contractors and consultants, either in the private or public sector. As the construction industry plays a major role in national development, it is expected that all key stakeholders play massive roles towards limiting or ending the spate of delays experienced in the construction industry, by applying professional mitigating measures. Some of these mitigating measures were identified in the study as follows; The award of contracts for construction projects must be done ethically and according to laid down rules of contract procurement, to ensure that contracts are handled primarily by capable contractors and consultants. This can have ensured by the collaborative working of the

Council for Regulation of Engineering in Nigeria (COREN), the Nigerian Society of Engineers (NSE), the Nigerian Institution of Architects and the government.

- Consultants are recommended to be proactive in reviewing and approving submittals, with accurate calculations of estimates and use of tools such as work breakdown structures, critical path method and cost benefit analysis.
- There should be proper coordination by project engineers, architects and quantity surveyors with the timely production and submission of drawings and designs as timely as agreed on the project schedule.
- For the control and management of funds and the project schedule, project managers are advised to employ project management tools and techniques like earned value management and software packages such as Microsoft Project and Oracle Primavera.
- The use of project management methodologies is encouraged and recommended to ease the burden of managing construction projects. Some methodologies such as Prince II, PMP, APM and Agile Project Management should be incorporated into the management of construction projects.
- Implementation of Project Management tools and Techniques. Every project has a start and finish date. Hence, integration and implementation of project management tools and techniques should be used judiciously, and this is possible when qualified project manager is employed in an organization.
- Solution to lack of community engagement during project execution. Sponsors and clients of project should endeavor to liaise with the anticipated beneficiaries of developmental project to improve their buy-in. This should be done during needs valuation and conceptualization stage of each project. UNDP (2006) recommends that, there should be a participatory planning and people-centered development agenda as remedy to minimize the lack of community buy-in in socio-economic intervention programmes.
- **Establishment of Project Management Offices (PMOs).** There is an urgent need for all government and organization at all sectors to initiate the establishment of project management offices (PMOs) as a subsidiary branch to help in monitoring projects that are under their jurisdiction. The benefit of this will be to help address problems that have escalated before they become an issue and then cause delay.

Conflict of Interest

The authors are not aware of any conflict of interest regarding our submission for publication.

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