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GHANA

Impact of the Use of Financial Incentives on Project Delivery in Ghana.

BY

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MASTER OF PHILOSOPHY

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DECLARATION

I hereby declare that the submission is my own work towards the Master of Philosophy in Construction Management and that, to the best of my knowledge it contains no material previously published by another person , nor material which has been accepted for the award of any other degree of the University, except where duly acknowledged has been in the text.

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ABSTRACT

Financial incentive systems are mitigating measures that are neither against the contract nor obligatory, but the client does it to boost productivity. The usage of one or more of the existing incentive schemes to improve contractor's performance and enhance timely completion of projects remains recommended for good practice in the Construction industry. However, projects in Ghana continue to face great challenges resulting in cost and time overruns and quality deficiencies. Although an appropriate use of incentive schemes on any given project is known to result in successful project performance (and vice versa), very little is known about the nature of this relationship from literature. Having persistently suffered a great deal of project failures over the years, the Ghanaian Construction Industry stands to benefit from detailed knowledge and understanding of how exactly financial incentives impact on project delivery. Stimulated by the depth of this information, this research aims at investigating the impact of the use of financial incentives on project delivery in Ghana. The methodological approach adopted for this research was the multi-method qualitative study, ie using either two or more qualitative techniques (interviews and archival records). The respondents of the research involved Consultant's and Contractor's team who executed the three cases selected from the Directorate of Physical Development and Estate Management (DPDEM) of the University of Cape Coast (UCC). With the aid of framework analysis, the collected data were analysed. The key findings of the research show that contractors' access to credit is improved when clients and consultants grant them financial incentives which in turn boost their performance. It also motivates them at the various phases of the project life cycle. The distinct contribution to knowledge arising from this research includes the affirmation of the impact of financial incentives on project delivery. Hence, it is suggested that proper background checks (audited accounts, history of previous works, etc.) of the Contractor must be done before giving him any financial incentives and Stakeholders (Clients and consultants) must monitor the use of the incentive by the contractor. Implications for future research include assessment the risk factors in giving financial incentives and the effect of financial incentives on project delivery teams.

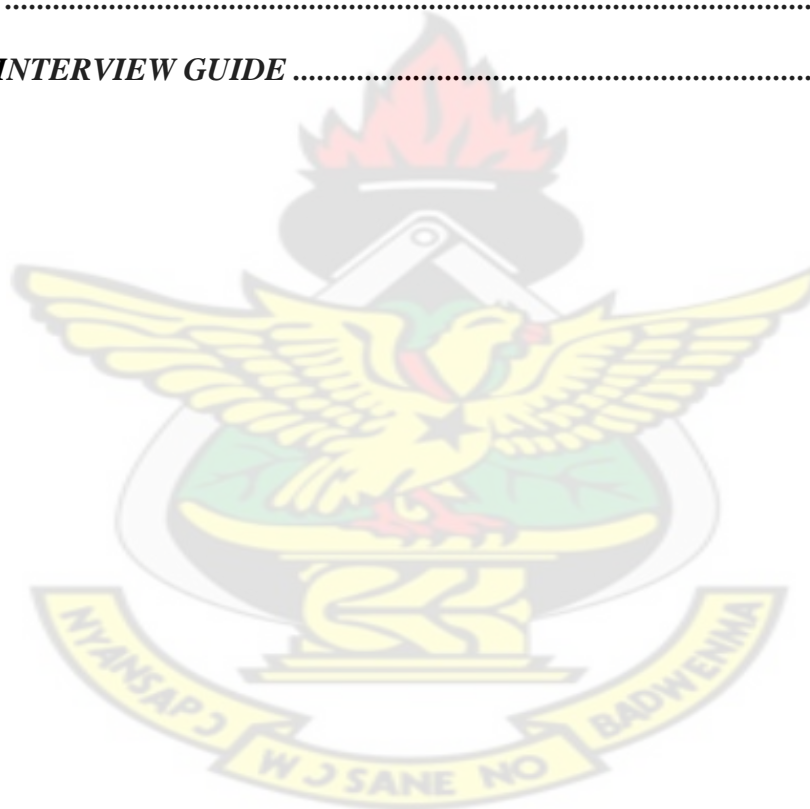
KEYWORDS: Construction Industry, Financial Incentive, Project Delivery, Project Performance.

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LIST OF ABBREVIATIONS

CM: Construction Management

DBB: Design – Bid – Build

DB: Design – Build

DLP: Defects Liability Period

GDP: Gross Domestic Product

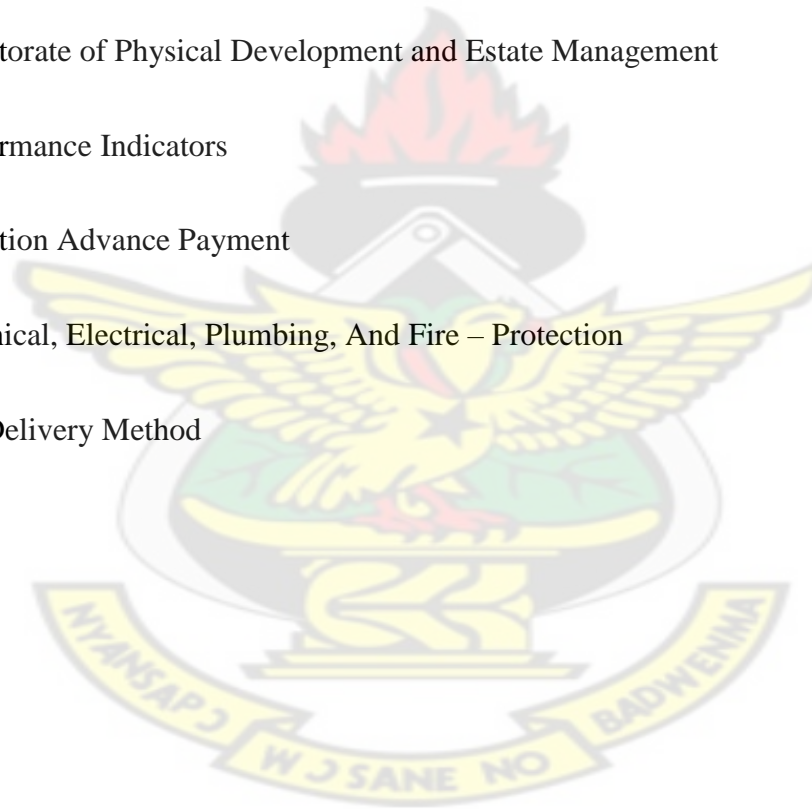
DPDEM: Directorate of Physical Development and Estate Management

KPI: Key Performance Indicators

MAP: Mobilization Advance Payment

MEPF: Mechanical, Electrical, Plumbing, And Fire – Protection

PDM: Project Delivery Method



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DEDICATION

This Thesis is dedicated to the ALMIGHTY GOD and most especially to my dear wife MRS. FLORENCE ANTWI AFARI and my sons AUGUSTINE ATTA ANTWI AFARI and MAXWELL FORDJOUR ANTWI AFARI for their Unconditional Love, Divine Favor, Support, Guidance and Encouragement for making this programme (MPhil. Construction Management) a success.

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION

This chapter presents a board survey of the thesis which emphasizes on the research, in terms of the background of the study and a broad perspective to the delivery of projects in the Ghanaian Construction industry. It also shows an extensive review of the work which stresses on the study in relation to the contextual of the research and the problem statement. Matters with respect to the investigation questions, aim and objectives of the research were similarly exclusively dealt with. These are then followed by the significance of study, research scope, research organization and the arrangement of the research.

1.2 BACKGROUND OF STUDY

Musa et al. (2010) argued that the contribution of the construction industry to sustainable economic growth and development of a nation is very substantial. Ghana's construction industry is enormous and reflected as one of the key drivers of the economy. Ofori (2012) observed that the industry is multifaceted, spread geographically and cuts across all sectors of the economy including buildings, roads, dams and bridges. According to Danso et al. (2011) Ghana's construction industry plays a major contribution to the Gross Domestic Product (GDP). The construction industry's portion to overall GDP grew from 7.2 percent in 2007 to 11.5 percent in 2012 and rose further to 13.7 percent in 2016 (Ghana Statistical Service, 2017). Laryea (2010) concluded that the construction industry serves as the podium through which other segments of the economy are advanced and also employs a substantial number of the citizens of the country.

Construction plays a very important role in providing capital goods to the economy. It provides more than one – half of the capital goods in many countries. The demand of construction materials and equipment like timber, steel, nails, cement, paints and chemicals, glass, back actor, concrete mixers and other earth moving equipment and machinery has been triggered by the rapid expansion of infrastructure and development by government and private sector initiatives. Ghana has a large number of registered building contractors from 20,000 in 2000 (Ayisi, 2000), but it has risen to about 50,000 registered contractors in 2010 (Ofori – Kuragu et al., 2016). Hence, the number of contractors registered in Ghana is very huge comparative to the magnitude of our economy.

Over the past half of the century, the construction sector has been under intense analysis on its seeming bad reput of dissatisfying shareholders through poor performance because of the importance it holds. According to Csehati and Szabo (2014), budget, quality and schedule are the prime project criteria that clients use to measure project success, but are always beneath expectations. Ball (2014) also added that fundamentally all clients of the construction industry appear dissatisfied with the products being produced. He explained that in most cases their projects take too long a time to complete, cost them more than expected or budgeted, their requirements for embarking on the projects are not met and the products do not last longer as expected.

The problems of project delivery and low productivity in the construction sector is not limited to any specific country, hence countless countries have and continue to make several efforts in

order to curtail the numerous problems facing the industry that has been acknowledged by the pertinent experts. Shareholders have enlisted low profitability of the industry, nonexistence of improvement and minimal investments in funds, and investigation and expansion as the areas which are much worrisome. Olupolola et al. (2010) conducted a questionnaire survey with construction professionals and included that delay in subcontractor works, ineffective planning and scheduling of project by contractor, delay delivery materials on the site, poor skills of the labourers and difficulty of project site and improper construction methods used by contractors are the factors that affect project delivery.

Sun and Meng (2009) agreed that many construction projects suffer performance problems due to budget overrun, schedule overrun and quality defect. There have been various researches in identifying different potential explanations to address these types of performance problems. The provision of financial incentives has an important prospective in addressing problems of performance in construction project delivery. The correct use of financial incentives can motivate substantial change in the industry. This was confirmed by Rose and Manley (2011), when they stated that proper use of financial incentives is a significant way of encouraging the performance of construction projects. They further explained that performance is achieved when the financial incentives simulate motivation for the employees to work harder and cleverer in chase of agreed objectives.

Nevertheless, financing construction activities by contractors is one of the key encounters that deter advancement of projects. Clients can provide advance mobilization/payment; assistance to

procure materials; bonus payment for early completion; waiving liquidated damages; and retention bond to aid contractors. This research analyzes the impact of financial incentives currently being used in construction, specifically on how they impact on performance.

1.3 PROBLEM STATEMENT

Mbuthia (2001) stated that the construction industry is coping with complications of poor profit, low output, low client satisfaction and poor quality and delivery of product. Kaliba et al. (2009) explain in their study that; low supervision and co – ordination; delayed in honoring certificates; changes in the contract; variations in specifications; client or contractor not having enough funds; design modification; economic difficulties; procurement of materials; recruitment glitches; equipment inaccessibility; re – work; and disputes are the major factors affecting construction projects. These problems have unbearable effect on stakeholders to the contract and normally generate hostile relationships, lawsuit, cash – flow difficulties, disbelief, and a general sensation of uneasiness (Bentil, 2014; Pathiranage and Halwatura, 2010; Ahmed et al., 2003; Al – Khalil et al., 2002).

Okeyo et al. (2015) concluded that timely provision of financial incentives to contractors is essential for guaranteeing the continuation of construction works and completion of infrastructural projects within schedule, cost, and quality specifications. They also stated that in low – income economies countries, construction projects exceed the anticipated budget and schedule because of non – availability of financial incentives such as prompt or early honouring of certificate of contractors.

In order to avert these problems, most clients have made available various financial incentives to contractors. Some of these financial incentives include mobilization advance payment, assistance to procure materials, retention bond, waiving of liquidated damages, bonus payments for early completion and prompt or early honouring of certificate. Despite these incentives, schedule overrun, cost overrun, and quality deficiencies exist in the construction industry. Hence, it is important an investigation is carried out to assess the consequence of the use of these financial incentives on project delivery.

1.4 RESEARCH QUESTIONS

- What are the factors that affect project delivery?
- What criteria are used for evaluating and computing project performance?
- How do these financial incentives affect contractor's cash flow?
- How do these financial incentives impact on project delivery?

1.5 AIM AND OBJECTIVES OF THE RESEARCH

1.5.1 Aim

The research's aim is to investigate the impact of the use of financial incentives on project delivery in Ghana.

1.5.2 Objectives

In pursuant of the aim, the research objectives are as follows:

- To identify project delivery methods commonly in practice and their criteria for selection.
- To establish the criteria for evaluating and computing project performance.
- To assess the effect of financial incentives on the contractor's cash flow.
- To establish the impacts of the use of financial incentives on project delivery.

1.6 JUSTIFICATION OF THE STUDY

The global increase in construction activities necessitates a better project delivery strategy to promote best performance. Polat et al. (2014) identified contract related factors, time related factors, communication related factors, quality related factors, risk related factor, human recourse and communication related factor as problems associated with project performance. Various writers have encouraged the usage of financial incentives as stimulus to lessen conflicts, to encourage co – operation and improve performance (Rose and Manley, 2011; Tang et al., 2008; Bower et al., 2002; Shane, 2001).

The study is expected to contribute to existing knowledge on project delivery as it drives to argue the guidelines the construction industry must follow in respect to financial incentives to guarantee an effective, receptive and liberal industry that can compete with other sectors in the economy since it is lagging (Mbuthia, 2001).

The research has also acknowledged further issues besides financial factors which have influence on the delivery of construction projects. In addition, a review of project delivery methods and their criteria for selecting will offer updated information to other scholars and experts.

1.7 RESEARCH SCOPE

A case study of three projects completed at the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast between 2011 and 2016 with final project cost exceeding ten (10) million Ghana Cedis has been adopted. The justification of the case study originates from the high fact – finding nature and complexity of investigation. It also permits for multifaceted interactions between mutually dependent variables to be considered. Again, it allows an additional all – inclusive method to be used in defining the impact of the use of financial incentives on project delivery. Moreover, because of the contextual nature of the study, it will be best served by case study. The unit of analysis was the contractors and consultants on those projects since the research focused on practices within the project delivery.

1.8 RESEARCH METHODOLOGY

For a thorough and vigorous research, the research was organized by implementing the suitable epistemological and ontological paradigm to help the gathering of applicable data and subsequent analysis and explanation of results. The methodology adopted for this study was the qualitative approach and consisted of the critical review of pertinent literature relevant to project delivery and financial incentives in the Ghanaian construction industry. Exploratory interviews

were used to collect data. The analysis of the data gathered was done by using framework analysis.

1.9 STRUCTURE OF REPORT

There five independent interrelated chapters in this thesis in the following outline:

- Chapter 1 – Introduction; it makes available an overview of the investigation. It gives the contextual of the study, problem statement, the aim and objectives, enquiry questions, significant of the investigation, methodology and dissertation's scope.
- Chapter 2 - Literature appraisal; it reviews other works on definitions, phases and methods of project delivery. It describes the factors affecting project delivery, financial incentives scheme available in the construction industry. Lastly, it looks at project performance measurement and project success criteria.
- Chapter 3 – Methodology; this chapter summarizes the methodological framework utilized to accomplish the research aims and objectives. A case study strategy of inquiry is given together with the research method and approach which will be employed to investigate the area of financial incentives. It starts from the philosophical stance of research, methods and approaches. The sampling design and procedure in the qualitative research is presented along with data collection techniques.
- Chapter 4 – Results and discussion; it discusses the observed analysis of information and deliberations from the interview that responded all the study questions and objectives.
- Chapter 5 – Conclusions and recommendations; the final chapter wrapped up the whole study by revising the research objectives. Findings of the investigation, contributions of

the enquiry to knowledge, recommendations and limitations of the work are also presented. It concludes with directions for future study.

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CHAPTER TWO

2 LITERATURE REVIEW

2.1 INTRODUCTION

An appraisal of past works was carried out so as to ascertain relevant benefits and challenges associated with project delivery, financial incentives and performance measurement. The literature was examined to access the differences between project delivery and building procurement systems. It also identified the concept and phases of project delivery. The chapter discusses the common project delivery methods and their selection criteria. General and financial factors affecting project delivery are also discussed. It also looks at the definition and schemes relevant to this study and related areas of financial incentives. Indicators for project performance evaluation and measurement and the criteria for project success constituents the concluding part of this chapter.

2.2 STAGES OF PROJECT DELIVERY

There are five stages through which a client can be supplied with a facility. The stages follow in the order stated below with some overlapping of neighboring phases: (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993)

- Pre – design phase
- Design phase
- Pre – construction phase
- Construction phase

- Post – construction phase

2.2.1 Pre – design phase

At the pre – design phase or planning phase, the facility is defined in relation to its purpose, role, range, and finances. Amongst the five stages it is the utmost critical; since the success or failure of any facility depends on how well this stage is clarified and accomplished. (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993) The facility can progress to the successive stages easily if it's brief clearer. For a large and/or complex project, developing the brief may be very challenging. The development of the facility's brief may be problematical by circumstances at which the client has an ambiguous knowledge of the facility and finds it difficult to clearly define it. In contrast, knowledgeable clients have a propensity to deliver a comprehensive, explicit brief to the design team. Whatsoever the case, the initial step in the delivery of project is the client's program. In order to guide the design, decrease responsibility risk for the design team, and circumvent its misunderstanding, the client should indicate in ink and in adequate detail. In case of any revision at any time of the project, the client's written approval is very essential. Some of the important tasks to be completed during the pre – design stage are as follows (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993):

- Facility brief description, comprising of events, purposes, and spaces needed in the facility, accompanied by their estimated number, sizes, and connections with one other.
- Assessment of the facility cost – effective viability, that is, the overall budget of the facility and financing

- Facility's proposed site selection and assessment, that is, the authentication of the site's suitability and defining its labeled usage of the land.
- Assessment of restraints due to governmental agencies, that is, permits for building, Environmental Protection Agency (EPA) permit and others.
- Selection of design members

2.2.2 Design phase

This phase commences with the selection of the architectural firm or an architect. Subject to the extent and magnitude of the facility, the architect may have restricted competences for supervising the wide variety of building – design activities; hence other professionals in different specialty are normally required. (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993) In most facilities, the design member comprises the architect, civil and structural consultants, cost consultant and mechanical, electrical, plumbing, and fire-protection (MEPF) consultants. On complex facilities, an acoustical consultant, roofing and waterproofing consultant, interior designer, landscape architect, and so on may be part of the design members. The client may contract a single firm if it has the entire design team (architects and specialized consultants). Usually, the design members consist of numerous professional firms. In those cases, the client naturally contracts the architect, and empowers him to contract other professional members required for the design as shown in Figure 2 – 1. The architect becomes the lead consultant since he is contracted by the client and is accountable to the client for his work and that of other professionals. In some facilities, the client may appoint some professionals by himself, predominantly a civil engineering professional, a geotechnical engineer, and a landscape architect.

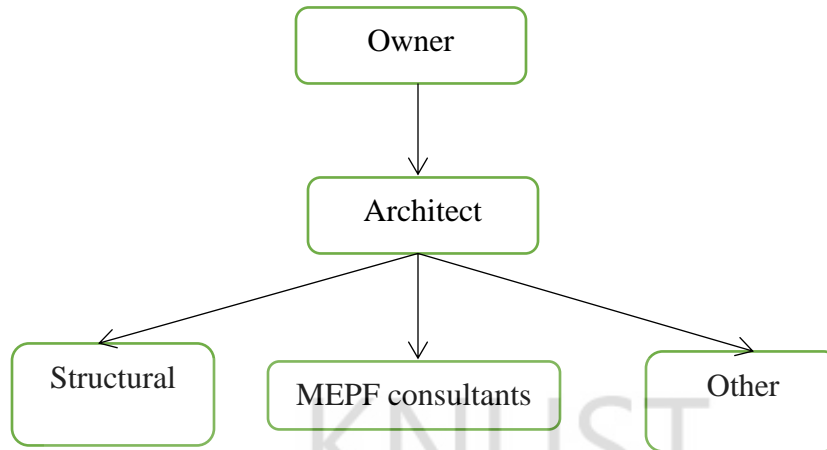


Figure 2-1; Organogram of design phase

Source: Author's Construct (2018)

From figure 2 – 2, it is seen that these professionals may be appointed before or at the same time as the architect. Nevertheless, when the client contracts any consultant directly, the architect holds some level of obligation for the professional's work. This happens when the architect is the lead design professional, hence he has the duty to harmonize the whole design work, and also the works of other professionals is depended on his architectural judgments. On some facilities, the process of design maybe organized by an engineer or other expert. For instance, in an extremely technical facility like manufacturing plant, a mechanical engineer may be the lead design professional. The design phase comprises of three phases: (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993)

- Schematic design phase
- Design development phase
- Construction documents phase

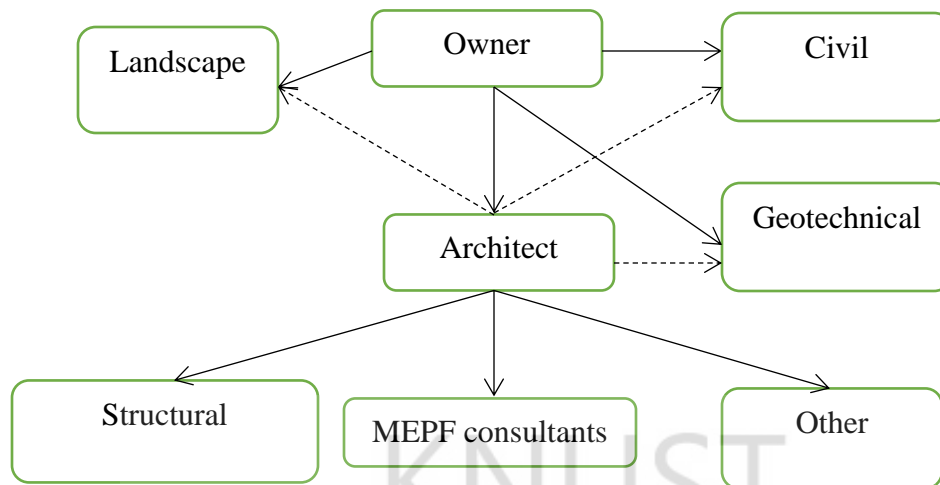


Figure 2-2; Organogram of design phase

Source: Author's Construct (2018)

2.2.2.1 Schematic design stage

This is a preliminary design scheme that seeks to clarify the overall scope and theoretical design of the facility including scale and interactions between facility's components (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). The chief person at this stage is the architectural designer, who produces the design scheme with some amount of help from other professionals (could be more than one design options). An approximate estimate of the facility's possible cost is made at this phase so as to help in decision making since most facilities have stern financial restrictions. The architect communicates the scheme proposal(s) to the client through several kinds of sketches showing the plans, elevations, sections, and three – dimensional perspectives. In other instances, a three – dimensional scale prototypical of the complete facility, displaying the framework within which the facility is sited. These sketches and / or model will offer the client with the chance to authenticate that the designer has appropriately understood the client's anticipated practical interactions between several activities. The drawings

will also make available to client the overall indication of the external design dialogue with emphasis on the creativity, conceptuality, and innovation aspects of the design. It is imperative to understand that the main objective of the schematic design sketches, pictures, models and virtual reality is to communicate the scheme to the client and other consultants that may work on the project at one or the other. Nonetheless, the schematic design is not meant for the contractor since it does not contain adequate information to construct the facility regardless of how well they are produced.

2.2.2.2 Design development stage

The development of schematic design of a facility into a better details starts after the approval of the schematic drawings by the client (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). A precise and organized explanation of all features of the project with much emphases on emerging real – world and realistic clarifications for the external covering, interior designs, structure, finishes, MEPF systems, and others. In other to achieve this development, it requires deliberate discussions within the design members. Nevertheless, decision making is the most precarious characteristics of this phase that may vary from broad design features to specifics. A colossal mainstream decision about the facility is made at this point. These include cost savings, materials, equipment, energy efficiency and constructability improvements amongst others. The Architect at the completion of the development phase will offer the client with scaled sketches that will show how the facility will look at when constructed. An effective management of the phase has a direct relationship with the efficient completion of the documents for construction. In addition, the consultants will produce a more comprehensive description of the specifications and possible budget of the facility at this stage.

2.2.2.3 Construction documents stage

These are the official papers that lay out the comprehensive requirements for the production of a facility. Construction documents comprises of Drawings and Specifications. The graphical constituent of the construction documents are called drawings. It includes but not limited to architectural design drawings, civil and structural design drawings, MEPF design drawings, external drawings, interior design drawings. They must indicate the geometry, layout, measurements, category of constituents, particulars for accumulating the constituents, colors and roughness, and so forth. Comprehensive budget estimate of the facility is prepared from the drawings. Specifications are inscribed technical descriptions connected to the materials for building the facility, equipment to be used, and the system of construction that shape the criteria to be encountered in the production of a facility. The two components of the documents for construction balance one other and must be used in unification with one another. They also deal with different phases of the facility. After the completion of the construction documents, the client will have adequate data to accept bids from contractors and seek other legal authorizations like building permits (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993).

2.2.3 Pre – construction phase

The pre – construction phase starts when the construction drawings, specifications and bill of quantities have been finalized and terminates after a contractor or construction team members has been selected (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). The construction of a minor facility encompasses several specific expertise and professions that the

execution cannot usually be embarked on by a sole construction company. Hence the works are normally executed by the general contractor and a number of specialist sub – contractors forming a team. In the nut shell, before the handing over of a facility, there would have electrical, mechanical, plumbing, firefighting, roof installers, glazing, tiling, interior decorator and etc. sub – contractors, in addition to the general contractor. The general contractor contracts the entire sub – contractors and bears their risks and is the only person answerable and accountable to the client. The general contractor can choose to perform some aspects of the works or contracts the whole works to sub – contractors. Nonetheless, the management of the entire construction rests on the shoulder of the general contractor. That is he has to coordinate the activities of the sub – contractors by certifying that the activities done by them is finished in harmony with the drawings and specifications. He also ensures the well – being of all employees at workplace. Below are the three most common methods among the lots that are used in choosing a contractor to carry out works of a particular need to a client.

- Open competitive method
- Selective competitive method
- Negotiated contract method

2.2.3.1 Open competitive method

Open competitive method discusses the procedure through which eligible contractors are requested to tender on a facility. The request is normally done through announcements in newspapers, trade publications, and other public media (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). The announcement for tenders provides the following information

narrative of the facility, its whereabouts, where and how to acquire the tendering documents, cost of the tender documents, date and location of opening bid, and other important information. The announcement is done with the notion of notifying and attracting a satisfactory figure of eligible contractors to contest for the contract to construct the facility. On the other hand, there is a limitation to the numbers of contractors who can tender. This limitation is through bid bond, which is a monetary security required from all contractors submitting their bid. The bond is allotted centered on the capability of the contractors, skill to execute the works, and monetary assets needed to accomplish predetermined commitments.

2.2.3.2 Selective competitive bidding method

The procedure is the same as that of the open competitive bidding, just that the consultants (acting as the client's representative) conducts the pre – screening procedure to pre – select construction companies who have established, centered on their work capability, assets, monetary status, personnel and know – how on similar jobs. The pre – selected construction companies may now put in their bids for the facility (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993).

2.2.3.3 Negotiated contract method

This is the process of choosing a construction company to execute some works devoid of asking for tenders. This procedure is normally used when the client is acquainted with one or more trustworthy, experienced, and reliable construction companies. In such situation, the client basically negotiates with these construction companies for the total construction cost, duration

within which the works will be completed, payment plan, and other vital fine points of the facility. The client does the negotiations with one company at a time. One main benefit of this method of contracting over the rest is that the main contractor can be agreed on during the design phase of the facility and he can help with his expertise to make the facility constructible (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). This method of contracting is often used in Ghana for private facilities.

2.2.4 Construction phase

This phase commences as soon as the general contractor is selected and the contract awarded, as defined in the documents of contract. The only difference between the contract documents and the bidding documents is that, the former has a signed legitimate agreement among the client and the selected contractor (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). A comprehensive explanation of the facility is delivered through the construction drawings and the specifications. Nevertheless, the construction drawings and specifications mostly do not define some constituents to the level that some specialist (for instance lifts) can create those constituents directly from them. Hence, those specialists produce new a set of drawings, termed as shop drawings. The shop drawings offer an advanced degree of details required to manufacture and bring together the constituents. They are specific, comprising of producers' or dealers' registers, but are specifically organized for a particular facility by the producer, constructor, dealer, supplier, maker or manufacturer. Case in point, a lift car dealer or supplier is required to create shop drawings to demonstrate that the supplied lift car and its installations kowtow to the specifications stated in the contract documents. Installation can only start when the consultants receive the shop drawings and approve them.

Construction, in general, can take many forms of delivering the final merchandise. The main contractor normally splits the deliverables into stages or smaller packages so as to accomplish its milestones. In this case, the main contractor will often tender individual work packages out to sub-contractors. However, the main contractor will retain responsibility for the quality of all work and for coordination of sub-contractor activities. During the construction works, there are many issues to consider but the most important points are as follows:

- Have appropriate quality requirements and a duty of care been imposed on the contractor?
- Is there any assurance that defects identified in the inspected works will be remedied?
- Was defect liability period included in the contract? How long is that period?
- Is there any dissimilarity among some phases of the project?
- Has the design been addressed appropriately?
- Is the facility schedule optimistic or realistic?
- In the case of a dispute, what are the procedures that would be implemented?

The activities during the construction works are numerous, but the most work intensive period is in the middle of the stage where all of the work packages are delivered. It is in this stage of the facility that many sub-contractors would be involved. As a result, it is particularly important to pay attention to sequencing, lead times for the material delivery, and any time-sensitive legislative compliance matters which can disrupt the program (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993).

The role of consultants throughout the construction stage has advanced since the past decades. Some years past, consultants used to provide steady direction at the site throughout the construction period of a facility. Nevertheless, consultants have been forced to abandon these responsibilities because of adverse effects of the liability exposure that results from these supervisory roles. But rather, in these years their role is field observation throughout the course of the project. This role of observation permits consultants to control the project such that whatever they conceived and transferred into drawings and specifications is what the contractor is transforming into realism (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). The observational role also delivers enough safety measure against mistakes that the contractor might cause through misinterpretation of the drawings and specifications. Again, the consultants are required to verify and approve intermittent payment certificate requested by the contractor based on the value of work done and materials made available at the project location. The consultants upon receiving the contractor's interim payment certificate which is normally once a month if not stated differently in the contract, evaluate the work done and other essential documents to validate the claim of the contractor. Almost all construction facilities require modifications when the works begin. Nonetheless, it is only the consultant who has the right to initiate alterations. Hence, if any other shareholder wants to make changes, it should go through the consultants to the contractor. In due of this, the contract that is signed amongst the contractor and the client acknowledges the fact that modifications might arise and makes available a provision for the client to vary the works through a change order and the contractor is obliged to agree to the variation order and in response provide unbiased price for the variation order if it calls for increase or decrease in cost. The work of the consultant after issuing the variation order

is to carry out an unbiased role to help the client and the contractor to agree on an appropriate price for the changes made (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993).

2.2.5 Post – construction phase

The contractor may request the consultants to conduct an inspection to ascertain that the project has been completed in most/all component (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993). This is carried out when the contractor sees that the works has be completed substantially enough for the client to move in and use it for the intended purpose. Nonetheless, there could be some cosmetic and/or minor works or items to be provided or completed. The inspection is initially conducted by the consultants and the contractors' team before later other shareholders is included. Before the inspection the contractor is required to submit all guaranties and warranties he has received from specialist subcontractors and manufactures of equipment and materials. These are to be handed over to the consultants for assessment before they are given to the client. During the inspection remedial works are recorded by both the contractor and the consultants. The contractor then carries out all the remedial works acknowledged so that it conforms to the drawings and specifications. After all the remedial works has been carried out by the contractor, he requests for the final inspection of the facility. When the consultants are satisfied with the works of the contractor, they provide him with a certificate of final completion. The facility is handed over to the client by the contractor through the consultant after the certificate of final completion. The contractor is then paid any outstanding valuation including fifty percent (50%) of the retention funds entitled to final payment. Final certificate is prepared after the defects liability period. During this period, the contractor is expected to repair any defects that may arise.

After handing over possession of the facility to the client, he becomes no longer responsible for insurance, electricity cost, water, and security of the facility. Nevertheless, he is responsible to repair any defects of the facility that may arise during the Defects Liability Period (DLP). The contractor is required to produce as – built drawings of the facility. It is supposed to take care of all the changes that took place throughout the construction of the facility. The client is able to make changes to the facility in future because of the as – built drawings that the contractor provides. The record document package delivered to the client by the contractor includes record drawings, record specifications, a set of accepted shop drawings and other necessary records (Ibbs et al., 2003; Konchar and Sanvido 1998 and Obelender 1993).

2.3 PROJECT DELIVERY METHODS (PDM)

Several stakeholders (client, engineers, architect, contractors, and sub-contractors) are tangled in the production of drawings and specifications and construction of a facility according to Jackson (2010) and Lichtig (2005). The method of project delivery preferred by the client determines the timing and extent of interaction between the stakeholders as suggested by Alarcón and Mesa (2014), Jackson (2010) and Lichtig, (2005). The relationships of the stakeholders such as the employer, consultants and contractor are structured in design and construction of a facility is called project delivery method. The method of delivery authorizes duties and responsibilities to an individual or a firm to deliver the design and/or construction services and also controls the predetermined arrangements among the client, financier, consultant and contractor (Jackson, 2010; Alarcón and Mesa, 2014). Hence, relating the consequences of method of project delivery and that contract conditions on performance, project delivery can be described as a mixture of

culture, economics, surroundings, management, political issues and contract approach (Austen and Neale, 1984).

According to McDermott (1999), condition of contract has an insignificant consequence on project performance. He explained that it is only essential when there are disagreements between parties to the contract. Hence, when there are decent working relations and project prehistory, there will be a smooth – organization of any facility notwithstanding of the method of project delivery.

2.3.1 Categories of project delivery method (PDM)

The most common methods of providing facilities from several writers (Nikou et al., 2014; Alarcón and Mesa, 2014; Thwala and Mathonsi, 2012; Love et al., 2012; Molenaar et al., 2009 and Masurier et al., 2006) are Design – Bid – Build (DBB) and Design – Build (DB) systems, whereas Construction Management (CM) is hardly used in Ghana.

2.3.1.1 Design – Bid – Build method (DBB)

DBB method is the oldest and the utmost popular system of disjointed and co – operative system of procurement (Francom et al., 2014). The traditional method is another name for the DBB method. The name traditional arises not only from the fact that it is the most primitive method, but it is the widest used method all over the world for countless ages to acquire both private and public facilities (Thwala and Mathonsi, 2012). After the departure of medieval period guilds, the

design – bid – build project delivery method began to rise. Satoh and Morton (1995) were not able to conclude if the increased in development and liking for procuring bids competitively; the progression of contractors into all – encompassing building contractors; and professions specialization and the improvement of architects in the way of producing of project drawings, writing project specifications and supervision of construction works has a direct influence on the growth of this new contracting method or not.

DBB used to be the method frequently in used in the 20th century (Knochar and Sanvido, 1998; Kent and Becerik-Gerber, 2010). In this system, the client has distinct agreements between consultants and contractor and as shown in Figure 2 – 3. The method works in a linear configuration; the consultants finalize the drawings and specifications before the client accept competitive bids from contractors (Ibbs et al., 2003). Normally, the lowest evaluated bid is awarded with the contract by the client. Hence, Jackson (2010) concluded that the company that will construct the works does not partake in the design procedure of the facility and all communiqué goes to the client. Ibbs et al. (2003) concluded that the contractor harbors the majority of the risk in this system due to the agreement.

According to Shrestha et al. (2012), the traditional project delivery method has two separate phases. That is design phase and construction phase. The first phase, the design phase, is the period that the client contracts consultant to translate his brief into reality and it ends with the opening of bid from interested contractors and selection of the most appropriate in terms of capacity to complete the proposed project on time, quality and within the lowest cost. The

construction phase starts as soon as the necessary contract between the selected contract and the client and ends with the handing over of the facility. Apart from open competitive bidding, owners using the traditional system can use the selective or negotiated bidding methods for the delivering of their facilities (Thwala and Mathonsi, 2012 and Rosmayati et al., 2010).

Despite the different roles and duties needed from the consultant, contractor and owner at the various phases, this system of project delivery permits teamwork among these shareholders. It is because of this that the traditional system is called “Separated and Cooperative” method according to Masterman (2002) even though the name is less popularly known. Francom et al. (2014) concluded that the DBB method accommodates the sharing financial and responsibility risks. They continued that owners most often are responsible for all the risks available during the pre – construction phase but the main contractor takes over all the risks during the construction phase.

According to these researchers (Al – Khalil, 2002; Ibbs et al., 2003), the owner is supposed to monitor the activities of the contractor through a consultant so as to ensure that the drawings and specifications are being followed by the contractor if he uses the DBB method. Nonetheless, Liv (2011) has argued that the contractor in DBB method has no liability with respect to the design of the facility and the consultant / designer does not also have a straight relationship with any of the suppliers but all communications should go through the key contractor. Again, Liv (2011) concluded that, the consultant is often the frontrunner of the facility and represents the owner. This is shown in Figure 2 – 3.

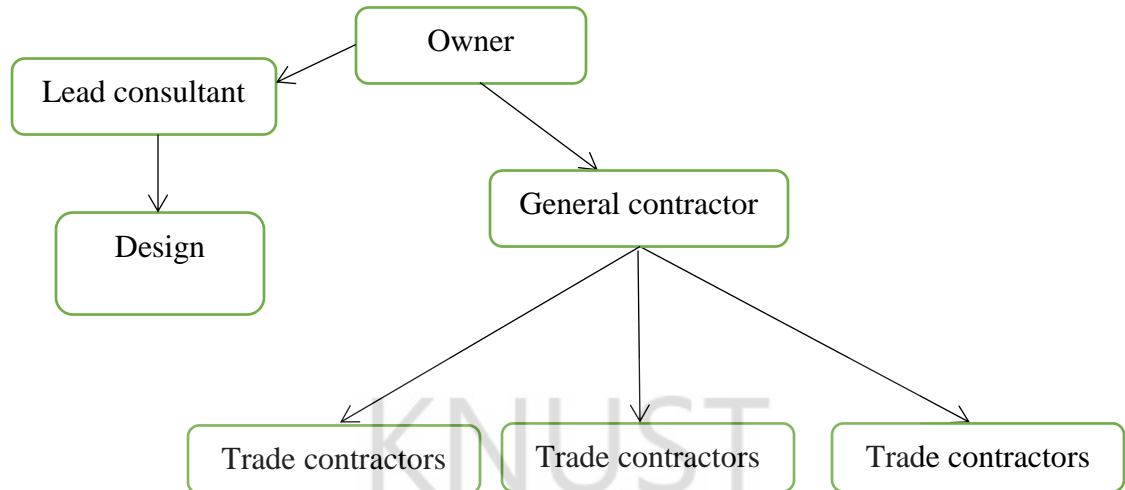


Figure 2-3; Organization structure for DBB procurement method

Source: Author's Construct (2018)

Nevertheless, these writers (Francom et al., 2014; Pishdad-Bozorgi et al., 2012; and Masurier et al., 2006) have comprehensively criticized this system as being an incompetent and unproductive method as it causes cost overrun, schedule overrun, quality defects and confrontational relationships between project teams. According to Love et al. (2012), the traditional method of project delivery causes a gap in the project delivery. That is design of the facility and construction activities are disjointed from each other. They continued that the gap is pondered to impede on organization, communication, incorporation and management between project parties and it can unpleasantly upset performance of projects.

2.3.1.1.1 Types of contract under DBB

Construction contracts are basically inscribed official papers that strive to warrant some component of predictableness and regulates on people's schedules throughout the progression of a facility according to Antoniou et al. (2012). Kate (2010) and Rodriguez, (2011), suggested that contract is essential part of any facility, since its application and right selection is the major stage on the road to guarding owners from the failures of their facility. That is the success of any facility depends on properly choosing an appropriate contract for that facility. There are different types of contracts under DBB but the common ones are unit price, lump sum and cost reimbursement (Antoniou et al., 2012; Kate, 2010; Grifa, 2006).

- Unit price; the unit price for of contract is also termed as bill of quantities. It is a form of a fixed – price agreement in which the supplier or contractor at the estimating process presents a unit price of every one entry of the works. The unit price of each entry comprises of estimated profit and overheads. The bill of quantities contract is carried out by breaking the works into different fragments according to the type and the scope of the facility, which is earth works, concrete works, masonry works, timber works, rendering works, steel works, painting and decoration works and so forth (Rodriguez, 2011). The cost of each entry is determined by multiplying the total estimated magnitude of that entry by their analogous unit price. The overall cost of the project is calculated by summing the results from all the entries of the works. The total cost of the facility is directly reliant on the unit price of each entry and the corresponding quantities required in executing the works. Throughout construction stage, the actual quantity of each entry of the works executed is measured at the site and multiplied by its corresponding unit price

and paid to the contractors as an interim certificate. According to Abd-Elshakour (2011), the core advantages of the bill of quantities contract are:

1. Unit price contracts are most suitable for competitive tendering;
2. Selection of appropriate contractor becomes easy with the bill of quantities contract
3. It permits for modification to the drawings and specifications by the owner.

➤ Lump sum contracts; it is the most elementary method of contract among an employer and employee. In lump sum contract the employee or contractor come to an agreement to execute all the identified works at a particular stable amount. The employer in the other hand pays the works based on the agreed schedule of payment whiles the work progresses or successfully completed. Kate (2010) mentioned that the employer is only required to pay the agreed fixed fees regardless of the genuine price suffered by the contractor, unless there was a provision in the contract on risk sharing that mentioned that. Due to this clause the contractor is permitted to execute the works through any available procedure and techniques but, he is liable for quality and improved work performance. The contractor is solely responsible for all the risks of the works whiles the employer's risk is financial which are little and static from the start of the contract. In calculating that total cost of a project for lump sum contracts, contractors normally approximate the labor and materials fees. An average amount of profit and overhead fees is added to the material and labor cost to become the total cost of the project. On the other hand, the desired overheads and profit can be calculated as a fraction of the total cost of the materials and labor. The profit and overheads value depends on the risks anticipated on

the project. The higher the risk, the higher the value of the mark – up. The main advantages of lump sum contracts are:

1. It is the most suitable for a project with a well – defined scope and schedule as the contractor can fully evaluate the cost of the project.
2. The overall cost of the project is known to the owner before construction begins.
3. The contractor can reduce his overheads and increase profit by completing the facility speedily.

➤ Cost reimbursable contract; this is also called cost plus contract. Cost reimbursable contract is an agreement in which the employer or client come to an agreement to settle the total material and labor cost in addition to a fee to cater for the employee's or contractor's overhead cost and profit. The additional fee is normally a fraction of the total cost of material and labor. Cost reimbursable contract includes the payment of the real fees, procurements and or expenditures caused from the construction activities directly (Rodriguez, 2011). He also said that cost reimbursable contracts must encompass detailed statistics about convinced pre – negotiated percentage of the agreed labor and material fees to cover overhead cost and profit of the contractor. This kind of contract is favored when the size and scope of the project is unknown or extremely indeterminate. The material, labor and equipment required for this type of contract is also unclear or uncertain. According to these researchers (Kate, 2010; Antoniou et al. 2012; Veld and Peeter 1989) for cost reimbursable contracts, proper recordings of materials and labors used by the employee / contractor must be maintained on the works at all times. This type of contracts is mostly used for important projects / facilities needed to be completed

within stipulated time. With projects with unclear technologies or major modification this method is mostly used. The initial budget of the facility is always not well – defined; hence the employer is mandatory to refund all the acceptable and realistic fees that the contractor has proven that he has incurred during the construction process. The main advantage of cost reimbursable contracts is, because of the incentive available for the contractor, it discourages them from inflating the cost of the project through contingencies. Also the contractor works quickly to complete the works since his fees remain constant. Nevertheless, some of the shortcomings of cost reimbursable contracts are poor materials selection control, unknown total construction cost and the like hood of resulting in to conflicts.

2.3.1.2 Design and build method (DB)

Some writers (Ramsey et al., 2014; Minchin et al., 2013; Kent and Becerik-Gerber, 2010; Turina et al., 2008; Seng and Yusof, 2006; Ibbs et al., 2003; Molenaar et al., 1999) suggested the DB method gained its popularity within various construction industries many years ago and considered as one of the utmost preferred method of project delivery in terms of its budget and duration saving standings. They continue that, the DB method reduces encounters and improves communication among project members. Park (2009) worked on the DB method and concluded that it is most efficient and effective method for constructing multifaceted facilities and it also permits construction of the facility to begin before the comprehensive completion of detailed drawings and specifications.

According to the following authors (Ramsey et al., 2014; Jackson, 2010; Seng and Yusof, 2006), the fundamental theory behind the DB is giving out a facility to particular body or company to be solely responsible for the drawings, specifications, engineering, constructing and commissioning. Due to the above theory, Lo and Chao (2007), Masterman (2002) and Turina et al. (2008) the constructing company undertakes the roles and duties for the drawings, specification and construction of the facility for the owner under this system. The design and build method has been given several interpretations in the works of other scholars. A case in point is the definition given by Ramsey et al. (2014) as another method of project delivery which is differentiated by design and builds members performing the sole responsibility for the drawing, specifications and construction of a facility in which these overlap. Single – step procurement and two – step procurement are the two key methods for procurement of DB facilities. Again, other researchers such as Shrestha et al. (2012) and Akintoye and Fitzgerald (1995) have explained DB as an acquisition of a facility from an individual or a sole construction that embark on pre – construction and construction activities. Lastly, another group of writers that is Shapiro and Knutson (2013), Migliaccio et al. (2006) and Seng and Yusof (2006) have concluded DB as a prearrangement in which a single company is responsible for the designs and construction of a facility for the owner through a single monetary business deal.

DB method involves giving a facility a company and it becomes accountable for the design, construction and handling over (Ramsey et al., 2014; Jackson, 2010; Seng and Yusof, 2006). Hence, the firm accepts the obligation for the design and construction of the facility (Lo and Chao, 2007; Masterman, 2002; Turina et al., 2008). Ramsey et al. (2014) considered it as one of the most favored project delivery methods in terms of its cost and time saving; improved

communication between stakeholders and subsequent reduced conflicts. DB method is efficacious in circumstances where the scope is defined, schedule is restricted and the design is a standard or repetitive. The client then implements a solo agreement for design and construction as shown in Figure 2 – 4.

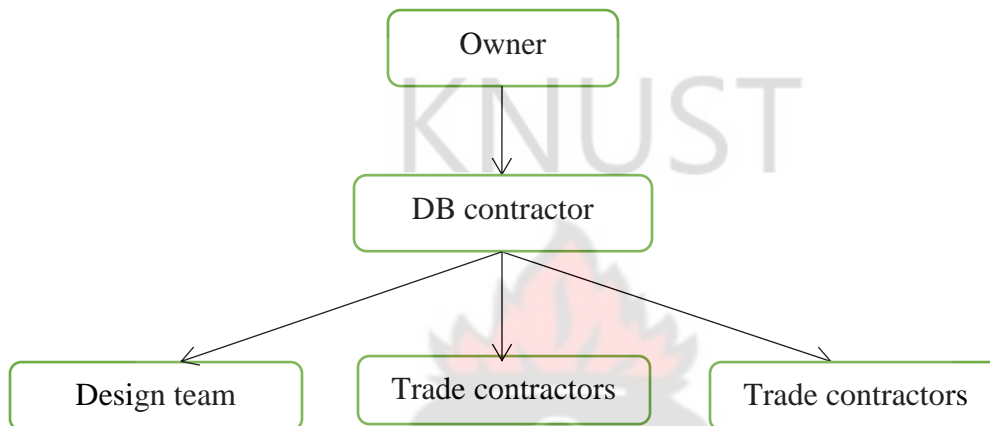


Figure 2-4; Organization structure of DB procurement method

Source: Author's Construct (2018)

2.3.1.3 Construction management (CM)

The Construction Management (CM) method is a comparatively new construction procurement method (Thwala and Mathonsi, 2012) and was introduced as a substitute to DBB (Kent and Becerik-Gerber, 2010). CM is defined it as a method in which a client agrees with a capable company or individual to offer guidance, administration and supervision services for a definite range of works (Mahon, 2011; Lo and Chao, 2007; Tawiah and Russell, 2005). CM is management focused method (Thwala and Mathonsi, 2012; Seng and Yusof, 2006), with a construction manager assisting in the design and acts as the general contractor throughout the construction activities (Liv, 2011; Al – Khalil, 2002). In this system, the client keeps two distinct

agreements between the design team and construction manager. Nonetheless the construction manager helps the design team to produce something that can be built within budget, constructability reviews, bill of quantities, and agreement drafting (Thwala and Mathonsi, 2012; Al – Khalil, 2002). His involvement with the design team can help him start working on cost control, scheduling, ordering materials and coordinating sub-contractors (Jackson, 2010; Thwala and Mathonsi, 2012).

There are more than a few roles and responsibilities that can be achieved by the construction method according to Lo and Chao (2007). Some of them are constructability appraisals it offers, estimates of the construction, packaging of the works into smaller work packages and value engineering. Tawiah and Russell (2005) suggested that this method of project delivery is usually realistic on huge, multifaceted facilities that need a blameless arrangement on supervision and organization. Al – Khalil (2002) also concluded the CM method is useful in facilities where the owner necessitates added services, like finishing faster than scheduled.

2.3.2 Criteria for selecting appropriate project delivery method

Jin Lin et al (2015) suggested that choosing the best suitable PDM for the delivery of a facility is the most complex and challenge task every client has to make throughout the initial stages of a facility. The choice of which project delivery method to embrace in the construction of a facility is the most multifaceted and challenging task for owners. This is because a wrong choice can result in schedule overrun, budget overrun and client dissatisfaction (Love et al., 2012). They also concluded that realistic measure of suitability or performance of the available PDMs has to

be assessed before owners can make the selection of the right project delivery method for a specific kind of facility.

The selection of a suitable PDM is a critical milestone in the process of constructing a facility. It involves a clear brief from the owner, consultants translating the brief into drawings and specification and then to the contractor for construction (Sundar, 2012). Ratnasabapathy et al. (2006) said, in determining the type of delivery method, a lot of consideration on the various factors must be made before any useful conclusions are made since a wrongful selection normally points to failure of the project and / or dissatisfaction of shareholders. Consequently, a logical methodology for selecting of the utmost suitable method is essential to enable the owners to accomplish their decisive project objectives, as it will guarantee the greatest value for money used in constructing the facility. A number of writers including Naoum and Egbua, (2015), El-Hassia, (2005) and Masterman, (2002) suggested these three significant fundamentals for the selection of PDMs:

- Determination of owner's needs,
- Features of the project and
- Environment of the project.

Therefore, choosing a PDM comprises a strategic set of judgments that must be planned for and should entail the involvement of experienced professionals. The process of selection demands a rigorous methodical procedure by owner, which encompasses depending on a number of prevailing techniques for selecting PDM (Ghadamsi, 2016; Touran et al., 2010; Chan, 2007; Al – Khalil, 2002; Chan et al., 2001). Table 2 – 1 summarizes the frequently used criteria from the

works of past researchers because there are a widespread collection of factors that may possibly count as benchmarks for the selection a suitable PDM.

Table 2-1: Common criteria for selecting appropriate project delivery method

DBB selection criteria	DB selection criteria
High price competition	Quick delivery of construction process
Clearness of scope definition	Quick project commencement
High level quality required	Effective communication between stakeholders
Owner involvement in the project	
Controllable project variations	Easiness to alter design and construction
Cost certainty	One point of accountability
Time certainty	Reduced encounter between stakeholders
Ease of organizing and reviewing project activities	Risk transfer to the contractor
Project functionality	Desiring reduced project budget
Clarity in the duties of shareholders	Desiring reduced project duration
	The know – how and experience of contractor
	Cooperative working rapport among team members
Design complication	Design complication
Desiring efficient project planning	Desiring efficient project planning

Source: Author's Construct (2018)

Apart from the above criteria, the traditional method of project delivery was adopted for this research because, that is the method used by the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast.

2.4 FACTORS AFFECTING PROJECT DELIVERY

Efficient project delivery means controlling and managing ambiguity. According to Asiedu, (2009) and Enshassi et al., (2009), the factors that affect project delivery are a set of circumstances or facts which contribute to the success or failure of a project. Various studies in construction industry recommended cost, time and quality/performance as the collective targets for project success (Williams et al., 2015; Arti et al., 2013; Lai and Lam, 2010; Shamas and Stephen, 2010; Asiedu, 2009; Cheung et al., 2004; Frimpong et al., 2003; Luu et al., 2003; De Wit, 1988; Wright, 1997).

There is a wide variety of thoughts regarding the factors affecting the delivery of projects. According to Ahmed et al (2003), a single problem or party to the contract and inter – connected array of problems are the causes of non – completion of projects. Aziz (2013) concluded that the path of project delivery is multifaceted with incorporation of numerous activities, that is different stages of works are done for a long time till the completion. A review of literature on project delivery revealed that contributing factors are common but the intensity, however, differs with each project (Ampadu-Asiamah, 2013). From literature, the factors that affect project delivery have been grouped as follows;

2.4.1 Pre – construction related factors

According to Doloi et al (2012), the factors that affect project delivery occurring before the commencement of the project are:

- Failure of the client to co-ordinate with authorities in pre – construction stage for proper documentation
- Unrealistic contract tender price
- Delay in design work
- The contractor not having proper technical study during the tendering stage
- The contractor delaying to mobilize to site
- Delay of shop drawing approval
- Unrealistic initial contract duration
- Preparation and approval of planning and network schedule before or after project start.
- Problems due to project delivery system
- Client delaying to hand over the site.

2.4.2 Materials related factors

One grave factor in the construction industry is materials. Different studies have been done by researchers to identify factors related to materials in project delivery. Kim et al. (2009) suggested that the most life – threatening factor in the construction of any facility is the delivery of materials. Material related direct factors as found in previous studies are:

- Quality of materials
- Material unavailability
- Interruption in the delivery of material
- Damaged material in store
- Material selection difficulties

2.4.3 Labor and equipment related factors

Sweis et al. (2008) concluded that labor and equipment related factors are one of the numerous factors that form the basis for interruption in project delivery. The direct factors related to labor and equipment is:

- Manpower unavailability
- Low labor productivity
- Personal conflicts among labors
- Scarcity of equipment
- Equipment failures
- Absence of high-technology mechanical equipment
- Increasing cost for renting construction equipment

2.4.4 Contractor related factors

A number of studies by several scholars (Doloi et al 2012; Sambasivan and WenSoon 2007; Assaf and Al-Hejji 2006 and Koushki et al 2005) have identified contractor related factors as follows:

- The contractor's team lacking of technical know – how
- Difficulties in project forecasting and programing on the part of the contractor
- The contractor employing improper method of construction
- Financing difficulties on the part of the contractor
- The contractor having problems with suppliers, subcontractors
- Accidents during construction period

- Rework due to errors
- Unsuitable leadership of contractor's construction manager
- Quality of contractor's work
- Inefficient site management
- Delay in taking action
- Insufficient experience of contractor

2.4.5 Client related factors

The employer/client of every facility has a countless influence its performance in respect to schedule (Kometa et al, 1995). The client related direct factors that were found in literature are:

- Delay in contractor's progress payments
- Client financial problems
- Design changes by owner
- Employer's poor communication with other stakeholders
- Deficiencies in owner's team
- The owner meddling in the construction activities
- Slow decision making by the employer
- Unnecessary bureaucracy in the client's organization

2.4.6 Consultant related factors

There has been some studies on consultants in past. However, since every project is different from the other, consultants are unable to deal effectively with some details because of their knowledge and delays in reviewing design drawings (Al-Kharashi and Skitmore, 2009).

Consultant related direct factors are:

- Design changes and modifications by the consultant
- Uncertainties, errors and discrepancies in drawings and design specifications.
- Design complexity
- Delay in taking actions regarding material, shop drawings approval or delays in providing design information.
- Wrong site investigation
- Problems in contract management

2.4.7 Project related factors

Project related direct factors that found in the previous studies are (Doloi et al 2012):

- Site possession
- Difficulties in obtaining work permits from public authorities
- Mistakes and discrepancy of contract clauses
- Inefficient delay penalty
- Weather delay conditions
- Unrealistic contract price or time
- Project Delivery System

2.5 FINANCIAL FACTORS AFFECTING PROJECT DELIVERY

Financial constrain is one of the core factors affecting project delivery (Frimpong et al., 2003). A comprehensive review of financial related factors affecting construction projects are snags of contractor's cash flow, delayed payments and unfortunate fiscal situations (Ahmed et al., 2003 and Alaghbari, 2005). Furthermore, Arditi et al. (2000) expressed difficulties in obtaining loans as a financial problem. The financial factors that affect project delivery are as follows:

2.5.1 Late payment

An employer's inability to pay executed work in time as specified in the contract arrangement is known as late payment. Late payment can cause a break in the capital chain of the contractors, which causes construction delays (Vu et al., 2015). Delay payment is caused by the stakeholders (contractor, consultant, client, banker and other players) connected to the procedure of preparing a certificate. When a disbursement difficult initiates to swell, it naturally becomes bad over a period. Hence the monetary problems will move from one member to other and eventually generate cash flow problem. The known causes of late payment include;

- Deprived financial and commercial administration of the employer,
- Employer withholding payment,
- Illegal claim by the contractor,
- Consultants delaying the assessment and authorization of provisional payment,
- Discrepancies in valuation for work executed,
- Inadequate data and records for valuation,
- Participation of several stakeholders in the procedure of payment,

- Contractor's misapprehension of owner's requirement on change order.

2.5.2 Poor management of cash flow

Management of Money is the biggest factor that affects project finance (Abdul-Rahman et al., 2009). The process of monitoring, examining and regulating projects' resources is termed as cash flow management. The life – blood of the construction industry is cash flow and it is an indispensable part in carrying out a fruitful project. Hence, a successful project can be delivered if cash flow is well – managed by carrying out a cash flow scrutiny frequently to recognize difficulties. Cash flow forecasting is used in evaluating a facility's cash flow, to predict cash flow problems. Project schedule performance will be improved if cash flow is well managed. The basic reasons to poor management of cash can be branded as;

- More projects being handled by a contractor simultaneously,
- Unsound monetary issues of the contractor,
- Low – bidding by unqualified contractor win contract,
- Absence of steady cash flow predicting,
- Capital being stocked in unproductive investments.

2.5.3 Inadequate funds

Every engineering construction need to be buttressed by enough capital. Alzahrani (2013) concluded that the ability of a contractor to raise funds has foremost influence on the schedule and cost of construction projects. Various writers, (Kaming et al., 1997; Noulmanee et al., 1999)

settled that shortage of funds is one of the key reasons for stoppages in construction. Also, Ubaid (1991) established that the assets of a contractor are the main yardstick on the performance of contractor that causes strikes.

2.5.4 Market issues

Various researchers (Ahmed et al., 2003; Alaghbari, 2005) has suggested that external factors of poor fiscal situations like money depreciation and high price rises could meaningfully affect cash flow of a facility, and therefore influence the scheduled performance. These are the essential causes of market uncertainty that can leads to cash flow difficulties;

- Increase of additional charges in settlement of credit,
- Increase in price rises of material, transportation costs and labor wages and
- Increase in the rate of foreign exchange for imported supplies.

2.6 DEFINITIONS OF INCENTIVES

“Incentive” is derived from the Latin “incentivus”, meaning “to stimulate” or “to provoke”, and when incentives are suitably engaged, it can motivate contractors and other stakeholders to accept, the aims and purposes of client (Gilbert, 1992). The philosophy of incentive is that an individual’s or organizations latent abilities, both mental and physical, can be expanded in far greater abundance than it is normally utilizes. Economic incentive is a scheme that uses quantifiable means to stimulate members to perform for the formation of common merchandise. (The Great Soviet Encyclopedia, 1979). Incentive is defined as a stimulus to inspire an individual

or organization so as to place superior importance in the way to accomplish an objective or to do things in a definite approach (Broome and Perry, 2002). According to Smith (1998) incentives are ‘bribes’ and ‘sweeteners’ in the context of project implementation. Stolovitch et al (2002) also explained incentives as something/item appreciated by an organization or individual that is presented in exchange for improved performance. It can be affirmative or destructive, noticeable or insubstantial, financial, or non – financial.

2.7 FINANCIAL INCENTIVES SCHEMES

Financial incentive systems are concentrated on persuading individuals or organizations to realize the specified project objectives in expectation of monetary assistances (Whitmore, 2012). Financial incentives are mitigating measures that are neither against the contract nor obligatory, but the client does it to boost productivity. The use of financial incentives is directed at snowballing productivity by improving the inspiration of individuals or organizations to aid achieve project goals. Most clients have introduced different financial incentive schemes aimed at improving contractors’ performance and enhancing timely completion of projects due to the poor performance of the contractors. The actions carried out by most clients include mobilization advance payment, assistance to procure materials, prompt or early honoring of certificate, retention bond, waiver of damages and bonus payments for early completion.

2.7.1 Mobilization advance payments (MAP)

Initial financial imbursement ushered by the employer to the contractor for preliminary expenses in terms of site mobilization, and a fair proportion of job overheads is called Mobilization

Advance Payment (MAP). MAP was introduced with the aim of helping of small and medium scale contractors to overcome financial difficulties. The advance payment paid ranges from 10 – 50% of the contract sum or more depending of the urgency and nature of the project. It was introduced to relieve cash flow problems faced by many small to medium contractors. Eyiah (2001) argued that, MAP is a positive approach as it reduces the need of the contractor to lobby for working capital. Nevertheless, mobilization advance is negatively affected by misappropriation of the cash and lack of management skills to successfully utilize it (Adolwa, 2002).

2.7.2 Bonus payments for early completion

Some construction contracts have a provision for an incentive bonus for early completion. It is common on private contracts, that affect utility or industrial projects and private public transportation contracts. The chance that the contractor will receive a bonus is attractive, but it emanates with a risk. The incentive bonus normally goes along with a disincentive price for the contract if he fails to meet the specified agreements. Campaigners of incentive systems claim that incentives such as bonus payment for early completion can help contractors to hand over their projects on time and within budget. Assaf and Al-Hejji (2006) studied the Saudi Arabia construction industry and concluded that, the absence of incentives to contractors who finish their projects before schedule as one of the main causes for delays. However, they did not mention the types of incentives.

2.7.3 Assistance to procure materials

Some contractors appeal to the employer for monetary support by asking them pay directly to suppliers of materials. Such a measure is very important when the contractor is facing cash flow problems and has no credit facilities with suppliers, since it will prevent delays. But, there are divided views from other participants as to whether the owner must support the contractors to procure materials. Nevertheless, such provision may not be useful in developing monetary judiciousness and long – term capacity of contractors.

2.7.4 Waiving liquidated damages

Clients normally waive the damages even though most projects are delivered beyond schedule. Liquidated damages are usually waived to prevent further financial problems on the contractors. Most at times the contractor who has failed to finish a project within the contract period may already be under cash – flow problems. Hence, punishing him with liquidated damages would make the condition worse. Nonetheless, it can be argued that the failures of construction clients from enforcing this clause in the contract, is contributing to persisting poor project performance.

2.7.5 Retention bond

A percentage (often 5% or 10%) of the amount of money certified as payment to the contractor on a provisional certificate is retained by the client and it is known as Retention. This is done to ensure the contractor accurately completes the works required of him under the contract. Retention bond is a kind of performance bond that guards the client after the project is completed. The bond guarantees that the contractor will rectify all required structural and/or other defects revealed immediately after completion of the contract, even if full payment has

been made. It has the benefits of providing protection to the client that any defects will be corrected without causing financial disadvantages to the contractor. It signifies a pledge by a third party (normally an insurance company or a bank), to pledge the commitments of the contractor. This is usually the same as the maximum cash retention amount. Retention bonds provide better value to the contractor throughout the construction stage but at the same time without being disadvantageous to the owner, concerning sub – standard work at the end of the construction stage.

2.8 PROJECT PERFORMANCE

The construction industry of both developed and developing countries has the problem of project performance measurement or evaluation (Enshassi et al., 2009). Nonetheless, most countries are doing their best to achieve a good project performance by improving and enhancing the project specification. Ordinarily, a project that meets its purposes in respect to schedule, budget and quality is considered to have attained good performance. Bassioni et al., (2004) considered these as the main criteria to assess and evaluate project performance. According to Asiedu (2009) a number of countries at different heights of socioeconomic growth have documented the requirement and significance of ensuring measures to advance the performance of the construction business in their respective countries. He continued to explain that one of the ways to end this is by ensuring performance efficiency in the execution of construction facilities. The iron triangle consists of schedule, budget, and quality which are still considered as the prime objectives of any facility (Chan et al., 2001).

2.8.1 Project performance measurement

Key Performance Indicators (KPI) is used to facilitate the evaluation of project and managerial performance throughout the sequence of the delivery of the project (The KPI Working Group, 2000). According to Polat et al. (2014) and Iyer and Jh (2005), even though it seems simple theoretically, assessing and evaluating the performance of any construction project is a very composite procedure, and it has gone through a lot research. Project performance appraisal is used as a logical means of measuring and mediating the performance of projects by assessing the inputs and outputs of the various happenings and the concluding results (Enshassi et al., 2009; Takim et al., 2003)

There are numerous studies conducted on different indicators for measuring and computing project performance. Many project performance criteria that relate to various dimensional collections, like budget, schedule, quality, health and safety, environment and others are used to measure performance. Nevertheless, the ‘iron triangle’ that is schedule, quality and budget are the main performance assessment scopes for project performance (Williams et al. 2015; Csehati and Szabo, 2014; Enshassi et al., 2009; Iyer and Jha, 2005; Bassioni et al., 2004; Bryde and Brown, 2004; Albert et al., 2002; De wit, 1988). The well – known differences between good and poor construction project performance always emphasis on attaining of budget, schedule and quality requirements (Bryde and Brown, 2004).

Ten performance criteria to evaluate the performance of a facility acquired by tradition system of project delivery were developed by Konchar and Sanvido (1998) and Molenaar and Songer

(1998). Those performance criteria are used to address the different sides of the success of a project. The prime project objectives being budget, schedule and quality were captured. The performance criteria have been grouped in to the following:

- In respect of budget it consists of cost growth and unit cost.
- Delivery speed, schedule growth and construction speed make up for schedule.
- In respect of quality, the list consists of material and equipment quality, workmanship quality and system quality.

The administrative liability of the owner and its satisfaction were also included in the performance metrics.

Ofori – Kuragu et al, (2016) established nine (9) project indicators for contractors in Ghana that are used for project performance evaluation. They stated that quality; employer satisfaction; cost; time; business performance; health and safety; environment, productivity and people are the KPI in order of importance to Ghanaian contractors. Asiedu (2009) grouped the KPI into objective and subjective indicators. Construction time, time variation, rapidity of construction, accident rate, unit cost and impact of the environmental are the objective measure, while quality, employer fulfilment, purposeful, design team fulfilment and construction team fulfilment are the subjective indicators.

From the above, it can be observed that evaluating and computing the success of projects were limited to project performance results in terms of duration, budget and quality metrics. There are other additional considerations like owner satisfaction, consultant satisfaction, contractor

satisfaction, environmental, innovation and health and safety which are subjective nature and are assessed by different project shareholders. For the purpose of this thesis, the following KPI were used to measured performance.

2.8.1.1 Time

Time is termed as the point by which the universal situations endorse the accomplishment of a facility within the assigned period. It is arranged to permit the facility to be made available by the day firmed by the employer (Hatush and Skitmore, 1997). It is assessed in terms delivery speed, speed of construction, time overrun and schedule growth.

- Construction time = Practical completion date – Project commencement date
- Time overrun can be given by the formula below:

Time overrun = Actual completed date – scheduled completed date

- Speed of construction can be defined by the formula below:

Speed of construction = Gross floor area (m²) / Construction time (days or weeks)

- Schedule growth (%) can be defined by the formula below

Schedule Growth (%) = (actual completed date – scheduled completed date) * 100 / scheduled completed date

2.8.1.2 Cost

It is termed as the point by which the universal situations endorse the accomplishment of a facility within the projected cost. The cost of a project is the complete cost from start to finish, which includes cost of variations, modification during construction time and legal claims. It is assessed in respect to unit cost, cost overrun, and cost growth.

- Cost overrun is given by:

Cost overrun = final contract sum – estimated contract sum

- Unit cost is given by:

Unit cost = Final contract sum / Gross floor area (m²)

- Cost Growth (%) is calculated by:

Cost Growth (%) = (Final contract sum – initial contract sum) * 100 / initial contract sum

2.8.1.3 Quality

Quality is the entirety of categories requisite by a product or services to please an agreed prerequisite (Parfitt and Sanvido, 1993). It is estimated by conformity with anticipations, total owner fulfilment, workmanship, contractor know – how and skills. Adhering to specification is another mean to assess quality (Songer et al., 1996; Wateridge, 1995). Specification is termed as workmanship rules delivered to a contractor by the employer or employer's agents at the beginning of a facility. The evaluation of quality is subjective.

2.8.1.4 Participants' satisfaction

Different writers (Cheung et al., 2004; Parfitt and Sanvido, 1993; Sanvido and Kochnar, 1999) have proposed participants' satisfaction as a vital measure. Client, consultant team and construction team make up the vital members in a usual facility. Their degree of fulfilment is a pointer of project success, even though subjective.

2.8.2 Project success

Project success is a matter which is extensively studied and debated; nevertheless, it is barely ever settled on (Csehati and Szabo, 2014). Chan and Chan (2004) indicated that the critical objective for all facilities is for it to be successful. A facility is fruitful provided that the result of the facility is far better compared to the predictable in respect to time, cost, quality and safety according to Csehati and Szabo (2014).

Other researches have different definitions for project success. For instance, Csehati and Szabo (2014) indicated that a project is successful if the product of the facility is much better than it's predictable in relation to duration, budget, safety and quality. On the words of Arti et al. (2013) a successful project is attaining the prerequisite expectancy of shareholders and accomplishing its projected purpose. This is achieved by stating the deliverables of a facility and comparing it with the attained end result after the construction of the facility. The success of a project is a tactical management theory where the efforts of project need to be associated with both short and long – term objectives of the establishment. Project success must also be observed from dissimilar viewpoints of persons and the objectives connected to a diversity of components, comprising of

educational, technical, social, financial and professional subjects (Al-Tmeemy et al., 2010). According to Bradley (2008), a successful project is the one completed on time, within budget and with organizational impact. He again directed that the opinion of fruitful construction projects is mostly founded on the scope and size of the project, participants, experience of the owner in relation to design and construction, complexity of the project, and their technological consequences.

According to Min et al. (2010), project success is the core goal of every stakeholder and may possibly be observed from diverse a perspective that is financial, technical, social, education and specialized matters. They also argued that since different stakeholders are involved in project administration, the success of the project can be viewed differently since their requirements differ. Koelmans (2004) confirmed this by stating that owners may contemplate success in relation to whether the facility has met its methodological performance, retained its planned schedule and finished within the agreed budget and quality specifications.

The success criteria of the parties to a project ordinarily changes from project to project in respect to the location, scope, innovation, size, and the experience of the client (Csehati and Szabo, 2014). They also indicated within a project, the benchmarks of measuring project success vary among shareholders as listed below:

- On schedule, within budget and good quality are client's criteria for project success

- Consultants' criteria include: satisfied client, within budget, on schedule, met design fee and profit goal, quality architectural product, minimal construction problems and professional staff fulfillment,
- Contractor's success criteria include: on time, under budget, no legal claim, profit, meeting quality specification and client satisfaction

Hence, conclusion can be made that a facility that is considered successful must have met the specification of its technical performance and task and also if there is an extraordinary degree of fulfillment regarding the product of the facility among its shareholders. Again it can be strongly stated that the success of a project is ruled on from the perspectives of the project shareholders. Nevertheless, the objectives of all members, even within the same project, are not always similar. Therefore, to explain the success of a facility, the participants and the benchmarks for mediating the performance must be specified. The iron triangle (cost, time and quality) and participants' (Client, consultant team, and contractor team) satisfaction are the key objectives and they were deliberated the principal benchmarks for measuring project success in this thesis.

2.9 RESEARCH GAP

Upon on the review of literature presented, the writer recognizes that there is an extensive investigation and enquiries conducted that report on a number of different project delivery topics. The emphasis of these investigation and enquiries has lean towards these areas of project delivery, namely: the characteristics and features of existing project delivery methods; the importance of using the right method for project delivery; selecting project delivery methods and

factors affecting the project delivery methods. Nonetheless, they presented significant and appreciable facts required to address the objectives of this enquiry.

However, little research has been considered regarding the use of financial incentive to influence the delivery of projects. From literature, it was also pointed out that, there is currently no systematic and no realistic approach applied or used to determine the impact of financial incentives of project delivery even though there are some incentive schemes being made available to contractors. Bearing in mind of this shortfall, this research attempts to examine the impact of financial incentives on project delivery using projects executed at the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast as a case study.

2.10SUMMARY

This chapter discusses the project delivery in general. It begins with an introduction of the stages of project delivery. Also, this chapter explores the methods of project delivery: DBB, DB and CM. Factors affecting project delivery in the construction industry is extensively dealt with. In addition, financial factors that hinder the success of construction project were looked at. A critical review of the concept of incentives and financial incentives schemes available in the construction industry in Ghana were carried out. The key indicators for project performance measurement (time, cost, quality and participants' satisfaction) were elaborated and the criteria for a successful project agreed. It was recognized that there is an extensive work has been

conducted on a number of different project delivery topics but little research has been considered regarding the use of financial incentive to influence the delivery of projects.

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CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

Rajasekar, (2006) said that it is important to identify the systematic procedure to attain the objectives and the research methods for the enquiry. Therefore, it discusses the various steps undertaken by the researcher to explore the objectives of this research. Also, the chapter describes the proposed research method used to investigate the impact of the use of financial incentives on project delivery in Ghana. The availability and selection of appropriate research design and method that would address the research problem and the key questions raised are also presented in the chapter. This includes the selection and justification for the choice of philosophy, approach, strategy, choice and research time horizon. Methods and techniques used in data collection, analyses, and interpretation are also presented.

3.2 RESEARCH PHILOSOPHIES

According to Collies and Hussey (2009), the term ‘research philosophy’ means the framework that outlines or controls how to conduct or carry out research grounded on people’s assumptions of the world and the nature of knowledge. Bryman (2012) described research philosophy as a cluster of beliefs that dictates what should be studied, how research should be done and how the results should be interpreted. Research philosophy controls how to conduct the study grounded on the assumptions of people of this world and their extent of knowledge (Collies and Hussey 2009). Hence, it offers an elementary arrangement and outlines that makes up a scheme which

comprises known ways, approaches and principles for describing and modifying research (Taylor et al., 2012; Glenn, 2009).

3.2.1 Ontology

Ontology is apprehensive with nature of reality. That is the assumptions researchers have to make about the way the world functions and the commitment held to particular opinions. (Saunders et al., 2009). According to Bryman, (2012) social ontology is concerned with the nature of social entities. The two features of ontology as referred to by Saunders et al., (2009) have their own followers among business and management scholars. Also, they are expected to be acknowledged as generating valid knowledge by many academics. They are objectivism and subjectivism.

Objectivism, as described by Saunders et al., (2009), represents the position that social entities exist in reality external to social players. It is an ontological stance that suggests that social phenomena confront us as external specifics that are beyond our grasp (Bryman, 2012). According to Saunders et al., (2009) the subjectivist opinion is that social occurrences are generated from the views and subsequent actions of social players. Bryman (2012) defined subjectivist or constructivism is an ontological stance that affirms that social occurrence and their meanings are constantly being accomplished by social players. It suggests that social occurrences and categories are not only created through social dealings but that they are in a constant state of modification

3.2.2 Epistemology

Epistemology, according to Saunders et al., (2009) is concerned with what constitutes acceptable knowledge in a field of study. Bryman (2012) suggested that, it concerns the question of what is or should be regarded as acceptable knowledge in a discipline. He explained further that, the fundamental issue in this context is the question of whether the social world can and should be studied according to the same ideologies, techniques, and beliefs as the natural sciences. According to Cohen et al., (2007) epistemology involves the nature and methods of knowledge. Baiden (2006) concluded that an epistemological matter is “how we know” and the approaches through which knowledge are attained in any discipline. Literature identifies positivism, also called scientific and anti – positivism, also referred to interpretivism as the main research philosophies related to an epistemological stance (Myers, 1997; Baiden, 2006; Saunders et al., 2009; Bryman, 2012; Remenyi, 2012).

Bryman, (2012) concluded that, positivism epistemological stance promotes the application of the methods of the natural sciences to the study of social reality and beyond. The positivist epistemological position’s aim is to produce a proposition and to check it using scientific and rational means. It promotes the use of ordinary sciences system to the learning of societal certainty and elsewhere. Positivism is also of the conviction that, the world obeys complex issues and rigid laws of origins and effects that could be undertaken via basic tactics. But the term stretches further than this opinion, though the component elements vary between writers. Conversely, Bryman, (2012) concluded that, positivism is also taken to entail the following principles:

- Only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (the principle of phenomenalism).
- The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (the principle of deductivism).
- Knowledge is arrived at through the gathering of facts that provide the basis for laws (the principle of inductivism).
- Science must (and presumably can) be conducted in a way that is value free (that is, objective).

There is a clear distinction between scientific statements and normative statements and a belief that the former are the true domain of the scientist. This last principle is implied by the first because the truth or otherwise of normative statements cannot be confirmed by the senses.

Bryman, (2012) explained interpretivism as a term that usually point toward an alternative to the positivist convention that has held dominance for years. It is predicated upon the view that a strategy is required that respects the differences between people and the objects of the natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action. According to Saunders et al., (2009), interpretivism promotes that it is essential for the scientist to apprehend differences between humans in our role as social actors. This highlights the difference between conducting research among people rather than objects such as trucks and computers. The research uses its perspective and point of reference in understanding and interpretations. The research cannot take an uninterested impartial point when using the anti – positivism position.

3.2.3 Axiology

Axiology is a division of philosophy that studies judgments about value. Although it may include values we possess in the fields of aesthetics and ethics, it is the process of social enquiry with which we are concerned here (Saunders et al., 2009). Axiology considers the philosophy surrounding the reality, as to whether research philosophy is ‘value free’ or ‘value driven’. If the choice for what to study or how to study is examined by objective criteria, it can be described as value free research. On the other hand, value laden is driven by subjective criteria. (Pathirage et al., 2005).

3.2.4 Philosophical position of this research

The study implemented the subjectivist position at the ontological level. This is because structures for the use of financial incentives happened but participants most at times do not diagnose and monitor the techniques and methods that make them operational. Hence the existing arrangements and how the structures existed could be explored and recognized. Again, the study observed the research to be as practical as possible. Contractors and consultants were already involved in the existing techniques and methods. On the other hand, the accepted epistemological stance was positivist. The study belief that the multifarious connections between the several project delivery players could be discovered through a methodical but streamlined steady style. In the axiological stance, this research use ‘value free’ since the choice for what to study or how to study is examined by objective criteria.

3.3 RESEARCH APPROACHES

A research approach, also termed as logic of inquiry, offers the investigator with a foundation and bearing to treat the research questions. Every research project involves the use of theory which may or may not be made explicit in the research design but in the presentation of the results and decisions. According to Saunders et al. (2009), a research approach should either be a deductive approach, in which the investigator develops a theory and hypothesis and a research strategy is design to test it, or the inductive approach, in which the investigator would collect data and develop a theory from result of the analysis of data. Each research approach has its unique ontological assumptions, logical steps, theories and concepts, explanations as well as outcomes (Blaikie, 2009).

3.3.1 Deductive approach

Deductive approach is the principal research approach in the natural sciences, where regulations forms the foundation of clarification, permit the expectation of phenomena, predict their occurrence and therefore allow them to be measured (Blaikie, 2009; Gray, 2009; Saunders et al, 2009). That is, it consists of the establishment of a theory that is subjected to a rigorous test. There are five sequential steps usually followed in a deductive research approach. These are: first, inferring a hypothesis, uncertain argument, an assumption or proposition from existing theories. Second, researcher expresses the hypothesis by indicating precisely, how the ideas or variables are to be computed, which suggests a correlation among two definite ideas or variables; Third, testing this operational hypothesis to know its importance in academia. Fourth, scrutinising the exact result of the analysis, that is, either it confirms the theory or shows the

need for its alteration. Fifth, if needed, the theory is modified in view of the conclusions. Otherwise, an effort is made to validate the reviewed theory by reiterating the whole sequence. When the outcomes support the theory, the investigator can debate that the theory is provisionally sustained, however not factually upheld (Blaikie, 2009; Saunders et al, 2009; Bryman, 2012). The deductive approach usually uses an extremely organised scientific procedure to help replication (Gill & Johnson, 2010), quantitative measures and an ample sample size so as to test propositions (Saunders et al, 2009).

3.3.2 Inductive approach

Investigators can easily offer descriptions of personalities, groups and events, but intermittently, they are obligated to clarify the features and patterns of personalities, groups or phenomenon (Saunders et al, 2009). Blaikie (2009) suggested that, the inductive approach empowers investigators to create limited generalizations about the dissemination of, patterns of association amongst, observed characteristics of individuals and social phenomena. With the inductive approach, investigators commence with collection of data and then search for developing patterns, theories or models that propose correlations between variables. Investigators with inductive approach usually criticise the deductive approach for disregarding descriptions and reasons. They also claim the deductive approach purely concentrate on results and stiff research frameworks (Saunders et al, 2009; Bryman, 2012). Table 3 – 1 is a list of some of the most important differences between the two approaches to research.

Table 3-1: Difference between deductive and inductive approaches

Deductive approach	Inductive approach
➤ Scientific philosophies	➤ Gathering of qualitative data
➤ Starting from theory to data	➤ Close appreciative of the study setting
➤ Need to clarify causal correlations among variables	➤ Attaining an appreciative of the values humans assign to happenings
➤ Gathering of quantitative data	➤ Very flexible structure to allow alterations of study emphasis as it develops
➤ Application of controls to safeguard strength of data	➤ Recognition that the investigator is part of the study process
➤ Operationalisation of ideas to safeguard explanations of definition	➤ Not very much concern with generalisation.
➤ Extremely organised approach	
➤ researcher independence of what is being researched	
➤ the necessity to select samples of sufficient size in order to generalise conclusions	

Source: Saunder et al. (2009)

3.3.3 Research approach adopted

The choice of research approach is influenced by the emphasis of the study and the type of the study questions (Saunders et al, 2009). From the review of literature, it was seen that there were limited number of studies on financial incentives and its impact on project delivery. Therefore, it is challenging for the investigator to create propositions, hypotheses, hypothetical models and mechanisms. Furthermore, assuming restraining theoretical propositions, hypotheses and models would be the grounds for prejudice and negative impact on the explanation of the project delivery (Strauss & Corbin, 2008). Therefore, the deductive approach could not be considered for this research.

From the research questions, it shows the research will develop a theory or model from the explanations of the observed phenomena on the use of financial incentives in project delivery. Therefore, an inductive research approach delivers the utmost suitable solution for this study.

3.4 RESEARCH STRATEGY

Research strategy offers the various frameworks available for the gathering and analysis of data (Bryman, 2012). Hence, research strategy is the framework upon which the method of research is engaged. It tolerates the investigator to link observed data in a reasonable order to the preliminary study question to draw conclusions on the enquiry (Bryman 2012). Saunders et al. (2012) decided that the selection of research strategy should be guided by the research objectives and questions, the scope of prevailing knowledge, the extent of time and other resources

available to the investigator, as well as the philosophical underpinnings. They concluded that the strategies should not be assumed to be being mutually exclusive.

3.4.1 Experimental

This is the research strategy that depends on the manipulation, control and testing of well – defined variables to appreciate inter – tendencies and causal relationships (Fellows and Liu, 2008). It uses manipulations to tests interactions among research variables and dependent variables (Kumar, 2011). Observations are used to collect further information for analysis. Control over the experiment, results being guarantee, dependable enquiry design and the recognition of specific issues are some of the benefits of experiment. Experiment is a strategy of research that owes much to the natural sciences, even though it features intensely in most social science research, especially psychology. (Fellows and Liu, 2008; Saunders et. al, 2009; Kumar, 2011). One of the primary objectives of this strategy is the attainment of objectivity, resource predictability, validity and replicability (Saunders et al., 2009). This approach could, however, be unpredictable in terms of its demands on time (Kumar, 2011). Experiments tend to be used in exploratory and explanatory investigation to answer ‘how’ and ‘why’ questions.

3.4.2 Surveys

The survey strategy is frequently related with the deductive research approach. In business and management research, it is the most popular and common strategy and most commonly used to answer questions with who, what, where, how much and how many (Saunders et al., 2009). Surveys tend to be used for exploratory and descriptive research. Saunders et al. (2009)

concluded that surveys are popular by means of allowing the gathering of a huge amount of data from a substantial population in an extremely cost – effective way. Surveys data are often acquired by the usage of questionnaires administered to the agreed population. The data received are standardized to allow easy appraisal. Survey involves large numbers as compared to experimental design and it includes the interactions amongst variables’ opinions and behaviors. Additionally, the survey strategy is observed as commanding by people in general and is both relatively easy to describe and to apprehend. Features of such a sample are often regarded as proxy for generalisation across similar traits in the wider population (Knight and Ruddock, 2008).

3.4.3 Action research

When a researcher works together with staff of an organization in order to resolve a problem it is called action research. Hence, the researcher becomes part of the study by involving in the collaborative diagnosis and evaluation of a problem. That is the investigator and other stakeholders outline the problem to be considered and collaborate with each other to find solutions to the problem. It refers to research within a hands – on scenery with the aim of assimilating action and reflection, theory and practice in resolving a research problem (Coghlan and Brannick, 2005; Cameron and Price, 2009). Reason and Bradbury (2008) suggested that action research uses the establishment of practical methodology as a means for the discovery of information for direct application. Cameron and Price (2009) also agreed that the action research regularly uses an ‘insider’ who collectively engages the rest of an organisation, to access existing practices or knowledge in the direction of enhancement. Hence, it is common for investigation within organisational or industrial settings where there is the need for appreciating or improving

a process (Coghlan and Brannick, 2005; Saunders et al., 2007). The period required for this strategy could be excessive (Reason and Bradbury, 2008).

3.4.4 Case studies

Case study is used for in – depth inquiry of an individual, group or event to discover causations in order to find underlying philosophies. Yin (2009) terms a case study as a practical investigation which explores a present – day occurrence within the context of its real life and can use several sources of proof. It comprises the collection of direct observation, documents, physical artifacts, archival records, interviews and participant – observation for qualitative or quantitative or both. It can be used to understand complex social phenomena. According to Remenyi (2012) case study can describe in the following:

- used for answering challenging or multifaceted research query
- follows an empirical methodology
- encompasses of various unknowns
- recognizes the context through which the research query is positioned
- extension over a long period is no permitted
- application of multiple data sources

3.4.5 Archival research

According to Bryman (2012), Archival research uses organizational records and documents as the basic source of data. Archival research can refer to recent historical document as suggested by Bryman (2012), although the term has historical inferences. It is a type of primary

investigation which encompasses looking for and digging out evidence from original archival records. These records may be held either in institutional archive repositories, or in the custody of an organization that initially produced or gathered them, or in that of an inheritor group

3.4.6 Research strategy adopted

A case study research strategy was adopted because of the high fact – finding nature and complexity of investigation. Case study permits for multifaceted interactions between mutually dependent variables to be considered. Again, it allows an additional all – inclusive method to be used in defining the impact of the use of financial incentives on project delivery. Hence, the study will be best served by case study.

With the main criticism of case studies being inability to generalize, the research preceded with considerations taken on the strength and trustworthiness of the enquiry. The following are the reasons why the other research strategies were not implemented in this investigation:

- Experiments take in the handling of a known variable to regulate its effect on dependent variables. But this investigation rather explores the depth and richness of interactions between interdependent unknowns instead of direct causal interactions among variables. Also the degree of dynamism and flexibility needed to depict the richness of correlation would have been tremendously restricted if an experimental research strategy was used.
- Surveys were not used because of rigidity in design and it not allowing for in – depth investigation of problems. Usage of surveys in this research would have minimized the exploratory potential needed to pinpoint the use of financial incentives in project

delivery. There is the occurrence of extensive disintegration of the research problem shows that worthy practices can be considered from cautiously chosen sample. This principle made the research not suitable a survey design which depends on bulky samples for decisive evidence.

- The conclusions of this investigation were to solve insufficiencies in a prevailing method and without finding the middle ground on the degree of fairness that is why action research strategy was not implemented. It also focused on pinpointing the impact of the use of financial incentives on project delivery. Moreover, it was better for the investigator to assess their files and records instead of being part of the working surroundings. Nevertheless, the study problem was not a collective determination among the investigated contractors, consultants and the researcher.

3.5 RESEARCH CHOICES

Research choice is the way in which an investigator chooses to combine quantitative and qualitative techniques and procedures (Saunders et al., 2009). They also identified two main methods. That is mono methods and multiple methods. Figure 3 – 1 shows the various research choices according to Saunders et al. (2009).

3.5.1 Mono method

Mono method is the usage of a single data collection technique and corresponding analysis procedures (Saunders et al., 2009). The mono method of research uses either quantitative or qualitative techniques or its corresponding analysis.

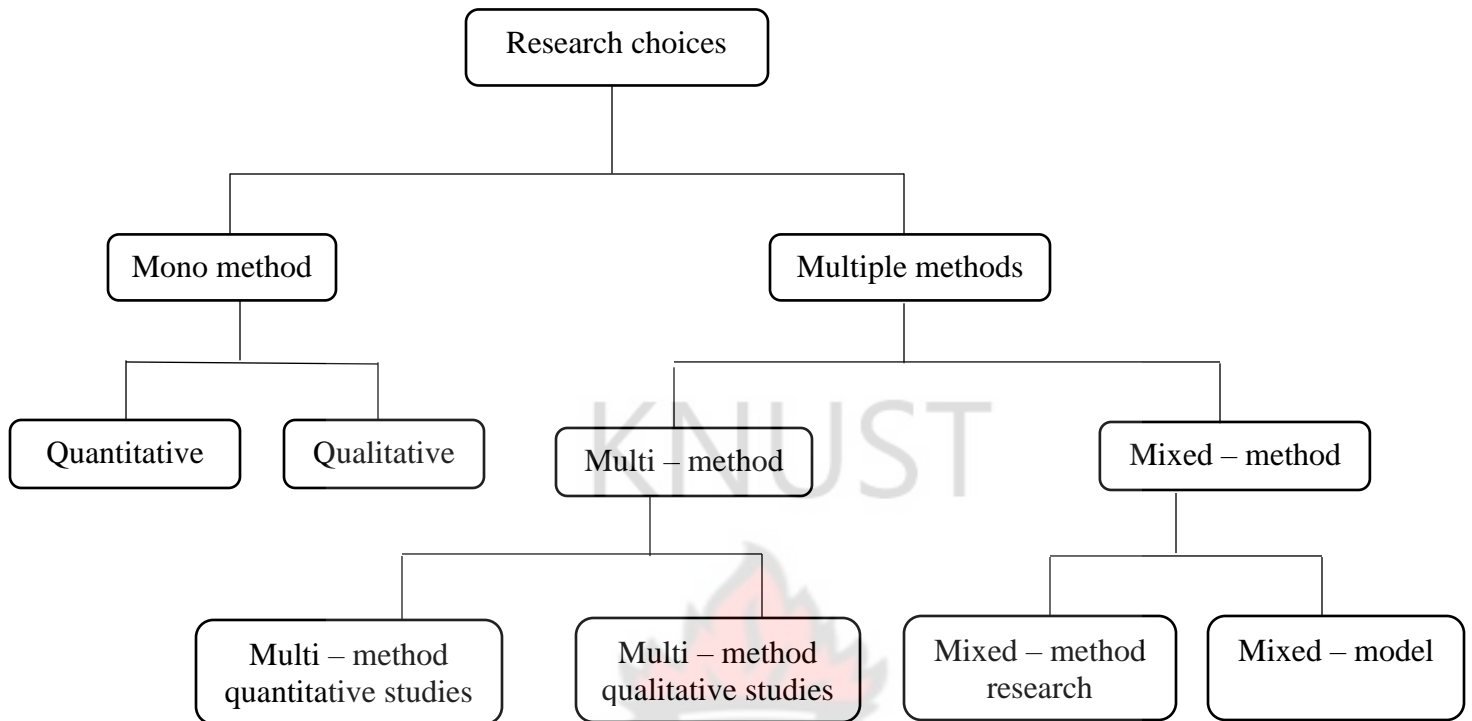


Figure 3-1; research choice

Source: Adopted and modified from Saunders et al. (2009)

3.5.1.1 Quantitative research

Quantitative research refers to a method that normally depend on techniques and procedures that are associated with facts and figures instead of subjective thoughts (Saunders et al., 2007). It is frequently used in describing empirical inquiry into occurrences through numerical or computational procedures (Denscombe, 2010). Denscombe (2010) concluded that, quantitative research refers to testing of unbiased theories through the formulations of hypotheses for subsequent testing of connection between variables. It is the most suitable method for solving research questions involving what, how much and how many (Fellows and Liu, 2008). Rigidity,

lack of context, inadequacy and inaccuracy of sampling techniques may, however, affect reliability of findings (Denscombe, 2010).

According to Bryman (2012), quantitative research can be interpreted as a research strategy that stresses quantification in the gathering and examination of information and that

- requires a deductive approach to the connection among theory and research, whereby much emphasis is placed on the testing of theories;
- has incorporated the practices and norms of the natural scientific model and of positivism in particular; and
- represents an opinion of social reality as an external, objective reality.

3.5.1.2 Qualitative research

Qualitative research encourages a natural and spontaneous development of an inquiry (Denscombe, 2010). It provides a means for discovering and appreciating the subjective opinions that individuals or groups ascribe to occurrences (Creswell, 2009). It is used in solving research questions involving how and why (Fellows and Liu, 2008). Nonetheless, Knight and Ruddock (2008) suggested that, qualitative research is connected with a lot of subjectivity challenges and prejudice because of the seeming lack of limitations. Qualitative research methods are considered as more appropriate in situations where the main inquiry objective strive for the enhancement of the understanding of an occurrence, most importantly when the occurrence is extremely rooted in its context (Knight and Ruddock, 2008; Denscombe, 2010).

According to Bryman (2012), qualitative research can be interpreted as a research strategy that stresses words in the gathering and examination of information and that

- largely highlights an inductive approach to the connection among theory and research, in which the emphasis is placed on the generation of theories;
- has rejected the practices and norms of the natural scientific model and of positivism in particular in preference for an emphasis on the ways in which individuals interpret their social world; and
- represents an opinion of social reality as a constantly shifting emergent property of individuals' creation.

3.5.2 Multiple methods

Multiple methods refer to the use more than one data collection technique and analysis procedures to answer research question (Saunders et al., 2009). There are two different methods under multiple methods according to Saunders et al. (2009). These are multi and mixed methods.

3.5.2.1 Multi – methods

This method refers to those arrangements whereby more than one information gathering procedure is used with accompanying analysis procedures, but it is limited within either a quantitative or qualitative (Saunders et al., 2009). That is, an investigator may choose to gather quantitative information using, either two or more techniques such as questionnaires and

structured observation and analyse these information using arithmetic (quantitative) techniques. This method is called a multi – method quantitative study. On the other hand, a multi – method qualitative study is when an investigator gathers qualitative information using, either two or more techniques such as in – depth interviews and diary accounts and analyse these information using non – numerical (qualitative) techniques. Hence, when an investigator agreed multi – methods he does not mix quantitative and qualitative techniques and procedures (Saunders et al. 2009).

3.5.2.2 Mixed methods

According Saunders et al. (2009) mixed methods approach is the method of using both quantitative and qualitative information gathering procedures and analysis techniques in a research design. There are two types of mixed – method, that is mixed – method research and mixed – model research.

Mixed – method research employs the usage quantitative and qualitative information gathering practices and analysis techniques to either at the same time (parallel) or one after the other (sequential) but does not combine them. That is, even though mixed – method research uses both quantitative and qualitative opinions at the research methods phase, quantitative information are evaluated quantitatively and qualitative information are evaluated qualitatively (Saunders et al. 2009).

Mixed – model research on the other hand, combines quantitative and qualitative information gathering practices and analysis techniques along with combining quantitative and qualitative methods at other stages of the inquiry such as the generation of inquiry questions. That is, an investigator may take quantitative data and translate it into narrative so that it can be analysed qualitatively. On the other hand, an investigator may take qualitative data and convert it into numerical codes so that it can be analysed mathematically (Saunders et al. 2009).

3.5.3 Research choice adopted for the study

The questions and objectives that the researcher wants a response to, determine the research choice to be used. In this thesis, a multi – method qualitative study was adopted based on the following reasons.

- An exploratory research with the aim of providing an all – inclusive method to establish the impact of the use of financial incentives by using prevailing techniques. This largely highlights an inductive approach to the connection among theory and research, in which the emphasis is placed on the generation of theories (Bryman, 2012).
- The study discovered the various factors that affect the delivery of project. It also concealed subjects in depth and tangled with comprehensive description and not numeric. The method was essential to increase understanding required to recognize and comprehend the importance on the use of financial incentives.
- Interviews and archival records were the techniques used in collecting data which were soft, descriptive and less structured. The data were analyzed using framework analysis.

3.6 RESEARCH TIME HORIZON

Time horizon symbolizes the extent of the time within which the investigation is carried out (Saunders et al., 2009). It can be classified into two main groups; cross – sectional studies and longitudinal studies. Cross – sectional studies reflect phenomena at a particular point in time. That is receiving inquiry information on significant variables at the same time or within comparatively smaller time duration. They are carried out when there are time constraints or inadequate resources. (Robson, 2002; Blumberg et al., 2008; Collies and Hussey, 2009; Saunders et al., 2009). Longitudinal studies are carried out over long periods of time to see progression of a phenomenon. It involves gathering information over long duration by taking measurements of the variables (Blumberg et al., 2008; Collies and Hussey, 2009; Saunders et al., 2009).

Cross – sectional studies focus on making interpretations from differences between people whereas, longitudinal studies focus on reiterated opinions (Blumberg et al, 2008). The choice of the time horizon depends on the inquiry questions and the scope to which they are to be responded within a specific duration of time (Saunders et al., 2007).

This research is largely a snapshot, therefore, cross – sectional in nature. The information gathered were those essential to response to the inquiry questions within a specific time. Hence, it did not call for the continuous study of its progression.

3.7 TECHNIQUES AND PROCEDURES

Techniques and procedures comprise of the collection and the analysis of data. The selection of the kind of data collection is influenced fundamentally by the research objectives, approaches

and choice (Naoum, 2007). He also stated that, the selection is also influenced by the accessibility or availability of the data. In conclusion, the data collected determines the method of analysis to use.

3.7.1 DATA COLLECTION

Collecting data can be the challenging, nonetheless, so as to realize the aim and objectives of the investigation it needs to be the suitable. Most at times access to information becomes difficult when dealing with organizations and/or gathering data for your research within specified time (Remenyi, 2012). Case study research comprises of six different sources of data collection and no particular one has a comprehensive benefit above the other. However, each of the sources of data has its own strong point and flaws. The usage of several sources of information gathering as the different sources supplements one another is recommended by Yin (2003). The six sources of information collections with its strong point and flaws are summarized in Table 3 – 2.

Table 3-2: Strong point and flaws of data sources

Data source	Strengths	Weaknesses
Documentation	<ul style="list-style-type: none"> ➤ easy to revise frequently ➤ inconspicuous - not generated because of the case study ➤ precise - contains precise labels and location and incident particulars ➤ extensive reportage – lengthy duration, several dealings and situations 	<ul style="list-style-type: none"> ➤ irretrievability – can be low ➤ partial choosiness from unfinished gathering ➤ reportage partiality - echo mysterious writer partiality ➤ right to use – can be constrained
Archival records	<ul style="list-style-type: none"> ➤ identical strengths as documentation ➤ exact and quantitative 	<ul style="list-style-type: none"> ➤ identical flaws as documentation ➤ ease of access because of secrecy explanations
Interviews	<ul style="list-style-type: none"> ➤ targeted – directly focused on case study ➤ helpful – offers supposed causal implication 	<ul style="list-style-type: none"> ➤ unfairness if question are badly formed ➤ bias answer likely ➤ incorrectness when recollection is bad ➤ reflexivity – examinee provides what questioner desires to listen
Direct /Nonparticipant observation	<ul style="list-style-type: none"> ➤ realism – shields proceedings in actual period ➤ contextual – shields the context of the proceedings 	<ul style="list-style-type: none"> ➤ expensive and timewasting ➤ can be selected unless extensive attention ➤ reflexivity – actions may go on contrarily from what is being detected
Participant observation	<ul style="list-style-type: none"> ➤ same as for direct observation ➤ insight into interpersonal behaviour and motives 	<ul style="list-style-type: none"> ➤ similar to direct observation ➤ unfairness because of researcher's influence of proceedings
Physical artifacts	<ul style="list-style-type: none"> ➤ helpful in traditional types ➤ helpful in practical setups 	<ul style="list-style-type: none"> ➤ choosiness ➤ accessibility

Source: Yin (2009)

3.7.2 Choice of data sources

The research used interviews and archival records as the main data sources. Added understanding of the use of financial incentives was done through semi-structured interviews. This is because it allows a high level of penetration without losing control on subjects being discoursed. Persistent questioning was circumvented to eradicate unfairness and interviewees were anticipated to have in – depth understanding of the problem being researched. The archival records were used to measure and evaluate the success of the cases theoretically. They were used to clarify and offer more fine points on subjects that were discovered from the literature. Table 3 – 3 summarizes the groups nominated for the interviews. The interviewee included five professionals from the consultants and three from the contractor team in each case study to make fourteen. The interview lasted between 40 and 60 minutes. The interviewees delivered more fine points and understanding of practices and processes on the use of financial incentives and their impact on project delivery.

Table 3-3: Particulars of interview groups

Team	Description	Members interviewed
Consultants	Design, detailing and supervision of works	Head of project, Project Architect, Services Engineer, Structural Engineers, Quantity Surveyor
Contractors	Construction of works	Director, Quantity Surveyor, Site Engineer

Source: Author's Construct (2018)

3.7.3 DATA ANALYSIS

Data analysis involved examining and categorizing the subjective answers from the semi – structured interviews. Since the strategies and techniques of analyzing qualitative data have not been well distinct by previous studies, it becomes a challenging procedure and needs imagination and methodical probing. Yin (2009), therefore, suggested usage of knowledgeable tools and techniques. Information reduction and display, conclusion representation and substantiation form the four phases of qualitative data analysis. The phases occur during the course of any qualitative study. The volume of data determines if the analysis should be done manually or electronically.

This study adopted “framework analysis” to analyze data from the fact – finding interviews. The framework analysis is flexible throughout the analysis procedure as it permits the researcher to either gather all the information and then evaluate it or conduct the data evaluation while gathering the information. The five steps involved in framework analysis are:

- Acquaintance;
- Detecting a thematic framework;
- Indexing;
- Registering; and
- Plotting and explanation. (Ritchie and Spencer 2002)

3.8 STANDARDS FOR ADJUDGING THE EXCELLENCE OF RESEARCH DESIGNS

The two important areas qualitative researchers should focus on, so as to maximize the quality of the study are validity and reliability (Patton, 2002). Bryman (2012) concluded that the three most prominent standards for the assessment of social research are validity, reliability, and replication. Research validity refers to the correctness or credibility of the research findings (Maxwell, 1996). It is apprehensive with the integrity of the decisions that are created from a piece of investigation (Bryman 2012). Patton (2002) advocates the use of triangulation in strengthening validity. This is the use of several information sources in an enquiry to create understanding.

Reliability is the extent to which a method can be replicated by others under similar conditions (Gummesson 1991; Bryman 2012). That is, if any researcher follows the same techniques as labelled by a previous researcher and carry out the same case study all over again, the later researcher should attain at the same results and decision. Bryman (2012) suggested that replication is the possibility of a researcher to replicate the findings of others. This is made possible if the researcher spells out his or her procedures in great detail. The toughness of the choice of the design of research needed quality concerns to be solved. It is important because the design of the research denoted a logical set of announcement and the quality can be rule on in relation to certain logical trials.

According to Yin (2009) the four main tests are generally used to institute the quality of any empirical social research. These are;

- construct validity: creation of accurate procedures for the ideas under research;

- internal validity: creation of a causative affiliation, such that certain circumstances are displayed to tip to other circumstances, as differentiated from untruthful affiliations;
- external validity: creating the area by which a research verdict can be universal; and
- Reliability: validating that the processes of a research can be reiterated with similar outcomes.

Table 3 – 4 summarizes all the logical tests, proposed strategies and how in this research they were accomplished.

Table 3-4: Logic test, strategies and procedures taken to accomplish within the research

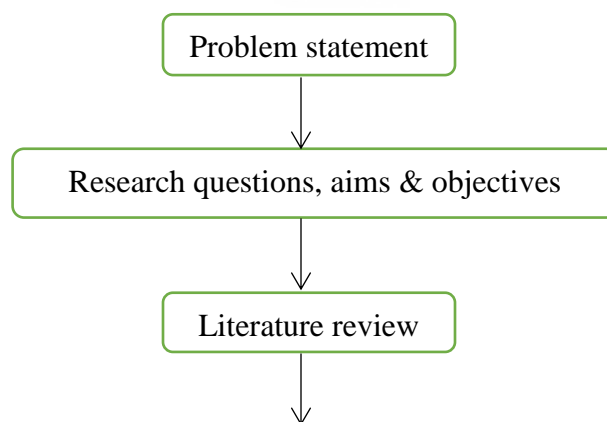
Logical test	Proposed strategies	How within research it was accomplished
Construct validity	Usage of several source of proof Establishment of chain of proof Having vital informers reviewing the drafted report of the case study	Using archival records and interviews Interview with different personnel with diverse viewpoints Reviewing of official papers
Internal validity	Doing pattern – corresponding Doing description – building Addressing opposing description Usage of reasonable prototypes	Analysis of data Analysis of data Analysis of data Analysis of data
External validity	Usage of duplication in several – case study	Research design
Reliability	Usage of case study procedure Propagate case study catalog	Data collection Data collection

Source: Yin (2009)

3.9 OVERALL RESEARCH DESIGN

The main step for the success of a research is the selection of the right inquiry procedures within research design. Research design is the overall proposal of how the investigator will go about responding to the research question (Saunders 2009). Yin (2009) defines it as a rational plan for steering through the investigation expedition. Therefore, research design is, the master plan for effectively solving inquiry questions after the knowing the study philosophy, approaches, strategies, choices, procedure and techniques. The research design should encompass strong objectives, resulting from the study questions, stipulate the sources data for collection and reflect any constraints that the investigator will unavoidably face.

The research questions to be addressed were derived from an exploratory and in – depth reviews of literature. These reviews provided the relevant theoretical background and framework to undertake the research. Having determined the philosophical viewpoint, research approach, strategy, choice and time horizon, the research processes adopted to meet the objectives of the research are outlined. These objectives were developed to achieve the aim of the research indicated. This study considers case studies design to establish the impact of financial incentives by examining a number of construction projects executed at Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast. Figure 5.1 below illustrates the phases implemented for the research design.



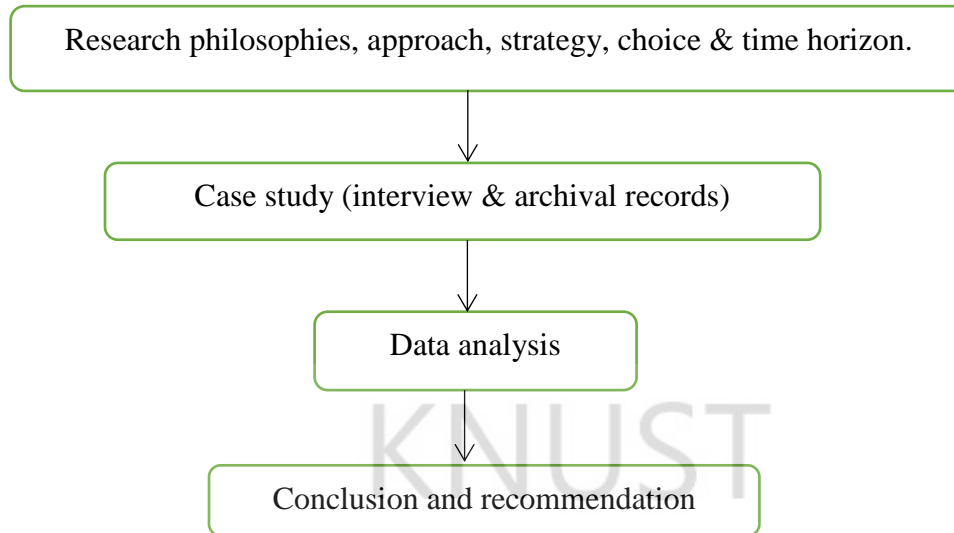


Figure 3-2; Master plan for the research design

Source: Author's Construct (2018)

3.10 CASE STUDIES

According to Baiden (2006) a case study is a realistic and all – inclusive method which is suitable for the universal study of a single case or multiple cases. The quality criteria of validity and reliability are met with the design of case study (Yin 2003). In the analysis of case studies the units need to be strong and unambiguous (Fellows and Liu 2008). The approach of case study is not prescription or prediction but relatively flexible, contextual and emphasized exploration. Hence, it empowers the investigator to realize and solve problems as they ascend during the research. According to Becker et al. (2005) case study design is certainly biased and principled deliberation has to be taken in the larger extent.

Yin (2003) suggested that the distinctive nature of case studies require that they should be accurately molded to produce anticipated outcomes. The case study method is the best approach for research activities containing several contextual variables that are qualitatively dissimilar. This was explained by Fellows and Liu (2008) that case studies design permits the usage of multiple information collection practices. A case study research can comprise of a single case or several cases.

In order to efficiently investigate the composite relationships associated with the use of financial incentives on project delivery in construction management, dependence on several information gathering methods is most suitable. The multiple data sources provide the richness of information needed to analytically make available an in – depth representation of the process and use of financial incentives.

3.10.1 Case study design

The reason which associates the information being gathered in the inquiry to the research question is called case study design (Baiden, 2006). In constructing the design, a work plan with a purpose of gathering information which can solve the study questions must be developed (Fellows and Liu 2008; Yin 2003). Case study design has four simple kinds and they are:

- Single – case all – inclusive;
- Single – case embedded;
- Several – case all – inclusive; and
- Several – case embedded.

There are either single or several case studies designs and every one might either be holistic or embedded units. The case being investigated and the unit of analysis determine the choice of design. The study is several – case embedded design because of the toughness of the design and improved outcomes simplification it provides. Despite the facts that cross – case evaluations were prearranged and sustained, the uniqueness of each single case was also upheld. Organized and consistent procedures, gathering and methods of inquiry were used for cross – case assessments. They were used because the consistency between cases is needed in replication logic according to Bryman (2012), Yin (2009) and Tellis (1997).

3.10.2 Cases, units of analysis and embedded units

Clearly defining and selecting the cases are immensely significant in case study research. The description of the cases is required to enforce the level at which the research would be carried out. It also defines basis on the level of specificity through which an activity is observed. Cases, units of analysis and embedded units are the three levels of specificity that need explanation based on the study questions according to Yin (2003), Blismas (2001) and Tellis (1997). Table 3 – 4 shows a summary of the levels and units defined for this study. The embedded units are the finer units that can be studied and analyzed.

Table 3-5: Stages and units defined for this study

Stage	Units defined for this study
Cases	Building projects completed at University of Cape Coast
Unit of analysis	Contractors and Consultants
Embedded units	Construction and management teams

Source: Author's Construct (2018)

This design was used to investigate the impact of the use of financial incentives through the enquiry of three completed construction projects managed by the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast. The cases for this research were building projects completed at the University of Cape Coast. The building project includes projects completed between 2011 and 2016 with completed project cost exceeding ten (10) million Ghana Cedis. The unit of analysis was the contractors and consultants on those projects since the study concentrated on procedures within the delivery of a project that hinders or boosts the use of financial incentives. Clients were excluded from the research but their impact and that of other parties of the project were considered.

3.10.3 Case selection

A lot of investigators have different thoughts on the selection of cases. There are two schools of thought (randomized and theoretical) on case study sampling. The principle of random and impartial self – selection has been followed and discussed as a valid collection approach. Nevertheless, in order to reduce the possible fruitfulness and range of outcomes in case studies the random selection was used in this study (Miles and Huberman, 1994). According to Yin (2003), cases are selected to theoretically or accurately duplicate other cases or to extent developing theory. A deliberate selection method was used for the choice of cases in this enquiry. The following were the reasons for selecting three cases;

- The projects were obtained by means of the traditional project delivery method because that is the only project delivery method being used at the Directorate of Physical

Development and Estate Management (DPDEM) of the University of Cape Coast. It also permits the integration of different financial incentives in the project delivery.

- They were managed by the Directorate of Physical Development and Estate Management (DPDEM) of the University of Cape Coast. This safeguarded uniformity in the projects in generating good practices and also certified that the projects were accomplished by the best professions within the industry.
- Access to personnel, documents and information were easy since it was essential for in – depth exploratory research. These accesses permitted follow ups on matters that required further clarifications or descriptions in order to get more understanding and enrich the data collection.
- Individual cases were exclusive and the completion periods were different but they mutually offered an all – inclusive opinion on the use of financial incentives.
- The cases show a variety of geographic regions, a variety of size parameters, or other parameters so as to replicate them.
- The cases are flexible and meet different interests and needs

Yin (2003) concluded that in a multiple – case study the number of cases goes further than sampling logic and typical benchmarks concerning sample size are unimportant. Hence, the conclusion should rather be founded on the number of case replications and is an optional subject. Nevertheless, the selection should be directed by the number of replications that will offer you with a suitable degree of conviction. More numbers are always preferred when the exterior conditions will give out dissimilar case study outcome. Therefore, two or three

replications are sensible within such circumstances. In this study, I selected three cases to reproduce the sensible replications.

3.11 ETHICAL CONSIDERATIONS FOR RESEARCH

Ethics has significant consequences for the cooperation of right of entry to people and organisations and data collection (Saunders et al., 2009). It remains very essential in guarding the integrity of investigation (Robson, 2002; Knight and Ruddock, 2008). The study considered the self – esteem, privacy and confidentiality of all contributors extremely significant. The inquiry was planned and carried out with full thoughtfulness of the ethical requirements for the conduct of post – graduate research. Ethical consent was sought before the collection of data from the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast.

Contributors were informed about the background, purpose and objectives of the investigation through data sheets specifying the aims, objectives and study process. Identifying particulars or details of data of participants with no use to the research were removed. Participants were reminder of their rights of withdrawal or non – disclosure of information during the interviews.

3.12 SUMMARY

The chapter discussed the philosophical stance behind the study and it accepted the subjectivist position at the ontological positions, interpretivism for epistemological and ‘value free’ for

axiological stance. Since the study will develop a theory from the explanations of the observed phenomena, an inductive research approach was used.

The common research strategies were discussed and case study design was adopted. Several – case embedded strategy comprising three completed building projects under the Directorate of Physical Development and Estate Management (DPDEM) of University of Cape Coast was selected. The research choice used was multi – method qualitative studies.

Semi-structured interviews and archival records were conducted to explore the impact of the use of financial incentives on the delivery of project in Ghana. The analysis of data both within and across the three cases was done by framework analysis. A test for the validity and reliability of the studies was carried out.



CHAPTER FOUR

4 DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

It reports and deliberates the interview and archival records results from the case studies. The findings from the analysis will be used to outline the conclusion and recommendation of this research. Background information of the projects used as case studies is defined to show their variety in geographical locations, durations, contract sum and other parameters. The basis with which information on precise matters of impact of financial incentives was collected is described. Project success evaluation of the individual cases was carried out before a cross case analysis.

4.2 BACKGROUND INFORMATION OF CASE STUDIES

All the three selected projects were designed and supervised by the Directorate of Physical Development and Estate Management, University of Cape Coast. Table 4 – 1 shows the project features of the selected cases

Table 4-1: Case study project characteristics

	Case study 1	Case study 2	Case study 3
Contract name	Construction of Association of African Universities' secretariat	Construction of Language Laboratory	Construction of Sports Complex
Contractor's name	Asumadu Construction Company	Premier Shelter Ltd	Paabadu Construction Ltd
Location	Accra (Legon)	Ucc Campus	Ucc Campus
Contract start date	15 th December, 2014	2 nd February, 2012	1 st July, 2014
Expected completed date	14 th December, 2016	1 st July, 2013	31 st December, 2015
Completed date	1 st September, 2016	11 th October, 2013	31 st December, 2015
Initial contract sum	GHC10,241,890.00	GHC9,851,860.00	GHC9,791,370.00
Final contract	GHC11,623,200.00	GHC12,148,390.00	GHC10,894,620.00
Financial incentives given	Mobilization advance and assistance to procure materials	Mobilization advance and assistance to procure materials	Mobilization advance and assistance to procure materials

Source: Author's Construct (2018)

4.3 THEME IDENTIFICATION

Data collected from the fact – finding semi – structured interviews were recorded. The data were transcribed verbatim to enable further manipulations, conduct and robust analysis. The transcribed data were then sorted out into three themes, within the project context (Lofland and Lofland 1995; Miles and Huberman 1994; Ritchie et al. 2003; Ritchie and Spencer 2002). In – depth vision and thoughtful on the various subjects were gained from the interviews. Table 4 – 2 shows the prefix codes of interviewees.

Table 4-2; Code prefix details of Interviewees

Interviewee	Code prefix
Head of project	PC – 01
Project Architect	PC – 02
Structural Engineers	PC – 03
Services Engineer	PC – 04
Quantity Surveyor	PC – 05
Director of case study 1	CD – 01
Quantity Surveyor of case study 1	CQ – 01
Site Engineer of case study 1	CE – 01
Director of case study 2	CD – 02
Quantity Surveyor of case study 2	CQ – 02
Site Engineer of case study 2	CE – 02
Director of case study 3	CD – 03
Quantity Surveyor of case study 3	CQ – 03
Site Engineer of case study 3	CE – 03

Source: Author's Construct (2018)

Using framework analysis discussed in the previous chapter, the results of the interview is presented in tables 4 – 3, 4 – 4, 4 – 5. The various themes are explained as follows;

4.3.1 Contractor's cash flow and adequacy of financial incentives

4.3.1.1 Contractor's cash flow

Generally, the financial incentives given to the contractors affected cash flow on all the projects. It aided the contractors to improve the supply of materials and equipment. Also, they were able to pay their personnel on time.

“Yes it gave the contractors enough liquidity to progress, but people misuse it so it becomes risky”. – PC – 01

“It provided more liquidity and they were able to do a lot faster, but if it does fall in a good hand then” – PC – 05

“Of course it does affect cash flow” – CD – 02

4.3.1.2 Adequacy of Financial incentive

In all the three cases, twenty percent (20%) mobilization was given at the start of the project. They were also paid for ‘materials on site’. Interviewees agreed that the quantum of the financial incentives given on those projects were adequate and it improved the rate of construction.

“The incentives were adequate because it was a GetFund project and the consultants helped us by paying for materials” – CD – 01

“Yeah but it won't be bad if increased” – CQ – 01

“Yes and in addition he was always paid on time” – PC – 02

“Yes but if it was increased it would have been better” – CE – 10

4.3.1.3 Procedures for incentives

The procedure followed by all the projects for the mobilization advance payment was a submission of a bank guarantee to the value of twenty percent (20%) of the contract sum. For the ‘materials on site’, an inspection and measurement was made.

“Looking at the scope and the composition of works, it was ok; the client needs to feel secure” –

PC – 01

“It was cumbersome but good for the client” – CQ – 01

“The procedures were ok; because the client even pays for the cost of obtaining the guarantee”

– PC – 03

“The procedure for the mobilization advance payment was a little cumbersome since you have to use your property as collateral to collect money which you will not use for your own private business but for an employer”. – CD – 03

4.3.2 Iron triangle

4.3.2.1 Project budget

The initial budgeted cost of all the three projects was exceeded. This was explained as follows: changes in specifications by consultants; fluctuations; and change in scope by the client. Nevertheless, respondents maintained that, the change in the budgeted cost has no relation with the incentives that were given on the projects.

“No, it didn’t affect the budgeted project cost since there were changes in the scope from the client.” – PC – 03

“No, because even though the contractors were given incentives, fluctuations were still applied of the evaluated works” – PC – 02

“No maybe it reduced the anticipated inflations, since the rate of construction increased, with the giving of the incentives, but the budget was exceeded.” – CQ – 01

“No, there were changes in specifications and scope which rather affected the budgeted cost” – CE – 03

4.3.2.2 Project duration

Even though two out of the three projects were completed beyond expected completion date, it was agreed by interviewees that they were completed on scheduled. The reasons given were as follows; changes in scope, changes in specifications, force majeure, and delays in approving variations. Respondents concluded that, the two contractors completed the works within the evaluated extension of time that was given.

“Yes the contractor finished before schedule.” – PC – 05

“It affected the duration of the project a lot, we finished before time.” – CD – 01

“Yeah we finished on schedule.” – CD – 03

“No because the client changed the scope of works, but we finished within the extension of time.” – CQ – 02.

4.3.2.3 Quality of works

The general quality of the works executed in all the three cases was satisfactory. Nevertheless, interviewees were divided on whether the incentives given has any effect on the quality of works delivered. While some believe quality of works has no relation to incentives but to supervision, others were of the view that, the incentives helped the contractors in delivery quality works since they had enough liquid to purchase materials and motivate workers.

“The general quality of works was low, so I think the incentives didn’t affect it.” – PC – 03

“Quality always depends on the supervision team.” – CQ – 01

“No it didn’t affect quality.” – PC – 01

“Quality was good because of the supervision.” – CD – 03

“Yes it affected quality indirectly.” – CD – 01

4.3.3 Participants’ satisfaction

4.3.3.1 Client’s satisfaction

The employers in all the three cases were very pleased with the work done. Interviewees agreed that even though there was extension of time (in cases 2 and 3) and the budgeted cost was exceeded in all the cases, the clients were generally happy with the outcome of the project and it was attributed to the incentives.

“Clients are always happy taking over their project.” – CQ – 01

“Yes the clients were satisfied with the product.” – PC – 04

4.3.3.2 Consultant's satisfaction

From the responses received, it can be concluded that the consultants were happy with their designs and supervision. Their satisfaction was due to the fact that the contractors were able to execute with designs with little supervision and this was partly due to the incentives given.

“The consultants were very satisfied.” – PC – 03

“Yes they were satisfied with the final product.” – CE – 02

4.3.3.3 Contractor's satisfaction

All the three contractors were happy of the outcome of the product. They were happy of the availability of financial incentives on the project, which helped to increase the rate of construction hence getting their profit in time. Again, they were satisfied with the quality of the works done, the duration taken to complete the projects and having been able to finish the product with no litigation.

“We were very satisfied with the work.” – CD – 01

“The contractors were ok.” – PC – 04

4.3.3.4 Legal claims

There were no legal claims and proceeding from any of the three cases but it cannot be concluded that it was due the available of financial incentives.

“There were no legal claims or proceedings.” – PC – 01

“No, all was well.” – CD – 02

Table 4-3; Interview results for Case study 1

Themes	PC – 01	PC – 02	PC – 03	PC – 04	PC – 05	CD – 01	CQ – 01	CE – 01
Contractor's cash flow	Yes, but risky	Yes	Very well	Yes	Yes	Yes	It improved cash flow	Yes, it really helped us
Adequacy of Financial incentive	Yes	Yes and he was always paid on time	It was ok	Yes	Yes, since he prepared monthly valuation	Yes for a GetFund project	Yeah but it won't be bad if increased	Yes but if it's increased it would have been better
Procedures for incentives	It was ok, the client needs to feel secure	It was ok	It was ok	It was ok	It was ok, the client needs to feel secure	They should accept insurance	It's cumbersome but good for the client.	It was ok
Project budget	No because he was paid fluctuations	No because fluctuations were applied	The cost increased due to changes	No	No because he was paid fluctuations	Yes, it reduced inflation	No, maybe on anticipated inflations but the budget was exceeded.	It only reduced the anticipated inflation
Project duration	Yes, the contractor	Yes, the contractor	Yes	Yes	Yes, the contractor	It affected duration a lot	It helped to achieve the	We finished before time

	finished before schedule	finished before schedule			finished before schedule		duration.	
Quality of works	Positively affected quality	It has no relation	Quality depends on supervision not incentives	Yes to some extend	No	Indirectly affected quality	It always depends on the supervision team	We worked in accordance with specification
Client satisfaction	Very satisfied	Very satisfied	Satisfied	Very satisfied	Very satisfied	Very satisfied	Clients are always happy taking over their project	Yes
Consultant satisfaction	Satisfied	Satisfied	Very satisfied	Quite satisfied	Satisfied	Quite satisfied	I think so	Yes
Contractor satisfaction	Quite satisfied	Satisfied	Satisfied	Satisfied	Quite satisfied	Ok	Yes	Very satisfied with the work
Legal claims	No	No	No	No	No	No	No	No

Source: Author's Construct (2018)

Table 4-4; Interview results for Case study 2

Themes	PC – 01	PC – 02	PC – 03	PC – 04	PC – 05	CD – 02	CQ – 02	CE – 02
Contractor's Cash flow	Somehow	Yes	Yeah at the initial stage	Yes	Yes	Of course	Yes	Yes
Adequacy of Financial incentive	Yes	Yes	It was ok	Yes	Yes	Yes	Yes	Yes
Procedures for incentives	It was ok	It was ok	It was ok; the client pays for the cost of the guarantee.	It was ok	It was ok	Ok	ok	It was ok
Project budget	No	No	No	No	No	No	No	No
Project duration	Yeah because he finished within time extension.	No because of changes	No because the scope changed	Yes if not due to variations	Yeah because others factors affected the contractor	Somehow	The scope changed	yes
Quality of works	No it didn't affect quality	No	The general quality of works was low, so I think it didn't affect it	It didn't	No	Indirectly affected quality	No	A little
Client satisfaction	Satisfied	A little	Satisfied	Yes	Very satisfied	Very satisfied	Was happy	Yes
Consultant satisfaction	No	Satisfied	quite satisfied	Yes	Satisfied	Quite satisfied	I think so	Yes
Contractor satisfaction	Yes	Ok	Yeah	Satisfied	Quite satisfied	Satisfied	Yes	It was ok
Legal claims	No	No	No	No	No	No	No	No

Source: Author's Construct (2018)

Table 4-5; Interview results for Case study 3

Themes	PC – 01	PC – 02	PC – 03	PC – 04	PC – 05	CD – 03	CQ – 03	CE – 03
Contractor's Cash flow	Yes it did	Yes	Very well	Yes	Yes	Yes	It helped cash flow	Yes,
Adequacy of Financial incentive	Very	Yes	Yeah	Yes	Yes	Yes	Yeah	Yes
Procedures for incentives	It was ok	It was ok	It was ok	It was ok	It was ok	A little cumbersome	Ok	Ok
Project budget	No	No	No	No	No	No	No	No
Project duration	Yes finished on schedule	Yes	Yes	Yes finished on schedule	Yes	It helped.	It	It affected duration
Quality of works	No	No	No, it was due to proper supervision	No	No	Quality was good because of the supervision	No	No, it was due to supervision
Client satisfaction	Very satisfied	Yes	Satisfied	Very satisfied	Very satisfied	Very satisfied	Satisfied	Yes
Consultant satisfaction	Satisfied	Satisfied	Very satisfied	Quite satisfied	Satisfied	Quite satisfied	I think so	Yes
Contractor satisfaction	Ok	Satisfied	Satisfied	Satisfied	Quite satisfied	Ok	Yes	Yes
Legal claims	No	No	No	No	No	No	No	No

Source: Author's Construct (2018)

4.4 PROJECT SUCCESS EVALUATION

It behaves as an instrument for uninterrupted enhancements (Enshassi et al., 2009; Takim et al., 2003). Findings from the case studies were grounded on ten key themes of project delivery produced from the interview results. In other to find solutions to the main study queries, individual and cross – case analysis of the outcome of the themes were carried out.

4.4.1 Contractor's cash flow and adequacy of financial incentives

4.4.1.1 Interview results

Table 4 – 6 shows the rundown of results from the interviews on the contractor's cash flow and adequacy of the financial incentives provided in all the three cases.

Table 4-6; Contractor's cash flow and adequacy of financial incentives interview results

Theme	Case study 1	Case study 2	Case study 3
Contractor's cash flow	Affected cash flow	Affected contractor's cash flow	Affected contractor's cash flow
Adequacy of incentive	Incentive was adequate Procedures is ok	Incentive was adequate Procedure is ok	Incentive was adequate Procedure is ok

Source: Author's Construct (2018)

4.4.1.2 Archival records results

So as to check the interview results on the effect of financial incentives on contractor's cash flow and ascertain the adequacy or otherwise, archival records of the three cases were assessed. Recovery of mobilization advance payment started on the third interim payment certificate (IPC) for case studies one and two and on the second for case study three. Recovery of 'materials on site', where done during the next IPC in all case studies. The contractor's cash flow analysis of the three case studies are as shown in figures 4 – 1, 4 – 2, and 4 – 3.

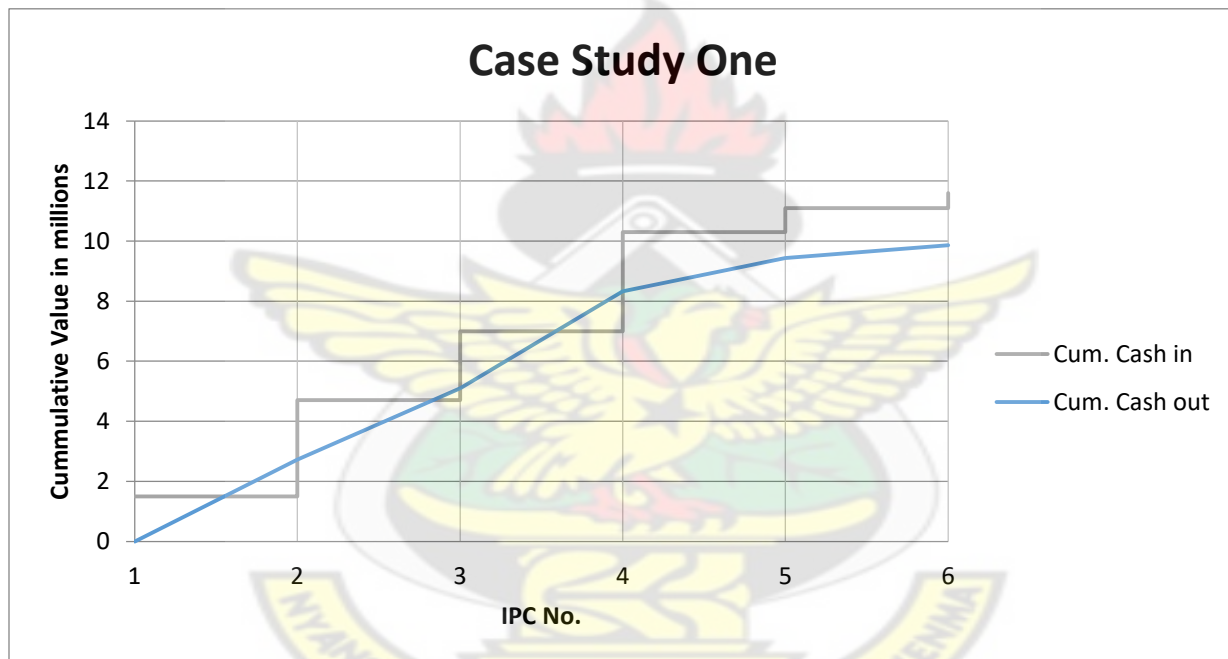


Figure 4-1; Cash in and cash out curves for case study one

Source: Author's Construct (2018)

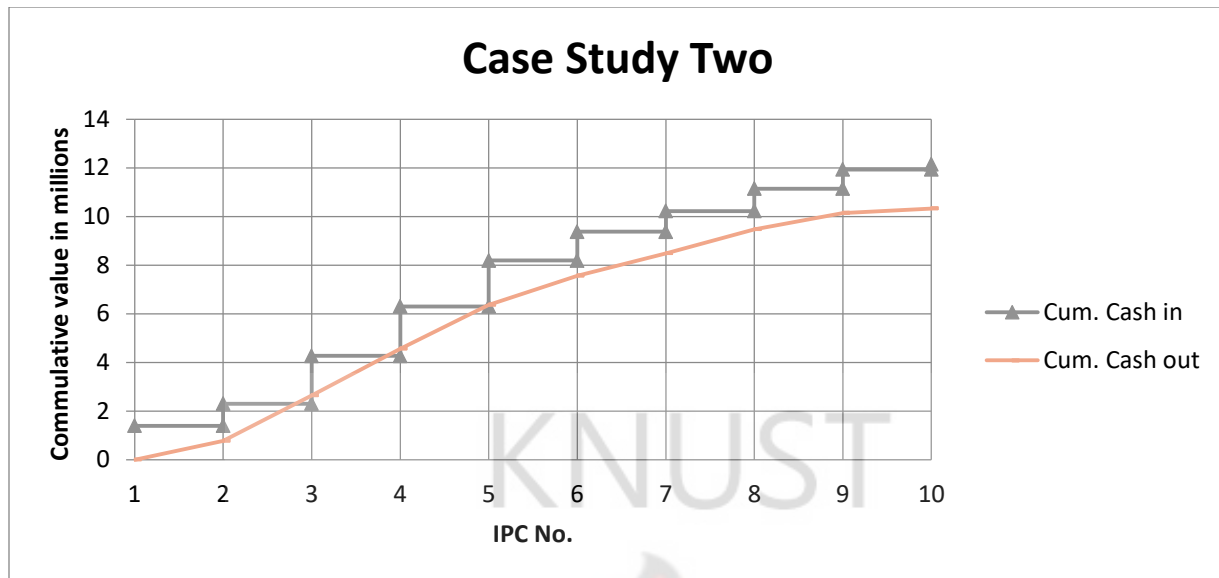


Figure 4-2; Cash in and cash out curves for case study two

Source: Author's Construct (2018)

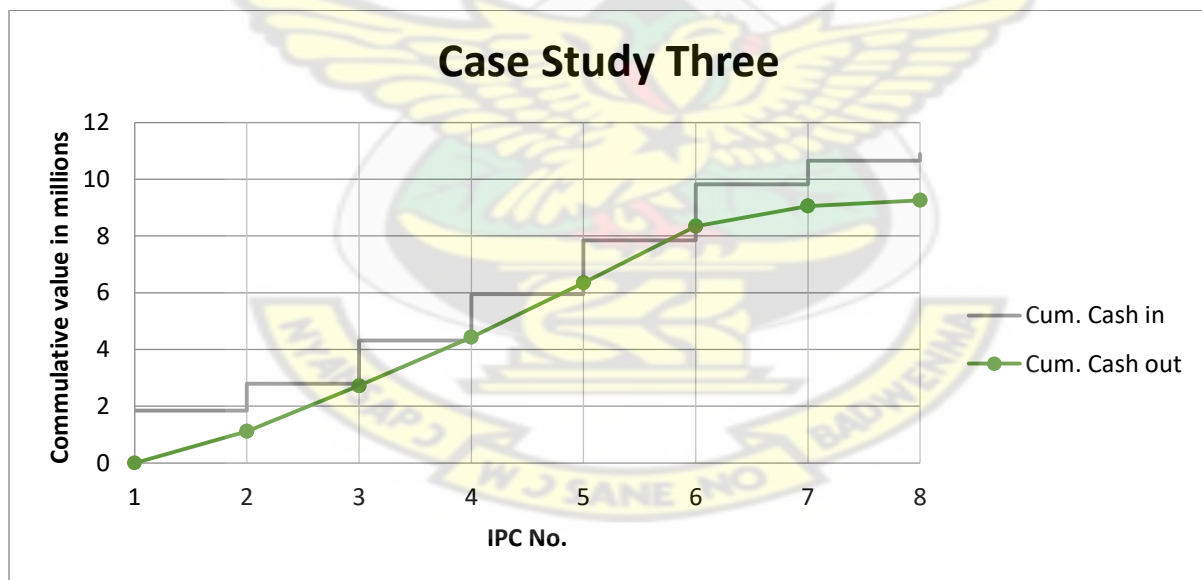


Figure 4-3; Cash in and cash out curves for case study three

Source: Author's Construct (2018)

4.4.1.3 Discussion of results

The mobilization advance payment given at the beginning of the project made the contractors liquid enough. Again, because they were paid for materials at site, it encouraged the contractors in all cases to purchase enough materials. It helped them had enough liquid during the recovery of mobilization advance payment. It also helped them to purchase materials for different stages of the project. Nevertheless, the supply of materials was faster and better in case study one and three than case study two. The explanation given was that, the contractor in case study two had other projects going on concurrently, but monetary resources on those projects used to delay. With these two financial incentives being made available in all the cases and the rate of delivery, it can be said that the financial incentives were adequate. Nevertheless, it will not be bad if increased, it should also not be forgotten that it is risky and can be dangerous if the contractor does not perform. Hence, proper background investigation of the contractor must be conducted before increasing the percentage.

From figure 4 – 1 the contractor always had a little financial problem before he receives an IPC until the fourth certificate. This was because he was not presenting his IPC at regular intervals and always has to wait till a substantial amount of works are completed. In case study two, the contractor had very little financial burden according to the cash analysis, and this happened before IPC 3, 4 and 5. But in reality, there were problems with cash flow because of his commitment to other projects. The contractor had excess cash on the third case study, until the fifth valuation. It is also seen getting to the valuation of the sixth IPC. If financial incentives (MAP and assistance to procure materials) were not accessible, they would have been confronted with monetary problems from commencement of the project. The case studies discovered that

financial incentives continuously have a progressive impact on the operational funds of the contractors. Operational funds encompass the liquid and non – liquid resources to grease the day – to – day dealings of the construction project. There is always a continuous flow of work on the site when sufficient amount of financial incentive is available.

4.4.2 Iron triangle

4.4.2.1 Interview results

The iron triangle theme comprises of cost, time and quality. Interview results from the three case studies on the above have been summarized at table 4 – 7.

Table 4-7; Interview results

Theme	Case study 1	Case study 2	Case study 3
Cost	No it didn't reduce cost	It didn't reduced cost	No it didn't affect cost
Time	It helped to finish before time	The project exceeded its duration because of other factors	It helped to finish on time
Quality	It affected quality to some extend	It didn't affect quality	Good quality of the works but was due to proper supervision

Source: Author's Construct (2018)

4.4.2.2 Archival records results

From the set of KPIs identified in chapter two, all the three case studies were examined. Table 4 – 8 shows the rundown of the outcomes of the different KPIs of these case studies.

Table 4-8; Outcome of different KPI

KPI	Case study 1	Case study 2	Case study 3
Time			
1. Construction time	20 ¹ / ₂ months	22 ¹ / ₃ months	18 months
2. Time overrun	-3 ¹ / ₂ months	4 ¹ / ₃ month	0
3. Speed of construction	213.93msq/month	240.73msq/month	267.30msq/month
4. Schedule growth (%)	-14.58%	24.06%	0%
Cost			
1. Cost overrun	GHC1,381,310.00	GHC2,296,530.00	GHC1,103,250.00
2. Unit cost	GHC2,716.59	GHC1,871.31	GHC2,264.32
3. Cost growth (%)	13.49%	23.31%	11.27%
Quality	Satisfied	Satisfied	Satisfied

Source: Author's Construct (2018)

4.4.2.3 Discussion of results

The given financial incentives did not affect the contract sum in any way. Reason given was that the factors that affected cost on the three case studies were external. One of them was changes to

design that were sanctioned by the client through consultants. These changes increased the contract sum. Again due to increases in inflations at the local market, actual fluctuations increased beyond the projected amount, hence the final contract sum increased in all case studies.

The contract duration for the case studies was different. Case study one completed and handed over the project before the scheduled completion date. This was because the contractor was determined and committed to the project. The rate of materials supply and its corresponding works output shown that he invested all the financial assistance given in the project. Case study two exceeded the completion time but it was partly due to changes in the scope of works. This project was characterized by a lot of changes and rework. Nevertheless, the contractor had other commitment from different projects which affected the rate of construction. An extension of time was given and the contractor handed over one week after that date. Case study three finished the project on time. The rate of supply and work output shows the contractor used the financial incentives for the intended purposes. The supply of information on the project was very efficient and effective.

The quality of the works in all the case studies was satisfactory. But the quality of works at case study three was better followed by case study one. Even though the supervision of the works was done by the same team, the competence and experience of the personnel at the three case studies differed. Case study three had the most experienced staff that was able to interpret the drawings and relate to the supervision team well.

From the outcomes, it can be concluded that every project has distinctive results. Table 4 – 8 shows the results of the case studies which vary because of the variance in scope, schedule, complication of project, etc. For the cost performance, all the three case studies overrun their initial cost. This was due to changes in scope, increases in fluctuations, etc. Case study two has a smaller unit cost than that of cases study one is 45.17 per cent and three by 21 per cent. The cost growth was higher in case study two than one and three. This is explained by the fact that there were a lot of scope changes and re – work in case study two.

As for time performance of the three case studies, the construction time of case study two is longer than case studies one and three. Only case study two was completed beyond schedule, case study one was completed three and half months before the scheduled completion date and that of case study three was on time. Case study one's speed of construction is extreme in arrears of case two and three. The fastest in outcome of case study three can be attributed to the experience level and competence of the contractor's team. The schedule growth of case study two was higher than case study one and three.

The quality of works in all the three case studies was satisfactory; this is explained to the fact that there were no records of caution letters or instruction to demolish and re – work to contractors on the quality of the works.

4.4.3 Participants' satisfaction

4.4.3.1 Interview results

Table 4 – 8 shows the rundown of results from the interviews on the participants' (client, consultants and contractor) satisfaction in all the three case studies.

Table 4-9; Contractor's cash flow and adequacy of financial incentives interview results

Participants	Case study 1	Case study 2	Case study 3
Client	Client was satisfied	Client was satisfied	Client was satisfied
Consultant	Contractor's team were satisfied	Contractor's team were satisfied	Contractor's team were satisfied
Contractor	Consultant's team were also satisfied	Consultant's team were satisfied	Consultant's team were also satisfied

Source: Author's Construct (2018)

4.4.3.2 Archival records results

The client on case study one was different from the other two case studies. Association of African Universities was the client for case study one and University of Cape Coast was the client for the two other case studies.

4.4.3.3 Discussion of results

Participants in all the case studies were satisfied in terms of quality, time, functionality, health and safety and environmental performance. The clients were happier for getting their product on time to use for the intended purposes. Consultants were satisfied with their design and supervision of the product. The contractors were pleased with their profit margins, the financial incentives given and that fact they were able to complete the project with no litigation and legal issues. It can be concluded that participants were generally satisfied with the project performance.

4.5 SUMMARY

It started with background information on the various case studies. Framework analysis was used to analyze the interview results and was presented in this chapter. The cases studies were again evaluated by using the interview results and their respective archival records with respect to contractor's cash flow, iron triangle and participants' satisfaction.

CHAPTER FIVE

5 CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The introduction and problem statement to the study was covered in the first chapter. It also contained the research questions, aims and objectives, justification and scope of the research. The next chapters established the academic features and the framework upon which the study was carried out. Procedural matters were deliberated and suitable exploration methods and approaches were designated and defended in chapter three. The fourth chapter covered the presentation of results, analysis and discussions from the data collected through interviews and archival records.

Chapter five takes care of the concluding part of the research. That is a review of the research objectives and outcomes of the enquiry. It also deliberates the contributions of the research and recommendations and policy implications arising from the study. Limitations of the study and directions for supplementary work form the concluding part of the chapter.

5.2 REVIEW OF RESEARCH OBJECTIVES

Investigating the impact of the use of financial incentives on project delivery in Ghana was the aim of this research. In pursuant of the aim, five key specific study objectives were established. These objectives were achieved as stated below:

5.2.1 Objective 1: To identify project delivery methods commonly in practice and their selection criteria.

Reviewing the literature in chapter 2, section 2.3 helped this research objective to be attained. It was seen from literature that; different forms of project delivery methods are used in the construction industry. Nonetheless, the difference between them is largely due to the allocation of risks and responsibilities between project stakeholders and the delivery procedures and practices. DBB and DB systems were established as the more frequently used methods in project delivery in Ghana but DPDEM, University of Cape Coast uses only DBB in delivering construction projects. The following are the reasons why DBB is more popular: an acquainted project delivery method, ability to define the scope of the project for design and construction, modest procedure to accomplish, the consultant and the construction team are accountable to the owner (Al-Khalil, 2002; Chan et al., 2001; Lee, 2006; Park et al., 2009). Moreover, the DB is popular for the following reasons: reduced duration and cost, good harmonization and communiqué among stakeholders, promotes faster delivery of the project, reduced likely to conflicts and eliminates disputes between project parties (Natkin, 1994; Park et al., 2009; Seng and Yusof, 2006).

Criteria for selecting DBB and DB project delivery methods were also identified. “employer participation in construction”, “high price competition”, “manageable variation”, “clarity of scope definition”, “comfort of establishing and revising project”, “functionality of project”, “extraordinary degree of quality requisite”, “time certainty”, “strong description of project shareholders’ duties” and “cost certainty” make up the selection criteria for DBB. However, DB selection criteria comprises of: “collaborative working relationship between project team”,

“rapid provision of construction procedures”, “rapid start of project”, “degree of competent and skilled contractor”, “effective communication among stakeholders”, “yearning reduced project time”, “easiness in changes of design and construction”, “yearning reduced cost”, “single point of responsibility”, “transfer of the risks to the contractor” and “less conflicts amongst project parties”. “Complexity of design” and “yearning effective project scheduling” is the two principles that are shared by both delivery methods.

5.2.2 Objective 2: To establish the criteria for evaluating and computing project performance.

An appraisal of literature in the field of project performance as shown in chapter 2, section 2.8 aided in achieving this objective. From literature there are a number of criteria for evaluating and computing project performance. That is, cost, quality, time, participants’ (client, consultant and contractor) satisfaction, environmental, health and safety, and innovation. However, the most commonly used and preferred criteria for assessing and evaluating project performance is time, cost and quality. Many studies and researches in construction project performance works have confirmed these criteria for evaluating and measuring projects successes or failure.

5.2.3 Objective 3: To assess the effect of financial incentives on the cash flow of the contractor.

In the case of the third objective, in – depth interviews were conducted to ascertain the effect of the financial incentives on contractor’s cash flow. All correspondents settled to the point that financial incentives have a very significant role in affecting the contractor’s cash flow of

positively and it must be encouraged. It aids the contractor to be liquid enough to purchase materials, equipment and resources early for the various stages of the work. These were emphasized when the archival records of the different case studies were accessed. The analysis of the various contractors' cash flow (cash in and cash out) proves that they had enough liquid from the start of the project to completion.

5.2.4 Objective 4: To establish the impacts of the use of financial incentives on project delivery.

In – depth interviews were conducted on correspondents on the key indicators for measuring the success of a project. Interviewees agreed that the financial incentives affected the duration of the project positively. In though there were increases in cost, it was not due to the financial incentives but rather scope creep. The overall quality of the projects was satisfactory. Nonetheless, interviewees were divided if the financial incentives had a role to play in the quality of work. Participants (client, consultant and contractor team) were very much appreciative and gratified with the work done. They established that the financial incentives aided in the delivery of the project.

5.3 FINDINGS OF THE RESEARCH

Having access to funds at the commencement of construction projects has a bearing on its success or failure. Thus, difficulties in raising funds impeded on the overall performance of the project. The inability for contractors to get hold of funding leads to the difficulty in providing enough materials, equipment and resources. Hence, they try to use inferior materials and engage

less qualified personnel to perform tasks which affect the output of the project. This make most stakeholders frequently discontented with the product, increases cost, affect quality and drags the project duration. Besides the findings under the review of research objectives, the study observed the following

- Contractors' access to credit is improved when clients and consultants grant them financial incentives which in turn boost their performance. Most contractors do not have adequate operational resources to back their construction projects. Therefore, it is strongly suggested that owners do their best to make financial incentives available and easily reached by contractors to improve project performance. It will also save contractors the problem of depending on banks for capital with higher interest rates which deprives them of their returns. Besides, apart from the client having an improved credit assessment to secure loans at a lesser borrowing percentage, it becomes double borrowing when the contractor secures a loan to execute a facility which the client has already taken a loan for it.
- The contractor is motivated at different phases of the project life sequence. At the start, the presence of financial incentives in the contract inspires the contractor to tender for that particular project. After the award, the contractor is again encouraged to start the construction as soon as possible. Furthermore, the contractor motivated to complete the project on schedule and at a good quality.

5.4 CONTRIBUTION TO KNOWLEDGE

The importance of a study is measured in relation to its contribution. There are increasing numbers of project – specific and comprehensive studies on the delivery of project and its performance. Through identification of the various traits that influence the use of financial incentives in project management the research contributed to the body of knowledge. This was achieved through exploratory interviews and archival records of the three different projects. It proves that availability of financial incentives affects the cash flow, duration and quality of the project. It supports the project team to produce a product that is acceptable to all stakeholders. Nevertheless, this research will contribute to knowledge through the following:

- Strengthening the academic understanding in delivery of project
- Pinpoints the financial issues in the delivery of construction project that affects value of money.
- Cultivates a novel methodology to assess the performance of project.
- To firm the impact of financial incentives on project delivery.

5.5 RECOMMENDATIONS AND POLICY IMPLICATIONS

The following recommendations have been made to enhance the provision of financial incentives to contractors to improve project delivery in Ghana.

- Proper background checks (audited accounts, history of previous works, etc.) of the contractor must be done before giving him any financial incentive.
- Stakeholders (Clients and consultants) must monitor the use of the incentive by the contractor.

- An unconditional on – demand guarantee from no other source than a bank must be provided by the contractor.
- The value of the financial incentive must be moderate.

5.6 LIMITATIONS OF THE STUDY

The limitations provided the basis for future research suggestions. It is envisaged that the following are the limitations of the research:

- The main bases of information used were founded on the perceptions of contractors' team and consultants' team. It was based on their experience, predominantly on the choice and management of the financial incentives. The research concentrated only on the Directorate of Physical Development and Estate Management, University of Cape Coast, projects.
- The effect of sampling and measurement error which might affect the collection of data and the kind of analysis to be carried out and the conclusions drawn;
- Individual skills, personal biases and peculiarities of the researcher easily influenced the research quality.
- The presence of the researcher during the collection of data can influence the subjects' answers.

Nevertheless, the fallouts of this research have momentous consequences and valuable submission in Ghana, as well as sister countries.

5.7 DIRECTIONS FOR FUTURE RESEARCH

This research has its own shortcomings and a number of areas were identified and therefore opens opportunities for further investigations, which could provide prolific results if investigated further. These includes but not limited to;

- Assessment of the impact of individual financial incentives on project delivery.
- Investigate the effect of financial incentives on project delivery teams.
- A study on how to finance contractors through retention bonds for improved performance.
- Assess the risk factors in giving financial incentives.

5.8 SUMMARY

This chapter summarizes the empirical findings which form the contributions to the body of knowledge and fills the research and knowledge gap in terms of theoretical and practical underpinnings. The main conclusions have been presented and the limitations of the research have been acknowledged. Directions for further research and policy implications for stakeholder and practitioners' involvement in the area of construction professionals and technology have been prescribed by the study.

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APPENDIX 1: INTERVIEW GUIDE

MULTIPLE CASE STUDY INTERVIEW ON IMPACT OF THE USE OF FINANCIAL INCENTIVES ON PROJECT DELIVERY IN GHANA

Part A: Background Information

Project:.....

Interviewee:.....

Organization:.....

Position:.....

Date of the interview:.....

E-mail/ Contact No:.....

PART B: INTERVIEW GUIDE ON THE USE OF FINANCIAL INCENTIVES

1. Did the financial incentives affect cash – flow on the project? Why?
2. Looking at the project characteristics (budgeted cost, duration, and scope of works), were the financial incentives given adequate? Why?
3. If no, what percentage do you consider adequate??
4. What is your view on the procedures for the incentive?
5. How do you think the procedures can be improved?
6. Did the incentive reflect the effort you put in getting it?
7. Did the incentive affect the project budget? How?

8. Did the incentive affect the project duration? How?
9. Did the incentive affect the quality of the works? How?
10. Did the incentive affect the rate of delivery of construction process? How?
11. Was the client satisfied with the product? Does it have any bearing on the financial incentives given?
12. Was the contractor satisfied with the product? Does it have any bearing on the financial incentives given?
13. Were the consultants satisfied with the product? Does it have any bearing on the financial incentives given?
14. Were there any legal claims and proceedings? Does it have any bearing on the financial incentives given?

END OF INTERVIEW

THANK YOU FOR YOUR PARTICIPATION

Please take a minute to ensure you have answered each question

Thank you very much for your time and effort