UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

ASSESSING THE ROLE OF CONSULTANTS IN ENHANCING VALUE FOR MONEY IN INFRASTRUCTURAL PROJECTS IN SECLECTED REGIONS IN GHANA

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UNIVERSITY OF EDUCATION, WINNEBA-KUMASI CAMPUS

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FEBRUARY, 2022

DECLARATION

STUDENT'S DECLARATION

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

SIGNATURE: …….

DATE: ……

SUPERVISOR'S DECLARATION

I hereby declare that, the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertation as laid down by the University of Education, Winneba.

Dr. Nongiba Alkanam Kheni …….

Signature: ……

Date: ……

DEDICATION

This work is dedicated to my family.

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LIST OF ABREVIATIONS

BOQ	Bill of Quantity
DETR	Department of the Environment, Transport, and the Regions
DFID	The Department for International Development
FIDIC IV	The International Federation of Consulting Engineers
GDP	Gross Domestic Product
GSS	Ghana Statistical Service
HKCIC	Hong Kong Construction Industry Committee
ILO	International Labour Organisation
NAO	The National Audit Office
ONS	Operational Needs Statement
ROI	Rate of Investment
VFM	Value for Money

ABSTRACT

Construction projects in Ghana suffer from many problems and complex issues such as cost, time, and quality. This research sought to identify and evaluate the major roles played by project consultants in ensuring value for money on public infrastructural projects in some selected regions in Ghana. The philosophical underpinning of the study was positivism. Also, the study employed a cross sectional survey design using deductive research approach characterized by descriptive and explanatory elements based on the research objectives. The target population covered consultants (architects and quantity surveyors) in building construction within the Upper West and Ashanti Region. Purposive and snow ball sampling techniques were used. Two hundred and twenty-four (224) questionnaires were administered and a response rate of 43% was achieved. Several factors were identified as the role played by project consultants leading to ensuring value for money. This included; consultants are responsible for advising the project management team on the most likely completion date, they ensure that the project is executed to the highest possible standard, in accordance with technical specifications and design guidelines, advising on schedule, and budgetary control. The study found that timely decision making has an impact on the efficiency of consultants working on public infrastructural projects. Political pressure from higher authorities, and desire to complete project within a short period of time are some militating factors against ensuring value for money. Also, project management teams sometimes overlook the necessity of Construction Audit at the early stages of project conception and poor contract administration are some challenges to achieving value for money on public infrastructural projects. It was concluded that, urgency of the project at hand, project duration in terms of time spent getting the work done, political influence from higher authorities affecting project delivery, timely decision making on the part of the consultancy team, and experience of the design team on the project are the key factors affecting value for money on public infrastructural projects. It was recommended that consultants should be more interested in design and cost by employing multi-criteria analysis and selecting the most cost-effective criterion. Consultants should plan properly to ensure that contract processes are duly followed.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The construction industry is vital for the development of any nation. Specifically, the pace of the economic growth of any nation can be measured by the development of its infrastructures, like buildings, roads and bridges. (Srinivasa & Srinivasu 2013), Almost all government projects and activities as well as that of the private sector are directly or indirectly dependent on the construction industry. A well-functioning construction industry is therefore very important to overall national development with Ghana being no exception. This is evident in the extent of resources invested into the construction industry in the form of schools, hospitals, roads etc. by government, donor countries, private individuals and corporate entities. This sector as an agent of development is so important it cannot be undermined. The construction industry has the ability to provide gainful employment for the world's teaming population.

Executing projects usually involves substantial funds and failure or abandonment of such projects has a crippling effect on the capabilities of the investors and the financiers because once a decision is taken to execute a project, scarce resources are tied down for a long time Alao, et al, (2017) . The project may be the only future hope of the client; therefore, he may expect nothing but success. Construction project development involves numerous parties, various processes, different phases and stages of work and a great deal of inputs from both the public and private sectors with the major aim of bringing the project to a successful conclusion, (Takim and Akintoye, 2002). The level of success in carrying out construction projects will depend on the quality of management, financial, technical and organizational performance of the respective parties, while taking into account the associated risk

management, business environment, economic and political stability Simaya & Maro (2018).

The finished product in any industry requires satisfying a certain standard to provide customer satisfaction and value for money (VFM). According to Barnett et al, (2010), Value for money in construction projects relates to functionality and cost of the built facilities. Value for money is used to describe a clear assurance to ensuring that best results possible have been obtained from the money spent (Happy & Godwin, 2018). According to (Barnett et al, 2010), the UK Government used this term to reflect a concern for transparency and accountability in spending public funds, and for obtaining the maximum benefits from the resources available.

In helping to achieve the infrastructural and developmental needs of the Government and also in line with the decentralization, departments and agencies are set up to co-ordinate, implement and supervise programmes and projects initiated by Government. One of such important decentralized bodies is the Metropolitan, Municipal and District Assemblies (MMDA). MMDAs which are under the Local Government are the highest political authority at the Metropolitan Municipal and District levels. One of their major functions is to carry out developmental projects in the district. In doing all these and to achieve the quality envisaged for projects to be completed in time and to ensure value for money, consultants are employed to supervise such projects.

This study intends to put the Upper west and Ashanti regions into perspective. It will look at the role that projects consultants play in ensuring that the huge amount of money the Assemblies spend in putting up building structures can result in producing

high quality and long-lasting structures that can serve their intended purposes very satisfactorily and thus achieve the required value for money.

1.2 Problem Statement

One would have taught that, with the employment of consultants, government building projects would be carried out with minimum constructional problems. However, most government infrastructural projects suffer project failures and deficiencies in the areas of delay, excessive project variations, unacceptable health and safety practices and astronomical increases in contract sum, (Dadzie, et al, 2012).

Some projects are unnecessarily delayed and often abandoned midway through the construction process and left at the mercy of the weather. During such idle periods, foundations are exposed to the effect of erosion, timber frames and doors are attacked by termites and roof carcasses are weakened by the forces of the weather. Such delays and abandonment lead to total weakening of the entire structure even before completion and sometimes variations and fluctuations in cost are incurred. Based on the forgoing problems, it has become increasingly clear that the role played by consultants in ensuring VFM on government building project in Ghana is vital.

Aspect of VFM have been addressed by Staples and Dalrymple (2012); Jackson (2012); Chezue (2014); Ademan, (2014); Osei-Owusu, et.al (2014); Opiyo (2015); Nsiah-Asare, and Prempeh (2016) who did studies on the benefits, techniques and audit practices for VFM. Ngogo (2014) and Abere and Muturi (2015) conducted studies on factors affecting compliance with the Public Procurement Regulations in Tanzania and Kenya respectively. Also, challenges in complying with public procurement regulations have been studied by Chigudu (2014) in Zimbabwe;

Biramata (2014) at Tanzania Ports Authority and Ivambi, (2016) for Public organizations in Tanzania; Adusei, and Awunyo-Vitor (2015) in Ghana whereas Frank T. Ademan (2014) studied ensuring value for money in public procurement in Ghana. Jha, and Iyer, (2007); Takim and Akintoye (2007); Saraf (2015); Jatarona et al. (2016); loke et al. (2016) did studies on public construction projects performance and factors affecting quality performance in construction projects in Malaysia.

It is significant however to note that most of these researches have concentrated much on public procurement, its benefits and factors affecting compliance with the procurement regulation as well as project performance and factors affecting construction projects to the neglect of the role's consultants play in ensuring VFM. Also, Architects and Quantity Surveyors are the only consultants considered for this work unlike most researchers who considered the whole consultancy firms. As such, their findings cannot be implemented in developing nations which Ghana is not an exception.

From the context of assessing value for money on construction projects in Tanzania, Simaya and Godwin (2018) conducted a study to assess the performance of building projects in Local Government Authorities in Tanzania to determine the extent of compliance with VFM. The study revealed that there was the unsatisfactory performance of time, quality and cost as key performance indicators VFM. Also, projects were faced with the challenges of excessive delays, inadequate BOQs, lack of proper progress reports, improper preparation of the documents, inefficient supervision and absence of approval from Procurement Entities (PEs) and Tender Board (TBs).

Olatunji et al. (2017) also conducted a study on ways by which the required value for money can be achieved in a project. This included detailed risk analysis and appropriate risk allocation, drive for faster project completion, curtailment in project cost escalation, encouragement of innovation in project development, preparation of a detailed specification etc. Meanwhile, the barriers to achieving value for money on investment for the client were discussed with recommendations for improving VFM practices.

Dadzie, et al, (2012), also conducted research in Ghana on the performance of consultants on government projects. It was revealed in their study that, the main factors negatively affecting the performance of consultants were urgency of project at hand, project duration, variations, political influences from higher authority, timely decision making on the part of the consultancy team etc.

Based on the analysis on the body of knowledge from the previous studies with regards to VFM and in order to address these shortfalls, the researcher identified a limited knowledge and seeks to assess the major roles project consultants play in ensuring value for money on government building projects in Ghana.

1.4 Research Questions

Having made a thorough and exhaustive review of theoretical literature on theories played by building consultants in ensuring value for money on Government building projects in Ghana, it would be safe to assume that the problem of this research is located within the context and framework of the following research questions:

1. What are the major roles project consultants play in the construction industry to ensure value for money on infrastructural projects?
2. What factors militate against project consultants' role in ensuring value for money for public infrastructural projects?

3. What are the key challenges to achieving value for money for public infrastructural project in selected regions in Ghana?
4. What framework can be developed for value for money-decision making on public infrastructure projects in Ghana?
5. What measures can be recommended to enhance efficient performance of project consultants in relation to value for money decisions in construction projects in Ghana?

1.3 Aim and Objectives of the Study

The aim of the study is to find out the roles played by building consultants in ensuring value for money on Government building projects in Ghana. The specific objectives of the study are:

1. to determine the major roles played by project consultants in construction projects leading to ensuring value for money in selected regions in Ghana;
2. to identify major factors militating against project consultants' role in ensuring value for money for projects in selected regions in Ghana;
3. to determine key challenges to achieving value for money for public infrastructural projects in selected regions in Ghana.
4. to propose a framework for value for money decision-making for public infrastructure projects in Ghana; and,
5. to recommend measures to enhance the efficient performance of project consultants in relation to value for money decisions in construction projects in Ghana.

1.5 Significance of the Study

Due to the high amount of the taxpayer's money that government spends through the Metropolitan, Municipal and District assemblies in putting up public buildings, it was imperative to study into the roles played by consultants in ensuring that structures were worth the amount spent on them. It was therefore envisaged that the study would create awareness or bring to the fore the contributions project consultants have to make to ensure value for money towards the infrastructural development in Ghana.

The study will also bring into light some of the inherent problems that hinder the smooth functioning of consultants and further propose remedial measures and recommendation to curtail these problems. The outcome of the study will also serve as a guide to policy makers on the sort of interventions needed to be made to improve upon the operations of consultants in Ghana.

1.6 Research Methodology

The study adopts primarily quantitative data collection and analysis approach. The methodology used in this study consists of critical review of relevant literature related to the role of consultants on construction industry. This helped in the identification of the previous work done, contributions made, criticisms, limitations, current findings and their applications. The literature review facilitated the development of sound and vital questionnaire, which centres on the aims and objectives of the study to collect data from the field. The initial step of the study focused on a comprehensive review of pertinent literature from books, journals, international conference proceedings and other publications involving the role of consultants. The next phase of the process encompassed the preliminary field survey. The study used purposive sampling in attaining the sample size of the consultants because of lack of a comprehensive

database on registered body of consultant in the Upper West Region. The third step involved the design of the questionnaires for data collection. The questionnaires contained principally closed-ended questions. Prior to the data collection, a pilot of the questionnaires was undertaken. The last stage of the study was dedicated to collection of relevant primary data through questionnaire survey. The data collected from the field survey was then analyzed using the Statistical Package for Social Sciences (SPSS version 20), focusing on descriptive statistics.

1.7 Scope of the study

The study considered some constituencies in the Ashanti and Upper West Regions of Ghana. The Upper West Region, with Wa as the regional capital, was formerly part of the then Upper Region which was itself carved out of the Northern Region in July 1960. In pursuance of the decentralization policy, the Government, in 1983, divided the Upper Region into Upper East and Upper West, (Statistical service, 2010). The Upper West Region covers a geographical area of approximately 18,478 square kilometers. This constitutes about 12.7 per cent of the total land area of Ghana (Ghana Statistical Service, 2012). The region is bordered on the North by the Republic of Burkina Faso, on the East by Upper East Region, on the South by Northern Region and on the West by Cote d'Ivoire, (Ghana Statistical Service, 2012).

Upper West region has a total population of 576,583 which forms 3.0 per cent of the population of Ghana of which 276,445 (47.9%) are males and 300,138 (52.1%), females. The region's population is predominantly rural (82.5%). The population of the region indicates an increase of 31.6 per cent over the 1984 figure of 438,008, and translates into an intercensal growth rate of 1.7 per cent. The region's population density of about 31 persons per square kilometer may appear low, but there is a large

concentration along the western corridor (Lawra, Jirapa and Nadowli areas) where the density is higher than 97 persons per square kilometre, (Ghana Statistical Service, 2012) (Refer to Figure 3.1).

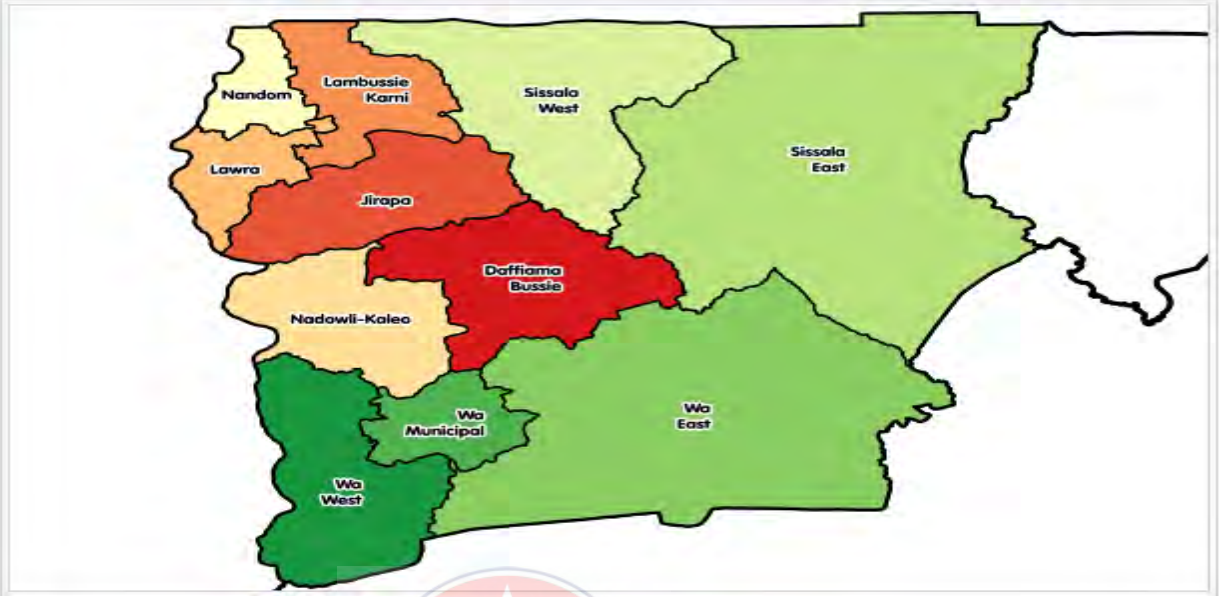

Figure 3.1 Map of Upper West Region

Fig.3.2 Map of Ashanti region

Ashante region is centrally located in the middle belt of Ghana. It lies between longitude 0.15W and 2.25W and longitude 5.50W and 7.46N. The region occupies a total land surface of 24,389 km2 (9,417 sq ml) or 10.2 per cent of total land area of

Ghana. In terms of population, it is the most populated region with 4,780,380 representing 19.4% of Ghana total population (Statistical Service, 2012). The region shares boundaries with six of the sixteen political regions, Bono, Bono East and Ahafo regions to the North, Eastern region to the East, Central region to the South and Western region to the southwest. The region is divided into 43 political administration MMDAs; 1 Metropolis, 18 Municipals, and 24 District Assemblies.

The study is also limited to only building consultants in the construction industry.

1.8 Organization of the study

The study was organized into six chapters. Chapter one looked at the subject matter of the study as related to identification of the problem, aim and objectives, methodology, scope of the study and limitation of the study. In Chapter two, a review of literature related to the topic was discussed. It reviews all manner of literature that talks about the topic and hence lays a foundation for the study. It reviewed other authors work considered relevant to the study.

The method employed in conducting the research was described in Chapter three. It comprises of the sample size, method of sampling, instruments used for scoring, validity and reliability of data collection procedure and analysis of data collected. Chapter four presented analysis of data collected and findings. Chapter five presented the detail analysis of data collected. Finally, chapter six presented the summary of the findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A well-constructed building that satisfies the need of the user is of great concern to the parties involved in its construction. In the case of government projects, huge amount of money is spent in putting up building in an effort to improve the availability of infrastructure in public institutions. This chapter reviewed the literature of authors and researchers in relation to the topic under study. The chapter was organised into eight main sections including; an introduction, overview of the construction industry, Concept of Value for Money and Related Terminologies, measurement of performance, construction management and performance, factors affecting the performance of managers, some approach to successful execution and summary of literature review and conceptual framework.

2.2An Overview of the Construction Industry

The construction industry converts a range of resources into social, economic and environmental infrastructure. It is one of the most influential sectors both globally and in individual countries Dadzie et al, (2008). The construction sector contributes significantly to the gross domestic product (GDP) of all countries. It is also a major employer. It is estimated that it provides on average 7 per cent of total global employment or some 220 million people ILO, (2019). The construction industry involves a large range of participants. The key players are the contractors, the consultants, the government agencies and the private investors. In addition, there are significant backward linkages like material and equipment suppliers, accountants, lawyers and insurers and also those benefitting from incomes earned and

infrastructure provided (forward linkages such as retailers, transporters and exporters), (ILO, 2019).

There were 194,025 construction firms in the UK in 2009, comprising 44,835 main trade construction firms and other trades making up the rest (Ofori et al., 2012). Amongst the main trade's firms, there were 10,629 non-residential construction firms, 27,791 residential construction firms and 6,415 civil engineering firms. Majority of the UK construction firms are small scale, with fewer than 20 employees. For example, in 2009, more than one-third of all construction firms in the UK had only one employee (75,382 firms), and more than two-thirds (136,007) had between two and three employees. Altogether, 94.5% had between one and thirteen employees and 5.8% employed 14 to 79 people. The larger construction firms (more than 80 employees) made up 0.67% of the total, with less than 0.2% employing more than 300 people (ONS, 2010). The number of small firms in the UK construction industry is similar to those in Ghana, thus presenting opportunities to learn from the structure and organisation of the UK construction firms for the benefit of the Ghanaian industry.

The Construction Industry Review Committee (CIRC) was set up as a follow-up to the Hong Kong Housing Authority (HKHA), which, prior to this point, had been mainly responsible for initiating and implementing initiatives in the construction industry and delivering ambitious housing programmes. The composition of the CIRC was composed of representatives of the government and various segments of the construction and property sectors, trade unions and universities with the vision of "an integrated construction industry that is capable of continuous improvement for excellence in a market-driven environment" (Ofori et al., 2012). Following the establishment in 2000 of the Construction Industry review board (CIRB) to review the current state of the construction industry and to make recommendations for

improvement, the "Construct for Excellence" report was produced in 2001. To address the fragmentation of the industry and the prevailing adversarial culture, the report proposed the establishment of a statutory Industry Coordinating Body (ICB). The Provisional Construction Industry coordinating Board (PCICB) was formed in September 2001 to champion the industry reform agenda and set the platform for the early establishment of the statutory ICB (HKCIC, 2012). Membership of the PCICB was mainly drawn from CIRC (Ofori et al., 2012).

Formed in 1997, the Construction Industry Joint Committee (CIJC) unites key players in the construction industry and works closely with the Singapore government towards improvement of the industry. Its eight members, according to Singapore Institute of Building (SIB) (2012), are the Association of Consulting Engineers Singapore, Institution of Engineers Singapore, Real Estate Developers' Association of Singapore, Singapore Contractors Association Limited, Singapore Institute of Architects, Singapore Institute of Building Limited, Singapore Institute of Surveyors and Values and Society of Project Managers. The member organisations work together towards the common goal of improving the construction industry in Singapore. The stated objectives of CIJC include serving as a platform to unite all key players in the construction industry and coordinating efforts to upgrade the construction industry. This is to enable the organisation play a key role in the economy, providing quality feedback to the government on policies affecting the industry and problems encountered the sector and working in partnership with the government to develop appropriate solutions to the various problems affecting the industry (SIB, 2012).

Examples of how a unified body for the industry can champion improvement efforts in the construction industries of their respective countries exist in Africa. In South Africa, The Construction Industry Development Board (CIDB) was established in 2000 as a statutory body to provide leadership to stakeholders and stimulate sustainable growth, reform and improvement of the construction sector for effective infrastructure delivery and improvement of construction skills (Ntuli & Allopi 2014). Its roles also include offering improved value to clients, providing strategic leadership to construction industry stakeholders to stimulate sustainable growth, reform and improvement of the construction sector as well as the determination and establishment of best practices that promote improved industry stability, industry performance, efficiency and effectiveness (Ofori, 2012). African countries such as Zambia, Rwanda, Malawi, Kenya and Tanzania all have central bodies for their construction industries that are backed by the state and are mainly responsible for the regulation and development of the industries (Donkor-Hyiaman, 2014). The key lesson to learn from the reviews of these countries' experiences is that giving legislative backing to these efforts helps provide the legal mandate and authoritative base for the work of these bodies.

2.2.1 The Ghanaian construction industry

The construction industry is very important to the economy of all nations. In Ghana, its contribution to the gross domestic product (GDP) has been approximately 8.2% per annum (Owusu-Manu & Badu, 2011). In Ghana, the construction sector appears to be performing well, and indeed contributes substantially to gross domestic product (GDP) and employment within the economy (Owoo & Lambon-Quayefio, 2018) . For example, the demand for cement, a key indicator of construction activity, has increased consistently from 4.8 million metric tonnes in 2010 to 5.5 million by 2012

(GSS 2018). According to the Ghana Statistical Service, between 2009 and 2013, the construction and real estate industry contributed averagely about 14.34 percent to the country's GDP (GSS 2018). Given its labour-intensive nature, the construction sector is a major employer within the economy.

It is an understatement therefore to say that the construction and housing industry plays an immeasurable role in the national developmental agenda of Ghana. What appears to be in contention however is whether the industry possesses the momentum required to realize its vital contribution towards accelerated national growth in terms of infrastructural development. For quite a long time, the advancement or otherwise of the construction and housing industry has largely been tied to the performance or competence of building contractors even though other professionals, notably architects, civil engineers, building technologists and quantity surveyors play complementary roles in the execution of projects or contracts Ofori-Kuragu et al (2016). Contractors, quite often, bear the brunt of public criticisms of shoddy work, undue delay of projects and perceived diversion or misapplication of contract payments because they constitute the front liners in the award and execution of contract. Like all other human institutions, contractors are not angels. They have bad lots among them and that is why it is important to separate the good from the bad ones and focus on the challenges and other issues affecting the development of the industry.

A number of studies have identified the challenges of the construction industry. Ofori (2012) explored the problems that have affected Ghanaian construction firms. Some of the challenges identified as affecting these firms include the inability to secure adequate working capital, inadequate management, insufficient engineering capacity and poor workmanship. Badu et al. (2012) noted that large and small contractors in

Ghana have difficulty accessing financing for projects. Where debt financing is available, the interest rates tend to be very high. One consequence of this situation is a high frequency of abandoned projects. The cost in terms of lost time, re-engaging new construction firms, and reworking and repairing defects is high. For example, project delays lead to high escalations in costs owing to high inflationary trends.

Adams (2008) opined that delays in the payment of contractors for completed work are very common and constitute a major cause of delays in the completion of projects (Fugar & Agyarkwa-Baah, 2010). Heavy penalties are therefore levied against the government by courts. In an unusual development, a group of Ghanaian contractors resorted to street demonstrations to demand payment for completed government projects after several months of payment delays (Osam, 2012). In 2019 government, through the ministry of roads and highways set up a special committee to raise funds to pay contractors, (Ghanaian times 16th July 2019) after series of picketing at GET Fund and ministry of Road and Transport and anger from contractors. Sometimes government will announce to having paid contractors only for the leadership on the Contractors Associations to come out to deny government claims.

On average, construction projects in Ghana recorded cost overruns of 60% to 180% and time overruns of between 12 and 24 months (Kpamma & Adjei-Kumi, 2010). There is also a lack of commitment towards the health and safety of Ghanaian construction workers, who work in generally unsafe environments (Ankomah et al., 2010). Only a small number of construction firms across the country, which are mostly foreign-owned, have the capacity to complete projects at a high standard of quality and excellence. The absence of clear-cut or well defined standards for the registration of contractors has led and continues to lead to the proliferation of all sorts

of incompetent contractors in the construction industry (Dansoh 2005). And the result? Scramble for the available few jobs, poor or under quotation of contracts, inexperience and ignorance conspiring effectively and efficiently to produce shoddy work (Ankomah et al., 2010). Though a good number of contractors are on record to have performed well and continue to do excellent jobs, Daily Graphic, (2009), the shoddy output of some of them has eroded public confidence in local contractors in general. This unfortunate setback appears to have provided officialdom with the much needed stance of their preference for foreign contractors to the local ones for the execution of medium and major contracts (Daily Graphic, 2009).

The construction industry in Ghana comprises building project consultants, engineers, architects, quantity surveyors, building contractors, and artisans. There is currently no national authority that governs and regulates the activities of the industry. In the absence of this authority, the various sectors within the industry have individual governing institutions. The Ministry of Works and Housing supervises all building and civil works in the country while the Ministry of Roads and Highways oversees the activities of players in the construction and maintenance of roads, highways, railways, airports, and other structures. These two ministries are therefore jointly responsible for the registration and classification of contractors within the industry. From a publication in daily graphic (2009), registration of contractors and renewal of their licenses must be done in consultation with the Association of Building and Civil Engineering Contractors of Ghana (ABCECG). In other words, membership of ABCECG must be a requirement for the registration of contractors to facilitate monitoring of their performance and sanctioning of recalcitrant or non-performing ones. Nonetheless, there is no national database of industry players with information on the respective sizes and capabilities of the Dadzie et al (2012). Contractors in

Ghana are grouped into eight categories (A, B, C, S, D, K, E and G) according to the type of works they undertake. These are (i) Roads, Airports, and Related Structures (A); (ii) Bridges, Culverts and other Structures (B); (iii) Labour based road works (C); (iv) Steel bridges and structures: construction rehabilitation and maintenance (S); (v) General building works (D); (vi) General civil works (K); (vii) Electrical works (E); and (viii) Plumbing works (G). In addition, Dansoh (2005) notes a combined category of AB for road contractors. According to Dansoh (2005), Class 4 contractors can tender for contracts up to $75,000; class 3 up to $200,000; class 2 up to $500,000. Class 1 takes contracts of all amounts. The total amount of work executed by these contractors ranged between 10% and 20% of the total construction output (Owusu-Tawiah, 1999).

The management of resources such as labour, finances, materials, plants and equipment are carried out haphazardly and therefore does not promote performance and enhance growth (Vulink, 2004). It is also reported that the majority of Ghanaian contractors do not have enough funds and credit facilities and lack appropriate technological capabilities, plants and equipment as well as key personnel to handle projects properly (0wusu-Tawiah, 1999). The Ghana business News (2009) also mention outmoded, low level of trained personnel, lack of qualified supervision and unused equipment at building sites are some of the nagging problems facing local contractors in Ghana. Such firms cannot compete with foreign contractors who are more able to capture a major share of the local construction market especially when it concerns more complex projects (Egmond and Erkelens 2007, OwusuTawiah 1990).

Delayed payment of contracts executed can best be classified as the greatest challenge facing contractors but more worrying is the failure of clients, usually the government,

to pay interest or compensation for delayed. The issue of outmoded equipment remains one of the nagging problems confronting local contractors (Laryea, 2010).

To help build their capacities and improve delivery, the ministry must, as a matter of urgency, assist local contractors to procure modem equipment. The plain truth is that whereas local contractors are afraid to claim interest on delayed payment for fear of victimization, foreign contractors are duly paid interest and suffer no victimization.

2.2.2 Overview of project consultancy in the building construction industry

The construction industry is fragmented in terms of the nature of work undertaken, the technologies it uses, its clients (private and public) and the large range of firms or companies involve. Thus, the construction industry has a complex structure. In simple terms, the industry may be classified and structured to reflect the method of organizing the construction processes. Traditionally, the construction process is undertaken by two main groups, consultants and contractors, both working on behalf of the client. As already explained, consultants are architects, engineers (structural and services) and quantity surveyors are constructional professionals with diverse skills and thus offer design management services at a cost. Contractors on the other hand, constitute commercial companies who supply materials and components and also carry out construction for profit (Kwakye, 1997).

A consultant works on a project-basis and he or she works with often highly specialized tasks. The types of consultants in construction projects vary. Typical consultants include project managers, architects, service engineers, as well as cost consultants. You also have third-party client-side technical inspectors, like Commissioning Authorities. Consultancies often have a bigger pool of specialist talent than an in-house team. Thus, by continuously working on projects that are

similar to yours, consultants can be a more time-effective alternative thanks to the expertise and data points they've developed. Consultants can help you anticipate issues before they become expensive and time-consuming. If a serious planning mistake is revealed months or even years into the process, the costs will quickly go well beyond any consulting fee. The best time to start working with consultants is usually the concept stage for design projects and mobilization for consultants (Jourdan, 2019).

2.2.3 Consultants

According to the oxford advance learners' dictionary, a consultant is a person who knows a lot about a particular subject and is employed to give advice about it to other people (Soanes, 2005). A consultancy is however a company that gives expert advice on a particular subject to other companies, people, or organizations. According to Dadzie et al, (2012), the Engineer (consultant) is the employer's agent. He ensures that the project is completed to the right quality against technical specifications and design standards, on time and within budget, i.e., gives the Employer Value for Money. According to Kwakye, (1997) consultants are architects, engineers, (structural/services) and quantity surveyors who are construction professionals with diverse skills and, hence, offer design and management services for a fee.

According to Rawlinsons, (2003) a project manager should have the following skills: a high level of leadership and communication skills; ability to manage the client issues; ability to manage the local government approval process; ability to manage the design process; ability to manage the construction process; and ability to manage risks.

2.2.4 The General Role of Project Consultants

According to Kwakye (1997), construction consultants, also known as "construction professionals" or "the design team" has got general roles to play in ensuring that building projects proceed smoothly and efficiently. The general roles played by consultants are:

- To organize the construction process and participate in briefing, design and construction;
- To offer services for design and cost estimates to the client;
- Factor into their processes all matter that affects the quality of the environment from the point of view of the ultimate user and of society as a whole; and
- To ensure that, the design solution gives the client value for money and affords the most economic production process.

Some of the main duties of the Consultant according to FIDIC IV, 2016 are: reviewing and updating design details; monitoring contractor's operations to ensure timely commencement of operation; reviewing contractor's programme; carrying out quality control tests; reviewing contractor's monthly invoices and certifying for payment; evaluating all claims for additional payment and applications for extension of time; and preparing monthly, quarterly and annual progress reports (Dadzie,et al 2012).

The needs for those professional roles in construction projects are important because client normally require advice since they do not have the expertise to develop the brief, produce a sound design and supervise the construction. Consultancies often have a bigger pool of specialist talent than an in-house team. Thus, by continuously

working on projects that are similar to yours, consultants can be a more time-effective alternative thanks to the expertise and data points they've developed.

According to Jourdan (2019), the role of consultants in construction projects can be to help avoid delays and lapses, achieve operational goals, improve the rate of investment of building, and overall, make the construction process more effective. On a high level, consulting tasks include tasks like developing and supporting the development of the design, working with tasks related to project management, contract administration, inspecting the work of construction contractors, advising on sustainability and giving advice and helping develop the project (Jourdan, 2019).

2.2.5 Factors Affecting Performance of Consultants

According to Bleout, (1998) and Pinto & Kharbanda, (1995), Consultants must be able to operate effectively on a day-to-day basis to ensure positive impacts on the overall quality of their projects. For this to happen, Consultants need to be nurtured and encouraged (Pinto & Slevin, 1989). Nicolini, (2002), asserted that to stop or hinder the performance of consultants will only stop or hinder the performance of the team chemistry and project results. To be most efficiently used, it is said that consultants need to be 'generalists' rather than 'specialists' (Pinto and Kharbanda, 1995). They must "deal with the day-to-day demands of their position while still maintaining a sense of strategic vision for the project" (Pinto and Kharbanda, 1995).

The traditional Construction Industry (CI) culture underestimates the actual time and costs spent in resolving technical issues (Love et al., 2002). Often, improving the consultants' future abilities and long-term performance are just not considered (Adel-Razek, 1997). Work environments that support and encourage creativity and

innovation have been associated with increased productivity in general (Veninga, 2000) and are likely to be of importance in influencing consultants' efficiency (Cleland, 1999). This is expected to involve cross-functional interaction between groups and people to achieve synergy, with organizations that encourage constructive conflict, risk taking and tolerance of failure being the most likely to inspire innovation and creativity (Jassawalla and Sashittal, 1999). A more bureaucratic approach to management, however, tends to stifle innovation (Winch, 2000). What is needed is suggested to be a trade-off between tightly defined systems - that ensure the efficient delivery of products, but also freedom within such systems to encourage creativity and innovation, with the ability to respond quickly to changing needs (Webb, 2000).

Long working hours also likely to be a major source of inefficiency for consultants' – these being increasingly endemic generally worldwide (Sparks et al, 2001; Cameron, 2002; Freeman, 2002; Cooper, 1999; Worrall and Cooper, 1999) and a major cause of productivity loss in the CI in general (Kaming et al, 1998; Horner and Talhouni, 1995). The growth in information technology, globalisation, organizational restructuring, changes in work contracts and work time scheduling are typically blamed (Sparks et al., 2001) together with job insecurity (Sparks, 2002). The effects of working long hours include industrial and social problems (Cooper, 1999); family breakdown (Cooper, 1998); physical and psychological health problems in general (Sparks et al, 2001; Cooper, 1999); and reduced alertness and concentration (Leonard et al., 1998). The critical consequences of time on the effectiveness of consultants have been acknowledged by several leading researchers, such as Thoms and Pinto (1999), indicating that effective project managers (PMs)/consultants must "act intelligently and wisely on concrete and opportune occasions". Similarly, love et al., (2002) research highlights the need for a system for assertive and preventative

strategies that continuously assess and evaluate project performance based on improving management responses.

Project management especially has a large influence on project productivity, quality and rework (Cooper, 1993 & 1994). Rework, in particular, is estimated to be greater than 10% of the total project cost (Josephson, 2002, Love et al., 2002; Woodward, 1997). Regardless of what "dynamic" is the original cause, resources need to be diverted to resolve it, as well as money and time expended often detrimental to other parts of the project (Love et al., 2002).

Finally, inefficiency in the Construction Industry (CI) has been attributed on many occasions to its ineffective traditional ways and bad practices (Egan, 1998; Latham, 1994). As per McKenna (1998), "Some argue that productivity can be achieved/increased by working harder, faster or longer''. In the real world, productivity cannot be achieved by only speed and harder work, without adopting best practices. True productivity (and profit) gains come from identifying and implementing the most efficient work process to satisfy the client's needs, CIB report (1996).

2.3 Concept of Value for Money and Related Terminologies

The value of something, according to Cambridge international dictionary of English, is the importance or worth of that item. In the construction industry, a building project is said to provide value for money if the resultant structure is constructed using quality good material and appropriate constructional methods that produce strong durable and aesthetically pleasing edifices that serve their intended purpose satisfactorily and also suits the comfort of the user (Akintoye et al., 2003). In support

of the above definition, Ivor, (1997) is of the view that clients expect that design decisions, materials and component selection by the professional advisers should give value for money. This value for money should not be in terms of cheap solutions but rather well calculated solution that will stand the test of time, give user satisfaction and benefit the community for the cost and efforts incurred.

In construction projects, value for money relates to functionality and cost of the built facilities. Cost is how the money given is been spent for the projects which should be effective, On the time we consider the completion time of the project which should be within the given time without any delay and on quality this is what the final results are looked at after the use of resources, it should have the best quality of the work. Factors for ensuring value for money are transparency, accountability, competitiveness, fairness and efficiency (Nsiah-Asare and Prempeh, 2016).

Value for money according to Barnett, et al; 2010 is used to describe a clear assurance to ensuring that best results possible have been obtained from the money spent. In the UK Government, use of this term reflects a concern for more transparency and accountability in spending public funds, and for obtaining the maximum benefit from the resources available. Jackson (2012) explained that Value for money is striking the balance between the three E's; economy (cost minimization), efficiency (output maximization) and effectiveness (full attainment of the intended results). It is a way of thinking about using resources well and a measure of quality that assesses the monetary of the produced goods or service (NAO, 2017). Good value for money is the optimal use of resources to achieve the intended outcomes (NAO, 2017). Value for money does not mean a tender must be awarded to the lowest tenderer thus not about achieving the lowest initial price but the optimum combination of whole life costing

and quality (Nsiah-Asare and Prempeh, 2016). Table 2.1 presents a summary of key definitions and an operational definition provided by the researcher.

Table 2.1 Definitions of value for money by various authors.

Author	Definition	Remarks
Barnett et al. (2010)	Value for money is used to describe a clear assurance to ensuring that best results	Emphasis of definition is end
Jackson (2012)	Value for money is striking the balance between the three E's; economy (cost minimization), efficiency (output	The thrust of the definition is on cost, efficiency and
NAO (2016)	It is a way of thinking about using resources well and a measure of quality	Emphasis is on judicious use of
Nsiah-Asare and Prempeh (2016)	VFM does not mean a tender must be awarded to the lowest tenderer thus not about achieving the lowest initial price but	Emphasis is on lifecycle costing and quality.
Ivor (1997)	Views that clients expect that design decisions, materials and component	Emphasis is on client's set criteria.
NAO (2017)	Good value for money is the optimal use of resources to achieve the intended	The focus is optimal use of resources.
Researcher's operational	Value for money is operationally defined as a means by which checks are imposed	Based on the various definitions stated, the

Source: Author (2021)

From the above definitions of Value for Money (VFM) given by various authors, the author defines value for money as a means by which checks are imposed on the use of resources to ensure ultimate benefits are derived from money spent.

2.3.1 Key Performance Indicators (KPI) for Compliance with Value for Money

According to Karim and Marosszeky (1999) the purpose of Key Performance Indicators (KPI's) is to enable a comparison of different projects and enterprises to identify the existence of particular patterns. The UK working groups on (KPI) have identify 10 parameters for benchmarking projects in order to achieve a good performance in response to Egan's report (1998). But most of these indicators such as construction cost, construction time, defects, client satisfaction with the product or services, profitability and productivity, promote result-oriented thinking whereas predictability of design cost and time, predictability of construction cost and time and safety can be regarded as process-oriented thinking (Karim & Marosszeky (1999). Dissanayaka and Kumaraswamy (1999) used different representation values to evaluate time and cost performance such as project characteristics, procurement system, project team performance, client representation's characteristics, contractor characteristics, design team characteristics and external condition. Karim & Marosszeky (1999) stated that the development and use of key performance indicators (KPI's) can help to identify dysfunctional in the procurement process. Karim & Marosszeky (1999) studied the development of key performance indicators to measure performance such as cost of pricing the tender as a percentage of contract value, number of times base tender price changed, time from the first tender to actual award of contract, average delay in payment of base claim, average delay in payment of agreed variations, average time for approval of agreed variations.

According to Dvir et al., (unpublished paper, 2002), the output of the requirements at the analysis stage will most likely determine the output of the entire development process. They indicate the origination and initiation phase in which major decisions are made, such as decisions on the projects objectives and planning the project's

execution, has the most influence on the project's success. The issue is much more serious when the kind of activities that should be undertaken depends on the outcome of earlier activities. It is therefore important to identify parameters (performance Indicators) for benchmarking projects at the projects selection phase in order to achieve good project performance.

According to Pillai et al., (2002) a performance measurement system is required to reflect the needs and expectations of all the stakeholders. Stakeholders' performances need to be measured and assessed throughout the project phases in order to ensure that no tremendous conflicts, disputes and blaming syndromes have occurred by the time the completion stage is reached. Since performance is an individual contribution to the execution of the task required in completing the construction project, the performance of each participant should be measured, evaluated and prioritized at every stage of the project phase in order to determine the extent to which a project has been successful (Liu and Walker, 1998).

Samson and Lema (2002) remarked that, characteristics of emerging performance measurement indicators need analysis of both the organization and environment such as: nature of work, global competition, quality awards, organizational role, external demands and power of IT. The indicators should be able to identify causes of problems, address all possible performance drivers, and identify potential opportunities for improvement.

Cheung et al (2004) remarked seven main key indicators for performance which are: time, cost, quality, client satisfaction, client changes, business performance, and safety and health. Navon (2005) stated that a number of research efforts to fully

automate project performance control of various project performance indicators have been carried out in recent years. These are also briefly described together with the concept of measuring indirect parameters and converting them into the sought indicators. These are (1) labor and earthmoving productivity based on measuring the location of workers or earthmoving equipment at regular time intervals; (2) progress based on the above data; (3) a comprehensive control of construction materials starting by monitoring orders and purchasing up to the movement of the materials on site.

Pheng and Chuan (2006) stated that project performance can be determined by two common sets of indicators. The first set is related to the owner, users, stakeholders and the general public which are the groups of people who will look at project performance from the macro viewpoint. The second are the developer, a non-operator, and the contractor which are the groups of people who will look at project performance from the micro viewpoint. Jin et al (2006) studied the relationship-based factors that affect performance of general building projects in China. Thirteen performance metrics was used to measure the success level of construction projects. These factors were categorized into four groups namely cost, schedule, quality and relationship performance. It was recommended that foreign firms that have entered or are going to enter the Chinese construction industry should learn how to build cooperative and harmonious relationships with Chinese partners and finally achieve satisfactory project performance by paying sufficient attention to the aforementioned factors.

Ugwu and Haupt (2007) developed and validated key performance indicators (KPI) for sustainability appraisal using South Africa as a case study. It used four main levels

in a questionnaire to identify the relative importance of KPI. The main indicators were: economy, environment, society, resource utilization, health and safety and project management and administration. Luu et al. (2007) provided nine key performance indicators (KPIs) which can be applied to measure project management performance (PMP) and evaluate potential contractors as well as their capacity by requesting these indices.

Based on previous literature review and historical studies about performance of construction projects, Loke et al; (2016) and Takim and Akintoye (2007) discussed that the building industry is considered to have underperformed compared to other industry. The key performance is construction time, cost, quality and client satisfaction with the outcome.

a) Time

Refers to the actual time required to produce a deliverable thus the end results of the project. Naturally, the amount of time required to produce the deliverable will be directly related to the number of requirements that are part of the end user along with the number of resources to the project (Tomtsongas, 2011).

b) Quality

Represents the fit for the purpose that the project must achieve to be a success. The amount of time put into individual tasks determines the overall quality of the project. Over the course of a large project, Tomtsongas, (2011) indicated that, quality can have a significant influence on time and cost. When concentrating upon the project processes and the successful achievement of cost and time objectives, product success deals with the quality of the project, final project and the quality objectives of the project (Tomtsongas, 2011).

c) Cost

Means amount of money or resources available. Each activity in the project has duration and corresponding cost attributes. Activity cost increases with the shortening of the duration and the duration increases if we decrease the activity cost. In construction, the need to estimate the cost of quality in the project is a vigorous task realized as the objective of attaining a product with a good quality is not only to meet the client's requirements but also to do it with the lowest cost (Anuar and Pohkiat Ng, 2014).

d) Value for Money Audit Opinion

In this case, value for money assessment criteria, scores for every audited project were collected and the overall performance of the project was evaluated depending on the computed collected score. Three different VFM views relating to three (3) ranges of collected scores for individual projects were shown as on the Table 2.2 below.

Table 2.2 Opinions on performance of construction project

Aggregate Scores	Value for Money Opinion	
75% - 100%	Satisfactory Performance	Executed works comply with contract conditions and specifications; and Value for Money has been achieved
50% - 75%	Unsatisfactory Performance	Executed works comply with contract conditions and specifications bur important improvements could have been made to enhance Value for Money
Below 49%	Poor Performance	Executed works have no Value for Money

Source: Adopted from (PPRA, 2014)

2.3.2 Ways by Which Project Stakeholders Can Achieve Value for Money

This section draws attention to ways by which the various stakeholders of a project can integrate their activities so as to achieve value for money invested in such project.

Baker et al. (2013), argued that, to measure value for money for any given project or programme, accountability measures, and beneficiary perceptions need to be considered, since this is the final value for money 'stamp'; they further stressed that beneficiaries feel that their needs have been catered for and that the organisation has achieved or exceeded expected results, taking into account available means (time, money, human resources) in the most efficient, effective, economical and equitable way. Furthermore, a forecast assessment of the attainable value for money needs to be carried to ensure the success of a project. Burger & Hawkesworth (2011) and Regan (2014) maintained that the ex-ante assessment of value for money is not sufficient to ensure that a project will deliver value for money and that a further requirement, which is the conducting of ex-post value-for-money assessments that will determine whether or not value for money has actually been delivered.

2.3.2.1 Detailed Risk Analysis and Appropriate Risk Allocation.

The risk in construction projects is of varying degree of impact and occurrence/likelihood. According to Regan, (2014), Risks involved in construction projects can be categorised into procedural risks (consent and licensing risk), design risks, construction risks (time and cost overrun; defective construction, financing risks (changing economic condition), maintenance risks operating risks (ineffective operation of an asset), revenue risks (disappointing performance of the asset) among others. Risk is central to delivering a successful project and it is measured by assessing the probability and cost of an outcome at variance with expectation (Regan, 2014); therefore, an effective and detailed analysis of these risks together with an efficient plan to allocate the risk to the various project stakeholders will facilitate the pursuit of securing and improving the worth of such project hence increasing its value. Treasury (2006), claimed that risks are allocated to the party, or parties, which

are best placed to manage and minimise these risks over the relevant period. The final equation for quantifying risk according to Partnership, Victoria (2003) is as follows:

$$Value\ of Risk = (Consequence \times Probality of Occuerence) + ContingencyFactor$$

2.3.2.2 Drive for Faster Project Completion.

A purposeful collaboration among project stakeholders in conjunction with the efficient utilization of some project management tools can serve in the good instead of reducing the overall project duration (Olatunji et al 2017). The knowledge of several project delivery methods such as design-build, a public-private partnership, single source system etc. and the correct understanding of which of them would be most suitable to fast-track the project would help to reduce the cost associated with the elongated project schedule, hence provide value for money invested by the client. Also, the use of project planning tools such as Gantt chart, Network Diagram, and Team Planner etc. will also be of help in the bid to plan and monitor the progress of work on the site.

2.3.2.3 Curtailment in Project Cost Escalation

A failure of the final project cost to be within the limit of initial target cost/project budget that has a significant effect on the value derivable from such project. Take, for instance, an event hall project in which the cost overrun after the project completion amounts to about 15% of the initial target cost, coupled with interest paid on borrowed capital could ultimately reduce the initial inflow and profitability for the client/owner thereby presenting a project with below par value for money invested. Hence, the identification of likely factors or activities in a project that could result in overall cost escalation and the diligence in reducing the impact (or avoiding them)

could help to ensure the final project cost doesn't offshoot the pre-determined project budget (Olatunji et al 2017). .

2.3.2.4 Encouragement of Innovation in Project Development

The introduction of innovating strategies and concept to the process of procuring a service and/or constructing a project can increase its value to the clients and end-users hence securing a greater measure of value and/or return on investment (Olatunji et al 2017)5. Innovative strategies could come in the form of the introduction of better and more efficient plants and equipment, development of an innovative solution, better motivation strategies for workers, improved framework for communication and decision making, improved supply chain management, the introduction of hi-tech facilities, development of cost database, efficiency in tracking supplies among others. DFID (2011) advocated for a more innovative way in assessing the value of projects.

2.3.2.5 Maintenance Cost Being Adequately Accounted For

The application of VFM tools such as value management and life cycle cost analysis will ensure the use of durable and maintainable building element and designs that will reduce the cost required to maintain such project in the long run. The fundamental issue in the LCC is the determination of the operation and maintenance costs of all possible alternatives which are then discounted to present worth of money (Pasquire & Swaffield, 2006) for analysis purposes. Accounting to the maintenance cost should be considered at the design stage (outline design) of a project, by identifying key components of the projects, objectively decide on alternative design items or components, estimate likely maintenance cost of each alternative design components, then finally choose the most cost effective design component based on the lowest

cost, provided it gives the required function and conforms to the required quality standard (Olatunji et al 2017).

2.3.2.6 Accurate Assessment of the Cost of the Project

The quantity surveyor/cost engineer on the project should endeavour to carry out an accurate assessment of the cost of the project, ensuring that the unit rate assigned to each item of the bill of quantities (BOQ) takes into its calculation, the various activities, materials, labour, plants and other variable costs that are needed to carry out the task. Also, the quantity surveyor should ensure that no item of work is erroneously excluded from the BOQ, as such error of omission though may win the contract can constitute claims and subsequent disputes if not well managed could affect the cost of the project and could in adverse situations lead to project abandonment hence loss of return on investment to the clients. Goldbach and Claire (2012) noted that when calculating the costs and risks to the government and private sector it is imperative that all costs and risks included are comprehensive and realistic; failure to do so will result in biased estimates that may lead to a less-than-optimal procurement choice and subsequent loss in value. Bidne et al. (2012) affirmed that establishing baseline cost estimates is critical in all VFM projects.

2.3.2.7 Detailed Specifications

The importance and relevance of workable specification to any project cannot be overemphasized. More so, if such specification is well detailed, that is taking into consideration all the design components, materials, the standard of workmanships, day work schedules, rates etc. The more detailed a specification is, the greater the ease by which the quantity surveyor or estimators carries out the assessment of the

cost of the project, hence the more accurate his cost estimate, and as before discussed the greater the client derives a value for his investment Olatunji et al (2017). An undetailed specification according to Olatunji et al, (2017), can give rise to dispute between the various consultants, most notably between the architect, engineer and the quantity surveyor; and if by chance the quantity surveyor does not notice that some specification of a design component are missing or he just utilize his previous experience to estimate for the project, it can result to claim by the contractor, and the contractor is successfully in filing the claim, it will result in cost overrun and subsequent reduction in value derivable by the client from the project.

2.4 Challenges Faced Adhering to Value for Money in Building Construction Projects

i. Insufficient Tender Documents

In this case, it shows that tender documents are not well and sufficiently prepared hence bringing confusion and changes during the execution of the project. Mostly the incompleteness and insufficient information are seen on the BOQs, drawings and specifications. Some PEs fail to clearly articulate the goods or services to meet their requirements thus making it difficult at a later date to implement the contract (Chimwaso, 2013; Semen, 2014; Jatarona et al, 2016).

ii. Unethical behavior among Professional Engineering Officials

This is unacceptable behaviors like awarding contracts to companies belonging to themselves or their relatives without undergoing the tendering process, obtaining tenders through quotations from a single supplier, soliciting bribes in order to influence tender award decision, approval of variations to suppliers and acceptance of low quality goods or services (Semen, 2014; Chirchir, and Gachunga, 2015).

iii. Poor contract administration

Include failure to give the necessary approvals, acceptance of poor quality goods or services and delayed payment to suppliers or services providers. Others include poor workmanship resulted from poor supervision and Late approval in giving the extension of time (Semen, 2014; Jatarona et al; 2016).

iv. Incomplete or non-completion of projects

On this, the buildings were not completed within the given time on the contract and thus there were liquidated damages which were supposed to be imposed but they were not (Jatarona et al; 2016).

According to Sohailand (2008), many factors are also hindering the adoption and implementation of Construction Audit (CA) practice in Ghana. One of such factors is lack of auditors or professional technical auditors' familiarity concerning construction projects and the environment to be audited. Dye and Stapenhurst (1998) and Goldberg (2010) add that it is usually difficult to identify areas of potential exposure when conducting a construction audit without understanding the contract terms and conditions. The above situation often arises because, in the early stages of project conception, project management teams often at time ignore the importance of CA. This is because auditors are not welcome at this phase as the exercise is usually term as an after-match event with the fear of being exposed. Furthermore, officialdom sometimes is not willing to expose project information and details during the design and implementation stages. Thus, they sometimes give auditors inadequate information on projects that affects CA practices in the industry in Ghana. There is also sometimes a language barrier between construction professionals, auditors and

construction projects implementing agencies. This is as a result of auditors sometimes not having a full understanding of the detail of what goes into project design and implementation. Hence, auditors demand documents which may not yet be available at a particular construction stage. In the context of Ghana, audit reports on construction projects are seldom prepared. In cases where they are ready, there is a lack of political will to enforce the various legislations and the necessary Acts to ensure project performance. Moreover, lack of resource commitment towards profits maximization of the benefits of CA is eminent in the construction industry (CI) in Ghana. Project managers and auditors should collaborate and allocate sufficient time and resources at the early stage of planning to understand project operations. The concept and practice of CA is also misunderstood as to whether it is an auditing, procurement or project management function among many stakeholders in the industry. Hence some aspects of CA are often left unattended to by those concerned which results in many fraudulent activities and poor performance of construction projects in the industry. There is also a lack of accountability on the part of stakeholders such as architects who often issue variation orders unchecked, and this sometimes results in many reworks on construction projects in Ghana. Although, as Love (2002) put it, rework often occurs as a result of poor workmanship and poor contract documentations, the situation described above is becoming the norm in most major projects in Ghana. The commitment of stakeholders and professional bodies in the country towards CA and its practice is not very encouraging. This is because as Nalewaik (2007) states that the auditor and other stakeholders in the CA supply chain usually receive resistance from project team members and are often considered as the least mattered stakeholders in construction project delivery. This has also become a stigma and hindrance to the Construction Audits Practice in Ghana: A Review of 1869 success of CA practice in Ghana. Unwillingness on the part of project

stakeholders in releasing project information on labour and materials charge record sheets, time sheets, payroll records, subcontractor invoices and bills of materials are factors belligerent to CA practice in the Ghanaian Construction Industry GCI. There is also a lack of integration and resistance towards CA practices in GCI. Olusegun et al. (2011) attribute the above to the over-concentration on individual goals than the overall project goals by project stakeholders in other jurisdictions. Lastly but not the least, lack of professional and skilled auditors specialised in CA particularly in Ghana affect the practice greatly. This makes it difficult to identify areas of exposure when carrying out CA without the requisite understanding of the conditions of contracts as a non-professional. CA practice in the GCI can best be described and remains an important project resource regulator despite the above factors affecting its adoption and implementation.

2.5 Measurement of Project Performance

Performance measurement has been viewed as critical for realizing the short- and long-term goals of an organization. Its result can be used by decision makers to improve programmed performance. Neely (2005) described performance as the process of quantifying the efficiency and effectiveness of actions. For a performance measurement system to be regarded as a useful management process, it should act as a mechanism that enables assessment to be made, provides useful information and detects problems, allows judgment against certain predetermine criteria to be performed, the system should be reviewed and updated as an ongoing process (Ong& The, 2008). Measuring result is important in that they give the management team confidence that achievement is made but they fail to identify the factors that cause poor performance (Jim et al (2004) as cited in Shaban, (2008)).

Samson and Lema (2002) stated that effective and efficient management of contractors' organizational performance requires commitment to effective performance measurement in order to evaluate, control, and improve performance today and in the future. Tangen (2004) obtained that performance measurement is a complex issue that normally incorporates at least three different disciplines: economics, management and accounting. Measurement of performance has garnered significant interest recently among both academics and practitioners. Tangen (2004) remarked the choice of a suitable measurement technique depends on a number of factors, including the purpose of the measurement; the level of detail required; the time available for the measurement; the existence of available predetermined data; and the cost of measurement.

For construction projects, there have been different measurement indicators. The generally perceived factors that influence quality performance can be grouped under the headings of client, project, project environment, project team leaders, project procedures and project management procedures (Chan and Tam, 2000). Research has documented that, sophisticated and specialized clients having a better chance of success are critical variables. The nature of the client (from public or private sector), the clarity of the project mission, their competency in terms of ability to brief, make decisions and define roles, have been found to significantly contribute to a quality of a project (Naoum,1991). Project scope, nature of the project and complexity of the project referred to as project characteristics; also have an influence on the performance of the projects (Walker, 1994). The environment in which a project operates could also influence its performance.

Navon (2005) defined performance measurement as a comparison between the desired and the actual performances. For example, when a deviation is detected, the construction management analyzes the reasons for it. The reasons for deviation can be schematically divided into two groups: (a) unrealistic target setting (i.e., planning) or (b) causes originating from the actual construction (in many cases the causes for deviation originate from both sources). Navon (2005) stated that performance measurement is needed not only to control current projects but also to update the historic database. Such updates enable better planning of future projects in terms of costs, schedules, labor allocation, etc. Pheng and Chuan (2006) stated that the measurement of project performance can no longer be restricted to the traditional criteria, which consist of time, cost and quality. There are other measurement criteria such as project management and products.

Cheung et al (2004) stated that New South Wales Public Works Department in Australia launched a Project Performance Evaluation (PPE) framework, which covers a wide range of performance parameters. PPE parameters are communication, time, cost, quality, safety, claims and issues resolution, environment, contract relations. The main purpose of PPE is to extend project performance measures to cover soft parameters such as communication and dispute resolution. In the UK, a project performance measurement tool referred to as the Key Performance Indicators (KPIs) was developed by the KPI working group under the UK Construction Industry Best Practice Programme to include; time, cost, quality, client satisfaction, change orders, business performance, health and safety. The three major steps in implementing KPIs are as follows: Decide what to measure, collect data and calculate the KPIs.

However, both the PPE and KPIs are valuable tools for measuring project performance over a period of time. Anyway, it is obtained from previous study that both methods PPE and KPIs can be used for measuring performance as the indicators are similar in two methods. In this study KPIs method will be used to measure performance. Iyer and Jha (2005) stated that measuring the performance of any construction project is a very complex process because modern construction projects are generally multidisciplinary in nature and they involve participation of designers, contractors, subcontractors, specialists, construction managers, and consultants. With the increasing size of the project, number of participants in the project also increases. The objectives of all participants need not be the same even in a given project. Hence to measure performance of a project without specifying the participant and without specifying the criteria for judging the performance holds no meaning. Past researchers have employed different criteria such as compliance to schedule, cost and quality to judge the project performance.

Lehtonen (2001) proposed new framework for measuring construction logistics by using two-dimensions in order to improve productivity. The first dimension (use of measures) contains two kinds of measures. One of these kinds is called improvement measures which help construction industry to find out the problems with current practices. These measures are mainly used during development projects. Another kind is called monitoring measures which are used for continuous monitoring of operations. The second dimension of the framework is the focus of measures. It clarifies at which organizational level measures can be used. There should be information available at the company and project level, as well as at the specific supplier or subcontractor level.

Samson and Lema (2002) proposed performance measurement system. The system comprises of construction business perspective including innovation and learning, processes, project, stakeholders, and financial perspective. The indicators developed from perspectives are categorized into three main groups which are drivers' indicators, process indicators and results indicators. The key to the success or failure of the measurement system are leadership commitment; employees' involvement and empowerment; and information coordination and management. Shen et al (2005) presented a method for measuring the environmental performance of construction activities committed by a contractor through calculating the contractor's environmental performance score (EPS). The level of EPS serves as a simple indicator for measuring and communicating the level of a contractor's environmental performance. According to (Kuprenas, 2003), Cost performance can be measured through a cost performance index (CPI) computed as:

$CPI = \frac{BCP}{ACWP}$ Where:

- BCWP = budgeted cost of the work performed
- ACWP = actual cost of the work performed.

From previous equation:

- If CPI value is one, it means, the cost was as planned (at the budget Value)
- If CPI value is above one, the project was below its budget
- If CPI of less than one means, the project exceeded its budget.

Based on previous equation, time performance is measured through a schedule performance index (SPI) computed as:

$SPI = \frac{BCWP}{BCWS}$ Where:

- BCWP = budgeted cost of the work performed
- BCWS = budgeted cost of the work scheduled.

From previous equation:

- If SPI value of one means, the time was as planned (at the time Value)
- If SPI value above one means, the project was ahead of schedule
- If SPI of less than one means, the project was behind schedule

Success of construction projects depends mainly on success of performance. Many previous researches had studied performance of construction projects. Dissanayaka and Kumaraswamy (1999) remarked that one of the principal reasons for the construction industry's poor performance has been attributed to the inappropriateness of the chosen procurement system. Reichelt and Lyneis (1999) remarked three important structures underlying the dynamic of a project performance which are: the work accomplishment structure, feedback effects on productivity and work quality and effects from upstream phases to downstream phases. Thomas (2002) identified the main performance criteria of construction projects as financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting. Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization.

It is obtained by Navon (2005) that a control system is an important element to identify factors affecting construction project effort. For each of the project goals, one or more Project Performance Indicators (PPI) is needed. Pheng and Chuan (2006) obtained that human factor played an important role in determining the performance

of a project. Ugwu and Haupt (2007) remarked that both early contractor involvement (ECI) and early supplier involvement (ESI) would minimize constructability-related performance problems including costs associated with delays, claims, wastages and rework, etc. Ling et al (2007) obtained that the most important of practices relating to scope management are controlling the quality of the contract document, quality of response to perceived variations and extent of changes to the contract. It was recommended for foreign firms to adopt some of the project management practices highlighted to help them to achieve better project performance in China.

2.5.1 Conceptual Review of Performance Indicators

Okuwoga (1998) stated that the performance of the construction industry is considered as a source of concern to both public and private sector clients. Karim and Marosszeky (1999) studied performance measurement using Key performance indicators (KPIs). KPIs enable a comparison between different projects and enterprises to identify the existence of particular patterns. The specialist contractors hoped that the data trends observed will provide insight into certain inefficiencies that are prevalent in the market. They intend to use the data to expose these inefficiencies and as a basis for industry development (Karim and Marosszeky, 1999). Key performance indicators (KPIs) include factors such as time, cost, quality, client satisfaction; client changes, business performance and safety in order to enable measurement of project and organizational performance throughout the construction industry. This information can then be used for benchmarking purposes, and will be a key component of any organization move towards achieving best practice (DETR, 2000). Lehtonen (2001) stated that performance measurement is a current issue in academia, as well as in business community. Samson and Lema (2002) stated that KPIs are very important in order .to deliver value to stakeholders. So, companies must

be sure they have right processes and capabilities in place. The KPIs also allow to trace which processes and capabilities must be competitively and distinctive, and which merely need to be improved or maintained.

In order to define the KPIs throughout the lifetime of a project, five key stages have been identified as shown in Figure 2.1 (DETR, 2000):

A. Commit to Invest: The point, at which the client decides in principle to invest in a project, sets out the requirements in business terms and authorizes the project team to proceed with the conceptual design.

B. Commit to Construct: the point at which the client authorizes the project team to start the construction of the project.

C. Available for Use: the point at which the project is available for substantial occupancy or use. This may be in advance of the completion of the project.

D. End of Defect Liability Period: the point at which the period within the construction contract during which the contractor is obliged to rectify defects ends (often 12 months from point C).

E. End of Lifetime of Project: the point at which the period over which the project is employed in its original or near original purpose ends. As this is usually many years after the project's completion, this is a theoretical point over which concepts such as full life costs can be applied.

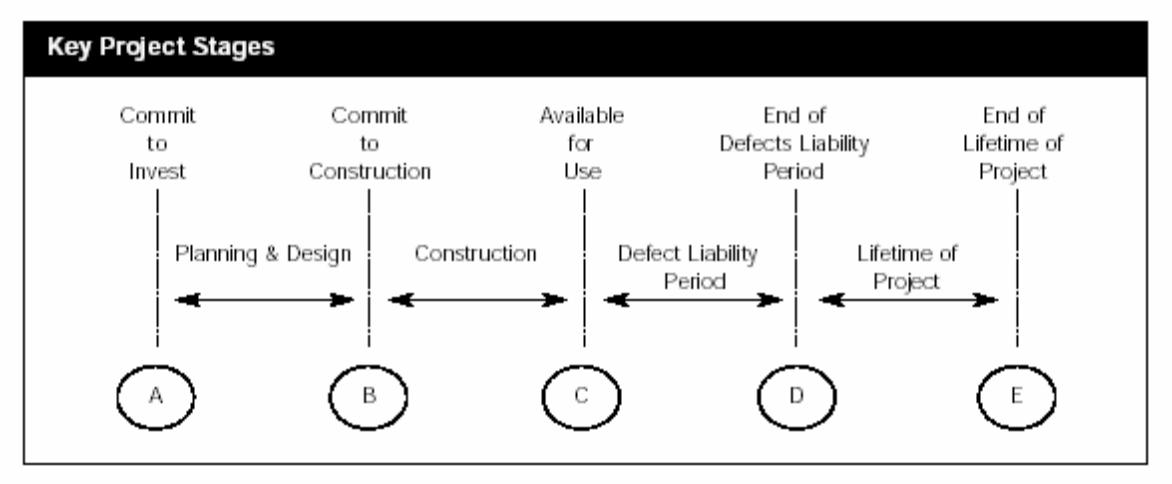

Figure 1 .1. KPIs throughout the lifetime of a project (Source: DETR, 2000)

2.5.2 Project Success and Project Performance

Al-Momani (2000) cited in Samirm (2008) stated that the success of any project is related to two important features, which are service quality in construction delivered by contractors and the project owner's expectations. Managing the construction so that all the participants perceive equity of benefits can be crucial to project success. It is obtained that the complete lack of attention devoted to owner's satisfaction contributes to poor performance. Declining market shares, low efficiency and productivity, and the rapid construction cost escalation also led to poor performance. Nitithamyong et al (2004) remarked that the success of construction projects depends upon technology, process, people, procurement, legal issues, and knowledge management which must be considered equally.

Pheng and Chuan (2006) defined project success as the completion of a project within acceptable time, cost and quality and achieving client's satisfaction. Project success can be achieved through the good performance of indicators of the project. So, success refers to project success and performance refers to performance of indicators such as project managers. Wang and Huang (2006) stated that Project success has

been widely discussed in the project management (PM) literature. The focus of most studies of project success is on dimensions of project success (how to measure it) and factors influencing project success. Wang and Huang (2006) studied that how the engineers evaluate project success and to what extent key project stakeholders' performance correlates with project success. It is obtained that project owners play the most important role in determining project success, and project management organizations' performance as the single point of project responsibility has significant correlations with project success criteria. Lam et al (2007) stated that the allocation of risk among the contracting parties in a construction contract is an important decision leading to the project success.

2.6 Construction Project Management and Performance Issues

There is a strong relation between project management and project performance. Management in construction industry is considered as one of the most important factors affecting performance of works. Lehtonen (2001) obtained a model for performance measurement which assist both firms' top management and operational managers with continuous feedback on operational activities. Thomas (2002) stated that documenting and archiving performance data could be useful for future reference, such as for settling disputes on claims, and in maintenance and repair works. Kuprenas (2003) remarked that quantification of the impacts of the project management processes are identified through three steps of analysis: comparison of summary statistics of design performance, proof of statistical significance of any differences and calculation of a least squares regression line of a plot of design performance measurement versus amount/application of project management as a means to quantify management influence to design phase cost performance.

Cheung et al (2004) studied the project performance related to project managers. It is remarked that development of a Web-based construction Project Performance Monitoring System (PPMS) can assist project managers in exercising construction project performance indicators and can help senior project management, project directors, project managers, etc., in monitoring and assessing project performance. Pheng and Chuan (2006) stated that while project management is only one of the many criteria upon which project performance is contingent, it is also arguably the most significant as people formulating the processes and systems who deliver the projects. Ugwu and Haupt (2007) stated that an adequate understanding and knowledge of performance are desirable for achieving managerial goals such as improvement of institutional transformations, and efficient decision making in design, specification and construction, at various project-level interfaces, using appropriate decision-support tools. Ling et al (2007) investigated project management (PM) practices adopted by Singaporean construction firms. It was determined, there were many fields and topics which are related to execution such as, construction management, information technology, factors affecting performance of managers, measurement of project performance, key performance indicator and benchmarking. Their projects in China; identifies PM practices that led to better performance; and recommended key PM practices that could be adopted by foreign construction firms in China to improve project performance. Cinergy et al, (2004) stated that Monitoring by direct productivity measurement provides these new management insights:

- Fast indication of factors that cause poor productivity.
- Continuous adjustment of manpower levels to actual, 'do-able' workload.
- Re-design of site logistics for smooth workflow and continuous improvement.

- Early warning of trends and opportunities that could impact budget or schedule.
- Customer-contractor relationship based on objective performance metrics.
- Capability to update estimating databases and planning future work with up-to date, estimate-independent productivity measurements.

2.7 Factors Affecting Performance of Consultants

Ogunlana et al., (1996) recommended the need for focused effort by economy managers and construction industry associations to provide the infrastructure needed for efficient project management and performance. Dissanayaka and Kumaraswamy (1999) stated that the knowledge that would influence potential performance enables project managers and other consultants to pay special attention to control performance more effectively. Chan and Kumaraswamy (2002) remarked that effective communication and fast information transfer between managers and participants help to accelerate the building construction process and performance. Kuprenas (2003) studied the impact of the use of a project management based organizational structure, project manager training, frequency of design meetings, and frequency of design reports on design phase cost performance. The process of a design team meeting frequently and the process of written reporting of design phase progress were found to be statistically significant in reducing design phase costs.

Navon (2005) stated that data are collected and used for construction managers as a basis to evaluate the project performance indicators (PPI) actual value to compare it with the planned value and forecast its future value based on past performance. Pheng and Chuan (2006) identified the importance of the working environment variables for the performance of a consultant in the private and public sectors according to three main groups which are job condition, project characteristic and organizational related

categories. The result revealed that working hours, physical condition of project site, complexity of project, material and supplies, project size, duration of project and time availability were viewed differently in terms of importance by the contractors and consultants' groups. Team relationship was ranked as the most important variable affecting the performance of a project manager. It is obtained that project managers' experiences do not have much effect on how they perceive their working environment.

2.8 Approaches to Successful Execution of Construction Projects

Deterioration of a well-planned project during execution can often have its origins traced back to how the plan was managed. Consider the project assumptions and constraints established during project initiation and planning. A crucial project initiation step is identifying and understanding the assumptions and constraints imposed on a project. Problems can arise when those assumptions and constraints are not revisited during execution to determine whether they remain valid and accurate.

Changes in assumptions and constraints, once recognized, should be dealt with as part of project performance reporting, a key element of the communications management plan. Project performance reporting can play an important role in team morale and project support by highlighting good project performance; but its real value lies in keeping the project tracking toward its objectives by bringing attention to activities that are off plan. The tendency to minimize or ignore problems in the belief that small inconsistencies won't become significant, is pure folly repeated with alarming regularity.

It is a reality of sound project management that there is no designated cost period during the project life cycle. A well-planned project is always vulnerable to becoming troubled without adequate due diligence in plan execution. The inevitable project pressures and project dynamics will be a source of obstacles that can take the project down a troubled path. But adherence to a sound project management structure and the guidance of a project manager with the necessary skills to apply and implement that structure, provide the basis for consistently meeting project objectives and avoiding troubled project status. Chan and Kumaraswamy, (2002) highlight the needs to identify the significant factor determining the success of a project to enhance time performance. The accepted parameters are time completion, within budget, compliance with established quality standard, client satisfaction and project completion without accident.

Chan and Chan, (2004) emphasizes that accurate construction planning is a key factor in ensuring the delivery of a project on schedule and within budget. The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depends on a methodology that requires sound engineering judgment, Al-Moumani, (2000) cited in (Alaghbari et al., 2007). Aibinu and Jagboro (2002) also identify two basic ways to reduce or if possible, eliminate time overrun as acceleration of site activities and contingency allowance. Kog, et al., (1999) cited in (Ying and Wilkson, nd) opine that project management factors, good project planning & scheduling are of equal importance and improving the situation of construction project are also to be considered. These includes developing human resources in the construction industry through proper training & classification of craftsman, adopting a new approach to contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors, adopting new approaches to contracting (Odeh and Battaineh, 2002).

2.9 Summary of Literature Review and Conceptual Framework

This chapter focused on the review of Ghana's construction industry and the general role of project consultants. The challenges faced by Project consultants in Ghana have been reviewed. In addition to that, previous studies on performance measurement were discussed. It was observed that these indicators can be used for benchmarking purposes, and will be as a key component of any organization to move towards achieving best practices.

Conceptual framework is the keystone for the study. According to Regoniel, (2015), a conceptual framework represents the researcher's synthesis of the literature on how to explain a phenomenon. It maps out the actions required in the course of the study, given previous knowledge of other researchers' point of view and observations on the subject of research (Regoniel, Patrick, 2015). According to Imenda (2014), a conceptual framework is a synthetization of interrelated components and variables which help in solving a real-world problem. Imenda (2014) further indicated that, the final lens used for viewing the deductive resolution of an identified issue. The development of a conceptual framework begins with a deductive assumption that a problem exists, and the application of processes, procedures, functional approach, models, or theory may be used for problem resolution (Zackoff et al., 2019). Several studies (Eisenhardt 1988; Bergen et al., (1992); and Rokkan and Buvik (2003) have contributed to the literature on principal agent theory. All these contributions have one main theme which is the relationship between a principal and an agent. The principal-agent theory concerns with the arrangement that exists when one person or entity (called the agent) acts on behalf of another (called the principal). For example, shareholders of a company (principals) elect management (agents) to act on their

behalf, and investors (principals) choose fund managers (agents) to manage their assets. In this case the government of Ghana (Principal) engages project engineers and consultants (agents) to ensure value for money in Government infrastructural projects on its behalf. With this relationship, the principal engages the agent who acts and makes decisions on behalf of the principal (Eisenhardt, 1989; Bergen et al., 1992). This relationship works well when the agent is an expert at making the necessary decisions.

The framework was developed in the context of assessing the variables that impact value for money in infrastructural projects in Ghana. These are time, Quality, Cost and Value for Money. According to Chan and Kumaraswamy, (2002), the accepted parameters in determining the success of a project are time completion, within budget, compliance with established quality standard, client satisfaction and project completion without accident. According to Tomtsongas, (2011), Time refers to the actual time required to produce a deliverable, thus the end results of the project. If buildings were not completed within the given time on the contract, it could lead to liquidated damages. As stated by Chan and Kumaraswamy (2002), construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization.

In construction projects, value for money relates to functionality and cost of the built facilities. Cost is how the money given is been spent for the projects which should be effective, On the time we consider the completion time of the project which should be within the given time without any delay and on quality this is what the final results are looked at after the use of resources, it should have the best quality of the work.

Factors for ensuring value for money are transparency, accountability, competitiveness, fairness and efficiency (Nsiah-Asare and Prempeh, 2016).

In construction, the need to estimate the cost of quality in the project is a vigorous task realized as the objective of attaining a product with a good quality is not only to meet the client's requirements but also to do it with the lowest cost (Anuar and Pohkiat Ng, 2014). The client has the responsibility of ensuring that funds are made available for the procurement of quality materials and employment of competent, experienced and qualified personnel to execute the project as far as ensuring value for money is concerned. Cost, time and quality are considered to be the main element for the success of any project. By finishing the project on time, within estimated budget and to a desired quality, client satisfaction is ensured and value for money will be achieved. Figure 2.2 is a conceptual framework that looks at the implementation of value for money. Every construction undergoes three phases thus: the design phase, construction phase and operational phase. The design phase is the planning stage where the consultant in consultation with the clients comes out with all the necessary designs for the project with the view of ensuring VFM. The construction phase is the second stage where the work is awarded to the contractor to execute the project. After the completion, the work is handed over to the client for it to be put to use, and that is the operational stage. Under each of these stages, problems or challenges are likely to be encountered. Professionally addressing these challenges, will lead to ensuring VFM.

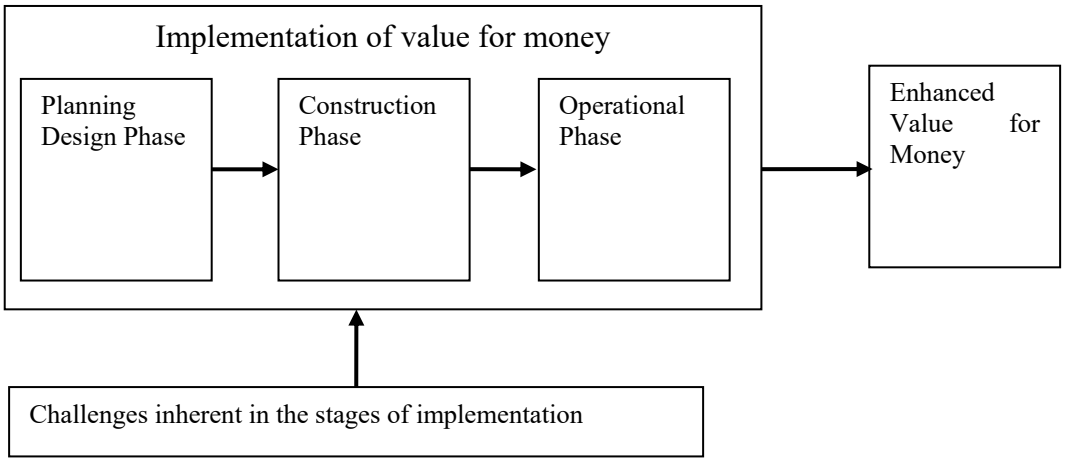

Figure 2.2 Conceptual framework for assessing the role of consultants in enhancing value for money in infrastructural project in Ghana.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explicates in detail, how the research was executed (methodology) to achieve the aim and objectives of the study. According to Fellows and Liu (2008) in any scientific investigation, research methodology encompasses the main beliefs and procedures of rational thought processes, which apply to the research. Mackenzie and Knipe (2006) also explained that the methodology shapes the overall approach to the research linked to the paradigm or theoretical framework, including the methods. The authors further explain that the methods refer to systematic modes, procedures or tools used for collection and analysis of data in any research effort. Hence, this section specifically presents the following: philosophical point of the research, framework for the study, design of research instrument, target population of the study, data collection and data analysis.

3.2 Philosophical Underpinning of the Research

The research phenomenon under study and its corresponding research questions dictates the type of philosophical stance to be adopted (Pollack, 2007). Crosswell & Crosswell (2018), identified the basic philosophical research paradigms as the interpretivism, pragmatism and positivism. Interpretivism is a response to the over-dominance of positivism which rejects the notion that, a single verifiable reality exists independent of our sense. In essence, interpretivism requires that a phenomenon can be understood through the eyes of the participants rather than the researcher. Pragmatism also arouses out of actions, situations and consequences rather than antecedent conditions. Thus, pragmatism opens the door to multiple methods,

different worldviews and different assumptions as different form of data collection and analysis. In this study, the position adopted at the ontological level was positivism. The research questions posed in Chapter 1, lend themselves with measurement and therefore in order to allow for objective measurements, it makes sense to adopt positivism stance for the phenomenon being studied. By adopting positivism, the roles of consultants in ensuring value for money in Government building projects can be viewed as realities which can then be observed and assessed objectively.

As explained earlier, positivism depends on precise and objective measure and it is usually characterized by quantitative data collection. Value for money related issues exist in reality and beyond the reach of influence of the researcher. These issues could be viewed as objective realities and not constructions of the researcher. Hence, a positivist paradigm was adopted for the study.

3.3 Research Design

Research design is a coherent plan of how the information required in providing the most suitable answers towards the achievement of the research objectives and research questions in a study and how data is collected and analyzed (Creswell, 2009). The adoption of appropriate research design and methodology draws boundaries for the study and also presents a consistent process to fulfilling the research objectives and questions (Kwofie, 2015). According to Yin, (2009), the research design also influences the choice of an appropriate and suitable data collection and analysis instrument, on the way to responding to the research questions.

Five main types of research design are usually employed in research (Bryman, 2004). They include experimental, survey (cross-sectional and longitudinal surveys), case

study and comparative designs. In relation to research methods in the construction industry, Fellows and Liu (2008), identified four types of research design as explanatory, exploratory, descriptive and predictive. Furthermore, Saunders et al. (2009) opined that the two main design options to any research endeavor are the deductive and inductive designs.

According to Baxter and Jack (2008), the deductive research design can also refer to as quantitative design. Creswell (2009), indicated that, deductive research design uses mathematical and statistical procedures to assemble and scrutinize data, to categorize facts and the underlying interactions among variables in order to test propositions and come up with conclusions.

This study therefore employed a cross sectional survey design which was characterized by descriptive and explanatory elements based on the research objectives. The study sort to establish the relationship between variables; it focused on studying the role consultants play in ensuring value for money in order to elucidate on the relationship between identified variables. Descriptive survey research is usually used to portray an accurate profile of persons, events or situations, Robson, (2002) as cited in Saunders (2009). This study further describes the present circumstances relating to the role of building consultants and ensuring value for money.

3.4 Research Strategy

A research strategy is described as the means by which the research objectives can be interrogated, (Naoum, 2007). The strategy to adopt is influenced by the purpose of the study and the type and extent of availability of the information being sought (Biggam, 2008). In this study the quantitative strategy was adopted in line with survey design

tradition to collect quantitative data. According to Fellows and Liu, 2008 quantitative research approach seeks to gather information aimed at describing a phenomenon involving a larger number of participants and to study relationships between facts and how those facts align to theories and the findings of extant research.

3.5 Research Process

According to Fellows and Liu (2008) there is no one rigid procedure for conducting research and hence the process must therefore be flexible. The research process adopted for this research involved an in-depth review of extant literature on value for money, identification of the main theories and further development of the theoretical foundations and collection and analysis of empirical data to meet the research objectives.

The first stage of the study focused on a comprehensive review of relevant literature from books, journals, conference proceedings and other publications relating to the role of building consultants and value for money. The identification of the research problem and subsequently, the development of the research aim and objectives followed.

The second stage involved the design of the data collection instruments; mainly questionnaires. The questionnaires comprised primarily closed-ended questions. A pilot of the questionnaires was undertaken before the actual data collection. The feedback from the piloting aided in the drafting of the main set of questionnaires for the respondents. The climax of the study was mainly used to the collection of appropriate primary data using survey questionnaire. The data collected from the field

survey was then analyzed using the Statistical Package for Social Sciences (SPSS version 20), focusing on descriptive statistics, t-tests and factor analysis techniques.

3.6 Target Population of the Study

The target population covered built environment consultants in building construction (architects and quantity surveyors,) within the Upper West and Ashanti Region. The main reason for using this category of people is that their activities directly or indirectly have bearing on value for money which is within the scope for the study.

3.7 Sampling Technique and Sample Size

When it is impossible to collect data from the whole population for a study within the stipulated time, a researcher must select a sample, (Saunders *et al*., 2009). According to Fellows and Liu (2008), the objective of sampling is to allow practical means by which the data collection process is undertaken to achieve a good representation of the sampled population. According to Bryman and Bell (2007), the ideal sample should be large number to serve as adequate representatives of the population and small enough to be selected economically, that is in terms of subject availability. The sampling techniques that were adopted by the researcher for the research were purposive sampling and snow ball sampling. In purposive sampling, the researcher tries to get information from a target group based on a certain criterion decided by the researcher (Sanders et al., 2007).

For the purposive sampling technique, the criteria used for selection of the interview respondents was number of years of practice as consultant which was set at three years and membership of relevant professional institution (in this case, Ghana Institute of Architects and Ghana Institution of Surveyors). Due to the difficulties in accessing the respondents, the researcher relied on snow ball sampling techniques. In

this case an identified respondent was asked for information on other respondents who satisfied the criteria adopted for the purposive sampling technique. Most consulting firms are situated in the regional capitals of the two regions (Table 3.1).

Table 3.1 Distribution of survey respondents

Name of Municipality/District	Number of Respondents
Wa Municipality	50
Kumasi Metropolitan	174
Total	224

Source Field Data

3.8 Data Collection

In any research endeavor it is particularly necessary to consider the data required, sources of the data and how the data will be collected, right from the beginning, especially the planning stage of the research, (Fellows and Liu 2008). This section provides information on how data was obtained for the preliminary survey. It presents the instruments of data collection for the field survey. The instruments employed in the research data collection were primarily questionnaires and interviews.

3.8.1 Questionnaire Design

Subsequent to an extensive review of literature relating to the topic, a detailed close-ended questionnaire was developed in order to attain the aim and objectives of the research. The questions were aligned in accordance with the objectives of the study and designed such that, respondents only had to tick the description which they thought was appropriate. The questionnaire was in two sections; section A and B.

Section A was about background information which sought to gather information like gender, qualification, years of experience, age and whether the respondent is an Architect or Quantity Surveyor.

Section B was centred on the objectives of the study and have been categorised into four areas with each area aligned to one objective. Objective one which happened to be the first area identified a number of roles project constants play in ensuring value for money. Using a scale of 1 to 5 where 1 refers to not at all, 2 refers to less often, 3 refers to often, 4 refers to very often and 5 is always, respondents were expected to rate by ticking the item considered the most appropriate.

The other three remaining areas under section B also sought to identify factors that militate against the role project consultants play resulting in loss of value for money, ensuring value for money on public infrastructural project and challenges to achieving value for money respectively. Respondents were expected to rate by ticking the item considered most appropriate using a scale of 1-7 where 1 means strongly disagree, 2 means disagree, 3 means slightly disagree, 4 means not sure, 5 means slightly agree, 6 means agree and 7 means strongly agree.

3.8.2 Validity and Reliability of Data Collection Instruments

Reliability is regarded as consistency in obtaining the same results after measuring the same variables repeatedly on different occasions. It entails consistence and quality measurement of data collected with minimum biasness and errors, (Bryman & Bell 2007). In this study, reliability was achieved by structuring and designing questionnaires in such a way that would avoid yielding different meanings.

Validity implies the extent to which the chosen research instruments accurately measure what they are intended to measure. In terms of validity of the research, it has been achieved by ensuring that, the instruments being utilised in the research are logically consistent and comprehensive enough to take into account all the abstract concepts under study. Apart from the definition of the salient concepts, the research has ensured that construct validity of variables through covering all aspects of the concepts under research.

3.8.3 Ethical Considerations

Ethics in relation to conduct of research aims at protecting the rights and welfare of the participants. As part of ethical consideration in the conduct of this research, respondents did not have to provide their names on the questionnaire in order to maintain their anonymity. The confidentiality of the respondents' identity was maintained and protected; whiles, participation was voluntary. Respondents were assured that the information provided was strictly for academic purposes. The researcher was objective and adhered to the general code of ethics for researchers. Prior to filling the questionnaire, the researcher briefed the participants on the objectives of the research.

3.9 Data Analysis

Data preparation was the initial step to convert raw date into structured format that are more appropriate for the analysis. Tasks in this stage will include data editing, data coding and data entry. The questionnaires returned were first cleaned and checked for completeness. They were then coded and fed into Statistical Package for Social Science (SPSS) version 22 and then transported into the Microsoft Excel 2010 for analysis using descriptive statistical tools and measures namely mean and standard

deviation, tables and Relative Importance Index (RII). Qualitative data obtained from semi-structured interviews will be analysed using content analysis. In determining the relationship between variables, one way Analysis of Variance (ANOVA) will be used to test hypothesized relationships between variables. Table 3.2 summarizes the data analysis plan for the study.

Table 3.2 Data analysis plan

S/N	Research Question	Variables	Method of	Outcome
1	What major role do project consultants play in the construction industry to ensure value for money?	Independent variable: role of project consultants. Dependent variable: ensuring value for money for public infrastructural projects.	Descriptive statistics; frequencies, mean and standard deviation. Inferential statistics; ANOVA Test.	Objective 1 achieved. Association between the role of project consultants and ensuring value for money on public infrastructural projects ascertained.
2	What are the key challenges to achieving value for money on public infrastructural projects?	Key challenges to achieving value for money on public infrastructural projects.	Descriptive statistics; frequencies, mean and standard deviation.	Objective 2 achieved. Key challenges to achieving value for money on public infrastructural projects ascertained.
3	What factors militate	Factors militating	Descriptive statistics	Objective 3

	against efficient performance of consultants on public infrastructural projects?	against efficient performance of consultants on public infrastructural projects.		achieved. Insights into factors militating against efficient performance of consultants on public infrastructural projects ascertained.
4	What strategies/factors can be carried out to ensure value for money is achieved on public infrastructural projects in Ghana?	Strategies to achieving value for money on public infrastructural projects in Ghana.	Descriptive statistics: frequencies, mean and standard deviation and ranking.	Objective 4 achieved. An explanatory model of how the factors or variables interact.

Source: Author (2021)

CHAPTER FOUR

ANALYSIS AND PRESENTATION OF RESULTS

4.1 Introduction

This chapter consists of presentation of the results, analysis and discussions of the data collected from the field. The first aspect of the results deals with the background information which comprises gender and age distribution. The second section of this chapter demonstrates the actual data collected on the variables that constitute the core of this research.

4.2 Response rate

Two hundred and twenty-four (224) questionnaires were administered out of which ninety-seven were retrieved. One questionnaire was not completed properly and therefore did not form part of the analysis. The response rate thus achieved was 43%. This response rate may be adequate as compared to response rates of 37% and 42% achieved in similar studies (Kheni et al. 2008; Mulwafu 2016).

4.3 Demographic Information about the Respondents

The demographic data of the respondents focused on gender, age, educational level, respondents working experience and professional category. Background results of the respondents are presented in Table 4.1 below. Table 4.1 Demographic information of respondents.

Variables	Frequency	Percentage
Gender		
Male	79	82
Female	17	18
Age of respondents		
Below 30 years	13	14
31-40 years	35	36
41-50 years	43	45
51 years and above	5	5
Educational background		
Bachelor degree	34	35
Post graduate	15	16
Master's degree	47	49
Others specify	-	-
Years of working		
1-5 years	17	18
6-10 years	33	34
11-15 years	38	40
16 years and above	8	8
Professional category		
Architect	37	39
Quantity surveyor	59	61

Source; field data, 2021

4.3.1 Gender distribution of Respondents

From Table 4.1, eighty-two respondents representing 79% of the respondents were males, whiles 17% were females. The table shows that majority of the respondents who form part of this study were males.

4.3.2 Age Distribution of Respondents

Table 4.1 depicts the age distribution of respondents expressed within ranges. From the table, it can be seen that the majority of the respondents were concentrated within two age ranges, thus 31-40 years and 41 -50 years. It is clear from the table that thirteen (13) of the respondents forming 14% were below 30 years, five of them representing 5% were 51 years and above. The Table also shows that 35 respondents forming thirty- six percent (36%) were within the age bracket of 31-40 years, while forty-three of them forming 45% representing the majority were within the age bracket of 41-0 years.

4.3.3 Educational background of Respondents

Educational background of architect and surveyor in the construction industry cannot be overemphasized. Therefore, educational level plays a key role in the work of architect and consultants in the construction industry. From the Table 4.1, it can be observed that the professional status of the respondents in the construction industry was highly acknowledged. Table 4.1 showed that, thirty-five percent (35%) of the respondents were Bachelor degree holders, sixteen percent (16%) were Post Graduate, while Master's degree represented forty-nine percent (49%). Information from study on educational qualification of the respondents is an indication that respondents possess an appreciable level of education necessary to have significant impact in the construction industry.

4.3.4 Working Experience Distribution of Respondents

The Table 4.1 depicts summary of working experience of the respondents expressed in terms of the number of years served in the construction industry. Table 4.1 shows that seventeen (17) of the participants representing 18% have been working in the

construction industry for 1-5 years. Thirty-three (33) of them forming thirty-four percent (34%) had served in the industry between 6-10 years. The Table also depicts that thirty-eight and eight of the respondents had work in the construction industry for 11-15 years and 16 above respectively. It can be noted that the respondents have gained adequate experienced in the construction industry.

4.3.5 Professional Category

In every industry, be it public or private there are different categories of workforce. Within each category there are different levels of responsibilities and authority. From Table 4.1, it can be observed that majority of the respondents forming sixty-one percent (61%) were Quantity Surveyors, while Architect represented thirty-nine percent (39%).

4.4 Role of Consultants in Ensuring Value for Money in Construction Projects

This section provides major roles performed by architect and quantity surveyors in guaranteeing value for money in construction projects as detailed in Table 4.2below.

Table 4.2 Roles played by consultants in construction projects

Major roles in achieving VFM for public infrastructural projects	Architects rating			Quantity surveyors' rating		
	Mean $\bar{x}$	σ	Rank	Mean $\bar{x}$	σ	Rank
Checking & verification of designer's submissions (design basis reports, value engineering, cost benefit analysis, drawings etc.).	3.94	.71	1st	2.75	1.02	11th
Prepare design brief in terms of function, cost, time, quality, and safety.	3.81	.59	2nd	2.58	.87	12th
On-site design co-ordination and issue of drawings/clarifications.	3.77	.75	3rd	3.02	.93	8th
Preparation of Project Master Schedule with base line.	3.67	.76	4th	2.81	.67	10th
Cost control during all stages of design and design development.	3.50	.65	5th	3.60	.64.	2nd
Preparation of works breakdown structure before construction commence	3.44	.75	6th	3.25	.64	5th

Analyze Client's project related requirements	3.35	.66	7th	2.92	.85	9th
Advice on probable date of timely project completion.	3.0833	1.01	8th	3.12	.84	7th
Prepare Quality Assurance/Quality Control plan and Method.	2.90	.90	9th	3.54	.74	3rd
Full time supervision of construction works/ activities for projects.	2.77	.905	10th	3.23	.86	6th
Review of technical specifications and Bill of Quantities (BOQ).	2.71	1.07	11th	3.71	.79	1st
Establishment of communication and reporting system for project.	2.60	.92	12th	3.27	.64	4th

Mean=$\bar{x}$, Standard deviation=σ

Source: Field data, 2021

According Table 4.2, consultants play major role in ensuring value for money in projects construction by Analyzing Client's project related requirements. The result showed mean values of 3.35 by Architects and 2.92 by Quantity surveyors, with a standard deviation of 0.66 and 0.85 for Architects and Quantity surveyors respectively.

With regards to the item consultants prepare design brief in relation to function ability, cost, time, quality and safety before projects execution, the table shows a mean score of 3.81 by Architects and 2.58 by Quantity surveyors, with a standard deviation of 0.59 and 0.87 respectively.

Regarding, consultant's role as providing full time supervision of all construction works/ activities for the projects, the table above demonstrate overall mean scores of 2.77 by Architects and 3.23 by Quantity surveyors, and standard deviation figure of 0.90 and 0.86 by Architects and Quantity surveyors respectively. On the issue of consultant's response on establishment of project communication and reporting system before projects execution, the data in Table 4.2 shows mean scores of 2.60 by

Architects and 3.27 by Quantity surveyors. The table further shows a standard deviation figure of 0.95 and 0.64 for Architects and Quantity surveyors respectively.

The result from the study depicts that architects and quantity surveyors prepare projects breakdown structure before construction commence. Table 4.2, shows mean scores of 3.43 by Architects and 3.25 by Quantity surveyors with standard deviation of 0.75 and 0.64 for Architects and Quantity surveyors respectively.

From Table 4.2 the respondents shared similar view that they are responsible for preparation of projects Master Schedule with base line. The table also depicted mean scores of 3.67 by Architects and 2.81 by Quantity surveyors. The table further shows standard deviation figures of 0.71 and 0.67.

With regard to consultants' response on checking & verifying designs submissions (design basis reports, value engineering, cost benefit analysis, drawings etc) before projects commencement, the table indicated mean score of 3.94 by Architects and 2.75 by Quantity surveyors with standard deviations of 0.71 and 1.02 respectively.

According to the respondents, they perform cost control analysis at all stages of design development. Overall, the table depicted mean scores of 3.5000 by Architects and 3.60 by Quantity surveyors. The table further shows standard deviation figures of 0.65 and 0.64 respectively.

According to the respondents they play major role in ensuring value for money in projects construction by reviewing of technical specifications and Bill of Quantities

(BOQ). The result showed mean values of 2.71 by Architects and 3.7083 by Quantity surveyors, with a standard deviation of 1.07 and 0.79 respectively.

On-site design co-ordination and issue of drawings/clarifications, the response of consultants as indicated in the table showed mean scores of 3.77 by Architects and 3.02 by Quantity surveyors, with standard deviation of 0.75 and 0.93 respectively. The table 4.2 further demonstrates overall mean scores of 3.08 by Architects and 3.13 by Quantity surveyors, and standard deviation figure of 1.00 and 0.84 regarding advice on probable date of timely project completion. The above responses should however be interpreted with caution in view of the fact that there is a tendency for the respondents to project positive role they play in ensuring value for money.

With regards to consultants Prepare Quality Assurance/Quality Control plan and Method statements, the data in Table 4.2 shows mean scores of 2.90 by Architects and 3.54 by Quantity surveyors. The table further shows a standard deviation figure of 0.90 and 0.74 by Architects and Quantity surveyors respectively.

Further analysis was done to determine whether there was any significant difference between the mean responses of the groups of respondents (architects and quantity surveyors) using one way ANOVA. This is indicated in Table 4.3.

Table 4.3 Major roles to achieving value for money for public infrastructural projects

Responses	**N**	Mean= $\bar{x}$,	**SD=σ**	**Std. Error**	**95% Confidence Interval for $\bar{x}$**		**Min**	**Max**
					Lower bound	**Upper bound**		

Architect	4	30.85	10.21	1.474	27.89	33.82	12	48
QS	4	31.18	10.04	1.450	28.27	34.10	12	48
Total	9	31.02	10.07	1.028	28.98	33.06	12	48

Source: Field data, 2021

From Table 4.3, mean scores are 30.85 and 31.19 for Architects and Quantity surveyors respectively. There is no any major difference between the means of the two groups. Also, from Table 4.4, it will be observed that F value of 0.04 and significant value of 0.87 was obtained. Since the significant value obtained is greater than p> 0.05, it implies that the variances for the two groups are not different. We therefore, reject the hypothesis that there is difference in the two groups and conclude that there is no significant difference in the means of the two groups (Architects and Quantity surveyors). The results show different ranking values regarding Major roles to achieving value for money for public infrastructural projects for Architects and Quantity surveyors. However, ANOVA showed no differences in the means, implying that Architects and Quantity surveyors perform complementary roles in the construction industry.

Table 4.4: Between and within group's comparisons

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	2.68	1	2.67	.035	.87
Within Groups	9649.29	94	102.65		
Total	9651.96	95			

Source; field data, 2021

4.5 Factors Militating against Project Consultants' Role in Ensuring Value for Money for Public Infrastructural Projects

This section analyses factors militating against project consultants' role in ensuring value for money of public infrastructural projects. The responses of the survey respondents are summarized in Table 4.5.

Table 4.5 Factors militating against project consultants' roles in ensuring VFM

Militating factors	Architects' ratings			QS ratings		
	$\bar{x}$	σ	Ran	$\bar{x}$	σ	Ra
Social in terms of family relations	4.15	1.09	1st	4.10	1.06	4th
Political influence from higher authority	4.12	1.10	2nd	4.13	1.20	3rd
Inaccurate and unreliable budget estimate	4.12	1.10	3rd	4.08	1.04	5th
Level of technological influence	4.12	1.08	4th	4.07	1.12	6th
Excessive variation orders	4.10	1.10	5th	4.19	1.08	1st
Design team experience	4.08	1.23	6th	4.17	1.20	2nd
Inability to foresee and budget for	4.04	1.09	7th	4.06	1.10	7th
Excessive errors or omission	4.00	1.17	8th	4.05	1.21	8th
Delay in producing design document	3.87	1.23	9th	3.90	1.32	10t
Inadequate technical background	3.83	1.19	10th	3.79	1.25	12t
Poor relationship among team members	3.81	1.23	11th	3.92	1.15	9th
Inability to take decisions when necessary	3.72	1.22	12th	3.85	1.17	11t
Desire to complete project within a short	3.50	1.25	13th	3.40	1.24	14t
Coordination of contractors' work in a	3.47	1.37	14th	3.37	1.43	15t
clients' inability to adequately finance	3.45	1.24	15th	3.48	1.24	13t

Source; field data, 2022.

The data presented in Table 4.5 showed that, majority of the respondents' shared similar view that inaccurate and unreliable budget estimate militate against project consultant's role in ensuring VFM in the construction industry. The result showed mean values of 4.13 by Architects and 4.08 by Quantity surveyors with a standard deviation of 1.10 and 1.10 for Architects and Quantity surveyors respectively.

The data on views of respondent on the item; inability to foresee and budget for potential inflation affecting efficient performance of consultants in relation to public infrastructure projects in Table 4.5 showed mean scores of 4.04 by Architects and 4.06 by Quantity surveyors. The table further shows a standard deviation figure of 1.09 and 1.10 for Architects and Quantity surveyors respectively.

The results from the study depicts that Excessive variation orders on projects design and implementation militate against consultant's role in ensuring VFM in relation to public infrastructure projects. Table 4.5, shows mean scores of 4.10 by Architects and 4.19 by Quantity surveyors with standard deviation of 1.10 and 1.08 for Architects and Quantity surveyors respectively.

From Table 4.5, respondents shared similar view that Coordination of contractors' work in a timely manner militate against consultants' role in ensuring VFM in relation to public infrastructure projects. The table depicted mean scores of 3.48 by Architects and 3.38 by Quantity surveyors. The table further shows standard deviation figures of 1.37 and 1.43 for Architects and Quantity surveyors respectively.

According to the respondents, Timely decision making is a factor that militates against consultants' role in relation to ensuring VFM on public infrastructure projects. The table also indicated mean scores of 3.50 by Architects and 3.40 by Quantity surveyors with standard deviation of 1.25 and 1.24 respectively.

According to the respondents' response with regards to timely submission of reports, payment certification and claims militate against consultants' role in relation to

ensuring VFM on public infrastructure projects; the Table 4.5 depicted mean scores of 3.46 by Architects and 3.48 by Quantity surveyors. The table further shows standard deviation figures of 1.24 and 1.24 respectively.

According to the respondents, design team experience affects consultant's role in ensuring VFM on public infrastructure projects. The results as indicated in Table 4.5 showed mean values of 4.08 by Architects and 4.17 by Quantity surveyors with a standard deviation of 1.23 and 1.19 respectively. In the view of the respondent's response to delay in producing design document militating against consultants' role in ensuring VFM on public infrastructure projects, the table shows mean scores of 4.13 by Architects and 4.13 by Quantity surveyors, with standard deviation of 0.75 and 0.93 respectively.

Regarding, Excessive errors or omission as a factor militating against consultants' role in ensuring VFM in relation to public infrastructure projects, Table 4.5 demonstrate mean scores of 4.00 by Architects and 4.05 by Quantity surveyors and standard deviation figure of 1.17 and 1.21 respectively.

The view of the respondent's response on inadequate technical background as a factor militating against consultant's role in ensuring VFM on public infrastructure project, as indicated in Table 4.5 shows mean scores of 3.83 by Architects and 3.79 by Quantity surveyors. The table further shows a standard deviation figure of 1.19 and 1.25 by Architects and Quantity surveyors respectively.

The result from the study depicts that Poor relationship among team members militate against consultants 'role in ensuring VFM on public infrastructure projects.

Table 4.5, shows mean scores of 3.81 by Architects and 3.92 by Quantity surveyors, with standard deviation of 1.23 and 1.15 for Architects and Quantity surveyors respectively.

From Table 4.5 respondents shared similar view that inability to take decisions, when necessary, militate against consultant's role in ensuring VFM in relation to public infrastructure projects. The table also depicted mean scores of 3.73 by Architects and 3.85 by Quantity surveyors. The table further shows standard deviation figures of 1.2 and 1.17 for Architects and Quantity surveyors respectively.

According to the respondents, Political influence from higher authority is a factor that militates against consultants' role in relation to ensuring VFM on public infrastructure projects. Table 4.5 also indicates mean scores of 3.88 by Architects and 3.90 by Quantity surveyors, with standard deviation of 1.23 and 1.32 respectively.

According to the respondents, Social in terms of family relations militate against consultant's role in ensuring VFM on public infrastructure projects. Overall, the table depicted mean scores of 4.15 by Architects and 4.10 by Quantity surveyors. The table further shows standard deviation figures of 1.09 and 1.06 respectively.

Regarding consultants' response on level of technological influence as a factor militating against the role of consultants in ensuring Value for Money, the result shown in Table 4.5 indicates mean values of 4.12 by Architects and 4.07 by Quantity surveyors with a standard deviation of 1.08 and 1.12 respectively.

4.5.1 One Way Analysis of Variance (ANOVA)

The researcher used Statistical Package for Social Sciences to code, enter and compute the measurements of ANOVA.

Table 4.6 Factors militating against project consultants' role in ensuring value for money for public infrastructural projects

Responses	N	$\bar{x}$	σ	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Architects	48	58.44	17.04	2.46	53.49	63.38	15.00	75.00
Quantity Surveyors	48	58.85	17.08	2.47	53.89	63.81	15.00	75.00
Total	96	58.65	16.97	1.73	55.21	62.08	15.00	75.00

From Table 4.6 mean scores are 58.44 and 58.85 for Architects and Quantity surveyors respectively. There is no any significant difference between the means of the two groups.

Table 4.7between and within group's comparisons

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4.17	1	4.17	.014	.905
Within Groups	27359.79	94	291.06		
Total	27363.96	95			

Source; field data, 2021

For the ANOVA test output, it will be observed that F value of 0.014 and significant value of 0.905 were obtained. Since the significant value obtained is greater than p > 0.05, it implies that the variances for the two groups are not different. We therefore, reject the hypothesis that there is difference in the two groups and concluded that there is no significant difference in the means of the two groups (Architects and Quantity surveyors). The ratings as demonstrated in Table 4.7 also revealed similar outcome. From the table, rankings of the two groups on individual items were very close. This implies that both groups generally agree that factors such as Poor relationship among team members, political influence from higher authority, social in terms of family relations, level of technological influence , adequate technical skills, excessive errors or omission, delay in producing document , timely decision making, inaccurate and reliable budget estimate and inability to foresee and budget for potential inflation mitigate against project consultants role in relation to ensuring VFM for public infrastructure projects.

4.6 Enabling Factors for Achieving Value for Money for Public Infrastructural Projects

This section gives an account of respondent's views on factors necessary to achieve value for money for public infrastructural projects. Table 4.8 presents a summary of the respondent's responses on what are the enabling factors for achieving value for money for public infrastructural projects.

Table 4.8 Factors necessary for achieving value for money for public projects

Enabling factors for achieving VFM for public projects	Architects' ratings			QS ratings		
	$\bar{x}$	σ	Rank	$\bar{x}$	σ	Rank
Enabling legal provision on value for money audit	4.14	1.22	1st	4.02	1.19	2nd

Curtailment in project cost escalation clients' demand for value for money	4.04	1.30	2nd	3.98	1.25	4th
Competition in provision of consultancy services	3.98	1.34	3rd	3.92	1.32	5th
Maintenance cost being adequately accounted for life cycle	3.96	1.18	4th	4.00	1.24	3rd
Rising demand for innovation in project development	3.81	1.36	5th	4.17	1.25	1st
Detailed risk analysis and appropriate risk allocation in contract clauses	3.74	1.41	6th	3.84	1.34	7th
Drive for faster project completion	3.63	1.30	7th	3.85	1.30	6th

Source: Field data, 2021.

In the view of the respondents to achieve value for money on public infrastructural projects, consultants should perform detailed risk analysis and appropriate risk allocation in contract clauses before commencement of construction projects. The risks mentioned are necessary to attain value for money at every stage of the construction project. The result showed mean values of 3.74 by Architects and 3.84 by Quantity surveyors, with a standard deviation of 1.41 and 1.34 for Architects and Quantity surveyors respectively.

Regarding drive for faster project completion as a factor to achieving value for money for public infrastructural projects, the table shows mean scores of 3.63 by Architects and 3.85 by Quantity surveyors with a standard deviation of 1.30 and 1.30 respectively. This implies that respondents agree that factors including reducing the overall project duration, public-private partnership, single source system and use of project planning tools are important elements to enable project management teams to achieve value for money.

From Table 4.8, respondents agreed that Curtailment in project cost escalation, lead to attainment of value for money for public infrastructural projects. The table 4.8 demonstrates overall mean scores of 4.04 by Architects and 3.98 by Quantity surveyors and standard deviation figure of 1.30 and 1.25 by Architects and Quantity surveyors respectively.

The data presented in Table 4.8 further show that, majority of the respondents shared similar view that rising demand for innovation in project development can ensure value for money and increase project returns. The data in Table 4.8 shows mean scores of 3.81 by Architects and 4.17 by Quantity surveyors. The table further shows a standard deviation figure of 1.36 and 1.25 for Architects and Quantity surveyors respectively. Innovative strategies could come in the form of the introduction of better and more efficient plants and equipment, development of innovative solution, better motivation strategies for workers, improved framework for communication and decision making, improved supply chain management, the introduction of hi-tech facilities, development of cost database, efficiency in tracking supplies among others.

From Table 4.8, respondents indicated that Maintenance cost being adequately accounted for projects life cycle such as value management and life cycle cost analysis will ensure the use of durable and maintainable building element and designs that will reduce the cost required to maintain such project in the long run. Table 4.8, shows mean scores of 3.96 by Architects and 4.00 by Quantity surveyors, with standard deviation of 1.18 and 1.24 for Architects and Quantity surveyors respectively.

From Table 4.8 respondents shared similar view that Competition in provision of consultancy services lead to attainment of value for money for public infrastructural projects. The table also depicted mean scores of 3.98 by Architects and 3.92 by Quantity surveyors. The table further shows standard deviation figures of 1.34 and 1.32 for Architects and Quantity surveyors respectively.

According to the respondents enabling legal provision on value for money audit is a necessary ingredient to achieve value for money for public infrastructural projects. The table also indicated mean scores of 4.14 by Architects and 4.02 by Quantity surveyors with standard deviation of 1.22 and 1.19 respectively.

4.6.1 One Way Analysis of Variance (ANOVA)

The research used Statistical Package for Social Sciences to code, enter and compute the measurements of ANOVA.

Table 4.9 Factors to achieving value for money for public infrastructural projects

	N	Mean	SD	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Architects	48	27.40	8.87	1.28	24.82	29.97	7.00	35.00
Quantity Surveyors	48	27.69	8.75	1.26	25.15	30.23	7.00	35.00

Total	96	27.54	8.77	.89	25.77	29.33	7.00	35.00

Source; field data, 2021

From Table 4.9 mean scores are 27.10 and 27.69 for Architects and Quantity surveyors respectively. There is no major difference between the means of the two groups.

Table 4.10: Between and within group's comparisons

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	2.04	1	2.04	.02	.87
Within Groups	7297.79	94	77.64		
Total	7299.83	95			

Source; field data, 2021

From the ANOVA test output, it will be observed that F value of 0.03 and significant value of 0.87 were obtained. Since the significant value obtained is greater than $p > 0.05$, it implies that the variances for the two groups are not different. We therefore, reject the hypothesis that there is difference in the two groups and conclude that there is no significant difference in the means of the two groups (Architects and Quantity surveyors). The rankings as revealed in Table 4.10 also revealed similar results. From the table ratings of the two groups on individual items were very similar. This signifies that both groups generally agree that factors such as detailed risk analysis and appropriate risk allocation in contract clauses, curtailment in project cost

escalation clients' demand for value for money, maintenance cost being adequately accounted for, life cycle and enabling legal provision on value for money audit affect value for money for public infrastructural projects.

4.7 Challenges to Achieving Value for Money for Public Infrastructural Projects

Table 4.11 below describes in detail respondent's opinion on obstacles to attaining value for money for public infrastructural projects.

Table 4.11: Barriers to achieving value for money for public infrastructural projects

Challenges to achieving value for money for public infrastructural projects	Architects' ratings			QS ratings		
	$\bar{x}$	σ	Rank	$\bar{x}$	σ	Rank
Poor supervision	4.18	.91	1st	4.20	1.01	1st
Lack of political will to enforce the various legislation and Acts to ensure project performance	4.08	1.18	2nd	4.00	1.17	6th
Failure on the part of project engineers to clearly articulate the goods or services to meet their requirement	4.06	1.06	3rd	4.13	1.12	4th
Project management team often at times ignore the importance of construction audit	4.02	1.21	4th	3.90	1.19	8th
Failure to give the necessary approvals	3.95	1.19	5th	3.81	125	9th
Soliciting bribes in order to influence tender award decision	3.94	1.33	6th	4.16	1.18	2nd
Awarding contracts to companies belonging to themselves or relatives without undergoing thorough tender processes.	3.92	1.18	7th	3.77	1.26	10th
Approval of variations to suppliers	3.85	1.18	8th	4.10	1.10	5th
Tender Documents not properly prepared.	3.83	1.28	9th	3.93	1.17	7th
Delay payment to suppliers or service providers	3.50	1.19	10th	4.15	1.25	3rd

Source; field data, 2021

From Table 4.11, respondents shared similar view that tender documents were not properly prepared to achieve value for money for infrastructural project. The table also indicated mean scores of 3.83 by Architects and 3.93 by Quantity surveyors with standard deviation of 1.28 and 1.17 respectively.

According to the respondent, Failure on the part of project engineers to clearly articulate goods or services to meet their requirement is a short coming in achieving value for money within the Ghanaian construction industry. Overall, the table depicted mean scores of 4.06 by Architects and 4.13 by Quantity surveyors.
The table further shows standard deviation figures of 1.06 and 1.12 respectively.

Regarding awarding contracts to companies belonging to themselves or relatives without under going through the tender process as barrier to achieving value for money for public infrastructural projects, result showed mean values of 3.92 for Architects and 3.78 for Quantity surveyors with a standard deviation of 1.18 and 1.26 respectively.

In the view of majority of the respondents there exists a phenomenon in the construction industry whereby stakeholders Solicit bribes in order to influence tender award decision. The table shows mean scores of 3.94 by Architects and 4.16 by Quantity surveyors, with standard deviation of 1.33 and 1.18 respectively.

The result from the study depicts that Delay payment to suppliers or service providers is a major obstacle facing attainment of value for money within the construction

industry. The table demonstrates overall mean scores of 3.50 by Architects and 4.15 by Quantity surveyors, and standard deviation figures of 1.19 and 1.25 respectively.

Regarding poor supervision, Table 4.11 shows mean scores of 4.18 by Architects and 4.21 by Quantity surveyors. The table further shows a standard deviation figure of 0.91 and 1.01 by Architects and Quantity surveyors respectively.

The data in Table 4.11 shows that respondents expressed similar opinion that the phenomenon where Project management team often at times ignores the importance of construction audit is a short coming to achieving value for money in the construction industry. The result showed mean values of 4.02 by Architects and 3.90 by Quantity surveyors, with a standard deviation of 1.21 and 1.19 respectively.

The data in Table 4.11 revealed that Lack of p,.olitical will to enforce the various legislation and Acts to ensure project performance is challenge facing achievement of value for money in construction industry. The table shows mean scores of 4.08 by Architects and 4.00 by Quantity surveyors with standard deviation of 1.18 and 1.17 respectively.

Table 4.12 presents the analysis of variance to determine if there is any significant difference in the mean responses of the two groups of respondents (architects and quantity surveyors).

Table 4.12 Analysis of variance of the mean response of respondents

	N	$\bar{x}$	σ	Std. Error	95% Confidence Interval for $\bar{x}$		Mini-mum	Maxi-mum
					Lower bound	Upper bound		
Architects	48	39.67	11.57	1.67	36.31	43.03	10.00	50.00
QS	48	40.10	11.36	1.64	36.81	43.40	10.00	50.00
Total	96	39.89	11.41	1.16	37.57	42.20	10.00	50.00

Source; field data, 2021

From Table 4.3 mean scores are 39.67 and 40.10 for Architects and Quantity surveyors respectively. There is no major difference between the means of the two groups. Now for the ANOVA test output, it will be observed that F value of 0.035 and significant value of 0.85 were obtained (Table 4.13). Since the significant value obtained is greater than $p > 0.05$, it implies that the variances for the two groups are not different. We therefore, reject the hypothesis that there is difference in the two groups and conclude that there no significant difference in the means of the two groups (Architects and Quantity surveyors). Table 4.13: Comparison of within and between group responses.

Table 4.13: Between and within group's comparisons

	Sum of Squares	Df	Mean Square	F	Sig.
Between	4.59	1	4.59	.035	.852
Within Groups	12355.15	94	131.44		
Total	12359.74	95			

Source: Field data, 2022

CHAPTER FIVE

DISCUSSIONS OF RESULTS

5.1 Introduction

This chapter gives a detailed discussion of results from the study. The presentation of the discussion is performed based on the objectives of the research. The findings are explained and supported with relevant literature.

5.2 Role of Consultants in Ensuring Value for Money for public infrastructural Projects

According to the respondents they played major role in ensuring value for money in projects construction as they analyze client's project related requirements. This was demonstrated in Table 4.2 where the item 'Analyze Client's project related requirements' was ranked 7th by Architects and 9th by Quantity surveyors. The table also revealed that respondents shared similar views that consultants prepare design brief in relation to function ability, cost, time, quality and safety before projects execution. This was shown in Table 4.2 where it was ranked 2nd by Architects and 12th by Quantity surveyors. This implies that Architects are ceased with this responsibility as compared to their Quantity Surveyor counterparts. Overall, functional ability, cost elements, time factor, quality and safety requirement are extremely important in achieving construction projects objectives. According to Dadzie, Abdul-Aziz and Kwame (2012), the Engineer (consultant) is the employer's agent. He ensures that the project is completed to the right quality against technical specifications and design standards, on time and within budget.

On the issue of consultant's role as providing full time supervision of all construction works/ activities for the projects, as further demonstrated in Table 4.2, it was ranked 10th by Architects and 6th by Quantity surveyors. This means that quantity surveyors are regularly engaged in full supervision as compare to their counterpart Architects. A similar study by Jourdan (2019) concluded that consulting tasks include tasks like developing and supporting the development of the design, working with tasks related to project management, contract administration, inspecting the work of construction contractors, advising on sustainability and giving advice and helping develop the project. A position which supports the findings of this current study.

The view of respondents on establishment of project communication and reporting system before projects execution were very much similar. The result depicted that consultants prepare projects breakdown structure before construction commence. There is no doubt that projects breakdown structures are essential elements in projects delivery since it enables contractors to follow work plan, thereby avoiding unnecessary projects delays. This is demonstrated in responses given by the consultants in Table 4.2 where Preparation of works breakdown structure before construction commence was ranked 6th by Architects and 5th by Quantity surveyors, signifying the importance of this role to both groups.

Table 4.2 also showed mean scores of 3.67 Architects and 2.81 by Quantity surveyors as well as ratings of 4th by Architects and 10th by Quantity surveyors. This demonstrates that Architects normally attach seriousness to Preparation of Project Master Schedule with base line. A related study by Jourdan (2019), whose findings support this current research indicated the role of consultants in construction projects can be to help avoid delays and lapses, achieve operational goals, improve the rate of

investment of building, and overall, make the construction process more effective. In the views of respondents these checks and re-examination of cost, value and drawings are performed to ensure that value for money of the projects is achieved. The result in Table 4.2 indicates that, Architects ranked this role 1st and 11th by Quantity surveyors. This signifies that Architects performs this responsibility often than their quantity surveyor counterpart. According to Kwakye, (1997) consultants are architects, engineers, (structural/services) and quantity surveyors who are construction professionals with diverse skills and, hence, offer design and management services for a fee.

The table also revealed that respondents expressed similar views that consultants perform Cost control functions during all stages of design and design development. This was showed in Table 4.2 where Cost control during all stages of design and design development was rated 5th by Architects and ranked 2ndby Quantity surveyors. This appears that quantity surveyors are ceased this responsibility as compare to their Architects counterpart.

Table 4.2 further showed that respondents expressed similar views that consultants undertake review of technical specifications and Bill of Quantities (BOQ). This was demonstrated in Table 4.2 where Review of technical specifications and Bill of Quantities (BOQ) was rated 11th by Architects and ranked 1st by Quantity surveyors. This appears that quantity surveyors perform this responsibility often as compare to Architects.

The result further showed that consultants shared similar views that architects and quantity surveyors have responsibility to advice projects management team on the

probable date of timely project completion. This was demonstrated in responses given by the consultants in Table 4.2 where it was ranked 9th by Architects and 3rd by Quantity surveyors. According to Dadzie, Abdul-Aziz and Kwame (2012), the project consultant is the employer's agent. He ensures that the project is completed to the right quality against technical specifications and design standards, on time and within budget. Overall, the One-Way Analysis Variance result further revealed that the variances for the two groups are not different; therefore, there is no significant difference in the means of the two groups (Architects and Quantity surveyors).

5.2 Factors Militating against Project Consultants' Role in Ensuring Value for Money for public infrastructural projects

Respondents expressed similar view that Inaccurate and reliable budget estimate militate against consultants' role in ensuring value for money in relation to public infrastructure projects. This is demonstrated in responses given by the consultants in Table 4.5 where Inaccurate and reliable budget estimate was ranked 3rd by Architects and 5th by Quantity surveyors, with mean values of 4.1250 and 4.0825 respectively. According to Badu, Edwards and Owusu-Manu (2012), large and small contractors in Ghana have difficulty accessing financing for projects. Where debt financing is available, the interest rates tend to be very high. One consequence of this situation is a high frequency of abandoned projects. The cost in terms of lost time, re-engaging new construction firms, and reworking and repairing defects is high. For example, project delays lead to high escalations in costs owing to high inflationary trends.

The table 4.5 also revealed that respondents expressed similar views that desire to complete project within a short period of time affect their role in ensuring value for money on public infrastructure projects. This was evident in Table 4.5 where mean

scores for Architects and Quantity surveyors were 3.50 and 3.40 respectively. This result is in line with Iyer and Jha (2005) as timely decision making enhances availability of resources and can improve schedule on time and cost performance. In support of this result, Bleout, (1998) & Pinto and Kharbanda (1995) mentioned that consultants or project managers must be able operate and coordinate effectively on a day-to-day basis to ensure positive impact on the overall quality of their projects.

According to the data shown in Table 4.5, Excessive variation orders mitigate against consultant's role in ensuring value for money on public infrastructure projects. This was rated 5th by Architects and ranked 1st by Quantity surveyors. Mohamed (2010) admitted that in some cases, the consultant directly initiates variations which bring about extension of contract durations. The variations come as a result of change in design, errors and omissions in design, conflicts between contract documents, and inadequate scope of work for contractor, design complexity, inadequate shop drawing details and lack of consultant's knowledge of available materials and equipment.

Table 4.5 further indicated that respondents expressed similar views that Excessive errors or omission affect the performance of consultants in relation to public infrastructure projects. This was demonstrated in Table 4.5 where Excessive errors or omission was rated 8th by both Architects and Quantity surveyors respectively. Mohamed (2010) argue that lack of these qualities will result in design errors, omissions, inaccuracies and eventually retards the performance of contractors as well as increase their operational cost. Iyer and Jha, (2005) are in agreement with this result as this factor is very important because it affects strongly on quality performance of consultants on projects development.

The data in Table 4.5 showed that respondents expressed similar views that inability to coordinate contractors' work in a timely manner affects the performance of consultants in relation to ensuring value for money on public infrastructure projects. This was shown in Table 4.5 where inability to coordinate contractors' work in a timely manner had means scores for Architects and Quantity surveyors as 3.48 and 3.38 respectively. In support of this result, Bleout, (1998) & Pinto and Kharbanda, (1995) mentioned that consultants or project managers must be able to operate and coordinate effectively on a day-to-day basis to ensure positive impact on the overall quality of their projects.

Political influences from higher authority greatly militate against the work of consultants in relation to ensuring value for money on public infrastructure projects. This is demonstrated in responses given by the consultants in Table 4.5 where Political influence from higher authority was ranked 2nd by Architects and 3rd by Quantity surveyors. Cheung (2004) and Iyer and Jha, (2005) are in agreement with this result as this factor is very important because it affects strongly on quality performance of consultants on projects development.

According to the data shown in Table 4.5, Level of technological influence affect performance of consultants in relation to public infrastructure projects was rated 4th by Architects and ranked 6th by Quantity surveyors. Veninga (2000) noted that Work environments that support and encourage creativity and innovation have been associated with increased productivity in general and are likely to be of importance in influencing consultants' efficiency.

5.3 Enabling Factors for Achieving Value for Money for Public Infrastructural Projects

Related research by Regan (2014) revealed that risk is central to delivering a successful project and it is measured by assessing the probability and cost of an outcome at variance with expectation, therefore, an effective and detailed analysis of these risks together with an efficient plan to allocate the risk to the various project stakeholders will facilitate the pursuit of securing and improving the worth of such project hence increasing its value. The findings revealed by Regan in his study is similar to the findings revealed by this current study. This was demonstrated in Table 4.8 where detailed risk analysis and appropriate risk allocation in contract clauses was rated 6th by Architects and ranked 7th by Quantity surveyors, with mean values of 3.74 and 3.84 respectively. It is important to note that respondents agree that to achieve value for money in the construction industry, consultants, engineers, architects, and quantity surveyors should perform procedural risks, design risks, construction risks, and financial risks before commencement of construction projects. The risks mentioned are necessary to attain value for money at every stage of the construction project.

According to the respondents Drive for faster project completion was a factor to achieving value for money for public infrastructural projects. This was demonstrated in Table 4. 8, where Drive for faster project completion was ranked 7th by Architects and 6th by Quantity surveyors. This implies that respondents agree that factors including reducing the overall project duration, public-private partnership, single source system and use of project planning tools are important elements to enable project management teams to achieve value for money. This finding is in support of a

research conducted by Olawumi et al (2017); they indicated that a purposeful collaboration among project stakeholders in conjunction with the efficient utilization of some project management tools can serve in the good instead of reducing the overall project duration. The knowledge of several project delivery methods such as design-build, a public-private partnership, single source system etc. and the correct understanding of which of them would be most suitable to fast-track the project would help to reduce the cost associated with the elongated project schedule, hence provide value for money invested by the client.

From the data in Table 4.8, clients' demand for value for money was rated 2nd by Architects and ranked 4th by Quantity surveyors. This appears that respondents shared similar view that client demand for value for money on projects would lead to value for money. This means that failure of the final project cost to be within the limit of initial target cost/project budget that has a significant effect on the value derivable from such project. Hence, the identification of likely factors or activities in a project that could result in overall cost escalation and the diligence in reducing the impact (or avoiding them could help to ensure the final project cost doesn't offshoot the pre-determined project budget.

On the issue of rising demand for innovation in project development, as further demonstrated in Table 4.8, it was ranked 5th by Architects and 1st by Quantity surveyors. The Encouragement of innovation in project development has a significant influence on value for money for public infrastructural projects. From the results, it is clear that Innovative strategies could come in the form of the introduction of better and more efficient plants and equipment, development of innovative solution, better motivation strategies for workers, improved framework for communication and

decision making, improved supply chain management, the introduction of hi-tech facilities, development of cost database, efficiency in tracking supplies among others. FID (2011) is in support of this finding as it advocates for a more innovative way in assessing the value of projects.

Project life cycle cost being adequately accounted for such as value management and life cycle cost analysis will ensure the use of durable and maintainable building element and designs that will reduce the cost required to maintain such project in the long run. This is demonstrated in responses given by the consultants in Table 4.8 where project life cycle cost adequately accounted for was ranked 4th by Architects and 3rd by Quantity surveyors. According to Olawumi et al (2017), who is in support of this finding, accounting for project life cycle cost should be considered at the design stage (outline design) of a project, by identifying key components of the projects, objectively decide on alternative design items or components, estimate likely maintenance cost of each alternative design components, then finally choose the most cost effective design component based on the lowest cost, provided it gives the required function and conforms to the required quality standard.

The table also revealed that respondents expressed similar views that Competition in provision of consultancy services has an effect on achieving value for money for public infrastructural projects. This was shown in Table 4.8 where Competition in provision of consultancy services was ranked 3rd by Architects and ranked 5th by Quantity surveyors. This implies that the two groups take serious view on Competition in provision of consultancy services as a tool to result in value for money on public infrastructural projects. Table 4.8 further indicated that respondents expressed similar views that enabling legal provision on value for money audit would

result in value for money on public infrastructural projects. This was demonstrated in Table 4.8 where Enabling legal provision on value for money audit was rated 1st by Architects and ranked 2nd by Quantity surveyors.

5.4 Challenges to Achieving Value for Money for Public Infrastructural Projects

According to Ofori-Kuragu (2016) the Ghanaian construction industry like most others, is bedevilled by challenges such as time and cost overruns, political interference, delays in payment to contractors and suppliers, fiscal constraints, inadequate supervision and contracts taking too long to reach final closure. This has greatly impacted the performance of the industry. It is now common for every government project to generate debates, whether in the inception stage or completion stage. For instance, the construction of a new court complex, which was worth US$50m and funded by the Government of Ghana raised discussions after defects were discovered in its development.

Similarly, the agreement of a US$2bn Sino hydro deal attracted widespread attention by the media and general public as to whether the agreement was going to offer good value for money (VFM). Furthermore, several campaigns have been made by public clients and end-users to ensure that value for money is attained in publicly delivered projects (Ameyaw, 2012). Achieving value for money remains a topical issue in Ghana, especially, within the public sector where the monies of taxpayers are used in providing infrastructure. It is crucial that value for money is achieved at every stage of the construction project (Mohd-Rahim, 2018). The success or failure in achieving value for money is largely dependent on the ability of construction professionals to determine whether they are giving their clients the best services (Ayettey and Danso, 2018). According to Ansell (2009) value for money is achieved when a project is as

follows: free from defects on completion; delivered on time; delivered within budget; fit for purpose; low construction cost; pleasing to look at; supported by worthwhile guarantees; satisfactory life of repair; low maintenance cost; minimal disruption to the public; and safe. This implies that there are so many dimensions that have to be satisfied with a construction project. However, the prevalent situation of poorly delivered projects and the continuous campaign for value for money necessitates the need for a study into explaining the latent shortcomings in achieving value for money within the Ghanaian construction industry.

The research findings revealed by the authorities sited are very much in support of the findings of this current study. This was demonstrated in Table 4.11 where Tender Documents not efficiently prepared was rated 9th by Architects and ranked 7th by Quantity surveyors, with mean values of 3.83 and 3.93 respectively. This implies that, Tender documents not competently prepared are an obstacle facing attainment of value for money within the construction industry. According to Semen (2014) tender documents are not well and sufficiently prepared hence bringing confusion and changes during the execution of the project. Mostly the incompleteness and insufficient information are seen in the BOQs, drawings and specifications. Poor procurement strategies, on the other hand, describe inefficient procurement processes that lead to loss or waste of money. Ntayietal (2009) attribute this to ineffective procurement policies and structures, as well as the failure to impose sanctions. With efficient procurement at the heart of successfully delivered projects, the use of poor procurement strategies affects the attainment of good value in construction projects. More so, the gradual increase in prices because of macroeconomic variables adversely impacts the cost of construction projects. This consequently results in cost overrun with huge payments made in the form of contractual fluctuations.

The perception that awarding contracts to companies belonging to themselves or relatives without under going through the tender process as barrier to achieving value for money for public infrastructural projects featured prominently in the result of the study. From Table 4.11, this item was ranked 7th by Architects and 10th by quantity surveyors with mean scores of 3.92 by Architects and 3.77 by Quantity surveyors. The results indicated a very significant number of the participants agreed to the position as articulated above.

Similarly, the phenomenon in the construction industry whereby stakeholders Solicit bribes in order to influence tender award decision came up strongly in the result. The result in Table 4.11 showed a ranking of 6th by Architects and 8th by quantity surveyors with mean scores of 3.93 and 4.16 respectively. Chirchir, and Gachunga (2015) are in support of this finding as they indicated that, unacceptable behaviors like awarding contracts to companies belonging to themselves or their relatives without undergoing through the tendering process, obtaining tenders through quotations from a single supplier, soliciting bribes in order to influence tender award decision, approval of variations to suppliers and acceptance of low quality goods or services is a challenge to ensuring value for money.

Table 4.11, also showed a very significant number of the respondents were of view that Delay payment to suppliers or service providers are a major obstacle facing attainment of value for money within the construction industry. The data from the table indicated a mean score of 3.50 for Architects and 4.15 for quantity surveyors with a ranking of 10th and 3rd respectively. A related study by Jatarona (2016) is in support of this finding, it revealed that failure to give the necessary approvals,

acceptance of poor-quality goods or services and delayed payment to suppliers or services providers greatly affect value for money on infrastructural projects. Others include poor workmanship resulted from poor supervision and Late approval in giving the extension of time.

The views of respondents regarding Project management team often at times ignore the importance of construction audit is a short coming to achieving value for money in the construction industry also featured strongly in this study. The result showed that majority of the consultants who formed part of this study agreed to the position, with mean scores of 4.02 and 3.90 respectively. According to Sohail and Cavill (2008) many factors are also hindering the adoption and implementation of construction audit (CA) practice in Ghana. One of such factors is lack of auditors or professional technical auditors' familiarity concerning construction projects and the environment to be audited. Goldberg (2010) noted that it is usually difficult to identify areas of potential exposure when conducting a construction audit without understanding the contract terms and conditions. The above situation often arises because, in the early stages of project conception, project management teams often at time ignore the importance of Construction Audit. This is because auditors are not welcome at this phase as the exercise is usually term as an after-match event with the fear of being exposed.

According to Twumasi-Ampofo, (2014) the abandonment of public projects in Ghana remains a perennial issue and this date back to the colonial era. This is largely attributed to poor project implementation, negative politics and lack of continuation of public projects due to changes in government. Allen (2017) stated that politically motivated projects are usually not subjected to any form of appraisal, with someone-

viable projects being undertaken with no form of scrutiny. Poor procurement strategies, on the other hand, describe inefficient procurement processes that lead to loss or waste of money. The findings revealed by Twumasi- Ampafo and Allen in their study are similar to the findings revealed by this current study. From Table 4.11, Lack of political will to enforce the various legislation and Acts to ensure project performance was ranked 2nd by Architects and 6th by Quantity surveyors.

5.5 Towards a Framework for Ensuring VFM on Public Projects

The figure 5.1 below is a validated framework designed towards ensuring value for money on public infrastructural projects. Based on the results and findings of the study the conceptual framework developed from the literature review was modified and preliminary frame work for ensuring VFM on public infrastructural projects was developed. The developed framework was presented to six consultants each with experience not less than ten years to validate. The incorporation of their comments into the preliminary framework resulted in the validated frame work described in the paragraphs that follow.

The implementation of a project has been categorized into three (3) stages. These are the planning stage, construction stage and operational stage. The planning stage (Pre-contract Stage) involves all the activities and processes that take place right from the time the client conceives the idea of developing a project to the point of award of contract. Some of these activities include Analysing client's needs or project requirements, Preparing the design brief and coming out with all necessary drawings, develop project execution systems, developing project control systems to help communicate about the objectives, priorities and outcomes of the project. In trying to ensure value for money, priority must be given to cost, time and quality. A typical

example of project control is the budget forecast for the project as this can weigh heavily on the success or failure of the project. Design of contract documents and contract clauses, Tendering and tendering procedure.

The second phase is the construction or execution stage. This involves all the activities that take place after award of contract to handing over. Some of these activities include, on-site design coordination and issue of drawing, full time supervision (monitoring and evaluation), validate change orders etc.

The third and final stage is the operational stage and this is where at the completion of the project, the contractor hand over the project to the clients, the client takes over and put the project to use. Some of the activities carried out include Testing and commissioning of facility, preparing and addressing schedule of defects/punch list, coordinate with contractors to rectify defects during defects liability period (DLP), preparation of final certificate etc.

According to the fig. 5.1, each of these stages of construction comes with its own risk or challenges. Measures are then taken to address these challenges after which they are reviewed to i) identify success and or failures in project implementation and ii) review the success and failures in project implementation. The challenges are revisited if the review of measures is unsuccessful. Value for money is achieved if after going through all these activities and processes, the project is completed on time, within budget and its able to function or serve its intended purpose appropriately.

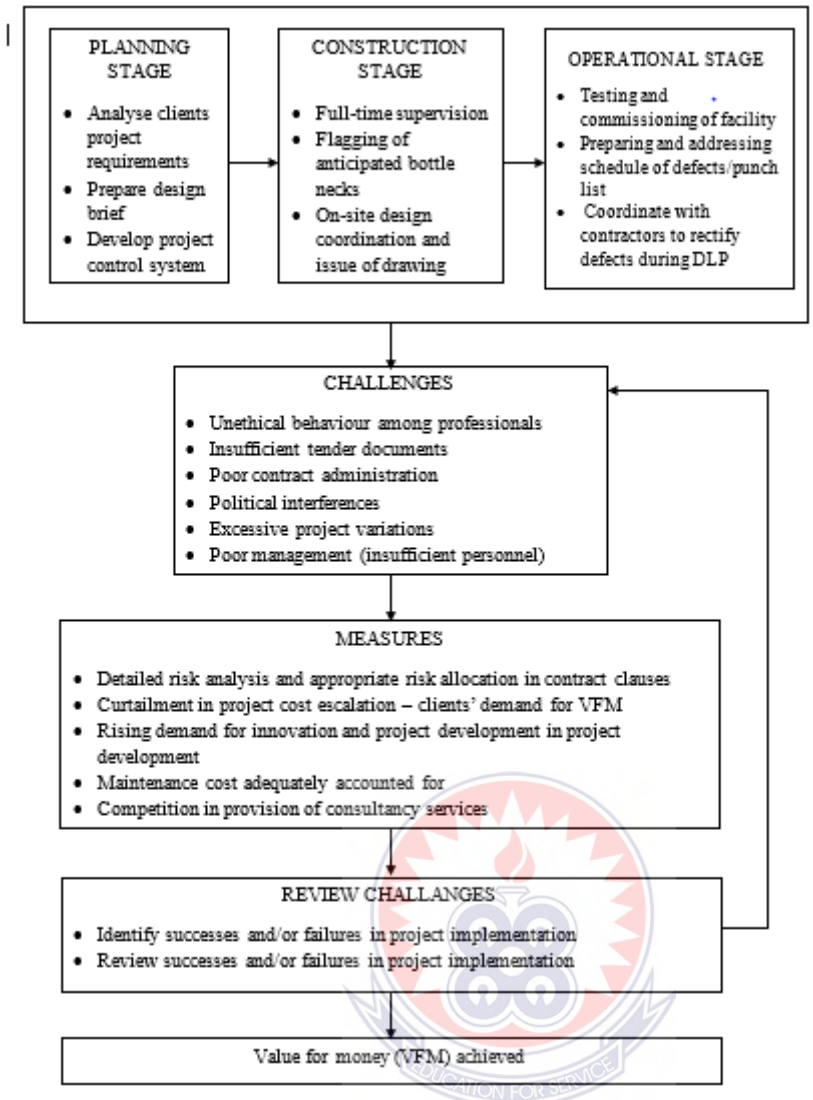

Fig. 5.1a Framework for Ensuring VFM of Public Projects

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1Introduction

This chapter summarise the details obtained in the study. The chapter is in three parts. The first part summarises the entire research findings; the second part outlines the conclusions drawn from the research and the third part makes recommendations on the role of consultants in enhancing value for money in infrastructural projects in Ghana.

6.2Summary of Findings

The findings of the study include the following:

6.2.1 Role of Consultants in Ensuring Value for Money for public infrastructural Projects

It was clear that project consultants conduct inspections and re-examinations of cost, value, and designs to guarantee that the projects' value for money is attained. The results also revealed that respondents shared the same opinion that consultants should review technical specifications and Bills of Quantities (BOQ). In comparison to their Architect counterparts, quantity surveyors appear to undertake this function more frequently.

The study found that project consultants played an important role in guaranteeing value for money in project construction by analyzing the client's project needs and preparing a design brief in terms of functional ability, cost, time, quality, and safety prior to the

project's execution. Overall, functional ability, cost aspects, time factor, quality, and safety requirements are critical in achieving the goals of building projects.

The findings also revealed that architects and quantity surveyors are responsible for advising the project management team on the most likely completion date. They ensure that the project is executed to the highest possible standard, in accordance with technical specifications and design guidelines, on schedule and on budget.

6.2.2 Factors Militating against Project Consultants' Role in Ensuring Value for Money for public infrastructural projects

The study found that timely decision making has an impact on the efficiency of consultants working on public infrastructural projects. Delays and cost overruns will always occur if consultants are not firm in making and agreeing on decisions that affect the timely delivery of the project. Timely decision-making increases resource availability and can improve schedule performance in terms of both time and cost.

Consultants' performance on public infrastructure projects is influenced by political pressure from higher authorities. In most interactions, nepotism and political favouritism are always present, which significantly impacts delivery. As a result, the evaluation team frequently fails to conduct due diligence during the expression of interest process to verify the legitimacy of these consultants' experiences and qualifications.

The study found that erroneous and unreliable budget estimates had an impact on consultants' efficiency when working on public infrastructural projects. Contractors in

Ghana have a hard time getting project financing. When debt financing is an option, the interest rates are typically very high. As a result of this predicament, there are a lot of abandoned initiatives. Due to high inflationary trends, this could result in project delays and high cost escalations.

6.2.3 Enabling Factors for Achieving Value for Money for Public Infrastructural Projects

The findings revealed that, consultants, engineers, architects, and quantity surveyors should perform procedural risks, design risks, constructional risks, and financial risks before beginning building projects to obtain value for money in the construction business. At every stage of the construction project, the risks listed are important to achieve value for money.

The study found that encouraging project development innovation has a beneficial impact on value for money for public infrastructural projects. Innovative strategies could include the introduction of better and more efficient plants and equipment, the development of innovative solutions, improved worker motivation strategies, improved framework for communication and decision making, improved supply chain management, the introduction of hi-tech facilities, the development of cost databases, and efficiency in tracking supplies, among other things.

The findings further revealed that accounting for maintenance costs should be considered during the project's design stage (outline design) by identifying key components,

objectively deciding on alternative design items or components, estimating likely maintenance costs of each alternative design component, and finally choosing the most cost effective design component based on the lowest cost, provided it performs the required function and meets the required quality standards.

6.2.4 Challenges to Achieving Value for Money for Public Infrastructural Projects

The study showed that granting contracts to companies owned by one self or relatives without going through the tender procedure is a hindrance to attaining value for money for public infrastructure projects.

The study revealed that project management teams frequently overlook the relevance of construction audits, which is a significant shortcoming in delivering value for money in the construction business. The aforementioned problem frequently happens because project management teams sometimes overlook the necessity of Construction Audit at the early stages of project conception. One of these factors is auditors' or professional technical auditors' lack of expertise with construction projects and the audited environment. This is due to the fact that auditors are not permitted at this stage, as the exercise is frequently referred to as an after-match event in order to avoid being exposed.

The analysis revealed further that, abandonment of public projects in Ghana is a persistent problem that extends back to the colonial period. This is mostly due to poor project execution, unfavourable politics, and the discontinuation of public projects as a

result of government changes. On the other hand, poor procurement tactics refers to inefficient procurement processes that result in money loss or waste.

6.3 Conclusions

From the findings the following conclusions were made:

It was concluded that, the most factors identified as affecting consultants' performance on development projects are: the urgency of the project at hand, project duration in terms of time spent getting the work done, political influence from higher authority affecting project delivery, timely decision making on the part of the consultancy team, and experience of the design team on the project. The consultant's capacity to function as part of a team, as well as his or her innovation in cost control and generating individual efficiencies to keep contract sums inside budget, are among others. The consultant's capacity to coordinate the job efficiently and effectively, as well as the team members' weak working relationships, was also identified.

Identifying value for money can be difficult because benefits, costs, and risks must all be considered throughout the planning stage. Once risks, costs, and benefits have been discovered, it is vital to estimate the comparable monetary value where possible, by making an informed and supported decision about benefits, costs, and risks; it is more likely that value for money may be achieved.

Project's value-for-money evaluation must be carried out both before and after the project is done to establish whether or not value for money was truly achieved. VFM can be

achieved on a project site in a number of ways, including detailed risk analysis and appropriate risk allocation, a push for faster project completion, a reduction in project cost escalation, encouragement of innovation in project development, maintenance costs being adequately accounted for, an accurate assessment of the project's cost, and the preparation of a detailed specification.

6.4 Recommendations

The following recommendations were made based on the findings earlier stated.

1. It is recommended that, to improve consultants` performance and raise client and contractor satisfaction, consultants should be more interested in design and cost by employing multi-criteria analysis and selecting the most cost-effective criterion.

2. Consultants should assist and speed the delivery of orders to contractors, issue site instructions on time, and limit conflicts and claims.

3. The consulting firm should hire competent and qualified personnel with good interpersonal skills who can work well together. This can be done by looking into their background in terms of their CVs and previous work experience with other companies.

4. Consultants should plan properly to ensure that contract processes are duly followed, thus, documentation including preparation and approval of drawings to reduce variation during construction. Consultants should monitor their assigned work closely by making inspections and corrections at the appropriate time to reduce or avoid rework. Since

consultant serves as an intermediary between client and contractors, their communication skill is essential to aid smooth flow of information to other contracting parties.

5. Poor contract management and oversight, inadequate accountability in the public sector systems in most developing nations or economies is exacerbated by offering the greatest explanation for public sector project cost overruns. To address this issue, the public sector system will need to adopt effective contract planning and supervision processes. In Ghana, agencies like the Public Procurement Authority (PPA) and the Audit Service should ensure that public procurement companies follow these protocols. Contract planning and supervision processes within public procurement bodies will be streamlined, and the danger of project cost overruns will be reduced.

6. Furthermore, a national law requiring mandatory evaluations of public sector building projects will be required to address the phenomena of poor contract planning and supervision, which is grounded by the problem of low accountability in the public sector. A law like this should focus on public-sector construction project audits, among other things. Not only will the evaluation exercise increase accountability in public sector building projects, but it will also give an opportunity for learning and improvement in project delivery.

7. Going forward, consultants should be made to show proof of their team of experts before being allowed to register at the various assemblies. This should be a major requirement for registration.

8. Policy makers, consultancy firms as well as MMDA`s should adopt and implement the framework developed towards enhancing VFM on government infrastructural projects in Ghana.

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APPENDICES

QUESTIONNAIRE

Section A: Background Information: Please tick (√) as appropriate:

1. Please state your gender

[ ] Female [ ] Male

2. What is your highest academic qualification?

[ ] bachelor degree [ ] postgraduate diploma[ ] master degree

[ ] others specify…….

3. How many years of experience do you have as a consultant?

[ ] 1-5yrs [ ] 6-10yrs [ ] 11-15yrs [ ] 16yrs and above

.4. What age category do you belong?

[ ] Below 30 [ ] 30 – 40 years [ ] 41 – 50 years [ ] 51 – 60 years

[ ] Above 60 years

5. Please indicate the profession you belong

[ ] Architect [ ] Quantity surveyor **Section B: Expert opinion on value for money in relation to infrastructure project**

6. To what extend do you perform the following roles in relation to achieving value for money in infrastructural projects? Please rate using a scale of 1 to 5 where 1

refers to not at all, 2 refers to less often, 3 refers to often, 4 refers to very often and 5 is always.

Roles	Rating				
Analyze Client's project related requirements					
Prepare the Design Brief in terms of function ability, cost, time,					
Finalize project organization chart.					
Establishment of project communication and reporting					
Preparation of works breakdown structure					
Preparation of Project Master Schedule with base line					
Checking & verification of designer's submissions (design basis					
Cost control during all stages of design and design development					
Preparation of procurement plan					
Review of technical specifications and Bill of Quantities (BOQ)					
Submitting Weekly and Monthly progress reports					
Full time supervision of All construction works/activities for the					
On-site design co-ordination and issue of drawings/clarifications					
Monitoring the progress of work with the Master construction					
Prior flagging of anticipated bottlenecks and analysis of its reasons					
Day to day correspondences including contractual issues					
Prepare Quality Assurance/Quality Control plan and Method					
Organize Progress review meetings on weekly basis.					
Collect, review and maintain all the records of contractors' daily					
Evaluate all claims for additional payment and extension of time					
Advice about probable date of Substantial Completion					
Preparing & addressing the schedule of defects/punch lists					

Provide assistance in Testing and commissioning of the facility					
Reconciliation and Certification of Final bills of contractors,					
Preparation of project close-out report					
Collate and verify all As-built drawings					
Addressing any queries during defects liability period					
Co-ordination with the Contractors to rectify the defects during the					

7. To what extend do you agree on the following factors militating against efficient performance of your role in ensuring value for money as a consultant in relation to public infrastructural projects? Please rate using a scale of 1-7 where 1 means strongly disagree, 2 means disagree, 3 means slightly disagree, 4 means not sure, 5 means slightly agree, 6 means agree and 7 means strongly agree.

Factors	Ratings						
	1	2	3	4	5	6	7
Cost Factors							
Inability to foresee and budget for potential inflation							
Excessive variation orders by client							
Changes in project scope by the client							
Time Factors							
Desire to complete project within a short period of time							
Clients inability to adequately finance project expenses/cost							

Quality factors							
Lack of cohesion of project team members							
Inability to involve contractors at the design phase							
Unavailability of personnel with high experience and qualification							
Management Related Factors							
Inadequate technical background							
Inability to coordinate and work as a team							
Environment factors							
Political influence from higher authority							
Others							
Project value							
Type of project							
Uniqueness of project activities							
Project duration							
Urgency of project							
Project complexity							

8.To what extent do you agree on the following enabling factors for achieving value for money for public infrastructural projects? Please rate using a scale of 1-7 where 1 means strongly disagree, 2 means disagree, 3 means slightly disagree, 4 means not sure, 5 means slightly agree, 6 means agree and 7 means strongly agree.

Factors	Ratings						
	1	2	3	4	5	6	7
Detailed risk analysis and appropriate risk allocation in							
Drive for faster project completion							
Clients demand for value for money							
Rising demand for innovation in project development							
Project life cycle cost							
Competition in the provision of consultancy services.							
Enabling legal provisions on value for money audit							

9. To what extent do you agree on the following challenges to achieving value for money for public infrastructural projects? Please rate using a scale of 1 to 7 where 1 means strongly disagree, 2 means disagree, 3 means slightly disagree, 4 means not sure, 5 means slightly agree, 6 means agree and 7 means strongly agree.

Challenges	Rating						
	1	2	3	4	5	6	7
Insufficient Tender Document							
Contract documents not properly prepared							

Incomplete and insufficient information on drawings and							
Failure on the part of project engineers to clearly articulate							
Unethical Behaviour among Professional Engineering							
Awarding contracts to companies belonging to themselves or							
Obtaining tenders through tenders from a single supplier							
Soliciting bribes in order to influence tender award decision							
Approval of variations to suppliers							
Acceptance of low quality goods or services.							
Poor Contract Administration							
Failure to give the necessary approvals							
Delay payment to suppliers or service providers							
Reworks							
Poor workmanship							
Poor supervision							
Late approval in giving extension of time							
Incomplete or non-completion of projects							
Lack of auditors or professional technical auditors'							
Project management team often at times ignore the							
Project management sometimes give auditors inadequate							
Language barrier between construction professionals and							
Audit report in Ghana are seldom prepared							
Lack of political will to enforce the various legislation and							