ANALYSIS OF FACTORS INFLUENCING COST PLANNING ADHERENCE IN NIGERIAN CONSTRUCTION PROJECT

BY:

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CERTIFICATION

This project has been read and approved by the undersigned on behalf of the Department of Building Technology, Institute of Environmental Studies as meeting the requirement for the award of (HND) Higher National Diploma in Building Technology.

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ABSTACT

Nigeria's construction industry faces persistent challenges with cost overruns and schedule delays, often stemming from inadequate cost planning and control practices. This research investigates the factors that influence adherence to cost plans in Nigerian construction projects, seeking to understand the root causes of these issues and identify potential solutions. A comprehensive analysis of literature and empirical data will be used to examine the interplay between various factors, including material cost fluctuations, inaccurate estimations, poor project planning, inadequate risk management, and ineffective stakeholder management. The study will also explore the role of technological advancements and innovative cost control strategies in mitigating these challenges. By identifying the critical success factors for effective cost planning and implementation, this research aims to provide actionable recommendations for improving project performance, ensuring timely and budget-compliant project delivery, and fostering sustainable growth within the Nigerian construction sector. The findings will contribute to the existing body of knowledge on construction project management and offer valuable insights for practitioners, policymakers, and researchers alike.

DEDICATION

This project specially dedication to Almighty God for His love, protection, guidance and supports for me especially in my academic career. Also, to my beloved parents for their care and full support during my course, may Almighty God bless them abundantly (AMEN).

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Costing in building construction is the application of price to schedules of item of labour and materials in order to obtain an approximation of cost of construction project (Ibrahim, 2004).

Cost planning of construction project is concerned with keeping the cost within a predetermined cost estimate during the pre-contract and post-contract stages of the construction works. The process of pre-contract cost planning involves the preparation of an approximate estimate amongst others. The object of the approximate is to provide an estimate of a probable cost of a project before detail design or post-contract service (Hoer, 2016).

Today's client needs are becoming more sophisticated and complicated leading to difficulties in estimating the probable cost of construction works. The clients themselves are becoming more sophisticated in the level of in-house technical expertise and techniques available to them and they in turn expect a high level of efficiency, accuracy and expertise from their professionals. The introduction of new construction methods, materials and systems create greater difficulties in assessing and planning for the capital and maintenance cost of construction.

Adams (2020) reported that cost planning has become more sophisticated over the last decade and is increasingly becoming a service that the employer is expecting from the Quantity Surveyor to ensure that he receives better value for money and the project cost is kept within the budget.

Cost planning of construction projects is aimed at ensuring that the resources are used to the best advantage amidst alternating high cost of construction resources and acute shortage of funds as clients increasingly insists on project designs to be executed in a way to give them better value for money when completed.

However, there are several factors that may affect the efficiency of cost planning at different stages of the project; from the pre-contract through the post-contract stage. Although, careful detailed order of work will definitely reduce these effects that lead to the large discrepancies between the tender figures and final cost of the construction.

The accuracy of cost planning is measured by how well the estimated cost can be compared to the actual construction cost (Oberleder and Trost, 2002).

Hore (2016) stated that the level of accuracy of a cost plan depends upon the level of information availability at time of preparation.

Pre-tender cost estimating and planning of building projects requires extensive knowledge and expertise. Due to inadequate design information in the early design stages, it is extremely difficult for Quantity Surveyors to arrive at accurate cost estimates and cost planning becomes inefficient (Koleola and Henry 2008).

According to Koloela and Henry (2008), there are seven most important factors, based on the construction industry experience of the Quantity Surveyors which affect the accuracy of pre-tender cost planning.

The seven most important factors as highlighted by Koloela and Henry are; expertise of consultants, Quality of information and flow requirements, project team's experience of the type of construction, tender period and market condition, extend of completion of pre-tender designs, complexity of design and construction, availability and supply of labour and materials.

Taking these factors into consideration at project inception stage could improve the accuracy of the preliminary cost advice consultant quantity Surveyors give their clients.

1.2 STATEMENT OF THE RESEARCH PROBLEM

It has been discovered that in practice, contractors device their own methods of cost planning and bidding and the accuracy of their methods is doubtful (Akintoye, and Fitzgerald 2012 citing Law, 2013). The importance of accurate estimates during the early stages of capital projects has been widely recognized for many years. Early project estimates represent a key ingredient in business unit decisions and often become the basis for a project's ultimate funding. However, a stark contrast arises when comparing the importance of early estimates with the amount of information typically available during the preparation of an early estimate. Such limited scope definition often leads to questionable estimate accuracy. Even so, very few quantitative methods are available that enable estimators and business managers to objectively evaluate the accuracy of early estimates. The problem here is how to establish such a model to assess the factors affecting the accuracy of cost planning. To accomplish this, quantitative data were collected from consultant Quantity Surveyors from the construction industry.

1.3 AIM AND OBJECTIVES.

1.3.1 AIM

i. The aim of this research is to assess and evaluate the factors affecting the accuracy of cost planning of building construction projects.

1.3.2 OBJECTIVES

The objectives of this research work are:

i. To identify the potential factors and their relative importance that affect accuracy of cost estimation of building contracts in Nigeria.

ii. To evaluate the effect of the accuracy of cost planning on project achievement.

1.4 SCOPE OF THE STUDY

This research is limited to the factors affecting the accuracy of pre-tender cost planning of Building projects only, the thesis follows the RIBA plan of work applicable to the Nigerian case. Consultant Quantity Surveyors are the target population in which data was obtained. The data obtained were from Kaduna only. A work like this must also include other contributory stages such as cost estimating, cost analysis, and cost comparison at the tendering stage.

1.5 LIMITATION OF THE STUDY

This research focused on only major factors that most often influence cost planning at pre-tender stage, few selected firms in Kaduna town were considered as time and financial constraints did not permit the research to cover much details of the whole aspect of cost planning and the whole nation as a whole.

1.6 SIGNIFICANCE OF THE STUDY

The study can helps to improve project outcomes by identifying and mitigating cost overruns and delays. Understanding these factors allows for better resource allocation, more accurate budgeting, and ultimately, more successful project completion within the established financial parameters.

1.7 DEFINITION OF TERMS

Construction Project: sometimes just referred to as a 'project is the organized process of constructing, renovating, refurbishing, etc. a building structure or infrastructure.

Development: Development means the process of carrying out construction works which are associated with a change in use of land or with its building or with a change in the intensity of the use of land or with the res-establishment of an existing use.

Cost Planning: is a crucial process in project management, particularly in construction, that involves estimating, budgeting, and managing a project's expenses from its inception to completion. It ensures a project stays within its allocated budget by proactively identifying potential cost overruns, monitoring actual expenditures, and implementing necessary controls.

Quantity Surveyors: a person who calculates the amount of materials needed for building work, and how much they will cost.

CHAPTER TWO

LITERATURE REVIEW

2.1 HISTORICAL DEVELOPMENT OF COST PLANNING

Cost planning started in the early 1950's in the United Kingdom, The then ministry of education had an extensive school building program due to three main reasons namely, a number of schools having suffered war damage, building neglect, an increasing young population and the philosophy at the 2006 Act. Proposals for new schools were sent by church and local authorities for approval, but since cost limit was yet to be devised enormous variations in the building cost per pupil occurred (Ashworth, 2014).

It was observed that some similarities in the distribution of costs among the various elements occurred. It was suggested that the future of that school building could possibly be cost planned on the basis of information. The process claimed two advantages over existing system. First, a greater amount of reconciliation would occur between approximate estimate and contractors' tenders. The second claim which was less tangible and more subjective to assess, was that of achieving a balanced design and better value for money.

The ideas were tested and found out to offer the suggested measures of improvement. In the ensuring years various local authorities began to develop the process now known as cost planning.

In 2017, the RICS set up its cost research panel, which was later instrumental in developing the building cost advisory service (now RICS). About the same time, RIBA had its own cost Research committee.

Methods of planning were advised such as percentage allocation method. Cost planning therefore, developed largely along two lines; the ministry of education method known as

elemental cost planning and the RICS method referred to as comparative cost planning. In practice, it is generally a combination of those alternatives (Ashworth, 2014).

2.2 Cost control

2.2.1 Definition

The concept s of cost control as given by seeley (2015) includes "All methods of controlling the cost of the building project within the limits of a predetermined sum, throughout the design and construction stages", but for the purpose of this research we will not go into details of the whole concept of control. The concept as further explained by Seeley also includes:

- **Cost research**

This involves all methods of investigating building costs and their interrelationship; including maintenance and running costs, in order to build up a positive body of information which form basic guidelines in planning and controlling costs of future projects.

- **Cost analysis**

This is the systematic breakdown of cost data, often on the basis of element, to assist in estimating the cost and in cost planning of future projects. Cost analysis is usually supplemented with specification notes, data concerning the sites and market conditions and various quantity factors, such as wall to floor ratios. Cost analysis is aimed at examining the cost of buildings already planned built and for which priced bill of quantities and tenders allowable. It is more valuable and this can assist materially in the design and cost evaluation of new projects.

- **Cost study**

This involves the breaking down of the total cost of the building with the following objectives;

a) To obtain and use cost data in planning for new building projects

b) To ensure a proper balance of quality and quantity within the appropriate cost limit.
c) To relate the cost of any single part of or element to its importance as necessary part of the building.
d) To consider whether cost could be apportioned to secure a better builder.
e) To compare the cost of the same part of element in different building
f) To reveal the distribution of costs between the various parts of the building (Seeley, 2015).

2.2.2 Cost plan

A statement of the expenditure on each section or element of a new building related to a definite standard quality. Each item's cost is regarded as a cost target and is usually expressed in terms of cost per square meter (cost/m^2) of floor area of the building as well as the total costs of the estimates.

2.3.0 Approximate estimating

This involves computing the probable cost of a new building works at some stage before the Bill of Quantities is produced. It is an essential and integral part of the cost planning process. Therefore, this research is more concerned with cost planning, and the factors that influence its accuracy in the building construction industry in Nigeria.

2.4.0 Concept of cost planning

Grafton (2012) defined cost planning as "a process of pre-costing which provides a clear statement of the issue and isolate the courses of the action and their relative cost so as to provide a guide to decision making".

Also Adam and Hayatudeen (2017) defined cost planning as a process of breaking down cost of building component and analysing it so as to provide the design team with a detail

information as regards standards, quality and utility of building in order to produce a design within an overall cost limit.

Another definition of cost planning was given by Brixton scheme of building, seeley (2015), Gandu and Haddary (2007) as “the systematic application of cost criteria to the design process so as to maintain first, quality, appearance and such overall cost or proposed expenditure as the circumstance could dictate”.

Project cost planning can be considered as aiming at ascertaining cost before many of the other designs are made relating to the design of a project.

The process of cost planning involves; preparation of cost plans, cost checking, cost target, cost limit.

- **Cost plan:** this is a statement of the proposed expenditure on each section or element of a new building related to a definite standard of quality. It involves the allocation of sum to various elements, after a sketch design has been completed (or before detail designs are made).
- **Cost target:**
- **Cost checking**: this is the process of checking the estimated cost of each section or element of the building as the detailed designs are developed and compared against the target set against it in the cost plan. Three (3) results are likely to be obtained.
    i. The cost may be within the limit, then proceeds with the design, or
    ii. The cost may be below the limit, upgrade the design or save difference for other uses, or
    iii. The cost may be above the limit, degrade the design to keep the whole cost within or accept the design and cost as it is and increase the cost limit

2.4.1 Preliminary cost planning

Preliminary Estimate / Feasibility Studies;

Preliminary estimates provide an indication of the possible cost of a project at an early stage. In a feasibility study, Quantity Surveyors provide a Stage **A** estimate based on concept drawings or sketches to confirm the project costing. The estimate is based on area studies of the project and application of rates appropriate to the natural usage of the space. The Stage **A** cost plan provides a low cost basis for deciding whether to precede further, redesign or reconsider the scope of the project to match the defined budget. Some projects may require several Stage **A** estimates before proceeding to detailed cost planning.

2.4.2 Cost Planning Reports

The cost planning report offers comprehensive information for the proposed design. This report indicates to the clients and financiers the materials, quantities, rates and associated costs of the project. The Quantity Surveyor offers three stages in cost planning services. A Stage **B** Cost Plan can be prepared from preliminary documentation such as floor plans and elevations. At this stage, assumptions are made after discussions with the client and consultants. A Stage **C** Cost Plan requires further input from consultants such as structural and services engineers. A Stage **D** Cost Plan is prepared using tender documentation. All cost plans prepared by the Quantity Surveyor provide cost checks, cost statements, comparative cost studies and advice on modification in documentation

- **Assessing Costs**

Cost Reporting is of benefit to every party involved in a project. Risk management is of prime importance to clients, contractors and financial partners, and a regular analysis of project costs and identification of cost risks are imperative for monitoring the project. A cost plan provides continuing comparisons of the impact that market trends, and expected trends, will

have on a project. The Quantity Surveyor produce cost analysis documentation for projects in order to monitor and control the financial aspects, and to avoid unexpected costs.

- **Value Management/Value Engineering**

Value Management is the process by which Quantity Surveyor liaise with the designers and clients in order to optimize the benefits and value for a project. The Quantity Surveyor assists the clients and financiers in analysing and reviewing the proposed design of a project and its specific functional requirements. This ensures the final project design meets all requirements, and that no funds are wasted. Quantity Surveyors undertake this task as part of the **cost planning procedure**. In the case of a cost plan exceeding client expectations, The Quantity Surveyor identifies the causes and assists in the process of determining whether the budget, scope or design requires revision (Prowse Quantity Surveyors, 2008).

2.5.0 *C*ost planning techniques

Adam and Hayatudeen (2007), in their previous project research work, explained that the cost planning process thus tends to reveal the feasibility or otherwise when the Quantity Surveyor and the client can see how the profitability has been maximized and when resources are being used to the best advantage.

2.5.1 Various cost planning techniques

There are various cost Planning methods like:

a) Easy Cost Planning (ECP)

b) Detailed Cost Planning

c) Network Costing

d) Unit Costing

When do we go for each of these methods, practically?

In general implementation, which Cost Planning would be used? (Dowling, 2008).

Here is a very brief overview:

2.5.1.1 Easy Cost Planning (ECP)

This is really Unit Costing with a pretty face. You can set up 'Cost Models' in ECP using Characteristics which can be used to calculate values and automatically create Cost Plan Line Items - this is useful for companies who have pre-set planning methods (e.g. Planning costs for building a bicycle, or a chemical test that requires known materials, labour, services and general costs.). It is a very flexible tool.

An extension to ECP is Execution Services, which allows you to automatically generate Material Reservations, Purchase Requisitions and Activity Allocations.

Therefore, a disadvantage of ECP is that it does not distribute planned costs across time (no distribution rule). Also, there is no scheduling (start-finish, dependencies). Configuration for ECP is relatively straight forward. Costs for ECP can be planned against any Plan Version (default is Plan Version *0).*

2.5.1.2 Network costing

This allows one to plan costs via objects called Network Activities. They are a little more complex to use, but they allow you to have a networked structure. Each Network Activity can have planned costs for Work Centre/Activity Type, Stock/Non-stock Materials, Services and General Costs by Cost Element. Activities can have a list of Material Components.

Networks will generate Material Reservations and/or Purchase Requisitions automatically. Configuration can be very complex. All costs for Networks are sent to Plan Version 0, in which the distribution of costs across time is supported.

2.5.1.3 Detailed Cost Planning

It is used when the Quantity Surveyors simply want to plan building costs via Cost Elements. Estimators can plan these costs against any Plan Version.

For a quick, easy planning method, ECP cannot be beaten as long as the Quantity Surveyor does not want complex scheduling.

It is impossible to list all the feature/advantages/disadvantages to the planning methods in this.

2.5.1.4 Unit costing:

This is the cost of specific unit of work such as excavating trenches, concrete in foundation, columns and beams, brickwork, block work, aluminium or asbestos roofing, terrazzo paving and similar trades that make a building. The unit cost of these works will be recorded for each trade and totalled in order to obtain the overall cost of the project. This is the amount actually spent by the contractor.

Barthus, et al (2009); and seeley (2015), identified two main techniques of cost planning: Elemental Cost Planning, and Comparative Cost Analysis.

2.5.2 Elemental cost planning

It is also called “target cost planning”, it is widely used whereby each functional element of the building as allocated to it a target cost figure based on experience from past building cost.

According to Grafton (2017), “is that parts of a building which however designed or constructed always perform the said function in relation to the building as a whole and had clearly to be scandalized if it is to be used for comparative purpose”.

Elemental cost planning according to (Douglas et'al, 2004; and Ashworth, 2002), is a system of Cost planning and Cost control, typically for buildings, which enables the cost of a scheme to be monitored during design development.

It should:-

- Ensure that the tender amount is close to the first estimate or that any likely difference between the two is anticipated and is acceptable.
- Ensure that the money available for the projects is allocated consciously and economically to the various components and finishes.
- Always involves the measurement and pricing of approximate quantities at some stage of the process.
- Aim to achieve good value at the desired level of expenditure.

Elemental cost planning is often referred to as 'designing to a cost' or 'target cost planning' since a cost limit is fixed for the scheme and the architect must then prepare a design not to exceed this cost. (Douglas et'al, 2004; and Ashworth, 2002).

2.5.3 Comparative cost planning;

This method seeks to obtain economy through the element on detail design and electing the one which satisfies the requirements of the client in terms of functions, quality and construction method.

Seeley (2018) stated that the comparative cost planning does not seek to enforce rigid cost unit for the design of a particular element, but rather to maintain flexibility of choice of a combination of possible design solutions that will serve the purpose it intended to achieve.

2.6 Uses of cost planning

Some of the uses of cost planning as highlighted by Seeley (2018) are;

a. To provide a framework of cost which can help to provide running cost information, forecast of total cost as the job proceeds.
b. Can be used during the post contract period, when a tender is accepted the priced bill can be analysed in a similar manner a comparison of the priced bill and final cost plan obtained during cost planning is the most valuable because it shows the difference between the cost plan and the tender figure and so, it assists in preparing future cost plan.
c. It is used to monitor expenditure on various elements of building.
d. It can be used to provide feedback to the Quantity surveyor strong source of information for cost analysis of future projects.
e. Cost planning can also be used to monitor cost of scheme during the design development stage.
f. Analysis of past project with similar design specification and construction method etc it can be used to compare a cost plan for another project.

2.7.0 Factors affecting the accuracy cost planning of building projects

Bowen (2009), in his Book" Construction Cost Management," and FRICS, *The Architect's Handbook of Professional Practice* (2006) opined that Building costs are influenced by several factors. A detailed review of such factors as location, design, performance requirements, construction, and time are considered below.

2.7.1 **Location Factors**

i. **Geographic location**: Costs will be influenced by such factors as climate and comfort requirements, building codes and regulations, ease of access, distances from sources of labour and materials, and productivity of workers in the area.

ii. **Condition of the site**: The bearing capacity of the soil, presence of rock, location of groundwater, slope, and existing conditions (such as old foundations or buried hazardous wastes) influence substructure costs and basic building design. Urban sites may require underpinning, extraordinary security, and limitations on access and manoeuvrability.

iii. **Regulations**: Building design and construction are affected by a wide range of building codes and standards as well as planning, zoning, environmental protection, construction labour, and site safety laws and regulations. These requirements, and the regulatory fees the owner must pay, may vary considerably from locality to locality.

iv. **Market place**: Construction prices are subject to change according to the laws of supply and demand. Overstressed and under stressed construction markets will affect the level and quality of competition as well as the prices charged.

2.7.2 Design factors

i. **Plan shape**: The plan dictates the amount and complexity of the perimeter required to enclose a given space. Generally, the higher the perimeter-to-floor area ratio, the greater the unit cost. Exterior closure is a high-cost item (often 10 percent to 20 percent of total cost) and has a secondary effect on lighting and heating, ventilation and air-conditioning (HVAC) system capacities and operating costs.

ii. **Size**: As buildings increase in size, unit costs tend to decrease. This is due to more efficient perimeter ratios, better utilization of high-cost service elements (e.g., elevators, toilets, HVAC plant) and the effect of greater quantities on the contractor's purchasing power. As a rule of thumb (and, like all rules of thumb, unworkable in extreme cases), an increase or decrease in size by a given percentage is likely to lead to an increase or decrease in cost of roughly half that percentage.

iii. **Building height**: Above six or eight storeys, unit costs per square foot tend to increase due to the costs of increased loads, wind bracing, elevators, and fire code requirements. Taller buildings also become less efficient in their use of space, requiring more built area to house the same functions.

iv. **Story height**: The greater the floor-to-floor height, the greater the cost. The vertical elements in a building may account for 25 percent to 35 percent of the total cost; thus a 10 percent reduction in story height might save 2.5 percent to 3.5 percent overall.

v. **Space utilization and efficiency**: To arrive at the gross building area, circulation, toilets, mechanical and electrical space, custodial, and other non usable spaces must be added to the owner's stated net usable square feet requirements. The design task, which may be made more complicated by site or program adjacency requirements, is to minimize these non usable areas and keep the net-to-gross floor area ratio as high as possible.

2.7.3 Qualitative factors

There is a direct correlation between qualitative factors, as stated in performance terms, and cost. The more demanding the performance requirements, the higher the cost. Some owners may have specific performance concerns or aesthetic preferences. Better quality and performance may need to be justified on a life-cycle basis to optimize higher costs over a longer term.

2.7.4 Construction factors

In a marketplace with many available qualified constructors, competitively bid lump-sum contracts are generally expected to produce the best prices. All things considered, negotiated lump sums, are often most appropriate for smaller projects, and cost-plus contracts may be

useful when time or complexity of construction is a factor. Clear and complete documents reduce uncertainties (and possible contingencies) in competitive bidding.

2.7.5.0 Time factors

Accelerated schedules often increase construction costs due to overtime, extra shifts, or other requirements. Time factor also include time allowed for consultants to prepare cost plans when commissioned, the season in which the contract is being carried out, the duration of the project. Time must be considered on a case-by-case basis. As an example, a winter start may ultimately make significant sums for a retail client if the project can be completed before the next major holiday shopping season.

In another research Akintoye and Fitzgerald (2013) identified some factors that affect the accuracy of cost planning (estimate) as: insufficient tender document analysis, lack of understanding of project requirements, poor communication between the project team, low participation in estimating by site team, lack of participation in estimating by site team, lack of review of cost plan by management, poor comprehension of site requirement, poor project cost feedback, lack of diligence by estimators, lack of adequate guidelines for planning, inadequate production data for cost planning, estimators lack of data processing techniques.

According to Enshassi et al (2005), project complexity, project information, technological requirements, contract condition, contractor's efficiency, market requirements, project's duration and project's risk are identified as the main groups of factors which affect the accuracy of cost planning. These eight classes were also identified from previous studies by (Shash, 2009; Ashworth, 2016; Akintoye and Fitzgerald, 2013; Hancock, 2020) each class of these factors is described below.

When a building is taking long time to complete, there is the tendency of spending more at the long run. Consider materials that would have gotten spoilt due to long delay of use on site,

what about woods that are left for rain to be beaten, cement that have gone bad, there may be need for some replacements on site anytime you go back to continue after a long layoff.

2.7.5.1 Project Complexity

Project complexity factors grouping is made up of type structure, scale and scope of construction, complexity of design, site constraints and expected project organization (Mawdeslay et al, 2021). The more complex the project the greater importance of producing detailed plans of work since a hold-up in one area can have wide-ranging repercussion through the project.

2.7.5.2 Availability/amount of project information

The amount of project information factors grouping comprise the quality of information and information flow, availability and supply of resources, extent of pre-contract design completion and consultant involved. Bill of quantities provide the most detailed basis of cost estimating, more time and wasteful effort can be saved in preparing bill of quantities for same building (brook, 2015). Project implementation strategy must include procedures for collecting information on project performance, which is a very vital way for monitoring and controlling cost (Ahiya, 2017).

2.7.5.3 Technological Requirements

Technology factor grouping is made up of specialist work, lead time from delivery of materials, proportion off-site and on site operations, sequence and limitations of operations and buildability aspects of a construction project will affect its economic. Buildability is largely concerned with the work on site and the practicalities of producing a structure for design (Ashworth, 2006).

2.7.5.4 Contract Requirement/ stage of work

This factor is made up of owner and his financial status and contractual condition such as; advance payment, retention, and bond, insurance, liquidated damages, method of payment

and procurement route (Clough, 2019). It is important to know the type of client you are dealing with as part of the project assessment and appraisal process. The key to successful project often lies in the understanding and corporation that is essential from all participants, each must be clearly aware of his rights, duties and obligation.

2.7.5.5 Team's/contractor's/consultant's experience and efficiency

Team's or Contractor's efficiency factor is made up of volume of work during estimation of new contract, requirement, financial status of the contractor, availability of qualified technical team and partnering with other construction companies, this must be decided as part of the estimate and planning function, whether the appropriate supervisors are available.

2.7.5.6 Market Requirement/stability of the market

Unstable economic conditions and rise in fuel products also affects building indirectly by multiplier effects. Remember vehicles that uses fuel are needed to bring materials to site.

This factor is made up of increase in construction material cost, inflation completion, method of paying Value Tax (VAT) and bank interest. Hence during the estimation planning and process the estimator must take into account the trends in the market conditions and the implication on the costs of resources for the project.

Predicting Accuracy of Early Cost Estimates Using Factor Analysis and Multivariate Regression

The importance of accurate estimates during the early stages of capital projects planning has been widely recognized for many years. Early project estimates represent a key ingredient

in business unit decisions and often become the basis for a project's ultimate funding. However, a stark contrast arises when comparing the importance of early estimates with the amount of information typically available during the preparation of an early estimate. Such limited scope definition often leads to questionable estimate accuracy. Even so, very few quantitative methods are available that enable estimators and business managers to objectively evaluate the accuracy of early estimates. The primary objective of this study was to establish such a model. To accomplish this objective, quantitative data were collected from completed construction projects in the process industry. Each of the respondents was asked to assign a one-to-five rating for each of 45 potential drivers of estimate accuracy for a given estimate.

The data were analyzed using factor analysis and multivariate regression analysis. The factor analysis was used to group the 45 elements into 11 orthogonal factors. Multivariate regression analysis was performed on the 11 factors to determine a suitable model for predicting estimate accuracy. The resulting model, known as the estimate score procedure, allows the project team to score an estimate and then predict its accuracy based on the estimate score. In addition, a computer software tool, the Estimate Score Program, was developed to automate the estimate score procedure. The multivariate regression analysis identified 5 of the 11 factors that were significant at that level. The five factors, in order of significance, were basic process design, team experience and cost information, time allowed to prepare the estimate, site requirements, and bidding and labour.

Knight and Fayek (2002) summarised other factors as follows:

i. Willingness of the prime consultant to approach the client

for extra fees,

ii. Time taken by the client/prime consultant/architect/

Engineer to make decisions,

iii. Knowledge base of the client,

iv. Level of project scope definition between the consultant and the client/prime consultant at the proposal stage,

v. Definition of scope duties passed on by the consultant's Project manager to the design team,

vi. Experience of the consultant's project manager,

vii. Experience of the prime consultant's project lead or project Manager,

viii. Skill set of the consultant's design team,

ix. Skill set of the prime consultant's design team,

x. Experience of the project team with similar projects,

xi. Project complexity,

xii. Timeline for design and construction, and

xiii. Project location.

CHAPTER THREE

RESEARCH METHOD

3.1 INTRODUCTION

This chapter presents the necessary steps that were followed to achieve the research objectives set for this study in section 1.3 in chapter one. This is presented in the steps below. The data used for this project was collected by the use of literature review and field survey.

According to Okeh (2020), this chapter refers also to research methodology. It deals with the procedures for collecting data for the study, from whom and where they were collected. Furthermore, emphasis is also made on the development of sample size from the defined population and method of presentation and analysis.

3.1 Population and sample

Population is defined as an arbitrary; it is the universe that the researcher wishes to investigate (Okeh, 2020). The population that this study seeks to investigate is the factors affecting the accuracy of cost planning around Kaduna state. The population used here in this context is a relative terminology as against its absolute meaning.

On the other hand, Fellow and Liu (2013), defined sample as an integral part of a population. A sample is a subset of the universal set called population, and represents virtually all its characteristics. The essence of sampling is to provide a practical means of enabling the data collection and processing component of research to be carried out while ensuring that the sample is a good representation of the population.

CHAPTER FOUR

DATA COLLECTION, PRESENTATION AND ANALYSIS

4.1 DATA COLLECTION

In order to determine the factors that affect the accuracy of cost planning of building projects and the Quality of advice consultants Quantity Surveyors give their clients in the building industry, questionnaire was used. An analysis of the data collected from the expert opinions provides some insight into the Factors affecting cost planning on a building project that have the most significant impacts and occur most frequently.

The table below shows the details of the data collected by the questionnaire and the reliability of each factor.

Table 4.1.0: Description of Data collection from questionnaire survey

Total number of questionnaire produced	60	100%
Total number distributed	57	95%
Total number retrieved	48	84.21%
Total number not retrieved	9	15.79%

Source: Field work, 2025

Administering questionnaire enabled large amount of standardised information to be collected.

In addition, questionnaires allowed for quantitative comparison to be made between the factors that affect the accuracy of cost plans for building projects in Nigeria.

The questionnaire was distributed to Quantity Surveyors (Consultants) working in various firms/organisations situated around Kaduna.

4.2 DATA PRESENTATION AND ANALYSIS

This section consists of the **presentation** and **analysis** of the data collected through a questionnaire survey.

An analysis of the data collected from the expert opinions provides some insight into the

Factors affecting cost planning for a building project that have the most

Significant impacts and occur most frequently.

The a**nalysis** of the **data** is done using simple statistical tools which includes;

Distribution tables, bar charts, pie charts, calculation of the mean of the distribution and standard deviation

- **Mean:** The Mean of a distribution is the measure of the central tendency of the distribution
- **Variance:** Variance is basically a measure of the general dispersion of data in a sample; it gives you a sense of how far away data points are from one another. The larger the variance, the more variability you have in your sample (in whatever it is you are measuring).
- **Standard deviation** is more concrete: it is the average distance of each point in the sample from the sample mean in terms of the original units of measurement. **Standard Deviation**

The Standard Deviation (**σ**) is a measure of how spreads out numbers are.

The formula is easy: it is the square root of the **Variance.**

Table 4.2.0 below shows how often the consultants have prepared cost plans on Building, Civil Engineering, Heavy/Industrial Engineering, and Service Works obtained from the questionnaire survey.

Table 4.2.0: Summary of results' tables showing how often the respondents prepares cost plans for building, civil engineering, heavy/industrial engineering, and services works.

Work type	R4	R3	R2	R1	Mean	Standard deviation
Building works	48	0	0	0	5.00	0.00
Civil engrg. Works	2	24	13	9	3.40	0.84
Services work	1	19	26	2	3.40	0.60
Heavy/Industrial engrg.	0	0	2	46	1.70	0.54

Source: Field work, 2025

Where: R1, R2, R3 and R4 are ranks in increasing order of importance.

Table 4.2.1: percentage ranking of work type showing how often the respondents prepare cost plans for building, civil engineering, heavy/industrial engineering, and services works.

Work type	R1	R2	R3	R4
Building works	0%	0%	0%	100%
Civil engrg. Works	18.7%	27.1%	50%	4.2%
Heavy/Industrial engrg.	95.8%	4.2%	0%	0%
Services work	4.2%	54.2%	39.6%	2.1%

Source: Field work, 2025

Building Works

Table 4.2.1 above shows the responses of the respondents on the types of project on which they prepare cost plans and offer cost advice. The mean of the distribution is 5.0 and the standard deviation is 0.0, in table 4.2.1, the percentage ranking R4 has 100% of the respondents. From this table it is seen that all the respondents' firms prepare cost plans for building project **very often** than any other type of project.

Civil Engineering Works

Table 4.2.1 shows the distribution of the responses on civil engineering works. The mean of the distribution is **3.4** and the deviation from the mean is **0.8**. This indicates that they are also **often** involved in civil engineering works. The standard deviation of **0.8** indicates the dispersion of the data about the mean, and the percentage ranking shows that not all of the respondents are involved in cost planning jobs for civil engineering projects completely.

Heavy/Industrial Engineering Works

Table 4.2.1 shows the distribution of respondent's involvement in Heavy/Industrial Engineering Works. The mean of the distribution is **1.7** with a standard deviation of **0.54.** The mean of the distribution is low to indicate that the consultant only **sometimes,** are they involved in preparing cost plans for Heavy/Industrial Engineering Works. The deviation from the mean is large to demonstrate the dispersion of the responses obtained about the mean.

None of the respondents is involved actively in this type of job as shown by R4 in table 4.2.1; about 96% goes to R1 which means not often.

Services Works

In table 4.2.0 above the mean of the distribution is calculated to be **3.4** and the standard deviation is **0.6**. This means the respondents **sometimes** prepare cost plans and offer cost advises in respect to Services Works as also shown by R2 and R3 (54% and 39%) respectively in table 4.2.1 above.

Table 4.2.2: respondents' preparation of cost plans for their organisation

Option	Frequency	Percentage (%)
Yes	44	91.67%
No	4	8.33%
	48	**100.00%**

Source: Field work, 2025

Table 4.2.2 shows whether or not the respondents prepare cost plans for their organisation. This is aimed at making sure that the information from respondents is reliable for use in this research work. The percentage distribution is shown in the figure below.

Table 4.2.2 above shows the total percentage of respondents' involvement in the preparation of cost plans for their organisation. 92% of the respondents usually prepared cost plans for their organisation as shown in the figure above and 8% indicates the percentage of the respondents who were not involved in the preparation of cost plans for their organisations.

Table 4.2.3: Percentage of building projects handled in which cost plans were prepared

Table 4.2.3 shows the percentage of building projects handled and which cost plans were prepare by the respondents as clearly represented in the pie-chart below.

Percentage	**Frequency**	**Percentage**
0-20	1	2.08%
20-40	8	16.67%
40-60	35	72.92%
60-100	4	8.33%
	48	**100.00%**

Source: Field work, 2025

In table 4.2.3 above, 73% of the respondents are responsible for up to 40-60% of the cost planning activities of the firm,17% are responsible for about 20-40%, 8% are fully responsible for about 60-100%, 2% are responsible for about 0-20% of the total number of cost plans prepared in the organisation.

Table 4.2.4: Methods used for preparing cost planning

Method	Frequency	Percentage
Elemental Cost planning	35	72.92%
Comparative Cost Planning	10	20.83%
Approximate Quantities	2	4.17%
Unit Costing	1	2.08%
Easy Cost Planning	0	0.00%
Superficial Method	0	0.00%
other method(s)	0	0.00%
Total	**48**	**100.00%**

Source: Field work, 2025

The table above represents the frequency against the methods that are most commonly used by cost consultants in preparing cost estimates and planning for building projects in Nigeria obtained from the result of the data in table 4.2.4 above. It showed that 35 respondents representing about 73% used elemental cost planning method in their organization.

Table 4.2.5: cost planning method(s) that is/are mostly used in the respondents' organisation

Cost planning method	Frequency	percentage
Elemental Cost planning	30	63%

Approximate Quantities	10	20%
Comparative Cost Planning	6	13%
Unit Costing	1	2%
Superficial Method	1	2%
Easy Cost Planning	0	0.00%
other method(s)	0	0.00%
	48	100%

Source: Field work, 2025

Table 4.2.5 shows the distribution of various methods of cost planning and which of these is mostly adopted by cost consultants in Nigeria when detailed designs are not yet ready.

Table 4.2.5 above shows the percentage distribution of the methods used for cost planning for building projects. It shows that 63% use Elemental cost planning, 20% use approximate quantities method, 13% use comparative cost planning method, 2% use unit costing method, 2% use the superficial method and none use the easy cost planning method.

Table4.2.6: Respondent's reason for choosing the above cost planning method(s)

Reason	Frequency	percentage
Easy for client to understand	21	44%
More reliable and accurate	9	19%
Saves time	7	15%
Easy to use	4	8%
Availability of Cost Data	4	8%
Cheaper to prepare	3	6%
Other reason	0	0%
	48	100%

Source: Field work, 2025

Table 4.2.6 shows the distribution of the respondent's preferences for a particular method of cost planning they used in their organisation, 44% being the largest, showed that the consultants are more concerned about the ease of understanding of the cost plans by their clients as against the reliability and accuracy of the cost plans with 19%.

In the table above, 44% agreed that elemental cost planning widely used by most of them is easy for their clients to understand, 19% said they prefer the method they used because the cost plans proves to be more reliable and accurate, 15% said the method they used saves a lot of time, 8% agreed with that their preferred methods are easy to use with another 8% saying that it is because of the availability of cost data. And 6% said their chosen method is cheap to prepare.

Table 4.2.7: Urgency of demand for cost plans when commissioned

Time	Frequency	percentage
2-3 days	2	4%
3-6 days	9	19%
7-10 days	27	56%
11-14 days	10	21%
above 14 days	0	0%
Total	**48**	**100%**

Source: Field work, 2025

From table 4.2.7 above, 56% indicates that cost plans are expect from consultants from 7-10 days after commission, 21% between 11-14 days, 19% between 3-6 days and only 3% said clients demand for cost plans within the period of 2-3 days after commissioned while none will guarantee above 14 days.

Table 4.2. 8: Adequacy of time to meet Client's Demand for cost plans

Response	Frequency	Percentage
No	40	83%
Yes	8	17%
	48	**100**

Source: Field work, 2025

Table 4.2.8 shows consultants responses to whether time allowed to prepare cost plan is adequate or not. 83% agreed that time is not always adequate for them to prepare accurate and reliable cost plans, while 7% said the time allowed is usually enough for them.

Table 4.2.9: Source of Data mostly used for Cost Planning

Source	Frequency	Percentage
Personal sources of Cost Data	22	46%
Published Cost Data	14	29%
Public sources of Cost Data	12	25%
Others	0	0%
	48	**100**

Source: Field work, 2025

Table 4.2.9 is a representation of distribution of the consultants' source of cost data. 46% are personal sources of cost data, 29% are from published cost data and 25% from public cost data their sources.

Table 4.2.10: Accuracy and Reliability of Cost Plans being used

x	f	fx	(x-ẋ)	$(x-ẋ)^2$	$f(x-ẋ)^2$
1	1	1	-2.0	3.92	3.92
2	3	6	-1.0	0.96	2.88
3	40	120	0.0	0.00	0.02

4	4	16	1.0	1.04	4.17
	48	**143**			**10.98**
Mean	**3.0**		**Standard deviation**		**0.48**

Source: Field work, 2025

1 represents the weighting factor for **not at all**

2 represent the weighting factor for **rarely**

3 represent the weighting factor for **sometimes**

4 represent the weighting factor for **very often**

Table 4.2.10 shows the level of accuracy of cost plans prepared by cost consultants (Quantity Surveyors). The mean of the distribution is **3.0** which shows positive towards the accuracy scale, it means the cost plans the cost consultants usually prepare are just accurate subject to the factors given n the figures below. The standard deviation is **0.48** meaning that the disparity between the responses is much, i.e. some did not agree that their estimates are always accurate. They are of the opinion that, in most cases their cost plans fall short of accuracy when the project commences due to a number of reasons.

Table 4.2.11: Factors that affect the accuracy of Cost planning of building projects

Rank / **Option**	**R10**	**R9**	**R8**	**R7**	**R6**	**R5**	**R4**	**R3**	**R2**	**R1**	**Not applicable**

Time allowed to prepare cost plan	**17**	**14**	**6**	**8**	**1**	**1**	**0**	**1**	**0**	**0**	**-**
Stage of work	**0**	**1**	**0**	**2**	**1**	**1**	**2**	**4**	**16**	**21**	**-**
Amount of information available	**20**	**15**	**8**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**-**
Complexity of the project	**5**	**7**	**14**	**13**	**4**	**4**	**1**	**0**	**0**	**0**	**-**
Experience of the consultants	**5**	**10**	**14**	**10**	**7**	**2**	**0**	**0**	**0**	**1**	**-**
Client's taste	**1**	**0**	**1**	**4**	**2**	**4**	**2**	**3**	**13**	**18**	**-**
Stability of the market	**0**	**0**	**2**	**5**	**17**	**14**	**5**	**4**	**1**	**0**	**-**
Labour requirements	**0**	**0**	**0**	**0**	**0**	**2**	**21**	**14**	**11**	**0**	**-**
Project location	**0**	**0**	**0**	**0**	**1**	**3**	**12**	**19**	**6**	**7**	**-**
Type of contract/procurement path	**1**	**1**	**3**	**3**	**13**	**17**	**4**	**3**	**1**	**2**	**-**

Source: Field work, 2025

Table 4.2.11 above shows the respondent's ranking of each factor affecting cost planning on the given scale 1 to 10.

Below is the table of summary of factors affecting cost planning for building projects in Nigeria.

Table 4.2.12: Mean score and standard deviation for factors affecting the accuracy of cost planning of building projects in Nigeria.

Appendix I:Table:	**Factor**	**Mean**	**Standard deviation**
8	Amount of information available	9.0	1.10
6	Time allowed	8.6	1.51
10	Experience of the consultant	7.8	1.32

9	Complexity of the project	7.6	1.44
12	Suitability/stability of the market	5.4	1.28
15	Type of contract/procurement path	5.3	1.74
13	Labour requirements	3.3	0.87
14	Project site location	3.0	1.18
11	Client's taste	2.9	2.32
7	Stage of work	2.2	1.79

Table 4.2.12 above, shows the severity of the factors affecting the accuracy of cost planning for building projects. The **means** describes the importance of the factors, how important is the factor in cost planning, and the **standards deviation** describes the disparity between the responses (data) and the mean. The degree of importance of the **means** is as follows:

1 represents the weighting factor for **LEAST IMPORTANT**

10 represents the weighting factor for **EXTREMELY IMPORT.**

Each of these factors affecting cost planning is given a rating between1 and 10 by the user. This rating represents the degree of existence of the factor on a specific project. A rating of 1 indicates ***least important,*** and a rating of 10 is an ***extremely important*** rating.

A rating of 5 indicates that the factor has a *neutral* effect on the project, or that the factor exists in a state that is typical or expected on a project**.**

Using the above scale it is seen that; From figure 4.2.12 above, the amount of information available at the time of preparation of cost plans is extremely important with a mean of 9.0 and standard deviation of 1.10 indicating that the relationship between the data

is positive with small dispersion from the mean of the distribution, next highest in the table is, the time allowed to prepare cost plans with a mean of 8.6 and standard deviation of 1.51 to show the dispersion of the data about the mean point, consultant's experience, and the complexity of the project are also very important with a mean of 7.8 and 7.6, standard deviation of 1.32 and 1.44 respectively in that order.

The least as opined by table 4.2.12 is stage of work followed by the clients' taste which had already been represented in his brief by the Architect.

CHAPTER FIVE

5.0 CONCLUSION RECOMMENDATION

5.1 CONCLUSION

In Nigeria the practice of cost planning of building projects at the pre-contract stage is seen to be limited to determining only the probable cost of the building by means of approximate estimate. The benefit of controlling the design development of the project by closely relating the cost to the design is not being fully realised.

Another benefit of cost planning which is not fully achieved is that of keeping actual expenditure within budget agreed with the client. This is because the approximate cost estimates prepared are not actually developed into cost plans and also are not used as a guide when developing the detail designs or in reconciling the actual cost with already set budget during construction.

a) From this research study, the factors which makes it difficult to effectively prepare accurate and reliable cost plans for building projects are; the time allowed for the consultants to prepare cost plans, the amount of (details) information available at the time of preparation of cost plans, consultants' efficiency/experience, the suitability or stability of the market, type of construction contract/procurement path, project location. Others as also identified through this study includes; Government policy resulting to instability in the Nigerian economy, choice of cost planning method, unavailability of cost indices/data, fraudulent practices in the building industry, qualitative and design

factors .e.g. changes in the building height, storey height, shape of the building and space utilisation when detailed designs are produced.

b) From the results of this study, the completeness and amount of quality information available at the time of preparation of cost planning was rated the highest by the respondents (combined) among the factors affecting the accuracy of cost planning of building project. However one thing is clear from the 10 factors affecting the accuracy of cost planning for building project **"detailed design information should be made available in good time to achieve project objectives"**. This seems to be the consensus of opinion as to the factors affecting the accuracy of cost planning from the weighted mean ranking.

c) In developing and improving the accuracy and effectiveness of cost plans, it is necessary to develop methods of keeping and analysing building cost data and information for use in cost planning and control. This will give a secondary effect of achieving the necessary balance and logical distribution of the available resources between the building elements and the project as a whole.

d) In this regard, I hereby conclude that, while accurate and effective cost planning is the cornerstone for all the successful completion of any building project, early involvement of the Quantity Surveyor is recommended, and cost data/indices must be made available and regularly reviewed to reduce the effects of inaccurate cost plans as widely experienced in the building industry in Nigeria.

5.2 RECOMMENDATIONS

The need for accurate and effective cost planning before embarking on any building project need not to be over-emphasized. Therefore, from the result of this study the following recommendation are made:

i. There is a need for adequate and regular updates of cost data and should be made available for use by consultants in the Nigerian building industry.

ii. Fraudulent and corrupt practices should be discouraged amongst consultants and the whole design team.

iii. Detail designs and information should be made available to consultants in good time in order to get the best cost plan and avoid the too many assumptions of quantities due to lack of detail information.

iv. There is a need to allow more time for the preparation of designs and cost plans including programming of the work, this is because with better cost planning the need to make changes in the designs after work had commenced would be greatly reduced.

v. Quantity Surveyors (consultants) should be given the maximum opportunity to properly perform the function of cost planning and control, which ensures logical distribution of expenditure as well as obtaining value for money, because the cost of a building is usually critical for a developer and is also often important for other types of clients.

vi. Contractors should be advised to purchase building materials whose prices are highly unstable in large quantities at the initial stage of the project when commissioned to

reduce the effects of inflation and or fluctuation claims due to the unstable nature of the Nigerian economy.

REFERENCES

Akintoye, A. (2000). "Analysis of factors influencing project cost estimating practice." Construction Management and Economics, Vol. 18 No.1, pp.77-89

Al-Harbi, K.M., Johnston, D.W., Fayadh, H. (1994). "Building construction detailed estimating practices in Saudi Arabia." Journal of Construction Engineering and Management.Vol. 120 No.4, pp.774-84.

Ashworth, A. (1988). "Expert systems – are they jeopardising the estimator's job?". Cost Engineering, Vol. 30 No.6, pp.11-15.

Ashworth, A., Skitmore, M. (1982), "Accuracy in estimating". Occasional Paper No. 27, Chartered Institute of Building, London, .

Babalola, O. (2007). "Cost estimating practices for electrical services projects in Nigeria". unpublished PhD thesis, Obafemi Awolowo University, Ile-Ife, .

Bowen, P.A. (1982). "An alternative estimating approach". Chartered Surveyor, Vol. 4 No.7, pp.191-4.

Caswell, F. (1996). Success in Statistics. (3ed.). John Murray: London, .

Chartered Institute of Building (1997*):* Code of Estimating Practice. Addison Wesley Longman: London.

Cooke,B., William, P. (2007). Construction planning programming and control. (2ed.). Blackwell Scientific Publications: London.

Douglas, J.F., Brandon, S.P., Ferry, J.D. (1999). Cost planning of buildings. (7ed.). Blackwell Science: London.

Enshassi, et'al (2005). Cost planning of Building Contract". Journal of Construction Engineering and Management, Vol.10 No.2, pp115-150.

Flanagan, R., Norman, G. (1983). "The accuracy and monitoring of quantity surveyor's price forecasting for building work". Construction Management and Economics, Vol. 1 pp.157-80

Flanagan, R., Norman, Meadows, J., Robinson, G. (1989). Life Cycle Costing; Theory and practice. Oxford press: London.

Flanagan, R., Stevens, S. (1990), "Risk analysis", in Brandon, P.S. (Eds),Quantity Surveying Techniques: New Directions. Blackwell Scientific Publications: London,.

Flanagan, R., Tate, B. (1997). Cost Control in Building Design. Blackwell scientific publications: London. Pp.157-208.

Flanagan, R., Tate, B. (2007). Cost control in building design. Blackwell Science. London.

Gandu, J.Y., Haddary, Y.M. (2007). Understanding Steps In Quantity Surveying Procedure. Shanshan Ltd: Kaduna. Pp.130-141

Hanna, A.S., Russell, J.S., Nordheim, E.V., Bruggink, M.J. (1999). "Impact of change orders on labour efficiency for electrical construction". Journal of Construction Engineering and Management, Vol. 125 No.4, pp.224-32.

Horman, M.J., Orosz, M.P., Riley, D.R. (2006). "Sequence planning for electrical construction". Journal of Construction Engineering and Management, Vol. 132 No.4, pp.363

Horner, R.M.W. (1991). "Fundamentals of construction project cost control systems", Proceedings of the Conference on Construction Project Modelling and Productivity and 4th Yugoslav Symposium on "Organisation and Management in Construction". Dubrovnik, April, pp.437-45.

http://www.buildingcontractorsecrets.com, Submitted Tuesday, October 09, 2007., *Date accessed*; *27/05/2009.*

Internet, "*http://en.wikipedia.org/wiki/elemental_cost_planning". Date accessed; 27/05/2009.*

John, A.O. (2001). Project planning techniques for medium sized construction firms. New Delhi. Pp.387

Liu, L. (1995). "Construction time – cost trade-off analysis using LP/IP hybrid method". Journal of Construction Engineering and Management, Vol. 121 No.4, pp.446-54.

Mok, C.K., Tummala, V.M.R., Leung, H.M. (1997). "Practices, barriers and benefits of risk management process in building services cost estimating". Construction Management and Economics, Vol. 15 pp.161-75.

Mtallib, M.O.A. (2007). “Magnitude of cost overrun in Building projects in Nigeria NJEM,Vol.8 N0.3,pp.14-17.

O'Dean, D.W. (1984). "Estimating for building projects". The Building Economist, Vol.129 No2., pp.11-29.

Onwusonye, S.I.J. (2005). Project planning in the construction industry (Theory and practice), Good-Davis Associate Press: Owerri.

Seeley, I.H. (1995). Building Economics, The Macmillan Press: London, .

Shash, A.A., Al-Khaldi, Z. (1992). "The production of accurate construction cost estimates in Saudi Arabia". Cost Engineering, Vol. 34 No.8, pp.15-24.

Siddens, R.S. (1989). The Building Estimator's Reference Book. Frank R. Walker Company: Lisle, IL.

Smith, A.J. (1995). Estimating, Tendering and Bidding for Construction. Macmillan: London.

Stone, P. A. (1983). Building Economics Design, Production and Organisation: A synoptic view. (3 ed.). Pergamon press: Oxford. Pp.196-202.

Stone, P.A. (1983). Building economics design, production and organisation: A synoptic view . (3rd ed.). Pergamon press: Oxford.

True, N.F. (1988). "Determining the accuracy of a cost estimate". American Association of Cost Engineers Transactions, pp.T.2.2-T.2.1.0.

Van Horne, J.C. (2007). Financial management and policy. New Delhi, pp.387-405.

Williams, J. (1996). Estimating for Building and Civil Engineering Works. Butterworth Heinemann: Oxford.

STUDENT'S RESEARCH QUESTIONNAIRE

RESPONDENT'S NOTE OF INSTRUCTION

I am a Final Year (500 Level) Student of the Department Of Quantity Surveying, Faculty Of Environmental Design, Ahmadu Bello University Zaria, carrying out a research on "**APPRAISAL ON ANALYSIS OF FACTORS INFLENCING COST PLANNING ADHERENCE IN NIGERIAN CONSTRUCTION PROJECT**" in partial fulfilment for the award of Degree of Higher National Diploma (Building Technology).

Please take a moment and answer the following questions either by writing or by ticking [√] the appropriate box that corresponds to your choice of answer. I appreciate the time and effort you may have put in to complete this questionnaire despite your tight schedules. All information given will be kept confidential. I look forward to your earliest response. Thank you.

RESEARCHER: **SULYMAN, SANNI KEHINDE**

INSTITUTION: **KWARA STATE POLYTECHNIC, ILORIN**.

PERIOD OF RESEARCH: AUGUST/SEPTEMBER**, 2025**.

SECTION A:

ORGANIZATION INFORMATION

a) Name of organization_____

b) Office Address_____

c) For how long have the organization being in operation_____

RESPONDENT'S PERSONAL DATA

a) Name of respondent_____ optional _____

b) Official position in the organization_____

c) For how long have you been serving in this organization/company_____

d) Date of responding_____

SECTION B:

QUESTIONS ON COST PLANNING;

1. Rate the types of projects you have offered cost advice most from (1 – 4) 1 – none, 4 – most
   i. Building works [ ]
   ii. Civil engineering works [ ]
   iii. Heavy/industrial engineering works [ ]
   iv. Services works [ ]

2. Do you prepare cost plans for building projects in your organization?
   i. Yes [ ] ii. No [ ]

3. Rate the percentage of building projects you handled and prepared cost plan in your organization
   i. 0 – 20 [ ]

ii. 20 – 40 [ ]
iii. 40 – 60 [ ]
iv. 60 – 100 [ ]

4. Which of these method(s) do you use for preparing cost planning
   i. Elemental cost planning [ ]
   ii. Comparative cost planning [ ]
   iii. Easy cost planning [ ]
   iv. Unit costing [ ]
   v. Approximate Quantities [ ]
   vi. Superficial method [ ]
   vii. State any other method(s)_____

_____

5. Which of them is mostly used in your organization?
   i. Elemental cost planning [ ]
   ii. Comparative cost planning [ ]
   iii. Easy cost planning [ ]
   iv. Unit costing [ ]
   v. Approximate Quantities [ ]
   vi. Superficial method [ ]
   vii. Cubic method [ ]
   viii. Other method(s)? specify _____

_____

6. What is your reason(s) for choosing the above cost planning method(s)?
   i. Easy to use [ ]
   ii. Cost data are readily available [ ]
   iii. Easy for client to understand [ ]
   iv. More reliable and accurate [ ]
   v. Cheaper to prepare [ ]
   vi. Saves time (speed of preparation) [ ]
   vii. Any other reason? state [ ]
7. How urgent do your clients often demand for cost plans when commission?
   i. 2 – 3 days [ ]
   ii. 3 – 6 days [ ]
   iii. 7 – 10 days [ ]
   iv. 11 – 14 days [ ]
   v. Above 14 days [ ]
8. Is time often enough for you to meet the client' demand?
   i. Yes [ ]
   ii. No [ ]

9. What is the source of data you mostly use for cost planning?
   i. Public sources cost data [ ]
   ii. Personal sources of cost data [ ]
   iii. Published cost data [ ]

   Any other sources? State _____

10. How accurate and reliable had being your cost plans?
    i. Not accurate [ ]

ii. Fairly accurate [ ]
iii. Accurate [ ]
iv. Very accurate [ ]

11. Use 1-10 and rate the factors that affect the accuracy of cost planning of building projects in decreasing order of importance.

    1 – least important or least significant

    10 – being the important or most significant

i. Time allowed to prepare cost plan [ ]
ii. Stage of work [ ]
iii. Amount of information available [ ]
iv. Complexity of the project [ ]
v. Experience of the team/consultants [ ]
vi. Client's taste [ ]
vii. Stability of the market [ ]
viii. Labour requirements [ ]
ix. Project location [ ]
x. Type of contract/procurement path [ ]
xi. Any other factor(s)? state_____
_____

12. State freely any other information

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Thank you for your time and response.