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KUMASI

Cost Management Practices on Large Building Projects: A Case Study of the Association of African Universities Secretariat Building Project in Accra

By

Isaac Aggrey (BSc. Quantity surveying and Construction Economics)

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DECLARATION

I hereby declare that this submission is my own work towards the MSc, Project Management and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

ISAAC AGGREY (20482753) (Student name & ID)

……..

Signature

……

Date

Certified by:

DR. EMMANUEL ADINYIRA

(Supervisor)

…….

Signature

……..

Date

Certified by:

DR. THEOPHILUS ADJEI-KUMI (Head of Department)

……..

Signature

…….

Date

ABSTRACT

Cost management system has been considered as an important tool in controlling cost of a project and keeping it within the pre-determined budget. In the case of large building projects, cost management is critical due to the high uncertainties surrounding such projects. The cost management practices of construction firms for large building projects and the challenges associated with them was examine. A case study of the Association of African Universities Secretariat Building Project in Accra was used. Face to face structured interview was held with the key professionals namely the Project manager, Construction manager, Site supervisor, Quantity surveyor, Architect, Civil engineer and the Risk manager who are involved in managing the cost of the project. The data collected was analyzed using content analysis. From the study, it was found that cost management on large building projects starts as earlier as the design/planning stage of the project. The techniques and tool used by firms to manage project cost include: estimating, cost planning and control, budgeting, cash flow forecasting, cost reporting and cost code system. These techniques are used together to support the overall project cost management. The challenges associated with managing cost on large building projects include: frequent variations/changes made to the scope, specification etc. of the project during the construction stage; Poor communication and coordination among project parties; lack of coordination between project processes and the need to manage large cost data create difficulties for the cost management on large building projects. It was recommended that frequent changes/variations in project scope and specifications during the construction stage should be avoided. Moreover, Information and Communication Technology should be utilized for information sharing to enhance communication and coordination. The used of computerized systems for data storage and handling is also encouraged.

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DEDICATION

I dedicate this report to my family

ACKNOWLEDGEMENT

In the first place, I thank the Almighty God, my maker whose grace has brought me to this point in my academic pursuit. Without Him, all my toils would have been in vain.

I also owe my supervisor, Dr. Emmanuel Adinyira much gratitude for supervising me through this thesis. I pray the Almighty God to bless him and his entire generations to come.

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Clients in construction industry highly cherish the ability of a contractor to complete a project successfully. Thus, a client wants his project to be completed within time, cost, quality and scope limits. An excellent builder is the one who is able to complete a project within the constraints of time, cost and quality whiles meeting the required scope. Cost control can be defined as the procedures a contractor follow to ensure that the construction cost of a project is managed. This ensures that, the client and the contractor does not make any loss in the execution of the various activities of a project. The main objective of cost control is completely construct a project successfully at the cheapest possible cost while meeting the client's requirements. Harris and McCaffer (2002), stated that, the decision of a contractor to do something differently and successfully converting that decision to practice are the actions to achieve control. Raina (2004), also condemned the post-mortem type of remedial actions. He stated that, it is of little use to take decisions on cost after the completion of the project.

Numerous contractors in Ghana encounter many hindrances in their pursuit to control cost on their construction sites. These hindrances may include poor project preparation, gap in management and control, poor budgeting, defective materials, weather changes poor communication and so on. All these challenges hinder the achievement of high project performance as it could lead to cost and time overruns, litigations and in serious scenarios total project abandonment.

Every business entity wants to make profits. This is key for the survival of every business organization in the competitive world. Cost management can aid in the realization of full

profits anticipated as a more desirable final cost will be achieved. Also, in cases where there are errors and mistakes that can affect the cost, corrective actions can be quickly taken. Construction projects involves the use of huge sums of money therefore, cost management is a very vital aspect of project management. Cost management tries to maintain project cost within the budget limits. The process of cost management includes tender estimating, cost planning and control. Hilton, et al (2000) describe that poor cost management can lead to an organization running into bankruptcy. The situation is even worse with large complex projects. The probability of having cost overrun is very high without effective and efficient cost management.

There are a number of books that discusses management of construction cost, cost planning and cost control. Unfortunately, these books only address the various theories and tools without touching on the real-world factors that causes cost overruns. Some of these factors were identified by Kaming et al, (2004) like inflation, inaccurate estimating and complexity of projects. This research delves into cost management practices in large construction companies in Ghana.

1.2 STATEMENT OF THE PROBLEM

The project cost management and control has been a challenge facing many contractors in the building and other civil works especially in the management of large building project due to many uncertainty surrounding it, hence the need for the study to look at challenges contractors faced in controlling cost on site and outline solution to the identified challenges. Project cost management system basically establishes cost control tools used in the construction industry and strategically devise principles that can be adopted by all parties in the construction industry.

This system identifies the challenges faced by the contractors during cost control. It also determines the cost control techniques adopted by contractors during the construction and proposed remedies to eradicate the challenges. Traditionally, all the detail issues of the design of a project are made at the early stages of a project. These design details can change along the project lifecycle. This can cause a substantial amount of waste to defective designs (Elfving et al., 2005).

According to Flyvbeg, (2008), many estimators are more concerned in getting projects funded and constructed rather than giving a realistic prediction of the cost of the project. He also stipulated that, it is costlier to make and correct mistakes during the execution stage of the project compared to the planning stage of the project where designs are still on-going. The corrections at the execution stage will mostly consume more resources and generate more waste. Eg re-work.

Cost overrun is most common these days as the initial cost target of projects are over spent due to poor management from the side of the contractors. These extra expenditures may eat into the profit of the contractor or add up as extra cost to the client. In either way, the effect of cost overruns is not desirable and steps must be put in place to eliminate its occurrence. Therefore, this research delves into cost management practices in large construction companies in Ghana.

1.3 Aim and Objectives of Study

1.3.1 Aim

To examine the cost management practices of construction firms on large building projects in Ghana.

1.3.2 Objectives

Based on the stated aim, the following objectives were pursued:

i. To identify the cost management practices of firms on large construction projects;

ii. To identify challenges associated with their practices; and iii. To outline solutions to overcome the identified challenges

1.4 Significance of the Study

This research will highlight the cost management challenges facing large construction project firms, which include the cost management planning, the estimating, the budgeting and cost control process. Therefore, in order to provide accurate guidance to the decision maker in initiating and making their contractual cost management decisions, consideration of value management and achievement of maximum accuracy and

reduction in cost of material and labor are very important to be considered in every cost estimation exercise.

From the above discursions of the problems, recommendations will be given to eliminate or reduce cost management problem. Also, this research will be a base for future study in this field.

1.5 Scope of the Study.

Project cost management is a huge challenge to organizations, clients, and contractors be it on large scale, medium or small construction projects. The current study focused on cost management on large building project in Ghana using a case study of the Association of African Universities Secretariat Building Project in Accra.

1.6 Brief Methodology

The current research used the Association of African Universities Secretariat Building Project in Accra as case study to examine the cost management practices of firms on large building project. Data needed for this research was collected via face to face interview. The views of key professionals who are involved in managing the cost of the project were sought. These professionals included the Project manager, Construction manager, Site supervisor, Quantity surveyor, Architect, Civil engineer and the Risk manager.

The data collected was analyzed using content analysis. Based on the findings of the study recommendations were made.

1.7 Outline of the Report

This research is divided into five different chapters. The chapter one talks about the general introduction to the study. It discusses the background of the study, the statement of the problem, the aim and the objectives of the study, the significance of the study, the scope and a brief description of the methodology.

The chapter entails the review of literature pertaining to the area of the study. The literature review was conducted in accordance with the objectives of the study which were to identify the cost management practices of firms on large construction projects, to identify challenges associated with their practices and to outline solutions to overcome the identified challenges

. The chapter three discusses the details of the methodology adopted for the study. It discusses the research design and strategy, the population and the sample size, the questionnaire administration procedure and how data were analyzed for this study.

The chapter four detail out the analytical procedures adopted for the study. A discussion of the findings is also done in the chapter four. Lastly, the chapter five discusses the findings of the study. Based on the findings, recommendations are proposed in the chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Project cost management is basically described as a set of tools for controlling and improving a company's procedures in its service and product delivery to be more cost effective. Cost management procedures may include analyzing, evaluating and reporting cost data for budgeting, estimating, forecasting and cost monitoring so as to aid in decision making. Literature from Ballard et al (2004), indicated the need for further improvement in the cost management practices to help save cost.

Cost estimation is a useful tool which is used to ascertain the probable cost of future projects before the preparation of design details and the particulars of the contract, the significance of cost estimation as he noted is that, it helps the client to be abreast with the financial commitments before any extensive designs are undertaken. Various researchers indicated and discussed an attempt to use forecasting as a technique to enhance the accuracy of estimating (Tommelein, 2009, Ballard, 2004,). Traditionally, cost management practices normally adopt cost data from previous data which normally inherit waste made in such projects. Waste generation can differ from project to project. This assertion increases the inaccuracies in cost estimates made therefore, in managing cost, it is essential to account for the emerging level of wastage in the whole construction process.

This chapter reviews literature pertaining to the cost management practices that can be adopted among large construction companies in order to control cost and stay within stipulated cost limits.

2.2 Definition of Project Cost Management

Project management body of knowledge PMBOK (2004), describes project cost management as the processes adopted to plan, estimate, budget, and control cost so that a project can be completed within the limits of the budget. PMBOK (2014), also identified life cycle costing (LCC) as a total and holistic approach in managing a project cost. LCC does not only consider the capital cost of a project but also the overall cost of a project during the life cycle of the project. LCC may include cost in use, maintenance cost, repair cost and demolition cost. Table 2.1 depicts the various elements and processes involved in cost management as identified by PMBOK (2014). The elements of cost management are;

- Cost estimating;
- Cost budgetary; and
- Cost control.

Table 2.1: The elements of cost Management

Element	Description
Cost estimating	Developing estimate and measurement for the costs needed for a resources to complete the project task and activities
Cost budgetary	Collecting the cost estimate, compiling them to develop an overall cost baseline
Cost Control	Managing and controlling factors that change or affect the budget

Source: PMBOK, (2014)

The basic purpose of project management is to achieve project success. Project success is measured basically as the ability to meet cost, time and quality goals of a project. A report from Standish group indicated that, IT projects still struggles to meet cost and schedule limits. The report indicated that, only 29% of projects is completed on time, 18% is totally terminated and 53% fail in both schedule and budget limits (Bathurst et al, 2001). Effective cost management brings on board strategic and innovative ways to improve project

management processes to meet cost limits (Layer et al., 2002). Thus, the chances of achieving a high project success will be improved if appropriate tools and techniques are adopted in the management of construction cost and the construction process as a whole.

2.3 Theory of Cost Management

Cost management and cost control are two different concepts with different applications. According to Hilton et al (2000), cost management is a proactive process that concentrates on the elimination of waste in the construction process. Also, cost management focuses on improving effectiveness and efficiency as well as focusing the customer's satisfaction and achieving profitability requirements. Cost management was also described as technique that creates the achievement of the required quality limits at a lower cost. The ability to create more value at the accurate cost or lower is vital in the world of high competitiveness.

Cattel et al (2008) describe that cost management is a philosophy that centers on general improvements as it thrives on the notion of continuously searching, finding and adopting to ways to assist an organization in making the right decisions to create a high customer value at a low cost. Incurring cost in the execution of a project all arise from management decisions. Thus cost management is a proactive systems and therefore, it relies on mechanisms adopted by project managers in making decisions. These techniques can be used singularly to support a specific decision or in combination with other techniques to aid the overall management of an organization. A collection of cost management systems that works together to support the goals of an organization is termed as the cost management system.

Cost is a measure of the consumption or acquisition of a scare resource to achieve a specific outcome (Hilton et al., 2000). Also, he defined cost management as a set of tools and

techniques that can be adopted to aid the achievement of an organization's goals. "Cost happens" is a common assertion that cost management processes rejects. Cost management embraces the idea that all cost should managed to meet required organizational goals. Thus, cost management determines various opportunities in enhancing an organizational performance and subsequently selects the most appropriate so as to improve the effectiveness and efficiency of an organization. This system of analyzing costs depends on the management of cost by modelling the impact managers' decisions on cost drivers, cost and profits. The fundamental principle of cost management is that cost does not just happen; they originate as a result of management decisions. In other to efficiently and effectively manage an organization, it is very crucial to determine strategic opportunities and maintain a competitive advantage. It is also important to note that, cost management focus on anticipating the impacts of alternate decisions.

The basic underlying theories of cost management are;

- The achievement of high customer satisfaction at a reduced cost;
- All costs are caused by management decisions; and
- Effective tools and techniques can increase value at reduced cost.

The underlying theories depicts that effective cost management allows managers to make crucial decisions that have huge impact on the success of a project. Cost management has numerous benefits to both the contractor and the client therefore cost managers requires a broad knowledge on how organizations' activities interact with each other so as to provide interpretation to various information and analyses alternative course of actions. Cost managers also identify opportunities to improve operational efficiency.

2.4 Cost Management in Construction

Construction cost management is basically described as the process of planning, estimating, coordinating, controlling and reporting of all cost items from the inception of the project to the time the product is being disposed-off (Ashworth, 2010). Thus, construction cost management takes into account all the various types of costs that are associated with the project through-out its life-cycle. A similar assertion was made by Ballard (2008). There are various cost accounting tools identified in literature by various researchers which aid cost managers in cost management. Some of these researchers are Frimpong et al (2003), Olawale et al (2010), Rush et al (2000), Hilton et al (2006 They identified the following accounting tools;

- Full absorption;
- Activity-Based Accounting;
- Constraint-Based Accounting;
- Target accounting;
- Lean cost accounting;
- Inter-organization cost management;
- Whole-Life Costing;
- Value management; and
- Risk management.

All these systems focus on the reduction and controlling project cost. A major flaw identified by Hanid et al (2010), in most of the systems is the inability of the system to account for achievement of value and process improvement. Therefore, these practices have failed in achieving the targets. Literature also reveals numerous challenges that cost managers faces in managing cost and they are discussed in the next section.

2.5 Challenges in construction cost management

Ashwort (2004), discussed various challenges associated with cost management in his studies. Some of the factors he considered were, disruption in construction process, liability in design, project duration, poor collaboration, poor design reviews, isolated decision making and the use of traditional accounting methods. Other factors discussed by Hanid et al., (2011) and Dallas (2006) were issues regarding the state of knowledge and understanding, communication and coordination of activities.

2.5.1 Knowledge and understanding

Hope and Frazer. (2003) stipulated that, the experience of a cost manager is vital in the determination of the cost of a project and coming to terms with the requirements of a project. Arditi, et al (2000), also stated that, the knowledge and understanding of a cost manager will aid him in making assumptions and choices of proper cost techniques to be adopted. Cost managers are mostly limited by knowledge in seeking to accurately estimate, monitor and control cost effectively as they are not abreast with the alternative tools and techniques to use to achieve their objective.

Also, detailed cost estimates are mostly not provided as cost managers are not familiar with the sophisticated techniques that are needed to provide such details. The unavailability of the needed detailed design information can also lead to inaccuracies of cost estimates. Therefore, cost managers normally depend on their experience in making assumptions. They make decisions based on what make sense to themselves without consulting any of their other team members. This can adversely affect the outcome of the cost manager's estimates and performance (Akintoye 2000).

2.5.2 Communication

Cost management can be greatly challenged as a result of poor communication and feedback system. Unfortunately, poor communication is inherent in the construction industry which subsequently affects the performance of cost estimators (Akintoye 2000). Inadequate or poor communication can be blamed on the fierce competition, lack of trust, selfishness and short-term relationship that characterize our industry. This normally leads to increase in construction cost as identified by Eastman (2011). Poor communication and information sharing can generally lead to defective decision making and can affect the project at various ways. Information that are released to cost managers makes them inefficient in their endeavors as the time taken for them to get such information causes delay in cost accounting and does not match the actual work progress therefore the proactive nature of cost management will be defeated. Information and

Communication Technology (ICT) can aid in the timely distribution of information (Cartlidge, 2006) but typically, the low level of collaboration amongst project participants gives an idea of the unwillingness in developing the habit of sharing information.

2.5.3 Coordination

In the construction industry, most of the processes are done in isolation. For instance, traditionally, the design of building and its construction are done by different professionals at different times. This shows the lack of coordination among construction project processes. This has a negative impact on the management of cost as is causes the difficulty in cost estimating, monitoring and controlling. There is also a lack of coordination among cost management and the production process which results in loss of value and inconsistency in cost accounting (Shen et al., 2001).

2.6 Factors Influencing Cost Management

The amount of profit attained from any business endeavor partly depends on the cost incurred. Therefore, cost is a very significant factor in the managing of any business. In other to be very effective in managing cost, all the factors affecting cost and causing cost overruns has to be identified and managed in other to eliminate its occurrence. A research conducted by Kamng et al., (2003), identified factors the causes cost overruns in Indonesia. These factors were subsequently ranked. The ranking is shown in table 2.2.

Table 2.2 Ranking of Factors Causing Cost Overrun

Factors	Importance index	Ranking
1.Unprecdictable weather condition	0.56	6
2. material cost increase due to inflation	0.78	2
3. Inaccurate quantity take off(by contractor	0.8	1
4. Labour increase due to environmental restriction	0.71	3
5.Lack of experience of project location	0.65	4
6.Lack of experience of project type	0.61	5
7.Lack of experience of local regulation	0.54	7

Source; **Kaming et al., (2003)**

From the table, it can be ascertained that, the three most significant causes of cost overruns in Indonesia were inaccurate quantity take-off by contractors, material inflation and increase in labour cost.

2.6.1 Overhead Cost

The indirect cost associated with cost describes indirect cost. They are cost that cannot be definitively attached to a single product or services (Kaming et al., 2003). They are not part of the actual cost of construction but neglecting overheads can force contractors to go out of business. Overhead costs are averagely more than 10% of the total project cost. Kaming et al., (2003) identified various factors that affects the overhead cost of a project.

These factors were subsequently ranked and the results are shown in table 2.3.

Table 2.3 Ranking of Factors Causing Increase of Overhead Cost

Factors for increase overhead cost	Ranking
Lack of New Project (recession)	2
Cost Inflation	3
Delay Payment	1
Government inflation charges	4
Increase Market cost	7
Client related cost	6
Firm growth	5

(Kaming et al., 2003)

From the table it can be ascertained that, the major factors that affects project overheads were lack of new projects, inflation and government regulations.

2.6.2 Interest rates and financial cost

The cost of borrowing from a bank describes the interest rate. If interest rates are increased, subsequently, the cost of financing a project will increase. Construction project requires huge capital and therefore in scenarios where there are delay payments, the contractor may have get additional financial assistance from banks. High interest rates will then affect the profit margin of the contractor when debts are paid leading to financial loss.

2.6.3 Relationship with sub-contractor

The relationships between the main contractor and the specialized sub-contractor can determine the success of the main contractor. This assertion was backed by Kale and Arditi (2000). They investigated the relationship between contractors and sub-contractors and they identified that, the perceived performance of a construction project is strongly related to the kind of relationship he has with the sub-contractors.

2.6.4 Safety cost and cost of accidents

The cost of safety and accidents are mostly neglected by contractors as their tender prices does not accommodate such expenses. The construction industry has been tagged as an accident-prone industry with higher levels of injuries and fatalities compared to other industries (Hillebrandt, 2000). Following safety rules and regulations normally comes with a cost and also occurrences of accidents on site can lead to various consequences that increases cost. For instance, reduced productivity, social cost, insurance premium and so on (Hope, and Fraser, 2003).

2.6.5 Environmental and safety restrictions

These days, the success of a construction project is not only based on the cost, time quality criteria but also the ability of the contractor to meet the environmental and safety requirements. Government and society are now more concerned about the protection of the environment. The establishment of environmental safety restrictions and regulations definitely requires financial inputs.

2.7 COST MANAGEMENT TECHNIQUES

The basics for cost management system techniques is “estimate” Ashworth (2004) opine that the fundamental keys to a good work and a successful cost management and control is the development of precise cost estimate.

Cost management involves the adoption of the various tools;

- Cost planning and control;
- Estimating;
- Budgeting;
- Cash flow forecasting;
- Financial Reporting and Cost reporting;

- Cost code systems;
- Value management; and
- Expert Judgement.

2.7.1 Cost planning and control

The first stage of cost planning is cost appraisal of the project so as to sufficiently establish the general cost limits and budgets (Dubois, 2003). Cost planning are the procedures adopted to be bring cost advice to bear upon the design process (Bathurst and Butler, 2000). There are basically two forms of cost planning which are the elemental cost planning and the comparative cost planning.

Also, there are three different phases of cost planning which are;

- The estimate;
- The cost plans; and
- The cost checking

Cost control was defined by Ballard, and Raiser, (2004) as the management of expenditure and not accounting for executed or completed projects. Thus, cost control looks at what is ahead. If cost control is carried out effectively, it aids the main contractor to have control over the outcome of his project in terms of cost. The current construction processes are very complex coupled with numerous uncertainties. Therefore, it is necessary to control cost on all the process involved in the life cycle of the project thus from inception to demolition.

2.7.2 Estimating

Estimating is the first phase of the construction cycle Brook, (2008). Estimating alongside construction accounting and cost control forms a continuous cycle. Thus, estimation forms

the foundation of cost control systems. If the foundation is weak, the whole structure will collapse. Therefore, strong and solid cost control systems can only function properly if an accurate bid estimate is made.

The estimation process should be carried out objectively and impartially but this is very difficult to sustain as a natural human being will be tempted to lower his cost when in competition with others or affect a sequence of failed tendering will gradually lower his pricing.

2.7.3 Budgeting

A budget is a management tool for planning, reporting, controlling costs and for forecasting (American Society of Civil Engineers, 1982). The main aim of budgeting is to estimate profit gains by ascertaining the future expenditures and anticipated income. A budget stipulates how an organization will be using his resources within a particular period of time (Hilton, 2000). The steps and stages followed in preparing a budget is termed as the budgeting systems. Pilcher (1985), stated the various aims of budget control. These are enlisted below;

- To quantitatively set out the objective of the organization or department;
- To aid in the analysis of alternative plans for realizing different objectives so as to select the best fit;
- Serves as a measurement tool to gauge the achievements against set standards; and
- To set a feasible plan for the organization.

2.7.4 Cash flow forecast

Cash is a very significant resource in construction and hence must be properly managed.

Cash flow forecast is the representations of the flow of money in a project (Burke, 1999). The timeline for cash flows is usually in monthly format. The cash flow statement is a very crucial document as in the case of taking loans to pre-finance a project, the institution will analyze that document to ascertain your cash inflows and cash out flows so as to come out with exactly how much you need, when your need it and when you are going to pay back. The movement of cash in a construction project is either in or out of the project accounts and this is referred to as cash flow. Incomes are positive cash flow and expenditure are negative cash flow. The principles of cash flow are as follows

- Valuation of works should be done each month;
- Payment is delayed by at least two months;
- Cash flow forecast is based on the program of works; and
- Execution of work items are not interrupted and are completed on time.

2.7.5 Financial report and cost reporting

Financial report is to record all the financial transactions and amounts owed in an organization. It was noted by Burgess (1982), that top management is supposed to be supplier with information concerning;

- Financial performances to date;
- Anticipated financial performances of the year; and
- Anticipated financial performance at the end of the project.

All this information can be obtained from financial reports and hence it is a very significant document for top management with regards to making decisions concerning finances. The successful execution of a construction project can also be hinged on a solid financial plan.

2.7.6 Cost code system

A good coding system is very crucial in simplifying data handling. The purpose of cost coding system is to simplify huge cost data and identify them with codes so that, it will simplify the application of cost management systems throughout the project duration. These codes can be computerized to minimize errors and omissions in cost statements and reports. The objectives of cost coding as identified by Joseph (1984) are as follows;

- To provide traceable information on the performance of an activity;
- To provide the basis for parameter estimation;
- To provide the basis for performance value engineering analysis; and To provide trades oriented sorting cost.

2.7.7 Value management

Fong et al., (2003), conducted a study that stipulated the features of value management and discussed it differences with cost planning. The characteristics of value engineering identified were;

- Systematic approach;
- Multi-discipline team-oriented process;
- Emphasize on value and performance; and
- Focus on construction cost and life cycle cost.

Value management focuses on value rather than cutting down cost (Fong et al., 1998). Thus, the quality aspect of a construction product is not sacrificed for the purpose of cutting

down cost. Value management ensures that, a perfect value for money is achieved without compromising on quality and client satisfaction.

2.7.8 Expert Judgement

A good price forecasting method considers both historical data and expert judgements (Al-Tabtabai and Dickmann (1992). Expert judgement qualities is obtained with time of experience and knowledge in the construction industry.

2.8 EFFECTIVE COST MANAGEMENT

The basics for effective cost management is to understand the cost structure and analyze the costs flowing through the structure (Hennigan, 2002). According to Godey (2003), cost management focuses on the customer's profitability. There are six (6) fundamental steps in effective cost management and they are;

- Understanding what causes the cost and revenue structure of the business;
- Understanding and reduction of inter functional complexities;
- Provision of tools to manage cost;
- Involvement of employees in decision making;
- Increment of effectiveness and continuously improve cost; and
- Take decisions based on strategic business plan.

2.8.1 Understanding what causes the cost and revenue structure of the business

This process is the most crucial in cost management. A contractor must ascertain where his revenue originates and the cost incurred to provide the revenue including the overhead cost.

2.8.2 Understanding and reduction of inter functional complexities

In an organization, the operations of one department affects other department and as such the complex cause-and-effect must be sorted out. Always employees must comprehend why a specific work is done and how it can be done efficiently.

2.8.3 Provide tools to manage cost

It is essential for the management to provide the requisite tools for the management of costs, improve quality and enhance productivity. When a contractor invests in his employees by training them, they are to work better.

2.8.4 Involves employees in decision making

The contractor must engage his employees in decision making. In other to do this effectively, the employees must comprehend the objectives of the contractor and have accurate cost information. If a contractor solicits information from his employees, he is more likely to discover a better way of managing cost

2.8.5 Increase effectiveness and continuously improve cost

Select contractor's cost structures that generates more profit. The procedures of cost management must become a standard procedure. The management and employees must always strive to eliminate or reduce unprofitable work. Contractors must always focus on tasks that generate revenue in other to maximize profits.

2.8.6 Measure decisions against strategic business plans

The long-term strategy of a business must be adhered to. The contractor must ensure that they do depart from the long-term objectives of the organization. Cost decisions should be weigh against long term strategies and come to a consensus.

2.9 CHAPTER SUMMARY

This chapter begun with the definition of project cost management. From literature, project cost management was defined as the processes adopted to plan, estimate, budget and control cost so that a project can be completed within the limits of the budget. The elements of cost management identified were cost estimating, cost budgetary and cost control. The theory and vision of cost control was then discussed. The basic theory of cost management was that; all costs are caused by management decisions. From there, cost management in construction was discussed which was followed by the challenges associated with cost management. Some the challenges identified were the lack of knowledge and understanding, ineffective communication, poor coordination and so on. Furthermore, the factors that affects cost management were described. These factors included the overhead cost, interest rates, relationship with sub-contractor, safety cost and cost of accidents and so on. Finally, this chapter ended with a discussion on cost management techniques followed by effective cost management practices. The cost management techniques included cost planning and control, estimating, budgeting, cash flow forecast, cost code systems, value management and judgement. Also, six (6) fundamental steps were identified in the effective management of cost. These were understanding what causes the cost and revenue structure of the business, understanding and reduction of inter functional complexities, provision of tools to manage cost, involvement of employees in decision making, increment of effectiveness and continuously improve cost and taking decisions based on strategic business plan.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The methodological approach adopted to fulfil the objectives of the study is discussed in this chapter. This chapter will discuss the research design, sampling frame and sampling technique, method of data collection and the tools adopted for the analysis of data

3.2 Research Design

The current study used a case study research of the Association of African Universities Secretariat Building Project in Accra to collect the necessary primary data to answer the research questions. Qualitative research approach using interview used as the data collection method since such approach helps in obtaining in-depth information about the issue at hand from the respondents.

3.3 Project description

The association of Africa university secretariat building is a three Story office complex with many security features, such as seven security door that uses key card the building is highly disability friendly has a ramp from ground floor to the third floor.

The building is situated in Accra, Okgbonglo near University of Ghana Legon to be precise. The procurement method used was an open competitive tender and has a contract duration of thirty-six months with a contract sum of seventy-five million Ghana cedis. The cost management on this project is sound and fairly shaped by action. The photograph of the building has been provided in appendix c.

3.4 Sampling Frame, sample size and sampling Technique

As stated in chapter one, the purpose of this study was to identify the cost management practices of firms on large building projects using the Association of Africa Universities Secretariat Building project in Accra as a case study. A purposive sampling technique was used, the secretariat project was selected based on the availability of professional on the project and their cooperation. The study population therefore consisted of seven key professionals on the project who play key roles in decision making on the cost management of the project. In view of this, Project manager, Construction manager, Site supervisor, Quantity surveyor, Architect, Civil engineer and the Risk manager on this project were purposively selected.

3.5 Methods of data collection

After a careful consideration of the nature of the study (i.e. a case study) and the research questions, the study used interview to collect the primary data from the respondents. This method according to Fellow and Liu (2008) enables one to collect in-depth information on a subject. In the current study, structured questions were set and used to guide the face-to-face interview session. The questions were set based on the information gathered from the literature review. A copy of the interviews can be found at appendix A. Each interview session took a maximum of 15 minutes. Voice recording of each interview session was done and latter transcribed. See appendix B for the data transcribed.

3.6 Data analysis

As mentioned earlier on, each of the interviews with the respondents was recorded and latter transcribed. The data was then analyzed using content analysis. That is, the views of the various respondents were analyzed by summarizing the key points raised by each of the participants.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study and discussion of the key findings. Issues discussed in this chapter are the background of the respondents, the cost management practices used by the firm to manage the project cost, the challenges associated with managing the cost on large building projects and measure required to overcome the challenges.

4.2 Background of the respondents

The background information of the respondent considered in the current study was their experience in cost management. It was reviewed during the interview that 3 out of the 7 interviewee have between 10-15 years of working experience. 2 had less than 10 years of experience while the remaining 1 person had over 15 years of working experience. It was further revealed that all 6 of them have been involved in the cost management of at least 3 projects during the past five years while the remaining 1 person indicated that he has managed the cost of just 2 projects. From the above statistics, it is evident that the professionals selected for the current study have some good level of experience in cost management on large project and for that matter stand in a good position to provide relevant information for the study.

Table 4.1: Background of Respondents

S/n	Background	Frequency	Percentage
(1)	**Years of working experience**		(%)
(a)	10-15 years	4	57.00
(b)	Less than 10 years	2	29.00
(c)	More than 15 years	1	14.00
	Total	7	100.00
(2)	**Number of projects respondents have been involved in its cost management in the past 5years**	2	29.00
(a)	3-6 projects	6	86.00
(b)	Less than 3 projects	1	14.00
	Total	7	

4.3 Cost Management Practices on large building projects

The views of the respondents on how the cost of the project is managed are discussed in this section.

4.3.1 Understanding of the concept of cost Management

According to Ashwort (2010), cost management in the construction industry is “a process of planning, estimating, co-ordination, control and reporting of all cost- related aspects from project initiation up to the time of an asset’s eventual disposal". The PMBOK (2014) also describes cost management as “the processes involved in planning, estimating, budgeting and controlling cost so that the project can be completed within the approved budget”. From the above, definitions it can be seen that certain key terms are common: Planning and estimating project cost, drawing a budget on how much to spend on each item, controlling the expenditure and regularly reporting on cost. Against this background, the respondents’ opinions were solicited on how they understand cost management. Various definitions were proposed. From their explanations, it was evident that even though certain elements of cost management were not explicitly stated by the

respondents, it is fair to say that the respondents understand the concept of cost management. For instance, the 1st respondent described that cost management "*is a process of controlling the expenditures on a project so that the budget is not exceeded*". In the view of the 2nd respondent, "*cost management is a process whereby the amount of money to be spent on a project is estimated and measures are put in place to ensure that this figure is not exceeded at the end of the project*". The above two respondents acknowledge cost estimating, budgeting and control in their definition of cost management as proposed by Ashwort (2010) and PMBOK (2014). Another respondent's definition added a new dimension to what was provided by the other respondents. According to him "cost *management is about ensuring that the project is executed with value for money. That is ensuring that the project is completed with the minimum cost and of good quality".* This definition agrees with that of Hilton et al. (2000), who describe that cost management is a set of techniques aimed at creating more value at lower cost. It also supports Ballard (2008) who posited that cost management is philosophy of seeking increased customer value at reduced cost or a set of techniques that increase value and reduce cost.

4.3.2 Cost Management Tools and Techniques

In the first place, it was indicated by the respondents that cost management on the project started right after the award of contract. According to them this was necessary before the firm had to draw a plan and know how much to spent on each element and at every stage so that the necessary funding could be arranged for the project. The Architect, Quantity survey and Project manager added that from their past experiences they have noted that sometimes cost management on large project begins at the planning or project development stage. This is done to help the client and the design team to make the best decision on the project cost before the construction begins. Thus, Hilton et al. (2000) was not wrong when

they stated that due to the complexity of large building projects, it is important for decisions regarding cost management be made at the design stage of the project.

The respondents were further quizzed on the tools and techniques they use in managing the project's cost. The following techniques were cited: Estimating, cost planning and control, budgeting, cash flow forecasting, cost reporting, cost code system and the use of past experience. They added that these techniques are used together to support the overall cost management of the project.

(i) Estimating

Estimating, according to the respondent is the first phase of the cost management process where the quantities (volume of work) of the various items in the BOQ are calculated. One of the respondents pointed out that even though the quantities can be found it the BOQ, it is necessary to re-measure the works to cross check and use figures for cost planning. This practice supports the argument by Hwee and Tiong, (2002) who believes that sometimes due to human errors they can be mistakes in the preparation of the Bill of Quantities (BOQ) and for that matter construction firms should re-measure the works during the execution stage. This issue is very important especially for large complex projects (Hilton et al., 2000).

(ii) Cost planning and control

These techniques were cited by Ashwort (2010) and supported by PMBOK (2014). From the interview it was the common opinion of the interviewee that due to the complex nature and the number of expenditures involved, cost appraisal of the project had to be done in order to establish its overall cost limit, the total budget to be used and draw cost plan for the various elements. For instance, the cost of substructure works, concrete works, block

work, painting and decoration, roofing, electrical installations among others are established and expenditure on each item controlled at all phases of the project.

(iii) Budgeting and cash flow forecasting

From the interview, the Quantity surveyor explained that budgeting is used to forecast the rate of expenditure and the anticipated income for the project. His explanation confirms that of Hilton (2000) who defines that a budget is a detailed plan that specifies how an organization will acquire and use resources during a particular period of time. The construction manager also added that without budgeting/cash flow forecasting most projects will experience problems such as cost overruns and running out of funds. He explained that in most cases the contractor is working with limited funds and for that matter the firm should be able to know how much money will be spent at every stage and the income that it will receive from the client. This will help the contractor to secure funding to support the project in a case where the net cash flow is negative (i.e. expenditure exceeds income). Adding up to the above, the Civil engineer during his interview pointed out that due to the problem of delay payment to contract for most government contracts in Ghana, it is important that cost budgeting/cash flow taken seriously by contractors.

(iv) Cost Reporting

In the literature, Hanid et al. (2010) warned that the objectives of cost management will not be met without regular review, updating and reporting on the status of the project cost. In confirmation of the above, most of the interview stated that regular cost expenditure and income review helps to identify if there is cost overrun on a particular element. Such information helps top management in making decisions to remedy the situation. Hennigan (2002) noted that in construction it always happens that at least one aspect of the project costs will attempt to exceed its targeted budget. In view of this, regular cost review,

monitoring and evaluation should be done to know the status of the project cost expenditure.

(v) Cost Code system

In order to simplify data-handling and storage it was explained by the Quantity surveyor and the construction manager that cost code system is used for aiding the management of cost and data on the project. They added that per the nature of the project (i.e. being large) a lot of cost information needs to be kept, retrieved and updated frequently throughout the project duration. This made possible and easy by employing cost code system.

4.3.3 Challenges associated with managing cost on large building projects

One of the objectives of the current study was to identify the challenges associated with managing the cost on large building projects. In the current study, a number of issues were raised by the professionals as summarized on Table 4.1. The results presented reflects both the challenges the interviewees are facing on their current project as well as what they have experienced in previous projects. The top three difficulties indicated by all the professionals are frequent in the variations, poor Communication and coordination among project parties and frequent changes in material prices.

(i) Frequent variations

It was reported in all the interviewee that the frequent changes in the scope of project is a major issue which make the management of large building projects difficult. Quoting the Quantity surveyor he stated: "*Frequent changes disrupt budgeting and other arrangements put in place to manage the cost of the project. However, this issue cannot completely avoid in large building projects such as our since usually at the design state a number of assumptions are made by the design team due to insufficient information*".

The site supervisor also added this: "*Sometimes, due to the haste in the preparation of the drawings, errors and discrepancies arises. This therefore calls for the changes*". This above statement confirms the report by Akintoye and Fitzgerald, (2000) who noted that error arises in project cost estimating and other design documentations due to the short period available for preparing the documents. *The Architect also revealed that project which begins without complete drawings are also bound to face the problem of frequent changes. He consequently advised as much as possible large building projects should commence after completion of all the design documentations involved and the all the parties should agree and be satisfied with the scope and specifications of the project.*

(ii) Communication and coordination problems

Construction is a team work as argued by Hanid et al., (2011). There should be regular communication and coordination among the various parties to ensure the smooth execution of the project. Akintoye and Fitzgerald, (2000) noted poor communication and feedback systems affect cost management practice. Hanid et al., (2011) also observed that the lack of coordination between project processes such as design and construction creates difficulty in cost estimating, monitoring and controlling. This results in value losses and inconsistent cost accounting. In the current study, the opinions of the respondents were not far different from what is being reported by the above researchers above. As shown on Table 4.1 all the interviewees unanimously agreed that poor communication and coordination among the project team affects the project. Quoting the construction manager, he stated: "*sometimes when there is a change in the design, poor communication and coordination between the Architect and the Structural engineer leads to delays in releasing information to the contractor. Demolitions and rework arises from these issues*"

Doloi (2011) and Kashiwagi and Savicky (2003) also noted that poor coordination may cause construction projects to go over budget and payment disputes.

Besides the above issues, the other challenges cited by the interview participants are shown in Table 4.1.

Table 4.1: The views of the interview participants on the challenges associated with managing cost on large building projects.

Sn	**Challenges**	R1	R2	R3	R4	R5	R6	R7	Freq.	Percent %
(i)	Frequent variations	√	√	√	√	√	√	√	7	100.00
(ii)	Communication and coordination problems	√	√	√	√	√	√	√	7	100.00
(iii)	Changes in material prices	√	√	√	√	√	√		6	86.00
(iv)	lack of computerized processes	√	√	√			√		4	57.00
(v)	The need to manage large cost data	√	√	√	√				4	57.00
(vi)	Inaccurate measurement of works	√	√	√	√		√		5	71.00

Note: R1 = Project Manager, R2 = Quantity surveyor, R3= the Site supervisor, R4 = the Construction manager, R5 = the Architect, R6 = the risk manager, R7 = Civil engineer

4.3.4 Overcoming cost management challenges

The last part of the study sought to seek the opinion of the respondents on how to overcome the challenges associated with managing the cost on large building projects. Table 4.2 also summaries the suggestions of the various interviewees. The suggestions are similar to what was being reported by researchers such as Hwee and Tiong (2002), Kern and Formoso (2004), Hanid et al. (2011) and Cartlidge (2006). For instance, Hwee and Tiong (2002) suggested that, improvement in coordination and information flow among project parties is vital for successful cost management. Cartlidge (2006) also recommended in her studies

that Information and Communication Technology (ICT) can enable the project team to share and disseminate project information. Data storage and handling can be made easy through the use of computerized cost accounting systems.

Table 4.2: Suggestions on how to address the challenges associated with managing cost on large building projects.

Sn	**Suggestions**	R1	R2	R3	R4	R5	R6	R7	Freq.	Percent %
(i)	Minimization of the number of variations which occurs in a project	√	√	√	√	√	√	√	7	100.00
(ii)	There should be effective communication and efficient coordination among project parties	√	√	√	√	√	√	√	7	100.00
(iii)	The use of computerized processes and ICT will help data storage and information sharing	√	√	√			√		4	57.00
(iv)	Enough time should be spent in the design documentations and measurement of the work	√	√	√	√		√		5	71.00

CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The aim of the current study was to determine the cost management practices of construction firms for large building projects. Based on the study results obtained from the Association of African Universities Secretariat Building Project in Accra the following conclusions have been drawn:

Objective 1: To identify the cost management practices of firms on large building projects

The following were found:

i. Most professionals in the Ghanaian construction industry understands the concept of cost management; ii. Cost management on large building projects starts as earlier as the design/planning stage of the project. During the construction stage, cost plan is drawn by the construction firm to know how much to spent on each element and at every stage of the project.

iii. The techniques and tool used by firms to manage project cost are: Estimating, cost planning and control, budgeting, cash flow forecasting, cost reporting, cost code system and the use of past experience. These techniques are used together to support the overall project cost management.

Objective 2: To identify challenges associated with their practices.

The following are the key challenges:

i. Frequent variations/changes made to the scope, specification etc. of the project during the construction stage. ii. Poor communication and coordination among project parties leading to problems such as delays and cost overruns iii. the lack of coordination between project processes such as design and construction creates difficulty in cost estimating, monitoring and controlling iv. Frequent changes in material prices disrupt cost estimates

v. lack of computerized processes makes data storage and handling difficult vi. The need to manage large cost data create difficulties in the cost management system vii. Inaccurate measurement of works

Objective 3: To recommend solutions to overcome the identified challenges

The following measures can be put in place to address the challenges above:

i. Efforts should be made to minimize of the number of variations which occurs in a project ii. There should be effective communication and efficient coordination among project parties. Information on project cost should be communicated among project parties. iii. The use of computerized processes and ICT to help in data storage and information sharing

iv. Enough time should be spent in the design and documentations of project to avoid the frequent changes which occurs during the construction stage

5.2 Practical Recommendations

From the findings of the study it was evident that cost management is known and has been appreciated by many construction professionals in Ghana and for that matter many relies on it to manage their project especially on large construction projects. However, it was found that frequent changes/variations in project scope and specifications during the

construction stage of projects make cost management difficult. It is therefore recommended that efforts should be made by design teams to have a wider stakeholder's consultation and a define project scope before and during the design process to ensure that such frequent changes are minimized. Moreover, I recommend that parties to the project or stakeholders should rely on Information and Communication Technology in information sharing. (i.e. The use of project information management system (PIMS), Building information modeling (BIM), local area network (LAN) and internet). This will enhance communication and coordination. The used of computerized systems for data storage and handling (i.e. MS project, primavera. MS excel etc.) Is also encouraged.

5.4 Limitation of the study

The current study due to time limitations selected only large project as a case study. This limits the extent of generalization of the results of the study. That notwithstanding, the findings of the study provide an insight into cost management on large projects.

5.5: Future Research

It is recommended that future studies should increase the sample size and select more projects. Moreover, studies which look at cost management in other large construction projects such as road works and other civil engineering works are encouraged.

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APPENDIX: INTERVIEW GUIDE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ARTS AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

Cost Management practices on large construction Project: A Case Study on Construction of Association of Africa Universities Secretariat Building Accra

Section A: List of project professionals to be interviewed

i. Project manager
ii. Construction manager
iii. Site supervisor
iv. Quantity surveyor
v. Architect
vi. Civil engineer
vii. Risk manager

Section B: The structure of the interview questions

1. How many years of working experience do you have in project management?
2. On the average how many large projects have you been involved in its cost management over the past five years?
3. How do you understand project cost management?
4. What cost management tools and techniques do you use to control cost on this project?
5. What stage of project did you started managing the cost of this project?
6. Please briefly explain how you manage the cost of this project?
7. What factors make the management of the cost of large building project difficult?
8. How do you determine you are having project cost overruns?
9. How do you overcome cost management challenges when they arise?

APPENDIX B

THE TRANSCRIBED INTERVIEW RESULTS 1. PROJECT MANAGER'S VIEW

Please how many years of experience do you have in managing project cost?

His answer 15 years

How many project have you been involve in the last (5) five years?

Answer (3) three project

What is your understanding of project cost management?

Answer:

Project cost management is the process of managing the project resources and cash flow within the approved budget, scope and time

At what stage do you start managing the cost of this project and why?

Answer:

Right from the inception of the project because cost should not happened it must be well planned, the best practice to avoid cost overrun is to plan every spending.

How is cost manage on this project?

Answer:

We follow cost management plan and also always measure our budget against every performed task

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of coordination, communication and personnel management.

How to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and get your hands into dirtier to solve it.

2. CONSTRUCTION MANAGER

Please how many years of experience do you have in managing project cost?

His answer 12 years

How many project have you been involve in the last (5) five years?

Answer (2) three project

What is your understanding of project cost management?

Answer:

Project cost management is the efficient way to manage the project cash flow to suit the project approved budget.

At what stage do you start managing the cost of this project and why?

Answer:

Right from the executing stage of the project because the lion share of the project cost is spend on executing.

How is cost manage on this project?

Answer:

We follow cost management plan and also always measure our budget against every performed task

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of coordination, inaccurate estimate and under budgeting How

to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

3. SITE SUPERVISOR

Please how many years of experience do you have in managing project cost?

His answer 10 years

How many project have you been involve in the last (5) five years?

Answer (3) three project

What is your understanding of project cost management?

Answer:

Process to ensure that you plan to efficiently manage and control the project budget and cash flow.

At what stage do you start managing the cost of this project and why?

Answer:

Immediately we take over the project site for commencement of the project How is cost manage on this project?

Answer:

We always make sure that every personnel work to satisfaction and always measure our budget against every performed task

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of prompt communication from top management How

to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

4. THE ARCHITECT

Please how many years of experience do you have in managing project cost?

Answer: 20 years

How many project have you been involve in the last (5) five years?

Answer (3) three project

What is your understanding of project cost management?

Answer:

Process to ensure that you plan to efficiently manage and control the project budget and cash flow.

At what stage do you start managing the cost of this project and why?

Answer:

The project cost is manage from the inception stage till you hand over to client.

How is cost manage on this project?

Answer:

Cost management plan is the basis to manage every project to satisfaction, so that is what we do here

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of prompt communication from top management

How to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

5. QUANTITY SURVEYOR

Please how many years of experience do you have in managing project cost?

His answer 10 years

How many project have you been involve in the last (5) five years?

Answer (3) three project

What is your understanding of project cost management?

Answer:

Project cost management is the processes undertaken to ensure project is executed and completed on time within approved budget.

At what stage do you start managing the cost of this project and why?

Answer:

Immediately we take over the project site for commencement of the project How is cost manage on this project?

Answer:

We follow cost management plan and always measure our budget against every performed task

We also used Earned value management system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Changes to project scope has always been challenge in managing a large project.

Inadequate decision making by client

Inadequate review of drawing

How to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

Through stakeholders meetings for approval and indication of early signs to employer or client.

6. RISK MANAGER

Please how many years of experience do you have in managing project cost?

His answer 8 years

How many project have you been involve in the last (5) five years?

(3) Three project

What is your understanding of project cost management?

Process to ensure that you plan to efficiently manage and control the project budget and cash flow.

At what stage do you start managing the cost of this project and why?

Immediately we take over the project site for commencement of the project How is cost manage on this project?

Answer:

We always make sure that every personnel work to satisfaction and always measure our budget against every performed task

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of prompt communication from top management How

to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

7. THE CIVIL ENGINEER

Please how many years of experience do you have in managing project cost?

Answer: 15 years

How many project have you been involve in the last (5) five years?

Answer (2) three project

What is your understanding of project cost management?

Answer:

Process to ensure that you plan to efficiently manage and control the project budget and cash flow.

At what stage do you start managing the cost of this project and why?

Answer:

The project cost is manage from the inception stage till you hand over to client.

How is cost manage on this project?

Answer:

Cost management plan is the basis to manage every project to satisfaction, so that is what we do here

We also used computerize system to monitor our cash flow

What makes the management of cost on large construction project difficult?

Answer:

Changes to project scope has always been challenge in managing a large project.

Lack of prompt communication from top management

How to determine you are having a project cost overruns?

Answer:

Project cost overrun are usually notice when you are spending more cash than your approved budget for a particular work package

How to overcome cost management challenges when they arise?

Answer:

Firs investigate to find out the source of the problem and institute the steps to remedy it.

APPENDIX C

PHOTOGRAGH OF THE SECRETARIAT BUILDING