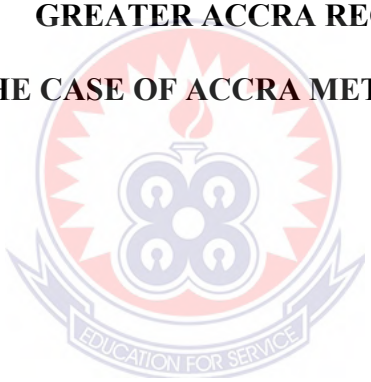
UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

COST CONTROL MEASURES USED BY BUILDING CONTRACTORS IN THE GREATER ACCRA REGION

(THE CASE OF ACCRA METROPOLIS)



OLIVIA AMA TETTEH

DECEMBER 2015

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A Dissertation in the department of CONSTRUCTION AND WOOD TECHNOLOGY EDUCATION, Faculty of TECHNICAL EDUCATION, submitted to the School of Graduate Studies, University of Education, Winneba in partial fulfilment of the requirements for the award of Master of Technology (Construction) degree.

DECEMBER, 2015

DECLARATION

I, Teteh Olivia Ama, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

……..……. ……

(Tetteh Olivia Ama) **Date**

Supervisor's Declaration

I, Mr. Michael K. Tsorgali, hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines for the supervision of thesis laid down by the University of Education, Winneba.

……..……..…… ……..……

(Mr. Michael K. Tsorgali) **Date**

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DEDICATION

I duly dedicate this piece of work to my pastor, Prophet Cephas Kwame Kpegah Tamakloe of Breaking Yoke Ministry International and my mother, Madam Leticia Agbagli.

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ABSTRACT

The issues of cost control in the building and construction industry pioneered by contractors and their allied players and professionals in the industry is a concern to ensuring due diligence in the building and construction sector. This research assessed contractors' commitment to cost control, the challenges that confront contractors and the proposed remedies to ensuring effective cost control measures. The case study research design was adopted for this study. Questionnaires were used for the study. A sample size of 63 respondents was used. Purposive sampling technique was employed for the surveyors, architects and storekeepers. Random cluster sampling technique was also used for the contractors and Foremen. The data was analysed using Statistical Package for Social Sciences (SPSS) software. For quality, the data was test-run and later generated simple frequencies. The information generated was then linked to contractors' efforts to control the cost of construction projects. The tone of the respondents were examined and reported as such. The qualitative information was linked to the figures generated through the simple frequency thus making confirmation of what the figures indicated. The findings of the study demonstrated that, contractors' experience, educational level, understanding of cost control, patience of some surveyors and architects to observe the necessary laws, rules and regulations concerning contracts are vital to the success of construction projects. Based on the study, it is recommended that contractors, surveyors, foremen, and storekeepers all pay attention to issues connected to cost control and also invite the inputs of each other when embarking on construction projects.

CHAPTER ONE

INTRODUCTION

This chapter addresses the introductory part of the study where a vivid description of required information is done under the following headings; background of the study, problem statement, purpose of the study, objectives and research questions among others.

1.1 Background of the Study

Professional cost control has received greater attention in the construction industry due to excessive cost escalation and woeful profit margin of some contractors (Amoah, et al, 2011). In Ghana, both public and private sector clients of the construction industry continue to complain about the industry's performance and its apparent failure to deliver projects on time, within budget line and to the expected quality standards (A1, 2010). The size, complexity and the nature of work undertaken by construction industry can affect the general performance of a project (Banaitiene, et al, 2012).

It should be noted that as projects grow in size and complexity, the ability to plan, monitor and control them is a key project management function and vital to successful execution of such projects (Arain, et al, 2005). Just like any other business venture, builders, contractors and developers have to plan their activities in a manner that they are effectively carried out (Assaf, et al, 2006). Construction project plans are usually drawn to ensure that work is carried out to the desired quality and within the time frame and budget allocation (Chen, et al, 2007). According to Rezakhani (2012), notwithstanding the complex nature of some construction works, cost and time needs to be effectively controlled if anticipated profit margin will be realized for the contractor and project completed within budgeted cost for the client (Corley & Gioia, 2011).

Cost control measures involves working out a plan of campaign or cost plan for a project and ensuring that it is completed within the predetermined tender price with all things being equal, while maintaining good quality product (Lektorskii, 2011). According to Anvuur, et al, (2006) cost control measures is the process of monitoring; evaluating and comparing planned result with actual results to determine the status of the project cost, schedule, and technical performance objectives. In spite of all the effort made to control cost, some contractor's still continue not to realize their expected profit margin at the end of the project completion, due to the fact that, to many contractors, cost control measures are not continuous (Kim Du et al, 2008). Many authors including Huang (2006) are of the view that, for cost control from contractor's perceptive to be effective the measures of cost control should be continuous from the conception stage up to completion stage of the contract; this will ensure that the various operations involved are executed and monitored to prevent unnecessary cost overrun due to irrelevant factors (Lindgren, 2009).

Cost control measures in building and construction industry is one of the most critical tasks in the stages of a building project. Sung-Hoon An, et al., (2010) explains that, control measures must deal with numerous uncertainties in the project life span. These uncertainties are the risks that affect the determination of the possible construction cost of any given project. The greater the uncertainties the less reliable a cost estimate and its control measures will be. Clients of construction projects are very concerned about the reliability of cost control measures. The success or failure of any building project depends on the accuracy of costs estimates and the ability to control it (Edmond & Erkelens, 2007).

In Ghana, however, the estimate for a construction project is often prepared by Quantity Surveyors (QS) (Fugar & Adinyira, 2009). Since cost and its associated control measures are pivotal to the success of any given construction project within the

construction industry, delving in to find out why most construction firms and consultants are not able to successfully carry out their projects within their budget and estimated time frame remains the core of this study.

1.2 Problem Statement

In recent times, players within the building construction industry have been going through a lot of challenges, ranging from the lack of trust in contractors by their clients, to frequent structural failures. Structural failures are being rampant these days and an example is the collapse of a section of the Methodist Church building which was under construction at Sakaman, a suburb of Accra. These failures are taking a lot of lives in addition to the lost of resources. Reports have it that most of these structural failures are due to the use of poor and sub-standard materials arising from the motive to control cost and save money.

1.3 Purpose of the Study

The purpose of the study is to identify the cost control measures by contractors in the Greater Accra Region and find out its effects on the quality of projects.

1.4 Specific Objectives

i. Identify issues of cost control measures

ii. Identify the challenges that contractors in the Greater Accra Region encounter when ensuring cost control

iii. Devise measures for effective cost control by contractors in the Greater Accra Region

1.5 Research Questions

i. What are the issues associated with cost control measures?

ii. What challenges do contractors in the Greater Accra Region encounter when ensuring cost control?

iii. What measures are most suitable for effective cost control by contractors in the Greater Accra Region?

1.6 Significance of the Study

The study will be of great benefits to those in the construction industry, Individuals and policy makers in the following ways;

i. It will increase the understanding of contractors regarding cost control measures, quality management of project time frame and ensures the use of quality material for construction purposes.

ii. It will inform contractors, consultants in the construction industry and clients on the importance of competitive bidding of projects and the implication of compromising quality to cost.

iii. The findings of this research will also provide the local authorities, policy makers and individuals an insight into the key issues affecting cost control measures in the Ghanaian construction industry and the way forward.

1.7 Scope of the Study

The study involved issues like; concept of cost control, challenges of cost control, failure to estimate the project as a setback to cost control as well as the compilation of project budget having a poor reliability among others.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the views of various persons of experience, knowledge and opinions on the issues of cost control. It involved among others issues like Concepts, Theoretical underpinnings and Ghana's construction industry among others.

2.2 Concepts

The concepts in this jurisdiction, comprises of many issues, among which are; the control of cost, project budgeting and others.

2.2.1 Cost Control

Cost control is a series of steps that businessmen and women within the domain of the construction industry use to maintain proper control over its costs of project planning and implementation. Cost control starts by way of the businesses identifying what their costs are and evaluate whether those costs are reasonable and affordable (Lee, 2014). Cost control seeks to manage expenses from the planning process of a project to its implementation stage (Olawale & Sun, 2014). Following Rui, et al, (2015) to be profitable, construction firms must not only earn revenues, but also control costs. Rui, et al (2015) adds that, if costs are too high, profit margins will be too low, making it difficult for some construction companies to succeed against their competitors.

Acebes et al (2015) is of the view that, to control cost, contractors must create a baseline, Calculate a variance, investigate variances and take action based on the

information gathered. To create a baseline implies establishing a standard or baseline against which actual costs are to be compared. These standards may be based on historical results, a reasonable improvement on historical results, or the theoretically best attainable cost performance. The middle alternative is generally considered to yield the best results, since it sets an achievable standard. Acebes et al (2015), indicates that, calculating variance means to calculate the variance between actual results and the standard or baseline noted in the first step. Particular emphasis is placed on the detection of unfavourable variances, which are those actual costs that are higher than expected. To investigate variances includes conducting a detailed drill-down into the actual cost information to ascertain the reason for an unfavourable variance.

Salehipour et al. (2015), maintains that, if a company is not making profit, then it should not make lost, thus such a company must breakeven in other to continue in business. Breakeven analysis determines the point at which one method becomes superior to another method of accomplishing some task or objective. Breakeven analysis is a common and important part of cost control.

2.2.1.1 Challenges to Cost Control

During the execution of a project, procedures for project control and record keeping become essential tools to managers and other participants in the construction process. These tools serve the dual purpose of recording the financial transactions that occur as well as giving managers an indication of the progress and problems associated with a project (Smith & Jaggar, 2007). In recent times, the industry is plagued with series of challenges including, failure to estimate the project exactly, unreliable project budget, unpractical working drawing budget, ignoring basic construction procedures, poor management of contracts, irregular management and many changes for a project, rise of cost due to

unreasonable financing structure, imperfect system, control of labour, site condition, location of site, materials and overhead and profits as explained below (Qun, 2009).

i. Exact Project Estimation Failure

According to Qun (2009), serious problems exist in the cost control and management of real estate construction. Qun (2009) established that, for some real estate construction, instead of feasibility studies before the design of the project, the design rather comes first thus making the later turn to be useless. Qun (2009), continues to explain that, in bidding, some construction companies perform poorly such that the bidding fail to control project cost very well. The popularization of assigned subcontracts serves as potential threats for project quality. The delay for project payment, especially for workers' wages, is serious. Some projects cannot manage the changes of designs while some Construction companies also fail to follow the designs completely, which sometimes lead to larger costs for construction. Some construction companies emphasize on the control of quality and period but fail to control the cost. All these activities make the cost of real estate construction out of control in Ghana, thus detrimental for the sustainable and healthy development of the real estate industry.

ii. Poor Reliability of Project Budget Compilation

Qun (2009) continues to state that one other challenge to cost control in project management is poor nature of the project budget. Qun (2009) maintain that, at the stage of project design, the investigation is far from sufficient with some fundamental materials for design been vague. As a result, the design may be irrational and will be changed significantly in construction, which causes the poor reliability of budget.

iii. Unpractical Working Drawing Budget

At this stage of the project, the project budget is compiled according to the design. The working drawing budget is to calculate the cost of design. The rationality of working drawing budget is about how to organize the construction and how to reach the design requirements by what kinds of methods, plus how to arrange the construction period, and how to manage workers and machines under different seasons, according to scientific designs. All these tasks are supposed to be arranged by construction companies. For design companies, to compile the budget is unpractical.

iv. Failure to Follow Basic Construction Procedures and Cannot Control Costs

For some projects, time is urgent. Therefore, the design may be imperfect given a shorter period of time. In such situations the construction may likely not follow the basic procedures strictly. Sometimes, the study of feasibility turns to be useless. As a result, the estimation and the budget cannot control the project cost effectively.

v. Poor Contract Management

Some developers neglect to manage contracts. They do not follow the terms written in contracts strictly. Besides, some developers cannot calculate the cost of project quantities correctly. They are incapable of managing external workers effectively.

vi. Irregular Management Leading to Changes in Proposed Project Plan

Some developers cannot design properly and have to change the management methods or carry on the execution of a weak project. Some designers also do change the project design at any time based on their personal intuition and not professional advice. This has the tendency of increasing the scale of the project and cost.

vii. Rise of Cost Due to Unreasonable Financing Structure

In recent times, individuals, private entities and some governmental agencies sources of funding for construction projects in Ghana are mainly from domestic loans, loans from the Banks, foreign funds and other sources. Although financing ways are few and some are immature, limits are more. Sometimes, funds are not readily available at the time of need. In order to insure the process of project, the construction companies have to apply loans from banks. Therefore, a large proportion of construction funds are from banks as loans. And the credit period is long and cannot match with investment return (Assaf and Al-Hejji, 2006). The characteristics of construction industry determine the lagged-behind investment return. One financing channel increases risks and costs, which leads to the accumulation of loan balance in banks, increasing construction costs and pressures for later in operation, thus a serious challenge.

viii. Imperfect System

One of the factors that cause overspending has to do with management. Main items that cause overspending include management and compensation fees. Main reasons include: Lack of a perfect cost control system and the inability to manage and control cost systematically, which makes it difficult to identify the out-of-control of cost in time. Project managers are always focusing on quality and construction period, but not cost control. The absence of system makes the expenditure more irregular while the absences of integrated standards for management fee are effective (Assaf and Al-Hejji, 2006).

ix. Labour Cost Control

The control of labour cost frequently causes much trouble to Cost Control because the productivity of labour is variable and posing challenge to the estimating stage. Although experienced estimators have their own database of historic cost data, but these data can only ever be regarded as an average for a given trade and does not make allowance for particular circumstances. A prediction of how labour will perform in the future on a particular project must be incorporated into an estimate of cost (Assaf and Al-Hejji, 2006).

Site management is greatly affecting the labour efficiency and their productivity. It is important that all labour resources, either self-employed or employed by somebody as labour and materials sub-contractors, are fully supervised and co-ordinated, to ensure that the labour resources are efficiently organized and making best use of them. If the labour resources are not well organized, it may reduce the productivity of the labour and making cost of labour to be higher hence causing difficulties to Cost Control because the labour cost is different with the estimated cost.

x. Site Conditions

After the design by the engineer, quantity surveyor will normally estimate the amount of the designed work. However, the unpredictability nature of the site condition makes the cost estimation rather challenging. In many of the construction project, there are majority of unforeseen and differing site conditions which are found in subsurface work such as tunnelling and foundation work. This situation can also arise in rehabilitation and restoration work, retrofitting to meet revised seismic codes and projects that improve energy efficiency.

Again, where ground water level is close to the surface of the site, closely pumping operation may be needed throughout the substructure work. This unforeseen situation will

increase the construction cost. A wet site may also involve raising temporary sheds and offices on brick bases, making temporary works more costly. The cost of excavating rocks is much more expensive than working in normal ground. This type of strata will need to be examined and to determine what type of support is needed to the sides of excavation. All these will contribute to the difficulty in cost control when the construction method is carried out wrongly (Assaf and Al-Hejji, 2006).

xi. Site Location

The cost of building on a site in a city could be much expensive than constructing a similar building on a local site. This is due to higher wages, materials and other costs. For instance, a project on a remote location site may involve long lengths of temporary access road and of temporary power cable for electricity suppliers and increased costs of transporting operatives and materials to the site (Dong, 2005). A site in a congested central area of a city will give rise to major problem in delivery and storage of materials and equipment, protection of adjoining building, construction method to carry out substructure work, restriction on the use of mechanical plant and to the protection of the public. Overcoming these challenges involves considerable additional cost and all these will considerably contribute to the difficulty in cost control (Zhang & Gao, 2007).

xii. Materials

In some of the project guides, the cost of materials can be easily identified, and adjustment to the measured rate is therefore a simple process. Material prices often depend on contractor, location, quantity and discount and hence making the estimation process to be rather difficult. The materials wastage of site will also contribute to this because there

will be difference between the actual amounts used and the estimated amount (Zhang & Gao, 2007).

xiii. Overheads and Profits

In most cases, during the estimation process of a project, the amount of overheads and profit will normally be referred back to previous projects. But the amounts included in the published rates vary considerably. In addition, overhead costs have generally been reduced in order to keep costs to an absolute minimum, while seeking to maintain the required workload. Builders will therefore need to access their own percentage and adjust this according to that quoted. Surveyors, in attempting to predict tender values, will also need to take this into account in their estimation.

In a nutshell, Cost Control in construction works should be the application of procedures or regulation during the project life cycle to plan, check and verify the construction project expenditure based on the established procedures or regulations to ensure that the construction project expenditure is within the project budget, within given timeframe with quality specified and also to ensure that resources are used to best advantages or maximization of the profit for the construction project (Dong, 2005).

Cost Control need to serve the purposes of providing the relevant feedback, provide the client with a value-for-money project, provide data to assist in the valuation, provide immediate warning of uneconomic operations, limit the client's expenditure, achieve balanced design expenditure, summarize progress and promote cost consciousness.

2.2.1.2 Ensuring Effective Cost Control on Construction Projects

Cost control measures on construction projects could be done effectively through several means, some of which are as follows;

i. Building Up of Scientific Management Systems for Construction Projects

The key for effective cost control is to build up a scientific management system, perfect relevant equipped measures and actualizing the separation of investment, construction, management and use. It must also reform present construction procedures and make the construction more rational. Simplify administrative approval process and strengthen the approval system. It also involves imposing effective supervision over real estate projects investigation, design, bidding, construction, and supervision. Perfect the supervision in construction and regulate the investigation, design, bidding and construction of projects, hence avoiding false bidding and reduce potential risks. Improving the effectiveness of cost control at the very beginning of all projects is vital to ensuring effective control mechanisms (Dong, 2005).

ii. Building and Perfecting the Cost Control System

Forming an organization or a body to control cost during the process of design, bidding, construction, management and building is one measure that helps to ensure effective cost control. It is also important to build a cost control system that focuses on project managers, which can help to predict costs and make decision. Building an information management system for cost control to actualize information feedback and process is yet another feature of ensuring effective cost control. Information system can help to offer pre-warning for errors, analyzing reasons, advancing suggestions, realizing a dynamic management of cost control, making up relevant standards for operations, Optimizing business operations, apply levelled empowerment and management as well as

establishing the responsibilities of positions. It also helps to build a check and incentive mechanism for cost supervision, make up standards for cost control and inspire workers' motives for cost management (Dong, 2005).

iii. Emphasizing on Designs and Strengthening Contract Management

Design is the most important ring for cost control in real estate construction, which can directly impact the construction period and investment scale. Therefore, it is necessary to select a design company carefully, checking its quality, experience, and general competence. By following the principle of convenience, select reasonable design indexes and control construction cost. Select the scheme properly and optimize the design to decrease the investment cost. Strengthen contracts management and supervise subcontracts and external workers. Control the changes of design strictly and build a system for changing designs (Qian, 2003).

iv. Enlarging the financing channels and optimizing the debt structure

Enlarge financing channels further by absorbing more funds to participate into real estate construction. Decrease the size of loans from banks and avoid too much dependence on banks. Construction companies should reduce capital costs by seeking fiscal low interests and official allowance. Explore new financing channels, such as assets reengineering, stock financing, issuing corporate debts, short-term financing, auction, listing in market, and absorbing foreign funds (Qian, 2003).

v. Controlling the Land Removing Fees

The government takes a part in land expropriation and removing. The government can make up a system for compensation standards by focusing on a series of standards for compensation in certain regions of Ghana. This may help to make the compensation fairer

and can benefit the stability of society. It is also essential at the very beginning to take the compensation into consideration so as to avoid its misuse. The design of the project must be precise as much as possible and ensure the predictability of land expropriation. Owners of construction projects should also prepare well for the construction and shorten the time distance between design and construction (Qian, 2003). Again, coordinating the relationship between the construction company and the local government and dealing with the illegal building properly is very necessary in controlling cost. For land to be used for certain period, the contract can restrain the construction company for the quantity, the type and the time, or the construction company is made responsible for the expenses of land used for certain period (Zhang & Gao, 2007).

vi. Controlling Management Costs and Reducing Expenditure

The construction company should strengthen internal control. The company should perfect the system by building an effective constraint mechanism, stop conspicuous consumption and improve the consciousness of saving. It should reduce management costs, build up a system which strengthens the construction of financial system and perfect the financial management rules. Further more, it is good to make up relevant regulations for expenditure, Standardize the approval of expenditure, establish the responsibilities of positions and work standards (Qian, 2003). Applying for budget control and execution system, compiling management budget and following the budget strictly, checking costs according to financial system and the budget and analyzing and examine the expenditure indexes are all critical to ensuring effective cost control

Also, allocation of management budget among functional sectors, and the financial sectors compiling the plan for expenditure by balancing the management expenditure eminent in ensuring effective cost control mechanisms. After the approval, all sectors can

compile the month's expenditure plan. Sign a target and responsibility contract for cost control. The construction company and relevant functional sectors can sign a target and responsibility contract for management cost, controlling the cost based on the contract and plan. Management expenditure should follow the approval procedures and authorities. Control the cost by plans and apply the target check system. Management expenditure should be associated with the process of construction, ensuring the normal, legal, and reasonable expenses (Qian, 2003).

vii. Budgeting

A budget can be explained as an estimate of costs, revenues and resources over a specified period, reflecting a reading of future financial conditions and goals. Budget is one of the most important administrative tools which is geared towards a plan of action for achieving quantified objectives, standard for measuring performance and a device for coping with foreseeable adverse situations (Dong, 2005). A budget is a set of interlinked plans that quantitatively describe a construction company, an entity or the contractors' projected future operations (Gao, 2007). A budget is used as a yardstick against which to measure actual operating results, for the allocation of funding and as a plan for future operations (Ma, 2009).

Budgeting as in construction refers to the process of creating a plan to spend money on project activities. This spending plan is called a budget. Creating this spending plan allows the contractor to determine in advance whether he/she will have enough money to carry out what is needed to initiate and complete a project. Budgeting is simply balancing expenses with income. If expenses and income do not balance and more income is spent than available income then comes a problem (Qian, 2003). The budgeting process typically begins with a strategic planning session by senior management. The management team

then applies the agreed strategic direction to a series of plans that roll up into a master budget. The plans include a sales budget, production budget, direct materials budget, direct labour budget, manufacturing overhead budget, sales and administrative budget and fixed assets budget. All of these plans roll up into the master budget, which contains a budgeted income statement, balance sheet and cash forecast. There may also be a financing budget in which is itemized the debt and equity structure needed to ensure that the cash requirements of the budget can be met (Zhang & Gao, 2007)

2.2.1.3 Efficiency and Effectiveness of Cost Control Measures

The building or construction industry regards effectiveness in cost control as the ability of the stakeholders or key players in the industry carrying out construction projects or works with optimal levels of input and output (Berg & Karlsen, 2007). Efficiency within the realms of building and construction is the ability to make the best use of resources to attain the satisfaction or benefits of a project given the capital requirement. Writing in Philanthropy Journal, analyst Creswell and Clark (2007), notes that satisfaction derived from a project constitutes a good measure of efficiency in the construction industry. Knutson (2001) is of the view that, regular monitoring of industrial efficiency can help to reduce financial wastage or loss in construction of projects. The most basic fundamental difference between organizational effectiveness and organizational efficiency lies in the fact that an organization can essentially use the former to measure anything, while the latter pertains exclusively to financial efficiency. Following the opinions of the Authorities indicated above, it can be concluded that, achieving cost control in the construction industry will demand, contractors, surveyors, foremen, storekeepers and Architects to be committed in the discharge of their roles and responsibilities (Zhang & Gao, 2007).

2.2.1.4 Commitment to Cost Control Measures

Commitment to cost control measures explains the ability of the key players at the realm of construction such as the constructors to remain focus in working towards reducing cost of construction and maximizes returns on the projects (El-Sabaa, 2001). It can also be described as the path way to ensuring cost effectiveness in project management. Efficient cost management in building construction is always one of the key aspects to ensure that the project remains optimally beneficial. The common practice is that, most of the building contractors or Project organizations ensure cost control establishing a project budget for the costs and track the actual project costs against it, to arrive at the remaining budget balances. Though the actual costs gives the required visibility to the remaining budget balances of a project, the "committed costs" also needs to be considered (Zhang & Gao, 2007).

Project Management Institute (2008) explained the "committed costs" expenses incurred on materials and services that are used over a period longer than the cost reporting period. However, Ofori (2012) established that, commitment to cost control in project management is not limited to one department of the construction industry. Ofori (2012) explains that, commitment to cost control cannot be successful without project managers employing effective and efficient surveyors, contractors, foremen, storekeepers and architects in pursue of quality project or construction works.

i. Architects' Perspective to Cost Control

Architects are professional designers of residential and commercial structures. As a professional, an architect considers cost of raising a building and uses that as a guide to design the building's style, safety and sustainability while maintaining the interest of the occupant and the requirements of the state as a regulator (Aziz, 2012). For quality,

sustainability and cost effectiveness associated with building, Architects meet with their clients to know the budget line and the specific requirements for their constructional project before drafting the plan.

To avoid unreasonably increasing cost of building projects, Architects work with other professionals, such as engineers, urban planners, landscape architects, construction representatives and interior designers to ensure that the design and cost of project is reasonable and sustainable (Aibinu & Pasco, 2008). As a cost control mechanism, Architects may sometimes be required to provide pre-design cost on environmental impact or feasibility study, cost analysis and land-use study. The professional architect after feasibility studies or environmental impact assessments puts forward the final construction plans to be used by the builders as a step-by-step guide on how the look and details of the building will play out.

As professionals who are usually sensitive not only to economic cost, but also social cost, more often than not, follow building codes, fire regulations, zoning laws and city ordinances when creating their plans. Architects view point on cost is not only directed at the final consumer of the product but the implied consequences on government should there be a disaster that causes damage to human life as result of poor architectural work. Though architects as much as possible try to consider or maintain reasonable cost of carrying a construction project, they do not compromise the interest of the disable in public buildings especially as per the disability laws on access.

According to Yoshimura, et al (2006), Architects must be well trained and familiar with computer-aided drafting systems, building modelling and other relevant technologies to aid them in their design and to avoid a wrong and costly design that does not stand the

test of modern technology. Yoshimura, et al (2006) established that, one classical feature of a qualified architect is for him to pass and possess the licensing examination certificate.

ii. Contractors' Perspective to Cost Control

A building contractor is an individual professional who engages in planning, developing and coordinating activities associated with building structures. The professional building contractor oversees the construction and makes certain that all necessary measures to avoid escalating cost or resources wastage and be able to finish the project as scheduled are under control (Georgieva, 2007). In the opinion of (Kerzner, 2006) a contractor carries out pertinent activities relating to cost of constructing a building or structure by preventing unreasonable cost associated to goods and services. The professional building contractor supervises employees, plans the execution of a project and its completion. The contractor also follows the laws, rules and regulations which may be in existence and correlate with construction. The contractor does this as measure to ensuring that the building project is cost effective (Hedeman & Heemst, 2006).

The building contractor ensures that the construction project is completed in a timely and correct manner through proper planning and implementation of the project plan and activities. This is to ensure that the client does not attract extra cost of completing the project. In addition to implementing the construction plan, the building contractor is responsible for hiring, supervising and, at times, firing employees who work on the specific project with the contractor (Gehring, 2007).

According to Marchewka (2006), hiring, supervising and firing employees are left in the hands of the contractor and not the client because the contractor has the technical expertise to know who does right and wrong. This mechanism is to eliminate unqualified persons in construction works and to avoid either an increasing cost of project or reducing cost and having shoddy work done for the client. Another mechanism of maintaining

reasonable cost in construction besides supervising the employees is that, the building contractor is mandated to take care of the payroll with regard to the workers.

However, the professional can also engage the services of a qualified accountant to take charge of the payroll functions for him. One other key function of the building contractor is to have proper communication and make negotiation in material acquisition from suppliers (Liu & Zhu, 2007). To avoid being caught up by law, the building contractor acquires all the necessary licenses and permits from relevant entities regarding the feasibility of the building before the building project can begin. This is to curtail the on-progress or in-process demolition of projects or calling for abrupt stop of work. When this happens it has the likelihood of increasing the cost of building projects since prices of goods and services are not stable (Harrison & Lock, 2004).

The building contractor also establishes a budget as a financial guide to avoid over and under expense of the construction project. The budget serves as a path way to building expenditure and allows the building contractor to be able to obtain supplies, hire workers and finish the construction in a cost-efficient manner (Neely, 1999). Throughout the construction process, the building contractor is also responsible for reviewing the progress and implementing any changes along the way that might affect cost of putting up the building.

Odusami and Onukwube (2008) advice that building contractor should possess decisiveness and have a wealth of experience which does aid the building contractor in getting the job done in a quick and efficient manner. In a bid to ensure cost effectiveness, most building contractors are quick and speedy in resolving issues which is a determinant to resolving delays in the construction of projects. Those building contractors who are determined, steadfast and seek quick resolutions are the ones who may prosper greatly in their occupation.

iii. Foremen's Perspective to Cost Control

A construction foreman is a person who works under qualified contractor in building projects and is being upgraded to the position of the foreman to take charge of activities of the construction on behalf of the contractor. A construction foreman is responsible for supervising the workers and also doing actual construction work. The construction foreman places employees in specific tasks to ensure the efficient completion of the project. This is one key determinant to ensure that projects do not exceed the scheduled time frame with its attended consequences of increasing cost of labour, materials and other services (Gao, 2007).

A foreman evaluates employees and determines how each employee can best contribute to the job, thus making sure that the actions and inaction of the employee does not jeopardize the construction of the project (Meredith & Mantel, 2010). One other measure that foremen use to control cost of building is their ability to read blueprints and knowledge of building codes to avoid violation of rules and demolition of construction projects. This measure is to ensure that future increase in prices of goods and services does not affect the project budget since the market for constructional goods and services in Ghana are not stable. Gao, (2007) reveals that, when a contract runs behind schedule, the foreman selects employees to work overtime until the contract is back on track. Gao, (2007) maintains that situation is not pleasant since it has the tendency of increasing cost of building materials and labour as against planned budget of the construction project.

In the interest of effective measures to control cost of construction projects foreman monitors employees for work done efficiently and within quality standards that meets value for money audit. Smith and Jaggar (2007) indicate that, competence in all skills also

enables the foreman to evaluate the other employees' work accurately and give feedback to the clients or managers of the construction company.

iv. Surveyors Perspective to Cost Control

The cost control of an engineering construction project is a complex dynamic system, which is throughout the whole project process, starting from the bid to the end of the project warranty period and every link needs to implement scientific and strict cost control (Chitkara, 2005). Chitkara maintain that, it is very important to study and work at the cost control of the engineering construction project and to improve the service efficiency of the construction funds to ensure avoidance of unnecessary cost.

In addition, Cost Control is a process where construction cost of a project is managed with the best method and systematic approach in order that the contractor would not suffer losses during the execution of the activities of the project and that the cost of construction of the project would not be over-estimated by the developer. Surveying and their associated roles are varied, but focused on providing clients value for money while adhering to the strict regulations which govern every aspect of the construction industry.

A typical work plan of a surveyor include, preparation of contracts, including quantities of required materials, on-going cost analysis, feasibility studies of client requests, analyzing completed work, arranging payment to contractors and allocating upcoming work to contractors. The land and construction surveys are the two main types of survey intended for this study in application for cost management of construction projects. Land surveyors are professionals skilled at marking out land by using historical evidence, recorded documents such as deeds and current surveying practices and standards. The role of land surveyor in this case is to make sure that accurate measurement of the land is taken to avoid inaccurate planning and cost of the building project (Meredith & Mantel, 2010).

Construction surveyors are land surveyors specializing in the construction field. A construction surveying establishes man-made objects such as highways, bridges, buildings and pipes located and ensure that a building or construction project has been placed on solid ground and sound footing (Smith & Jaggar, 2007). All the techniques used by land and construction surveyors is make certain that all that concerns the building project is accurate, cost effective and sustainable (Smith & Jaggar, 2007).

v. Storekeepers' Perspective to Cost Control

The Storekeeper is responsible for all warehouse operations activities including shipping, receiving deliveries, coordinating stock, documenting warehouse transactions, maintaining records, and overseeing storage of surplus inventory and property of the Construction Company. The role of the storekeeper is very vital because a little negligence can cause the contractor or the construction company financial loss. The storekeeper's inability to control store, lost of focus in the movement of the materials, lack of technical knowledge and experience in the maintenance of the store can cause financial havoc to consultants and contractors in the industry.

Meer-Kooistra, et al (2000) thinks that, the storekeeper is a professional because he has an organized ability and undoubted integrity, receives materials from suppliers on the basis of purchase order, materials received are arranged in a proper manner, bins are allotted to each and every item in the store, material in the store are kept on safe custody and recording of receipts and issuing of materials in their respective bin card are regular. In the views of (Meer-Kooistra, et al, 2000), issuing of materials, issuing purchasing requisition and supervision are professional qualities that the store keeper possesses in a bid to coordinate, supervise and control stock against unnecessary cost that might come as a result of mismanagement of stores.

2.2.1.5 Challenges Encountered When Ensuring Cost Control

One of the biggest problems on most building sites is the large amount of materials wastage due to varying circumstances (Amoah et al, 2011). This problem requires a supervisor to constantly be on the lookout for the losses. According to Ampadu-Asiamah et al (2013) wastage of materials can take place during the procurement process, storage, and during utilization. Wastage during procurement can result from one or more of the following causes: buying materials of wrong specifications, buying more than the actual requirements to cater for unrealistic and unforeseen eventualities, untimely buying of short-life materials, improper and unnecessary handling of materials, and wastage in transportation. Wastage during storage can occur due to the following reasons: damages and breakages during handling, deterioration due to incorrect storage, incorrect maintenance and short-shelf life and losses due to fire, thefts or vandalism, and exposure to extreme climatic conditions. Other causes are lack of pre-work preparation and coordination, improper accounting and poor storekeeping, negligent and careless attitude of the supervisor, high rate of deterioration due to long storage at the place of work, and over-issues from the central stores and failures to return unused surplus materials to the stores (Amoah et al, 2011).

Some unavoidable wastage is inherent during utilization, but excessive wastage is of concern to the management as it affects the productivity adversely, with consequences of extra costs. Most problems relating to material wastage revolve around requisitioning and ordering, receipt and checking of deliveries from suppliers, offloading and handling, storing and protecting, and issuing, distributing and use of materials. Material prices often depend on contractor, location, quantity and discount and hence making the estimation process to be rather difficult. The materials wastage of site will also contribute to this because there will be difference between the actual amount used and the estimated amount

used. In most cases, during the estimation process, the amount of overheads and profit will normally just be referred back to previous projects (Doloi, 2009).

In construction, some tasks are labour intensive, some predominantly employ equipment, and some use a combination of both. While the actual work done and the associated labour is accounted by the supervisor concerned, the equipment and productivity control is undertaken to determine its employment time, the output achieved, and its productivity at site. The main purpose of the control is to minimize wastage in utilization so that the overall project cost is not affected. Industrializing construction would probably reduce the cost of construction by about 30% which would likely settle the back log of 25% of Ghanaians without proper housing.

The control of labour cost frequently causing much trouble to Cost Control because of the productivity of labour is variable and causing the difficulty to the estimating stage. Although experienced estimators have their own database of historic cost data, but these data can only ever be regarded as an average for a given trade and does not make allowance for particular circumstances. A prediction of how labour will perform in the future on a particular project must be incorporated into an estimate of cost (Anbari, 2003).

Site management is greatly affecting the labour efficiency and their productivity. It is important that all labour resources, either self-employed or employed as labour and materials sub-contractors, are fully supervised and co-ordinated, to ensure that the labour resources are efficiently organized and making best used of them. If the labour resources are not well organized, it may reduce the productivity of the labour and making cost of labour to be higher hence causing difficulties to Cost Control because the labour cost is different with the estimated cost (Barazza et al, 2004).

After the design, quantity surveyor will normally estimate the amount of the designed work, but due to the site condition being unpredictable; it causes the cost estimation rather difficult. In many of the construction project, there are majority of unforeseen and differing site condition which are found in subsurface work such as tunnelling and foundation work, such situation can also arise in rehabilitation and restoration work. This contributes to the difficulty in cost control when the construction method is carried out wrongly (Davison, 2003).

Difficulties of Cost Control during construction stage are failure to estimate the project exactly, the compilation of project budget has poor reliability, working drawing budget is unpractical, do not follow basic construction procedures and cannot control costs, contract is not managed well, irregular management and many changes for project, rise of cost due to unreasonable financing structure and system is imperfect. Factors that contribute to those difficulties are control of labour cost; site Condition, location of site, materials and overheads and profit. It is necessary for management to study the difficulties involved and the factors contributing to these difficulties so that they will design a cost control system that more efficient for a particular project (Ahadzie, 2011).

i. Challenges Architects' Encounter in Ensuring Cost Control

The inability of architects to have time or meet with their clients to know the objective of their building is one of the challenges that beset the construction industry in Ghana. The implication of this challenge is the fact that the architect is most likely to draw building plan that does not conform to the client's budget. For want of financial gains, some architects refuse to work with other professionals such as engineers, urban planners, landscape architects, construction representatives and interior designers who are imbued

with diverse knowledge that can contribute to the construction of successful projects (Knutson, 2001).

Thompson (2010) is of the view that, one of the factors that contribute to resources or financial wastage of some construction firms is that some architects are always in a haste and does not carry out pre-design cost on environmental impact or feasibility study, cost analysis and land-use study properly before starting the building project. The consequences of this Irani, Sharif and Love (2005) established are the leading cause of unrealistic budget for the construction firm. In the wisdom of Wells (2007), Architects who are born before computers are not used to modern technology of using the computers to aid their architectural drafting, hence are still using manual drafting that does not stand the test of time in modern construction industry because of its inaccuracies in design and estimates.

ii. Challenges Contractors Encounter in Ensuring Cost Control

According to The World Bank (2010) contractors who do not want to abide by the rules and regulations which exist and correlate with construction in Ghana are bound to fail in their building projects. Some contractors upon winning the contract leave the duties of supervising employees and plan towards the execution of the project and its completion in the hands of foremen with little or no supervision. The end result of this is the production of shoddy building or contract which does not merit value for money audit.

Ghattas and McKee (2004) stated that most contractors go in for many building contracts at the same, thus their inability to make certain one construction project is completed timely and does not attract extra cost of completing the project for its delay. Hiring family members and relatives to work in construction works affects quality of labour efficiency because the contractor will be sceptical driving away family members and relatives who are inefficient in the discharge of their duties (Fugar & Agyarkwa, 2010).

The inability of the building contractor to oversee the issues of payroll, but engages the services of someone else to handle with little or no supervision affects the operational budget of the contract. Poor communication and negotiation skills of contractors greatly affect the material acquisition from suppliers (Dewberry, 2004)

iii. Challenges Foremen Encounter in Ensuring Cost Control

A construction foreman with limited knowledge in supervising workers and assigning them specific tasks of construction project affects scheduled time frame of the project and inversely on the labour and materials of construction (Cooke-Davies, 2002).

Today's' construction industry is flawed with incompetent personnel and made worst by political interference in the construction industry hence, people who cannot even read and write are made to be at the realm of affairs of the project execution and supervision. Since people who cannot read and write are made to be leaders, they are bound to flaw the building codes, rules and regulations governing the construction industry which can affect quality of output, hence cost of construction (Cooke-Davies, 2002). The incompetence of some supervisors affects the timely completion of building projects and attracts extra cost of labour to finish it. This affects the planned budget and puts the client into financial distress.

iv. Challenges Surveyors Encounter in Ensuring Cost Control

When contracts are not well managed with the best systematic approach, such contracts are bound to suffer losses during the execution of the building project activities. When surveyors are unable to make proper preparation of contracts, including quantities of required materials, on-going cost analysis, feasibility studies of client requests, analysis of completed work, arrangements of payment to contractors and allocation of work to

contractors, they failed in essence to provide value for money project to their clients (Wells, 2007).

2.2.1.6 Proposed Measures for Effective Cost Control

The relationship between time and cost is a very important aspect in the control of costs on site as any variation in time has automatic implication on cost. It is important to report and record all the works involving materials, plant and labour on sites. This enables the contractor be able to know the costs and expenses of the resources used on site and compare with the initial cost budget. Various report techniques used include; daily or weekly and monthly recording, schedule control, site daily diary report and the project budget.

Cost Control in construction industry should be the application of procedures or regulation during the construction project life cycle to plan, check and verify the construction project expenditure based on the established procedures or regulations to ensure that the construction project expenditure is within the project budget, within given timeframe with quality specified and also to ensure that resources are used to best advantages or maximization of the profit for the construction project (Fugar & Agyarkwa, 2010).

2.3 Theoretical Underpinnings

According to Meer-Kooistra and Vosselman (2000), a theory can basically be explained as model. It illustrates how something works by showing its elements in relationship to one another. Friedman explains that, some models show the elements in a dynamic relationship by describing process or action though others such as taxonomy describe relationships without describing process or action. The dynamic demonstration of

working elements in action as part of a structure or the demonstration of relationship is what distinguishes a model from a simple catalogue.

Meer-Kooistra and Vosselman (2000) views theory as, the analysis of a set of facts in their relation to one another, an abstract thought, abstract principles of a body of fact, a science, procedure proposed as the basis of action, hypothetical set of facts, scientifically accepted general principle, hypothesis assumed for the sake of investigation, conjecture and body of theorems presenting a concise systematic view of a subject. Theory allows us to frame and organize our observations and question what we see and do. It helps us to develop general view of a situation in place, thus the central issue in design. It is intuitive in nature and sometimes produces desired results. Intuitive practice of design produces unpredictable desirable results that can be seized retrospectively as the useable result of muddling through.

Fugar & Agyarkwa, (2010) Muddling through also has the chances of two kinds of failures. The first kind of failure involves proposals that fail in the early stages of conception of a development project. This is a good time for failure, since failure in conception or development eliminates potentially wasteful efforts and resources. The second kind of failure involves completed attempts at solutions in which the designers believe that they have solved the problem even though they have not done so. One of the central aspects of this kind of failure is the fact that some designers never learn that they have actually failed to meet clients or end-user needs. This is because designers often end their involvement with the project before the failures arise and the clients of most failures do not return to the original designer for repair. To meet the challenges of the design process requires understanding the actions that lead from existing situations to preferred ones. This means understanding the principles of predicting and measuring outcomes based on what Hedeman, et al (2006) termed profound knowledge. This knowledge comprised of

'four parts, all related to each other: appreciation for a system; knowledge about variation; theory of knowledge and psychology. Meer-Kooistra and Scapens (2000) conclude that, when these are properly accounted for, development projects are bound to succeed.

The production and design theory is one of the simplest theories that are used in the construction and engineering industry in recent times. The theory concerns itself with the design and implementation of constructional projects. It describes the activities of the construction project from the beginning to the end. It takes into consideration the competence of the technical persons involves in the execution of the project. It does cost-benefits analysis of the project and takes a decision that is cost effective.

One of the challenges in the design approach is the possibility of a mismatch between the goal of the theory and the goal of design practice. In the opinion of Zimmerman and Forlizzi, (2008), these perspectives cast the construction of theory as a design process involving sketching, critiquing and refinement into a unifying whole that specifically addresses how all the elements and properties relate. The challenge for the design approach is how to connect the outcomes of the design to the focus in theory development that reduces cost of construction and maximizes returns on the construction.

Zimmerman and Forlizzi, (2008) opined that the theory of cost-benefit analysis is very widely used and it is therefore important that its methods be properly understood. The purpose of cost-benefit analysis in cost control of project management is to provide a consistent procedure for evaluating decisions in terms of their consequences. This might appear as an obvious and sensible way to proceed with a construction project. However, other procedures such as majority voting, collective bargaining, the exercise of power, or the assertion of rights are all available alternatives.

Following the perspectives of the three theories presented, it can be inferred that, efficiency and effectiveness through the acquisition of knowledge, skills and experience is

the bedrock underlying competency and incompetence in the construction industry in Ghana. These two tenets of competency; efficiency and effectiveness including qualification and communication pattern on the part of the actors in the construction industry can be described as the major determinants of a cost effective project. The Architects, Contractors, Surveyors, Foremen and Storekeepers qualification, communication pattern, knowledge, experience and skills are very essential cost control and management of a construction project. The theories discussed are serving as the basis of this study line with the study objectives of the different actor's commitment to cost control, challenges encounter when ensuring cost control and proposed measures for effective cost control. However, it also of interest to briefly have an overview of the construction industry in Ghana before discussing literature of the effective determinants of cost control as envisioned in this study.

2.4 Ghana's Construction Industry

Ghana is a well-known promising market in sub-Saharan Africa building construction industry (Laryea, et al, 2010). The industry is dominated by physical infrastructure and asset-based-lending as a means for growth and development. According to Amoah, et al (2014), the construction industry contributes about 5% to 10% of Gross Domestic Product (GDP) to the country and employs nearly 10% of the working population.

Ofori (2012) has identified the sporadic development of the construction industry in local areas as a means of alleviating poverty in the country. The Chartered Institute of Building in Ghana estimates that there are over 1,600 building contractors working in Ghana since October 2012. Although the building construction industry supports the country's economy and thus provides a means for social development, the industry is

characterized by unprofessional practices (Amoah, et al, 2014). The industry suffers from lack of planning, including inappropriate water and energy use, building material consumption, failure to meet clients' needs, and disjointed stakeholders cooperation in the industry. These deficits form part of an industry caught up in corruption without transparent processes for procuring the services of consultants and contractors.

The unsustainable building construction processes coupled with the constant degradation of the environment continues to take their toll on Ghana's development. The sustainability challenge confronting the construction industry is to meet the demand for housing and other buildings in a strategic and sustainable manner. Generally stakeholders within the industry have the power and capacity to influence the positive changes necessary to improve the state of the industry (Ofori, 2012). Currently, the approach the Ghanaian building construction industry is employing to tackle existing challenges is not consistent and is adopted differently by the government and private organizations, rendering most efforts unproductive. This has often resulted in many building construction failures and is indicative of a lack of concise understanding and dialogue among stakeholders in the industry (Ampadu-Asiamah, et al, 2013).

Ofori (2012) also explains that most construction projects in Ghana have a long gestation period due to their large and complex nature and thus are slow to respond to planned and unplanned changes. Therefore, there is a need to mitigate the sustainability challenges in the building construction industry by immediately integrating sustainability into its practices. Amoah, et al, (2011) concludes, invariably, the challenges involve; ineffectiveness and inefficient management of building construction projects due to poor commitment to cost control, inability to mitigate challenges arising as a result of ensuring cost control and poor vision in proposing effective measures to cost control on the part of actors.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methods used to collect data for the study. It includes study area, research design, population sampling techniques and sample size. It also includes data collection techniques like questionnaire.

3.2 The Study Area

The Accra Metropolis is among the twenty (20) Metropolitan, Municipals and Districts of the Greater Accra Region of Ghana. Accra is the Administrative capital of the metropolitan assembly. The metro shares common boundaries with la-dadekotokpon municipal on the east and Ga west municipal, Ga central municipal and Ga south municipal assemblies. The metropolitan assembly also share common boundary with the Gulf of Guinea.

The population of Accra Metropolitan Assembly (AMA), according to the 2010 Population and Housing Census, is 1,665,086 representing 42 percent of the region's total population. The Metropolis has a household population of 1,599,914 with a total number of 450,748 households. The average household size is 3.7 persons per household. The housing stock of Accra Metropolis is 149,689. The total number of households in these houses was 450,794 with population per house estimated at 11.1% and an average household size of 3.7. The main construction material for outer walls of dwelling units in the Metropolis is cement block and concrete accounting for 81.9% with wood constituting 11.3%, Cement 82.5% and wood, 4.5%.

One room constitutes the highest percentage (65.0%) of sleeping rooms occupied by households in dwelling units in the Metropolis. About 23.0% of households with 10 or more members occupy single rooms. The three main sources of lighting in dwelling units in the Metropolis are electricity (93.8%) flashlight/torch (2.1%) and kerosene lamp (1.7%). The most commonly used toilet facility is public toilet accounting for 41.6%, followed by WC representing 31.9% and KVIP 14.9%. About 2.3% of the household's have no toilet facility. The study considered the period June, 2015 to June, 2016.

3.3 Research Design and Approach

A research design can be described as a detailed outline of how an investigation takes place. It usually includes how data is collected, what instruments are employed, how the instruments are used and the intended means for analyzing data collected. This research adopts Case Study as the logic of enquiry. The distinctive need for case studies arises out of the desire to understand complex social phenomena because; the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events, such as organizational and managerial processes. This study used the quantitative approach. The quantitative research approach involves the generation of data with simple frequencies and percentages which is subjected to formal and rigorous analysis.

3.4 The Study Population

The study population consisted of Architects, Surveyors, Contractors, Foremen and Storekeepers from the Accra Metropolis. These sections of the population was chosen because they are directly involved with information pertaining to cost control measures in building or constructional industry in Ghana. The estimated target population was 117 as illustrated in table 3.1.

Table 3.1:
Study Population

GROUP	FREQUENCY	PERCENTAGE (%)
Architects	3	3
Surveyors	5	4
Contractors	40	34
Foremen	65	56
Store keepers	4	3
TOTAL	**117**	**100**

Source: Public Works Department, Accra

3.5 Sampling Technique

Purposive sampling technique was used to gather information from the Architect and the surveyor. This was because they are few in the system and their role in the construction industry is also unique. In this study, the units of investigation exist in clusters. In this regard those in the industrial area of Tema were considered as cluster and those in the commercial area of Accra also considered as another cluster. Therefore, a simple random selection of a cluster simplified the investigation, reduced cost and at the same time retained almost the same degree of accuracy as random sampling.

3.6 Sample Size

The sample size for the study comprised of the three (3) Architects, two (2) surveyors, thirty (30) Contractors, thirty-five (35) Foremen and three (3) Storekeepers giving a total sample size of seventy-three (73), illustrated in table 3.2. All the respondents were quizzed on their knowledge and skills in cost control. The questionnaire was administered to all of the sample population except the Storekeepers who were booked for an interview.

Table 3.2:
Population Sample

GROUP	FREQUENCY	PERCENTAGE (%)
Architects	3	4
Surveyors	2	3
Contractors	30	41
Foremen	35	48
Store keepers	3	4
TOTAL	**73**	**100**

3.7 Data Collection Instruments

To examine the cost control measures used by contractors in the Greater Accra Region, two main instruments were used for the collection of data. The tools happened to be questionnaire and interviews.

3.7.1 Questionnaire

The questionnaire was developed to elicit information on the cost control measures employed by building contractors in the Greater Accra Region after an intensive review of literature from journals, articles, official publications, books as well as internet resources. The questionnaire items prepared were made up of closed-ended questions that sought for information on the cost control measures employed by building contractors. The questions dealt with issues like; problems associated with cost control measures, challenges encountered in ensuring cost control, as well as the most suitable measures for effective cost control. Different sets of questionnaire were designed for the different categories of respondents for the study, being the Contractors, Foremen, the Architects and Surveyors. The questionnaire was developed and administered by the researcher, but to start with, approval was sought from the stakeholders or actors in the construction industry within the

Metropolis of study. This was to seek the consent of the respondents and institutions to conduct the research (Sample of the questionnaire can be found at appendix A).

3.7.2 Interview

The next tool used to solicit information on cost control measures was as interview. An interview is a face-to-face meeting between an interviewer and an interviewee in an attempt to collect data for descriptive studies, correlation and evolutional studies as well as action research. It provides opportunity for the interviewer to probe for meaning of responses an interviewee would make due to its ability to create the opportunity for personal contact thereby yielding higher response rate.

An interview guide consisting of five (5) items was prepared, it was solely meant for the focus group, being the Storekeepers. Appointments with the Storekeepers were booked and on the interview day, all the necessary preparations were made since the interviews were to be recorded on tape with their consents (Sample of the interview guide can be found at appendix A)

3.8 Data collection procedures

The Procedures for Data Collection provides information on how and when data was collected. The procedure is intended to help improve the usefulness, timeliness, accuracy, and comparability of information among various stakeholders on cost control measures and inform key policy decisions on the building and construction industry. This procedure describes processes more often than not is geared towards high quality data and information. The administering of questionnaires for this study started on 25th November, 2015. The data collection ended on 10th December, 2015.

3.9 Data Analysis

The quantitative data was coded and entered into statistical software called the Statistical Package for Social Sciences (SPSS version 21.0). The data that was entered into the SPSS software was test run before final analysis. The data was analyzed and presented in charts and frequencies for easy understanding of the phenomena.

The Information gathered using the interview schedule was analyzed by first transcribing the information that was audio-taped during the data collection. The researcher then read through the information to obtain first hand ideas and tones of the participants and that informed the researcher on the impressions, credibility and use of the interview data. The detailed analysis of the data or information gathered began with sorting them into themes. It involved taking text data gathered during the data collection, segmenting the sentences and labelling them according to the respondents' language. The information was then presented thematically.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This section of the study presents a complete analysis of results concerning issues of cost control measures used by contractors in the Accra Metropolis of the Greater Accra Region of Ghana. The key areas of analysis were contractors' commitment to cost control measures, the challenges contractors encounter in cost control and their proposed measures for effective cost control. The contractor considers contributions of some actors such as the storekeepers, surveyors, architects and foremen as essential to ensuring effective cost control in building and construction. This is because the contractor does not work in isolation but within a system or a value chain. This means that the contractor alone cannot control cost since he/she is not the only one controlling the cost of goods and services in the process of carrying out a construction project.

4.2 Results and Discussion of Questionnaires Received From Respondents

The various respondents, being, the Contractors, the Foremen, the Surveyors and the Architects, were issued with the questionnaires. In all, seventy (70) questionnaires were issued out. Out of the seventy (70) questionnaires that were distributed, sixty-two (62) were received, representing about 88.57% of retrieval. The questionnaires retrieved were the ones used for the analysis.

4.2.1 Results and Discussion of Questionnaire from Contractors

The total number of questionnaires retrieved from the Contractors, numbered thirty (30). All the thirty questionnaires were used to analyse the data received from the Contractors, ranging from their age through to their responsibilities as Contractors.

The first objective sought to solicit the views of the contractors on the measures or ways and means by which cost of construction could be controlled while maintaining the desired quality of the project which meets the value for money standard. The objective focuses on some key areas such as educational level of the respondents, years of experience, understanding cost control, ability to acquire proper documentation (licenses and permits) for building projects, key responsibilities of the contractor and the contractors' knowledge on some basic skills in professional areas that are not directly within his domain. The combine effect is to ensure cost effectiveness of building or constructional projects.

4.2.1.1 Age Distribution of Contractors

Age is a major determinant of one's attitude towards work. The analysis revealed that, about one-seventh of the respondents (13.3%; n=4) were between the ages of 25 and 30 years whiles those within 36 - 40 and 41 - 45 years constituted about a third of the respondents (30%; n=9). Age was considered vital because it is a major determinant of the contractors' attitude, knowledge and skills towards the use of modern technology in construction as a way of ensuring effective cost control. The analysis revealed that, majority of the contractors (56.7%; n=17) are in the active age bracket of 31 – 35 years. This is an indication that the construction industry in the Accra Metropolis and Ghana for that matter has a brighter future since the future of every human society lies on the youthful population. The distribution of the respondents is as shown in table 4.1

Table 4.1:

Age Distribution of Contractors

AGE (YEARS)	FREQUENCY	PERCENTAGE (%)
25 – 30	4	13.3
31 - 35	17	56.7
36 - 40	2	6.7
41 - 45	7	23.3
TOTAL	**30**	**100**

4.2.1.2 Work Experience of Contractors

One other important determinant that was established from the analysis was the experience of the contractors and its impact on cost control. In this regard, age and years of experience were very vital. It is certain that, the more one's experience and age in a field of work, the better the person understands to issues surrounding that sector. The analysis again established that, the young contractors were more likely to be abreast with current technology of computer and other electronic gadgets that could aid them in their constructional plans and works than the aged contractors.

As the old adage goes, "experience is the best teacher", the analysis revealed that majority of the contractors (53.4%; n=16) had between 4 - 6 years of experience, with a half of the remaining respondents (23.3%; n=7) having between 7 - 9 years of experience and the other half (23.3%; n=7) having 10 or more years of work experience in building and construction as table 4.2 depicts.

Table 4.2:

Working Experience of Contractors

YEARS	FREQUENCY	PERCENTAGE (%)
4 - 6	16	53.4
7 - 9	7	23.3
10 AND ABOVE	7	23.3
TOTAL	**30**	**100**

A respondent is certain that the more contractors stay and work in the building and construction industry, the more likely the contractor gains professional experience in the work and develop more skills based on the experience acquired. The respondent continues to explain that experience helps the contractor to be able to manage resources so as to reduce cost and also do proper cost-benefit analysis of a building project.

Another respondent was of the view that experience enhances the contractors' knowledge to engage in proper bidding of construction contract. The results also revealed that the contractors' work experience presents the contractor with an in-depth knowledge of the zoning laws, ordinance, rules and regulations governing the construction industry. In view of this, it can be implied that knowledge in the legal issues on construction allows the contractor to strictly adhere to them and avoid violating these rules which eventually might lead to termination of contracts. In the opinion of some respondents, contract termination and demolition of building projects has the tendency of increasing the budget of a contractor and the client on the construction project.

However, the findings of the study indicate that, contractors with less years of experience constituted the greater percentage of 53.4% of the study population. This also means that, Ghana is now producing more contractors than previously. However, since greater number of years has an impact on the knowledge and skills of the contractors in

their day to day's work, it is quite disadvantageous having those in less years of experience been the greater proportion of the contractors. In the positive domain, this shows that the building and construction industry in Ghana has a brighter future since more and young enterprising contractors are coming out from the various professional Institutions and Universities.

4.2.1.3 Educational Level of Contractors

On the educational level of the respondents, formal education can be described as the bed rock on which knowledge and skills of modern building and construction are acquired and used. A respondent is certain that effectiveness and efficiency regarding the current methods of construction is linked to the use of computers which aid contractors, surveyors and architects in their plans and design of constructional projects.

The results indicated that, almost a half of the contractors (47%; n=14) had attained educational qualification up to the Tertiary level. This category of persons has degrees in their field of study mostly from Universities. A third of the contractors (33%; n=10) had professional qualification from some of the Institutions that offer professional courses in building and construction. Some of these educational Institutions include the Country's Polytechnics. Their responses are as illustrated in figure 4.1.

The respondents explained further that the use of modern technology such as the computers helped contractors in the use of spreadsheet or excel to enter records of a constructional project such as income and expenditure, materials sent and received and payroll issues. This enables the contractor to keep track of cost incurred and uses the management skills to manage such cost.

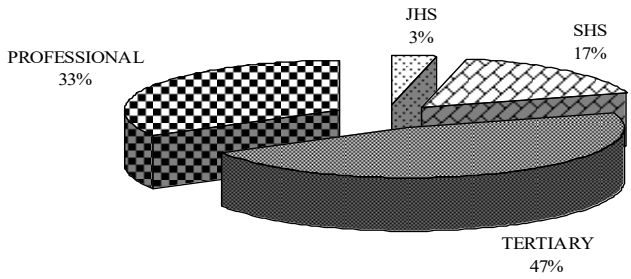

Fig. 4.1: ***Educational Level of Contractors***

4.2.1.4 Contractors' Knowledge on Issues of Cost Control

The analysis unravelled that, understanding the concerns of project management regarding cost reduction and ensuring effectiveness and efficiency in the delivering of building project activities is one step forward towards handling issues of cost control. The results of the study shows that, majority of the contractors (77%; n=23) did indicate their understanding of issues surrounding cost control whereas the rest (23%; n=7) indicated not having full knowledge of issues surrounding cost control measures. Implicitly, contractors with full knowledge of cost control have diverse ways of saving increasing expenditure of construction projects while maintaining the desired quality.

The findings again showed that, such contractors knew how to handle material acquisition, labour and the protocols involved in the process of building and construction. By inference, this helps to address poor management of personnel and resources and the violation of building rules, laws and regulations including zoning which might lead to the demolition of the structure. Hedeman and Heemst (2006) affirm this assertion by the respondents that contractors must follow the laws, rules and regulations which are in existence and correlate with building and construction. It allows the contractor to be able to make good budget and monitor cost of project execution, propose timelines and ensures value for money project and audit.

In the opinion of a contractor, one of the challenges that beset them sometimes as contractors is that, some contractors are not law abiding, thus violating the rules of contract which can affect the sustainability of a building project. This is in consonance with the idea established by the World Bank (2010) that contractors do not abide by the rules and regulations which exist and correlate with construction in Ghana and are therefore bound to fail in their building projects.

The respondent established that most of the contractors go in for many projects at the same time, hence are sometimes unable to effectively run the projects concurrently for a successful completion thus posing a challenge on the resources and timeline to the client. Ghattas and McKee (2004) view this assertion as most contractors go in for many building contracts at the same time and are not able to complete them timely without attracting extra cost as result of its delay. In soliciting the views of respondents on challenges that they encounter in their field of work, another respondent had this to say;

> *"The inability of surveyors to create platforms for appropriate groundwork of contracts, including materials required, cost analysis, client requests, analyzes of completed work and allocation of work to contractors affects the cost of a building contract".*

This view is in line with the assertion of Wells (2007) on the challenges confronting surveyors in reducing cost of building projects.

4.2.1.5 Availability of Challenges in Ensuring Cost Control

The respondents were tasked to indicate the availability of challenges when it comes to the practices that would help ensure effective cost control in the execution of their projects. In their response, about two-thirds (77%; n=23) of the respondents indicated that

they do face a lot of challenges when it came to the implementation of cost control measures in the execution of projects. About one-third of the respondents (23%; n=7) unfortunately, did not respond at all. Upon a critical analysis, it could be deduced that those who refused to respond might be those contractors who indicated not having full knowledge of issues surrounding cost control measures.

4.2.1.6 Contractors' Acquisition of Permits

On the issue of licence permits, the respondents were asked if they acquired all the necessary permits before putting up projects. In their response, majority of the respondents (60%; n=18) indicated that acquiring licenses and permit before beginning a constructional work is not always important. About a quarter of the respondents (40%; n=12) were of the view that it was very essential to acquire all the necessary licenses and permits before beginning a construction project as shown in figure 4.2. A respondent was emphatic that, acquiring the necessary licenses and permits helps the building contractor and the client to avoid unnecessary demolition of the building or its termination.

In line with this assertion from the respondent, Licenses and permits are therefore very important documentation needed in the process of acquiring legal documents for a construction project. However, it is quite disappointing to find some contractors, according to this study, claiming that acquiring licenses and permit for buildings are not all that important processes for a start of a building project. Following this assertion by the respondent, it may be inferred that such contractors are those that are not legally registered and also do not know the building laws, rules and regulations governing the execution of a contract of a building project. It can also be inferred that, this category of contractors are also those with no or less formal education who do not consider building protocols as important but just want to have a building put up.

It is understood that, contractors are sometimes compelled to ignore the necessary procedures and protocols in carrying out construction projects because the processes involved are usually cumbersome and delays the process of starting the construction. In the event where the client considers it as a duty and acquires the building permit before the contract is awarded to a qualified contractor, then this process becomes easy. It can be implied that the respondents who indicated the importance of licenses and permits before a building starts are those within the older contractors and experienced enough in the process of having smooth process of carrying out the processes of building. This is because they know the consequences of violating the construction protocols.

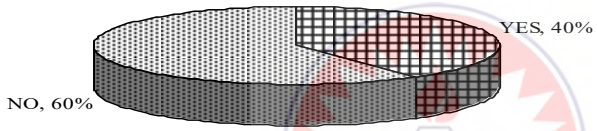

Figure 4.2: ***Contractors' Acquisition of Permits***

4.2.1.7 Contractors' Knowledge in Basic Skills

Here, the respondents were required to give an indication on whether they had some basic skills in the construction industry. Their response indicates that a well qualified contractor has the requisite knowledge and skills in budget development, plumbing, framing, carpentry and masonry. This knowledge helps the contractor to track quality of work because the contractor has the requisite knowledge in the areas and will be able to tell whether works done in these areas are properly executed. Their views are as illustrated in figure 4.3

In the absence of any of the workers in these areas of work, the contractor can step in to do the work since he/she has knowledge in the field. This can help to reduce the cost

of employing an extra employee to fill in the vacancy created by the employee. Figure 4.3 indicates that for the thirty contractors, majority of them (86.7%; n=26) had some knowledge in the development of budgets, plumbing, framing, carpentry and masonry. This implies that cost control measures regarding these areas of construction are well managed. It also indicates that contractors are actually in tune with modern technology and are enthusiastic about their work. This is very paramount to ensuring cost control measures since the contractor's knowledge in all these areas will help the contractor to be able to track cost that measures to the value for money standard.

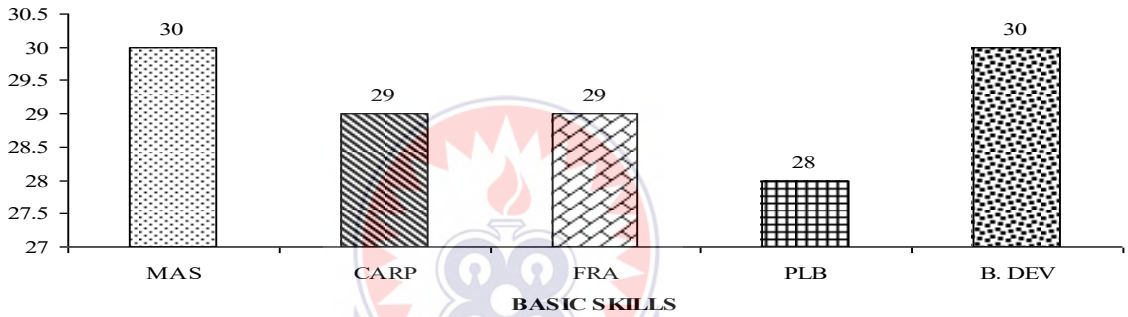

Figure 4.3: ***Contractors' Knowledge in Basic Skills***

4.2.1.8 Responsibility of Contractors

The respondents were asked to indicate whether it was part of their responsibilities to hire workers for a building project, negotiate in material acquisition from suppliers as well as to draw budgets that served as a financial guide to their projects. In their response, majority of the respondents (66%; n=20) indicated that they were responsible for all the activities. A few of them (27%; n=8) indicated that they were not responsible for the activities.

This shows that the contractors are highly involved in the processes associated with a building project; hence, if they were to take a critical look at the measures of ensuring effective cost control, it will go a long way to enrich the outcome of their projects.

4.2.2 Results and Discussion of Questionnaire from Foremen

The total number of questionnaires retrieved from the Foremen, numbered thirty (30), out of the thirty-five (35) questionnaires that were sent out. This represented about 85.7% of retrieval. All the thirty questionnaires retrieved were used to analyse the data received from the Foremen.

4.2.2.1 Assigning of Roles by the Foremen

In their response to whether they assigned roles to the employees in the execution of a building project, the respondents indicated in their responses that they really assigned roles. All of the respondents (100%; n=30) indicated that their main role in the industry was to assign roles and ensure that the roles are adhered to the latter. This then gives the indication that the Forman of any construction site would have to be abreast with the day to day roles of the project. He must also be on top of issues concerning the employees as well as the strengths and weaknesses of all the available employees for the project.

4.2.2.2 Functions of the Foremen

Foremen are expected to function as a means to checking the unwanted cost control in the construction industry as indicated in table 4.3. Table 4.3 presents the perspective of the Foremen on cost control in the building and construction industry. The key areas of assessment for cost control was the responsibilities of the Foremen which included, safety precautions such as training of employees (TE), involvement in the actual construction

work (AC), assigning roles (AR) and monitoring of employees (ME) as measures to ensure that employees are effective at work and does not waste constructional resources.

The training of employees by the foremen is meant to ensure that employees are more active, effective and efficient in the discharge of their duties so as not to engage in attitudes that has the tendency of increasing the cost of project construction. A respondent explains that, the involvement of Foremen in building and construction was also to see to it that monitoring was done to ensure that materials meant for projects were properly used and accounted for in the end. The respondent was of the view that, the assignment of roles ensured that there was effective monitoring of work done by individual employees. Apparently, this helped in the identification of employees who were not effective and efficient in the discharge of their duties.

It is also worth noting that, monitoring of employees helps in the identification of lukewarm employees who are capable of mishandling the duties and resources of the construction firm thus increasing cost of projects execution. Effective monitoring would help the contractor to be able to eliminate employees who are not measuring up to standard. The results of the analysis shows that (60%; n=18) of the Foremen do carry out training for their employees, (80%; n=24) get involved in the actual construction itself, (80%; n=24) assigns specific roles to their employees and (100%; n=30) are involved in monitoring of their employees. This result is encouraging and gives a window of hope since all the four key areas of assessments are responding above average. It therefore implies that the Foreman's role of ensuring effective cost control has gained firm roots in the construction industry. It also means that given the Foreman a full control over the workers, there can be maximum reduction and control regarding cost control and ensuring effective and quality building standards.

Table 4.3:

Functions of Foremen

FUNCTIONS	RESPONSE	FREQUENCY	PERCENTAGE (%)	TOTAL	
EMPLOYEE TRAINING (TE)	YES	18	60	60	
	NO	12	40	40	**100**
ACTUAL CONST. WK. INVOLVEMENT (AC)	YES	24	80	80	
	NO	6	20	20	**100**
ASSIGNING ROLLS (AR)	YES	24	80	80	
	NO	6	20	20	**100**
EMPLOYEE MONITORING (ME)	YES	30	100	100	
	NO	0	0	0	**100**

4.2.2.3 Encouragement of Cost Control by Foremen

The Foremen were asked to indicate whether they supported the view that cost control in the building construction industry be encouraged. In their response, majority of the respondents (97%; n=29) were in favour of the view that, cost control should be encouraged within the construction industry. Only one of the respondents (3%; n=1) shared a divergent view as indicated by figure 4.4.

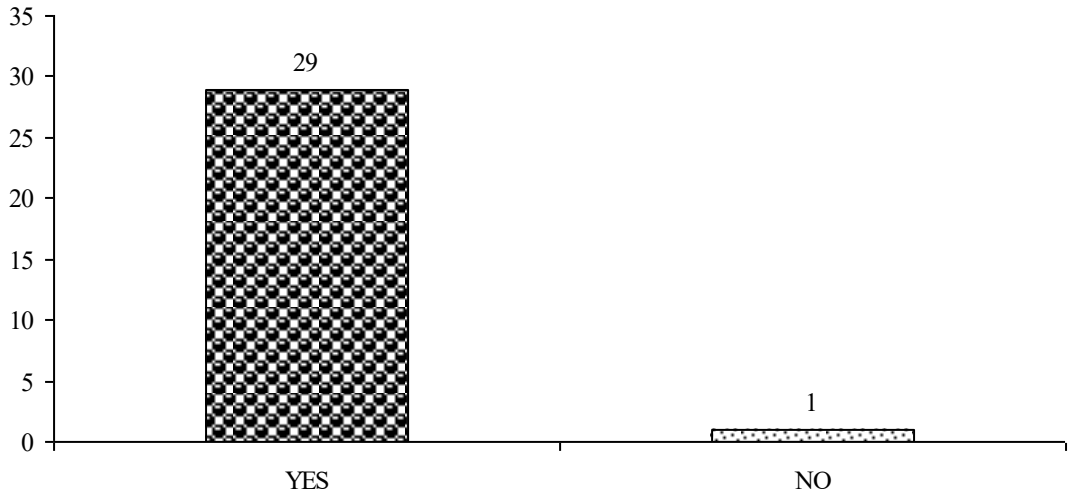

Figure 4.4: Encouragement of Cost Control by Foremen

4.2.3 Results and Discussion of Questionnaires from the Architect & Surveyor

Five (5) questionnaires were sent out, three (3) to the Architects and two (2) to the Surveyors. In all, only (1) questionnaire each was received from the groups. Both questionnaires were analysed together since they both had the same questions and the responses were also similar.

4.2.3.1 Encouragement of Cost Control by the Architects and Surveyors

The Architects and Surveyors were asked to indicate whether they supported the view that cost control in the building construction industry be encouraged. In their response, all the respondents (100%; n=2) were in favour of the view that, cost control should be encouraged within the construction industry. This was after they had all declared having enough knowledge about cost control issues within the building construction industry. Non of the respondents had a divergent view.

4.2.3.2 Challenges to Cost Control

The second objective of the study presents the challenges that the industry players encounter in the cause of discharging their duties. The Architects and Surveyors were asked to give their views as to whether there were challenges associated with cost control issues in their various areas. In their response, both respondents (100%; n=2) indicated that there were a lot of challenges associated with cost control issues within the industry. In a follow up question, the respondents indicated that the challenges in the construction sector were not small, but they were managing. The major problem they faced was the way the prices of petroleum products were going up daily. They added that most of the building materials have some correlation with petroleum products in terms of pricing and an increase in the price of petroleum products has direct effect on the prices of building materials and workers salaries.

The Architect revealed that most Architects have little time to meet with their clients to identify their objective of the building they intend to put up. The inference is that the Architect is more prone to drawing building plans that do not conform to the client's financial strength or budget. The constructional value chain is very important if a contractor is to achieve the quality desired and to continue in business. Some of the professionals do not want to involve other professionals to co-plan and build a construction project. This sometimes affects the quality of buildings because the contractor alone cannot have all the knowledge of the construction industry. Knutson (2001) presents this assertion as knowledge is not imbued in one person and therefore all the other players in the building and construction projects need to support each other with their expert advice and ideas to have a successful project executed.

According to the responds, Architects by their profession are busy and so more often than not carry out some hasty decisions and plans which in the long run affect the

project quality. This opinion by the respondent is in line with the assessment made by Thompson (2010) that, one of the factors that contribute to resource wastage within the building and construction industry is that some Architects are always in a haste and does shoddy pre-design cost on feasibility studies, cost analysis and land-use study before starting the building project.

4.2.3.3 Proposed Measures of Cost Control

The third objective of the study sought to solicit the views of the respondents on their proposed solutions to the challenges militating against the successful execution of building contracts by contractors. The analysis revealed that employing well qualified and experienced professionals in the field of building and construction would enable proper recording and reporting of transactions which is an important aspect of the cost control measures.

According to the respondents, the best way to Control the cost of a building project or goods and services is to follow procedures or regulations laid down for the construction and acquisition of materials. The respondents proposed that since the prices of building and construction materials are affected by the continuous increase in prices of petroleum products, it is recommended that building materials are acquired ahead of time in bulk for a building project than buying them in piecemeal. In connection to the site of building project, a respondent suggested that proper site studying or feasibility studies needs to be carried out to ascertain the nature of the site which will inform the budget of the project. Proper cost control can only be carried out if the major actors or players in the construction industry come together to contribute their knowledge and skills towards a construction project. The responds maintained that the coming together of the various players of the

construction industry will help reduce the unfortunate mismanagement of resources resulting from imperfection in the knowledge of one aspect of the construction industry.

4.2.4 Results and Discussion of Interview Held with the Storekeeper

Three (3) Storekeepers were identified and booked for an interview on their convenient days. Unfortunately, only one of them availed himself for the interview on the agreed date and time. The others could not make it even after three consecutive postponements. The views of the available Storekeeper was analysed and used for the study.

4.2.4.1 Knowledge on Cost Control

One's level of knowledge on an issue is very paramount when it comes to making decisions pertaining to that particular issue. It was upon this assertion that the Storekeeper's level of understanding was sought for on the issue of cost control. In his response, the Storekeeper disclosed full knowledge of cost control issues. This then gives the indication that his responses to the questions that followed were going to be reliable.

4.2.4.2 Encouragement of Cost Control

On the issue of whether cost control should be encouraged in the industry, the interviewee responded that almost all projects could thrive and end well if, as a matter of fact, all measures that were supposed to ensure effective cost control were to be seriously adhered to. In his view, this practice was in all ways going to minimise cost and ensure profitability in all angles.

4.2.4.3 Challenges to Cost Control

According to the respondent there are challenges with cost control in the construction industry. In a follow up question, the respondent had this to say;

> *"The challenges in the construction sector are many, but we only do our best to manage them. The major problem is the price fluctuations as a result of the frequent increases in prices of petroleum products".*

The respondent added that most of the building materials have some correlation with petroleum products in terms of pricing and an increase in the price of petroleum products has direct effect on the prices of the materials within the industry. The respondent made it clear that some of the contractors go in for new projects while they are no where near the completion of old ones, hence, they are sometimes unable to effectively run the projects concurrently for a successful completion. This, to him, creates a challenge on the resources to the client. He further had this to say;

> *"the inability of surveyors to create platforms for appropriate groundwork of contracts, including materials required, cost analysis, client requests, analyzes of completed work and allocation of work to contractors affects the cost of a building contract".*

4.2.4.4 Proposed Measures of Cost Control

With the objective of soliciting the views of the respondents on their proposed solutions to the challenges militating against the successful execution of building contracts by contractors, the interviewee revealed that, employing well qualified and experienced professionals in the field of building and construction would enhance the proper recording and reporting of transactions which is an important aspect of cost control measures.

The respondent indicated that, following the right procedures and principles laid down for the construction and procurement of materials was the best way to deal with cost control in the construction industry. He also had this to say;

> *"Sometimes some of the items are procured in excess and the extra ones are kept at the stores for a very long time, this makes some of the materials which may be perishable, go waste. Some materials are also used when they were actually not necessary because of a lapse somewhere. All these are part of the waste which when checked will go a long way to control cost".*

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusions and recommendations of the study.

5.2 Summary of Findings

i. The study revealed that contractors with minimum experience form the greater proportion of the study population.

ii. The study showed that some contractors have some level of understanding of issues concerning cost control, whereas some also have full knowledge of issues involving cost control measures.

iii. The study revealed that, there are enormous challenges with cost control measures in the construction industry. The unstable nature of market for goods and services are seen as a major factor.

iv. It was also established that the haste nature of some contractors in the bidding process has affected the quality of the project to be carried out.

v. It was noted with concern that most of the contractors are not able to complete their projects on time, because they go in for many building projects at the same time but with the same number of labour employed.

vi. The study also showed that most construction firm's personnel do not understand the principles and practices of cost control; hence, they do not enforce the rules to achieve the best results.

5.3 CONCLUSION

The findings of this study creates the impression that, cost control measures are not the preserve of the contractor, but includes the expert knowledge of other players in the industry such as the storekeepers, surveyors, Foremen and architects. It is also clear that most of the contractors, if not all, have attained University and professional qualification that aids their professional conduct. It is an underlying principle which enhances understanding of cost control. It is still evident that contractors are adhering to cost-benefits analysis which plays a central role in ensuring cost control measures in the construction industry. It is equally worth noting that, the other professionals such as the surveyors, Foremen, Storekeepers and architects including the contractors have full understanding of their role and responsibilities which contributes to ensuring effective cost control in the building and construction industry. However, each party must respect the constructional protocols in other to have a successful project execution. It is also good to note that a good contractor must possess additional competence except what pertains in his specialization so as to reduce cost of employing an employee in the event that some workers are absent.

5.4 RECOMMENDATIONS

Following the findings of this research, the following recommendations are made for further consideration by stakeholders in the building and construction industry in the Accra Metropolis.

i. Only experienced contractors should be invited during the bidding process of a project.

ii. Contractors should update their level of knowledge in cost control measures by undertaking short courses.

iii. Contractors should equip themselves with the enormous challenges associated with cost control measures such as the unstable nature of market for goods and services, before going in to bid for projects.

iv. The bidding of projects should not be carried out in haste, but consideration should be given to factors like; site location, nature of the land and price fluctuations among others.

v. Contractors are to complete their projects on time; they should not go in for many building projects at the same time with the same number of labour employed.

vi. There should be on-the-job training for construction firm's personnel for them to understand the principles and practices of cost control, so they can enforce the rules to achieve the best results.

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APENDIX A

QUESTIONNAIRE FOR CONTRACTORS

This questionnaire is for academic purposes and your contributions are highly needed. Please be assured that your responses would in no way be used in any situation that may affect you. Please do not write your name on the questionnaire, thank you.

Respond through YES or NO, by writing or by ticking where appropriate.

1. Age in years
   1. 25-30 [ ] 2. 31-35 [ ] 3. 36-40 [ ] 4. 41-45 [ ] 5. 46-50 [ ] 6. 51+ [ ]

2. Educational level
   1. JHS [ ] 2. SHS [ ] 3. Tertiary [ ] 4. Professional [ ]

3. Years of experience
   1.1-3[ ] 2. 4-6[ ] 3. 7-9[ ] 4. 10+ [ ]

4. Registered as a contractor
   1. Yes [ ] 2. No [ ]

5. Do you understand the meaning of cost control in construction?
   1. Yes [ ] 2. No [ ]

6. If yes to question '5' explain your understanding of cost control
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……
……

7. Do you have basic skills in any of the following?
   1. Masonry [ ] 2. Carpentry[ ] 3. Framing [ ]
   4. Plumbing[ ] 5. Development of budget [ ]

8. Are you responsible for the following activities?
   i. Hiring of workers to work in a building project

ii. making negotiations in material acquisition from suppliers
iii. drawing a budget that serves as a financial guide to your projects

1. Yes [ ] 2. No [ ]

9. Do you follow the building laws, rules and regulation that existence and correlate with construction?

1. Yes [ ] 2.No [ ]

10. Are you involved in taking care of the payroll?

1. Yes [ ] 2.No [ ]

11. Do you acquire all the necessary permits from relevant entities before putting up a building project?

1. Yes [ ] 2.No [ ]

12. Do you face challenges in practicing cost control measures?

1. Yes [ ] 2.No [ ]

13. If yes, what are the challenges?

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QUESTIONNAIRE FOR FOREMEN

This questionnaire is for academic purposes and your contributions are highly needed. Please be assured that your responses would in no way be used in any situation that may affect you. Please do not write your name on the questionnaire, thank you.

Respond through YES or NO, by writing or by ticking where appropriate.

1. Do you train employees for safety precautions?

    1. Yes [ ] 2.No [ ]

2. Do you assign roles to employees?

    1. Yes [ ] 2.No [ ]

3. What are your functions as a Foreman?

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……

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4. What is your understanding of cost control in construction?

……
……
……

5. Should cost control be encouraged and why?

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……
……

6. What are the challenges you encounter in construction as a Foreman?

……
……

QUESTIONNAIRE FOR SURVEYORS & ARCHITECTS

This questionnaire is for academic purposes and your contributions are highly needed. Please be assured that your responses would in no way be used in any situation that may affect you. Please do not write your name on the questionnaire, thank you.

Respond through YES or NO, by writing or by ticking where appropriate.

1. Do you have any idea about cost control?
   1. Yes [ ] 2. No [ ]

2. What is your understanding of cost control in construction?

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……
……

3. Should cost control be encouraged and why?

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……
……

4. What are some of the challenges of cost control?

……
……
……

5. What measures can you propose to ensure cost control?

……
……
……

AN INTERVIEW GUIDE FOR STOREKEEPERS

1. Do you have any idea about cost control?

2. If yes, what is your understanding of cost control in construction?

3. Should cost control be encouraged and why?

4. What are some of the challenges of cost control?

5. What measures can you propose to ensure cost control?