KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

TOPIC:

"EFFECTIVE PROCUREMENT PROGRAMMING AT THE PRE-CONTRACT STAGE OF BUILDING CONSTRUCTION PROJECTS"

STUDENT:

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(BSc Construction Technology and Management)

A thesis submitted to the Department of Building Technology, College of Art and Built Environment in partial fulfilment of the requirements for the degree of MSc Procurement Management

OCTOBER, 2015

DECLARATION

I hereby declare that, this project report is the result of my own work, except for the literature whose sources have been explicitly acknowledged and that, this submission has neither in whole nor in part been prescribed by another degree elsewhere.

JOHN KWEKU KUMATSE

(STUDENT) **DATE**

…….. **……**

I declare that I have supervised this student in undertaking the study reported herein and confirm that the student has my permission to present it for assessment.

DR. EMMANUEL ADINYIRA

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ABSTRACT

Pre-contract planning phase in construction comprises all activities that are undertaken from the time of receipt of letter of award up to the time of site possession. Procurement is made with the aim of accomplishing a specific task. Due to the fact that resources are constantly in short supply, procurement programming should be important to an organization. The main aim of this research is to identify ways of improving on procurement programming at the pre contract stage of building construction projects. A literature review was undertaken and it delved into the benefits, challenges and strategies to enhance procurement programmes. Arising from this, questionnaires were used to gather data from respondents in the Kumasi metropolis. Quantitative approach was adopted and purposive sampling technique employed. Fifty nine questionnaires were retrieved out of seventy distributed representing an eighty four percent response rate. The data were analyzed and presented using descriptive statistics and Relative Importance Index only. The findings of the study pointed out that *leads to effective and efficient projects; promotes transparency and accountability; leads to overall cost reduction, helps to review and assess compliance, helps improve communication channel* and *aids in identifying clear roles and responsibilities in the procurement process* were the most important benefits of procurement programmes. Furthermore, the findings also pointed out that *incomplete specifications, inadequate information concerning budgeting process; determining how long each step in procurement cycle is likely to take, coordinating the procurement schedule with funds release dates, unrealistic delivery schedule* and *bottlenecks in approval structure* were the most severe challenges to procurement programming. Finally, *adequate feasibility of project should be conducted, specifications*

should be clear and sufficient, rational delivery schedule, adequate planning of construction projects, speed of information flow and *source of funding should be well established* were the most significant strategies in effective procurement programming. The findings from the study are useful for construction stakeholders, helping them to know effective procurement programming at the pre-contract stage. It is recommended that there should be adequate planning of construction projects.

Keywords: Pre-contract, Procurement, Programmes

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DEDICATION

This project work is wholeheartedly dedicated to God Almighty and my family.

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CHAPTER ONE

INTRODUCTION

1.1BACKGROUND

Pre-contract planning phase in construction comprises all activities that are undertaken from the time of receipt of letter of award up to the time of site possession. Procurement is made with the aim of accomplishing a specific task. Due to the fact that resources are constantly in short supply, the task to be accomplished should be important to an organization (Nakamura, 2004).

When needs have been recognized, the procurement department should develop a plan or programme for the operation or goods needed. This plan should be built up in alliance with the other undertakings in the company, in order that it is incorporated with the strategy of the organization and consequently catered for sufficiently (Shaw, 2010). In order to procure the correct services and goods, the requirements and specifications of which will be needed by the construction firm needs have to be comprehensible. Specifications and requirements in the procurement programme help in corresponding to the supplier the needs and exactly what ought to be delivered. There is therefore the necessity to have apparent, exact and precise specifications when developing procurement plans (Shaw, 2010).

Caldwell *et al*. (2009) provide that a specification depicts a comprehensive depiction of the service, the design, or materials. It portrays in full the prerequisites which the services or supplies should match. The fundamental necessity of an excellent requirement and specification in a procurement programme is to apparently recognize the product or

service to stakeholders. Specifications should essentially be unambiguous to all those involved at the pre contract stage. These include the user, supplier and the procurement. Aspects that should be considered when stipulating products include physical characteristics, technical specification, and the proposed use (Thai *et al*., 2005).

Procurement programmes at the pre contract stage management requirements usually incorporate quality, timeliness, cost, decreasing business, monetary and technical risks, taking full advantage of competition, and upholding uprightness (Nakamura, 2004). The requirements of procurement plan generally encompass financially viable targets (choosing indigenous or local companies), protection of the environment or green procurement (enhancing the application of recycled materials), communal goals (helping minority and woman-owned business concerns), and worldwide buying and selling contracts. Hence, it is essential that, procurement practitioners make an optimal decision when developing procurement plans and programmes at the pre contract stage of construction (Thai *et al*., 2005).

1.2 PROBLEM STATEMENT

It is observed that, most entities are unable to award contracts on time due to inadequate procurement plans at the pre tender and contract stages (Nakamura, 2004). World Bank (2003) intimated that “misapplication of the procurement procedures in construction firms is due to uneducated procurement staff.

Lack of effective procurement programmes and plans by contractors have led to unfairness in procurement delivery, an increase in procurement cost and a reduction in expenditure. Unfortunately, enough efficiency in procurement delivery has not been

realized as yearned for by construction companies (Shaw, 2010). Furthermore, another factor that has hampered effective procurement programming at the pre contract stage is that majority of contractors have little knowledge in the preparation of procurement plans and programmes (Shaw, 2010).

This study is therefore undertaken to explore ways of improving on procurement programming at the pre contract stage of building construction projects.

1.3 AIM AND OBJECTIVES

1.3.1 Aim

The aim of this research is to improve on procurement programming at the pre contract stage of building construction projects.

1.3.2 Objectives

In a bid to achieve the above stated aim, the following objectives are set:

- To explore the benefits of procurement programme at the pre-contract stage;
- To identify the challenges to developing an effective procurement programme at the pre-contract stage; and
- To outline strategies to develop effective procurement programmes at the pre-contract stage.

1.4 SCOPE OF STUDY

The geographical scope of this study is Kumasi in the Ashanti region of Ghana. The contextual scope consists of D1 construction firms. Kumasi is the second largest city in Ghana and has abundant construction activities.

1.5 METHODOLOGY

Quantitative research strategy was employed in this research. This approach built upon previous works which have developed principles that helped to decide the data requirements of this particular research. The methodology adopted for this study consisted of a critical review of pertinent literature relevant. This aided in the identification of the previous works done, contributions made, criticisms, limitations, current findings and its applications. The literature review concluded in the development of a questionnaire, which centered on the aim and objectives of the study to collect data from the field. Respondents were asked to rate each variable on a Likert scale. The tools for analyzing the data collected consisted of descriptive statistics and Relative Importance Index for ranking the various phenomena identified.

1.6 SIGNIFICANCE

This research is important and of much significance to the construction industry as it will serve as a reminder of effective procurement programming at the pre contract planning stage. The findings of this research will educate contractors on the need to develop procurement programmes at the pre contract phase. In addition, the Government of Ghana will be one of the fundamental beneficiaries of the findings of this study as it will bring about increased knowledge leading to effective procurement programming of government projects. This study is finally going to benefit the academic world as the findings will contribute to knowledge and this will accordingly impel others on to engage in further research on procurement programming.

1.7 ORGANIZATION OF STUDY

This study consists of five major chapters. Chapter one presents the introduction. The introduction was broken down to include the background to the study, problem statement, aim and objectives, scope, methodology, justification, limitations and the structure of the study. Chapter two presents literature related to the study. Chapter three discusses the methodology adopted for the study. Chapter four Chapter four presents the results and discussions, and Chapter five is the summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter captured the background discussions on procurement programming which included the problem statement, research aims and objectives, scope, research questions and the research methodology. This chapter begins with critical review of literature on the construction industry. It delves into procurement programmes, challenges and benefits of procurement programmes at the pre-contract stage and the strategies to promote effective procurement programming.

2.2 OVERVIEW OF THE CONSTRUCTION INDUSTRY

Construction is a term that covers a wide range of activities in civil engineering and building which includes new works, repairs and maintenance (Hamilton, 2006). Oladapo (1974), continued to explain that the construction industry could be divided into two main branches, namely building and civil engineering. Building and civil engineering vary in many other respects. Hamilton (2006) said building project covers residential house, office complexes, ban house and other commercial units lie market stalls. They vary in size ranging from single room accommodation to bungalows and to high-rise buildings and Civil engineering works encompasses a wide range of different projects and constructed with different materials, *e.g.* roads, bridges, sewers, reservoirs, water towers just to mention a few. Also Strasser (1970) positted that the industry has several types of firms engaging in a variety of activities from heavy construction (such as work on highways and bridges) to special trade contractors (e.g., plumbing work and

carpentering). The construction work is seasonal, hazardous, and subject to an extensive amount of time lost because of bad weather and industrial strife (Strasser, 1970).

2.1.1 The Ghanaian Construction Industry

Ghana in wanting to be the gateway to West Africa has been growing steadily its construction industry over the years (Anvuur and Kurnaraswamy, 2006). The construction industry in Ghana has over the years developed into two sectors: the formal sector: which adopts a variety of procurement routes (Anvuur and Kurnaraswamy,2006) and the informal sector which is labour intensive. In Ghana, four major clients who are distinctive in the construction business are: the Government, property expanders, financiers and proprietors (Gyadu-Aseidu, 2009).

2.3 PROJECT PLANNING AND CONTROL PROCEDURES

Project planning starts with the contractor deciding whether to bid or not for a project and ends when a successful project is delivered to the client. Project planning and control within the contractor's outfit can be categorized under three (3) main phases namely;

- Pre-tender Planning phase.
- Pre contract Planning phase.
- Contract Planning phase.

Pre-tender planning phase comprises all activities undertaken from the time a project is known up to the time that a *bona fide* tender is submitted. *Pre-contract planning phase* is all activities undertaken from the time of receipt of letter of award up to the time of site

possession. *Contract planning phase* begins from the possession of the site to the handing over of project (Pilcher, 1976).

Pre-Tender Planning:

Decision to tender should be carefully considered and the facts surrounding the project assessed, to ascertain ones chances of winning the contract, as well as the project's viability and profitability (Kwakye, 1997).

The decision to tender should be the responsibility of senior management:

– Managing Director or one of the Directors.

– Chief Estimator.

– Contracts Manager.

– Chief Buyer.

– Office Manager.

Information required for decision to tender:

According to Harris and McCaffer (2002), the following are the information required for decision to tender;

1. The client for the project.

2. The consultants for the project, i.e., architects, quantity surveyors, structural engineers and services engineers.

3. The location of the project.

4. The type and size of the project.

5. The value of the project.

6. The local authority within whose jurisdiction the project is located.

7. Current work load.

8. Degree of competition.

9. Market conditions, in terms of the availability of contract works.

10. Availability of finance, especially from sources outside the company.

11. The “going” interest rate.

12. Government’s fiscal as well as monetary policies.

13. The current labour and materials supply markets.

14. Adequacy of tender information.

15. Time available for preparing and submitting tender.

16. Terms and conditions of contract (Harris and McCaffer, 2002).

Attendance:

– General Manager/Director.

– Chief Estimator.

– Contracts Manager.

– Planning Engineer.

– Buyer.

– Office Manager.

– Job Estimator (Harris and McCaffer, 2002).

• **Purpose:**

– announce the company’s participation in the bidding process

– plan the activities for the pre-tender stage (pre-tender programme)

– allocate responsibilities for the process (Harris and McCaffer, 2002).

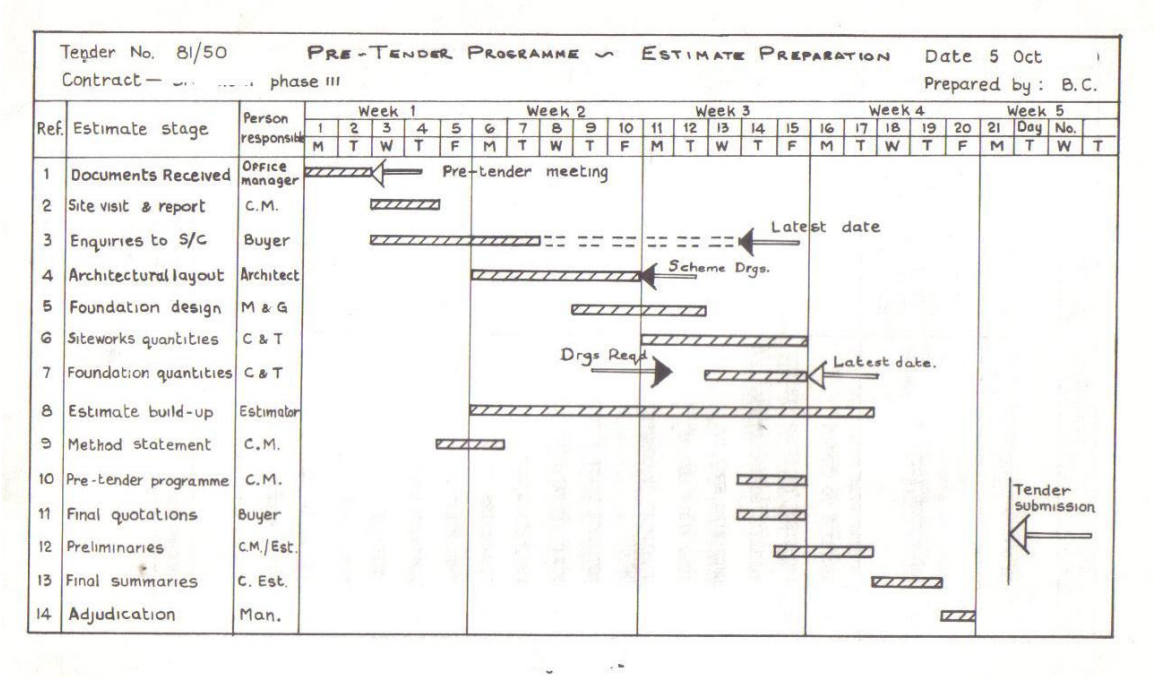

Figure 2.1 Pre-tender programme
Source: Harris and McCaffer (2002)

2.4 PRE-CONTRACT PLANNING

At the pre-contract planning phase, the following items must be subjected to further analysis (Calvert *et al*., 1995):

– Site Visit Report.

– Methods Statement.

– Site Organisation Structure.

– Sub-Contracting Arrangements.

– Pre-Tender Programme.

– Estimate Finance Statement.

Key Pre-contract planning issues:

• Sub-Contractors

– Nominated sub-contractors or specialist sub-contractors

• Co-ordination of Specialist Work

• Suppliers

– Domestic Supplier.

– Nominated Supplier

• Pre-Contract Methods Statement

• Pre-Contract Master Programme

• Site Layout Planning

• Requirement Schedules

• Check List and Requisition for Starting New Contracts

2.5 PROCUREMENT PLANNING

The procurement plan spells out elements of the process of procurement, and the procedures that will be needed. The procurement plan ought to classify the following, which would then be reproduced in the request for tender and in the agreement (Shaw, 2010).

• Aims and objectives of the procurement

• Prospective service suppliers

• Contract period

• Procurement method

• Payment mode

• Extent of required services

• Monitoring and evaluation of contract

• Tender layout

• Evaluation of tender

• Procurement agenda and schedule

• Cost approximation

The procurement plan aids in rendering information on the acquisition of services and goods, the choosing of vendors, the type(s) of contract(s) to be employed, how suppliers will be supervised, and who will be engaged at every phase of the procedure. This document must be endorsed by requisite personalities prior to the real procurement process (Public Procurement Board, 2007). The Act provides for procurement planning activity in section 21 of Part 3 which specifies:

(1) a procurement unit should set up a plan of procurement to sustain its consented programme and the plan should designate:

(a) packages of the contract

(b) anticipated price of each package

(c) the method of procurement

(d) steps and time of processing

(2) an entity of procurement should put forward the procurement plan to its tender committee not exceeding a month to the end of the economic and fiscal year for the subsequent year for authorization.

(3) after budget consent and at periodical periods after that, every procurement entity should present an update of the procurement plan to the tender committee.

(4) the procurement entity should present to the Tender Review Board, notices of procurement for contracts and procurement plans higher than the threshold required in Schedule Three for publishing in the Public Procurement Bulletin.

(5) an entity of procurement should not divide a procurement order into divisions nor reduce the price of a procurement order to steer clear of the application of the procedures for public procurement in this Act (Public Procurement Board, 2007). It is extremely imperative to know that procurement entities require to plan their procurement for the coming year by thirtieth November of the previous year, evaluated and sanctioned by their entity tender committees and revised every four months (Public Procurement Board, 2007). This falls under the planning within the cycle of procurement. It is similarly significant to be reminded that procurement opportunities are to be circulated in the Public Procurement Bulletin and there should be no room for splitting of contracts so as to steer clear of the appliance of the procedures laid down in the Act. For this reason, for the period of the first segment of the procurement cycle, procurement requirements are specified by the client. The approach to be applied is chosen comprising “make or buy” decisions; financial support decisions are taken; the appropriate methods and rules to use

are well thought-out and then a schedule for procurement process set up (Public Procurement Board, 2007).

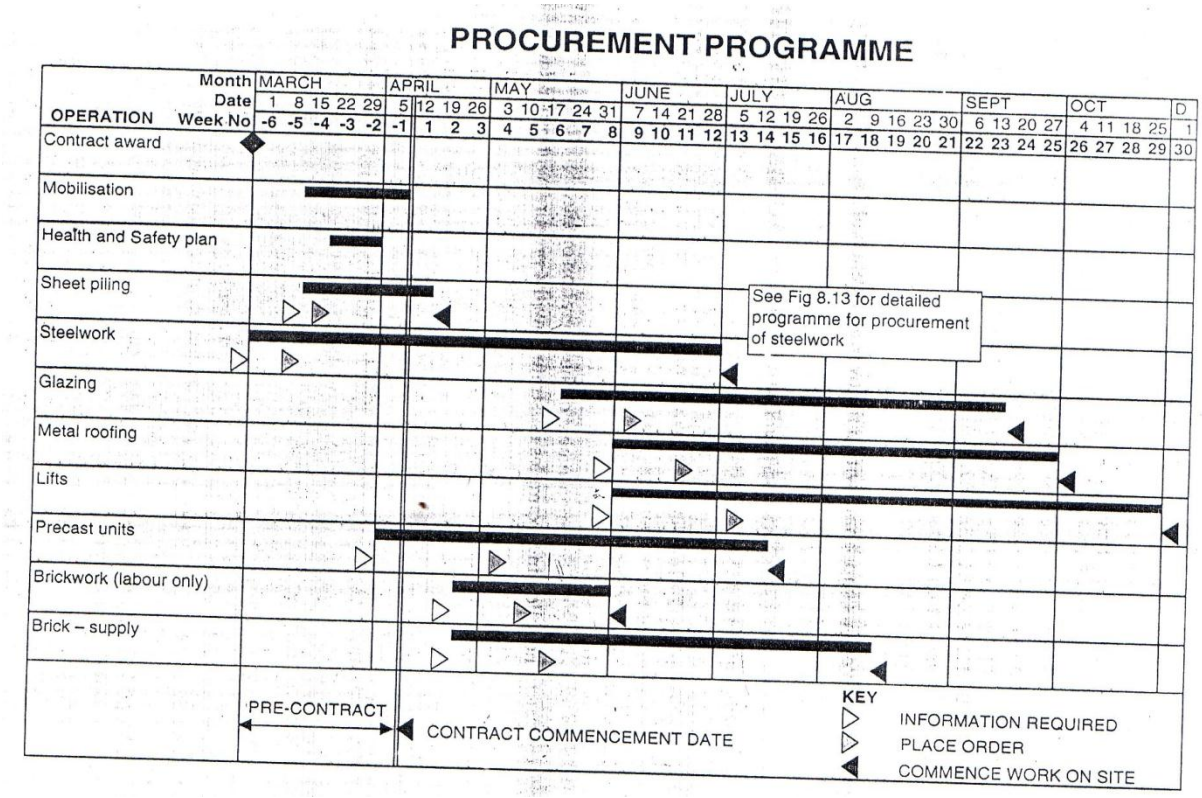

Figure 2.2 Procurement programme at the pre-contract phase
Source: Harris and McCaffer (2002)

2.6 BENEFITS OF PROCUREMENT PROGRAMMING AT THE PRE-CONTRACT STAGE

Procurement programming looking from the economic point of view helps to enhance efficiency through savings on transaction cost and reduced direct procurement costs. It also promotes transparency, accountability, speedy exchange of information. Other intangible benefits like reduced administrative costs are achievable (Davila *et al.*, 2002; Henriksen *et al.*, 2005).

Cost savings have expectedly been shown to be the main rationale for procurement programming at the pre-contract phase by contractors (Thai *et al*., 2005). Even though some cost benefits may be realized from procurement programming, the sustainable benefits will only be accrued when strategic management perspective is adopted (Tookey *et al.*, 2001).

Agencies and contracting firms over the globe that seek administrative efficiencies and cost and productivity have widely embraced procurement programming at the pre-contract stage. This is a common trend that is gained prominence in Europe (Thai *et al*., 2005).

Other benefits of procurement programming at the pre-contract stage according to literature also include helping improve communication channel; aids in identifying clear tasks and duties in the procurement process; serves as criteria for evaluation and negotiation; helps control and manage inventory; helps to review and assess compliance; leads to effective and efficient projects; promotes transparency and accountability; leads to higher productivity; risk mitigation; leads to overall cost reduction and contributes to higher quality of work (Procurement Capacity Toolkit, 1997; Tookey *et al.*, 2001; Thai *et al*., 2005; Hardcastle, 2007).

2.7 CHALLENGES TO EFFECTIVE PROCUREMENT PROGRAMMING

The preparation of procurement plans and programmes, according to Hardcastle (2007), is normally undertaken by personnel who are mediocre and lack the right combination of skills, knowledge and capacity to prepare standard procurement programmes at the pre-contract phase. Furthermore, woefully insufficient allocation of budget for the training and development of skills in relation to procurement programmes serves as a hindrance

for recruits to partake in tutoring meetings that are run by the private consulting groups (Tookey *et al.,* 2001).

Insufficient planning also poses as a challenge to developing effective procurement programmes. In a study by Hunja (2003), it was found out that planning is a core ingredient of strategic management. It is essential therefore that all procurement officers and contractors uplift the ideals of planning in construction (Thai *et al*., 2005).

However, the reverse is the case in Ghana since most contractors undertake their activities without recourse to adequate planning. Preparations and provisions are not catered for in evaluating the procurement schedules at the pre-contract stage. Furthermore, procurement officials are not given enough time so as to enforce and implement the necessary procurement processes that would ensure value for money and the development of a n effective procurement plan. This leads to the eventuality of some essential requisition items not being met (Hunja, 2003).

Establishing the length of time every step in procurement cycle may take affects the developing of procurement programmes. Procurement cycles are defined as the repetitive series of steps in procurement planning and normally start at the initial planning stage and ends when goods have been possessed. In procurement, the open bids entail the longest cycle (Hunja, 2003). This therefore demands planning the earliest probable procurement start date that is necessary to sustain the release dates needed. Even though other techniques are quite shorter, they may require approval if the whole procurement price is in excess of the set threshold financially which entails open bidding. The process of determining the time each step of the procurement cycle will require is very complicated

when drawing a procurement programme (Thai *et al*., 2005). There exists no definite rule of thumb or know-how with the specific situations and the information gotten from confirming and elaborating requirements should guide estimation and programming. Sometimes, time limits are set for specific procurement steps (Procurement Capacity Toolkit, 1997).

Identifying and working around probable internal constraints and peripheral conditions is a challenge to developing procurement programmes at the pre-contract stage (Shaw, 2010). A lot of procurement backgrounds have inconsistencies and anomalies which hamper effective procurement programmes. Some of these constraints include accounted funds not discharged unless payment has been made (Tookey *et al.,* 2001). Also, the budgeted funds for some construction projects are discharged on either monthly or quarterly cycles and these might necessitate to be accrued over a period of time and then synchronized with the payment commitments especially for contracts with high worth. Procurement entity may also have the challenge of losing control of the element of time (Procurement Capacity Toolkit, 1997).

In procurement programming, it is not just enough for those developing the procurement programmes to carry on with the planning relying only on the written procurement requisition document (Tookey *et al.,* 2001). This is because there is always the possibility of misunderstanding and uncertainty concerning precisely what is to be purchased and the time it will be wanted. Procurement request might not also disclose essential information that is exposed at the stages of budget processing and options assessment (Tookey *et al.,* 2001). Procurement requisition may not also cater for important details known to the procurement entity. Furthermore, the specifications that are attached to the requisition

might need more consideration. The availability of budget may also need constant updating (Procurement Capacity Toolkit, 1997).

Unrealistic delivery schedule is another challenge in procurement programming. The extent of time from the point of order to delivery is affected by a number of issues such as issues of transportation, the situations at the marketplace, provider's order and the position of inventory (Procurement Capacity Toolkit, 1997; Shaw, 2010). Shipment by ocean requires a minimum of four weeks from the majority of locations. Even though shipment by air can be done overnight, it is far more costly. Further, if shortages occur in the marketplace as in demand exceeding supply or the capability of manufacturing, then the contractor may have to wait a while longer before order is brought (Procurement Capacity Toolkit, 1997).

In addition, other challenges to the development of effective procurement include but not limited to synchronizing the procurement schedule with funds release dates; synchronizing dates of delivery with warehouse capacity and requirements of inventory; misconstruing precisely what is to be procured and time required; incomplete specifications; inadequate information concerning budgeting process; reference costs not reflecting current market prices; insufficient regulatory requirements; bottlenecks in approval structure and challenges with source of funding (Tookey *et al.,* 2001; Thai *et al*., 2005; Hardcastle, 2007).

2.8 STRATEGIES TO DEVELOP EFFECTIVE PROCUREMENT PROGRAMMES AT THE PRE-CONTRACT STAGE

In developing effective procurement programmes, the penultimate step is to corroborate, elucidate and spread out the standard and basic knowledge relayed by procurement

requisition (Thai *et al*., 2005). Procurement unit of the contractor must examine every aspect of the requisition and each supporting document. This would help to identify obstacles to performance and the areas that will need explanation or modification. The timing for the availability of funds should be ascertained (Tookey *et al.*, 2001; Hardcastle, 2007).

Further, reference prices should be established and confirmed independently through the use of the internet or other search tools. Technical specifications should be reviewed in order to ascertain they are complete, and their formats are conformable to standards. Regulatory requirement should also be clearly stated (Procurement Capacity Toolkit, 1997). The procurement entity of the contractor developing procurement plans at the pre-contract stage should come to a perfect agreement and understanding on what will be procured or purchased and the time to be delivered (Shaw, 2010). These would aid in developing an effective programme. The team should come across and exhaust all information that will have a bearing or impact on the procurement timelines. These issues include the constraints or the peculiarities in the procurement system (Tookey *et al.*, 2001).

The procurement entity should openly communicate opinions about whether or not it is possible to develop the programme based on the experience of the personnel developing the programme. Some of these opinions include whether the delivery date requested is realistic, whether the mode of transport is practical and if the location of delivery is practical and convenient. The procurement options and the procurement methods should be adequately discussed (Procurement Capacity Toolkit, 1997). By the date of meeting, the procurement personnel must confirm the cost and budget estimates. In this case, if

there is any discrepancy, then it can be discussed with another party. If these meetings are informal, the better it is since some of these meetings are most likely to border on issues on which there may be conflict with reality and management policy (Procurement Capacity Toolkit, 1997).

According to literature, other strategies to help develop effective procurement programmes at the pre-contract stage include: rational delivery schedule; source of funding should be well established; consistency in procurement schedule with funds release date; there should be abundant information concerning budgeting processes; regulatory requirements should be sufficient; coordination about what will be purchased and when it will be needed; specifications should be clear and sufficient; adequate feasibility of project should be conducted; speed of information flow; continuous education on need for procurement programmes and quick decision making to solve any challenge that arises during programming (Procurement Capacity Toolkit, 1997, Tookey *et al.,* 2001; Thai *et al*., 2005; Hardcastle, 2007).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the methodology used for the research. It addresses issues on research strategy, design and process. It specifically throws light on the population under study, sample and sampling techniques adopted, the data collection instruments and methods of data analysis.

3.2 RESEARCH DESIGN

A research design is the outline or plan for a study used as a guideline in accumulating and interpreting data (Al-Moghany, 2006). It is a cycle of steps connecting research questions to the data collected. Research design is a plan that guides the researcher in the procedure of gathering, analyzing and inferring observations (Nachmias and Nachmias, 1992). It is a rational process of evidence that permits the researcher to conclude inferences regarding causal relations among the variables being investigated (Nachmias and Nachmias, 1992). According to Al-Moghany (2006), it is a blueprint for a research that tackles at least four problems: what questions to study, what data are relevant, what data to collect and how to analyze results.

Research design is a used to attain answers to questions being studied (Al-Moghany, 2006; Polit and Hungler, 1999). It is also used to cater some of the challenges that may be encountered during the research process (Al-Moghany, 2006; Polit and Hungler, 1999; Naoum, 1998). It is not possible for researchers to presuppose that people think in a particular way without asking them what they consider (Al-Moghany, 2006). According

to Polit and Hungler (1999), the research design usually specifies which research approach to be taken on and how the researcher intends to put into practice scientific controls to improve the interpretability of the outcomes. Research has shown that there are different survey designs that may be used to put up with varying essential needs and problems if those challenges are forecasted in the scheduling of the review (Al-Moghany, 2006; Weisberg and Bowen, 1977). According to Naoum (1998), the most extensively used data collection technique used to conduct surveys to find out facts, opinions and views of people is the structured questionnaire.

3.2.1 RESEARCH APPROACH

An effective way to increase the validity of any social research is to illustrate the research approach (Cresswell, 2007). The deductive approach was used to undertake this study. This is because the researcher had to determine the concepts that present significant aspects of the problem under investigation. These identified concepts were then transformed into observables to enhance quantitative empirical testing.

3.2.2 RESEARCH STRATEGY

The strategy adopted for this research was quantitative research. The strategy engaged the use of a structured questionnaire survey. The questionnaire survey was employed to allow the researcher bring about generalization that would add to theory and allow the investigator to foretell, elucidate and comprehend phenomenon (Naoum, 2002).

3.3 RESEARCH PROCESS

The literature review presented in Chapter two provided the relevant theoretical background to undertake this study. This research was designed by considering the

philosophical view point, the research approach, research strategy, activities and methods. It was designed to meet the objectives of the study.

3.4 POPULATION SAMPLING AND SAMPLING TECHNIQUE

The target population for the study consisted of D1 contractors operating in the Kumasi metropolis. Purposive sampling technique was employed. Snowball led to one organization leading the researcher to other organizations with similar characteristics being sought for. The list of registered D1 contractors operating in the Kumasi metropolis was seventy (70). A census sampling approach was used to select all the 70 contractors. This approach was used because research has shown that it is attractive for small populations of 200 or less as it eliminates sampling error and provides data on all individuals in the population. From these seventy (70) respondents, fifty nine (59) questionnaires were retrieved representing eighty four percentage response rate.

3.5 SOURCES OF DATA

Primary and secondary sources of data were used in the study. The primary sources included the first-hand data obtained by the researcher through the questionnaire. Relevant books, journals, magazines, etc. were among the secondary sources of data.

3.6 RESEARCH INSTRUMENT

The research data was obtained primarily through the use of structured questionnaires.

3.6.1 Questionnaire Design

The questionnaires were prepared and divided into two parts. The first part sought the respondents' background information. The second part required the respondents to rank

the benefits of procurement programmes at the pre-contract stage on the Likert scale of 1 to 5, where 1= not important and 5= very important. Part three further sought challenges of procurement programming on the Likert scale of 1 to 5, with 1= not severe and 5=very severe. The final part of the questionnaire required the respondents to identify strategies to improve procurement programmes by ranking the factors on the Likert Scale of 1 to 5 where 1= not significant and 5= very significant.

3.6.2 Procedure for Data Collection

The questionnaires were administered to the respondents through a face-to-face session with some being retrieved immediately and others taken at a later time.

3.7 ANALYSIS OF DATA

The questionnaires obtained were edited to ensure their completeness. The data obtained were arranged to ensure easy analysis. Computable data from the questionnaires was coded into the Statistical Package for Social Sciences (SPSS) software. The statistical techniques discussed below were employed to analyze the data collected from the survey. Descriptive statistics and Relative Importance Index (RII) were employed in analyzing the data. Relative Importance Index (RII) was used to rank the identified variables where, W = the weighting given to each cause by respondents, ranging from 1 to 5, A = the highest weight (i.e. 5 in the study), N = the total number of samples. This was used in ranking the significant factors in terms of degree of importance.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

Having wrapped up the introduction, reviewed the pertinent literature, and described the research methodology, this chapter now introduces the data analysis and discussions of results using Statistical Package for Social Sciences version 20 (SPSS v 20). The demographic data is analysed using descriptive statistics while the dependent variables are analysed using Relative Importance Index and mean score index.

The first section deals with the profile of the respondents. The other part is the detailed analysis of the specific objectives of the study. Out of the 70 questionnaires distributed to respondents, 59 questionnaires representing 84 percent were completed and retrieved. These questionnaires formed the basis of the whole research findings used in the analysis.

4.2 ANALYSIS OF DEMOGRAPHIC DATA

This section presents the results of the descriptive analysis. This was to help provide an understanding of the profile of the respondents. The importance of knowing the background of the respondents is to help generate confidence in the reliability of data collected.

4.2.1 Profession of respondents

This section sought to find out the profession of the respondents to the study. From Figure 4.1 below, project managers constituted 24 percent of the respondents. Furthermore, 19 percent of the respondents were quantity surveyors. Another 15 percent of the respondents were architects while 42 percent representing majority were procurement officers. This implies this study has the right fusion of professionals and their responses can therefore be trusted.

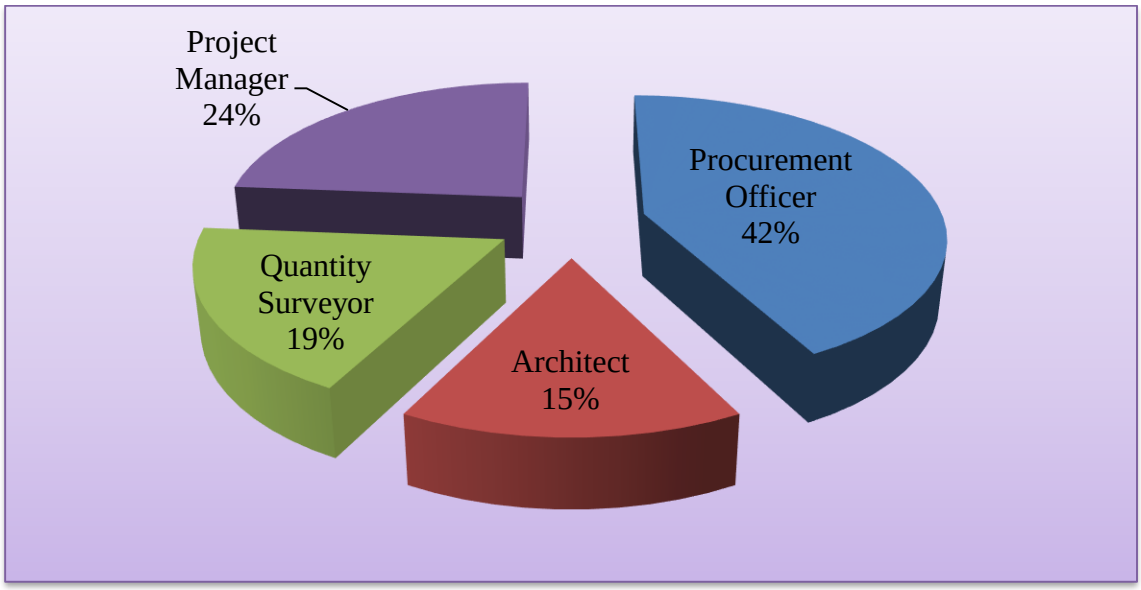

Figure 4.1 Profession of respondents
Source: Author's fieldwork (2015)

4.2.2 Experience of respondents

In seeking to know the experience of the respondents of this study, Figure 4.2 below shows that 7 percent of the respondents have less than 5 years experience. In addition, 51 percent indicating majority have 5-10 years experience, 31 percent of the respondents have 11-15 years experience. Furthermore, 10 percent of the respondents have 16-10 years experience while the remaining 2 percent have above 20 years experience. The

implication is that this research has respondents who have adequate experience in the construction industry and therefore are knowledgeable in procurement programmes.

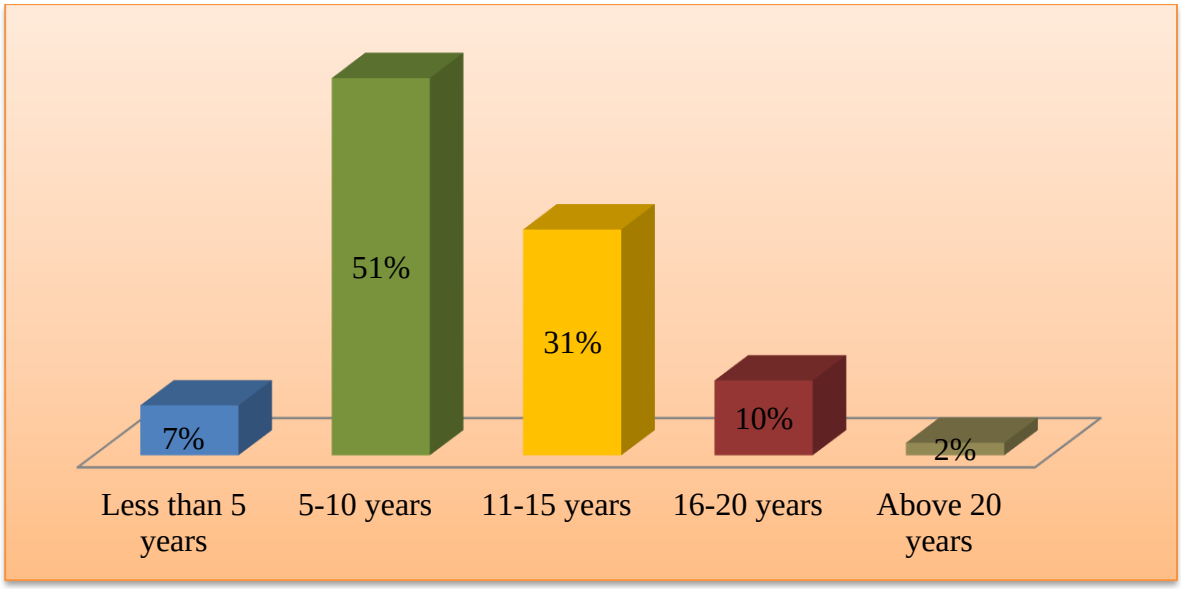

Figure 4.2 Experience of respondents
Source: Author's fieldwork (2015)

4.2.3 Number of projects undertaken within the last five years

This section sought to find out from the respondents how many projects they had undertaken within the last five years. From Table 4.1 below, 11 respondents representing 18.6 percent have undertaken 1-5 projects. 20 respondents representing 33.9 percent have undertaken 6-10 projects. A closer look at the table also shows that 25 respondents representing 42.4 percent have undertaken 11-15 projects within the last five years. Finally, 3 respondents representing 5.1 percent have undertaken above 16 projects. This implies that majority of respondents for this study have undertaken 11-15 projects within the last five years.

Table 4.1 Number of projects undertaken within the last five years

Number of projects	Frequency	Percentage	Cumulative Percentage
1-5 projects	11	18.6	18.6
6-10 projects	20	33.9	52.5
11-15 projects	25	42.4	94.9
Above 16 projects	3	5.1	100.0
Total	59	100.0	

Source: Author's fieldwork (2015)

4.3 BENEFITS OF PROCUREMENT PROGRAMMING AT THE PRE-CONTRACT STAGE

The respondents were asked in this section to rank the benefits of procurement programming at the pre-contract stage on a Likert scale of 1 to 5 where 1 = Not important, 2 = Less important, 3 = Moderately important, 4 = Important and 5 = Very important. Relative Importance Index (RII) was used to analyse the data. The mean as well as RII scores of all fifty nine (59) respondents were calculated and have been presented below. From Table 4.2, *leads to effective and efficient projects* was ranked 1st with a mean of 4.14 and RII of 0.827. *Promotes transparency and accountability* was ranked 2nd with a mean of 4.05 and RII of 0.810. *Leads to overall cost reduction* was ranked 2nd with a mean of 3.97 and RII of 0.793. *Helps to review and assess compliance* was ranked 4th with a mean of 3.90 and RII of 0.780. *Helps improve communication channel* was ranked 5th with a mean of 3.69 and RII of 0.739. *Aids in identifying clear*

roles and responsibilities in the procurement process was ranked 6th with a mean of 3.52 and RII of 0.705.

According to literature, procurement programming looking from the economic point of view helps to enhance efficiency through savings on transaction cost and reduced direct procurement costs. It also promotes transparency, accountability, speedy exchange of information. Other intangible benefits like reduced administrative costs are achievable (Davila *et al.,* 2002; Henriksen *et al.*, 2005).

Cost savings have expectedly been shown to be the main rationale for procurement programming at the pre-contract phase by contractors (Thai *et al*., 2005). Even though some cost benefits may be realized from procurement programming, the sustainable benefits will only be accrued when strategic management perspective is adopted (Tookey *et al.,* 2001).

Agencies and contracting firms over the globe that seek administrative efficiencies and cost and productivity have widely embraced procurement programming at the pre-contract stage. This is a common trend that is gained prominence in Europe (Thai *et al*., 2005). These findings agree with literature.

Table 4.2: Benefits of procurement programming at the pre-contract stage

	FREQUENCY					*TOTAL*	*∑W*	*MEAN*	*RII*	**RANK**
	1	***2***	***3***	***4***	***5***					
BENEFITS										
Leads to effective and efficient projects	2	3	9	16	29	*59*	244	4.14	0.827	1st
Promotes transparency and accountability	2	3	14	16	25	*59*	239	4.05	0.810	2nd
Leads to overall cost reduction	5	4	7	15	28	*59*	234	3.97	0.793	3rd
Helps to review and assess compliance	4	6	11	9	29	*59*	230	3.90	0.780	4th
Helps improve communication channel	8	4	10	13	24	*59*	218	3.69	0.739	5th
Aids in identifying clear roles and responsibilities in the procurement process	10	2	12	17	18	*59*	208	3.52	0.705	6th
Leads to higher productivity	9	8	9	22	11	*59*	195	3.31	0.661	7th
Contributes to higher quality of work	7	17	19	6	12	*59*	182	3.08	0.617	8th
Serves as criteria for evaluation and negotiation	6	20	14	4	15	*59*	179	3.03	0.607	9th
Helps control and manage inventory	13	12	12	12	10	*59*	171	2.89	0.579	10th
Risk mitigation	17	13	10	13	6	*59*	155	2.63	0.525	11th

Source: Author's fieldwork (2015)

4.4 CHALLENGES OF DEVELOPING PROCUREMENT PROGRAMME AT THE PRE-CONTRACT STAGE

The respondents were asked in this section to rank the benefits of procurement programming at the pre-contract stage on a Likert scale of 1 to 5 where 1 = Not severe, 2 = Less severe, 3 = Moderately severe, 4 = Severe and 5 = Very severe. Relative Importance Index (RII) was used to analyse the data. The mean as well as RII scores of all fifty nine (59) respondents were calculated and have been presented below. From Table 4.3, *incomplete specifications* was ranked 1st as the most severe challenge with a mean of 4.05 and RII of 0.810. *Inadequate information concerning budgeting process* was ranked 2nd with a mean of 3.90 and RII of 0.780. *Determining how long each step in procurement cycle is likely to take* was ranked 3rd with a mean of 3.69 and RII of 0.739. *Coordinating the procurement schedule with funds release dates* was ranked 4th with a mean of 3.69 and RII of 0.739. *Unrealistic delivery schedule* was ranked 5th with a mean of 3.52 and RII of 0.705. *Bottlenecks in approval structure* was ranked 6th with a mean of 3.41 and RII of 0.681.

According to literature, The preparation of procurement plans and programmes, according to Hardcastle (2007) is normally undertaken by personnel who are mediocre and lack the right combination of skills, knowledge and capacity to prepare standard procurement programmes at the pre-contract phase. Furthermore, woefully insufficient allocation of budget for the training and development of skills in relation to procurement programmes serves as a hindrance for recruits to partake in tutoring meetings that are run by the private consulting groups (Tookey *et al.*, 2001).

Insufficient planning also poses as a challenge to developing effective procurement programmes. In a study by Hunja (2003), it was found out that planning is a core ingredient of strategic management. It is essential therefore that all procurement officers and contractors uplift the ideals of planning in construction (Thai *et al*., 2005).

However, the reverse is the case in Ghana since most contractors undertake their activities without recourse to adequate planning. Preparations and provisions are not catered for in evaluating the procurement schedules at the pre-contract stage. Furthermore, procurement officials are not given enough time so as to enforce and implement the necessary procurement processes that would ensure value for money and the development of a n effective procurement plan. This leads to the eventuality of some essential requisition items not being met (Hunja, 2003).

Establishing the length of time every step in procurement cycle may take affects the developing of procurement programmes. Procurement cycles are defined as the repetitive series of steps in procurement planning and normally start at the initial planning stage and ends when goods have been possessed. In procurement, the open bids entail the longest cycle (Hunja, 2003). This therefore demands planning the earliest probable procurement start date that is necessary to sustain the release dates needed. Even though other techniques are quite shorter, they may require approval if the whole procurement price is in excess of the set threshold financially which entails open bidding. The process of determining the time each step of the procurement cycle will require is very complicated when drawing a procurement programme (Thai *et al*., 2005). There exists no definite rule of thumb or know-how with the specific situations and the information gotten from confirming and elaborating requirements should guide estimation and programming.

Sometimes, time limits are set for specific procurement steps (Procurement Capacity Toolkit, 1997).

The findings confirm existing literature.

Table 4.3: Challenges of procurement programming at the pre-contract stage

	FREQUENCY					*TOTAL*	*∑W*	*MEAN*	*RII*	**RANK**
	1	***2***	***3***	***4***	***5***					
CHALLENGES										
Incomplete specifications	2	3	14	16	25	*59*	239	4.05	0.810	1st
Inadequate information concerning budgeting process	4	6	11	9	29	*59*	230	3.90	0.780	2nd
Determining how long each step in procurement cycle is likely to take	8	4	10	13	24	*59*	218	3.69	0.739	3rd
Coordinating the procurement schedule with funds release dates	8	4	11	12	24	*59*	217	3.68	0.736	4th
Unrealistic delivery schedule	10	2	12	17	18	*59*	208	3.52	0.705	5th
Bottlenecks in approval structure	3	10	8	18	20	*59*	201	3.41	0.681	6th
Bottlenecks in approval structure	9	10	12	13	15	*59*	192	3.25	0.651	7th
Challenges with source of funding	7	11	17	10	14	*59*	190	3.22	0.644	8th
Coordinating delivery dates with warehouse capacity and inventory requirements	8	15	2	25	9	*59*	189	3.20	0.641	9th
Insufficient regulatory requirements	8	8	29	4	10	*59*	177	3.00	0.600	10th
Misunderstanding about exactly what is to be purchased and	12	3	30	8	6	*59*	170	2.88	0.576	11th
Reference costs not reflecting current market prices	15	17	15	10	2	*59*	144	2.44	0.488	12th

Source: Author's fieldwork (2015)

4.5 STRATEGIES TO DEVELOP EFFECTIVE PROCUREMENT PROGRAMMES AT THE PRE-CONTRACT STAGE

The respondents were asked in this section to rank the strategies to develop effective procurement programmes at the pre-contract stage on a Likert scale of 1 to 5 where 1 = Not significant, 2 = Less significant, 3 = Moderately significant, 4 = Significant and 5 = Very significant. Relative Importance Index (RII) was used to analyse the data. The mean as well as RII scores of all fifty nine (59) respondents were calculated and have been presented below. From Table 4.4, *adequate feasibility of project should be conducted* was ranked 1st with a mean of 4.31 and RII of 0.861. *Specifications should be clear and sufficient* was ranked 2nd with a mean of 4.17 and RII of 0.834. *Rational delivery schedule* was ranked 3rd with a mean of 4.15 and RII of 0.831. *Adequate planning of construction projects* was ranked 4th with a mean of 4.14 and RII of 0.827. *Speed of information flow* was ranked 5th with a mean of 3.98 and RII of 0.797. *Source of funding should be well established* was ranked 6th with a mean of 3.93 and RII of 0.786.

In developing effective procurement programmes, the penultimate step is to corroborate, elucidate and expand on the standard and basic information relayed by procurement requisition (Thai *et al*., 2005). Procurement unit of the contractor must examine every aspect of the requisition and each supporting document. This would help to identify obstacles to performance and the areas that will need explanation or modification. The timing for the availability of funds should be ascertained (Tookey *et al.*, 2001; Hardcastle, 2007).

Further, reference prices should be established and confirmed independently through the use of the internet or other search tools. Technical specifications should be reviewed in

order to ascertain they are complete, and their formats are conformable to standards. Regulatory requirement should also be clearly stated (Procurement Capacity Toolkit, 1997). The procurement entity of the contractor developing procurement plans at the pre-contract stage should come to a perfect agreement and understanding on what will be procured or purchased and the time to be delivered (Shaw, 2010). These would aid in developing an effective programme. These findings confirm past literature.

Table 4.4: Strategies to develop effective procurement programmes at the pre-contract stage

	FREQUENCY					*TOTAL*	*∑W*	*MEAN*	*RII*	RANK
	1	*2*	*3*	*4*	*5*					
STRATEGIES										
Adequate feasibility of project should be conducted	2	3	4	16	34	*59*	254	4.31	0.861	1st
Specifications should be clear and sufficient	2	4	6	17	30	*59*	246	4.17	0.834	2nd
Rational delivery schedule	1	3	11	15	29	*59*	245	4.15	0.831	3rd
Adequate planning of construction projects	2	3	9	16	29	*59*	244	4.14	0.827	4th
Speed of information flow	2	8	4	20	25	*59*	235	3.98	0.797	5th
Source of funding should be well established	4	4	9	17	25	*59*	232	3.93	0.786	6th
Coordination about what will be purchased and when it will be needed	4	6	11	9	29	*59*	230	3.90	0.780	7th
There should be abundant information concerning budgeting processes	10	2	12	17	18	*59*	208	3.52	0.705	8th
Continuous education on need for procurement programmes	3	10	8	18	20	*59*	201	3.41	0.681	9th
Consistency in procurement schedule with funds release date	9	8	9	22	11	*59*	195	3.31	0.661	10th
Regulatory requirements should be sufficient	8	15	2	25	9	*59*	189	3.20	0.641	11th
Quick decision making to solve any challenge that arises during programming	10	10	26	8	5	*59*	165	2.80	0.559	12th

Source: Author's fieldwork (2015)

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter five presents the summary of findings of the study based on the data collected from the field. It further concludes the study and makes recommendations on effective strategies to promote effective procurement programmes.

5.2 ACHIEVEMENT OF RESEARCH OBJECTIVES

5.2.1: Benefits of procurement programmes at the pre-contract stage

Relative Importance Index was used to analyze the data. The following were found in descending order to be the benefits:

- Leads to effective and efficient projects
- Promotes transparency and accountability
- Leads to overall cost reduction
- Helps to review and assess compliance
- Helps improve communication channel
- Aids in identifying clear roles and responsibilities in the procurement process

5.2.2: Challenges of effective procurement programmes at the pre-contract stage

Relative Importance Index was used to analyze the data. The following were found in descending order to be the challenges:

- Incomplete specifications

- Inadequate information concerning budgeting process
- Determining how long each step in procurement cycle is likely to take
- Coordinating the procurement schedule with funds release dates
- Unrealistic delivery schedule
- Bottlenecks in approval structure

5.2.3: Strategies to develop effective procurement programming at the pre-contract stage

Relative Importance Index was used to analyze the data. The following were found in descending order to be the strategies:

- Adequate feasibility of project should be conducted
- Specifications should be clear and sufficient
- Rational delivery schedule
- Adequate planning of construction projects
- Speed of information flow
- Source of funding should be well established

5.3 CONCLUSION

Procurement programmes are essential and procurement practitioners should make an optimal decision when developing procurement plans and programmes at the pre contract stage of construction.

5.4 RECOMMENDATIONS

1. The right personnel with the right combination of skills, knowledge and capacity to prepare standard procurement programmes should be engaged.

2. Adequate and sufficient allocation of budget for the training and development of skills in relation to procurement programmes should be done for recruits to partake in tutoring meetings that are run by consulting groups.

3. Specifications should be clear and sufficient. This would be to prevent any ambiguities and confusion among the procurement team preparing the programmes.

4. Quick decision making should be the hallmark of the procurement team. This is to help solve any challenges that may arise during programming.

5. There should be adequate planning of construction projects. This would help ensure that procurement programmes are prepared with all relevant information available.

6. Continuous education seminars should be organized for stakeholders on the need for procurement programmes.

5.5 DIRECTION FOR FUTURE RESEARCH

Similar studies should be conducted on effective procurement programming at the pre-contract phase in the road sector.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ART AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

QUESTIONNAIRE

TOPIC: "EFFECTIVE PROCUREMENT PROGRAMMING AT THE PRE-CONTRACT STAGE OF BUILDING CONSTRUCTION PROJECTS"

I am a postgraduate student of the Kwame Nkrumah University of Science and Technology (KNUST) conducting a research on effective procurement programming at the pre-contract stage of building construction projects. The aim of this research is to improve on procurement programming at the pre-contract stage of building construction projects.

This is purely for academic purposes and all information will be treated with strict confidentiality. Your response would be highly appreciated for the success of the research. Kindly respond to the question by ticking the appropriate box for each item.

PART ONE: RESPONDENT PROFILE

1. Please indicate the category of your profession

   [ ] Procurement Officer

   [ ] Architect

   [ ] Quantity Surveyor

   [ ] Project Manager

   [ ] Other (Please specify)……

2. How long have you been practicing?

   [ ] Less than 5 years

   [ ] 5 – 10 years

   [ ] 11 – 15 years

   [ ] 16 – 20 years

   [ ] Above 20 years

3. How many projects have you undertaken within the last five years?

   [ ] 1-5 projects

   [ ] 6 – 10 projects

   [ ] 11 – 15 projects

   [ ] Above 16 projects

PART TWO: BENEFITS OF PROCUREMENT PROGRAMMING AT THE PRE-CONTRACT STAGE

Please indicate the level of importance of the following benefits of procurement programme at the pre-contract stage using the following Likert scale. **[1=Not important; 2=Less important; 3=Moderately Important; 4=Important; 5=Very important]**. Please tick (√) in the space provided.

No	BENEFITS	1	2	3	4	5
1	Helps improve communication channel					
2	Aids in identifying clear roles and responsibilities in the procurement process					
3	Serves as criteria for evaluation and negotiation					
4	Helps control and manage inventory					
5	Helps to review and assess compliance					
6	Leads to effective and efficient projects					
7	Promotes transparency and accountability					
8	Leads to higher productivity					
9	Risk mitigation					
10	Leads to overall cost reduction					
11	Contributes to higher quality of work					
	Any other, please state and rank					

PART THREE: CHALLENGES OF DEVELOPING PROCUREMENT PROGRAMME AT THE PRE-CONTRACT STAGE

Please indicate the level of severity of the following challenges of developing procurement programme at the pre-contract stage using the following Likert scale. **[1=Not severe; 2=Less severe; 3=Moderately severe; 4=Severe; 5=Very severe]**. Please tick (√) in the space provided.

No	CHALLENGES	1	2	3	4	5
1	Determining how long each step in procurement cycle is likely to take					
2	Recognizing and working around potential internal constraints and external conditions					
3	Coordinating the procurement schedule with funds release dates					
4	Coordinating delivery dates with warehouse capacity and inventory requirements					
5	Misunderstanding about exactly what is to be purchased and when it is needed					
6	Incomplete specifications					
7	Inadequate information concerning budgeting process					
8	Reference costs not reflecting current market prices					
9	Insufficient regulatory requirements					
10	Bottlenecks in approval structure					
11	Challenges with source of funding					
12	Unrealistic delivery schedule					
	Any other, please state and rank					

PART FOUR: STRATEGIES TO DEVELOP EFFECTIVE PROCUREMENT PROGRAMMES AT THE PRE-CONTRACT STAGE

Please indicate the level of significance of the following strategies to develop effective of procurement programmes at the pre-contract stage using the following Likert scale. **[1=Not significant; 2=Less significant; 3=Moderately significant; 4= Significant; 5=Very significant]**. Please tick (√) in the space provided.

No	STRATEGIES	1	2	3	4	5
1	Adequate planning of construction projects					
2	Rational delivery schedule					
3	Source of funding should be well established					
4	Consistency in procurement schedule with funds release date					
5	There should be abundant information concerning budgeting processes					
6	Regulatory requirements should be sufficient					
7	Coordination about what will be purchased and when it will be needed					
8	Specifications should be clear and sufficient					
9	Adequate feasibility of project should be conducted					
10	Speed of information flow					
11	Continuous education on need for procurement programmes					
12	Quick decision making to solve any challenge that arises during programming					
	Any other, please state and rank					