

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

**EXAMINING WORKS PROCUREMENT SYSTEMS SELECTION
PRACTICES IN GHANA ARMED FORCES (GAF)**

BY

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**THESIS SUBMITTED TO THE DEPARTMENT OF BUILDING
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PARTIAL FULFILMENT OF THEREQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE
IN
PROCUREMENT MANAGEMENT**

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DECLARATION

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

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ABSTRACT

Ghana Armed Forces is one of the largest agencies under the Ministries, Departments and Agencies (MDAs) in Ghana dealing with a lot of works procurement across the various Barracks in the Country to equip both military and civilian personnel for executing their jobs effectively to provide adequate protection for the citizens of Ghana and its boundaries. In Ghana Armed Forces (GAF), the number of works procured is increasing from time to time and are largely Offices, Accommodations, Training grounds and other facilities etc. Given the limited financial resources of GAF coming out of Tax payer contribution by the Government of Ghana, this research aims at examining the works procurement systems selection practices and understanding of the procurement management process in relation to improving works procurement management systems in Ghana Armed Forces (GAF). The study used both primary and secondary data sources, while questionnaires were the main research tool used for the study. A case study approach was chosen since such an approach enables in-depth analysis of a defined phenomenon with the procurement team members including (Architects, Quantity Surveyors, Electrical Engineers, Civil Engineers and Mechanical Engineers).The study identified Traditional system as the most practiced procurement system being adopted in GAF.

It was further recommended that there should be an effective training and improvement on how to maintain these identified general ways of improving the procurement management system in GAF. It further suggested that, there should be adequate education to increase the awareness of the factors influencing the choice of procurement system selection in GAF and further improve on it.

DEDICATION

To my late grand mother Theresa Cromwell for her Priceless concern and support
towards my basic stage in my educational carrier up to date.

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ABBREVIATIONS AND ACRONYMS

DEPT	Department
PROC	Procurement
GHQ	General Headquarters
LOG	Logistics
PPP	Public Private Partnership
MDAs	Ministries, Departments and Agencies
AFPC	Armed Forces Procurement Centre
Q & A	Stands for 'Q' field related stores and 'A' Administration stuff for office use
P & D	Planning and Development
DFC	Defence Financial Controller
CDS	Chief of Defence Staff
MOD	Ministry of Defence
DES	Directorate of Engineers Services
PGPA	Public Governance, Performance and Accountability
NDO	National Defence Organization
CPRs	Commonwealth Procurement Rules
DCAF	Democratic Control of Armed Forces
RICS	Royal Institution of Chartered Surveyors

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Procurement is the acquisition of works, goods and services coming out as of an outside resource to the procurement entity. It is appropriate that, such works, goods and services be procured in a manner that meets the allocated cost planned for in terms of quality and quantity, time and to achieve value for money. Other entities and public sectors also for the type of business they are in whiles the system minimize the level of to fraud and collusion (Arrowsmith and Hartley, 2002).

The processes required for acquiring works, goods and services from outside the performing organization or entity is termed as Procurement. (Boswell and Lorna, 2004).

Procurement has also been defined as a purchasing of merchandising or a service which is possible to achieve an optimized overall cost in terms of correct price and quality through some processes. (Rosli et al., 2006).

Besides traditional procurement system approach, it can be said that other innovated procurement systems are used by many procurement entities in works procurement projects across the world. There are different procurement systems with different dimensions which cut across in terms of how it allocates responsibility, the sequential order of activity, processes and procedures, and finally the organizational approach in project delivery (Rosli et al., 2006). The differences in procurement methods influence the time performance of construction projects (Chan, 1996).

Bowen et al. (1999) also support the view that some of the reasons that have affected the kind of procurement challenges we face in recent are the inappropriateness of selection of procurement systems. In view of this it gives indications that the design and build approach for instance integrates the design and build process whereas in the traditional method the two processes are separate. It has become very important to address the issue in question by limiting the study to the common procurement systems identified by Masterman i.e. Traditional System, Design and Build system and Contract Management.

The three main sequential phases to the traditional procurement system are: the design phase, the bidding (or tender) phase and the construction phase.

The traditional procurement system does not encourage proper integration, coordination and communication between project team needed to overcome this fragmentation (Latham, 1994). This according to Egan (2002) and Love (1998) is because the various teams in the project are not able to properly collaborate and work together as expected to deliver projects effectively.

Anvuur and Kumaraswamy (2007) stated that increased complexity, uncertainty, and time pressure in building projects have increased the need for cooperation among different project actors. This has led to the evolution of other procurement systems such as design and build.

Despite the fact that each project with works procurement systems have its own merits and demerits, analyzing the influences of each procurement system on the performance of the project team will go a long way to enhance the project delivery in the building construction industry.

Ghana Armed Forces aims to ensure an enabling security environment for the sustenance of economic stability as well as reducing the poverty level to achieve the millennium development goals and middle income status through a sustainable procurement by using the right procurement systems and practices. The MOD which is one of the Ministries under the MDAs has one main agency called Ghana Armed Forces (GAF) with both military and civilian officers working together to achieve the said aim of the ministry. Under the GAF is Directorate of Engineers Services (DES) which is in charge of most of the works procured by the GAF. However, procurement has assumed a global dimension and requires in-depth scrutiny at every stage. It is in this light that this project is being carried out in line with the Public procurement act of Ghana, Act 663 of 2003. The GAF under the MOD is a huge beneficiary of public and Tax payer's funds for its procurement purposes (MOD, 2012).

1.2 Problem Statement

Ghana's Public Procurement Act, Act 663, seems to address only a few issues on selection of procurement systems in contract management with regards to how the team is organized in procuring works contracts and improving the procurement management phase. Additionally, according to Mensah and Ameyaw (2011), the recent review done by PPA in 2006 came out with some of the challenges confronting the Public Procurement entities in Ghana which need a very urgent attention.

Some weakness' identified are unqualified procurement officers, Lack of good interpretation and applying the provisions stated in the Act, long process regularizing the entity's drafted regulations, unclear procurement procedures, in-service training for personnel, improper ways of keeping records, improper handling of suppliers, unclear procedure to lodge a complaints, poor procurement contract management in

choosing the right procurement system, failure to plan leading to uncompleted projects, poor contract management in choosing the right procurement systems and high cost of Advertisement (PPA, 2007).

Procurement management systems selection has received very little research attentions by both the PPA and researchers who are interested in procurement issues with regards to MDAs entering into contracts. The limited research in this area of how to select a best procurement systems practices especially in GAF can be attributed to the very little interest on the subject as well as the legality associated with each contract. It has added to the limited knowledge on the importance of best procurement systems practices we have in Ghana.

In view of this, it can be said that the delay in the implementation of the procurement plans, in most cases has led to overrun of cost and contract period.

This has led to situations where most public contracts have been breached. It has also been observed that, there is not enough documented knowledge on the effects of these breaches or contract overruns in the public sector.

The study therefore seeks to examine the works procurement systems selection practices and understanding of the procurement management process in relation to improving the procurement management system selection in the Ghana Armed Forces. Specifically the study seeks to unravel and put in proper context the systems adopted by GAF for the procurement of works.

1.3 Aim of the study

The study examines the works procurement systems selection practices and understanding of the procurement management process in relation to improving works procurement management systems in Ghana Armed Forces (GAF).

1.4 Objectives of the study

For the research to achieve the above aim, specific objectives were directed to it which includes the following:

1. To identify the works procurement systems selection practices in GAF.
2. To identify the factors influencing the choice of selection of works procurement systems in GAF.
3. To make recommendations for the improvement of works procurement management systems in GAF.

1.5 Research Questions

Based on the research objective outlined above, the following research questions are worth considering:

1. What kind of works procurement systems selection does GAF engage in during selection of works procurement systems for any particular project?
2. What are the factors influencing the selection of works procurement systems practices in GAF.
3. How can works procurement management system be improved in GAF?

1.6 Significance of the study

The researcher is of the view that the Public Procurement Act is very crucial to enterprise development and growth in the Ghana Armed Forces (GAF) under the Ministry of Defence (MOD). The study consequently seeks to seal this space by empirically examining the works procurement systems selection practices and understanding of the procurement management process in relation to performance of project teams in GAF. This exercise will facilitate a smooth transition from wastage to ensuring efficiency in the public procurement system and to facilitate a fast procurement that leads to the attainment of value for money that creates transparency, accountability, fairness, equity, competitiveness and value for money. The resultant effect is that there will be value for money in the procurement system in GAF leading to higher competition and promotion of good governance as it is directed to its aim but also improving the systems already established.

This study will also provide an empirical literature for future researchers who will be interested in conducting similar researches in the area of works procurement systems selection management practices among the MDA's. It would also serve as stock of knowledge for practitioners and students to gather experience in the area of procurement management.

1.7 Scope of the Study

The works department of Ghana Armed Forces (GAF) which is Directorate of Engineering Services (DES) under Ghana Armed Forces located at Burma Camp, Accra was used as the study. The study covered the procurement practices of the GAF in relation to the selection procedures.

1.8 Limitation

Ghana Armed Force procurement practices are the three types of systems being procurement of goods, works and services. However, due to limited time and funds the researcher limited this study to works procurement system selection practices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical study on procurement systems and how to improve the management of the project team in procuring works projects. The review aims at discussing the overview of procurement systems management reforms. The chapter begins by discussing the overview of works procurement in general. This is followed by the definition of procurement in general and the nature of procurement systems with respect to Defence Ministries procurement, evolution of contemporary procurement, procurement management project team as well as a detailed analysis of various procurement systems selection.

2.2 Background

Procurement of works project is extremely large because it consists of the act of obtaining something like suppliers for an army or other organizations, it also involves the act of gathering different individuals, office buildings, building accommodations, bridges, roads etc. for a “client or a customer’s”. On the other hand, procurement comes from the word procure which has different meanings such as; “to acquire”, “to gain”, and “to obtain”. System is a way to work, organize and obtain something which follows with a fixed plan or set of rules. System can at the same time mean an organized scheme, process or procedure and technique. Besides all the above definitions project procurement is all about an organized scheme, process or procedure of acquiring a construction project such as, offices for both military and civilian officers to execute their duties, accommodation for both junior and senior officers, bridges and roads etc (Maizon, 1996).

There is documentation with the rationale of one of the most important purpose for the works procurement project failure is due to the incompatibility of the procurement system that was selected for a selected works projects (Maizon, 1996).

To select a correct procurement system as cited by (NEDO, 1985) is one of the challenges most procurement entities face. Time, price competitiveness, associated risk, needed quality, how flexible the system is, certainty of achieving the targeted objective, any possible dispute and arbitration are some of the common criteria concerning the of particular procurement system selection (Skitmore and Marsden, 1988; Love et al., 1998).

Also according to Maizon,(1996) most of the increasing complexity in building works projects has to do with the financial management aspect which has a direct influence on the type of procurement system that need to be considered by management in planning of the next fiscal year by all public procurement entities. Deciding to Choose a particular procurement systems over the other is a great burden for the procurement entity which sometimes determines the system to go for. Consequently, due to such procurement system, alternative systems are used owing to the growing knowledge of most procurement entities particularly in terms of improving procurement criteria of time, cost and quality.

The essential objective of every procurement system selected is to achieve value for money. An emerging understanding has been noticeable in recent years that value for money is not the same as cost effectiveness. It does not matter how cost effective the industry is, in its design and construction stages if the end product does not add value to the client's business (Maizon, 1996).

2.3 What is procurement?

Procurement is simply another word for the process by which an economic entity, such as a business enterprise or a government agency, acquires the goods, services or assets which it needs to carry out its economic activities. The procurement process involves several dimensions of choice: the nature of what is to be acquired, the identity of suppliers, and the legal mechanism to be used to affect the acquisition and side-deals and wider economic and social effects that might accompany the purchase (Arrowsmith and Hartley, 2002).

Economics recognizes the significance of these issues in analysis of product quality and characteristics, inter-firm performance differences, deficiencies and asymmetries in information in relationships between the buyer and the seller, transaction costs, and externalities and spillovers. For legal scholars and practitioners, the interest of the procurement process lies particularly in contracting relationships between parties and enforcement aspects. In management research, the focus is on the organization and its relationship to suppliers in the supply chain or network (Arrowsmith and Hartley, 2002).

The concept of works procurement have been defined in numerous customs and according to Hibberd (1991) the term procurement is described in oxford English dictionary as the work of obtaining by heed or attempt, acquire or bring regarding the procurement entity's needs. He then further argued that the aim of this concept of procurement is that, it can raise awareness of the issues which can involve both the challenges which is generally accepted in practices and in establishing strategies.

According to World Bank (2003) purchasing of works, goods and services on the greatest achievable full amount in terms of cost in the right quantity, right quality, at

the right time, in the right place for the purpose of what the government , entity, organization, or individual generally perceive through contract is termed procurement. Apart from world Bank, Mohsini and Davidson (1989:86), came out with another definition as a way of acquiring a new works project space either by direct buying, rentals or leasing from competitive open market or complete design of a building space to meet the required needs.

Every procurement entity that considers achieving a maximum goal in adopting a particular procurement system in terms of speed, price, certainty, quality and risk transfer must practice good procurement management (Mohsini and Davidson, 1989:86).

Kumaraswamy (1994a) when citing example commencing on Sri Lanka's earlier submissions, also came out with a different argument that the accomplishment of technology transfer which itself is frequently misconceptualised from a developed to a developing countries has been shifted by the use of wrong approaches.

2.4 Public Procurement Act of Ghana

According to Eyaa and Oluka (2011), public procurement can also be defined as the operation of the environment with an increasingly intense scrutiny by a driven technology force, reviews in programmes, external public consideration and political influence in improving the systems. By considering the emerging changes in the way Government procure, public procurement has progressively more turn into a worldwide disquiet not excluding Ghana. Before the reform, all departments and agencies were in-charge of their own procurement until the Public Procurement Act (Act 663) in 2003 came to being.

The main reason why Ministry of Finance enacted the Public Procurement Act (Act

663), was to secure thoughtful, monetary and resourceful use of state assets, merge with public procurement processes in the public service to ensure that all public procurement are done in free and fair manner, transparent and not discriminating to ensure total sustainable procurement through value for money, (MoF, 2001). A recent study that was conducted by the World Bank also reported that about fifty to seventy percent (50-70%) of the national budget once not public emoluments is also associated to procurement (World Bank 2003). Having critically defined what public procurement means, it can be said that well-organized public procurement system could guarantee value for money in government expenditure.

In Ghana, the (Act 663), took effect in August, 2004 requires that public entities and organizations undertake procurement of works, goods and services in accordance with the Law. This was enacted by parliament of Ghana and promulgated in bringing judgment and conventionality to public procurement through all the Government institutional entities and principles that harmonize the public procurement process and any other activities involved. These requirements although laudable is bedeviled with numerous challenges and according to Arrowsmith&Trybus (2003) public procurement entities have been facing and will continue to face many challenges. Some of these challenges have been classified by other authors as either external or internal factors. Apart from the above mentioned challenges, all nations will have their own exclusive societal, intellectual, economic, and political atmosphere hence public procurement challenges differ from country to country.

The major challenge in the public procurement process has to do with the management of the contract especially in Ghana.

This is because traditionally all public procurement entities with greater focus based

their concentration on value for money goal at the same time as public procurement contract management which helps in achieving value for money has received very little attention. One can cite a typical situation in Ghana where huge judgment debts in most cases are attributed to the lack of proper contract management with an example of a case where the importation of Mitsubishi Pajero o were procured into the country which had been parked at the Institute of Local Government Studies without being used. If proper contract procurement procedure was followed in the procurement process, the country will not have incurred such huge debts. In Ghana, the public procurement as acknowledged earlier will always face many challenges, especially those that have to do with contract if proper measures are not put in place to ensure that all these challenges are addressed in its proper manner.

2.5 Procurement Systems

Procurement systems in it natural view has a fragmental nature in relation to procurement of works project particularly the separated design and build with the individuality of constructing works projects. Consequential to the transient natural history on projects organization gives greater confidence on the procurement management in location process concerning procurement and to bring such projects to a meaningful termination. For the purpose of identification and communication it is necessary to adopt a term to describe this organization. A record from past research and literature reveals that phrase such as procuring systems; procuring entity and procuring were adopted by numerous researchers with regards to such procurement approaches.

The ‘amalgamation actions undertake via procurement entity towards obtaining a works procurement project by using a particular approach and examination of such

system confirm that they relate to the approach or organizational structure used to acquire a goods, in this case a procurement of works project (Franks 1984).

The option of system accessible to most entities is broad such that it has become necessary to bring out the procurement process in a disciplined and objective manner should be self-evident, but the fact that such a course of action is not adopted by many of the construction industry's customers suggests that the philosophy and the advantages of a systems approach to both the detailed and general management of construction projects is still not widely accepted.

2.6The evolution of contemporary procurement systems

The vast majority of construction projects prior to the Second World War(1939-1945), were implemented by conventional methods of procurement that had remained unchanged for over 150 years. Since that time, however, the number of different available procurement systems has substantially increased, often as a result of importation from the USA, and perhaps more significantly, the willingness of an increasing number of client organization to sponsor and use these new methods. Three phases in the development of contemporary procurement systems can be identified.

First, it was sustained financial development when the use of usual approach of procurement still prevailed, the second was a recession characterized by an increased use of non-conventional procurement systems and the third and final period, which has recently ended, was a time of post-recession recovery during which the most experienced clients of the industry designed and implemented their own procurement systems and more generally, although conventional systems still predominated, design & build and management orientated procurement methods increased their share of the available workload.

Chronologically, these periods broadly relate to the years 1945 to 1972, 1973 to 1980 and 1981 to the present time nearly half a century during which the changed attitudes and needs of client organizations have resulted in a substantial boost in the numeral and type of procurement systems available following the end of hostilities the demands placed upon the building industry rapidly increased in both complexity and workload. Despite this, the pattern of organization of projects remained largely unaltered, particularly in the public sector, with the majority of works still being let on the basis of open competitive tendering even though in Simon's report had strongly recommended the use of selective bidding (Simon Report, 1944).

Philips Report (1950) reiterated this recommendation and in addition highlighted the need for greater co-operation between all of the parties involved in the construction process although by now some innovations in procurement systems, such as tendering which goes through negotiations as well as turnkey project of design and build. This type of system is now been used by a very limited extension particularly the non-public section of the central government.

2.7 Procurement systems, culture and conflict

After careful consideration from the preceded literature review, it is clear that research in the area which relate to procurement systems goes a long way in motivating on technical and solid procurement system approach into more soft-like system phenomenon. Based on these paradigms which come into being, it can be viewed to have a well-structured prospect for clearing up the differences in how procurement system performs on a particular works project.

According to Rowlinson and Root (1997), Crook (1996) they all argue that, for a culture of procurement to have a significant subject matter, it should first investigate

the procurement system. Observations which have constantly articulated has it that dispute normally arises when such circumstances in a contract between two parties becomes necessary. For a smooth running of procurement project to be ensured, the best approach is to consequently improve cultural nature of the particular procurement project. When a peculiar circumstance surface in the initial stage of the contract before the pre-contract stage is reached, then such contract will only arise in a dispute which will not necessarily change the procurement culture. One of the observations suggested by one participant in research work was that it, always profitable for one to put the right ingredients into a well conducted procurement plan which is the only ways of achieving value for money in procurement management.

Fenn, (1989) also came out with a strong argument that procurement issues like arbitrations, disputes, contractual claims, conflict resolutions are broadly considered in every procurement plan.

The strong cultural difference connecting court case, arbitration, and reconciliation measures surrounding developed countries compare to those from Asian countries in most of the time relates to critical western conflicts.

In order to fully come into a logical conclusion on the subject matter, other two well known researchers also tested the hypothesis on contractual claims which were Abdel-Meguid and Davidson (1996). They concluded with a view that, for a dispute to occur within a specific procurement transaction, it can bring about as a result of selecting a bad procurement approach.

2.8 Environmental sustainability on procurement systems

A sustainable procurement is a way of procuring goods, works and services that does not endanger our environment through the actions we apply today which does not affect the future through a total procurement cycle. We live in days where it has become necessary to protect our environment from destruction. The primary aim in every procurement is to achieve value for money a proper sustainable procurement. Such decision must be included in the procurement plan and ensure that such goal is achieved at the end of the project through proper disposal after the end use of the procured item. Sustainability in procurement goes a long way to even ensure that the natives living within the community also benefit from one generation to another by maintaining the natural state of the asset without causing any damage to the environment to secure the future. Unfortunately, certain actions that have happened in the past made it impossible for us to live a normal life in today's era. To ensure that the quality of life that we enjoy today is sustained we should adopt certain actions today that can help us achieve this goal in the near future.

This phenomenon has now been determinedly entrenched inside the state of mind of most research gurus specifically to a number of procurement entities. Due to this, some researchers have decided to do a detailed investigations including (Pasquire, 1997) and (Elliot & Palmer, 1997).

Elliot and Palmer (1997) with their consideration identified which type of procurement system best suits the environment that accommodates such system and they concluded with the intention that procurement systems such as traditional and contract management systems are the best suitable approaches to adopt. In order to come to solid conclusion on this, it is important that the GAF procurement

management not only engage with this concept but also engage with other private consultants groups working in this area.

2.9 Factors Influencing Procurement Systems

Procurement entities before embarking in any works procurement adopt a collaborative strategy in a form of partnership irrespective of the type of procurement system adopted. Such a strategy has been often used by procurement entities with a series of lined up projects completed or on- going.

According to Morledge et al., (2006), proper monitoring can be conducted on both the contractors and consultants by using already defined indicators for each works project and with that a complete comparison can be done on them. The following factors may then be considered after all the necessary primary strategies for the project has been established for the majority suitable strategic procurement; Rowlinson, 1999, Morledge et al. 2006):

- a. Time
- b. Variation
- c. Complexity
- d. Quality Level
- e. Price Certainty
- f. Competition
- g. Responsibility
- h. Risk Avoidance
- i. Price Completion

2.10 Categorization of Procurement Systems

As an aid to adopting a more logical strategy in selecting the suitable method based on the proliferation of systems currently available which suggest that there are different methods of achieving this through the following:

1. Assessment of all risks associated by the participating procurement entity.
2. Through extending the design and build procurement integration.
3. The payment arrangement by the procurement entity to the executing contractor.

The adoption of the first and third methods would only result in categorizations which would be based upon single characteristics of procurement systems and thus provide an insufficiently wide basis for selection. The second method touches upon a critical element within the design and construction process, i.e. the relationship between the two processes but it is again too narrow in its approach.

The NEDO guide adopts traditional, design & builds, contract managing as well as design and management as a four practical approaches of which there is a variations on each one.

According to Perry, (1985), the procurement approaches in categorization are as follows:

- a) Divisions of design and build procurement management.
- b) Design and build Cooperative procurement management.
- c) As simple procurement management.
- d) Design and build as integrated procurement management.

Certain considerations have been given to this kind of procurement categorization as the best approach for assisting in simple classification of procurements system.

Mastermann (1996) also classified procurement systems into other classification based on their inter-related characteristics and how they relate to each other by integrations. The categorization of the various procurement systems are as follows (refer Figure 2.1):

- a) Separate and Co-operative System
- b) Integral System
- c) Management Oriented System

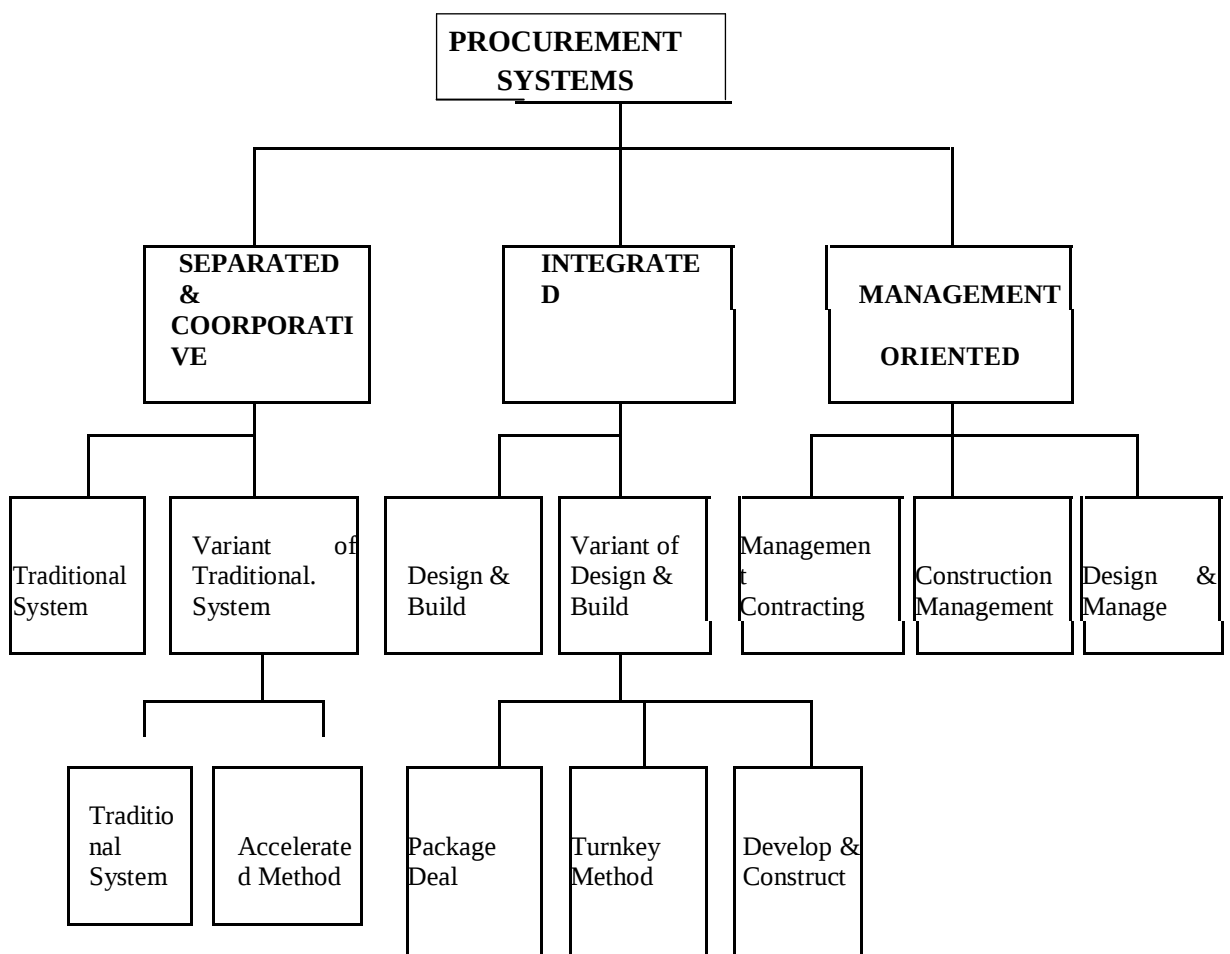


Figure 2.1: Categorization of works procurement systems

Sources: Building Procurement Systems (Masterman, 1996).

2.10.1 Separated and Cooperative Procurement System

The separated systems basically take the form of design and build by which works project are separated and then carried out by a qualified independent entity in this case consultants and contractors. This is a system which is normally termed linear or sequential contracting procurement system. This type of procurement approach starts by first activity called feasibility study followed by preliminary designs, documentation for the construction of the project and finally the handing over of the project which is carried out sequentially one after the other.

After that consultants Architect will prepare the working drawings of which bill of quantities will be prepared by a Quantity Surveyor traditionally before it goes through tendering and construction process or activities.

This type of procurement categorization is further split into sub divisions of Traditional System and its variant. These variant approaches are sub divided into the following:

- a) Sequential system
- b) Accelerated system.

With the sequential system or a single stage tendering approach, the procurement entity has to employ a panel of consultants in the direction of acting on behalf of procuring entity in producing working drawings, specifications, and tendering documents and to administering the tender processes to select a contractor through the approved type of tendering process by the procurement entity. Once the contractor who has won the tender is selected, necessary contract documents are signed for the awarded of contract. Finally, the execution of the project will be done by the appointed contractor with supervision and monitoring from the procuring entity's

representatives until the project is handed over to the client. These methods are capable of further division into two sub categories i.e. two-stage and negotiated tendering methods. Equally these two methods involve pre-discussion through the chosen contractors by submitting a fixed tender or cost negotiations.

2.10.2 Integrated procurement systems

Design and build becomes the accountability of one procurement entity under this system. More often than not a contractor and the procurement entity have merely one institution to transact with.

2.10.3 Management-oriented procurement systems

This is also a fast track strategy which overlaps the design and construction stages and allows early element of the construction process to be commenced before design has been completed. It is a process whereby an organization, normally construction based is appointed to the professional team during the initial stages of a project to provide construction management expertise under the direction of the contract administrator. It employs and manages works contractors who carry out the actual construction of the project. The contract then gets fee for his management services.

2.11 Types of Procurement Systems

Based on the Mastermann (1996) classification of project procurement systems stated in the categorization, empirical studies will be carried on the following procurement systems.

2.11.1 Traditional Procurement System

Comparing the traditional procurement system to design and build system it can be seen that the mostly accepted system is the traditional system. Based on this observation, it can be concluded that, the remaining types of procurement systems

depend on small percentages of most works projects. There is a sequential approach to this type of system compared to others due to its separation nature from sourcing, tendering up to award of contract. Professional consultants are engaged by the procuring entity to give advice concerning the design, tendering and finally awarding the contract to the most evaluated contractor which must be kept within the budgeted cost.

Such procurement entity can engage the services of a qualified quantity surveyor who can give advice and guidance base on the working drawings (designs) by preparing a budgeted estimate through a preparation of Bill of Quantities. The quantity surveyor must also check and help in tender selection and evaluations during the pre-contract stage and preparing interim valuations for the contractor's claims.

According to Seamuscooley, (2015) the contract budgets are mostly prepared by a qualified quantity surveyor through preparation of bills of quantities which includes the total sum to be incurred in the project. The responsibility of the contractor is to construct the project and not to engage in the design process. The separation of responsibility for designing and constructing the project can be seen as the fundamental purpose of substituting the contractual procedures.

Accelerated traditional system is used when two stage tendering or negotiated tendering is employed in selecting a contractor. It is under this kind of system at which both the construction stage and the designing of the project can run parallel to a limited extent. As such action occurs, it can allow an earlier starting time on site giving less attention to the cost involved. The traditional procurement system has three types of contracts which include:

1. Lump sum contracts– with this type of contract, the amount involve is determined before the actual construction so the amount involved is agreed on before construction.

2. Measurement contracts – at this stage the amount involves is known by the completion stage of the project.

3. Cost reimbursement – the contract is agreed on at the initial stage in terms of total cost of materials, plant and labour of which a percentage of profit and overhead cost is added.

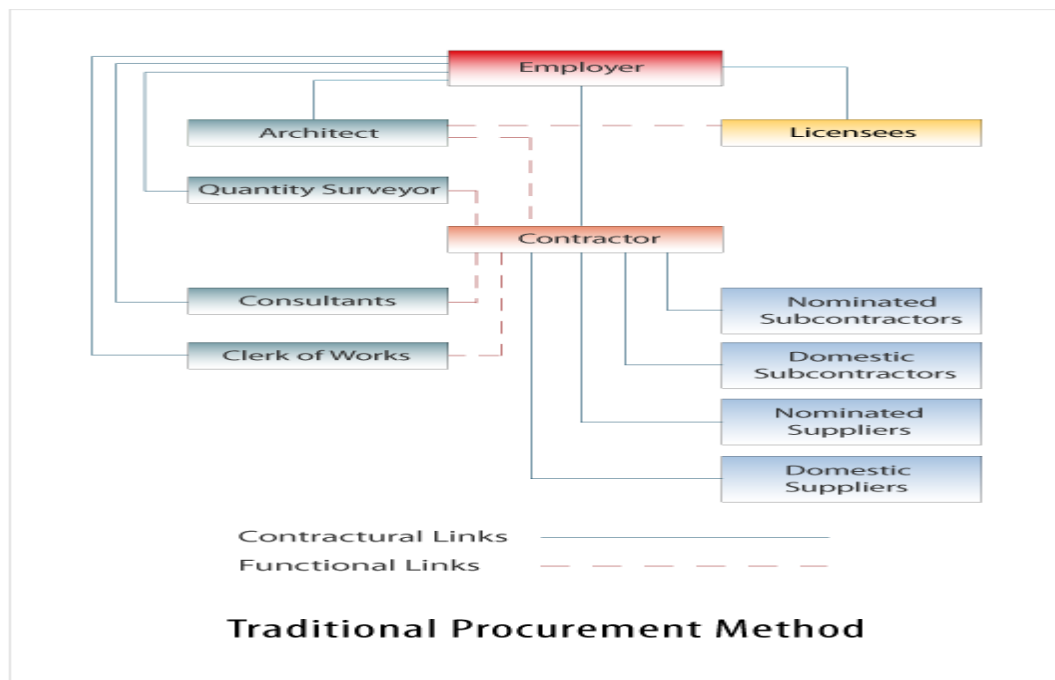


Figure 2.2 Traditional procurement system structures

Sources: (SC quantity surveyors procurement 2007-2015)

2.11.1.1 Some Differences in the variants of Traditional Procurement

- a) With the traditional systems, in particular lump sum contract, enough time must be allowed as it requires a full preparation of contract documents before commencing the tendering process,

- b) The designs are normally prepared by the procuring entity's consultant which totally eliminate the involvement of the selected contractor for the execution of the works project.
- c) Total control over the working drawings (designs) and cost of the project are fully established by the procurement entity's consultants.
- d) There is no contribution from the selected contractor concerning the designing of the project but only accept guidance and directions from the entity's consultants for the execution of the work of which the entity bears any associated risk that can result in claims thus if it occurs.
- e) The procurement entity determines which consultants the contractors must work with even though the contractor might prefer to work with his or her preferred consultants.

2.11.1.2 Advantages of Traditional Procurement System

- a) It provides answerability due to a competitive way of selection.
- b) It uses competition to develop the good organization and quality of work for the procurement.
- c) The partnership within the design team and the procurement entity are coordinated in a possible manner to facilitate highly motivated quality of work in the designs.
- d) To assist procurement entities in establishing a realistic prices for the construction process.
- e) It is comparatively easy to manage any changes that may arise in terms of variations with this type of system.
- f) This type of procurement system has gone through vigorous testing to a large extend of which most procurement entities prefer to use.

2.11.1.3 Disadvantages of Traditional Procurement System:

- a) There could be increasing pressures which may be exerted on the designers and construction management, that can also lead to disputes between the architect and the main contractor.
- b) Relatively to other procurement systems, the whole project period may be longer as the chronological construction process cannot be commenced prior to the completion of the design.
- c) There is no requisite input from the contractor during the design stage as they are not appointed by the procurement.
- d) There is little chance for input on effectual alternates being offered as the main contractor is brought to the team during post-contract design stage.

2.11.1.4 The Use of Traditional Procurement System

According to Turner (1990), Traditional procurement should be used when:

- i. There is enough time to allow a design project programme to run.
- ii. There is a warrant for consultant's design.
- iii. This is normally practiced when a procurement entity wants to employ separated consultants for the design of the project.
- iv. There is a price certainty which is needed before the commencement of the project.
- v. There is a requirement for Product quality.
- vi. There is a risk balance to be strikes between client and contractor.

2.11.2 Design and Build System

The term design and build is where a contractual arrangement is made by which a contractor provides to prepare and enter into a design and build contract for a reasonable amount which includes both the designing stage and the construction stage. This is where the contractor selected is engaged in designing the project during pre-contract stage. In most times, it has become the first choice for some number of procurement entities. This system put the whole burden of responsibilities over the appointed contractor between the two parties. Instead of the procurement entity consulting an independent consultant for the design of the project in this case qualified Architect, the services of contractor who will be employed for the project is allowed to come out with a design and to also construct the project. There is also an option whereby a Quantity Surveyor and Architect will be needed to provide their services on such project for a quality work, time and reasonable cost. They are to also provide good assessment on contracting contractor's proposal in terms of cost as well as the design itself. The Quantity Surveyor is also responsible for valuation of work done by the contractor at every stage of the construction for payment of claims submitted by the contractor.

There is time and cost saving in this type of procurement system since the contractor is allowed to come out with a design that can be controlled during the design and construction stage. Lower cost must be achieved in the final project, on the other hand, resulting in low construction expenses during construction.

Turner (1990) supported the argument that, contractors who are into design and build contracts are more or less applying what is termed as procurement of finished product.

Masterman, (1992) also argues that the design and build system has become more or less a collective way of interpreting a contractual arrangement where one procurement entity becomes a sole responsible to some extend lump sum fixed contract.

Masterman, (1992) went on to say that; this system provides three main basics which include:

- a) Apportioning responsibilities to the designing and constructional stage.
- b) Fixed price lump sum is provided as means of reimbursing the contractor.
- c) The procurement entity's priority becomes the ultimate goal during the design stage.

Every now and then a qualified team is appointed either directly by the main contractor or preliminary appointment will be done a novation manner. "Novation" is the course of achievement whereby the rights and obligations of the employer under the engagement are transferred to the constructor. The engagement will still continue until full accomplishment and effect but the contractor are owed with the obligation of the team to perform the design services, who in turn is obliged to pay their fees.

Alongside, the design consultant is responsible to the contractor and not the owner; with the contractor as the single point of accountability in the incident of a defect in the design or workmanship of the project.

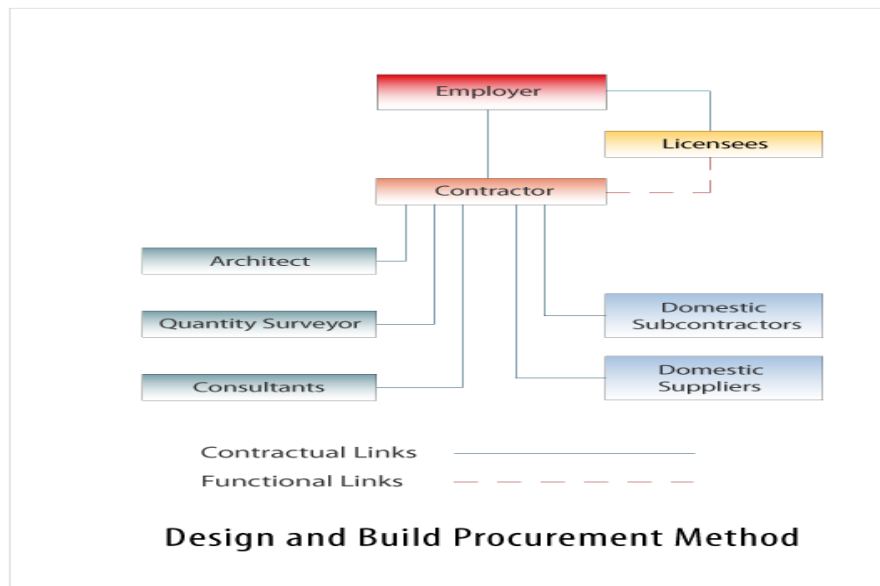


Figure: 2.3: Design and build system structure for managing a project

Sources: (SC quantity surveyors procurement 2007-2015)

2.11.2.1 Some differences in the variants of design and build procurement

- a) There is single theoretical responsibility in design and build contracts in professional responsibility point of view.
- b) The advantage is that, the procurement entity has only one consultancy firm to deal with should something go wrong.
- c) There is a detail in the requirement of procurement entity's to an extent of the contractor contributing to the liability of the entity is totally reduced.
- d) Total control by the procurement entity with regards to design details is limited to the procurement entity due to broader line of schemes are satisfying and less important.

2.11.2.2 Advantages of Design and Build

- a) Only one firm is involved in dealing with which decreases extent to which the procurement entity will put resource and time into such contract.

- b) There is a price certainty which is obtained before the commencement of actual construction by the procurement entity which is specified in procurement requirement and does not affect any change.
- c) The overlapping in design and build construction activities can reduce the time spent on a particular project.
- d) It can increase speed in construction due to contractor's input in during the design stage.

2.11.2.3 Disadvantages of Design and Build

- a) It is complicated to prepare an adequate and sufficient comprehensive brief during the pre-contract stage.
- b) It can be expensive when the client wants to change the project scope
- c) There is some degree of liability in designing to suit the standards of the available contract.

2.11.2.4 Uses of Design and Build

According to Turner, (1990) Design and Build should be used when:

- a) The finished project provides functions rather than impressiveness.
- b) It gives a simple finished project rather and a complicated one.
- c) There is a likelihood of changes occurring in the design brief within the scope.
- d) There is always a flexibility of overlapping the construction design to speed up construction process.

2.11.3 Construction Management

With this route, the contractor who is to manage the project is selected by the procuring entity to manage the whole of the construction activity. Additional payment is made to the contractor for constructing the project by the procurement entity. The

fee is based on the estimated costs of the works as established by the quantity surveyor - usually adopting a cost plan as the basis for budgeting.

Management contracting was popular in the 1980s and 1990s, but this popularity has diminished since then. Construction works are carried out by firms employed by the management contractor, referred to as 'works contractors'.

Unlike construction management, the management contractor has a direct link in terms of contractual obligations of which the contractor is also accountable for the execution of all works according to Royal Institution of Chartered Surveyors (RICS).

The management contractor might offer several of the regular services including temporal office accommodation, plant and equipment's, security, hoisting plants, cranes for hoisting materials which are shared by the works contractors, nevertheless in unadulterated management contracting, such works are let as a self-contained work package.

The entity engage consultants and later bears the risk should such consultants who do the design fails to do so. Eventually the designing of the project will not be completed until the initial work is done even though it is expected for the design to be done on time. The appointment of the contractor who will carry out the construction of a particular project must be done first to ensure cost certainty. After the appointment of the contractor, qualified QS can be engaged to prepare an approximate estimate on how much the project is expected to cost.

Based on the agreement between the procurement entity and the designers, the contractor who is to manage the project is required to appoint potential tenderers which can be done through restricted or competitive tendering for a section of the

work to be done. Payments are issued to the management contractors who in turn pay the contracting contractor for executing that part of the work. All communication concerning the on-going project is communicated to the employed contractor through the contracting management from the procurement entity for the execution of that part of the contract.

It is practical, with this system, for the client to have adequate risk management capability.

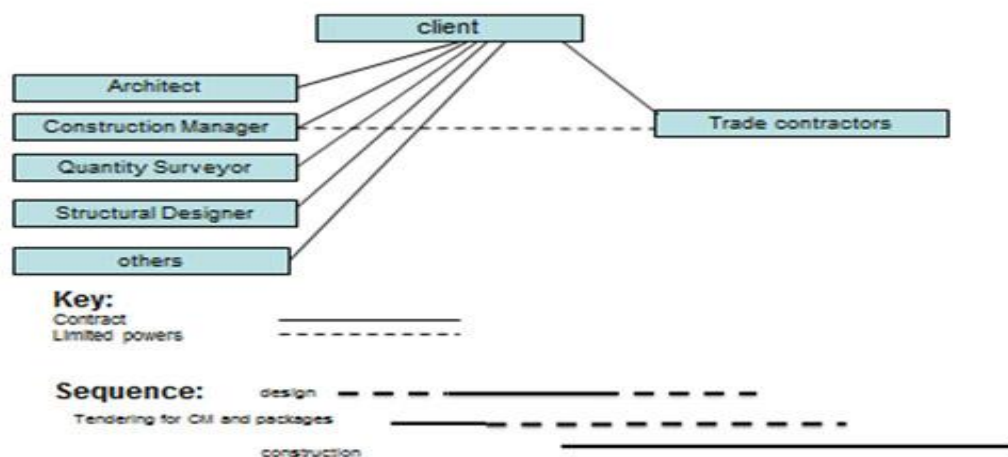


Figure 2.4: The management contracting showing the contractual arrangements

Sources: (Royal Institute of Surveyors)

2.11.3.1 Some differences in the variants of management contracting

procurement

- i. Contracting procurement projects are functional rather than prestigious.
- ii. This type of system takes a simple form rather than a complex one which does not demand any kind of technical creativity.
- iii. It is easy to change the brief scope of the work at any time.
- iv. Speed in construction can be achieved through overlapping in its design and construction process.

2.11.3.2 Advantages of Management Contracting

- i. The main advantages of a management contracting route are as follows:
- ii. The strategy enables the management contractor and works contractors to contribute to the design and project planning.
- iii. It can allow changes to be done to any part of the on-going construction provided it is in line with the initial design and does not affect the scope of the design.
- iv. The arrangement of construction process is done in a way that does not allow changes in price.

2.11.3.3 Disadvantages of Management Contracting

- i. Commitment depends upon design team estimates.
- ii. The approach relies on an excellent and committed management contractor.
- iii. Unfortunate certainty of price is presented at an early stage and the prospective cost to the procurement entity by the management contractor;
- iv. Design must be closely managed to guarantee that package procurement is kept on programme.
- v. Except the contract is correctly completed, particularly where a proprietary Management Contract is used, the nonexistence of the completed inter-related forms of appointment in a Management Contract will leave the employer open to claim or the contractor at risk, where design liability has not been resolved through to design subcontractors.

2.11.3.4 Uses of Management Contracting Systems

According to Turner, (1990) Design and Build should be used when:

1. It is normally adopted where a huge and complex design of works procurement is expected.
2. Due to its nature of starting the project by the management contractor before a reasonable price is agreed on, it does requires a very high level of trust and assurances during the construction of the work.
3. The appointed contractor's interest must be protected since he or she serves as an agent to the procurement entity in management contract.

2.12 Phases of construction procurement team

A construction project develops or evolves through some very distinct phases. Whether described by a plan of work (Royal Institute of British Architects, 1968 onwards) or a construction management procurement process (CSSC, 1991) the basic generic phases it passes through are:

1. **Briefing**-during which the project requirements are identified
2. **Designing**- during which design solutions are proposed and agreed
3. **Specifying**-during which the production requirements are defined for the physical realization of the design.
4. **Tendering**-during which prices for the production are determined and agreed
5. **Constructing**-during which the production is carried out
6. **Maintaining**- during which the completed project is managed for its useful life.

Ensuring that all the 'requirements' of everyone involved are clearly identified and that it is agreed that they have been met throughout every one of these phases as a chain of conformance is the aim of any quality management process for a project

(Cornick,1991). The above six (6) phases also describe the outline life cycle of a project.

It is also useful to point out that these functions are always carried out on any project regardless of whether the procurement route is traditional, design and build, or construction management or any hybrid of all the three. The procurement method only changes the context and relationship in time in which these functions are carried out. So then, construction project teams come together over the life of the procurement project with the role of the same team member changing as each phase comes into being.

2.12.1 Factors influencing improvement of procurement system.

Like any group of people brought together to carry out any task of whatever sort and for however long, a number of factors will influence how well-or how badly they work together and operate effectively as a team.

According to Chang, (1994) a dynamic team in every organization needs to:

- a) Clearly state its mission and goals
- b) Operate creatively
- c) Focus on results
- d) Clarify roles and responsibilities
- e) Be well organized
- f) Build on individual strength
- g) Support leadership and each other
- h) Develop a team climate
- i) Resolve disagreements
- j) Communicate openly

- k) Make objective decisions
- l) Evaluate its own effectiveness
- m) Political stability
- n) Less Political interference
- o) Being transparent
- p) Means of accountability
- q) Value for money
- r) Sustainability of procurement

It would appear that many of the above elements are always naturally in place in any construction project. For example a clearly stated mission and goal would be to build a building, bridge or road and each basic key team member, as described above, operates creatively for this or her own particular contribution to the overall design and construction process. Each of the project's evolutionary phases has definite enough outputs in terms of information or completed construction to make sure that there is a focus on results and, as also described above, each team member's role and responsibility is distinct and clear enough.

It is used and built on throughout the project and through its traditional conventions, disagreements are quickly resolved to allow progress, although the ramifications can be felt long after in pursuit of financial claims. Communication is reasonably open between all parties who have to communicate to carry on with their part of the project and decisions are usually objective when all the relevant factors have been considered.

Those elements that may not necessarily be naturally being put in place in any of the construction project are, for example:

- a) That there are unclear roles and responsibilities beyond the basic functions of each team members.
- b) The project is not necessarily well organized as a team.
- c) Lack of identity of and therefore lack of support for leadership as it shifts from one team member to another.
- d) An undeveloped team climate.
- e) Disagreements which although resolved in the short term have long-term costly consequences because they are not really resolved satisfactorily.
- f) There is often no real opportunity or incentive for the team to evaluate its own effectiveness as a whole and there are even liability inhibitions to do so anyway.

The influences that may result in the later elements not being place are varied but will come from either human, operational, information, organizational or legal (contractual) factors. For example, the traditional method of procurement and the contractual systems which support it can well inhibit team effectiveness evaluation because of individual party's liability consequences. Equally, an ill-thought-through information system with any method of procurement can seriously inhibit open communication and therefore indirectly affect mutual support in terms of knowledge charring when it is needed.

2.12.2 Improving the works procurement selection system in Ghana Armed Forces

The construction industry is constantly under re-examination as to how its work can be improved. In order to achieve the overall improvement on project team, it will come in part through utilizing changing technologies and in part through improved teamwork. According to Cornick, (1996) the twin T's of technology (where new

construction or information technology) and teamwork (brought about by new management approaches) are interdependent in the context of achieving overall improvement in the industry's performance in whatever terms that improvement may be measured. Improving the 'procurement system' part, just like improving the technology part will come initially through knowledge about what these approaches are and how they relate to the industry's current structure and practices.

Change in any field of human activity is never that revolutionary, in that change itself inevitably means changing the status quo from which the majority of people in work derive their economic and emotional security. Change is therefore initially resisted until those people whom it will affect can see it as an opportunity and benefit rather than a threat and disadvantage.

The construction industry and those who work in either the design or the construction firms which it comprises are no exception to resistance to change and perhaps because of its traditional historic roots as an industry is more resistant than most.

However, its people whether designers, procurers and constructors are by the very definition of their work very practical and therefore often skeptical of new ideas, technology or managerial unless the advantage is very obvious, preferably in the short term and they can see how it will help them on their next project Cornick, (1996).

Given the basic need for a construction procurement team to have to work as an interdependent group, it might be argued that if the right environment is created to allow improved teamwork, it will naturally happen that addressing these missing elements can be applied to the individual team member, be it procurer, designer or constructor in their relationship with another team member in the context of the overall construction procurement project.

Having gone through this empirical phase of this literature review, it can be said that to improve works procurement system selection will come a long way when certain missing elements are understood and permitted to be applied by each team member in the context of their day to day activities. In adopting a particular procurement systems and coordinating an effective team, every procurement entity must have qualified professionals who will be involved in planning, Sourcing, Contracting, Contract management, Storage, Distribution, Evaluation(life cycle cost) in this case Quantity Surveyor, Architects, Civil Engineers, Mechanical Engineering etc.

The following points have been identified as some of the ways to improve procurement system selection among the team which includes:

a. Cohesiveness

The initial point to consider will be the inter-relationships between all the procurement members within the management. Even though these characteristics are complex to examine, certain signs can be looked at by procurement managers to get them well familiar with.

b. Communication

Well-organized communication mechanisms are critical to develop effective reflection on how to go about planning any initial works procurement project. an effective communication among all professionals who constitute the procurement panel must have an effective communication approach to achieve the targeted procurement goal for a particular procurement system. Below are some points to consider in ensuring an effective communication:

- a) Adopting smooth conversations among members ,
- b) Eagerness in the direction of considering all opinion available,
- c) Frequent communication enhancement,
- d) Efficient way of resolving conflicts,
- e) Well-organized decision making approach.

c. Homogeneity

The complex nature of every procurement entity is how to balance the homogenous and exaggeratedly heterogeneous of the procurement members within the entity. Similarities and differences must be considered by procurement managers in terms of the following points:

- Personal characteristics
 - Skills, generational backgrounds
 - Educational background
 - Abilities, cultural background
 - Income levels when evaluating procurement panel of team homogeneity,
- (Plowman, 2015).

d. Role Identity

The degree to which procurement panels are able to assume diverse responsibilities in the structural form by diversifying effort with a well developed subject matter by expert is what we termed Role identity, (Plowman, 2015).

e. Stability

For an effective improvement to be achieved in every procurement project, high level of cohesiveness must be enshrined to reduce lower turnover rates of experience

through effective communication strategy with clearly defined role identification (Plowman, 2015).

f. Team Size

Procurement Managers are able to make best use of efficiency to make sure maximum level of procurement performance in well planned procurement through proper evaluation of team's size. For a procurement goal to be achieved, the size of members within the procurement team must be proportional to available resources. One interesting thing is that conflicts that normally arise in procurement have a direct relation to the size of the team, (Plowman, 2015).

2.13 Ghana Armed Forces Procurement Systems

Commonwealth member countries constitute the largest procurement in every defence ministry or agency and are mainly in complex procurement activities. Ghana Armed force has its own procurement systems which are controlled internally due to its sensitive security nature.

And for defence procurement practitioners, the interest lies in how the procurement of goods and services by the National Defence Organization (NDO) contributes to the formation and sustaining of national military capabilities and in how it could be conducted in the most efficient and timely manner.

In the case of defence procurement, inputs are acquired to enable the NDO, a publicly owned and government –controlled economic entity, to produce the output of defence procurements. By defence we mean protecting, if need be by application of lethal force, the nation (its people and physical assets) from military threats posed by other nations, groups or individuals. Increasingly, these threats are posed by quasi-military organizations and groups that aim to perpetuate armed violence and acts of terrorism

and which may or may not be controlled by other governments.

However, in the sort of mature democracies of primary interest to us in this volume, only governments organize the supply of national security, including defence, because in democracies only the state is empowered to use lethal force.

The Public Governance, Performance and Accountability (PGPA) Act 2013 established that there are numerous legislations with a strong impact on most of commonwealth procurement countries of which Ghana is one of them. Apart from such legislations, there is also certain mandatory inter-connected procurement from the commonwealth countries including well co-ordinate procurement, value for money which is the rule of the CPRs. For procurement to achieve the required value for money, official's responsibilities toward such procurement must be a satisfying one after a reasonable consideration. To achieve such value for money, the following points must be implemented:

- a) Avoiding non-decimations and encouraging sanctified competition.
- b) The commonwealth policies are to ensure proper use of public funds it in an effective, economical, ethical and efficiency manner without any inconsistency.
- c) To ensure transparency, free and fair procurement through proper accountability to ensure value for money.
- d) Creating awareness of risk management in all procurement activities.

2.13.1 What makes Ghana Armed Forces procurement system unique?

Defence procurement is comparable to any other type of governmental procurement in so many ways which includes assessing the needs, competitive bids are usually issued, options are evaluated and a choice of suppliers is made according to

Democratic Control of Armed Forces (DCAF (2009). However, Ghana Armed Forces has an internally built system that goes through some procurement process set by GAF under the Ministry of Defence in purchasing large procurement projects with a numinous characters distinguishing it from other governmental agencies or organizations amongst them includes:

- **Long-term planning-** every good procurement start with planning of which Ghana Armed Forces procurement is no exclusion. The entire life cycle cost of the project to be procured is considered by taking a proper account through developing, testing, production and maintaining the end project until it is finally disposed off completely. All this must be planned by the presiding procurement manager within the stipulated time frame for budgeting.

- **Secrecy vs. transparency-**Defence procurement with regards to planning of every procurement system must ensure that it is able to balance between security regarding the technicality, approaches and the execution of the project in line with operational issues and finally accessing the information necessary to ensure transparency and accountability in achieving value for money.

- **Public exposure and political sensitivity-** just recently, a major road was constructed from 37 Military road through Ghana Air Force Base inside Burma Camp, Accra of which one can say that, it exposes the territory of the GAF. Defence procurement tends to attract the media houses and civil society due to its public and political sensitivity especially when it has to do with procurement of works project to accommodate some sophisticated armory.

- **partnerships from other countries-**for the reason that major procurement decisions like goods, works and services will attract other security concerns internationally not

excluding GAF, needs a proper management at the political and diplomatic level to maintain the relationships amongst sister countries and be young.

- **Foreign military assistance-** Ghana is one of the African countries that depends most on loans or grants from other states. Such condition that governs these grants often requires that the money is used in judicious manner without any embezzlement.

A typical example can be cited US foreign military assistance in 2004 financial year of which 87% was spent on goods and services by US which consequentially had an adverse effect on domestic industrialization.

- **Project collaboration-** Ghana Armed Forces continues to receive support for its procurements including goods, works and services from both commonwealth countries a US in support of partnering the global war fighting and this can be achieved through international collaborations especially when it comes to technical complexity and expensive defence procurement.

2.13.2 The Procurement management structure of Ghana Armed Forces (GAF)

The works procurement department of GAF has a linear linkage directed to the General Head Office (GHQ) of Ghana Armed Forces (GAF) through Director General of Logistics (DGLog) to DES. For the purpose of this study, this line of structure below will be used to conduct the research.

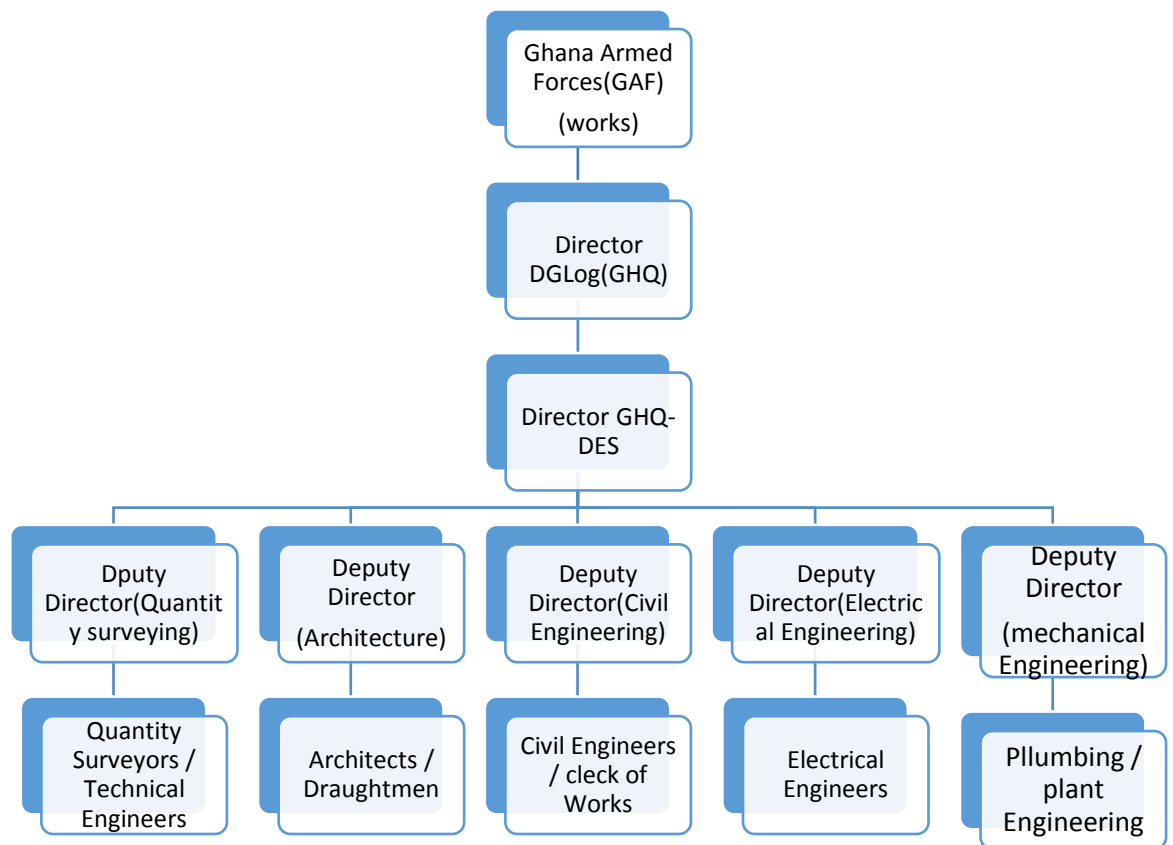


Figure 2.5- Procurement structure at DES

Source: DES 2015

The following are the Duties and Responsibilities of the Directorate of Engineering Services:

- i. Preparing indications of Costs (I of C) and Preliminary rough estimate (PRE) for Defence Projects. These are normally calculated from sketch designs or preliminary drawings prepared by the Planning and Design Department. Costs are based on a meter, square meter and cubic meter and apply to work to be executed by 49 Engineering Services by direct labor or by contract or to selected contractors Fitcher F. Lt. Col. 1968.
- ii. Preparing Bills of Quantities for buildings, bridges, roads, and external works including all services. Standard Bills of Quantities are available for most barracks buildings in the regions.

According to Fitcher F. Lt. Col. (1968) there were no structured public procurement practices for procuring works in the Ghana Armed Forces (GAF) before the reforms. The directorate normal practices for procuring works projects for the Ministry was drawn up by using a particular specifications and conditions of Contract which was based on internal information available as at that time.

The Standard Documents available will have to be altered to suit new requirements for the invitation of Tenderers and award of contract for GAF Projects. Instruction are issued from Director General Logistics (DGLog) to Directorate of Engineers (DES) after the identification of a project that goes through the Traditional system by the composition of project team which comprises of Architects for the conceptual design phase, Quantity Surveyors for the preparation of bills of quantities, Structural Engineers, Electrical Engineers etc. within the Directorate for GAF projects.

Due to the emerging partnership in Private Public Partnership (PPP), the GAF now adopt some kind of Design and Build contract in a form of PPP.

Tenders are normally based on Bills of Quantities and drawings or drawings only depending of the type of procurement systems been selected for the projects. Occasionally, Tenders may be invited for the design phase, supply of materials and special equipment when Design & Build is adopted for GAF's projects. The Ministry of Defence Contract and Supply Procedure for its procurement outlines the steps which are to be taken. (Fitcher F. Lt. Col. 1968).

The award of contract by the Ministry through the works department of Ghana Armed Forces procurement Committee is assigned to the Quantity Surveying Department by Director of Logistics under the supervision of DES. For the award phase of the contract, letter of acceptance of Tenders are then written by Quantity Surveying Department and are signed by Chief Engineer (Works). All those contractors who

were not successful are written to, informing them that their tenders have not been accepted and there is a standard forms are available for this.

The Third Edition of Articles of Agreement and Conditions of Contract is used by the Ministry. Commencement of works orders are issued immediately after the signing of the contracts for construction works and deviation orders are prepared following on site Instruction given to the Contractor by the Garrison Engineers. (Fitcher F. Lt.Col. 1968).

2.13.3 Procurement Systems practices in Ghana Armed Forces

Ghana Armed Forces(GAF) being one of the security agencies adopts the Traditional systems for most of the their works project through the two regiment which are '48- Engineers' located in Teshie camp and '49- Engineers' located in Burma Camp all in Accra under the Directorate of Engineers for approval by GAF.

The Directorate of Engineering Services (DES) of the Ghana Armed Forces was established under the auspices of Ministry of Defence which is located at Burma Camp in Accra for most of the its works procurement consisting of Building construction, renovation, maintenance, etc. with monitoring and control of all Ghana armed Forces projects.

The directorates which foresee all the works procurement sometimes engage other private consultants in the areas where specialist or an expert's advice is needed for a particular project. The Directorate has sub-departments such as:

- i The quantity surveying department that prepares the necessary contract documentation and preparation of bills of quantities,
- ii The administration that coordinates and keeps all records of such documented contracts,

- iii Stores which keeps all the building materials for its maintenance and renovation works internally,
- iv Planning & Design Department which is in charge of all the architectural, electrical, mechanical and structural designed drawings for procurement of works.

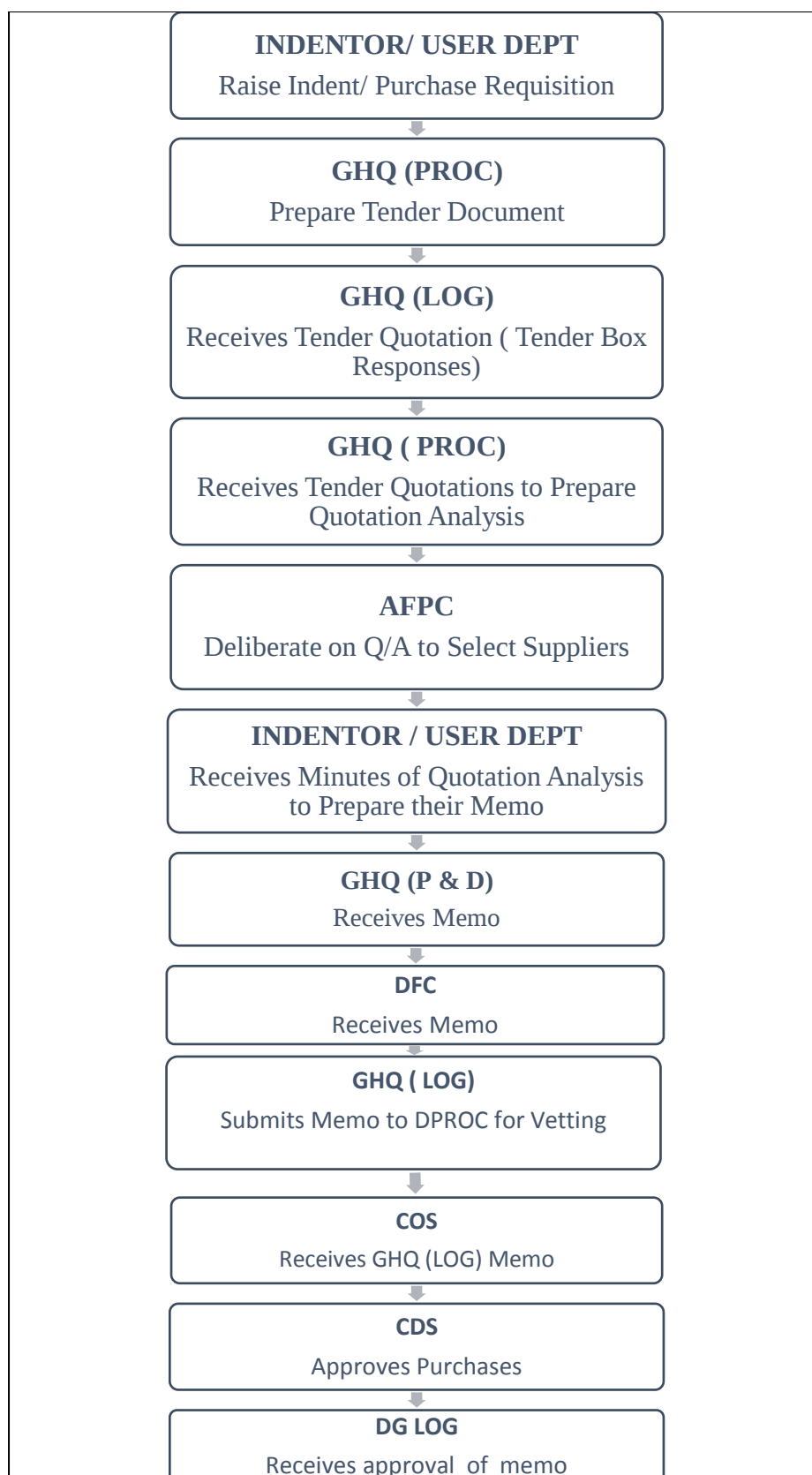


Figure 2.6 Procurement structure in GAF

Source: GHQ Directorate of Procurement

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The approach to this study primarily entailed examination of works procurement systems selection practices and understanding of the procurement management process in relation to improving project teamwork in Ministry of Defence (MOD).

This chapter begins with research approach, the research design, the data collection procedures, the sampling techniques and sources of collecting the data. It concludes by presenting the data analysis procedures and the ethical consideration in this study.

3.2 Research approach

The case study approach is predominantly helpful to make use of when there is a requirement to obtain an in-depth admiration of an issue, event or experience of concern, in its natural real-life context (Yin, 2009).

Case study approach was adopted since this study is of more issue oriented for finding questions and answers rather than hypothesis testing based on existing theories.

Creswell and Plano Clark (2007), argue that the deductive investigator works the top down from a hypothesis assumption or add data to contradict the theory. In disparity, the inductive researcher is identified as someone who works from the "bottom up, using the 'spond views' to build broader themes and Produce have the hypothesis interconnecting themes. The deductive part of the approach is argued from an extensive previous researches conducted within the field of procurement of works in relation to MOD procurement.

Inductive research is a supple approach since there is no prerequisite of pre-determined theory to collect data and information as this helps the research to give inductive arguments (Mertens 2008).

3.3 Research Design

Quantitative theorists believe in one reality that can be reliable and actually deliberately using systematic principles, while qualitative theorists "believe in many constructed realities that generate different meanings to different people, and interpretations which depend on the goal of the researcher (Onwuegbuzie & Leech, 2005).

Based on the stated aim of this study, a qualitative research approach was carried out using case studies due to the relatively little amount of research into the field of procurement system selection MOD.

A case may be technically defined as a phenomenon for which we present and interpret a single measure on a relevant variable (Eckstein, 2002). One advantage of using a case study approach is that it allows the analysis of different types of material, which includes interviews, observations, and different documents, which extends the analytical base (Merriam, 1994) and Yin, (1994) also cited one of the disadvantages of case study approach as often been considered as lacking rigour information from the investigation will be gotten from the administration of questionnaires for this study.

3.4 Determination of Sample Size

The researcher purposively selected Civilian and Military Senior officers, Junior officers as sample frame for this study. The population of the study was Ghana Armed Forces numbering about eleven thousand and fifty(11050). However due to limited

time available for this study, the researcher was carried out with concentration on the Directorate of Engineering Services from basically five (5) departments. Purposively, sample size of ten (10) were selected from each category of key staff that constitutes the works department of Directorate of Engineers (DES) which includes Architects, Quantity Surveyors, Civil Engineers, Electrical Engineers, and Mechanical Engineers under them we also have Technician Engineers (Droughts men), Technician Engineers (QS), Technician Engineers (Civil Engineers), Technician Engineers (Electrical Engineers) Technician Engineers (mechanical Engineers) respectively totaling 100 (constituting ten of each of above classified staff) in number was considered. According to Stoker (1985) as cited by Fugar (n.d) on the determination of sample size for research work, if the population is 100 then 45% may be considered as the sample size. However 10% was added to the minimum sample size to cater for irregularities such as refusal to respond to questionnaires, ineligibility to respond to questionnaires, inability to locate respondent which occur during distribution and collection of data.

And so $45 + 4.5 = 49.5 = 50$

Finally, 50 respondents were decided to be used for the study. Thus 50 key staffs were used to represent the key staff from the above mentioned categories of staffs that form part of the directorate.

The crucial step in the sample size, cited by (Miles & Huberman 1994) is to be explicit about what you want to study and why. Otherwise, you may suffer the evacuated collection traps of each data. You may suffer accumulation of more data than it is time to analyze and detours in the attractive issues related to waste time, goodwill and analytical capacity. Involving the financial system and expediency of small samples,

reliability and representativeness of the sample size is a compromise point, a balance between the practical considerations against the statistical power and generalization. Questionnaires were administered to them as they are familiar with the procurement activities within the units.

3.5 Sampling Techniques

Sampling is the act, process, or a technique of selecting an appropriate sample, or a representative part of the population in order to determine the parameters or characteristics of the overall population (Webster, 1985).

Purposive sampling, also known as the critical sampling, selective gold opinion, is a type of non-probability sampling technology which was used for this study since it focused on GAF.

Purpose sampling technique was used because of the specialized nature of the study and it also helped to eliminate people who did not form part of this study. Purposive sampling technique was used because it is based on the investigator's discretion when selecting the units (eg, people, cases / organizations, events, pieces of data) will be studied. Usually, the sample that is being investigated is quite small, especially when compared with the probability sampling techniques and also due to its time consuming, the results are expected to be more accurate.

Questionnaires were administered to procurement officers who form part of procurement unit at GAF under MOD.

3.6 Sources of Data

This study will comprise primary and secondary sources of data for stated questions in order to provide the needed answers to achieve the aim of examining works

procurement systems selection practices and understanding of the procurement management process in relation to improving project teamwork in Ministry of Defence (MOD). The primary sources of data were gathered through the administration of the research instrument (mainly questionnaire) while the secondary sources of data were gathered from published and unpublished books, thesis and reports.

3.7 Data Collection

Questionnaires were used as a primary method of collection data. Eisenhardt (1989) proposes a roadmap for the development of the theory of case study research that synthesizes grounded theory construction techniques and more structured approaches to qualitative data collection and analysis, as a construction specification above, theoretical sampling and triangulation of data sources. Semi-structured questionnaires made questions of both closed and open ended questions were used for this study. For a survey to be successful, you must minimize the risk of two types of errors: poor measurement of cases (observation errors) and omission of cases that must be surveyed (lack of observation errors) (Groves, 1989).

3.8 Data Analysis

The analysis of responses were gathered from the questionnaires administered and field notes were based on a project to identify patterns in data through inductive approach using Statistical Package for Social Science (SPSS).

The inductive analysis means that the patterns, themes and categories of analysis derived from data that emerged from the data rather than being imposed on them prior to data collection and analysis" (Patton, 1980). The collected data was statistically analyzed and presented in the form of tables and charts.

3.9 Profile of the study area

The Ministry of Defence (MOD) exists to actively promote the interests of national defense through:

- a) Effective formulation, coordination, monitoring and evaluation of policies and programs for the defense.
- b) The maintenance of the Ghana Armed Forces (GAF) in a high state of readiness for national and international commitments, and
- c) Active participation in promoting peace and stability in the country and the sub-region.

CHAPTER FOUR

RESULTS, ANALYSIS AND DISCUSSION

4.1 Introduction

The chapter presents the results, data analysis and interpretation. The chapter is structured into five (5) sections. The first section concerns the demographic characteristics of respondents to the study. The second section deals with works procurement systems selection practices in GAF. The third section identifies the factors that influences works procurement systems selection in GAF. The fourth section talks about improving the works procurement management systems selection in GAF and last section presents the discussion of the findings with references to the literature sampled in chapter two.

A total number of ninety (50) questionnaires were administered to procurement staff from the Directorate of Engineers Services under the Ghana Armed Forces (GAF). Out of this number eighty (45) questionnaires were retrieved, thus the study had a 90% response rate. Table 4.1 below shows the response rate from the surveyed conducted with the questionnaires.

Table 4.1: Details of Questionnaire Distribution, Rate of Return And Response.

Categories	Nomenclature	Questionnaires Issued	Questionnaires Received	Questionnaires Responsive	Response Rate (%)
A	Architect Department	10	10	10	100
B	Quantity Surveyor Department	10	10	10	100
C	Civil Engineering Department	10	10	10	100
D	Mechanical Engineering Department	10	7	7	70
E	Electrical Engineering Department	10	8	8	80
	Total	50	45	45	90

Source: Field Survey, 20th August, 2015

From Table 4.1, a response rate of 90% was achieved from the respondents. This was due to the fact that all the relevant respondents were located within a common geographical area that is DES, which made follow up on respondents easy.

4.2 Demography and Awareness of the Works procurement system in GAFS

The views of the respondents are considered here as those of the principals of the various departments who are in charge of works procurement section in GAF for the purpose of the analysis. The general information being sought are the respondents gender, level of education, the description of employment status, the working experience in the practice of respondents, It also probes their level of conversance of respondents with the procurement system selection practice in GAF.

It concluded by examining the respondents experience on the number of works procurement project executed in GAF.

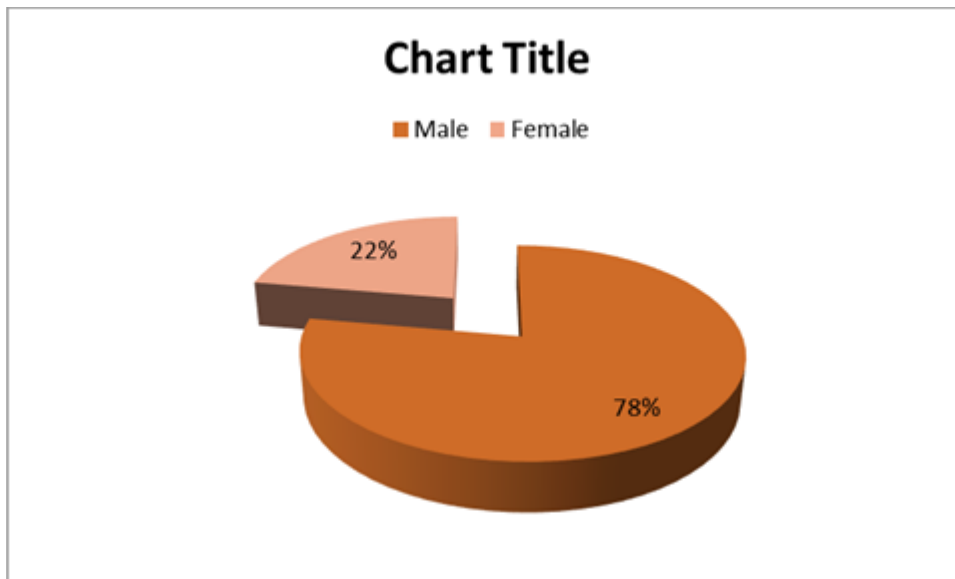


Figure 4.1: Gender Distribution of Respondents

Source: Field Survey, 2015

From Figure 4.1, 10 of the respondents representing 22% were females while 35 respondents representing 78% were males. This is an indication that the procurement of works section of GAF is dominated by males.

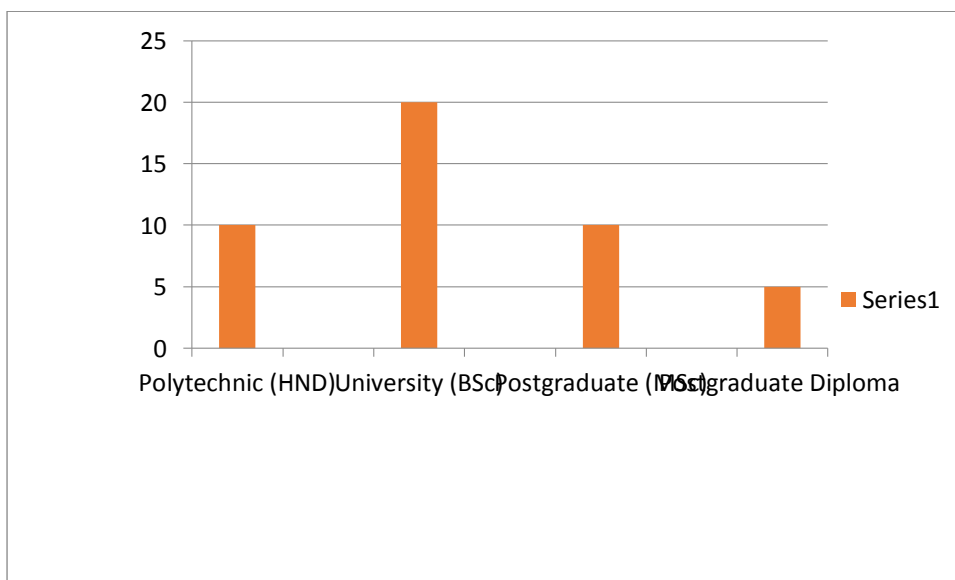


Figure 4.2 Educational level of respondent

Source: Field Survey, 2015

Figure 4.2 above indicates that 20 respondents have had their formal and higher education up to the first degree (BSc.) level representing 45% while 10 respondent representing 22% had masters` degree (MSc.). 10 of the respondents had Polytechnic Higher National Diploma (HND) which represents 22 % and finally 5 of the respondents had Postgraduate Diploma level representing 11%.

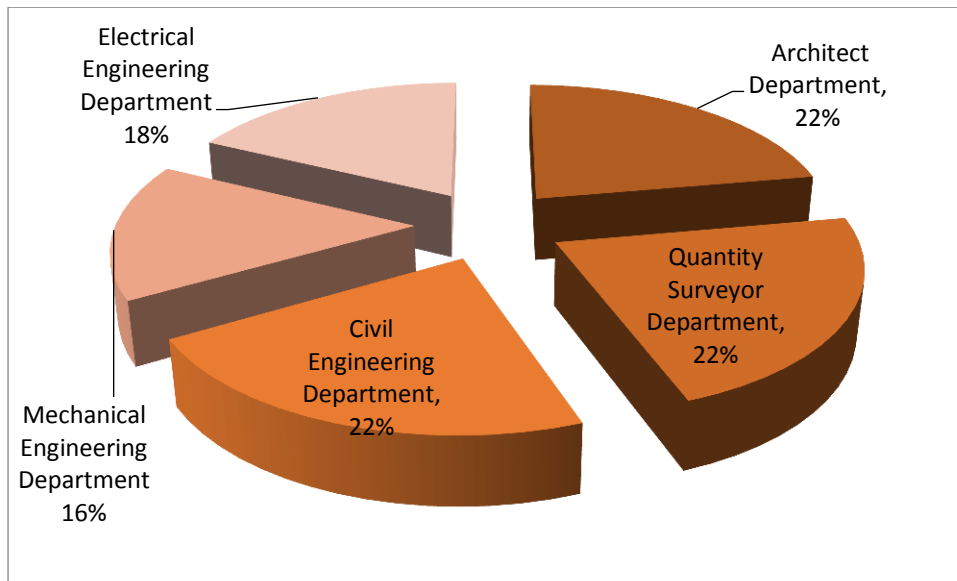


Figure 4.3 Departmental Distributions of Respondents

Source: Field Survey, 2015

From Figure 4.3 above indicate that 10 of the respondents representing 22% said they belong to Architect Department, 10 of the respondents representing 22% also belong to Quantity Surveyors Department. Civil Engineering Department had 10 respondents also representing 22% who are working there while the two Departments which are Mechanical and Electrical had 7 and 8 respondents representing 16% and 18% respectively.

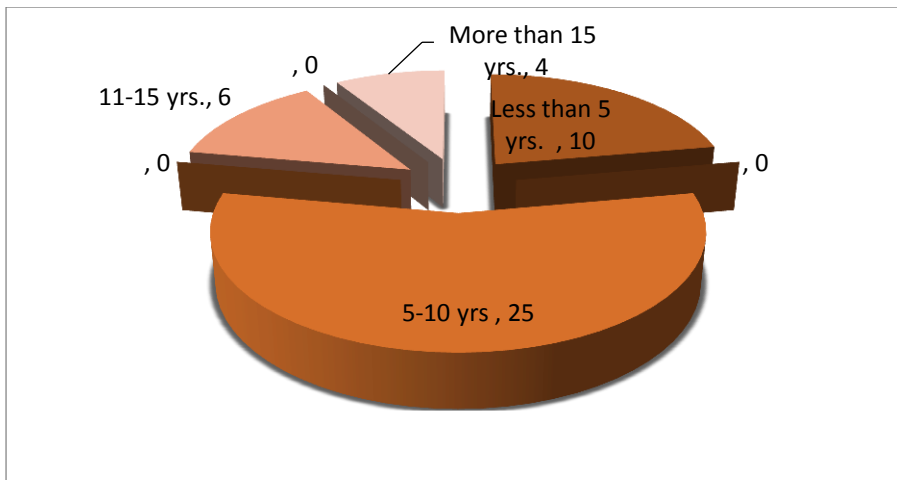


Figure 4.4 Numbers of Years of Experience of Respondents

Source: Field Survey, 2015

From Figure 4.4, in terms of the working experience of the, 10 respondents representing 22% said they had working experience which is less than 5 years, 25 respondent representing 56% said they had working experience of between (5 – 10) years, 6 respondent representing 13% said they had working experience of between (11 – 15) years and 4 respondent representing 9% said they had working experience of more than 15 years. From the above figure it is evident that most of the respondents have working experience of between (5-10) years.

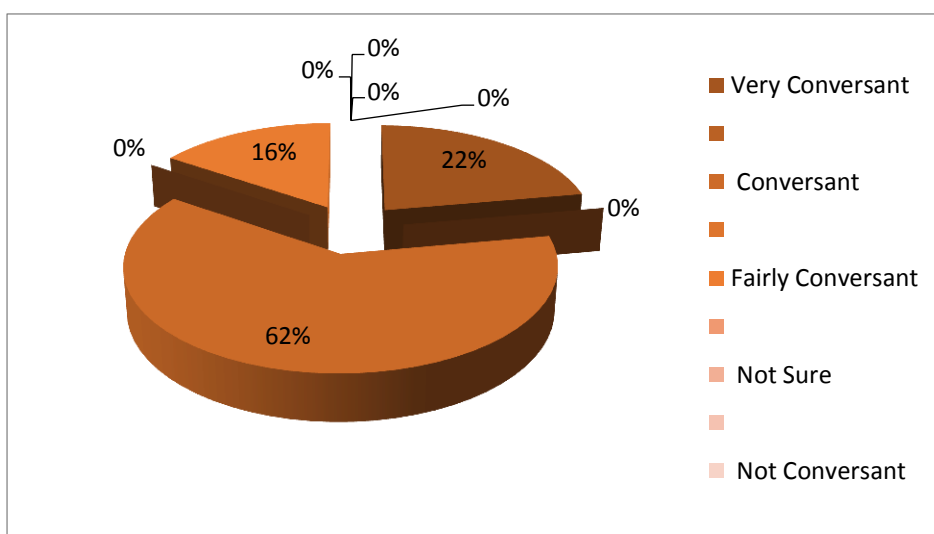


Figure 4.5 Conversant levels of respondents in GAF procurement works project.

Source: Field Survey, 2015

Regarding the extent of conversance with the GAF procurement system from figure 4.5 above, 10 respondents representing 22% said they were very conversant, 28 respondents which constituting 62% said they were conversant with the GAF procurement system, 7 respondents representing 16% indicated that they were fairly conversant with the concept of GAF procurement system, none of the respondents indicated that they were not sure of the GAF procurement system as well as not conversant. It was evident that, almost all the respondents were conversant with the GAF procurement system considering the fact that all respondents had attained tertiary education in works procurement field.

4.3 Works procurement system selection practices in GAF.

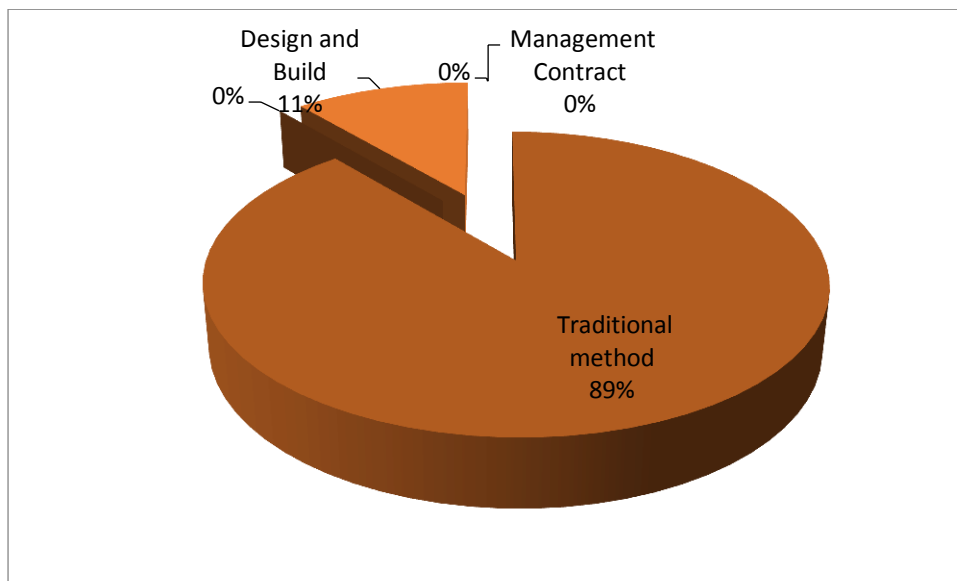


Figure 4.6 Types of Procurement Systems Practiced in GAF

Source: Field Survey, 2015

From figure 4.6 above, it can be seen that most of the respondents indicated that 89% of the procurement system practiced in GAF is Traditional system representing 40 of the respondents out of 45 questionnaire received while only 5 of the respondents representing 11% are of a view that it is Design and Build system that is practiced in GAF. Based on the three types of procurement systems examined, it is clear from the respondent that Management Contract system is not practiced in GAF.

4.4 Factors influencing the choice of procurement system in GAF

Table 4.1 below indicates the extent to which respondents place importance on the identified 15 factors that influence procurement system selection in GAF. It is notable to know that the less the mean of importance placed on a factor which is below 2.5 (average of a range 1-5), the lesser the mean close to 1. This indicates that the factor in question was considered very important by the respondents and on the other hand the closer the mean of the importance place on the factor is above 2.5, the less it was considered important. What is interesting to know is that a mean of 2.5 indicated that the factor was considered fairly important. It is worth noting that for an attribute to be significant, it must have a mean of 1.5 and at a confidence interval of 95% the attribute must have T-Test value of 0.000 to 0.049 to be considered significant.

Table 4.2: Respondents Perception on the Importance of the Factors influencing procurement system selection in GAF

General factors that influences GAF procurement system	Mean	Standard Deviation	Significant Test Value	Ranking
1.Variation	1.76	0.529	0.000	1 st
2.Security consideration	1.27	0.539	0.000	2 nd
3.Emerging Technology	1.78	0.560	0.000	3 rd
4.Government policies	1.91	0.630	0.000	4 th
5.Risk allocation / reduction	1.36	0.645	0.000	5 th
6. Familiarity of procurement system	1.82	0.650	0.000	6 th
7. Quality level	1.42	0.723	0.000	7 th
8. Funding arrangement	1.53	0.726	0.000	8 th
9.Cost	1.49	0.727	0.000	9 th
10. Corruption / self enrichment	1.64	0.743	0.000	10 th
11.Responsibility	1.93	0.751	0.000	11 th
12.Price certainty	1.89	0.775	0.000	12 th
13.Time	1.56	0.785	0.000	13 th
14.Complexity	1.82	0.806	0.000	14 th
15.Political consideration	3.71	1.199	0.000	15 th

Source: Field Survey, 2015.

From table 4.1 above, Variation had a mean of 1.76, a standard deviation of 0.529, significant test value of 0.000 and was ranked 1st, Security consideration was ranked as 2nd and had a mean of 1.27, a standard deviation of 0.539 and significant test value of 0.000, Emerging Technology had a mean of 1.78, a standard deviation of 0.56, significant test value of 0.000 and was ranked 3rd, Government policies had mean of 1.91, a standard deviation of 0.630, significant test value of 0.000 and was ranked 4th, Risk allocation/reduction had mean of 1.36, a standard deviation of 0.645, significant test value of 0.000 and was ranked 5th, Size and technical complexity of the project had mean of 1.82, a standard deviation of 0.650, significant test value of 0.000 and was ranked 6th, Quality level had mean of 1.42, a standard deviation of 0.723, significant test value of 0.000 and was ranked 7th. Funding arrangements had mean 1.53, a standard deviation of 0.726, significant test value of 0.000 and was ranked

8th, Cost had mean of 1.49, a standard deviation of 0.727, significant test value of 0.000 and was ranked 9th, Corruption/self enrichment had mean of 1.64, a standard deviation of 0.743, significant test value of 0.000 and was ranked 10th.

Also Responsibility had mean of 1.93, a standard deviation of 0.751, significant test value of 0.000 and was ranked 11th. Price Certainty had mean of 1.89, standard deviation of 0.775, significant test value of 0.000 and was ranked 12th, Time had mean of 1.56, standard deviation of 0.785, significant test value of 0.000 and was ranked 13th, Complexity had mean of 1.82, standard deviation of 0.806, significant test value of 0.000 and was ranked 14th, and finally, Political consideration had mean of 3.71 with a standard deviation as high as 1.199 of a significant test value also being 0.000 and was ranked 15th. From the above table all the factors had means below 2.5 except Political Consideration which was above the average mean, therefore it means that respondents considered those factors to be very important and only political consideration was considered less important. Again using T-Test all the factors had their significant test values to be less than 0.05 thus it can be concluded that all the fifteen (15) factors influencing procurement system selection in GAF are very significant.

4.5 Identified ways of improving works procurement system management in GAF

Table 4.2 indicates the extent to which respondents identify the ways in which procurement management system can be improved in GAF. Respondents were to indicate the extent to which they agree to the ways of improving the procurement management system proposed in the literature review. It is important to note that a mean below 2.5 (average of a range 1-5) indicate that respondents agree or strongly

agree to the ways of improving the procurement system management proposed by the researcher. On the other hand mean of above 2.5 indicates that respondents disagree or strongly disagree to the mode of risk sharing proposed. A mean of 2.5 signifies that the way in question is considered to be happening often and considered fairly agree by respondents. It is notable to know that the less the mean of respondents agreeing placed on a factor which is below 2.5 (average of a range 1-5), the lesser the mean close to 1.

Table 4.3: Respondent agree to the ways of improving works procurement system selection in GAF

General ways of improving the procurement system management in GAF	Mean	Standard Deviation	Significant Test Value	Ranking
1.Clearly defined procurement structure	1.33	0.522	0.000	1 st
2.Employing competent staff	1.31	0.557	0.000	2 nd
3.Clearly defined goals	1.76	0.570	0.000	3 rd
4.Operate creatively	1.78	0.636	0.000	4 th
5. Sustainability of procurement	1.76	0.645	0.000	5 th
6. Resolving of conflict	1.89	0.647	0.000	6 th
7 Being well organized	1.82	0.684	0.000	7 th
8. Communicate openly and effectively	1.60	0.688	0.000	8 th
9.Supporting leadership and each other	1.73	0.688	0.000	9 th
10.Clarity role and responsibility	1.64	0.712	0.000	10 th
11.Less political interference	1.76	0.712	0.000	11 th
12.Means of accountability	1.76	0.743	0.000	12 th
13.Being transparent	1.71	0.757	0.000	13 th
14. Building on individual strength	1.87	0.757	0.000	14 th

Source: Field Survey, 2015.

From table 4.3 above indicated that Clearly defined procurement structure had mean of 1.33 and standard deviation of 0.522 was ranked 1st , Employing competent staff had mean of 1.31 and standard deviation of 0.557 was ranked 2nd.

Clearly defined goals had mean of 1.76 and standard deviation of 0.570 was ranked 3rd, Operate creatively had mean of 1.78 and standard deviation of 0.636 was ranked 4th, Sustainability of procurement had mean of 1.76 and standard deviation of 0.645 was ranked 5th, Resolving of conflict had mean of 1.89 and standard deviation of 0.647 was ranked 6th. Again, Being well organized had mean of 1.82 and standard deviation of 0.684 was ranked 7th, Communicate openly and effectively had mean of 1.60 and standard deviation of 0.688 was ranked 8th. Supporting leadership and each other had mean of 1.73 and standard deviation of 0.688 was ranked 9th, Clarify role and responsibility had mean of 1.64 and standard deviation of 0.712 was ranked 10th, Less political interference had mean of 1.76 and standard deviation of 0.712 was ranked 11th.

Means of accountability had mean of 1.76 and standard deviation of 0.743 was ranked 12th, Being transparent had mean of 1.71 and standard deviation of 0.757 was ranked 13th, Building on individual strength had mean of 1.87 and standard deviation of 0.757 was ranked 14th. From table 4.3 above all the ways of improving the procurement management system proposed had their means being below 2.5 which is the average. It was also observed throughout the proposed ways that significant test value of 0.000 was recorded. This means that respondents strongly agree to all the proposed means through which procurement management system in GAF can be improved.

4.6 Summary

It is interesting to know that most of the respondents had their education up to first degree and they constituted 45% while the remaining 55% was distributed among Masters` Degree (MSc.), Polytechnic Higher National Diploma (HND) and

Postgraduate Diploma level. Most of the respondents were mainly those professionals who constitute the works procurement section of GAF in this case DES which included Architect Department having 10 of the respondents, Quantity Surveyors

Department also having 10 of the respondents as well as Civil Engineering Department with 10 respondents while the two Departments which are Mechanical and Electrical having 7 and 8 respondent respectively participating in this field of survey.

The working experience of most of the respondents was between 5-10years. Most of the respondents (62%) admitted they were conversant with the type of procurement system in GAF. Also most of the respondents indicated that 89% of the procurement system practiced in GAF was Traditional system.

The entire factors influencing procurement system selection practice in GAF had all their means below 2.5 which is less than the average. Therefore to those respondents all the factors that were considered had an importance level with a significant test value of 0.000 meaning that every the respondents really considered every factor as very important with exception of Political consideration. Regarding the improvement of procurement management system in GAF had their means also below 2.5 (the average) therefore respondents did strongly agreed to these identified ways of improving the procurement management system in GAF especially with a significant test value of 0.000 for each of the identified ways proposed in the literature review.

4.7 Discussion on the study's of the findings

From the factors proposed in the literature review, it became clear that variation has a great influence on selecting or choosing a particular type of procurement system in GAF as it was the most ranked factor among the factors identified by the respondent

in their opinion. It had a mean of 1.76 and a standard deviation of 0.529 with a T-test result of 0.000 becoming the very important factor as proposed by the respondents. The Table below shows result generated by using SPSS for the analysis.

Table 4.4: The most ranked factor by the respondents

Variation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	13	27.1	28.9	28.9
	Important	30	62.5	66.7	95.6
	Fairly Important	2	4.2	4.4	100.0
	Total	45	93.8	100.0	
Missing	System	3	6.2		
Total		48	100.0		

Source: Field Survey, 2015.

From table 4.4, 30 respondents said variation is an important factor that can influence the selection of procurement system in GAF representing 62.5% out of the remaining variable summing up to 37.5% including those who said nothing on “not sure and not important”.

For the ways of improving the procurement management system of GAF, it was obvious that clearly defined procurement structure will always bring an improvement as proposed by the respondent. It recorded the highest ranked identified way of improving the procurement management system in GAF. It had the lowest mean of 1.33 and standard deviation of 0.522 with a T-test of 0.000 indicating that most respondents agreed that it was the best way of improving the system. The Table below shows result generated by using SPSS for the analysis.

Table 4.5: The most ranked identified way of improving the procurement management system in GAF
clearly defined procurement structure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	31	60.8	68.9	68.9
	Important	13	25.5	28.9	97.8
	Fairly Important	1	2.0	2.2	100.0
	Total	45	88.2	100.0	
Missing	System	6	11.8		
Total		51	100.0		

Source: Field Survey, 2015.

From table 4.5, 31 respondents said variation is an important factor that can influence the selection of procurement system in GAF representing 60.8% out of the remaining variable summing up to 39.2% including those who said nothing on “Disagree and Strongly Disagree”.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The aim of the study is to examine the works procurement systems selection practices and understanding of the procurement management process in relation to improving works procurement management systems in Ghana Armed Forces (GAF). Three objectives were set to achieve the aim of the research. However, a number of research questions were posited to guide the accomplishment of the aim and objectives. This chapter seeks to recall the research questions and the objectives in order to address the extent to which the aim and objectives of the study have been achieved. Also in this chapter, the recommendations of the research are presented for further action. The recommendations made are however, based on the findings of the study.

5.2 Research Questions

The following are the research specific questions posed and addressed by the study:

1. What kind of works procurement systems selection does GAF engage in during selection of works procurement systems for any particular project?
2. What are the factors influencing the selection of works procurement systems practices in GAF.
3. How can works procurement management system be improved in GAF?

The research questions directed the study to achieve its aim and purpose. The objectives were revisited to guide the study achieve its aim by commenting on in an attempt to adequately respond to the research questions.

5.3 Findings

5.3.1 Objective One

The first objective set was “To identify the works procurement systems selection practices of GAF”. This objective was achieved through the review of relevant literature on the various procurement systems available and settling on which one is most practices in GAF. From the literature review, three procurement systems were deliberated on which were the Traditional system, Design & Build system and finally Management Contract system. It became clear after receiving the questionnaire distributed to the respondent that Traditional system is mostly adopted by GAF for works procurement project. From the open question posited to the respondents, most of them gave the reason that it provides accountability due to a competitive way of selecting GAF’s works procurement. The collaboration within the design team and the client is able to have a direct influence which can facilitate a high level of functionality and improve the quality in the overall design. Any variations or changes to the contract are relatively easy to arrange and manage.

Some also are of the view that, it is prudent to use the two arms of GAF works procurement which are “48 and 49 Engineers Regiment for the minor works which includes renovation, maintenance, alteration, remodeling. In addition to the reasons given larger population of the respondents said it has a tried and tested system of procurement which the GAF is very familiar with.

Few people said it is Design and build with a reason been that, other partners help the GAF in some works project in a form of grant either directory from the such partners or through the Government Budget for the defence ministry. Some of the reasons were also attributed to their merging Public Private Partnership (PPP) which has the

Design & Build concept under the turnkey project as their reason for selecting such system. None of the respondents selected Management Contract which indicates that it is not practiced in GAF since it is a Government agency.

5.3.2 Objective Two

The second objective is “To identify the factors influencing the choice of selection of works procurement systems in GAF”. To achieve this objective, respondents who were key staff in the GAF works Department in this case Directorate of Engineering Service (DES) were questioned on the number of years they had practiced, they were also asked question concerning the number of projects they had worked on and which concerns the works procurement projects. Besides, respondents were asked as to indicate how conversant they were with the procurement system selection practice in GAF. It can be concluded that although majority of the respondents were conversant with the concept of GAF’s procurement system, they responded by an average number saying they had worked on more than 15 projects.

5.3.2.1 The significant factors influencing the choice of procurement system in GAF are:

- .Variation
- Security consideration
- .Emerging Technology
- Government policies
- Risk allocation / reduction
- Familiarity of procurement system
- Quality level
- Funding arrangement

- Cost
- Corruption / self enrichment
- Responsibility
- Price certainty
- Time
- Complexity

5.3.2.2 The Less Significant factors influencing the choice of procurement system in GAF is:

- Political consideration Residual value risk

5.3.3 Objective three

The third objective set was ‘To improve upon the works procurement management systems in GAF. For this to be achieved respondents were asked to rate (Strongly Agree, Agree, Fairly Agree, Disagree and Strongly Disagree) some perceived general ways of improving the procurement management systems in GAF. The research findings revealed that respondents’ response to the perceived general ways to an appreciable value. To great extent respondents placed adequate value on all the risk general ways of improving the procurement systems identified.

5.3.3.1 The proposed or perceived general ways of improving the procurement management system in GAF are:

- Clearly defined procurement structure
- Employing competent staff
- Clearly defined goals
- Operate creatively
- Sustainability of procurement

- Resolving of conflict
- Being well organized
- Communicate openly and effectively
- Supporting leadership and each other
- Clarify role and responsibility
- Less political interference
- Means of accountability
- Being transparent
- Building on individual strength

5.4 Conclusion

The Traditional procurement system was found out to be the most practiced procurement system in GAF

The choice of procurement systems in GAF is influenced by several factors which include; variation, security consideration, emerging Technology, good policies etc. It was agreed that the procurement system selection can be improved by adopting improvement strategies such as clearly defined procurement structures, employing competent staff, clearly defined goals, etc. Whiles GAF is engaged in procurement of goods, works and services, the researcher limited the study to works procurement and to be specific procurement system selection practices.

5.5. Recommendations

- It is recommended that design and build procurement system should also be introduced alongside the Traditional system especially for projects that are complex, urgent and requires security considerations.
- It is further recommended that there should be effective training and education on improving the procurement management system practices in GAF.
- Intermittently, the ongoing procurement system must be reviewed and further improvement strategies be recommended.
- The staff of the works procurement system department of GAF should be sufficiently motivated to assist with the implementation of the procurement improvement strategies.

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APPENDIX: QUESTIONNAIRE

QUESTIONNAIRE FOR GIA RECOGNISED ARCHITECTS

**RESEARCH TOPIC: Examining works procurement systems selection practices
in Ghana armed forces (GAF).**

INTRODUCTION

The researcher is a final year student of Kwame Nkrumah University of Science and Technology- KNUST from the Department of Building Technology. He intends to execute this research as part of the university's academic requirement for the completion of his Master of Science degree programme in Procurement Management.

Your objective response to this questionnaire is an invaluable aid to this research work. All information provided would be treated as confidential and for academic purposes only. There are no rights or wrong answers.

In case of any doubt/s or need for clarification, please contact any of addresses given below.

Thank You.

Supervisor

Student

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SECTION A – DEMOGRAPHIC QUESTIONS

Below are some demographic questions. Kindly respond appropriately by ticking.

1. What is your sex?

Male

☐

Female

☐

2. What is the highest level of education you have attained?

Polytechnic (HND)

☐

University (BSc)

☐

Postgraduate (MSc)

☐

Postgraduate Diploma

☐

Others.....

☐

Others.....

☐

Others.....

☐

3. Which department do you belong to?

Architect Department,

☐

Quantity Surveyor Department,

☐

Civil Engineering Department,

☐

Mechanical Engineering Department

☐

Electrical Engineering Department

☐

4. For how long have you been practicing?

Less than 5yrs.

☐

[5-10] yrs.[1

☐

rs.

More than 15 yrs.

☐☐

5. How many procurement works projects have you been involved?

[0-5] [6-10] [11-15] More than 15.

6. How conversant are you with the procurement system selection process in Ghana Armed Forces?

Very Conversant Conversant Not Sure
Fairly Conversant Not Conversant

SECTION B – SELECTION OF A PARTICULAR PROCUREMENT SYSTEM AND IT REASON.

What type of Procurement system selection does GAF practice?

Traditional method Design and Build Management Contract

In your opinion, state the reason for selecting this type of procurement system.

.....

.....

.....

.....

.....

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.....

**SECTION C – FACTORS INFLUENCING THE PROCUREMENT SYSTEM
SELECTION IN GHANA ARMED FORCES.**

Below are some general influences on a particular procurement system selection.

Please from your experience as a professional in works procurement at GAF, express your opinion on **(what choice of factor influences)** a particular procurement system selection by ticking the appropriate cell?

General factors influencing the choice of procurement systems selection in GAF.	Very Important	Important	Fairly Important	Not Sure	Not Important
1 Time					
2. Variation					
3. Complexity					
4. Quality Level					
5. Price Certainty					
6. Responsibility					
7. Cost					
8. Security consideration					
9. Political consideration.					
10. Corruption/self enrichment.					
11. Size and technical Complexity of the project.					
12. Funding arrangements					
13. Familiarity of procurement System					
14. Government policies					
15. Risk allocation/reduction					
16. Emerging technology					
Others please specify and rate them.					

**SECTION D – WAYS OF IMPROVING UPON THE WORKS PROCURMENT
SYSTEM SELECTION IN GHANA ARMED FORCES.**

Below are some identified ways of improving **procurement selection system**. Please express your opinion on **(how works procurement management system can be improved)** by ticking the appropriate cell?

General ways of improving the procurement management system in GAF.	strongly Agree	Agree	Fairly Agree	Not Sure	Don't Agree
1. clearly defined procurement structure					
2. Employing competent staff					
3. Clearly defined goals					
4. Operate creatively					
5. Clarify role and responsibility.					
6. Being well Organized					
7. Building on individual strength and skills.					
8. Supporting leadership and each other					
9. Resolving of conflict					
10. Communicate openly and effectively					
11. Making objective decisions					
12. Less Political interference					
13. Being Transparent					
14. Means of accountability					
15. Sustainability of Procurement					
Others please specify and rate them.					