

EVALUATION OF FACTORS INFLUENCING PLANNING EFFORTS IN BUILDING PROJECTS IN UYO, NIGERIA

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ABSTRACT

Purpose: This study investigates the factors influencing planning efforts in building projects in Uyo, Nigeria. The focus is specific on those factors that significantly affect the pre-contract planning stages of building projects.

Design/methodology/approach: A survey approach was adopted in the collection of data among key professional consultants involved in building project planning and execution. A sample selection of Architects (32), engineers (43) and Quantity Surveyors (38) was drawn from 56 project sites and 9 consulting firms in the study area adding up to a sample size of 113 professional consultants. Structured questionnaire were administered with 81.4% response rate.

Finding: The outcome from analysis of the square sum of ranks indicates factors such as client's demand, client's policy and planning procedures as the most significant factors influencing pre-contract building project planning efforts.

Research limitations/implications: The investigation of the factors was limited to those most applicable to the pre-contract planning stage of building projects.

Originality/value: The conclusion is that clients have significant influence on the amount of efforts invested in planning and performance of building construction projects.

Keywords: Building projects; consultants; factors; planning efforts; pre contract stage

1. INTRODUCTION

Planning efforts have become an issue of growing concern amongst professionals in the construction industry, it is the measure of how much resources are invested into planning activities at the pre-contract stage. Efforts invested in planning activities often impact on the successes or failure of construction projects (Zwikaël & Sadeh, 2007). Planning activities include all actions involved in the preparation or production of contract documents used in carrying out construction. Every construction project is unique, though may essentially involve the same basic resources. Frank and McCaffer

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(2001) also remarked that each project is peculiar and to ensure success, the procurement process must address the technicalities of the project features alongside the client and contractor's needs. Hence, investigations are required into whether the efforts invested into project planning activities differ and their influence on project success (Zwikael, 2009).

Project planning is applied in varying degrees of details when procuring a construction project; this is depending on the stage at which it is carried out in the process. The essence is to ensure that adequate provision is made for availability of resources at the right time and at each stage in the process. The resources being invested in the project planning and execution are described as renewable and non-renewable (consumables) resources (Patrick & Geffner, 2001). Renewable resources are needed during the execution of a project but are not consumed in the process e.g. machines, computers. Consumable resources, on the other hand, are consumed or used up in the process e.g. fuel and time. Hence to effectively plan and execute a project, an assessment is required of the availability of resources so as to provide a forecast into how the project can be managed, control and monitored.

Challenges are sometimes inevitable in spite of the level of preparation and progress made in any construction project. Some of these challenges are those of the projects itself on the measure of how much resources will be invested at pre-contract stage. Previous studies have shown that construction projects' failure to meet their objectives is as a result of poor or inadequate planning efforts. The advancement in information technology (IT) and its practical applicability to project planning and control has to a large extent, stem the growing concern over projects' inability to meeting their objectives. However, regardless of IT, concerns of overruns in project costs, delays, rework and poor quality of work in construction still persist. This possess a major task before the stakeholders and leaves the question as to what are the factors that weigh significantly on the level of efforts devoted in the planning of building construction projects especially at the pre-contract stage.

Zwikael (2009) stated that most construction projects' failures can be traced to inadequate and inaccurate planning as well as rigid adherence to originally formulated plans without modifications. This is in disregard to certain emerging interim changes within the project environment. While according to Mohamed (2010), the most successful construction project is characterised by a well-considered and thought of plan carefully developed by an understanding and committed project team. Not just by project managers, or some independent consultants.

Following the above background, the study aims at ascertaining the factors inhibiting effective project planning efforts among selected consultants in Uyo, Akwa Ibom State of Nigeria. The study objectives are to; identify the factors impelling planning efforts of a building project; assess the significant level of the identified factors among the consultants and determine the overall ranking of the factors based on their significant influence on the efforts devoted to the planning of building project in the study area. The expectation here is that the outcome and recommendation arising from this study will greatly benefit professionals and other stakeholders in the building construction industry.

2. PROJECT PLANNING

Project planning is defined as the establishment of a set of directions in sufficient detail for project teams to know exactly what must be done when it must be done and what resources are required in order to produce the deliverables of the project

successfully (Meredith & Mantel, 2006). It is also the process of defining project objectives, determining the framework, methods, strategies, tactics, targets and deadlines to achieve the objectives and the techniques of communicating them to project stakeholders (Idoro, 2010). Adequate planning equally involves the anticipation of possible problems and measures developed towards providing solutions whenever they arise as well as getting agreement among all concerned on clear targets and deadlines of work schedules.

There are 3 levels of project planning identified by Dvir, Raz and Shenhar (2003), these are; the end-user level where planning focuses mainly on the functional characteristics of the project end-product; the technical level which focuses on the technical specifications of the project deliverables that are needed to support the functional requirements. The third is project management level, which focuses on planning the activities and processes that need to be carried out to ensure that the technical work proceeds effectively. These three levels of planning can otherwise be regarded as project conception planning, project design planning and contract planning (Idoro, 2010).

Each project has a predetermined duration with a definite beginning (starting point) and identifiable end. According to Chitkara (2011), the starting point is the time when the idea is conceived by the client and the end marks the time all activities relating to the project comes to an end. The time span between the start and the completion of a construction project represents the project lifecycle. Although construction projects differ in many regards, their lifespan follows a similar pattern. After the project conception, there is a gradual build-up at the initiation and in the use of resources (construction), followed by a long duration of planning and design that increases the rate of resource consumption. It further peaked at the implementation phase with a higher rate of resource consumption and rapidly run-down till completion (closeout).

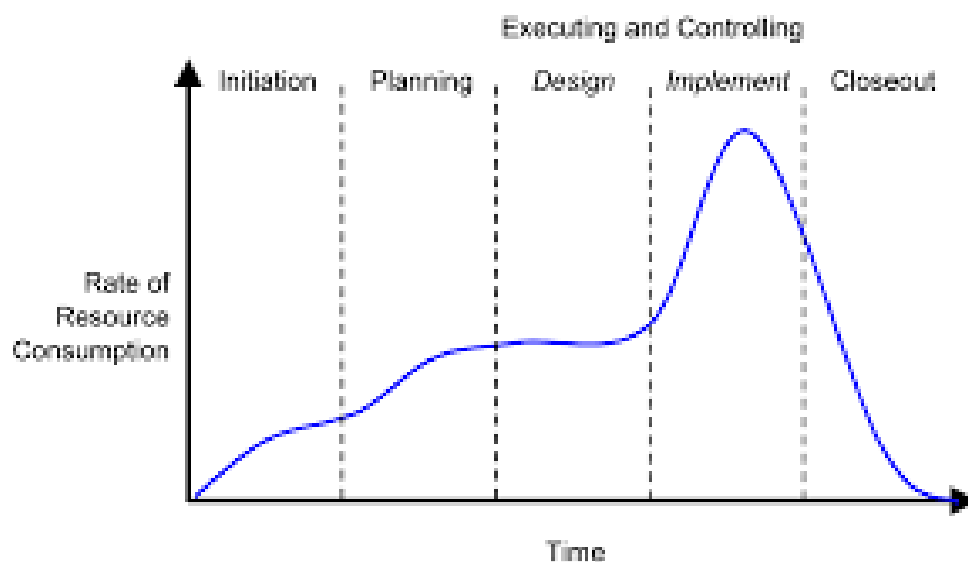


Figure 1: Diagram of a project lifecycle

The activities in a construction project are commonly categorised into five (5) main stages namely: opening or conception, design, tendering, construction and closing or handing-over based on the parties (Puthamont & Charoenngam, 2004). These stages constitute the project life cycle and are further categorised into two main phases,

namely: pre-contract and contract phases (Cooke & William, 2009). Pre-contract phase consists of the opening, design and tendering stages of project development while contract phase involves the construction and the closing of project development (Idoro, 2010).

2.1. Pre - contract stage

The conception stage is the first phase of the project lifecycle otherwise known as the inception stage or formulation stage. At this stage, clients' needs are very important in the planning decision. Though sometimes what clients perceive as their needs and what they actually need may differ. However, the success of any project will depend on how accurately these perceived and actual clients' need are articulated and harmonised (IFRC & RCS, 2000). Chitkara (2011) suggested that a feasibility study is required at this point to evaluate the project potentials of meeting its objectives and can be achieved by assessing its technical, economic viability and financial implications. Report from the feasibility study will enhance clients' decision on their needs and also outline the approach needed to tackle the project. The appointment of key personnel like the construction project manager to act as the client's representative, nomination of specialised associated agencies and professionals such as the architects, designer and consultants as per requirement will also be enhanced. The process of formulation of needs, collection of information, critical examination of concepts and re-examination of needs, may have to be repeated several times over before a project inception will finally take form.

The project design planning stage is the second phase in the project lifecycle otherwise known as the definition stage; this stage aims at processing the project preliminaries so as to facilitate the commencement of the construction stage. Chitkara (2011) mentioned that the composition of the design team at this stage depends on many factors such as the size and nature of the project, characteristics of the project and the time and cost objectives. The design team is led by a project manager and consists of participants such as architect, design and construction engineers, quantity surveyors, contract manager, and specialised consultants. After approval of the design development documents, the architects and the engineering team with the other specialised consultants, prepares the construction documents consisting of working drawings and technical specifications for the project components (Frederick & Ricketts, 2001).

2.2. Planning efforts at the pre-contract stage

Planning activities during the pre-contract stage of any building project are very pertinent. How much efforts should actually be invested in these activities and how they should be organised to achieve the expected performance, greatly determines the success levels of such projects. Some studies have attempted to examine or establish the relationship between planning efforts and success level of projects; Faniran, Love and Li (1999) and Zwikael (2009) belong to this streak of studies. They examined the probability of a link between these two variables and found that additional efforts a little above the optimal committed to a project increase the likelihood of a successful outcome of the project.

Further, project consultants are sometimes very itchy to open up and commence work on sites without much attention given to some details that could contribute to the critical

success factors. Zwikael and Sadeh (2007) look at the level of influence, the amount of planning could exert on the project success even under certain unforeseeable risks. This was in view of the fact that construction risks are sometimes inevitable and overcoming these risks, will require a carefully thought out alternative courses of action from the planning stage. Hence the study emphasised the need for a careful and detail planning among professionals where measures will be put in place in anticipation of any risk that may arise. In view of the importance of the requirement for additional efforts during the pre-contract planning, Idoro (2011) opined that there is a need for a careful project planning and the development of a quality documentation at the pre-contract stage. This will ultimately go a long way in providing a proper guide into the execution of a project. It is therefore very imperative for a careful and detail planning to be carried out that will take into cognisance those factors that could influence the amount of efforts that can be invested at this stage of the project.

3. RESEARCH METHODOLOGY

This study adopted a survey approach in data collection so as to achieve the research objective. Uyo the Akwa Ibom State capital was selected as the test bed for the research following the numerous building construction projects that are currently on-going. Also, it is one of the fastest growing state capitals in terms of infrastructure and development within the South-South region of Nigeria. The State is bounded by neighbouring states of Abia to the north, Cross River to the east, Rivers state to the west and the Atlantic Ocean to the south with a population of about 4 million according to 2006 Census.

Data for the study was obtained through the use of questionnaire distributed among the key professional consultants involved in building project planning and execution in the study area. The selection of the consultant was made through a random sampling by identification of building project sites and consulting firms in the study area. Architects, civil/structural engineers and Quantity Surveyors were the predominant professionals on sites and were adopted as the population for the study. A total of 56 project sites were identified which are made up of 87 professionals in all and 9 consulting firms with a total of 26 professionals. This brings a sum total of 113 professionals sampled and this was made up of 32 Architects, 43 Engineers (Civil/structural) and 38 Quantity Surveyors. See Table 1 below of questionnaire administered.

Table 1: Analysis of questionnaire distribution

Consultants	No of Questionnaire distributed	No. of questionnaire retrieved	%
Architects	32	28	87.5
Engineers	43	33	76.7
Quantity Surveyors	38	31	81.6
Total	113	92	81.4

The survey attained 81.4% success rate and data obtained for analysis includes those on academic and professional qualifications as well as levels of experience attained by the respondents. A total of 16 factors were generated from earlier literature and measured on a 3-point scale, with 1 = less significant, 2 = significant and 3 = highly significant. Analysis was made using descriptive statistics involving mean which was used in ranking the factors

to determine their level of significance. The Kendall test technique (Kendall Coefficient of Concordance W) was further used to ascertain the relationship of the responses among the professionals. It is obtained as follows;

$$\sum r = r_1 + r_2 + \dots + r_n \quad \dots\dots\dots 1$$

Where $r_1 + r_2 + \dots + r_n$ represent the ranking of the various professionals sampled

$$\sum r^2 = (r_1 + r_2 + \dots + r_n)^2 \quad \dots\dots\dots 2$$

The equation 2 above provides the squared sum of ranks where the final test is computed using the formula;

$$W = \frac{12 \sum r_t^2 - 3k^2 n(n+1)^2}{k^2 n(n^2 - 1)} \quad \dots\dots\dots 3$$

Where, r_t^2 = the squares sum of ranks, n = no. of factors being ranked and k = no. of professionals from which the ranking of the factors was taken. The test coefficient ranges from 0 to 1 with values closer to 1 indicating strong relationship or agreement while those closer to 0 indicates a poor or weak relationship. The rank of pairs of professionals is also measured using the Average Rank Correlation (r_s) from the equation 4 below.

$$r_s = (kw - 1) \div (k - 1) \quad \dots\dots\dots 4$$

This further provides for the determination of the overall consensus in the significance of the factors as ranked by the different respondents (professionals) in the study area.

4. RESULTS AND DISCUSSION

4.1. Qualifications and experience of respondents

Majority of the consultants involved in project planning holds first degrees representing 43.5% of the total professionals sampled and closely followed by those who acquired further qualification (MSc/MTech) with 30.4%. See Table 2 below.

The consultants are all registered with their respective professional institutions e.g. Nigeria Institute of Architects (NIA), Nigeria Society of Engineers (NSE) and Nigeria Institute of Quantity Surveyors (NIQS). Effective project planning and execution requires skills and professional experience acquired through academic and training. In Uyo the study area, most of the professional consultants meets this requirement which indicates their physical and mental competences to undertake project planning, control and execution. A high proportion of the consultants comprising 39.1% have put in between 11 and 15 years in their professional practice. While 22.8% have working experience of between 16 and 20 years thus, acquiring a substantial knowledge of the rudiments of project planning tasks in Uyo. This will afford them a good level of exposure to construction related problems and expertise solutions that embodies best practices. The results further show a wider disparity across gender which indicate that 80.4% are male whereas 19.6% female. One may be tempted to conclude here that, it may probably not be far from the age-old perception in

Nigeria that the construction industry is a male affair hence their dominance.

Table 2: Qualification and experience of the Respondents

Item	Description	Frequency	%
Sex	Male	74	80.4
	Female	18	19.6
	Total	92	
Educational Background	M.Sc./M.Tech.	28	30.4
	B.Sc./B.Tech.	40	43.5
	HND	24	26.1
	Total	92	
Professional qualification	MNIA	25	28.3
	MNSE	36	26.1
	MNIQS	31	25.0
	Total	92	
Working Experience (in years)	1 – 10	27	29.3
	11 - 15	36	39.1
	16 – 20	21	22.8
	21 & Above	8	8.7
	Total	92	

4.2. Factors influencing project planning efforts

In order to ascertain the significance of the factors affecting planning efforts of building projects, the means of all the 16 variables measured were computed and ranked in order of descending magnitude.

The outcome of the ranking of the factors as analysed and shown in Table 3 above indicates that, Architects considers client budget first as having a significant influence on planning efforts of building projects. This is followed by the experience of the planning team with a mean value of 3.94. However, they consider the level of use of IT as the least (3.06). Analysis of responses from the Engineers indicates that policy of the client (3.69) rank first, planning and approving authority (3.63) and client demand (3.60) are 2nd and 3rd most significant factors affecting project planning in Uyo. The Quantity Surveyors consider the Level of I.T. Use (3.94) as the 1st among the factors while client budget (3.71) and availability of construction materials (3.71) as 2nd and 3rd among the factors respectively.

4.2.1 Kendall Coefficient of Concordance (W)

Considering the outcome from analysis of the factors affecting planning efforts of building projects by Architects, Engineers and Quantity Surveyors, the Kendall test technique is used at this point to establish if there is an agreement among the professionals on the significant levels of the factors. Note that while the *W-coefficient* measures the overall relationship in the ranking of the factors among professionals (in this case 3), the r_s

–*coefficient* measures the possibility of a relationship or agreement between the ranking of one professional and the other.

Table 3: Mean and ranking of factors influencing project planning efforts

Factors	Architects		Engineer		Quantity Surveyors	
	Mean	Rank	Mean	Rank	Mean	Rank
Experience of the planning team	3.94	2	3.23	13	3.06	15
Client budget	3.96	1	3.53	7	3.72	2
Construction method	3.90	4	3.43	9	3.46	12
Planning and approving authority	3.91	3	3.63	2	3.34	13
Client demand	3.84	5	3.60	3	3.51	11
Type of project	3.77	6	3.33	11	3.34	13
Availability of local construction materials	3.71	7	3.54	6	3.71	3
Complexity of the project	3.68	8	3.47	8	3.58	6
Type of contract	3.61	9	3.53	7	3.68	4
Type of Client organization	3.47	11	3.55	5	3.66	5
Type of contractor	3.48	10	3.58	4	3.16	14
Policy of Client	3.42	12	3.69	1	3.52	10
Location of the project	3.39	13	3.39	10	3.57	7
Time invested in planning by the client	3.16	14	3.07	14	3.55	9
Awareness of project consultants	3.10	15	3.03	15	3.56	8
Level of I.T Use	3.06	16	3.30	12	3.94	1

The result of the test, $W = 0.083$ indicates a statistically poor relationship in the rankings of the significance of factors affecting planning efforts of building projects in Uyo among the professional consultants. This is further confirm by the result of the average rank correlation (r_s) of the factors among the consultants. The coefficient of $r_s = -0.375$ indicates a substantial disagreement between all possible pairs of rankings among the professionals. This finding suggests that despite these professionals are all part of the project planning team; they differ in their opinion as to the significant level of influence of these factors.

4.3. Level of consensus among the professionals

To determine the level of consensus among the professionals in relation to the level of significance of the factors, the sum of the square sum of ranks ($\sum r^2$) is extracted from Table 4 above and ranked.

The outcome of the analysis so far has shown that clients demand, policy, planning and approval, client budget and type of client organisation are the top 5 most significant factors influencing building projects planning efforts in Uyo.

In project planning, the pre-contract stage is very important following that it is the basis for the determination of the level of execution of such project. Chitkara (2011) suggested for a feasibility study be conducted at this point to ascertain its technical and economic viability as well as financial implications. Hence, the building project design by Architects also embodies financial implications and the Quantity Surveyors, who are experts in bills and quantities as well as elemental costs, all maintained that client's budget is critical during

the planning stage. This is in recognition of the fact that, finance is the lifeline of any project. Away from the budget factor is the issue of planning and development approval.

Table 4: Results from Kendal coefficient of concordance

Factors	r_1	r_2	r_3	Σr	Σr^2	W	r_s
Experience of the planning team	2	13	15	30	900	0.083	-
Client budget	1	7	11	10	100		
Construction method	4	9	12	25	625		
Planning and Approving authority	3	2	13	18	324		
Client demand	5	3	11	19	361		
Type of project	6	11	13	30	900		
Availability of Local Construction materials	7	6	3	16	265		
Complexity of the project	8	8	6	22	484		
Type of Contract	9	7	4	20	400		
Type of Client organization	11	5	5	21	441		
Type of contractor	10	4	14	28	784		
Policy of Client	12	1	10	23	529		
Location of the project	13	10	7	30	900		
Time invested in planning by the client	14	14	9	37	1369		
Awareness of project consultants	15	15	8	38	1444		
Level of I.T Use	16	12	1	29	841		

Note: r_1 = Architects, r_2 = Engineers, r_3 = Quantity Surveyors

Table 5: Overall agreement among the consultants in Uyo

Factors	Σr^2	Ranking
Client demand	100	1
Policy of Client	256	2
Planning and Approving authority	324	3
Client budget	361	4
Type of Client organisation	400	5
Type of Contract	441	6
Complexity of the project	484	7
Availability of local construction materials	529	8
Construction method	625	9
Type of contractor	784	10
Level of I.T Use	841	11
Location of the project	900	12
Type of project	900	12
Experience of the planning team	900	12
Time invested in planning by the client	1369	13
Awareness of project consultants	1444	14

Every city or town has its planning and development approval requirements for different types of projects. When planning for a project, adequate attention could be given to its

acceptability and conformity to planning and development regulations, as delay in the approval means late commencement and behind schedule completion. Therefore, the Architects and Engineers in Uyo maintained that applying for and obtaining early approval from the planning authorities can prompt the timely commencement of other activities that are dependent on the planning approval. Although the Quantity Surveyors, differ slightly from the Architects and Engineers regarding their first 3 factors. They believe that involvement and use of information technology as is the current best practices and availability of construction materials are crucial factors that need to be harnessed properly so as not to affect negatively the planning efforts of any building project.

The overall consensus among the professionals in Uyo is that client demand, policy, planning and approval of projects, client budget and types of client organisation are the most significant factors affecting planning efforts of building projects. Project planning is an intricate task that involves a wider spectrum of considerations which the requirement for professional competences cannot be overemphasised. The client's demand forms the basis that brings in the concept of the project itself and as such, the demand must be clearly understood by the professionals before any planning will commence. A client could be an individual, corporate entity or the government and each has their respective policies relating to building projects. Organisations establish corporate images and strategies which their activities revolve around and which are often encompassed in their development and growth policy and same goes to the government. Whichever of their policy in relation to building projects, understanding these policies is also critical in the pre-contract planning stage of a project. Thus, the demand of clients, their policy, budget, project planning and approval requirements, as well as the type of client's organisation, are critical factors that needed to be considered among others in building project planning. This will also explain the level of efforts to be invested in the pre-contract planning that will ensure its successful execution.

5. CONCLUSION AND RECOMMENDATIONS

The study assesses the level of significance of factors influencing planning efforts of building projects in Uyo, Akwa Ibom State. Analysis and findings have led to the conclusion that, although the professional building project consultants differ slightly in their various expertise and experience in relation to the level of significance of the factors affecting planning efforts, they all agreed that clients' demand, client policy and planning and approval procedures, as well as budget, presents most significant challenges on projects planning efforts. By implication, clients have a greater influence on the efforts invested in project planning activities at the pre-contract stage. The study hereby recommends that;

Project consultants should establish effective and efficient ways of interacting with stakeholders and among themselves especially during the pre-contract planning stage. This will enable them to harmonise their knowledge and expertise towards an effective and holistic plan of action.

It was also found that clients have a significant amount of influence at this stage of project planning hence, the consultants should ensure a detailed brief is obtained from them (client) which will avail the consultants the necessary information that will determine the amount of efforts to put into planning.

Finally, information flow and frequent collaborations are encouraged among the consultants geared towards building stronger and viable partnerships. Continuous update

on current developments on relevant ICT will ensure effective communication as planning does not cease until the project is fully completed.

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