

## The Effect of Capital Project Planning on Construction Project Delivery in Nigeria

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**ABSTRACT:** *The purpose of this article is to investigate the impact of capital project planning on project delivery in Nigeria. To do this, a survey of relevant literature on the subject was conducted in order to determine the effectiveness of solid project planning on the various capital projects. The study by Idoro (2012) & Inuwa (2015) in Nigeria, Fateh et al (2022) in Malaysia, Owuor (2022) in Kenya, Yehualashet (2023) in Ethiopia, Gaur (2023) in India and Baleni et al (2023) in Botswana gave credence to the fact that there is significant influence of project planning on the performance of construction projects. Oladigbolu et al (2022) further recommends that the use of all project planning methods, both employees and employers, enlightenment line of balance method for project planning, monitoring & evaluation would ensure optimum project performance. The Nigerian government and her multiple procurement organizations are challenged by the outcome of this research to demonstrate greater concern, devote more resources, and increase their efforts to project planning at the preconstruction stage of their projects.*

**KEYWORDS:** project planning, project delivery, project performance, capital project

### INTRODUCTION

#### Project Planning

Faniran et al. (1998) described project planning as the process of determining appropriate strategies for the achievement of predefined project objectives. They classified project planning into *preconstruction and construction planning*. Preconstruction planning is regarded as pre-contract planning which refers to the planning done during the conception, design and tendering

stages of a project while construction planning often refers to contract planning which describes the planning done during the construction of a project.

Dvir et al. (2003), in another classification of project planning, identified three levels of project planning, namely: *the end-user level* where planning focuses mainly on the functional characteristics of the project end-product, *the technical level* that focuses on the technical specifications of the project deliverables that are needed to support the functional requirements, and *the project management level* that focuses on planning the activities and processes that need to be carried out to ensure that the technical work proceed effectively. These three planning levels can also be thought of as contract planning, project design planning, and project conception planning. The conclusion is that there are several types of planning done at each of the five stages of a project, which are conception, design, tendering, construction, and closeout. Project planning can therefore be classified according to the stage at which it is done (Puthamont and Charoenngam, 2004).

Project planning is a field that deals with how to accomplish a project within a specific timeline, usually with defined stages and resources. One view of project planning divides the activity into these steps: setting measurable objectives and identifying deliverables. It is a critical component of project management that focuses on developing a detailed plan that defines the processes and resources required to fulfill the project's objectives, such as determining the project's scope, defining a timeframe, assigning tasks and resources, and budgeting for the project. Project planning is an iterative process, and as the project proceeds, the project plan may need to be updated. It is critical to evaluate and update the project plan on a regular basis to ensure that it remains on track and accomplishes its objectives. In general, project planning consists of eight steps:

### **Define the goals and objectives of the project**

Set goals that are specific, measurable, achievable, relevant, and time-bound (SMART). This covers the milestones and smaller tasks that the team must complete by the project's finish. When developing the work plan, it is critical to solicit input from all stakeholders to ensure that everyone is on the same page.

### **Develop the project plan**

Create a work breakdown structure, timetable, and budget to define the project's scope. The work breakdown structure specifies the tasks that must be done, the schedule outlines the project's timeline, and the budget identifies the resources needed and the expenditures connected with the project.

### **Identify the project risks**

The project manager devises a contingency plan for the unforeseen. This includes potential risk management solutions. There is a backup plan in place in case something goes wrong.

### **Create a communication plan**

The communication plan specifies who will be kept up to speed on the project's progress and how frequently. This keeps everyone on the same page.

### **Assign roles and responsibilities**

Each team member must understand what is expected of them. This contains their deliverables as well as their deadlines. The project manager allocates assignments based on the skills and shortcomings of each team member. This guarantees that activities are executed efficiently and that the project remains on pace.

### **Obtain approvals**

The project manager presents the plan to the CEO of the company for approval. Once accepted, the marketing director is in charge of ensuring that all assignments are executed on time and within budget.

### **Launch the project**

The execution phase begins with a kickoff meeting. It establishes the project's pace. This is the point at which the team puts all of the puzzle pieces together and begins working toward the project's objectives.

### **Monitoring and evaluation**

The project manager reviews and updates the plan as needed to ensure the project's success.

### **Types of project planning**

The type of planning depends on the nature of the project and personal preferences. There are three types of project planning: vertical, horizontal, and joint.

#### **Vertical planning**

Also known as waterfall planning, vertical planning is when the project manager plans the different phases of the project sequentially, from start to finish.

### **Horizontal planning**

Horizontal planning is when the different parts of the project are planned simultaneously. This type of planning is also known as agile planning.

### **Joint planning**

This is a mix of both vertical and horizontal planning. Part of the project is planned sequentially, and some parts are planned at the same time. This type of planning is also known as integrated planning.

## **CAPITAL PROJECTS**

A capital project is a long-term, capital-intensive endeavour to expand, enhance, or replace a capital asset. Capital projects are distinguished by their large scope and high cost in comparison to smaller investments that require lesser preparation and resources.

Several criteria can be used to categorize projects in general. The most important classification is based on the project promoters or financiers, who are generally referred to as clients. In every economy, governments and their agencies, as well as private groups and individuals, are the primary boosters of project development. These promoters, like all other participants, are divided into two categories: public and private clients.

Governments and their agencies currently make up the majority of clients for building projects in Nigeria, according to Nubi (2001), because they have control over the country's economy and, consequently, its natural resources. Private clients, on the other hand, develop primarily for financial reasons or to meet specific needs. He went on to point out that private clients are usually more selective in terms of contractor selection, project location, and financing. The dominance of governments and its agencies on project development in Nigeria stems from the fact that the entire Nigerian economy, including private sector activity, is largely dominated by government resources, primarily crude oil. The economy's reliance on government revenue is so obvious that any decline in government earnings from crude oil in any year usually results in a recession. Governments and their agencies are key players in the construction industry in Nigeria because of their economic control. Government spending on major projects such as schools, hospitals, roads, housing, energy, water supply, and athletic facilities, to name a few (Okun, 2009).

The Federal Government's Appropriation Acts for 2023 show that the sum of ₦4.90 trillion, representing 24% of Federal Government of Nigeria (FGN) total appropriation, was earmarked for capital expenditure while the balance sum of ₦15.10trillion, representing 76% of FGN total

appropriation, was budgeted for recurrent expenditure (Budget Office of the Federation, FMFBNP, 2023). There are no statistical records of the contribution of the private sector to project delivery. However, what cannot be disputed is the fact that the contribution of the private sector is small when compared with that of the public sector.

Because of the complexity of the resources, procedures, activities, and parties involved, project development and delivery require careful planning. According to Naoum et al. (2004), one of the important instruments that stakeholders utilize to ensure the success of construction projects is planning. In a study conducted by Faniran et al (1994), the capacity of a construction project to meet its clients' time, cost, and quality objectives was identified as the major measure of construction planning efficiency. In a different study, Faniran et al. (1998) argue that the goal of planning in construction projects is to complete a specified quantity of work within a set timeframe, at a previously projected cost, and to a set of quality criteria. To accomplish project objectives, project plans are created. The claims made by Faniran et al. (1994, 1998) are true, even though project objectives are not restricted to project delivery time, cost, and quality because they are the main goals of a project and the main indicators of its success. In other words, the metrics used to assess the success of project planning and project performance are equivalent. As a result, competent planning can be said to have gone into a successful project, whereas inadequate planning can be said to have gone into a failed one.

The level of planning done during the development and execution of a project will likely be significantly affected by the professionals involved. The level of project planning will consequently vary between projects in the public and private sectors due to differences in the professionals hired or in the project plans created throughout project delivery. This understanding results in an assessment of the impact of project planning levels on project performance.

## **PROJECT PLANNING AND PROJECT DELIVERY – THE RELATIONSHIP**

Project planning has been identified as a component of the project delivery process, with project performance serving as the foundation for determining its effectiveness (Naoum, 1991; Ling and Chan, 2002; Thomas et al., 2002). It is one of the key tools that stakeholders use to ensure that construction projects are successful (Naoum et al, 2004) and it is concerned mainly with the achievement of project objectives. Project success is measured in terms of the achievement of these project objectives.

Project objectives are the focal point of every effort and action in project delivery. Project objectives are crucial in planning because they serve as the foundation for project plans. Project

objectives are defined initially in project planning; then strategies to attain them are developed and presented as project plans, which are used to evaluate the objectives' achievement.

As a result, project planning can be defined as the process of defining project objectives, determining the framework, methods, strategies, tactics, targets, and deadlines to achieve the objectives, and communicating them to project stakeholders. Client expectations and available resources must be defined first, then matched to specified project objectives, so that available options can be identified and analyzed, and the most relevant frameworks, methods, and tactics to achieve the objectives may be chosen. It concludes with communicating the objectives as well as the frameworks, methods, strategies, targets/deadlines for achieving them to the persons, parties, and organizations involved in their implementation, monitoring, and control. Project planning produces various project plans that provide defined strategies for achieving defined project objectives.

These plans articulate both project objectives and strategies for accomplishing them, and they serve as the foundation for identifying project objectives, which otherwise allude to a project's success. While planning is a process that involves effort, plans are the end result of that effort. Planning that does not result in a plan is thus an effort that yields no results. Design, tendering, and programming efforts can result in design documents, tender plans, charts, schedules, and programs of resources and tasks to be completed. Each plan serves a specific purpose related to the attainment of specified project objectives. As a result, project sponsors are frequently asked to guarantee that many of these plans are produced during project development by employing qualified professionals.

While the drafting of these plans is intended to improve a project's success, it may also extend its delivery time. Documentation of information, which generally refers to planning, is a critical enabler to the successful completion of any project, and inadequate documentation is one of the causes of conflicts. (Sommerville et al; 2004). While every effort should be made to ensure that all components of the design are addressed and approved, the time spent on the development of the design should not be so extensive that it affects the entire construction duration and the client's desired financial objectives (Pheng and Ting, 1998). The preceding stage of project execution or production entails carrying out the prepared plans. Project success reflects the effectiveness of the plans.

Throughout the world, project performance continues to be a major problem with project delivery. This is true because projects call for the employment of multiple resources that must be used effectively as well as clearly stated objectives that must be met. In the UK and Sweden, it was emphasized how important it is for those involved in the construction project delivery to create

and apply performance measurement tools (Robinson et al. 2005). The performance of projects can also be measured using a variety of criteria that have been created by various researchers (Naoum, 1999; Ling and Chan, 2002; Thomas et al., 2002; Josephson and Lindstrom, 2007). 250 parameters are identified by Josephson and Lindstrom (2007) in an analysis of the metrics applied to gauge project performance in 16 journal papers. Ling (2004) developed and assessed 70 potential criteria for measuring project success based on a study of prior research papers on project performance indicators. These and other characteristics utilized in research investigations are divided into two major categories: subjective and objective parameters. Ling (2004) states that the performance of a project is multifaceted and may include unit cost, construction and delivery speeds and the level of client satisfaction. Pinto and Slevin (1998) classify project performance parameters into:

- (1) Internal factors that are project variables, namely: schedule, cost and quality, and
- (2) External factors that are concerned with stakeholder satisfaction of the performance of a project and the perceived impact on an organisation's effectiveness.

Ling et al. (2004) established two types of project success indicators: product success, which consists of measurements of quality standard achievement, and process success, which comprises of variables that measure time and cost achievement. Subjective parameters refer to stakeholder satisfaction with the finished product (i.e. the structure), whereas objective parameters refer to project variables such as schedule, cost, and quality that are used for setting and defining project objectives as well as setting targets and deadlines for project delivery. The classification of project performance parameters is important because, while not all available data can be utilized every time performance is measured, any measurement that does not contain parameters from the two categories may not be trustworthy. The fact that stakeholders spent more time and money on a project than was originally planned may not reduce their satisfaction with the project's performance.

Stakeholder satisfaction is becoming increasingly important in modern methods to performance monitoring. According to Kotler (2000), satisfaction can be defined as a person's feeling as a result of a product's performance in comparison to the person's anticipation. Individuals and organizations that are actively participating in a project or whose interests may be affected positively or negatively as a result of project execution are referred to as project stakeholders (Project Management Institute, 2004). According to Marjolein et al. (2008), it is widely understood in project management that stakeholders' interests must be addressed in order for a project to succeed. According to the Project Management Institute (2004), in order to ensure a successful project, the project team must identify the stakeholders, understand their requirements and



expectations, and, to the greatest extent feasible, manage their influence in relation to the requirements.

A construction project's stakeholders include project sponsors such as the client, developer, and financier, project team members, and customers. According to Faniran et al. (1994) and Neto et al. (2007), the client is the most essential stakeholder in construction project delivery. Faniran et al. (1994) defined a contractor's success as his capacity to meet its clients' time, cost, and quality objectives, but Neto et al. (2007) thought that meeting or exceeding clients' expectations leads in satisfied clients.

Due to the fact that client needs are the emphasis of a project and project objectives are established by them, project success is all about meeting and exceeding client expectations. Client satisfaction can be measured in a variety of ways (Idoro, 2008). Three factors, however—time, money, and quality—remain the most important in research studies. According to Josephson and Lindstrom (2007), project goals that take client goals into account are evaluated from a variety of angles, but their primary objective is to encourage clients to articulate and clearly present their goals, as well as to encourage all managers involved to inform and remind everyone of the goals. According to Hatush and Skitmore (1997), time, money, and quality are typically operationalized as the three pillars of project success. According to Michell et al. (2007), construction clients' top priorities include having their projects finished on schedule, within budget, and with the required caliber. Based on the aforementioned claims, this study used the three project criteria of time, money, and quality to represent the three main concerns of clients and the variables used to gauge client satisfaction.

The characteristics used to define project objectives and set targets and deadlines for project delivery are frequently utilized to determine objective parameters of project performance. The same parameters are used for project monitoring, evaluation, and control. Although there are many of these parameters, two of them, namely scheduling and cost, are common in research investigations. The reasons behind this are not implausible. According to Michell et al. (2007), clients, contractors, and consultants all view timely completion of a construction project as a major measure of project success. They also stated that cost overruns are one of the primary causes contributing to the high cost of construction.

According to Vincent and Joel (1995), stakeholders consider the purpose of quality management as customer satisfaction; hence the third element (quality) is not a typical objective parameter in research studies. According to prior research, two factors, namely time overrun and cost overrun, remain the most important indicators of objective project performance monitoring. However, these



two criteria have limitations because their values are heavily dependent on the project's initial time and budget.

In his study, Idoro G. (2012) chooses four parameters as the factors for objectively measuring project performance: time overrun, cost overrun, percentage of time overrun to initial contract period, and percentage of cost overrun to initial contract sum. Based on the fact that the original contract period and amount have a significant impact on project time-overrun and cost-overrun, the factors of time and cost-overruns to initial contract period and durations were selected.

## **PREVIOUS STUDIES**

The study by Idoro (2012) on the levels of use of project planning by public and private clients and its effects on project performance suggest three things:

1. Increased level of project conception planning can bring about increased performance in delivery time of projects procured by public clients and increased performance of both delivery time and cost of projects procured by private clients.
2. Although the levels of project conception planning by the two categories of clients are not significantly different, that of private clients has more influence than that of public clients.
3. Those increased levels of project conception planning by the two clients can influence the delivery time and cost of their projects.

The study also showed that the level of project design planning by public clients has influence on project cost-overrun and percentage of cost-overrun to initial contract sum, while that of private clients has influence on only project time-overrun. The results indicate that the higher level of use of project bill of quantities and specifications by public clients has influence on project delivery cost while the higher level of use of project drawings by private clients has influence on project delivery time.

The study also revealed that the level of contract planning by public clients influences client satisfaction with project quality, while that of private clients influences client satisfaction with project cost. These results tend to indicate that the efforts of public clients relative to contract planning are directed at ensuring that they are satisfied with the quality of work while that of private clients is directed at ensuring that they are satisfied with the cost of projects. Increase in the level of contract planning by public clients will tend to increase their level of satisfaction with the quality of work in their projects while increase in the level of contract planning by private clients will increase their level of satisfaction with the cost of their projects.

Since project stage planning is a component of overall project planning and it influences project performance, the result thus encourages clients to concentrate on increasing the level of project stage planning in their efforts to improve project performance.

Iroegbo et al (2003) in their study recommended that enough time should be made available especially at the pre-design stage – for adequate planning which surely have serious impact on the overall project performance. Their study which focused on project cost planning, suggests that the recognition and application of project cost control techniques will help increase the growth rate of construction industry in Nigeria. They went further to recommend that enough time should be made available especially at the pre-design stage – for adequate planning.

The findings from the study carried out by Oladigbolu et al (2022) revealed that the Line of Balance method as a tool for project planning remains largely unused in Nigeria but recommends that the use of all project planning methods, both employees and employers, enlightenment line of balance method for project planning, monitoring & evaluation would ensure optimum project performance.

In a related study on the Determination of the Influence of Project Planning on the Performance of Road Construction Project, Nnadi et al (2023), shows that about 55.5% of road project performance is as a result of proper project planning and that high quality road construction can be used effectively in improving the road construction sector and improve the economy. It was further recommended that road construction firms should undergo proper checking on all levels of planning to improve performance of road projects.

On a global perspective, a Malaysian study carried out by Rahah et al (2022) indicates that there are still inefficiencies in the financial and physical performance of public projects due to the weaknesses at the project planning stage. By examining the influence of human/personnel, project management, technical, and organisational factors on project planning for physical projects in Sabah, Malaysia. Esmailzadeh et al (2022) in their study also alluded to this fact. It was conclusively agreed that deploying PDRA (Project Definition Rating Assessment) tool at the Front End Planning (FEP) stage is critical to project risks identification and handling thereby ensuring project success.

Abdullahi et al (2023) also made a case for a robust construction using lean construction principles for an effective project delivery. They opined that implementing lean principles has positively impacted construction project planning, scheduling efficiency, and effectiveness. That it can lead to improved project planning and scheduling, reduced waste, improved productivity, and increased customer satisfaction. Also, it can help reduce the time spent on non-value-adding activities, such

as rework, and focus on activities that add value to the project. Construction project management can perform better when implementing lean principles. They went further to argue that applying lean concepts to project planning and scheduling resulted in reduced project durations, higher quality, and higher production levels. According to the study, applying lean principles to construction project management can significantly improve project performance. What is more, applying lean principles in construction project planning and scheduling can significantly improve the scheduling and planning of construction projects and thereby impact project outcomes.

Other studies by Mohd Fateh et al (2022) in Malaysia, Inuwa (2015) in Nigeria, Owuor (2022) in Kenya, Yehualashet (2023) in Ethiopia, Gaur (2023) in India and Baleni et al (2023) in Botswana, all collaborated the fact that an effective project planning is key to a successful project delivery.

## **CONCLUSION**

Planning, as one of the management activities, is the process that kicks off the management process and is thus a requirement for other management tasks such as monitoring, evaluation, and control. As a result, project planning has a substantial impact on the performance of construction projects.

This study has revealed that in the delivery of construction projects, both public and private clients commit resources and efforts to project planning at the design stage. Although private clients commit more results which makes them manage projects better than public clients at the preconstruction stage and a robust management at the conception stage is expected to bring about better results. The Nigerian government and her multiple procurement organizations are challenged by this outcome to demonstrate greater concern, devote more resources, and increase their efforts to project planning at the preconstruction stage of their projects.

The study also revealed a dynamic interplay in the levels of use of project life-cycle charts, project stage planning by both private and public clients which significantly impacts on project delivery time as reflected in the high percentages of time-overrun to initial contract period recorded in the study. Public and private clients in Nigeria need to commit more resources and efforts to the planning of project delivery period in order to improve the performance of their projects. Hence, there is significant influence of project planning on the performance of construction projects.

The impact of planning on project delivery process and performance is expected to be the same with other management functions. Where project planning is ineffective, the chances of monitoring, evaluation and control being effective diminish. The two categories of clients will need to improve the level of planning of their projects in order to achieve effective monitoring, evaluation and control of their delivery process and improved project performance.

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