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Project Planning: A Determinant of Project Delivery to Time and Cost

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ABSTRACT

Planning is not only the most basic of all the managerial functions, it also determines how the other functions will be implemented. With efficient project planning, utilisation of administrations, and hierarchical strategies, proper project operations can be sequenced to achieve a successful project delivery. This research study set out to appraise the project planning impact on project delivery. To achieve this, a qualitative research method was adopted in which archival data was obtained for public building projects executed between January and December 2021 within Lagos State, Nigeria. Analysis of retrieved data was done using descriptive statistics and Pearson Correlation. The findings indicated that a significant relationship exists between time overrun and cost overrun while planning techniques used for projects has a non-linear relationship with time and cost overrun experienced on construction projects. The study concluded that planning plays a major role in the successful delivery of construction projects. Hence, there is a need to incorporate adequate project planning into the pre-contract phase activities on construction projects.

Keywords: Project delivery, Project planning, Time and cost performance

INTRODUCTION

Harris and McCaffer (2013) defined and described the construction industry from the functional perspective and concluded that the industry is made up of the client, consultants, contractor, materials, manufacturers, distributor, financial institution and labour force. The Nigerian form of construction steadily remains in the form of block work construction for the majority of her building construction steel or concrete framed buildings cladded or infilled in whatever type of constructions (Ibrahim, Daniel and Ahmad, 2014). These authors postulated further that though the construction industry in Nigeria and her educational system are fashioned alongside that of the United Kingdom, her performance has not been very impressive when compared to the international standard obtained in the United Kingdom. It was argued that most construction firms are very small, ill-equipped and have no

sophistication adequately enough to rise up to face the challenges of rapid industrialization and urban development as compared to the international growth obtained in the industrialized world because of the ugly experiences of political and social instability in the country since the civil war ended in 1970.

Despite the effectiveness of the industry to the economy of the country, it has been faced with difficulty in winning the fight against delay that arises in construction projects undertaken within the country. Jagboro (1998) has defined that, "a delay is a time during which some part of the construction project has been extended or not performed due to an unforeseen circumstance." So, it is essential to define who and what is responsible for this delay and at which stage is this delay mostly felt in construction projects. It is therefore suggested that the lack and improper utilization of various planning techniques could be the cause of this delay experienced by the construction industry. Construction Industry is faced with a lot of risks which results in financial loss. These risks are events that generally influence any or all of the project's objective which a contracting organisation globally has for a particular construction project and as such the Nigeria construction industry (NCI) contractors are not exempted. Risks events could result in positives (opportunities) and/or negatives (threats) to contractor's set project objectives (Aibinu and Jagboro, 2002).

However, the construction industry had witnessed a tremendous rise in the number of firms since the end of the civil war, but statistics show that the rate of failure of construction firms in Nigeria when compared with other industries records one of the highest bankruptcy rates due to incompetence (43%) and lack of managerial experience (50.4%) (Ibrahim, Daniel and Ahmad, 2014). The indication of this is that success in construction business operations will depend entirely upon the type of management organization operated by the firm which in turn will depend on the effective and efficient application of management and planning techniques and tools such as in this work study. According to Ahuja, Dozzi, and AbouRizk (1994), the management process thrives on the key role planning plays in project management. For management to be proactive, plans must be made and achieved. The importance and essence of management in any construction firm is to describe how effectively and efficiently men and other resources - plant, finance, and materials can be planned, organized, controlled, motivated and managed to achieve the organizational goals and objectives easily and readily (Lester, 2017). Project failures, bankruptcy of contractors and financial loss recorded in the Nigerian construction industry (NCI) are mostly as a result of inadequate use of formal contract planning and management principles and techniques by contracting organization. This becomes more evident in renovation and refurbishment projects in which unexpected and unforeseen additional works, scope management issues and excessive requirements are inevitable problems (Chong, Uden and Naaranoja, 2007; Berggren, Söderlund and Anderson, 2018). It is against this background that this research set out to appraise project planning impact on actualization and the delivery of projects in the NCI.

PROJECT PLANNING AND ITS EFFECTS

According to Hendrickson, Hendrickson, and Au (1989), Contract planning is a "fundamental and challenging activity in the management and execution of construction projects which involves the choice of technology, the definition of work tasks, the estimation of required resources and the duration of individual tasks, and the identification of any interaction among the different work tasks". Planning as defined by Al-jibouri (2002) is "determining what the organization's position and the situation should be at sometimes in future and deciding how best to bring that situation to fulfillment". Project Planning is more than estimating time and cost, it is a question of preparing schedules and charts, it is primarily a management function that creates a framework of agreement on who supplies what, to whom, where and when (Hensey, 2006). Hensey (2006) further argued that planning is not a secondary function performed by computers or specialized planners. It is a vital activity to be carried out at all levels of the project organization. Planning proceeds all other managerial functions and it is acclaimed as the most important of them all in any organization enterprise, or establishment. Wonder that the saying goes that: "No man plans to fail but man fails to plan". Construction planning involves proper management of the available construction planning tools as they have an effect on the time and delivery. Planning, therefore, permits, harmony within an establishment. Furthermore, it aids control which is necessary to ensure that resources are allocated and utilized prudently to make individual, and groups perform to achieve maximally the stated goals and objectives. It states what are to be accomplished and controlled systems are created and developed to evaluate how plans are progressing (Andawei, Enenimiet and Openebo, 2007).

Working out a construction plan is a critical task when it comes to the management of construction project as it determines the layout of how the construction project will be executed within the scheduled period of time to ensure cost and expenses is not exceeded while maintaining the specified quality. The inability of the contractor to complete the aforementioned works at any stage prior to practical delivery can be classified or categorized as an abandoned project. (Sundaraj, 2007) analysed and described the abandoned project as the one that was once initiated, but on which construction work for one reason or the other stopped mostly as a result of improper planning or absence of planning. Resumption of work on such a project may almost be nil. In addition, (Sundaraj, 2007) further categorized abandoned projects into two, viz: partial and complete abandonment. Suspended project or partial abandonment are those projects on which work was once in progress, but because of certain considerations, work had to stop for some time and after a while, it will pick up again. Projects of this nature in this category are classified as partially abandoned. They are not completely abandoned, but rather are undergoing some financial metamorphosis or adjustment programmes to meet up with the realities of time before they commence again. Secondly, the complete or totally abandoned projects in the 2nd category had progressed in the site formerly but had to stop completely, not to resume again because of certain factor(s) and consideration(s). Both categories of project

abandonment have a common economic trait of wastage both to the clients and the contractor executing the project. Such wastage comes in the form of cost and time overrun. With project planning, utilisation of administrations, hierarchical strategies, inside operations and new items can be devised (Naeem *et al.*, 2018).

RESEARCH METHODOLOGY

The main purpose of this study is to appraise the effect of project planning on the successful delivery of construction projects. To achieve this, qualitative research method was utilised. The study was carried out in Lagos State, Nigeria. Archival data was obtained from the Ministry of Works department in Lagos State for projects executed between January and December 2021. The timeframe was selected to ensure there is no need to discount the project cost data to present value of the most recent data as the inflation rate was averagely constant within this period. Out of the 45 building projects retrieved, only 16 were found suitable for use as they contain the necessary information needed for the analysis to be carried out. To analyse the retrieved data, descriptive statistics and Pearson Correlation was employed.

RESULT AND DISCUSSION

This section takes into cognizance practical projects executed in 2021 in Lagos state, Nigeria which was used as a case study to evaluate the effect of project planning techniques on project delivery to time and cost. As earlier stated, 45 projects were retrieved but only 16 projects were found suitable for the analysis as other projects do not have one of the major variables to be considered for the analysis which is the planning technique employed for the construction projects. All the projects are building projects to ensure regularity. The cost and time data as presented in Table 1 were analysed using correlation analysis. The information presented indicated that most construction projects in which CPM was used, less cost and time overrun was achieved on these projects compared to other planning techniques while LOB wasn't employed for any of the construction projects. In one of the projects executed using CPM for the planning process, the project was achieved using less cost and less period.

Pearson Correlation analysis was adopted in establishing the relationship that exists between project planning techniques used for construction projects and delivery to time and cost which was presented in Table 2. From Table 2, it cou ld be deduced that a significant relationship exists between planning techniques, cost overrun and time overrun at 5% level of significance.

However, time overrun and cost overrun has negative Pearson correlation values with planning techniques. This implies that the planning techniques used for projects have a non-linear relationship with time and cost overrun experienced on construction projects. This can be because there is no consistency with the planning techniques as there are time and cost overrun at some instances while there are no time and cost overrun in other instances while using the same planning technique. The result also indicated that there

Table 1. Cost data of some construction project executed in Lagos State, Nigeria.

Planning Technique employed	Initial Completion Period (weeks)	Final Completion Period (weeks)	Time Overrun (weeks)	Initial Contract Sum ($)	Final Contract Sum ($)	Cost Overrun ($)
CPM	80	78	-2	715,789.47	714,105.26	-1,684.21
CPM	50	50	0	263,157.89	263,157.89	0.00
BAR	42	40	-2	214,736.84	214,736.84	0.00
WBS	43	51	8	231,578.95	233,684.21	2,105.26
WBS	45	47	2	245,263.16	245,789.47	526.32
CPM	12	13	1	102,105.26	102,147.37	42.11
PERT	12	13	1	117,894.74	118,315.79	421.05
BAR	65	64	-1	505,263.16	507,157.89	1,894.74
CPM	62	62	0	476,947.37	477,368.42	421.05
CPM	15	15	0	143,157.89	143,157.89	0.00
WBS	52	57	5	211,621.05	212,042.11	421.05
BAR	68	75	7	536,421.05	546,305.26	9,884.21
WBS	46	58	12	214,736.84	234,757.89	20,021.05
CPM	8	12	4	77,894.74	80,315.79	2,421.05
CPM	16	15	-1	138,947.37	138,947.37	0.00
PERT	168	168	0	1,989,473.68	1,989,473.68	0.00

Table 2. Effect of Project planning techniques on project delivery to time and cost.

		Planning technique employed	Time overrun	Cost overrun
Planning technique employed	Pearson correlation	1	-.528*	-.504*
	Sig. (2-tailed)		.036	.047
	N	16	16	16
Time Overrun	Pearson Correlation	-.528*	1	.815**
	Sig. (2-tailed)	.036		.000
	N	16	16	16
Cost Overrun	Pearson Correlation	-.504*	.815**	1
	Sig. (2-tailed)	.047	.000	
	N	16	16	16

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

is a significant relationship between time overrun and cost overrun at 1% level of significance. This shows that once there is time overrun on a project, there is a high tendency for cost overrun to occur as well.

CONCLUSION AND RECOMMENDATIONS

The study set out to appraise the project planning impact on actualization and project delivery in the NCI which was achieved through thorough literature review and archival data analysis. From the result of this study, it could be concluded that Critical Path Method is more accurate in ensuring a

project is delivered to scheduled time and predetermined cost with all other project factors remaining constant. This study further revealed there is a proven relationship between the planning technique employed for a particular construction project, cost overrun, and time overrun on the project. This study, therefore, recommends that planning should be carried out at the pre-contract planning stage of a construction project to ensure effective planning and achieve the core objectives of the construction project. During the execution of construction projects, the scheduled plan should always be crosschecked with the progress made daily on site to ensure the work is being executed based on the plan and it is delivered to time and cost. A major limitation to this study is the study focus which is a single state among the 36 states in Nigeria. This shows that the findings cannot be generalised for the NCI. Further study can be carried out on the other states in Nigeria to give a carpet view while a study can be conducted on the impact of project planning techniques on the efficiency of labourers on construction site.

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