

Impact of Traditional Procurement System on Construction Project Delivery

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Abstract

Poor project performance issues have been a problem in the construction industry. A large number of projects have failed to meet their goal as a result of the choice of procurement approach adopted. The traditional method is the commonly used procurement method in the construction industries of the world, and its sequential and linear nature has serious implications on project time, cost and quality baseline performance. The purpose of this study was to determine the impact of the traditional procurement system on construction project delivery. The specific objectives of this study were; to assess the influence of the traditional procurement system on construction project parameters, and to determine the factors responsible for the poor bottom lines of traditionally procure construction projects. This study was achieved using a structured questionnaire administered to construction experts using a purposive sampling method. With a reliability index of over 0.800, the data gathered were analysed using appropriate descriptive tools. It was found that projects delivered through the traditional procurement system have the greatest impact on project time parameters, more on cost and quality parameters. Also, poor time, cost and quality performance are caused by major factors such as rework, poor original planning/unrealistic scheduling, poor communication among project participants, lack of competent staff and inadequate proper training of available staff, and design and documentation issues. Project clients and consultants should be careful in project procurement selection to ensure that maximum value and goals are met

Keywords: *traditional procurement, procurement, construction project, project performance, project cost, project time*

1. INTRODUCTION

The construction industry drives the delivery of construction projects such as buildings and civil engineering projects of different dimensions and complexities. These projects act as good propellers of socio-economic development and growth accelerators of nations, as they provide shelter, and employment opportunities and contribute to the GDP of nations, as well as impacting activities of non-construction-based sectors (Eze et al., 2019; Onyeagam et al., 2019; Onyejeakor et al., 2020). Despite these benefits of the construction sector, building and civil engineering projects have been adjudged to be ill-performed and delivered as they suffer from time and cost overruns, poor productivity, poor quality and high accidents rates, excessive claims and disputes and overall dissatisfaction of the stakeholders (Chan & Chan, 2011; Odeyinka and Yusuf, 2011; Okereke et al., 2021; Shehu, 2021). These situations have been largely blamed on the procurement system adopted which is primarily the traditional procurement system of project delivery (Ogunsanmi *et al.*, 2012; Olanike et al., 2020).

The procurement system defines the comprehensive process through which construction stakeholders (Architects/design engineers, constructors and consultants) render their services from the design, and construction to project completion to clients' satisfaction (Molenaar et al., 2012). It is equally the organizational structure that the clients have accepted, and implemented to ensure the completion of projects as well as their operation (Chan, 2011). There are various procurement methods in existence, and they include traditional, labour-only, design and build, construction management, project management, direct labour, alliancing, joint venture, and partnering systems (Dada, 2012). The choice of procurement system adopted largely determines the performance of a construction project as pointed out by (Ogunsanmi et al., 2012; Abedin et al., 2021). The traditional method is common in the construction industry of nations of the world. This system allows for a sequential and linear process where design must be completed to a large extent before work can commence on site (Masterman, 1992; Yu and Shen, 2013).

In the Nigerian construction industry, more project delivery problems have been reported on the project delivered through the traditional system than others. Olanike et al. (2020) confirmed that delays are a major issue in construction execution in Nigeria. Similarly, according to Ojo et al., (2014) and Okuwoga (2011), delays in delivery, budget slippage, productivity losses, revenue shortfall, disputes and lawsuits, and termination of the contract, among others, are common characteristics of construction projects in Nigeria. These situations have remained despite advances in technology and modern methods of project delivery. Although the demand for modern construction businesses and digitization in the construction sector of developing nations have put appreciable pressure on the choice of procurement methods adopted in developing countries, the Traditional Procurement System still exist. However, it is declining in popularity (Kong & Gray, 2012) but this exists only in theory and not practice. While procurement-related studies exist in Nigeria (e.g. Ojo et al., 2006; Ibrahim, 2008; Babatunde et al., 2010; Idoro, 2012a; Dada, 2012; Ikediashi et al., 2012; Idoro, 2012b; Ogunsanmi, 2013; Inuwa et al., 2014; Olanike et al., 2020), there is the dearth of studies that have focused on the Influence of traditional procurement system on construction project parameters of (time, cost and quality) and the Factors responsible for the poor bottom lines of traditionally procure construction projects. The lack of a dedicated study on this subject is the gap that this study stands to fill.

The majority of the problems associated with this procurement method, especially during the construction stage evolve from unseen and hidden problems and inefficiencies at the design stages. The client and his consultants have a critical role to play at this stage of the project life. However, with greater clients, sophistication, quest for better-performing projects and client satisfaction (Yu et al., 2010), the emphasis has shifted to understanding the problems and impact of the traditional procurement system on project performance. According to Poee et al. (2015), a lot of debate has been triggered by issues regarding the procurement method and how it impacts project performance. According to Ogunsanmi (2013),

construction management literature has reinforced the perception that procurement has an impact on the performance of construction projects. This has contributed to the criticism of the traditional procurement system. Furthermore, according to Kong and Gray (2012), the traditional procurement system is widely criticized and this is based on the time-consuming nature of all aspects of the development processes, costly effects of uncertainties, buildability issues and fragmentation interfaces of the organizations involved. It is based on the foregoing that this study assesses the impact of Traditional Procurement System on Construction Project Delivery. The specific objectives of this study are to; i) assess the influence of traditional procurement systems on construction project parameters, and ii) Factors responsible for the poor bottom lines of traditionally procure construction projects.

The outcome of this study would reinforce existing knowledge of the problems and time and cost impact of the traditional procurement system in Nigeria and other developing countries of the world that still patronize this procurement system of construction project delivery. Furthermore, decision-makers and project managers commissioned on a project are better positioned to make decisions regarding procurement choices at the onset of the project.

2. LITERATURE REVIEW

2.1 Traditional procurement in the construction sector

Procurement of projects is described as structured and organised techniques and procedures by which clients obtain construction products and services (Rashid et al., 2006). Innovation in procurement and the need to have more efficient and effective construction project delivery has led to the development of different variants of procuring projects in the sector. This includes turnkey, partnering, joint ventures, and management contracting, among others (Babatunde et al., 2010). In the traditional procurement system which is commonly referred to as design-bid-build, the client is at the top of the procurement value chain. The client aims to get satisfaction and value for money through timely delivery, within the proposed budget and with the required quality standard. Studies have shown that attaining client satisfaction and value for money has remained an unachievable objective, especially with the traditional system (Babatunde et al., 2010). This is further supported by Hasan et al. (2021) show posit that successful project completion is hindered by the limitation of time and cost monitoring practices under the traditional settings of project delivery.

As stated earlier, the traditional procurement system is linear and sequential. It starts with the client who conceives the need for a project and engages the consultants who prepare and helps to develop the brief through feasibility study, design and tendering. The contractor is selected at tendering stage to construct the design up to handing over and commissioning. The flow of activities in the traditional system shows a linear flow and indicates the allocation of duties and responsibilities between the clients, consultants and constructors (see figure 1).

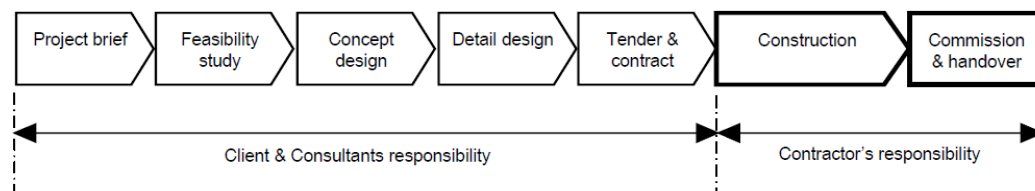


Figure 1: The sequential nature of the traditional procurement system

Source (Rashid et al., 2006)

2.2 Impact of traditional procurement system on construction project performance

Construction project performance is measured commonly using the three major parameters for measuring project success such as time, cost and quality (Mahamid, 2016). These parameters summarise the goal of every project (Chitkara, 2005), and it is by meeting or exceeding these parameters that stakeholders' satisfaction is measured, especially from a project management perspective (PMI, 2004). Modernisation of operations brought by technological advancement and the high level of competition upon which construction businesses are performed have led to changes in the requirement of clients and what constitutes successful project performance. In addition to time, cost and quality, the client now consider value for money for investment, reduced risk exposures, and timely confirmation of design and budget prices, which are considered in determining performances (Rashid et al., 2006).

An exploratory interview study by Kong & Gray (2012) revealed that there is consensus among stakeholders that the traditional procurement system is slow. This was blamed on the fragmented nature of the system which is in phases and stages, evidenced by the separation of the design responsibilities and construction responsibilities. For Daniel (2006), the central idea behind procurement is the optimisation of performance parameters of cost, time and quality. These main constraints have remained a change to the job of the design team, contractors and project and portfolio managers (Adesanya, 2008). The used of traditional system of procurement have a link with the inefficiencies in contractor selection procedures and in emerging countries. Construction project in developing nations have suffered from meeting time, cost and quality baselines (Okekere et al., 2022a). The success of a construction projects in terms of time, cost and quality is largely dependent on the procurement type employed, and that the traditional system has poor records of baseline performance in the construction industry (Mangyvat et al., 2020).

In terms of time performance, the traditional procurement system is mostly linear and sequential, and these have made it to be known

as the slowest approach to delivering projects (Leo-Olagbaye and Idowu, 2019). The clear accountability and the custom of ensuring that designs are completed before construction starts; give clients control over their projects. The consultants as well as the clients have enough time to review and scrutinise the project since the pre-contract stage is longer with the traditional system. Designs are reviewed before construction on site (Rashid et al., 2006; Padang, 2006). While at the early stage of the contract, the client can know the price of the project, which gives a firmer and more competitive price for the design and the completed drawings, before tendering. The Bill of Quantities used gives every tenderer fair and equal opportunities to price the same items of work. There is better cost control but these changes as the number of variations increases due to unforeseen problems, which cause cost overruns (Masterman, 1996; Rashid et al., 2006).

Ideally, the traditional procurement system is supposed to provide the highest degree of quantity certainty and standards. This is because it gives the client and the consultants enough time to develop fully the design and specification (Leo-Olagbaye and Idowu, 2019). The absence of the contractor at the pre-contract stages makes it impossible for the contractor's expertise to be utilised at the onset, especially in the design, specification and planning. The contractors are brought in only when the design has been concluded and approved (Rashid et al., 2006). According to Kortenko et al. (2020), there is a high level of uncertainty in the subsequent phase of the design. The need for changes at construction stages has impacted several projects' delivery timelines. In almost all projects, the initial designs are subjected to changes (Bajari et al. 2009). This harms the delivery of the project in terms of time and cost, as well as quality. There is also the complex contractual agreement between parties which impacts the flexibility of communication and interactions. This impact the learning and efficiency of work delivery items (Perkins 2009). Segmentations of controls, poor transparency of the process, leadership issues and fragmentation among project teams; are common among projects procured through

traditional means. (Dada, 2012). Figure 2 below shows a summary of the relationship that exists between key project performance parameters and the traditional procurement system. Owing to the linear and sequential nature of activities and phases of traditionally procured projects,

projects are frequently impacted negatively leading to poor performance. This is evident in studies such as (Ogunsanmi et al., 2012; Abedin et al., 2021; Okekere et al., 2022a; Mangvwat et al., 2020; Kortenko et al. (2020; Leo-Olagbaye and Idowu, 2019)

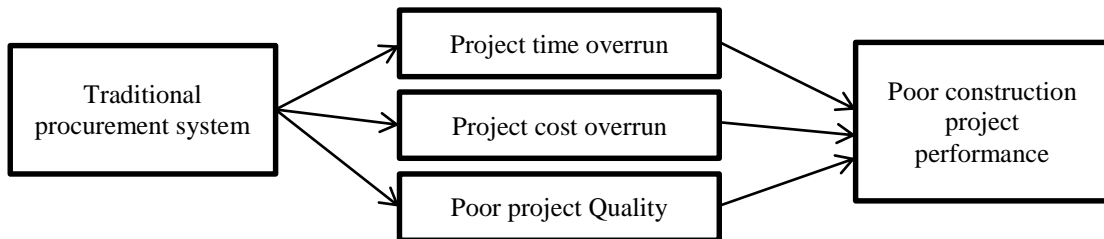


Figure 2: Impact of traditional procurement system on project performance

2.3 Factors responsible for the poor bottom lines of traditionally procure construction projects

Although, more factors qualify a project to be successful or well-performed, time, cost and quality are at the apex of the others. Therefore, the focus here would be on a review of factors that affect the baseline of construction projects procured through the traditional system. Cornerstone projects (2022) identified four critical reasons for the poor time, cost and quality performance of construction projects, and they are; poor original planning/unrealistic scheduling, lack or delay in information about the project, changes to the initial specifications, and resource availability. Yusoff et al. (2021) confirmed that the skilled labour shortage has a serious impact on the success and performance of construction projects in the construction industry. The improvement of information especially those of site investigation and drawings before the start of work on-site have been suggested to be measures for avoiding poor time performance. Furthermore, improved scheduling and project management, regular project monitoring and frequent updates of progress are ways of mitigating delays in traditionally procured projects (Cornerstone projects, 2022).

Owners, consultants and contractors in Saudi Arabia identified the common cause of poor

time performance to be poor communication among project participants, poor labour productivity, poor planning and scheduling, payments delay, escalation of material prices, poor planning and scheduling, and poor site management (Mahamid, 2016). These factors alter negatively the triple bottom lines of cost, time and quality of construction projects procured through traditional means. Construction project procured using the traditions means suffers from a lot of poor time and cost performance. In the Malaysian construction industry, Kong and Gray (2012) identified factors are responsible for the frequent time uncertainty of the traditional system, and they are; the majority of project details were not finalised upon tendering, economic factors influenced the supply and cost of construction materials, shortage of materials, financial and cash flow problems, poor weather conditions, and lack of site management. Other includes; client interference or strong involvement during the design development stage, project complexity, size and type, lack of information given during tendering stage, source of materials, late payment of progress works, budget allocation or government funding, clients favouring certain conditions, variation in orders, Uncertainty of design, Lack of complete design documents and poor site conditions.

Puspasari (2005) reported that the top factors responsible for the poor performance of a project are the relationships between project team leaders, the communication system among project participants and the motivating skills of the project team leader. Momeet et al. (2022) found that the major critical causes of the poor performance of projects are; the lack of competent staff and inadequate proper training of available staff. For Rahman et al. (2012), the chief cause of poor construction project performance is; design and documentation issues, financial resource management, project management and contract administration, contractor's site management, ICT information and communication technology, material and machinery resource, and labour (human) resource. Time, cost and other parameters of a construction project are affected by factors such as a change in project scope, project complexity, inadequate planning, inappropriate project schedule, design variation, inaccurate engineering estimate, inefficient material and equipment management, and improper post-execution phase management (Goldstrong, 2022).

In the Egyptian construction industry, Aziz (2013) reported that project performance is caused by factors such as; Delay in progress payments (funding problems), Different tactics patterns for bribes, Shortage of equipment, Ineffective project planning and scheduling, Poor site management and supervision, Poor financial control on-site, and Rework due to errors. Rework is a major retarder of construction project progress and it is also central to poor construction project time, cost and quality performance. According to Eze and Idiako (2018), rework contribute to 46.60% of

cost overrun and an average of 7.35%, equivalent to 19 days' extra days to building construction projects. Chidiebere and Ebhohimen (2018) confirmed that rework has a very high impact on project performance, as it leads to projects overshooting their planned budgets and durations, and degrades the quality of project outcome.

Seeboo and Proag (2019) found that Miscommunication, improper planning and absence of internal supervision of works lead to some reworks which could impact the project cost and time as well as the quality of finished products. Thomas (2019) reported that quality as well as cost and time could be impacted by damaged and low-quality materials, supplier and vendor failures, subcontractor mishandling, failure to document changes and practices, last-minute changes, scope creep, miscommunication between teams, the complexity of designs, lack of project management system, and ignored audits and testing. Masoetsa et al. (2022) identified 29 construction constraints that impede progress toward meeting construction project goals of being within time and budget and having acceptable quality. These constraints via an exploratory factors analysis were grouped into six clusters, and they are; Stakeholders' inappropriate project scheduling and coordination, Organisation and government policies, Ownership financial and contractual delays, External factors., Project peculiarity factors, and Managerial factors. Overcoming these constraints would involve improved project scheduling, coordination, organisation and managerial capabilities (Masoetsa et al., 2022).

3. RESEARCH METHODOLOGY

This study adopted a structured questionnaire administered to construction experts in Owerri, Imo state. Imo state has an emerging construction market that is influenced by the rebuilding agenda of the present government. A lot of construction projects are being awarded, constructed and commissioned by both the government and private individuals (Okereke et al., 2022a). The questionnaire was administered to construction experts such as Engineers, builders, architects and quantity surveyors; these are key experts that form the larger percentage of the experts engaged by construction companies (Eze et al., 2020; Nwaki and Eze, 2020). The use of questionnaires is common in construction management studies, as it is easy, economical to use and can cover wider audiences at a relatively shorter duration (Blaxter, et al., 2001; Tan, 2008; Obonadhuze et al., 2021). Owerri is an urban settlement and houses three local government areas (LGAs) out of the 27 LGAs in Imo state. Thus, making the use of questionnaire ideal on this study that covered construction experts that are scattered all over the areas.

The questionnaire used was subjected to a pilot survey to determine its suitability and completeness regarding the subject of this study. Three industry practitioners and 3 academics took part in the pilot survey and based on their feedback, the final draft of the questionnaire was made. The participants were recruited based on certain criteria which include; i) having at least 5years of industry

experience, ii) being involved in an active construction site in the study area, and, iii) having knowledge of traditional procurement systems. According to Okereke et al., (2022b), these criteria would ensure that objective and quality responses are obtained from the survey participants. Furthermore, these criteria made it difficult to have a firm sample population that met these criteria; this informed the use of purposive sampling techniques in the distribution of the questionnaire among the participants.

The questionnaires used were developed using information obtained from the literature review. The respondents were required to rank the assessed variables based on their level of influence on traditional procurement systems on project parameters. The respondents were required to rank the selected factors according to the level of influence on the poor bottom lines of traditionally procure construction projects on a 5-point Likert scale, where 1 represents the lowest scale and 5 is the highest scale. A total of 118 usage questionnaire were retrieved after a sampling period of 13weeks, and they form the basis of the analyses and result reported herein. Data analyses were carried out using frequency, percentages, and mean item scores (MIS). The Reliability tests were done using Cronbach's alpha test and a coefficient of 0.982 was obtained. This shows that the instrument is reliable and the data is of good quality. This is based on the suggestion of Pallant (2005) that Cronbach's alpha coefficient should be higher than 0.70. The research flow chat is depicted in figure 3 below.

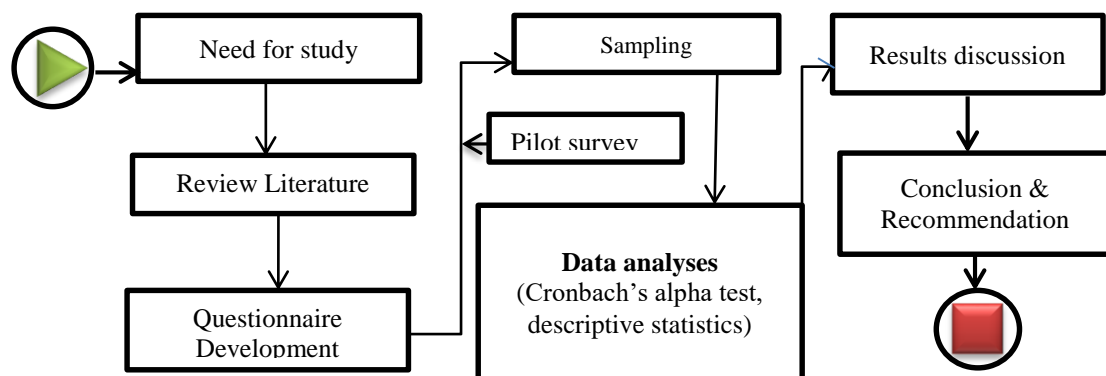


Figure 3: Study methodological flow chart

4. RESULTS AND DISCUSSION

4.1 Participants' background information

From the results in table 1, the respondents' professional representation indicates that; the majority of them are Engineers (45.76%), this is followed by Quantity Surveyors (27.97%), then Architects with 16.10% and Builders (10.17%). This shows that the various key built environment professionals are represented. Their professional status shows that 89.83% of them are corporate members of their various professions, and only 10.17% are probationer members. The distribution of the years of

experience of the respondents reveals that 47.46% have spent 5-10 years in the industry, 32.20% had 11-15years in the sector, 12.71% had 16-20years experience and those with over 21years of experience 7.63%. With regards to academic qualifications, 39.83% have a BSc/B. Tech, 32.20% have M. Sc/M. Tech, those with PGD are 15.25%, HND is 11.86% and only 0.85% have PhD.

Overall, the results of the respondents' background information revealed that the respondents are professionally, and academically qualified and have the requisite experience to give an educated response to the questions of the questionnaire.

Table 1: Demographic characteristics of Respondents

Category	Classification	Freq.	%	Valid %	Cumm. %
Respondents' profession/Responsibility	Architects	19	16.10	16.10	16.10
	Builders	12	10.17	10.17	26.27
	Engineers	54	45.76	45.76	72.03
	Quantity Surveyors	33	27.97	27.97	100.00
	TOTAL	118	100.00	100.00	
Professional status	Corporate members	106	89.83	89.83	89.83
	Probationer members	12	10.17	10.17	100.00
	TOTAL	118	100.00	100.00	
Years of experience	5 - 10years	56	47.46	47.46	47.46
	11-15 years	38	32.20	32.20	79.66
	16-20years	15	12.71	12.71	92.37
	Above 20	9	7.63	7.63	100.00
	TOTAL	118	100.00	100.00	
Highest Academic Qualification	HND	14	11.86	11.86	11.86
	PGD	18	15.25	15.25	27.12
	BSc/Btech	47	39.83	39.83	66.95
	M.Sc/M.Tech	38	32.20	32.20	99.15
	PhD	1	0.85	0.85	100.00
	TOTAL	118	100.00	100.00	

4.2 Influence of traditional procurement system on construction projects parameters

The level of influence of the traditional method on the major three project performance measurement baselines is shown in figure 4. It can be seen that the most influence is felt on the project time parameter as it has the highest value of 37.29%. This is closely followed by the influence of the traditional procurement method

on the cost aspect of projects with a value of 34.75%. The impact on quality is the least with a value of 27.97%. The result obtained here is an indication that traditional procurement has the greatest impact on project duration and cost over quality. Although quality performance plays a critical role in the acceptance of deliverables by the clients/customers, most clients are interested in time and cost of completion. Any changes to the project scope or plan which affect the time duration of projects

must have corresponding financial cost implications and also by extension impact the quality of what is being produced. Leo-Olagbaye and Idowu (2019) report confirmed that project procurement method in use, have impact on the eve of success of a project, particularly as it concerns achieving quality

standard, cost and time targets, client satisfaction. Furthermore, the traditional procurement system has been challenged by enormous problems of cost and time overrun, project abandonment and heavy rework and quality problems.



Figure 4: Traditional system VS project parameters

A further breakdown of the impact result in figure 5 shows that the time impact of the traditionally procured projects is very high (59.09%), while the impact on cost and quality is 53.66% and 42.42% respectively. Similarly, 38.64% of the respondents indicated that the impact of traditional procurement is high on project time, followed by cost (36.59%) and then on quality (30.30%). However, construction projects parameters are impacted seriously when an unsuitable procurement method is used in the delivery of a project (Ogunsanmi et al., 2012; Abedin et al., 2021).

Okekere et al. (2022a) blamed the inefficiencies in contractor section procedures and the subsequent use of traditional contract in developing nations, are the major cause of failure of construction project to achieve its baseline target of being delivered with schedule and budget and with the required quality standard. Mangvwat et al. (2020) implied that the success of a construction projects in terms of time, cost and quality is largely dependent on the procurement type employed, and that the traditional system has poor records of baseline performance in the construction industry.

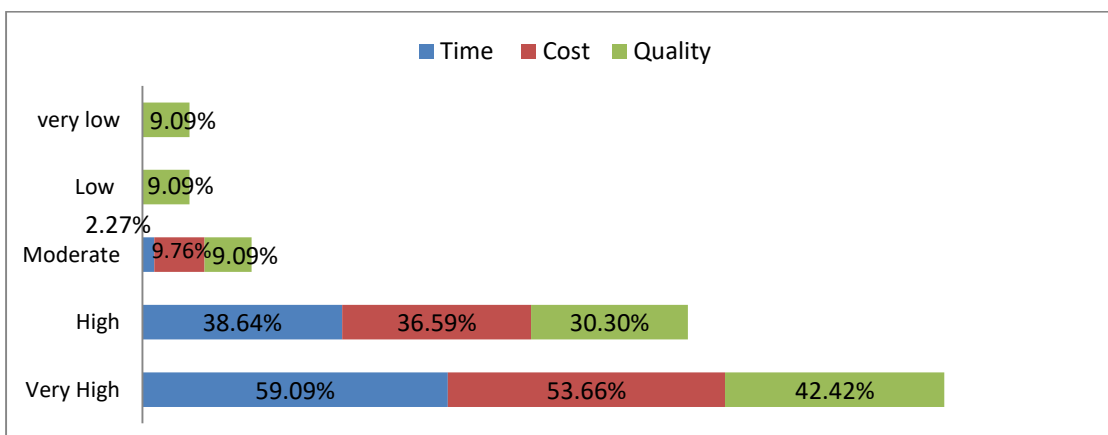


Figure 5: Level of impact Traditional system on project performance baselines

4.3 Factors responsible for the poor bottom lines of traditionally procured construction projects

The result of the analysis of the data gathered on the factors responsible for the poor bottom lines of traditionally procured construction projects is displayed in Table 2 and figure 6. The results showed that the top five factors responsible for the poor bottom lines of traditionally procures construction projects are; Rework (mean=4.61; SD=0.766), Poor original planning/unrealistic scheduling (mean=4.61; SD=0.766), Poor communication among project participants (mean=4.59; SD=0.673), Lack of competence staff and inadequate proper training of available staff (mean=4.51; SD=0.816), and Design and documentation issues (men=4.44; SD=0.865). While, the least ranked factor is; Poor weather conditions (mean=4.08; SD=0.966), Inaccurate engineering estimate (mean=4.00; SD=0.891), Uncertainty of design (mean=3.92; SD=1.117), Poor labour productivity (Mena=3.92; SD=1.191), and Improper post-execution phase management (mean=3.67; SD=1.708).

The results in this section are in support of the findings of (Cornerstone projects, 2022; Kong and Gray, 2012; Aziz, 2013; Mahamid, 2016; Seeboo and Proag, 2019; Yusoff et al., 2021; Momeet et al., 2022; Masoetsa et al., 2022). The pressure to win a bid by a contractor during competition could lead to setting unrealistic and unachievable deadlines. Sometimes, contractors accept jobs with predetermined deadlines, and without crossing checking, would agree to such timelines even when they are unrealistic and difficult to meet. This happens more in the traditional system and has been identified as a key cause of poor time performance of construction projects (Cornerstone projects, 2022). Aziz (2013) made it clear that one of the factors that impact project performance is ineffective project planning and scheduling. Rework is a dangerous occurrence that degrades project cost, time and quality and other vital variables (Aziz, 2013; Chidiebere and Ebhohimen, 2018; Eze and Idiake, 2018). In the traditional system, rework is commonplace and an integral part of project delivery (Eze and Idiake, 2018). This has made

poor project performance a norm in the construction industry.

Resources availability is an important factor influencing project bottom-line performance in the traditional method. Studies have shown this to be true. For instance, shortages of labour, materials, equipment and experienced professionals have been found to impact project performance (Aziz, 2013; Masoetsa et al., 2022). Materials shortages and poor or inadequate supply of competent labour or staff could impact the time performance of a traditional project. When labour and materials are in short supply, the progress of work will be impacted negatively (Momeet et al., 2022). Communication is what binds every facet of a project. The project managers spend a larger proportion of their time communicating. Project goals are met when there is effective communication. Poor communication among project participants has been identified as a factor that affects project bottom lines (Puspasari, 2005; Seeboo and Proag, 2019; Rahman et al., 2012; Mahamid, 2016). One of the major shortcomings of poor communication in the client team is the delay in issuing construction drawings, design documents and timely approval. It is the client's responsibility to provide complete information on time. Failure to do this leads to poor time performance of the project (Cornerstone projects, 2022).

Embedded errors or defects in contract documents used during traditional procurement are another major factors that impact project bottom line performance. The bulk of the issues that evolve at the construction stages came from pre-contract stage documents. Change in designs and documentation often leads to variability in the planned project time, cost and quality (Rahman et al., 2012; Goldstrong, 2022). Design and documentation issues could lead to poor communication of methods, specifications and materials and labour requirements for a component or elements. It can equally lead to misinformation among team members (Thomas, 2019) and this can cause serious drawbacks in the execution of project tasks and meeting project performance goals. Contactors can sometimes make change recommendations on the initial design,

specification or materials choices which are approved by the client. The adjustment could also be made by the client, which could distort an already tight schedule. Some changes have a

cost impact and the unavailability of the fund could implement such changes could lead to a delay or even abandonment.

Table 2: Factors responsible for the poor bottom lines of traditionally procured construction projects

S/N	variables	Mean	Std. Devi.	Rank
1	Shortage of materials	4.33	0.870	9
2	Rework	4.61	0.766	1
3	Financial and cash flow problems	4.08	1.106	15
4	Poor site conditions and investigation	4.42	0.790	6
5	Poor weather conditions	4.08	0.966	15
6	Lack of site management	4.24	0.784	11
7	Lack of information given during tendering stage	4.15	1.091	12
8	Variation in orders	4.26	1.202	10
9	Uncertainty of design	3.92	1.117	18
10	Lack of complete design documents	4.11	0.865	13
11	Poor original planning/unrealistic scheduling,	4.61	0.766	1
12	Lack or delay in information about the project	4.39	0.809	8
13	Changes to the initial specifications	4.10	0.871	14
14	Poor communication among project participants	4.59	0.673	3
15	Poor labour productivity	3.92	1.191	18
16	Lack of competent staff and inadequate proper training of available staff	4.51	0.816	4
17	Design and documentation issues	4.44	0.865	5
18	Inaccurate engineering estimate	4.00	0.891	17
19	Inefficient material and equipment management	4.40	0.861	7
20	Improper post-execution phase management	3.67	1.708	20

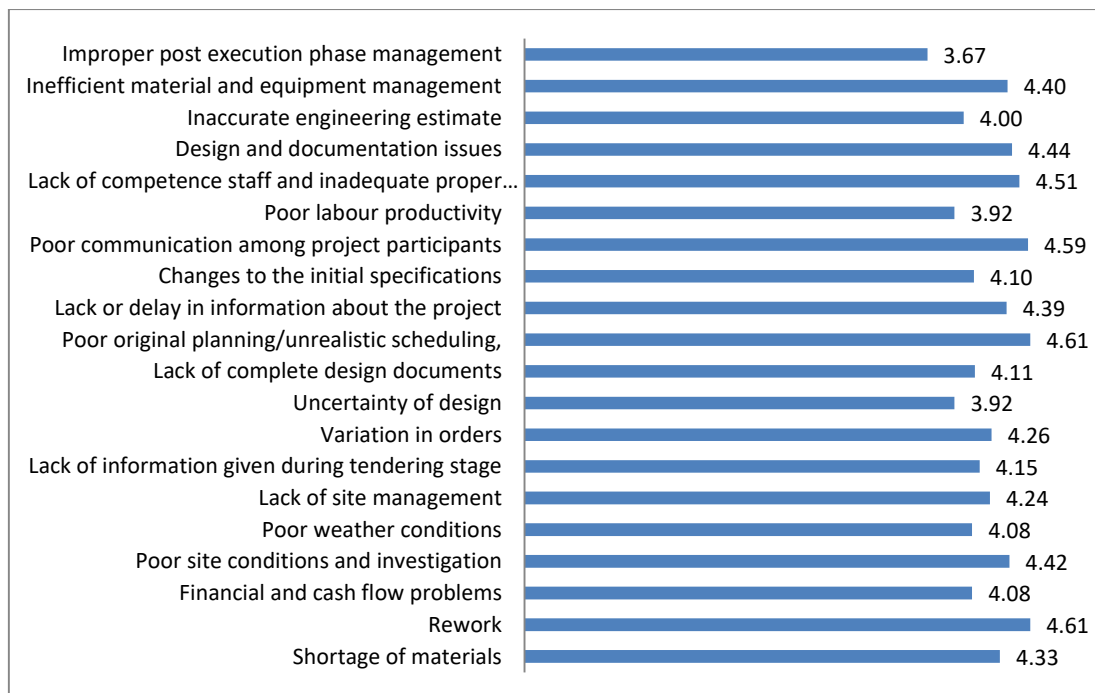


Figure 6: Causes of poor bottom-line achievement in traditionally procured projects

5. CONCLUSION AND RECOMMENDATIONS

This study set out to determine the impact of traditional procurement systems on construction project delivery. The specific objectives of this study were; to assess the influence of the traditional procurement system on construction project parameters, and to determine the factors responsible for the poor bottom lines of traditionally procure construction projects. This study was achieved using a structured questionnaire administered to construction experts using a purposive sampling method. The analyses of the collected data lead to some vital findings and conclusions drawn.

The study revealed that project delivery through the traditional procurement system has the greatest impact on project time parameters, more on cost and quality parameters. It also revealed the poor performance of these parameters is caused by major factors such as rework, poor original planning/unrealistic scheduling, poor communication among project participants, lack of competent staff and inadequate proper training of available staff, and design and documentation issues. This study implies that if nothing is done to move to modern and advanced procurement systems procuring construction assets, project performance in the sector will continue to decline. This is based on the understanding that these factors have existed for a decade and are experienced on most projects delivered via traditional means.

To minimise the impact of the traditional system, a move away from the traditional system and the adoption of modern digital and smart technologies is recommended. The construction industry of Nigeria like other developing nations is still largely dependent on manual techniques and technologies have not been fully embraced. This study digitization of construction operation, for example the use of Building information modelling (BIM) which have been found to minimise and improve communication and collaborations, reduce rework both at the design and construction stages, improve construction scheduling and production of realistic estimates of construction works items/materials.in addition to BIM, staff

and employees should be trained on modern project management tools and techniques like the lean methods. This have proved over time to be useful in value maximisation, waste reduction and healthy time and cost performance of construction projects. Furthermore, smart contracts enabled by blockchain technology could be used to make sure their compliance to contract terms is automated and the quality design documents and records are produced. This will reduce documentation issues and minimised claims and disputes that have cause the construction sector a lot of efforts, time and money.

The study would give project clients and consultants an understanding of the factors that degrades project performance expectations and goals. So that decision can be made to choose a suitable procurement route for it. The study also adds to the existing body of knowledge on the impact of traditional procurement on the performance of construction projects' bottom lines. Even though, this study was carried out in Nigeria; it can be useful to other developing nations of Africa and beyond, especially those with similar construction markets as Nigeria. A generalisation of the finding of this study should be done with caution as it is limited by geographical area, sampling method, sample size and analytical methods. Therefore, a similar study should be carried out in other states of Nigeria or other countries to compare results.

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