EXPLORING THE EFFECT OF THE IMPLEMENTATION OF VALUE FOR MONEY ON CONSTRUCTION PROJECTS PERFORMANCE IN GHANA

By

Adu-Yeboah Kwasi Prince

(BSc. Construction Technology and Management)

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgment is made in the thesis.

Adu-Yeboah Kwasi Prince   …………………………   ……………………..
  (PG5037518)   Signature   Date

Certified by:

Dr. Ernest Kissi   …………………………   ……………………..
Supervisor   Signature   Date

Certified by:

Prof. B.K Baiden   …………………………   ……………………..
Head of Department   Signature   Date

ABSTRACT

The implementation of VFM in Ghana is challenged and highly ineffective. This affects the performance of the project. The aim of the study was to assess the effects of the implementation of Value for Money on construction project performance in Ghana. The study had three (3) objectives which were to identify the significant factors that affects VFM in construction projects in Ghana, to assess the critical challenges in achieving VFM in construction projects in Ghana and to identify the significant strategies to improve the achievement of VFM in construction projects in Ghana. The study adopted the quantitative research method and survey strategy. A review of literature was conducted on the set objectives and subsequently, a structured questionnaire was developed to aid in the collection of data. A total of 59 questionnaires were used for the analysis. The data collected were analyzed using mean score ranking and multiple regression. With the objective one, the first ranked factor was sufficient skills and expertise followed by the level of competition and the accurate assessment of project cost. With the second objective, cost performance was affected most by VFM. This was followed by quality performance. With the third objective, the most severe challenge was unclear client objectives. This was followed by poor risk allocation and lack of knowledge and awareness of VFM tools. there is a lack of awareness of some VFM tools. Based on the findings, it was recommended that, project managers should continuously educate themselves so as to gain more expertise in VFM implementation. Also, project managers must put in more effort to adequately understand the requirements of the client before the commencement of a project so as to enhance the achievement of VFM. Further studies can be conducted to evaluate the impact of VFM on project performance using the Structural Equation Modelling (SEM).

Keywords: Value for Money, project success

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VFM……………………. Value for Money

SEM……………………. Structural Equation Modelling

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DEDICATION

I dedicate the entire work to almighty God for seeing me through this program

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The construction industry plays a huge role in the development of a country. Abdullah et al. (2004), indicated that, the construction industry aids in the establishment of infrastructure needed for socioeconomic development which aids in a country economic development. Similar assertion was made by Ofori (2012) within the Ghanaian context. He indicated that, the growth of the Ghanaian economy is linked to the success of the construction industry. The construction industry contributes approximately 14.8% of the GDP (Ghana Statistical Service, 2015). Thus, the construction industry possesses numerous benefits to the development of the country however, most clients are not satisfied with the outcome of executed construction projects. Ramly and Shen (2012) indicated that, clients are now very much concerned with the value they gain from their investments. Therefore, there is the need to adopt and promote new methods to facilitate the achievement of Value for Money (VFM) for the clients.

According to HM, Treasury (2006), VFM can be described as the optimum combination of life cycle cost and quality of the goods or services to the meet the requirements of the user. ACCA (2002), opined that, VFM is a process which that is executed throughout the life cycle of a project, thus, from the inception to the end of the useful life of the asset. This gives the indication that, VFM incorporates the whole life cycle cost of a project and quality to meet the client's requirements. With the desirable scope of VFM, there have been growing interest in both the private and public sector as the traditional lowest evaluated bidder approach of selecting contractors have been abandoned in value-based approaches in the UK, Victoria and Australia (Staples, 2012).

Concretely, clients can assess the realization of VFM if they compare the service, they received to the amount they paid to receive the service. Hence, mathematically, value can be described as;

Value = Benefits Delivered/ Resources used.

Antoine (2012) indicated that, the resources utilized can be quantified in monetary terms. This may involve the use of raw material resources, human resources and/or technical resources. The ratio between them is described as VFM. Furthermore, the assessment of the benefits delivered can be easily executed as it consists of both subjective and objective components (Antoine, 2012). Kelly and Male (2004), opined that, the objective section of VFM denotes all economic categories as it is possible to accurately quantify by assessing the price and cost of each phase of the construction process. The phase includes the feasibility studies, procurement, construction and operational phase. However, the subjective category of VFM denotes the benefits realized socially. The subjective aspects is very complex to quantify as it relies on individuals perception. The concept of value for money is very important for public sector and private sector projects as it aids organizations to critically analyze the value of a project before it is implemented (Morallos and Amekudzi, 2008). Furthermore, VFM ensures that projects are more focused on the quality of the work and not only the lowest evaluated bid to meet the objectives of the project. However, the implementation of VFM is challenged and highly ineffective (Ntayi et al., 2009). This affects the performance of the project

Based on the background, the study seeks to explore the effect of the implementation of value for money on construction project performance in Ghana

1.2 PROBLEM STATEMENT

Previous studies have shown that, the concept of VFM incorporates the ability to achieve a high level of quality at an optimum cost. However, the construction industry faces numerous performance challenges especially in cost and quality that ultimately leads to client dissatisfaction. Amoah et al. (2011) opined that the Ghanaian construction industry faces numerous challenges with regards to quality. According to Ling et al., (2009), quality is the end product of the service provided or work executed. Also, studies have shown that, cost overruns are the most severe challenge in the construction industry (Olawale and Sun, 2010; Cantarelli, 2009). Cost overrun does not just affect the profitability of construction projects for the contractor, it also affects the overall economy as a whole especially in public projects. Rahman et al. (2013) opined that, the construction industry faces challenges like low quality, low productivity, cost overrun, time overrun, construction waste and others. These challenges ultimately lead to clients' dissatisfaction and affects the growth of the economy. Hence the achievement of VFM is highly impossible as VFM incorporates cost and quality (HM, Treasury, 2006)

The application of VFM principles and strategies can aid in the eradication of these problems facing the Ghanaian construction industry. Due to the fact that, project cost performance is easily measurable, it is often thought that, cost reduction encompasses the concept of VFM. However, the central focus of VFM is achieve high quality and an optimal cost. Achieving a high quality denotes the realization of varying needs which may include durability, cheaper to maintain, user friendly etc. According to Cox and Townsend (1998), the concept of VFM is highly challenged in the construction sector due to the nature of the industry. Therefore, the study seeks to assess the effect of the implementation of value for money on construction project performance in Ghana.

1.3 RESEARCH QUESTIONS

This study seeks to answer the following questions;

1. What are the factors that affects VFM in construction projects in Ghana?

2. What is the effect of the implementation of VFM on construction project performance?

3. What are the challenges in achieving VFM in construction projects in Ghana?

1.4 RESEARCH AIM AND OBJECTIVES

This section enlists the aim and objectives of the study

1.4.1 Research aim

The aim of this study was to assess the effect of the implementation of value for money on construction project performance in Ghana.

1.4.2 Research objectives

In other to achieve the aim of the study, three objectives were set. They were;

1. To identify the significant factors that affects VFM in construction projects in Ghana;

2. To examine the effect of the implementation of VFM on construction project performance; and

3. To assess the critical challenges in achieving VFM in construction projects in Ghana.

1.5 SIGNIFICANCE OF THE STUDY

The nature of the construction industry keeps changing as there is the introduction of new innovations, advancements in technology, complexity of construction projects and clients' ever-changing needs. There is therefore the need for construction personnel to adopt new ways of meeting these needs in other to improve the performance of the construction industry. The VFM concept is a technique that can aid in that respect. Hence, this study will provide the theoretical basis for construction firms and other construction stakeholders to know and deal with the challenges of VFM so as to aid in the implementation VFM in construction projects.

Furthermore, this study will add to the literature on VFM and aid in identifying further aspects of VFM that needs to be researched. Lastly, this study will aid policy makers and government agencies in effectively implementing strategies to ensure VFM in construction projects executed in their jurisdiction.

1.6 RESEARCH METHODOLOGY

The methodological approach of a study is a significant aspect of every research. This study involved the review of literature which subsequently led to the development of questionnaire to solicit information from the respondents. The study adopted a quantitative method of study where only numerical data are used. Therefore, mathematical tools were used for the analysis using SPSS version 22 and the platform for entering the data. The research adopted a survey research strategy and the research approach was purely deductive. This aided in making inference about the challenges associated in VFM. However, prior to the analysis, the data was tested for validity and reliability using the Cronbach's Alpha. The data was analyzed the 1-sample t-test in conjunction with mean scores to assess the significance/criticality of the factors identified.

1.7 RESEARCH SCOPE

VFM is a process which that is executed throughout the life cycle of a project, thus, from the inception to the end of the useful life of the asset. Hence, the design stage of a project is an ideal phase to begin the processes of VFM. Therefore, construction project managers were selected as the respondents for the study. However, based on the nature of the study, only project managers involved in construction were contacted for the study.

1.8 RESEARCH STRUCTURE

This research is divided into five various chapters. The chapter one discusses the general introduction of the study. They consist of sub-sections like the background of study, the

problem statement, aim, objectives and the significance of the study. The chapter two review the literature pertaining to the area of study. The chapter three talks about the methodological approach adopted for the research. This included the research design, research strategy, the population and the sample size of the study. The chapter four looks at the analysis of data and discusses the findings from the analysis. The final chapter deals with a discussion of the findings from the chapter four. From there, recommendations were made based on the findings.
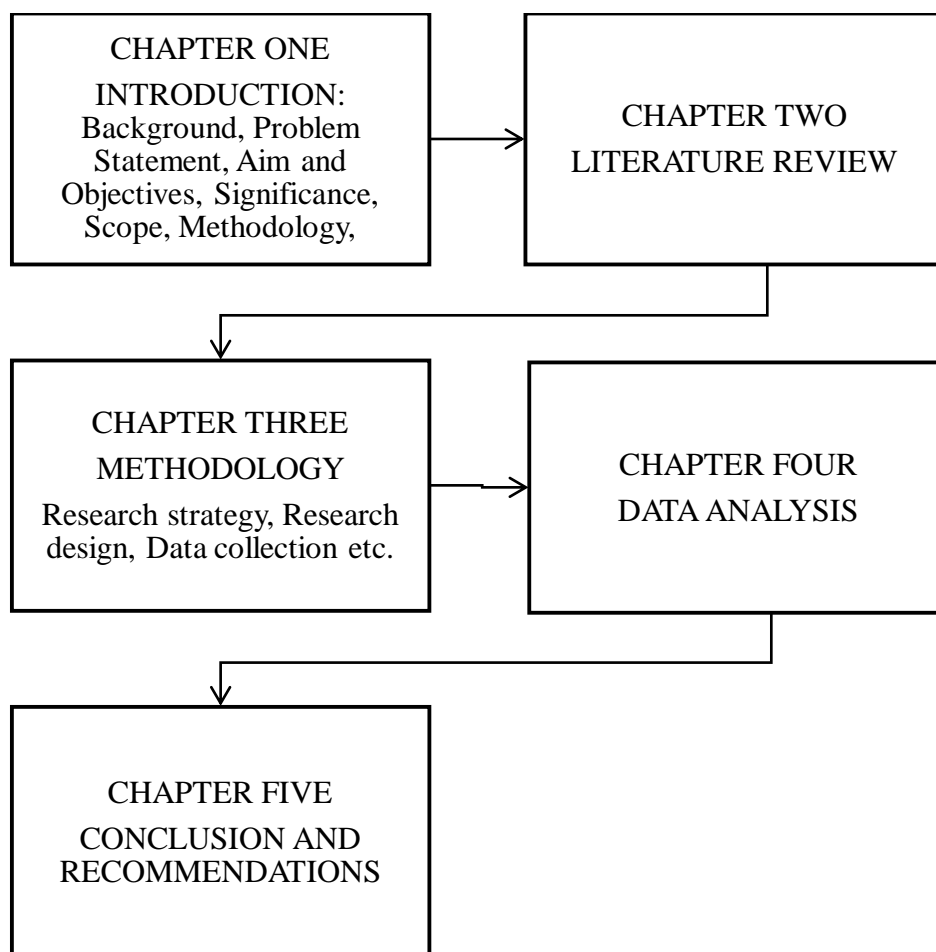

Figure 1.1: Structure of the report

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Literature review is a very significant aspect of a research. This chapter focuses on the review of literature pertinent to the subject area of study. The review fundamentally aided in grounding the study in a specific field of literature and eventually aided in the development of the instrument for data collected. Literature review shows the outcome of other studies that are similar the current study (Creswell, 1994). Finally, the literature review gives a framework for the establishment of the significance of the study.

This review begins with a conceptual review of the keywords of the research. This aids in the provision of conceptual definitions, concepts and highlights on some issues related to the industry. The conceptual review involved the definitions and comparative discussion on project success and value for money (VFM). There was also a discussion on the nature of public sector construction projects.

Subsequently, an empirical review was conducted this involved a discussion on the factors that affect VFM and subsequently and a review on the challenges in achieving VFM. This chapter concludes with an empirical review on the effects of the implementation on projects.

2.2 PUBLIC SECTOR CONSTRUCTION PROJECT

There is no straightforward and convenient description of the public sector. Generally, the public sector is part of the economy that is under the control and direction of the state. The duty of the public sector is to provide needs that private initiatives cannot or will not supply. Hence the duties of a manager in a public sector varies entirely from that of the private sector (Cameron and Stone, 1995). Also, Fox et al. (1991), indicated that, the approaches and systems of public and private organizations are more similar at the technical level but less similar at the

political, managerial and decision-making level. Similarly, project execution in the public and private sector have distinct features. The construction industry plays a significant role in public development. In Ghana, it contributes approximately 8.2% to the gross domestic product (GDP) (Owusu-Manu and Badu, 2011). There is an enormous subculture of underperformance as majority of the foremost undertaking in Ghana are awarded to very few giant companies which are mostly overseas Ghanaian construction firms. In his research, he identified problems like the inability to secure adequate working capital, inadequate project management skills and poor workmanship as significantly affecting the progress of the Ghanaian construction industry. Badu and Owusu-Manu (2012) explained that, construction firms in Ghana find it difficult in accessing financing for projects, therefore, they normally opt for debt financing which usually is accompanied by high interest rates. These problems facing the Ghanaian construction industry affects the performance of the industry. However, the construction industry in Ghana can draw beneficial training from the experiences of other international locations (Ofori et al., 2012). Benchmarking against countries with better developed industry constructions will grant instruction on the way ahead in the struggle to acquire industry-wide organizational and project enhancements in the Ghanaian development sector.

2.3 PROJECT SUCCESS VERSUS VALUE FOR MONEY CONCEPT

Project success and value for money are two distinct concept and achieving value for money may not necessarily mean the project was successful and vice versa.

Project success is a very complex concept to describe. Shojaie et al. (2016), indicated that, a project is considered successful if the project management is a success and the project product is a success. In the case of project management, a project may be deemed successful if it completed within time limits, within a given budget and meets the satisfaction of the customer (Bodicha, 2015). Similarly, there are various parameters based on which people consider project product successful. Projects may involve numerous stakeholders and thus, the success

of the project depends on the perception of the stakeholders (Ramos and Mota, 2016). For instance, a project may be considered successful by the project team but not the client. This may be as a result of project delays and cost overruns. This gives an indication that project stakeholders (organizations and individuals) may adopt different methods for measuring the success of a project. For instance, Ellis (2015) indicated that, some organizations measure project success by taking customer satisfaction surveys. Harwardt (2016), also indicated that some organizations adopt the use of senior management or project manager's feedback. Some conducts team project surveys while others measure success based on financial terms (Parisi and Rossi, 2015). Regardless of the technique adopted in measuring the success of a project, stakeholders consider the following factors in determining the success of a project. They are, cost, time, quality, health and safety, scope and relationship with other stakeholders. Project cost is the most used success criteria in the construction industry due to the ease in its assessment. It describes the amount expended in the execution of a project from inception to completion. Time is described as the period allowed for the execution of a project and quality is achieved when the legal, aesthetic and functional requirements of a project of the customers/client is achieved (Tang et al., 2005).

On the other hand, VFM can be described as the optimum combination of life cycle cost and quality (fitness for purpose). VFM is extensively used in the commercial and industrial fields as a critical mechanism for ascertaining the cost and benefits of available options for selection for providing public projects (Baker et al., 2013; Barr and Christie, 2014). According to DFID (2011), the concept of VFM should never be equated to lowest cost. Thus, the concept of VFM is not a mere selection of a bidder with lowest price, however, having an understanding of the implications in terms of cost of the option selected. Also, VFM is a concept in which there is a comparison between potential outcomes and different procurement options. Decorla-souza (2015) indicated that, the processes of VFM should be done at the early stages of a project

ideally at the feasibility study stage. Akintoye et al. (2003) opined that, the assessment of VFM should be done whiles considering various aspects of the project like service quality and risk transfer. Furthermore, the success of a project can be measured on the capability of the client to adopt a sustainable approach of VFM throughout the lifecycle of a project. However, the concept of project success considers a wide range of factors in its definition and hence the concept of VFM cannot entirely encompass the project. The most efficient form of VFM is the combination of cost, quality and sustainability to meet the requirements of the customer. The concept of cost in VFM refers to life cycle cost whiles quality refers to meeting the specifications sufficient to meet the requirements of the costumer and sustainability refers to economic, social and environmental benefits.

Best value is another value concept mostly used in place of VFM. Similar to VFM, best value aids an organization to increase performance. Also, best value aids in the delivery of a project at the lowest cost as well as achieving continuous improvement. Best value has four (4) main components. These are effectiveness, efficiency, economy and continual improvement.

The concept of VFM is not limited to only traditional methods of project delivery but other forms of projects like Public-Private Partnerships and relational contracting. According to Burger and Hawkesworth (2011), when public entities are choosing between Public-Private Partnerships and traditional contract methods for any project, there must be substantial consideration of the method that delivers the best VFM.

2.4 THE CONCEPT OF A SUCCESSFUL CONSTRUCTION PROJECT

2.4.1 Introduction

Project success can be defined as the ability to complete a project within cost time and quality limits. The cost, time and quality trio also known as the iron triangle is a suitable definition of project success (Westerveld, 2003). A team in charge of a project may be mistakenly applauded

or held liable to the outcome of a project. Due to this misconception, de Wit (1988) came out with a clear difference between project success and project management success. Munns and Bjeirmi (1996) suggested that, construction project management goals should be separated from the project objective. This is due to the fact that, they could no longer bare the cost to confuse strict adherence to the most common objective of construction project management (cost, time and quality) with project success.

According to Wateridge, (1998) benchmarks for success of a construction project is very broad and it incorporates stakeholder's performance and evaluates their contribution and coming to terms with their expectations. A is a person or group, within or outside the construction project, who have a share and can have impact on the performance of the construction project. Construction projects may have different stakeholders and like the client, consultant, contractor, the community etc. A project can be considered successful if the various stakeholders are satisfied with the outcome of the project (Atkinson, *et al.*, 1997).

In 1994, a very popular contractor in Kuala Lumpur constructed 1,000,000m^2 shopping complex situated in an up-market suburb of Petaling Jaya. A Malaysian-Japanese Consortium was awarded the contract for RM 100 million and a completion period of 12months. It took the contractor 15 months to complete the project and at a cost of RM146 million. Extension-of-time claim was issued for 3 months and variation orders amounted to RM46 million. Meanwhile, since opening, the complex has been very popular among tenants and shoppers.

From the perspectives of the client and contractor, the project was a failure. Meanwhile, from the perspective of the users and stakeholders, the whole project was a big success with is different from the perspective of the client and contractor. This scenario presented by Lim and Mohammed (1999) shows that, the client, contractor, users, the general public will have different criteria of project success.

The two major areas that research on project success touches are project success criteria and examination of critical success factors. In rare occasions, the two concepts are combined and they act as a connector between critical success factors and success criteria. Also it is very important to clearly distinguish between the two project success concepts. This is because it is very common to read articles that does not clearly define the distinction between them (Lim & Mohamed, 1999).

Project success criteria basically deals with a number of parameters used to judge a successful project while critical success factors talk about the situation that increases the success rate of a project. A classic and more measurable way to deal with the issue of determination of a successful project is to come out with an unambiguous and easy to use formula that the stakeholders to the project can see reasonable and can agree to it (Dvir, Raz and Shenhar 2003). Therefore, the cost, quality, time triangle was adopted as the way of accessing project success. Many researchers criticized this judgement as they saw it to have limited scope (Hazebroucq and Badot, 1996). Therefore, client satisfaction was added as another criterion for project success. Further research conducted by (Lim and Mohammed 1999) introduced various factors to project success therefore moving from triangle to hexagon.

They added more factors like strategic objectives realization in the client's organization, end-user satisfaction and stakeholder satisfaction which broaden the scope of project success. Murphy, Baker and Fisher (1974) come out with a proposal to replace the cost, quality, time triangle with a measure of perceived success. Perceived success mainly comprised of construction professionals giving their experience. These were clearly distinct from scientific empiricism (Hazebroucq, 1993). A scientific criterion for success was postulated by Pinto and Slevin (1987). They consisted of ten parameters for measuring success and included; the project mission, support from top management, project schedules, client consultation, troubleshooting and communication etc. These factors are considered suitable by the project

team. The same author then added more to the list which included; project team leader characteristics, politics and power, environmental events and urgency. Project success criteria will also include project life cycle. Therefore, knowing the criteria of project success will mean that the parameters that need to met for a project to be deemed successful will be known before the project even commences.

According to various studies conducted by practitioners, the project mission and the client consultation would be the most important success parameters at the design phase of a project while at the project planning stage, the project success parameters which are most significant may include support from top management, client acceptance and urgency. At the project execution stage, the key parameters are mission of the project, project team leader characteristics, troubleshooting, project schedules/plan, technical tasks, and client consultation. At closing stage of a project, the parameters for project success are technical tasks, project mission and client consultation.

Project success factors and success criteria must be considered in other to achieve high productivity of construction project. However, a small number of studies talks about both success criteria and success factors and a fewer number of studies have sought to identify the significant links between critical success factors and success criteria. It is very important to determine the project success criteria and choose critical success factors of a project at project startup and also ensure that all stakeholders are in tune with your definition (Wateridge 1998). Studies regarding critical success factors and success criteria have shown that, it is virtually impossible to come out with an exhaustive list which meet the needs of all projects. Thus, from project to project, there is a huge difference between success criteria and critical success factors due to construction project characteristics like project scope, uniqueness and complexity (Wateridge, 1998). However, a standard set of project success criteria and a standard grouping

of critical success factors would seem more feasible and is gaining more attention (Lim and Mohammed, 1999; Westerveld, 2003).

2.5 FACTORS THAT AFFECT VALUE FOR MONEY

This section discusses the various factors that affects the achievement of VFM. Baker et al. (2013) opined that, in measuring VFM for any given project, accountability measures and client's perception need to be considered as it encompasses the whole idea of VFM.

2.5.1 Risk allocation

Risk are inherent in any project or organizational activity and tries to alter the initial established objective. Hence, risks can affect the achievement of VFM goal. Risk in projects have different extent of impact and probability of occurrence. In construction, risk can be categorized into procedural risks, design risks, construction risks, financing risks, maintenance risks, operating risks, revenue risks among others. However, it is significant to ensure that, risks are allocated to the parties with the best capabilities and expertise to manage and minimize the impact of the risk over specific period of time (HM Treasury, 2006).

2.5.2 Nature of contracts

The nature and terms of the contract may enhance the achievement of VFM. The terms of the contract must cater for foreseeable eventualities. Morallos and Adjo (2008), indicated that, the nature of a contract is a key factor that drives VFM in a project. Hence, it is significant to include relevant terms and conditions as well as key performance standards, remedies, monitoring procedures and notice provision in a contract. Also, the terms of the contract must be transparent and effectively negotiated. The terms of the contract are an imperative determinant for the achievement of VFM in construction projects (HM Treasury, 2006).

2.5.3 Level of competition

Morallos and Adjo (2008), had the opinion that, competition is essential for ensuring VFM. Therefore, it is essential to consider and compare competing methods and partners and to select the option that offers the optimal mix of costs and benefits. Clients and other decision makers must encourage the culture of competition of ideas and alternative solutions when making project investment decisions. Furthermore, clients and other decision makers must encourage and use competitive selection processes when selecting contractors.

2.5.4 Detailed specifications

In other to achieve VFM in a project, the significance of detailed specifications cannot be overemphasized. A detailed specification may consider all design components, materials, workmanship standards, daywork details, rates among others. Olatunji et al. (2017) opined that, a detailed specification makes it easy for the estimator to carry out the assessment of the cost of the project. This leads to the attainment of an accurate cost estimate and consequently, the clients derive value for his investment. Undetailed specifications may lead to disputes between consultants and most often causes the estimator to rely of experience in providing estimates. These estimates are mostly inaccurate resulting in claims by contractor during project execution. This will consequently lead to cost overruns and a reduction in value derivable by the client from the project. Therefore, Morallos and Adjo (2008), elaborated on the significance of detailed specifications in the attainment of VFM.

A World Bank (2016) procurement guidance on VFM grouped specifications into two (2) broad categories. They were conformance and performance categories. The conformance category is based on specifications that describes the technical requirements of the design, method of production, construction and delivery whiles the performance category describes the outputs required in terms of functional performance requirements. In other to achieve VFM, World Bank (2016), opined that, a tradeoff between the cost and time to create the specification; who

will bear the risk due to poor specification, ability to create innovations and the complexity of the evaluation.

2.5.5 Sufficient skills and expertise

The concept VFM comprise of the optimum combination of life cycle cost and quality (fitness for purpose). These major components of VFM requires that, the construction firm has enough expertise to carry out the project whiles considering the life cycle cost of the project. Hence Morallos and Adjo (2008), opined that, in other to effectively achieve VFM organizations must be highly experience to meet the requirements needed for VFM.

2.5.6 Accurate assessment of project cost

It is the duty of the estimator to fully assess the cost of the project. The assessment of the cost of a project is done by assigning unit rates to all the items in the BOQ. The unit rates consist of material cost, labor cost, plant cost and other variable cost that are needed to adequately execute the works. It is very significant to ensure that, no work item is mistakenly excluded from the BOQ as it can lead to subsequent claims and disputes. Hence, Goldbach and Claire (2012) postulated that, in the process of cost estimation, all costs and risks factors should be considered and must also be realistic. Furthermore, due to life cycle cost component of VFM, it is imperative to accurately account for maintenance cost of the product. This consideration must be done in the design phase of a project.

2.5.7 Innovation in project development

World Bank (2016) acknowledged the significance of innovation in the achievement of VFM in the provision of goods and services. It must be noted that, introducing innovative ideas on a project will significantly increase the value to the client hence earning a greater measure on the value on investment. However, DFID (2011) opined that, it is crucial to identify more innovative ways in the execution of project as it aids in achieving greater VFM.

2.6 VALUE MANAGEMENT AS A TOOL FOR ACHIEVING VFM

Value management can be described as a proactive way of project management that aids in the improvement of the functional value of a project.

Olanrewaju (2013) opined that, VM aids in the reduction of project failure through the reduction of cost, schedules, improvement in quality and safety. Even though the concept of lice cycle costing is very helpful, VM is introduced at the early phase of the project. The principles of VM are initiated prior to making decision to execute or not execute a project. Also, the concept of VFM is initiated to aid in making decision on the kind of project that can provide the client maximum return on investment made (Kelly and Male, 2004). Ahuja and Walsh (1983), opined that, VFM can be introduced at any stage of a project, however, it is more beneficial if it is introduced at the pre-contract stage when full designs have not been committed.
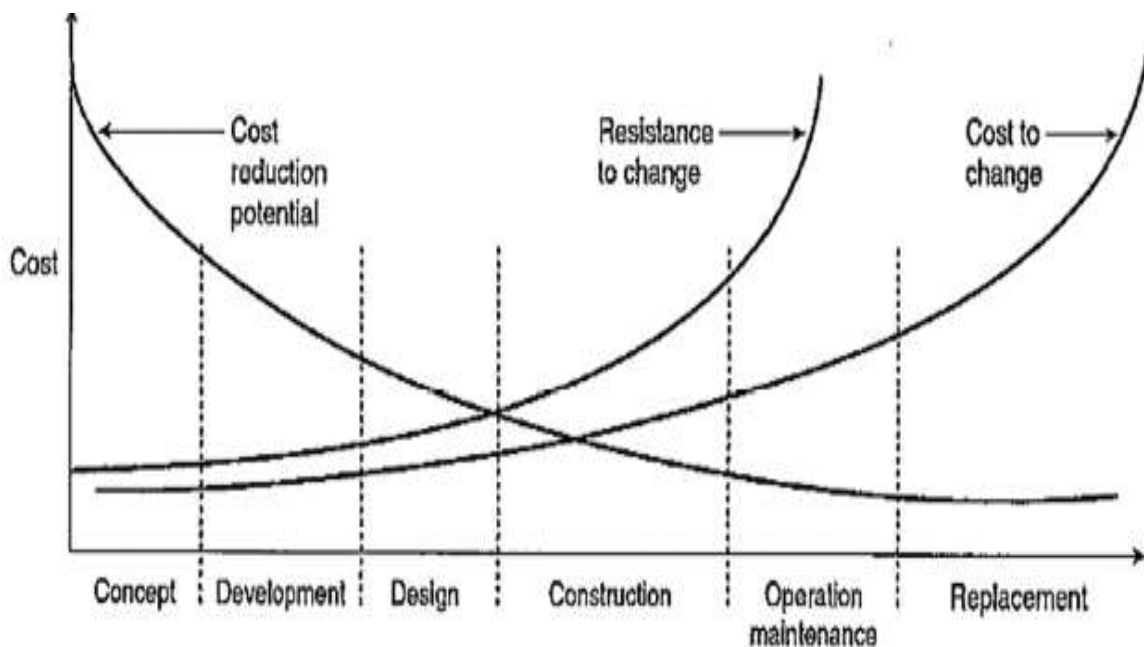
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Figure 2.1: Opportunities associated with Value Management (VM)

Source: Ellis et al. (2004).

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2.7 CHALLENGES IN ACHIEVING VALUE FOR MONEY

Regan (2014) indicated numerous significances of the assessment of VFM to government and other stakeholders in the construction industry. However, there are some challenges that hinders the achievement of the requisite VFM. They are discussed as follows.

Furthermore, there is a lack of awareness of some VFM tools. Olatunji et al. (2017) indicated that, some professionals have a negative perception of the application VFM tools. This may be due to the lack of knowledge and awareness of processes OF VFM. Also, some clients may not have adequate knowledge of the VFM and hence may not be able to demand their utilization for their projects.

The VFM assessment is best carried out at the scheme design stage, however, in a situation whereby the client is still unsure of the type of project, location of such project. For instance, if the client is undecisive on the final usage of a facility as to either use it as a block office or mini-halls, the assessment of VFM can be very inaccurate. This is because, VFM regards the life cycle cost and usage of the facility. Table 2.1 provides a summary VFM challenges.

2.6 STRATEGIES TO IMPROVE THE ACHIEVEMENT OF VALUE FOR MONEY

The achievement of VFM is important for all stakeholders in the construction industry especially in the public sector. However, the nature of the construction industry creates numerous barriers that hinders the effective implementation of VFM.

In a study conducted by Olatunji et al. (2017) on the achievement of VFM in construction projects, they postulated nine (9) strategies to improve the achievement of VFM. They included;

- Improving clients' expertise and knowledge on VFM practices;
- Further standardization of project risks assessment and management;
- Provision of standard and procedure for VFM evaluation and assessment;

- Seek ways to incorporate VFM practices effectively;

- Assess current performance to identify areas of weaknesses;

- Introduce a guide for VFM practices and the utilization of its tools;

- Promote clients' interest on VFM practices and its tools;

- Prove VFM tools capability as a mechanism to deliver better sustainable value; and.

- Formulate strategies for effective inclusion of VFM as prequalification criteria in selecting project team members such as contractors and consultants to the project.

Table 2.1: Summary of the challenges in VFM

SN	CHALLENGES	REFERENCES
1	Unclear client objectives	Olatunji et al. (2017); Morallos (2008).
2	Lack of knowledge and awareness of VFM tools	Olatunji et al. (2017); Morallos (2008).
3	No standard approach to VFM	Olatunji et al. (2017); Abidin and Pasquire, 2005
4	Low and discontinuous demand	Cox and Townsend (1998)
5	Frequent changes in specifications	Cox and Townsend (1998)
6	Inappropriate selection criteria	Olatunji et al. (2017)
7	Poor risk allocation	Cox and Townsend (1998); Goldbach and Claire (2012
8	Fragmented industry structure	Cox and Townsend (1998)
9	Inefficient construction methods	Cox and Townsend (1998)
10	Adversarial culture	Cox and Townsend (1998)

Source: Author's construct, (2019).

Olanrewaju (2013), indicated, the practice of Value Management (VM) can aid in the achievement of VFM. However, there are misconceptions as to whether LCC or VM is more involving, proactive and can create and sustain the best VFM. Furthermore, the implementation

of Building Information Modelling (BIM) has been recognized as a significant way of ensuring VFM. BIM when effectively and rigorously applied to a construction process facilitate the ease of dissemination of information, tracking of supplies, ease of estimating and building up cost rate, concept visualization among other. This, when put together, allows the needed VFM and return on investment for the client. Similarly, the concept of lean construction when applied effectively can aid in the achievement of VFM. The principles of lean as described by Womack et al. (1990) must be applied by defining the client's requirements and identifying the value-stream and eliminating the activity that does not add value to the process.

2.6 SUMMARY OF CHAPTER

The chapter begun with a review on the nature of public sector construction project. From the review, it was realized that, the public sector construction contributes significantly to national development however, it is faced with numerous challenges that reduces its potential. Subsequently, a comparative review was conducted on project success and VFM. It was realized that, the overall project success is to a very large extent determined by the ability of the client to adopt and sustain the VFM regime throughout the project life. However, the concept of project success considers a wide range of factors in its definition and hence the concept of VFM cannot entirely encompass the project. Also, a review of the factors that affect VFM was conducted where seven (7) factors were identified. From there the challenges in achieving VFM was were reviewed and nine (9) variables were identified. Finally, the review ended with the strategies to improve the achievement of VFM where eleven (11) variables were identified.

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This section concentrates on the discussion of the methods and strategies adopted for the study. The research methodology indicates the procedures needed to put together the required knowledge for the achievement of the research aim and objectives. This chapter includes sections that discusses the research design, research strategy, research approach, research method, source of data, population, sample size and sampling technique, questionnaire development and administration and data analysis technique.

3.2 RESEARCH DESIGN

The research design describes the plan that is established to aid in the achievement of the research objectives (Spencer-Oatey, 1993). There are two basic types of research design. They are the descriptive research design and the explanatory research design. The two research designs are discussed in subsequent sections

3.2.1 Descriptive research design

According to De-Vaus (2001), the descriptive research design gives an account on what is going on. That is, the descriptive research design gives an accurate description of the features of a population. Hence, the descriptive research design gives accurate accounts of characteristics, situations, so as to discover new meanings and a description of what exists, determination of frequencies and categorizing of information.

3.2.2 Explanatory research design

The explanatory research design gives an account of why it is going on (De-Vaus, 2001). In the description, there is the establishment of cause and effect relationships. Hence the explanatory research design depends on the notion that, one phenomenon is affected by another

phenomenon. Zikmund et al. (2012) opined that, explanatory research can also be referred to as causal research since it is executed to ascertain the extent of relationship between concepts.

3.2.3 Research design selected

Based on the description above, the explanatory research design was deemed most appropriate. The aim of the study seeks to ascertain the effect of VFM on the performance of projects. Since the explanatory research design establishes causality, the explanatory research design was deemed most appropriate.

3.3 RESEARCH STRATEGY

The research strategy is a significant consideration for the selection of research methods. There are numerous strategies available for research studies. They are discussed as follows;

3.3.1 Action research

Bradbury-Huang (2010), described action research as a type of research strategy that involves researchers conducting studies with practitioners. Thus, the action research strategy is more suitable for studies that are executed within the course of a work to aid in the improvement of processes. Sachs' (2003), opined that, the action research strategy is used most often in an educational setup.

3.3.2 Ethnographic research

In ethnographic research, individuals or groups are studied in their own environment using observations or face-to-face interviews. According to Smith (1979), there are huge similarities between ethnographic research and case study research because, they both requires an in-depth description of an individual or group. The main difference between ethnographic and case study research is that, case study researches are more explanatory.

3.3.3 Survey research

According to Isaac and Micheal (1997), survey research is used to describe what exists, in what quantity and in what context. It also answers questions that have been raised, solve problems that have been observed and assess needs. Kraemer (1991) described three distinguishing features of survey research. First, survey research describes specific aspects of a population. Secondly, the data needed for the research are collected from people hence making it subjective. Lastly, survey research uses a selected portion of the population from which the outcome can be generalized for the population.

3.3.4 Research strategy adopted

The survey research method was adopted for this study as the three (3) features of survey research as identified by Kraemer (1991), are met by this study. This study involved the use of a sample from a population to assemble data and make inferences to generalize the outcome and thus, the survey research is most appropriate.

3.4 RESEARCH APPROACH

There are two (2) fundamental research approaches in research. These are the deductive and inductive research approach. The deductive research approach is aimed at testing theories whiles the indictive approach is focused on the formulation of new theory from data. The deductive research approach basically starts with a hypothesis; however, the inductive research approach utilizes research questions to narrow the scope of the study. Furthermore, deductive research focuses on causality. However, inductive research approach generally aims at exploring a concept.

Based on the descriptions above, it can be realized that, deductive research is mostly associated with quantitative studies whilst inductive research focus on qualitative studies. However, there are no set ground rules as some qualitative studies have deductive orientation. This study

utilized the deductive research approach as the study aimed at assessing the effect of the concept of VFM on project performance. This aid in the establishment of relationship between two concepts makes deductive approach the most suitable.

3.5 RESEARCH METHOD

There are basically three (3) forms of research method. They are quantitative research, qualitative research and the mixed research method. These research methods are subsequently discussed below.

3.5.1 Quantitative research

According to Creswell (2003), the quantitative research method uses an empiricist paradigm as the research itself is independent of the researcher. Furthermore, Leedy and Ormod (2001), opined that, the quantitative research is used for building on existing theories. It is very specific in its surveying and experimentation and does not involve any manipulations from the researcher. Hence the quantitative research is more objective and used mostly in measuring reality.

3.5.2 Qualitative research

The qualitative research method is normally executed in natural environments which allows the researcher to conduct a detailed study from the viewpoint of the respondent (Creswell, 1994). Carrie (2007), indicated that, the qualitative research is utilized for discoveries. Data collected for qualitative studies are mostly described and interpreted.

3.5.3 Mixed research

The mixed research method combines method of collecting and analysing data from the quantitative and qualitative method in a single study (Creswell, 2003; Tashakkori and Teddlie, 2003). The mixed method is regarded as an extension rather than a replacement for the quantitative and qualitative research approaches as they will continue to be useful in the

research world (Johnson and Onwuegbuzie, 2004). Thus, the mixed approach draws from the strengths of the two approaches and limits it weaknesses.

3.5.4 Research method adopted

The aim of the study is to assess the effect of VFM implementation on project performance. With this aim the quantitative research method was deemed most suitable as the outcome of the study is built on objective responses given by the respondents.

3.7 SOURCE OF DATA

There are two (2) major forms of data sources for research studies. These are the primary source and the secondary source of data. The primary source of data is gathered for a particular research problem. At the onset of a study, primary data are not available hence must be gathered by the researcher. Hence, the collection of primary data denotes that, new data is added to the general research community. When primary data are collected and reused, it then becomes secondary data. In most cases, secondary data are used for reanalysis, teaching and learning.

3.7 POPULATION, SAMPLE SIZE AND SAMPLING TECHNIQUE

The population of the study describes the unit from which the sample was chosen (Bryman, 2004). The population for this study were Project Managers in Ghana. From the Project Management Institute (PMI, 2019), there are four hundred and seventy-eight (478) registered project managers in Ghana. The goal of sampling size is to obtain a sufficient sample that is representative of the population of interest(Ponto 2015).The sample used are a subset of the target population. The target population included project managers. Using the Yamane formula, the sample size attained was 83. Mathematically, the formula is given below:

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{478}{1+478(0.10)^2} = 83.$$

Where,

n = the sample size

N= the estimated proportion of characteristics in the population

e = the level of precision desired = 0.10

The purposive sampling technique was used in reaching the respondents. The purposive sampling technique was used because, only project managers who have been involved in construction were contacted for data. Hence, the purposive non-probability sampling technique was seen as the most appropriate technique to use.

3.8 QUESTIONNIARE DEVELOPMENT AND ADMINISTRATION

Before data collection, the researcher needs to plan and identify the data collection instruments, how to analyse the collected data, identify the population for the study, and sampling size. Inappropriate data collection instrument can lead to the collection of inaccurate data which can then have a negative impact on the results of a study and ultimately lead to invalid results. Primary data was collected using structured questionnaires as the main data collection instruments.

The primary data enabled the researcher obtained first-hand information which was obtained from a well – structured questionnaire. The questionnaires comprised of closed – ended questions that allowed the respondent to select from various options given. The respective respondents were administered with the questionnaires to seek their opinion on the subject matter.

The questionnaire is divided into four (4) sections. The first section identified the general organizational and background information of the respondents. With the background of the respondents, the respondents were asked to indicate their highest level of education, their number of years of experience and their level of knowledge on VFM. The second section ask questions relating to factors that affect VFM. With this, the respondents were asked to indicate the extent of significance of the factors that affect VFM using a five-point Likert scale of 1 – Not significant, 2 – Slightly significant, 3 – Neutral,4 – Significant, 5 – Very significant. The third section wanted to ascertain the effect of VFM on project performance. Hence the respondents were asked to rate the impact of VFM on the various performance measurement criteria using a five-point Likert scale of 1 = No impact; 2 = Slight impact; 3 = Moderate impact; 4 = significant impact; 5 = Very significant impact. The final section concentrated on the challenges associated with VFM. The respondents were asked to rate the challenges associated with VFM using a five-point Likert scale of 1 = Not severe   2 = Slightly severe   3 = Moderately severe 4 = severe   5 = Very severe.

Using the purposive sampling technique, a total of 83 questionnaires were distributed however, 59 were retrieved for the analysis representing a response rate of 71.084%.

3.9 DATA ANALYSIS TECHNIQUE

The study employed quantitative approaches for analysis in order to have a depth of knowledge on variables identified. As such the data from questionnaires administered were gathered, were well-coded, counted and categorized in various frequencies and percentages to give a clear visual presentation of data. Hence charts and figures were used to present the results with regards to the demographic data.

The study used the mean score ranking to analyze the objective one and three of the study. The mean score ranking was used to assess the significance of the various demographical factors and project performance indicators, using a five-point Likert's-scale ranging from 1 (not

significant) to 5 (very significant). The mean values were given by the SPSS software in conjunction with standard deviation values. In ascertaining the significance of the variables, those with high mean values were deemed most significant. In a rare case where two (2) mean values were equal, the standard deviation value was used as the separating agents. Standard deviation values depict the level of variability among variables. Thus, standard deviations above 1 depicted higher variability whiles below 1 shows lower variability.

The multiple regression technique was used to analyze the objective two of the study. Regression analysis is used to study the relationship between two or more factors/variables. Also, the regression analysis method can be adopted to observe changes in the dependent variable with changes in the independent variables. There are two (2) fundamental forms of regression. These are simple linear regression and multiple linear regression. The multiple linear regression was adopted for this study as linear regression is used to study the relationship between one independent and one dependent variable. However, since this study as more than one independent variables, the multiple regression analysis was used as its study the relationship between one dependent variable and multiple independent variables.

3.7 RELIABILITY AND VALIDITY

To ensure validity and reliability of results, the questionnaires was first pre-tested. Administrators of the questionnaire as well as respondents will be also well-educated on the relevance of the exercise before they were administered in order to avoid biasness in data collected. Also, questions which were asked ensured anonymity in order to enhance confidentiality of information. Misleading questions was also avoided. Again, follow – ups were done continuously to ensure clarity of data from the field study. Aside all these, the questionnaires were coded accurately using the Statistical Package for Social Sciences (SPSS). The quantitative data was also tested for reliability and validity using a mathematical approach

called the Cronbach's Alpha. Studies have shown acceptable values of Cronbach to range between 0.700 to 0.950 (DeVellis, 2003).

3.8 ETHICS

Participants were voluntarily allowed to participate in the survey. Again, the consent of the respondents will be sought prior to the administration of the survey instrument. Participants of the survey will be assured of anonymity and confidentiality with regard to the provided information on the questionnaire. There will be no issues of conflict of interest.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

This chapter analyse and discuss data collected from the respondents. The respondents for this study were project managers in Ghana. A total of 59 questionnaires were used in the analysis for this study. The analysis aided in making inferences about the objectives of the study which were to identify the significant factors that affects VFM in construction projects in Ghana, to assess the critical challenges in achieving VFM in construction projects in Ghana and to identify the significant strategies to improve the achievement of VFM in construction projects in Ghana. A review of literature was conducted on the set objectives and subsequently, a structured questionnaire was developed to aid in the collection of data. The questionnaire had four separate sections. The first section concentrated on the background of the respondents whiles the remaining sections concentrated on the three (3) objectives of the study. The background of the respondents was analysed using percentages and displayed using figures. The three (3) objectives were analysed with the aid of the mean score ranking in conjunction with standard deviations and multiple regression. The analysis aided in making inference on the most significant factor that affects VFM, the effect of VFM on project performance criteria and the most severe challenge of VFM implementation. The data were presented with tables. At the end of the analysis, a summary of the findings was discussed.

4.2 BACKGROUND OF RESPONDENTS

The background of the respondents is a crucial aspect of every data analysis. It helps in assessing the reliability of the responses given by the respondents based on their knowledge levels. With the background data, the respondents were asked to indicate their highest level of education, their practical years of experience and their level of know on VFM. A summary of

their responses is displayed in Figure 4.1, 4.2 and 4.3 subsequently discussed in subsequent sections.

4.2.1 Level of education

The first question on the background of the respondents wanted to ascertain the level of education the respondents. This is a significant background data as it gives an indication of the knowledge of the respondent accumulated through education. From Figure 4.1, majority of the respondents had BSC qualifications forming 56%. 39% of the respondents had postgraduate qualification, 3% indicated NVTI whiles 2% indicated HND. Generally, over 70% of the respondents had Bsc qualification and above which is very satisfactory for the study.
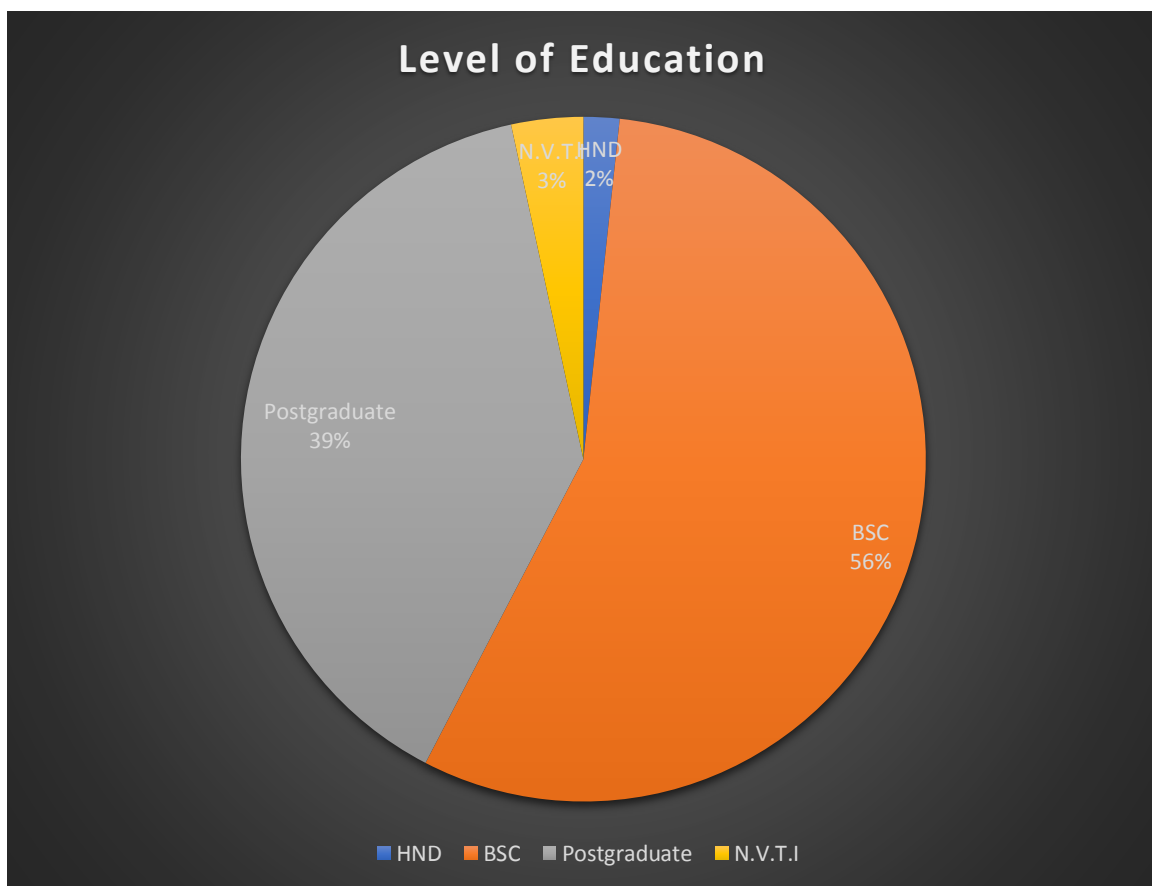
Figure 4.1: Level of education

Source: Field survey, (2019)

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4.2.2 Years of experience

The second question on the background of the respondents concentrated on the number of years of experience. This was a significant question to the researcher, as it aided in ascertaining the knowledge level of the respondent accumulated through practice. Based on the Figure 4.2, the majority of the respondents had 6 to 10 years of experience forming 42%. This was followed by 11-15 years forming 36%. 19% indicated 1-5years. Similarly, since over 60% of the respondents indicated have above 5 years of experience, the results were deemed satisfactory.
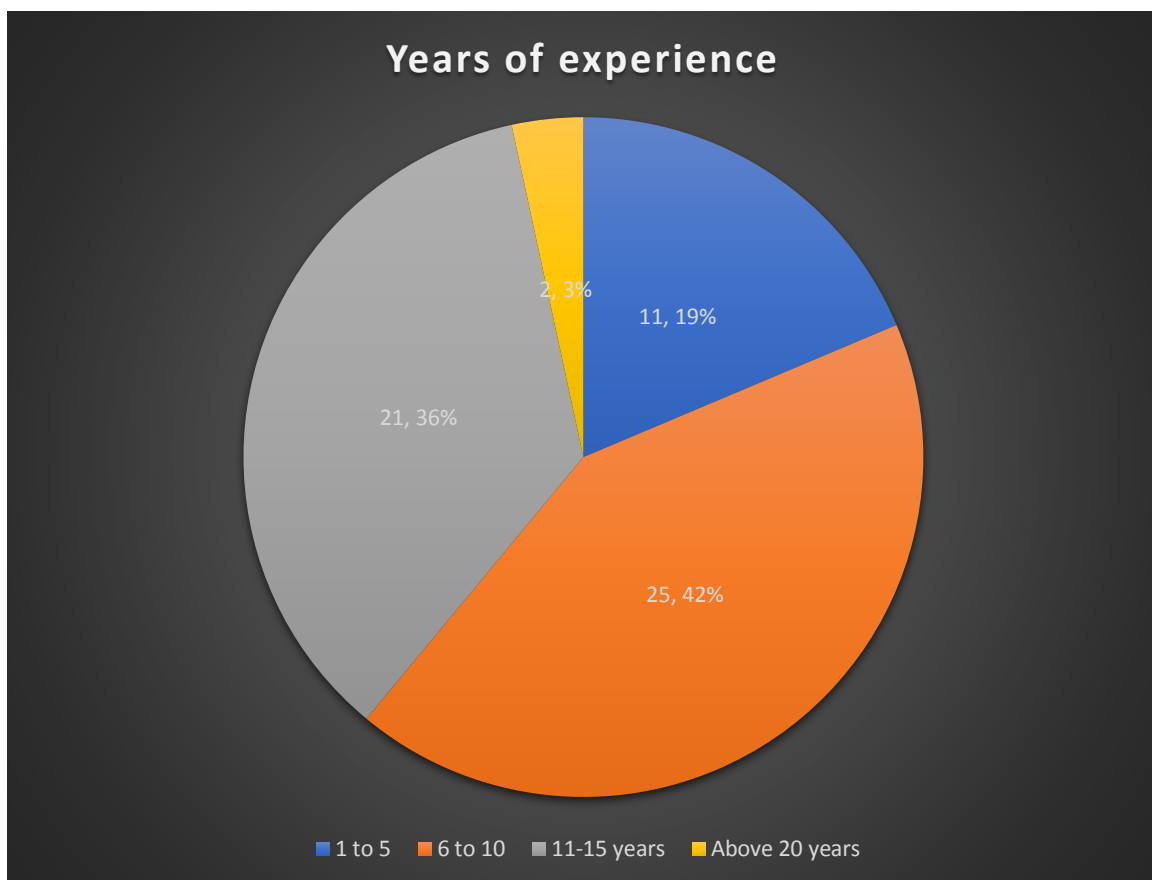
Figure 4.2: Years of experience

Source: Field survey, (2019)

4.2.3 Level of knowledge

The respondents were finally asked to indicated their level of knowledge on VFM implementation. In other to accurately answer questions on VFM implementation, it is crucial for the respondent to shown a significant amount of knowledge on VFM. The options provided were "No knowledge", "Medium" and "High". A summary of the response is shown in Figure 4.1. From response, none of the response, none of the respondents indicated no knowledge on the VFM phenomenon. 64% of the respondents indicated medium knowledge and 36% indicated high knowledge. The was deemed as a satisfactory result for the study.
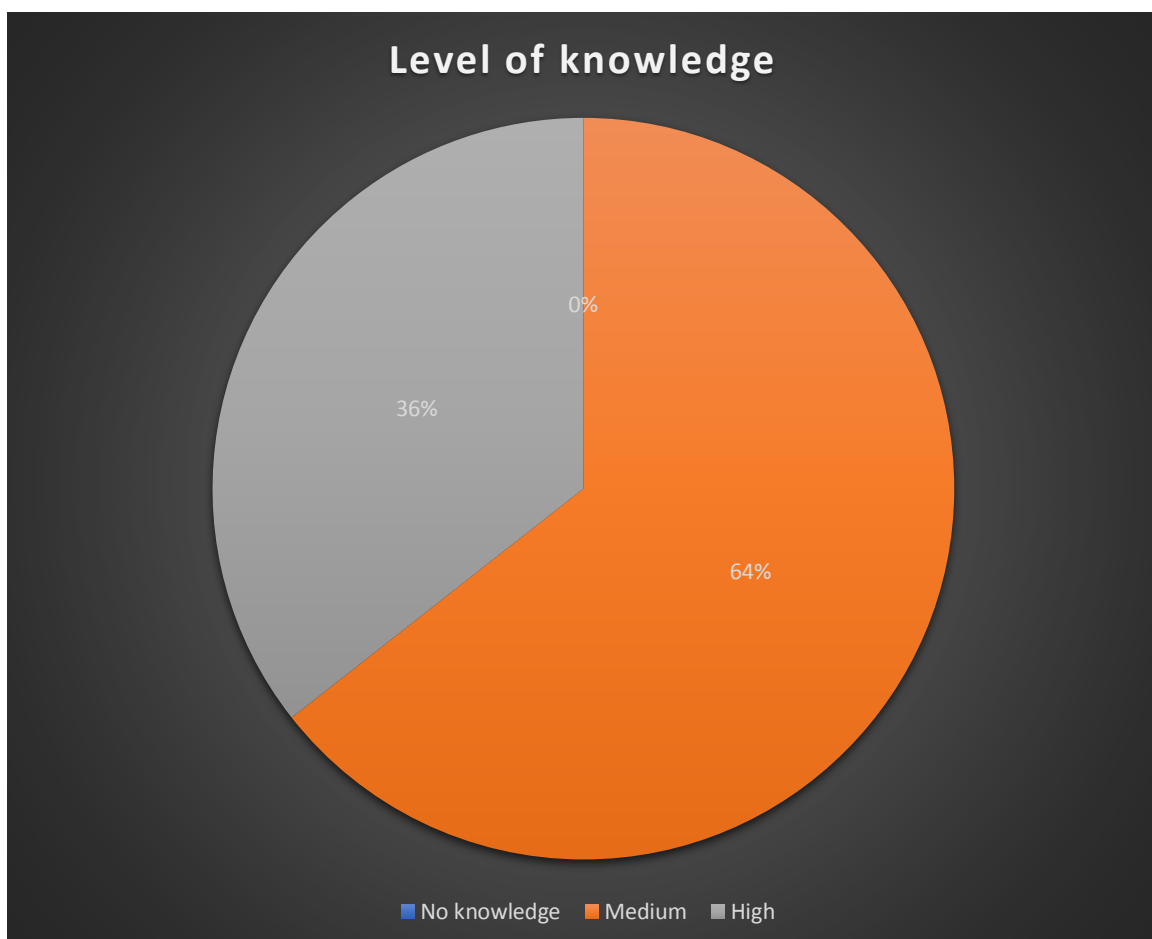
Figure 4.3: Level of knowledge

Source: Field survey, (2019)

4.3 RELIABILTY AND VALIDITY TEST

The reliability and validity test are a crucial part of every study. The questionnaires were coded accurately using the Statistical Package for Social Sciences (SPSS). The quantitative data was also tested for reliability and validity using a mathematical approach called the Cronbach's Alpha. Studies have shown acceptable values of Cronbach to range between 0.700 to 0.950 (DeVellis, 2003). For this study, the Cronbach Alpha value was 0.784. Based on the recommendations on acceptable values, the outcome was deemed satisfactory.

4.4 FACTORS THAT AFFECT VFM

This section analyzes and discuss data collected on the first objective of the study which was to identify the significant factors that affects VFM in construction projects in Ghana, From the review of literature it was realized that, the client's requirements may be catered for if the organization has achieved the expected results, taking into consideration time, money and human resource in the most effective, efficient, economic and equitable way. Seven (7) factors were identified which was used in the development of a structured questionnaire. The respondents were asked to rate the significance of the factors that affects VFM. The data collected was analyzed with mean score ranking in conjunction with standard deviation.

From the analysis, the first ranked factor was sufficient skills and expertise. In a study conducted by Morallos and Adjo (2008), they indicated that, in other to effectively achieve VFM, organizations must be highly experience to meet the requirements needed for VFM. Furthermore, the concept VFM comprise of the optimum combination of life cycle cost and quality (fitness for purpose). These major components of VFM requires that, the construction firm has enough expertise to carry out the project whiles considering the life cycle cost of the project.

Table: 4.1: Ranking of the factors that affect VFM

Factors that affect value for money	MEAN	STD. DEV	RANK
Sufficient skills and expertise	4.49	0.569	1ST
Level of competition	3.66	0.863	2ND
Accurate assessment of project cost	3.36	0.992	3RD
Detailed specifications	3.14	1.058	4TH
Nature of the contract	3.08	1.208	5TH
Risk allocation	2.69	1.118	6TH
Innovation in project development	2.53	1.419	7TH

Source: Field survey, (2019)

The second ranked factor was the level of competition. Morallos and Adjo (2008), had the opinion that, competition is essential for ensuring VFM. Therefore, it is essential to consider and compare competing methods and partners and to select the option that offers the optimal mix of costs and benefits. Clients and other decision makers must encourage the culture of competition of ideas and alternative solutions when making project investment decisions. Furthermore, clients and other decision makers must encourage and use competitive selection processes when selecting contractors.

The third ranked factor was accurate assessment of project cost. The Life Cycle Cost component of VFM is very crucial hence it is imperative to accurately account for the maintenance cost of the product. This consideration should be done in the design stage of a project by identifying the key components of the projects, objectively decide on an alternative design component, estimate the probably maintenance cost of each alternative design component and finally select the most cost-effective design component. The estimator on a

project should endeavor to accurately assess of the cost of a project, ensuring that the unit rate assigned to each item of the bill of quantities (BOQ) takes into consideration, the various activities, materials, labor, plants and other variable costs that are required to execute the task. Furthermore, the estimator should ensure that no item of work is erroneously excluded from the BOQ.

4.5 THE EFFECT OF VFM ON PROJECT PERFORMANCE

This section analyzes and discuss data collected on the second objective of the study which was assess the critical challenges in achieving VFM in construction projects in Ghana. From the review of literature, it was realized that, the most efficient form of VFM is the combination of cost, quality and sustainability to meet the requirements of the customer. Hence, VFM affects the performance of a project. With six (6) success criteria identified from literature, the respondents were asked to rate the impact of VFM on the project performance factors. The data collected was analyzed with the multiple regression analysis.

Table 4.2 Impact of VFM on project performance

The effect of VFM on project performance	Beta	t-value	Sig value
Cost performance	0.434	3.804	0.000
Schedule performance	0.092	0.846	0.402
Quality performance	0.208	1.992	0.050
Health and safety performance	(0.288)	(2.856)	0.006
Environmental performance	(0.085)	(0.838)	0.406
Project scope	0.071	0.662	0.511

Source: Field survey, (2019)

In making an inference on the level of impact, the Beta and t-vales were used. The higher the values, the more significant the impact. The sig-values denoted the statistical significance of the variables at 95% confidence level.

From the analysis, cost performance was affected most by VFM. This was followed by quality performance. There are various parameters based on which people consider project product successful. Projects may involve numerous stakeholders and thus, the success of the project depends on the perception of the stakeholders (Ramos and Mota, 2016). For instance, a project may be considered successful by the project team but not the client. This may be as a result of project delays and cost overruns. This gives an indication that project stakeholders (organizations and individuals) may adopt different methods for measuring the success of a project. Project cost is the most used success criteria in the construction industry due to the ease in its assessment. It describes the amount expended in the execution of a project from inception to completion and quality is achieved when the legal, aesthetic and functional requirements of a project of the customers/client is achieved (Tang et al., 2005). According to DFID (2011), the concept of VFM should never be equated to lowest cost. Thus, VFM is no the selection of goods and services based on the lowest bid but rather, having a better comprehension of the cost implications of the selected goods or services. Furthermore, VFM is a relative concept which needs a comparison between the potential and actual outcomes of alternative procurement options. According to Decorla-souza (2015), VFM analysis should be conducted at the early stages of the project when assessing the project delivery options. However, the achievement of VFM in a project should be assessed in conjunction with other project aspects such as service quality, risk transfer, and wider policy objectives (Akintoye et al., 2003).

4.6 CHALLENGES IN THE IMPLEMENTATION OF VFM

This section analyzes and discuss data collected on the third objective of the study which was to assess the critical challenges in achieving VFM in construction projects in Ghana. From the review of literature, it was realized that, there are numerous significances in the assessment of VFM to government and other stakeholders in the construction industry. However, there are some challenges that hinders the achievement of the requisite VFM. Ten (10) challenges were identified which was used in the development of a structured questionnaire. The respondents were asked to rate the severity of the factors that affects VFM. The data collected was analyzed with mean score ranking in conjunction with standard deviation.

Table 4.3: Challenges in the implementation of VFM

Challenges	MEAN	STD. DEV	RANK
Unclear client objectives	4.31	0.815	1ST
Poor risk allocation	4.14	0.937	2ND
Lack of knowledge and awareness of VFM tools	4.10	0.845	3RD
Inappropriate selection criteria	4.10	0.865	4TH
Low and discontinuous demand	4.03	0.964	5TH
Fragmented industry structure	3.98	0.938	6TH
Frequent changes in specifications	3.95	0.936	7TH
Inefficient construction methods	3.73	0.552	8TH
No standard approach to VFM	3.71	1.099	9TH
Adversarial culture	3.42	0.498	10TH

Source: Field survey, (2019)

From the analysis, the most severe challenge was unclear client objectives. This was followed by poor risk allocation and lack of knowledge and awareness of VFM tools. there is a lack of awareness of some VFM tools. Olatunji et al. (2017) indicated that, some professionals have a negative perception of the application VFM tools. This may be due to the lack of knowledge and awareness of processes OF VFM. Also, some clients may not have adequate knowledge of the VFM and hence may not be able to demand their utilization for their projects.

The VFM assessment is best carried out at the scheme design stage, however, in a situation whereby the client is still unsure of the type of project, location of such project or the use of the project after completion, it can affect the correct implementation of VFM assessment of such project. For example, an indecision by the client on whether to let out the building after completion as either block of offices or mini-halls (for meetings and workshops), may lead to inaccurate VFM assessment. This is due to the fact that VFM assessment considers the optimum balance between the whole life cycle cost and the quality delivered.

A study conducted by Olatunji et al. (2017) indicated that, unclear client objectives hinders the effective achievement of VFM. A similar finding was obtained in a study conducted by Morallos (2008).

4.7 SUMMARY OF CHAPTER

This chapter concentrated on the analysis and discussion of data collected from 59 respondents. The data analysis comprised of the background of the respondents, a reliability and validity analysis and evaluation of the three (3) objectives of the study. The background of the respondents was analyzed using percentages and displayed with figures. The validity and reliability analysis were done using the Cronbach's Alpha. The objective one and three were analyzed using mean score ranking whiles the objective two was analyzed using multiple regression. The background of the respondents and the reliability and validity test were deemed

suitable to conducted further analysis. With the objective one, the first ranked factor was sufficient skills and expertise followed by the level of competition and the accurate assessment of project cost. With the second objective, cost performance was affected most by VFM. This was followed by quality performance. With the third objective, the most severe challenge was unclear client objectives. This was followed by poor risk allocation and lack of knowledge and awareness of VFM tools. there is a lack of awareness of some VFM tools.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The concept of VFM is highly challenged in the construction sector due to the nature of the industry. Therefore, the study aimed at assessing the effect of the implementation of value for money on construction project performance in Ghana. The study had three (3) objectives which were to identify the significant factors that affects VFM in construction projects in Ghana, to assess the critical challenges in achieving VFM in construction projects in Ghana and to identify the significant strategies to improve the achievement of VFM in construction projects in Ghana. The study adopted the quantitative research method and survey strategy. A review of literature was conducted on the set objectives and subsequently, a structured questionnaire was developed to aid in the collection of data. A total of 59 questionnaires were used for the analysis. The data collected were analyzed using mean score ranking and multiple regression. The outcome of the results is summarized in the subsequent section. This is followed by conclusion then limitations to study. Furthermore, this chapter provides recommendations based on the findings and recommendations for further studies.

5.2 SUMMARY OF FINDINGS

Based on the background of study and research problem, three (3) objectives were established for the study. The objectives were achieved through and extensive literature review and a questionnaire survey.

For the objective one, the literature review identified seven (7) factors that affect VFM. They included risk allocation, nature of the contract, level of competition, detailed specifications, sufficient skills and expertise, accurate assessment of project cost and innovation in project development. With these factors, a questionnaire was developed in which the respondents were

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asked to rate the significance of the factors. The data collected were analyzed using mean score ranking. From the analysis, the first ranked factor was sufficient skills and expertise followed by the level of competition and the accurate assessment of project cost.

For the objective two, the literature review identified six (6) project performance factors that may be affected by VFM. They included cost performance, schedule performance, quality performance, health and safety performance, environmental performance and project scope. With these factors, a questionnaire was developed in which the respondents were asked to rate the impact of VFM on the factors. The data collected were analyzed using multiple regression. From the analysis cost performance was affected most by VFM. This was followed by quality performance.

For the objective three, the literature review identified ten (10) challenges of VFM. They included unclear client objectives, lack of knowledge and awareness of VFM tools, no standard approach to VFM, low and discontinuous demand, frequent changes in specifications, inappropriate selection criteria, poor risk allocation, fragmented industry structure, inefficient construction methods and adversarial culture. With these factors, a questionnaire was developed in which the respondents were asked to rate the significance of the factors. The data collected were analyzed using mean score ranking. From the analysis, the most severe challenge was unclear client objectives. This was followed by poor risk allocation and lack of knowledge and awareness of VFM tools.

5.3 CONCLUSION

The application of VFM principles and strategies can aid in the eradication of these problems facing the Ghanaian construction industry. Hence the study aimed at assessing the effect of the implementation of value for money on construction project performance in Ghana. With the achievement of the aim of the study, the study realized that, VFM is affected by sufficient skills

and expertise of the user. Thus, in other to effectively achieve VFM organizations must be highly experience to meet the requirements needed for VFM. The study also shown that, VFM affects the cost performance of a project the most. However, the concept of VFM should never be equated to lowest cost. The study also finds out that, the most severe challenge was unclear client. Other significant challenges included poor risk allocation and lack of knowledge and awareness of VFM tools. The construction industry faces challenges like low quality, low productivity, cost overrun, time overrun, construction waste and others. These challenges ultimately lead to clients' dissatisfaction and affects the growth of the economy. Hence the achievement of VFM is highly impossible in projects as VFM incorporates cost and quality. However, if strategic plans are adopted to curb these challenges a substantial amount of VFM can be achieved.

5.6 RECOMMEDATIONS

Based on the findings of the study, the following recommendations were made;

1. Project managers should continuously educate themselves so as to gain more expertise in VFM implementation

2. Project managers must put it more effort to adequately understand the requirements of the client before the commencement of a project so as to enhance the achievement of VFM.

3. Project managers should try as much as possible to increase the level of competition during contractor selection. This aids in increasing the probability of achieving VFM.

5.5 LIMITATIONS OF THE STUDY

The study used multiple regression in assessing the relationship between VFM and project performance. The multiple regression is limited in its application in the sense that, it can only accept one dependent variable. The implementation of VFM depends on more than one (1)

variable and hence, a more advanced tool can be applied to get more emphatic results. Hence the study was limited in terms of the tool used for the analysis.

5.6 FURTHER STUDIES

Further studies can be conducted to evaluate the impact of VFM on project performance using the Structural Equation Modelling (SEM).

REFERENCES

Abdulllah, F., Chiet, C. V., Anuar, K., and Shen, T.T. (2004). An overview on the growth and development of the Malaysian construction industry workshop on construction contract management 2004, University Technology Malaysia.

Abidin, N. Z., & Pasquire, C. L. (2005). Delivering sustainability through value management: Concept and performance overview. Engineering, Construction and Architectural Management, 12(2), 168–180. http://doi.org/10.1108/09699980510584502.

ACCA (2002), ACCA Members' Survey: Do PFI Schemes Provide Value for Money? Association of Chartered Certified Accountants. (Available at: www.acca.co.uk/news) accessed on 17.02.2004.

Ahuja H, N, & Walsh M, A. (1983), Construction Management and Engineering: Successful Methods in Cost Engineering. Canada: John Wiley & Son Inc.

Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E., & Asenova, D. (2003). Achieving best value in private finance initiative project procurement. Construction Management and Economics, 21(July), 461–470. http://doi.org/10.1080/0144619032000087285.

Amoah P., Ahadzie D. K., Danso A., (2011).The factors affecting construction performance in Ghana; The perspective of small-scale building contractors, *"surveyors journal",* pp.41-52.

Ansell, M., Holmes, M., Evans, R., Pasquire, C., & Price, A. (2009). Delivering Best Value in Highways Major Maintenance Schemes: Case Study. JOURNAL OF CONSTRUCTION ENGINEERING AND MANAGEMENT © ASCE, 135(4), 235 246. http://doi.org/10.1061/_ASCE_07339364_2009_135:4_235.

Antoine, D. du Lou. (2012). Value for Money evaluation in PPPs: difficulties and developments. KTH Architecture and the Built Environment. Retrieved from http://kth.divaportal.org/smash/get/diva2:527412/FULLTEXT01.pdf.

Atkinson, A.A., Waterhouse, J.H., and Wells, R.B. (1997). A stakeholder approach to strategic performance measurement. *Sloan Management Review; Cambridge*, **38** (3) pp 25-37.

Badu, E., Edwards, P. and Owusu-Manu, D. (2012), Trade credit and supply chain delivery in the Ghanaian construction industry: Analysis of vendor interactions with small to medium enterprises. "Journal of Engineering, Design and Technology", Vol. 10, No. 3, pp. 360–379. http://dx.doi.org/10.1108/17260531211274729.

Baker, J., Dross, E., Shah, V., & Polastro, R. (2013). Study: How to Define and Measure Value for Money in the Humanitarian Sector. Retrieved from http://reliefweb.int/sites/reliefweb.int/files/resources/Study-Howto-Define-and-Measure-Value-for-Money-in-the-Humanitarian-Sector-Final-Report_3659.pdf.

Barr, J., & Christie, A. (2014). Better Value for Money: An organising framework for management and measurement of VFM indicators. Retrieved from http://www.itad.com/wpcontent/uploads/2014/11/Itad-VFM-paper-v21.pdf.

Bidne, D., Kirby, A., Luvela, L. J., Shattuck, B., Standley, S., & Welker, S. (2012). The Value for Money Analysis: A Guide for More Effective PSC and PPP Evaluation. Retrieved from http://www.ncppp.org/wp-content/uploads/2013/03/PS-051012ValueForMoney-paper.pdf.

Bodicha, H. H. (2015). How to Measure the Effect of Project Risk Management Process on the Success of Construction Projects: A Critical Literature Review. The International Journal of Business & Management, 3(12), 99-112.

Bradbury-Huang, H., (2010), What is good action research? Why the resurgent interest? *Action Research*, *8*(1), pp.93-109.

Bryman A., (2004), *The Disneyization of society*. Sage.

Burger, P., & Hawkesworth, I. (2011). How To Attain Value for Money: Comparing PPP and Traditional Infrastructure Public Procurement. OECD Journal on Budgeting, 2011(1), 1–56. http://doi.org/10.1787/16812336.

Cameron, R.G. and A.B. Stone. 1995. Serving the public: A Guide for practitioners and students. Pretoria: Van Schaik.

Cantarelli, C.C., (2009). Cost overruns in Dutch transportation infrastructure projects. Bijdrageaan het Colloquium Vervoersplanologisch Speunverk (Contribution to the Transport Planning Research Colloquium). http://www.cvs-congres.nVcvspdfdocsIcvs09-156.pdf.

Carrie W., (2007), Research method, *"Journal of Business and Economic research"*, Vol 5, pp. 65-71.

Cox, A. & Townsend, M. (1998). Strategic Procurement in Construction: Towards better practice in the management of construction supply chains. Thomas Telford Publishing. ISBN- 07277 2600 5.

Creswell, J. (2003). Research design: Qualitative, quantitative and mixed methods approaches *(2nd ed.).* Thousand Oaks, CA: SAGE Publications

Creswell, J. W. (1994). Research design: Qualitative and quantitative approaches. Thousand Oaks, CA: Sage.

De Vaus A. D., (2001), Research Design in Social Research, pp.1-52.

de Wit, A. (1988), Measurement of project success, *"Project Management Journal",* Vol.3, pp. 164–170.

Decorla-souza, P. (2015). Value for Money Analysis: A Tool for Evaluation of Public-Private Partnerships. Retrieved from http://www.nga.org/files/live/sites/NGA/files/pdf/2015/1511CTPPPDeCorla Souza.pdf.

DeVellis R., (2003), Scale development: theory and applications: theory and application. Thousand Okas, CA: Sage;

DFID. (2011). DFID's Approach to Value for Money (VfM). Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67479/ DFID-approachvalue-money.pdf.

Dvir, D., Raz, T. and Shenhar, A. (2003). An empirical analysis of the relationship between project planning and project success. *"International Journal of Project Management",* Vol. 21, pp. 89–95.

Ellis R.C.T., Keel D.A., & Wood G.D. (2004). Value management practices of leading UK cost consultants. Construction Management and Economics.

Ellis, C. (2015). Why customer satisfaction is your most important project metric. Retrieved on 19 March 2015 from http://www.cio.com.au/article/570800/ why-customer-satisfaction-your-most-important project-metric.

Fox, W., E. Schwella and H. Wissink. 1991. *Public Management.* Kenwyn: Juta.

Ghana. Statistical Service, (2015), Pattern and trends of poverty in Ghana, 1991-2014. Ghana Statistical Service.

Goldbach & Claire (2012). Public Cost Comparator for Public-Private Partnerships. National Council for Private- Public Partnerships.

Harwardt, M. (2016). Criteria for successful it projects from management's perspective. Open Journal of Information Systems, 3(1), 29-54.

Hazebroucq, J. M. and Badot, O. (1996). Le management de project, Vol.1 pp.22-57.

HM Treasury. (2006). Value for Money Assessment Guidance. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252858/vfm_assessment guidance061006opt.pdf.

Institute of Value Management (2002), What is Value Management? IVM, available at www.ivm.org.uk/vm_whatis.htm.

Isaac, S., and Michael, W. B. (1997), Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences. (3rd Ed.). San Diego: Educational and Industrial Testing Services.

Johnson, R. B. and Onwuegbuzie, A. J. (2004), Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, (Vol. 7), pp. 14-26.

Kelly, J., & Male, S. (2004). Value management. In Kelly, J., Morledge, R., & Wilkinson, S. (Ed.), Best value in construction, United Kingdom: Blackwell Publishing, pp. 77-99.

Kraemer, K. L. (1991), Introduction. Paper presented at The Information Systems Research Challenge: Survey Research Methods.

Leedy, P. and Ormrod, J. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Merrill Prentice Hall. Thousand Oaks: SAGE Publications.

Lim, C. S. and Mohamed, M. Z. (1999), Criteria of project success: An explanatory re-examination. "*International Journal of Project Management*", Vol. 17, pp. 243–248.

Ling, F. Y. Y., Low, S. P., Wang, S. O. and Lim, H. H. (2009). "Key project management practices affecting Singaporean firms' project performance in China." International Journal of Project Management, 27, pp. 59-71.

Morallos, D. and Adjo A. "The State of the Practice of Value for Money Analysis in Comparing Public Private Partnerships to Traditional Procurements." Public Works Management & Policy 13.3 (2008): 114-125.

Morallos, D. and Amekudzi, A., 2008. The state of the practice of value for money analysis in comparing public private partnerships to traditional procurements. Public Works Management & Policy, 13(2), pp.114-125.

Munns, A. K. and Bjeirmi, B. F. (1996), The role of project management in achieving project success, "*International Journal of Project Management",* Vol. 14, pp. 81–87.

Murphy, D.C., Baker, B.N. and Fisher, D., 1974. Determinants of project success.

Ntayi, J.M., Gerrit, R., and Eyaa, S. (2009), Supply Chain Swiftness in a Developing Country: The Case of Uganda Small and Medium Sized Enterprises, E-Journal of Business and Economic Issues, Vol. IV, No. I. PPDA (2011-2014).

Ofori G. (2012). Developing the Construction Industry in Ghana: the case for a central agency, Vol.1, pp.45-64.

Ofori, G., Ai Lin, E. and Tjandra, I. (2012), Construction industry development initiatives: Lessons for Ghana from overseas. "International Conference on Infrastructure and Development". Kumasi, Ghana: College of Architecture and Planning, Kwame Nkrumah University of Science and Technology, pp. 12–17.

Olanrewaju, A. L. A. (2013). A critical review of value management and whole life costing on construction projects. International Journal of Facility Management, 4(1), 1–12.

Olatunju S.O. Olawumi T. O. and Awodele Oo. A. (2017), Achieving Value for Money (VFM) in construction projects, "Civil and Environmental Research" Vol. 9, No.2, pp. 54-64.

Olawale, Y.A. and Sun M., (2010). Cost and time control of construction projects: Inhibiting factors and mitigating measures in practice, "*Journal of Construction Management Economics*", Vol. 28, pp. 509-526.

Parisi, C., and Rossi, P. (2015). Strategic Performance Measurement of Research and Development: A Case Study. The International Journal of Business & Management, 3 (12), 322-330.

Pinto J. K., and Selvin P, (1987), Critical Factors in Successful Project Implementation, "*Journal of Transactions on Engineering Management*", Vol. 1, pp. 22-27.

Ponto, J., 2015. Understanding and evaluating survey research. Journal of the advanced practitioner in oncology, 6(2), p.168.

Project Management Institute, (2000), A Guide to the Project Management Body of Knowledge, PMBOK Guide 2000 edition, Project Management Institute, Pennsylvania.

Rahman I. A., Memon A. H. and Abd.Karim A. T., (2013). Significant factors causing cost overruns in large construction, "*Journal of Applied sciences*", Vol. 13, No. 2, pp. 286-293.

Ramly, Z.M., and Shen, G. Q. (2012). Value management in Malaysia: past, present and future. Proceedings of the International Conference on Value Engineering and Management 'Innovation in value methodology' 6th-7th December; 2012.The Hong Kong Polytechnic University Hong Kong, p.105-110.

Ramos, P. A., & Mota, C. M. (2016). Exploratory Study Regarding How Cultural Perspectives Can Influence the Perception of Project Success in Brazilian Companies. Production, 26(1), 105-114.

Regan, M. (2014). Value for money in project procurement. Faculty of Society and Design Publications. Paper 120. Retrieved from http://epublications.bond.edu.au/fsd_papers/120.

Sachs, J., (2003), September. Teacher activism: Mobilizing the profession. In *British Educational Research Association Conference* pp. 1-20

Shojaie, A. A., Shadalooie, M., Khalili-Damghani, K., & Pakzad, M. R. (2016). Development of a conceptual model of project management information systems for investigating its effective factors impacting the success of project using structural equation model. International Journal of Life Science & Pharma Research, Special Issue (1), 17-29.

Smith, L. M. (1979), An evolving logic of participant observation, educational ethnography, and other case studies. Review of Research in Education 6: pp. 316-377.

Spencer-Oatey, H., 1993. Conceptions of social relations and pragmatics research. *Journal of Pragmatics*, *20*(1), pp.27-47.

Staples WJ & Dalrymple JF (2011) Exploring infrastructure procurement by Australian state governments, International Journal of Managing Projects in Business, 4(3): 512 – 523.

Tang, L., Shen, Q. and Cheng, E.W., (2005). A review of studies on public–private partnership projects in the construction industry. International journal of project management, 28(7), pp.683-694.

Tashakkori, A. and Teddlie, (2003), *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: SAGE Publications.

Wateridge, J. (1998). How can IS/IT projects be measured for success. *International Journal of Project Management,* **16** (1), pp 59-63.

Westerveld, E. (2003)**,** The project excellence model: Linking success criteria and critical success factors, "*International Journal of Project Management",* Vol. 21, pp. 411–418.

Womack, J., Jones, D. and Roos, D. (1990), The Machine that Changed the World, Rawson Associates, New York, NY.

World Bank (2016), Value for Money: Achieving VFM in Investment Projects Financed by the World Bank.

Zikmund, W., Babin, B., Carr, J. and Griffin, M. (2012). Business Research Methods. 9th ed. Ohio, p.160.

RESEARCH QUESTIONNAIRE

Brief Background of the study

The study focuses on exploring the effect of the implementation of value for money on public sector construction projects performance. The aim of the study is to assess the effect of the implementation of value for money on public sector construction project performance in Ghana. This study contributes to knowledge in the area of value for money and the outcome of the study will also be significant for application by various stakeholders like Government agencies, project managers, contractors as well as professional bodies. This study is purely academic oriented and as such, we would like to assure that your responses would not be used for any other purpose other than those stated above. In other to improve the quality of this study, I humbly request you to take your time to read and understand the items on this instrument before responding to them. Objectives responses will be highly appreciated.

Please carefully read the instructions under each section to aid you in your responses. Thank you so much for your willingness to participate in this study.

SECTION A: RESPONDENT'S PROFILE

Q1. Please indicate your academic qualifications.

  HND ☐;   BSc ☐;   MSc/Mphil ☐;   PhD ☐;   Others ☐

Q2. Please indicate your years of practical experience in the construction industry.

  1-5yrs☐;   6-10yrs☐;   11-15yrs☐;   16-20yrs☐;   Over 20yrs

☐

Q3. Please rate your knowledge on value for money implementation in the construction industry?

  No knowledge ☐; Medium ☐;   High ☐

SECTION A

OBJECTIVE 1: FACTORS THAT AFFECT VALUE FOR MONEY

5. Please rate how **significant** the following factors affect value for money in public projects. Please use the response scale below:

1 = Not significant; 2 = Slightly significant; 3 = Moderate; 4 = significant; 5 = Very significant

No.	Factors that affect value for money	1	2	3	4	5
1	Risk allocation					
2	Nature of the contract					
3	Level of competition					
4	Detailed specifications					
5	Sufficient skills and expertise					
6	Accurate assessment of project cost					
7	Innovation in project development					
	If other, please specify					

OBJECTIVE TWO: EFFECT OF VALUE FOR MONEY ON PROJECT PERFORMANCE

5. Please rate the **impact** of VFM on the following project performance factors. Please use the response scale below:

1 = No impact; 2 = Slight impact; 3 = Moderate impact; 4 = significant impact; 5 = Very significant impact

No.	The effect of VFM on project performance	1	2	3	4	5
1	Cost performance					
2	Schedule performance					
3	Quality performance					
4	Health and safety performance					
5	Environmental performance					
6	Project scope					
	If other, please specify					

SECTION C

OBJECTIVE THREE: CHALLENGES ASSOCIATED WITH VALUE FOR MONEY

8. Please indicate the **SEVERITY** of the challenges associated with value for money in public projects. Please use the response scale below:

1 = Not severe   2 = Slightly severe   3 = Moderately severe 4 = severe   5 = Very severe

No.	Challenges	1	2	3	4	5
1	Unclear client objectives					
2	Lack of knowledge and awareness of VFM tools					
3	No standard approach to VFM					
4	Low and discontinuous demand					
5	Frequent changes in specifications					
6	Inappropriate selection criteria					
7	Poor risk allocation					
8	Fragmented industry structure					
9	Inefficient construction methods					
10	Adversarial culture					
	If other, please specify					