



Evaluation of Critical Factors Affecting Construction Contract Planning in Nigeria: Contractors' Perspective

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ABSTRACT

Performance dips are perennial contemporaries of construction projects delivery across the globe. Varying degrees of these failures are increasingly attributed to planning-related problems. While expansive narrations of planning practices are obtainable notably in construction project management literature, the facets of barriers and drivers of effective construction contract planning as precursor of successful project delivery are limitedly accounted. In this study, we examined the barriers inhibiting effective contract planning among contractors in Akwa Ibom State. Survey data obtained from a purposive sample of 50 contract planning experts including quantity surveyors, contract managers and engineers designated as contract and project managers in building and civil engineering projects in Uyo were analysed using Mean Item Score (MIS), Friedmans test and Kendall's Concordance Index (KCI). The results showed that project characteristics, low adoption of technology, pressure management and lack of time and lack of collaboration as well as the dearth of personnel are critical drivers of inefficiencies in contract planning among contractors in the research environment. Across contracting organization structures (size), the test of variation in the perception of planning experts about the critical barriers to effective contract planning does vary significantly. The implication suggests that contracting firm structure could predict the level of planning as well as the effectiveness of contract planning efforts. Amidst this emerging viewpoint, the study concludes that ineffective contract planning are correlates of project characteristics, low adoption of technology, pressure management and lack of time and lack of collaboration. In order to improve the effectiveness of contract planning, the study recommends engagement with state-of-the-art planning applications, education and training and proper timing of pre-construction activities.

Keywords: Contract, Pre-Tender, Planning, Tender and Tendering.

Introduction

In the building and engineering industries, project quality and planning success are crucial. These industries have room for growth because of their project-based nature. There is a need for

constant development due to problems with performance, inherent failures from poorly planned projects, and other factors affecting budget, schedule, and quality. Low cost growth is attributed to poor contract planning. Analysis

of the factors affecting the efficiency of contract planning may boost project performance, as suggested by Chen et al. (2019). As a result of insufficient planning, construction cost estimates in Germany were 30% off. Based on their research, Adafin et al. (2016) concluded that poor contracts account for between 3.67 and 3.95 percentage points of variation in New Zealand's residential construction estimates, 3.98 and 12.15% in educational projects, and 14.22 and 16.33% in commercial construction projects. Planners on contracts may decide to make the deviation larger. In Ghana, both the estimates provided by consultants and those provided by contractors were off by significant margins. There was enough of a variance to indicate that consultants and contractors had adequately prepared for contingencies at the outset of the project and the tender process to mitigate cost overruns. This paper argues that careful preparation of the bidding process for a contract can help to minimise unexpected cost overruns.

The field of contract planning evolved in tandem with the field of project scheduling. The critical steps leading up to the contract serve as the basis for planning in this research. Contract formulation planning input quality has not received as much attention as firm participation decision factors (Bohari et al., 2021). Despite this, planning skills are more crucial to a successful contract (Flynn and Davis, 2016). Reviewing project delivery activities is necessary because of the growing dependence of one project on the success of subsequent activities and overall contract performance (Alaloul et al., 2016). To wit: Alaloul et al. (2016). Given the disjointed nature of the construction business and the many parties involved in a given project's execution, careful forethought is essential if efficiency is to be achieved. The importance of well-coordinated project deliverables throughout the contract planning stages is highlighted. Successful construction projects are influenced by careful contract preparation (Alaloul et al., 2016).

Contractors are essential to construction projects. Collaboration among key players early in the process may help keep projects manageable. The involvement of contractors at

various stages of building might lead to a misunderstanding of the project's intended outcomes (Oaikhena and Ekung, 2018). Professional project managers for hire are familiar with project schedules. Despite the fact that pre-contract planning issues are rarely investigated (Abbas et al., 2016), Ekung et al. (2021) recommended analysing planning in the traditional project delivery framework along separate project deliverables or milestones. The purpose of this study is to enhance tender rates by investigating the effectiveness of contractor pre-tender contract preparation. This research uses the perspectives of stakeholders in Akwa Ibom State, Nigeria, to examine some of the lesser-studied aspects of contract planning in that country.

Literature Review

Factors challenging Contract Planning Efficiency

Many construction projects are failing because heuristics are being used instead of planning and processes. Abandonment, insufficient value for money, wasted resources, excessive billing, and inflated contract costs are all examples of delivery process failures that Ezech (2011) lists. Another classic Nigerian criticism of bad planning expressed concern about the misuse of processes and subpar results in service provision (Arah, 2011; Ibrahim, 2011). Nigeria's contract auditing neglects are attributed to a lack of willingness to implement new processes, as discussed by Fabi and Awolesi (2015). Change resistance is a common problem when implementing new construction innovations. Both Lozano (2006) and Ellis and Wood (2005) deal with the problem of opposition to partnership procurement in the construction sector. Contract planning might be affected by organisational constraints and a lack of experience in contract planning. Contract planning activities are affected by factors such as project size, estimating team size, and the aim of the contract plan, as determined by Chatzoglou and Macaulay (1996).

In their post-project review, Enshassie et al. (2014) outlined five significant obstacles. The problems stem from a multitude of causes, including an abundance of work, time

constraints, pressure to get things done, a lack of expertise, the high cost of planning and scheduling, and hazy objectives. Issues with project personnel, incentives, and performance evaluation were all recognised as potential influences on contract planning in the study (Enhassi et al., 2014). Staffing, training, data processing, administrative, and planning engineer costs are all accounted for in the size and scope of the project planning model developed by Faniran et al. (1999). Commitment, expertise, motivation, contractor selection (tendering), feedback capacities, and project characteristics were all shown to have an impact on planning in a related study (Bjarnason, 2015). US electrical contractors, according to the research of Menches et al. (2008), need to prioritise project elements in order to maximise the effectiveness of their contract planning. Variables such as project type, design completion, expected bid accuracy, revisions, and delays in construction are all examples. Contractor planning challenges were a recurring theme in the 11 case studies of Northern Nigerian projects examined by Ibrahim et al. (2014). Although the validated criteria covered all phases of the project, little preparation was done due to factors such as many changes, flawed designs, delays, incompetence, poor contract management, and fluctuating costs of materials and labour. Lack of time, delayed stakeholder involvement, and poor cooperation all hampered pre-contract preparation (Abbas et al., 2016).

The type, complexity, and management requirements of a project are the reasons why planning fails, according to Collyer et al. (2010). Complexity increases the need for careful planning for the completion of today's construction projects (Larsen et al., 2018). According to Doloi (2011), project complexity is the primary reason for ineffective budgeting. Data about projects may be forgotten or destroyed, according to Serado (2012). High-level planning is rated as one of the lowest two success factors for project delivery by Young et al. (2011). Deadlines for completing tasks may have a significant impact on the effectiveness of the planning process. Thomas et al. (2008) point out that deadlines aren't the only constraint on project managers; management and customers that place little importance on planning also put enormous pressure on them to hit their milestones. The need to decrease project preparation time and effort is justified, according to Serado (2012). (Pressure from management and clients, and pressure to reduce time and planning effort.) Analysis of key factors used in cost estimates in Indonesia saves money (Chen et al., 2019). Ignorance of the cost planning process, say Stoy and Schalcher (2007), may lead to an inaccurate estimate. Time and experience were also addressed in the study of the inaccuracy of construction costs in Jordan (Bakr, 2019).

Below is a table that summarises the literature on the several aspects that play a role in contract planning.

Table 1: Summary of identified variables from the literature

S/N	Variables	Sources
1	Pressure from management and client	Thomas <i>et al.</i> (2008); Serado (2012)
2	Pressure to reduce time and planning effort	Thomas <i>et al.</i> (2008); Serado (2012); Enhassi <i>et al.</i> (2014)
3	Inadequate time	Bakr (2019)
4	Lack of experience among planning personnel	Bakr (2019)
5	Low perception for value for money	Thomas <i>et al.</i> (2008);
6	Project types, complexity and scope	Menches <i>et al.</i> (2008); Collyer <i>et al.</i> (2010); Dolio (2011)
7	Level of design completeness	Menches <i>et al.</i> (2008); Hatamleh <i>et al.</i> (2018)
8	Expected bid accuracy	Menches <i>et al.</i> (2008)
9	Resistant to the use of modern technology	Fabi and Awolesi (2015)
10	Dearth of knowledge, skills and training	Stoy and Schalcher (2007)

11	Size of planning staff	Chatzoglou and Macaulay (1996); Enshassi <i>et al.</i> (2014)
12	Dearth of resources (human personnel)	Faniran, <i>et al.</i> (1999)
13	Quality of planning inputs	Faniran, <i>et al.</i> (1999)
14	Purpose of contract plan	Chatzoglou and Macaulay (1996)
15	Lack of awareness	Enshassi <i>et al.</i> (2014)
16	Cost of planning (training cost, data processing and administrative costs)	Faniran <i>et al.</i> (1999); Enshassi <i>et al.</i> (2014)
17	Ambiguous objectives	Enshassi <i>et al.</i> (2014)
18	Lack of incentives	Faniran, <i>et al.</i> (1999)
19	Dearth of performance evaluation	Faniran, <i>et al.</i> (1999)
20	Level of commitment of planning	Bjarnason (2015)
21	Method of contractor's selection	Bjarnason (2015)
22	Feedback capabilities	Bjarnason (2015)
23	Late involvement of stakeholders	Abbas <i>et al.</i> (2016)
24	Lack of collaboration among stakeholders	Abbas <i>et al.</i> (2016)

Sources: compiled by the authors from literature review

Therefore, due to relevant issues, plans to enter into a contract fail. Success in a construction project in the face of these obstacles can be achieved through careful planning. Unlike other industries, such as IT software projects, management contracting practises suggest that planning and development can be done concurrently. This paper demonstrates the reciprocal growth of project scheduling and contract planning in the academic literature. While it is true that design, cost estimation, and tendering are all separate contract processes, this knowledge dominates the field of study. Very few studies have looked at how contractor-level factors affect the creation of contract plans. Instead, studies have zeroed in on the scheduling aspect of planning, with work scheduling serving as the central focus. In addition, inefficient planning is a topic of study for scheduling. This paper argues that this unbalanced disposition can be remedied through the use of contract planning, which incorporates the diverse discrete work groups that are planned separately in various organisations. Therefore, this study's underlying research hypothesis is concerned with broadening the scope of contractors' tendering management strategies through the examination of the most important determinants of pre-tender planning success rates.

Research Methodology

The research strategy, including the questionnaire and the quantitative survey, was inspired by existing literature on the barriers to effective planning. Quantity surveyors, contract managers, and project managers in Akwa Ibom State who deal with tender processing and contract planning were asked to fill out the survey. Researchers are actively engaged in construction projects that employ both formal and informal contractors. According to the research, public sector public works procurement is only possible through selective tendering, and there are no formal pre-tender activities through open tendering. Although the volume of related work has declined in recent years due to the economy, open-tendering is still used to procure building and civil works services for corporate clients in the private sector. The number of contracting firms was unclear due to these problems. Samples were selected in a planned manner. To this end, we sought responses from 70 professionals in the construction business with backgrounds as bidders, project managers, contract managers, and procurement managers or advisors. Answers to this survey will shed light on what variables impact the effectiveness of planning for building bid contracts. Background information was gathered in the first section of the study instrument to guarantee the accuracy of the results. In this section, we looked at your

education, your occupation, your years of expertise with tender planning, and the number of projects you've been a part of during the previous five years. The next section of the survey presents 24 characteristics collected from international literature that are used to assess the effectiveness of contract planning based on respondents' perceptions (see Table 1). This section was constructed using a five-point Likert scale, where 1 is very low, 2 is low, 3 is moderate, 4 is high and 5 very high.

The administration of the questionnaires involved mainly face-to-face administration, as well as, their retrieval. This strategy supported the study's quest to achieve a significant response and efficiency rates. Out of 70 copies of the research instrument distributed, 50 copies were duly completed and fit for analysis. This response produced the efficiency rate of 71.43%, which is also adequate and significant response rate. The data were analysed using mean item score (MIS). The MIS was engaged to determine the hierarchy of the severity of the contribution of each factor to the problem domain. In addition, the study examined the significance of the response by determining variation in respondents' vicars using Kendall and Friedman's tests.

Results And Discussion

Respondents' characteristics

The data related to the respondents' characteristics is important to the research and aids in determining the reliability of the research's data and validity. In this section, seven attributes of the respondents were examined including employment responsibility, education and professional qualifications, experience and number of projects tendered over ten years. In line with the purposive traits prioritized in the study, the respondents were grouped into three roles; however, there were more quantity surveyors in sample than other contract roles. Three professionals perform three roles in the sample, namely: architect, engineers and quantity surveyors. This result offer insight into the project profiles tendered by respondents in the study's sample. Educationally, the proportion of first-degree holders and others with postgraduate degree are almost equal (60:40). The respondents are also fully registered professionals with their respective professionals. In terms of experience, average years of experience of respondents is significant and between five and ten years in the industry and pre-tender practices

Table2: The respondents' characteristics

Variables	N	%	Variables	N	%
Roles in establishment			Profession/qualification		
Contract manager	8	15	NIA	5	10
Quantity surveyor	33	65	NSE	10	20
Project manager	9	20	NIQS	35	70
Total	50	100	Total	50	100
Registration status			Education		
Professional registration	50	100	First degree/equivalent(HND)	30	60
Total	50	100	Postgraduate	20	40
Year of experience			Total	50	100
Averagely seven and half years	50	100	Participation in pre-tendering planning		
Total	50	100	All respondents	50	100
Number of project			Total	50	100
0-10	18	35			

10-40	28	55
Above 50 project	4	10
Total	50	100

The number of projects executed is also significant ranging from one to fifty. The respondents' attributes indicate the sample has requisite ingredients to proffer that data arising from this sample is reliable to embed imperative knowledge about barriers inhibiting contract planning.

Factors affecting contract planning

Twenty-four (24) variables were used to assess the degree of impact on contract planning inefficiency. The variables rated on Likert scale 1-5 and each factor is a significant barrier when the mean item score (MIS) is 3.00 and above. The result in Table 3 indicates 21 factors are important barriers influencing the efficiency of contract planning with MIS greater than 3.00 (3.24 -4.60 > 3.00). The perceived level of importance of three factors achieved MIS less than 3.00 and this set of variables are considered insignificant barriers to effective contract planning. In terms of factors' hierarchy, project characteristics, use of technology, management pressure, lack of time and collaboration are important predictors of contract planning efficiency. The results indicated that project types, complexity and scope are the most significant factors influencing the quality and efficiency of contract planning. In addition to this project characteristics, resistant and non-applicable of modern technology, pressure from management, inadequate time and lack of collaboration among stakeholders (planning stakeholders, project consultants and contractors) emerges the top-five factors, ranking 2nd, 3rd, 4th and 5th respectively (MIS, 4.60-4.84 > 3.00). In the tier of ten top important problems that must reduce to improve contract planning efficiency, are dearth of resources, late involvement of contractor, dearth of feedback between client and contractor's team, inexperience of personnel undertaking and

tendering methods. These factors are the 6th, 7th, 8th, 9th and 10th ranking factors in list of important barriers contracting organisations must improve to advance contract planning efficiency (MIS 4.36-4.61 > 3.00). The next tier of barriers to effective contract planning are factors dealing with level of commitment to project, cost of planning, level of design completion, education, training and knowledge and level of performance evaluation in the organisation (MIS, 3.98-4.36 > 3.00). The least ranking factors relates to level of awareness, quality of planning inputs, low perception for value for money and expected level of accuracy (ranked 17th - 21st; MIS, 3.24-3.96). Despite emerging the least ranked factors, these sets of factors are equally significant challenge to the efficiency of contract planning. In addition to the hierarchy of the relevant factors, the deviation in respondent opinion however, shows a standard deviation less than one.

Further analysis using the Friedman test of variation in perceptions and Kendall's Concordance test of agreement reveals that perceptions of the significant factors affecting contract planning does not differ by job roles in the contracting organizations. The inferential statistics are valid by values greater than 0.05(accept null hypothesis) and value less than 0.05(reject null hypothesis). In Table 4, the results show a Friedman's Chi Square (236.567; $p(0.000)$ less than 0.05 to show the rejection of null hypothesis or alternately, the acceptance of alternate hypothesis. The implication indicates that perceptions towards the significant and insignificant factors affecting contract planning in the study do differ by job roles in the contracting sector. In addition, the Kendall's agreement index likewise indicated a high level of agreement among the respondents (W , 0.691). Overall, the viewpoints of respondents about the significant factors are consistent.

Table3: Factors affecting tender planning

Variables	N	Sum	MIS	Std. Dev	Rank	Remark
Project types, complexity and scope	50	230	4.84	0.49	1st	Significant
Resistant to the use of modern technology	50	242	4.60	0.55	2 nd	Significant
Pressure from management and client	50	235	4.70	0.65	3 rd	Significant
Inadequate time	50	230	4.60	0.49	4 th	Significant
Lack of collaboration among stakeholders	50	230	4.60	0.49	5 th	Significant
Dearth of resources (human personnel)	50	230	4.60	0.49	6 th	Significant
Late involvement of stakeholders	50	230	4.60	0.49	7 th	Significant
Feedback capabilities	50	220	4.40	0.76	8 th	Significant
Lack of experience among planning personnel	50	220	4.40	0.76	9 th	Significant
Method of contractor's selection	50	218	4.36	0.48	10 th	Significant
Level of commitment of planning	50	218	4.36	0.44	11 th	Significant
Cost of planning (training cost, data processing and administrative costs)	50	200	4.00	0.38	12 th	Significant
Level of design completeness	50	200	4.00	0.42	13 th	Significant
Dearth of knowledge, skills and training	50	200	4.00	0.36	14 th	Significant
Dearth of performance evaluation	50	199	3.98	0.14	15 th	Significant
Lack of incentives	50	198	3.96	0.20	16 th	Significant
Expected bid accuracy	50	197	3.94	0.24	17 th	Significant
Low perception for value for money	50	195	3.90	0.42	18 th	Significant
Quality of planning inputs	50	190	3.80	0.67	19 th	Significant
Purpose of contract plan	50	170	3.40	0.88	20 th	Significant
Lack of awareness	50	162	3.24	0.43	21 st	Significant
Pressure to reduce time and planning effort	50	76	1.52	0.74	22 nd	N. significant
Size of planning staff	50	61	1.22	0.42	23 rd	N. significant
Ambiguous objectives	50	59	1.18	0.39	24 th	N. significant

Table 4: Variation in respondents' perceptions of significant contract planning factors

	Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig
Between People	505.000	119	5.924		
Within People					
Between Items	391.700 ^a	9	65.744	480.840	0.000
Residual	624.300	1071	.688		
Total	1219.000	1080	1.231		
Total	2011.000	1199	1.696		

Grand Mean = 3.84
Cronbach's Alpha for the ten items = 0.884

a. Kendall's coefficient of concordance $W = 0.691$.

Discussion of Findings

The research demonstrates that in the typical supply chain, late QS participation increases stress on the cost consultant. To make accurate predictions, QS requires technological expertise. The time spent estimating highlights the need for engaging cost consultants early in the project. There are a few problems with using contracts for planning. Features of the project, technology used, management stress, deadlines, and cooperation were all validated by the investigation. Larson and Gray (2011) agreed that available time is a major factor in the precision of estimates. Other contract planning considerations are based on the estimated time required for preparation. In Jordan, the three most influential resource-related tendering-phase parameters on public construction project accuracy were the estimating team's experience, the project team's experience, and the estimating team's preparation time (Bakr, 2019). Even NASA agreed in 2013. Smaller projects are easier to estimate since they need less detailed information and less strict adherence to technical standards and specifications. The quantitative and qualitative aspects of a project are described in the technical description. The review committee's ability to check the earlier estimate judgements is bolstered by the technical specification.

Time and specialised labour were cited as important factors in determining a contract's success. Time and stakeholders have been recognised by Abbas et al. (2016) as partners in pre-contract planning that contribute to project success and profitability. Project coordination characteristics such as planning and scheduling (time) and resource management were ranked highly by respondents in a 2016 study by Alaloul et al. Previous results on teamwork, cooperation, and document quality were verified (Peurifoy and Oberlender, 2015; Alaloul et al., 2016). Organization-wide and departmental site meetings, as well as open lines of communication among team members, were shown to be effective means of facilitating project coordination by Alaloul et al. (2016).

Project complexity, duration, and scope may all be good predictors of an organization's success (Menches et al., 2008). The study's emerging themes of important tender planning factors were reaffirmed by the importance of efficiency in global projects. Tender organising is affected by global economic factors (Ciutiene and Meiliene, 2015). Small and medium-sized enterprises (SMEs) are underrepresented in public-sector bids due, in part, to the factors of tender preparation considered in this research (PwC, 2014; Flynn and Davis, 2016).

Conclusion

The study appraised the dimension of critical factors influencing the efficiency of contract planning in the construction industry. Contract formative processes enlist several processes that requires a well detailed inputs to actualize, which contexts are less engaged in the literature. The result of descriptive analysis of critical stakeholders related to contract planning indicates that project characteristics, low adoption of technology, pressure management and lack of time and lack of collaboration are the top five important factors in the contracting organisations that can enhance the efficiency of contracting and success rate of construction tender in Nigeria. The implications suggest that the quality of contract planning and success rate of tender are likely to improve when the project attributes are well understood. The appropriate resources are allocated to meet its requirements in one hand, modern technologies notably, information technologies applications are engaged in planning, reducing pressure from management of contracting firms and improving the level of collaboration between firm's internal stakeholders. These dimensions of factors must improve to enhance the success rate of construction tender and construction firm performance through increased performance. The study however notes that the results of this study can be further enhanced by determining the principal factors emerging from the validated themes of important factors.

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