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COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

**A MODEL FOR PREDICTING THE PERFORMANCE OF
PROJECT MANAGERS IN THE TENDERING PHASE IN MASS
HOUSE BUILDING PROJECTS IN GHANA**

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‘‘Sometimes our light goes out but is blown into flame by another human being. Each of us owes deepest thanks to those who have rekindled this light’’ Albert Schweitzer.

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DEDICATION

‘‘If we stand tall it is because we stand on the backs of those who came before us’’,
(Yoruba Proverb).

I hereby dedicate this thesis to my late mother and father, Madam Rebecca Kosi
Amesachie and Mr. Samuel Ahuma Korda.



ABSTRACT

Taken into consideration the important role PMs play in execution of projects in general and in particular in the construction industry. It has become imperative to develop a model for assessing the performance of PMs in MHBPs in Ghana. Ahadzie (2007) considered the need for an empirical research into developing a model for predicting the performance of PMs in MHBPs in Ghana, a departure from established standards and practices. Ahadzie (2007) successfully completed the research at the construction phase of the project lifecycle. The model is based on the project lifecycle framework at the conception, planning, design, tender, construction and operational phases of the project lifecycle.

A decision was taken to research into the potential variables or indicators that can be used in assessing the performance of PMs at the tendering phase. The tendering phase of a project lifecycle was identified to be critical and vital, decisions taken at this stage have huge impact on the success or otherwise of the outcome of a project.

The conceptual framework that guides the predictive model by Ahadzie (2007) reflects both the elements of performance behaviors and outcomes in predicting the performance of the PMs at the conception, planning, design, tendering, construction and operational phases of the project life cycle.

Members of Ghana Real Estate Developers Association (GREDA) were chosen for the sampling frame for the study from a list of registered members .GREDA is a major stakeholder assisting the government alleviates the housing delivery challenge facing the country and also duly recognised by the Government of Ghana.

The model accounted for six of the variables for predicting of the performance of PMs at the tendering phase in MHBPs in Ghana, these are :*close attention to important specification requirements of MHBPs, having strong memory of tendering information of MHBPs, Being creative and innovative in making suggestions for solving tendering problems for MHBPs, commitment to speedy production of tender documents of MHBPs, Being mentally alert to managing the tendering process of MHBPs, technical quality strategies for managing the tendering process of MHBPs.*

Findings of this study will serve as a benchmark for employers engaging the services of project managers and also in assessing the performance of PMs at the tendering phase of MHBPs in Ghana. Also, practicing project managers and potential ones will be informed about the expectation from their employers and again, help identified areas where they need to step-up their game. This is a further step; in deepen the management practices in Ghana, for that matter in MHBPs.

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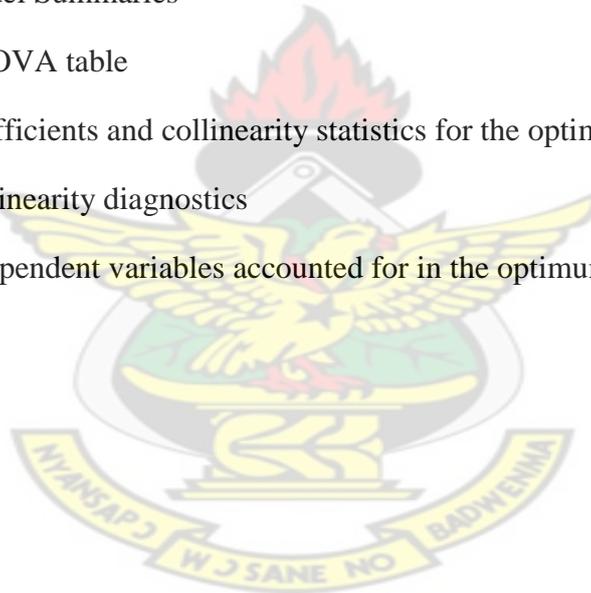
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ABBREVIATION AND ACRONYMS

AIPM.....	Australian Institute of Project Management
APM	Association for Project Management
BoG.....	Bank of Ghana
BS	British Standards
CIOB	Chartered Institute of Building
GoG	Government of Ghana
GREDA	Ghana Real Estate Developers Association
HRM	Human Resource Management
IPMA	International Project Management Association
MHBPs.....	Mass House Building Projects
PMs	Project Managers
PMI	Project Management Institute
RICS	Royal Institution of Chartered Surveyor.
SSNIT	Social Security and National Insurance Trust
SHC	State Housing Compan



CHAPTER ONE: INTRODUCTION

1. INTRODUCTION

This chapter provides the general knowledge to the background information of the study which includes introduction, problem statement of the research, research questions to be answered by the study. The objectives to address the research aim is stated, research methodology adopted to collect data and scope of the study. The chapter ends with how the study was organised from beginning to the end.

1.1 BACKGROUND OF STUDY

Measuring the performance of organizations is considered to be highly relevant and important Neely (1999); Cain (2003); Beathamet al. (2004) as it is linked with evaluating and taken corrective action in line with organisational strategy. Indeed, performance measurement is said to provide the feedback required to control and improve actions that are related to strategy (Sinclair and Zairi, 2000; Beathamet al, 2004).

Performance measurement therefore, has been given a prominent place in most organisations as it helps achieve continuous improvements (Martinez, 2005; Baldwin et al., 2001). It has become an integral part of planning and controlling organizations (Barnard, 1962; cited in Neely, 1999). Cain (2004) identifies performance measurement as the first stage of any improvement process that benefits the end users with lower prices and the organizations with higher profit margins, whilst enhancing the quality of the product.

Against this backdrop, Performance measurement is defined as “the process of determining how successful organizations or individuals have been in attaining their objectives and

strategies” (Kagioglou et al, 2001). Love and Holt (2000) have outlined the importance of performance measurement as: ensuring that customer requirements are properly met (and if not, why); enabling the establishment of achievable business objectives and monitoring compliance; providing standards for business comparisons; providing transparency and a scoreboard for individuals to monitor their own performance; identifying quality problems and those requiring priority attention; giving an indication of the costs of poor quality; justifying the use of resources; and providing feedback for driving the improvement effort.

By considering the above, it can be said that performance measurement is an important aspect for organisations to evaluate their actual objectives against predefined goals and to make sure that the organisation is doing well in the competitive environment (Kulatunga et al, 2006).

According to Chandler (1977); Kaplan, (1984) performance measurement systems have a long track-record which can be traced back to the U.S. railroads in the 1860s and 1870s. Nanniet al, (1990) argued that performance measurement systems have been historically developed to monitor and maintain the organisational processes which help to achieve the goals and objectives of the organisations.

Therefore, individual performance is a core concept within work and organizational psychology. Organizations need highly performing individuals in order to meet their goals, deliver the products and services they specialize in and can to achieve competitive advantage (Sonnetangand Frese, 2002). In a project-based industry such as construction, performance indicators are gradually being affirmed as a viable option for engendering superior performance levels of PMs Dainty et al.(2003), cited in (Ahadzie, 2007).Again, Dainty et al,

(2003) cited in Ahadzie et al, (2008a) emphasised that project-based organisations within the construction industry are becoming keenly interested in identifying the appropriate behavioural competencies of the key managerial staff. To deal successfully with the multiple roles and responsibilities in ever changing workplace environments, PMs required to possess a wide range of attributes and competencies.

Against this background, identifying and developing appropriate PM's performance indicators or variables could be an important step towards the advancement of the improved HRM practices of the construction industry in many developing countries, especially given the increasingly important role that the PM's are playing in the project management practices in the recent times (Ahadzie,2007).

The Chartered Institute of Building (2002) defined project management as: 'The overall planning, co-ordination and control of a project from inception to completion aimed at meeting the Client's requirements in order to produce a functionally and financially viable project that will be completed on time within an authorised cost and to the required quality standards. Project management as a discipline; developed from several fields of application including civil construction, engineering, and other disciplines. Two forefathers of project management are Henry Gantt, called the father of planning and control techniques, who is famous for his use of the Gantt chart as a project management tool (alternatively Harmonogram first proposed by Karol Adamiecki; and Henri Fayol for his creation of the five management functions that form the foundation of the body of knowledge associated with project and programme management.

According to CIOB (2002) PMs stem from various backgrounds and are required to govern a project throughout its life cycle. In order to be able to adequately manage a project, the project manager must possess the relevant leadership skills and competencies which will allow them to be a capable project manager. The British standard guide to project management (BS 6079, 1996) defined the role of the PM as 'the individual or body with responsibility for managing a project to achieve specific objectives'. It is therefore, important for PMs to acquire the relevant competencies to carry out their roles effectively to achieve the clients' pre-defined goals. According to Ahadzie and Amoah-Mensah (2010) "the PM is the individual with the requisite authority and responsibility for management of both design and construction of housing projects from inception to completion and the works primarily in the interest of the client and/or promoter of the development".

It is therefore necessary to look beyond currently established project management standards and practices, further investigate through empirical research, the core competencies of the effective project manager in the workplace (Brill et al, 2006). This study attempts to develop a model for predicting the performance of PMs at tendering phase in MHBP's in Ghana.

Ahadzie et al. (2004) defined MHBP's as "the design and construction of speculative standardised house units usually in the same location and executed within the same project scheme". MHBP's includes terrace, multi-storey or tower blocks, maisonettes, semi-detached, and/or detached residences or a combination of them (Ahadzie et al, 2008b). Ahadzie and Amoah-Mensah (2010) had established that, in Ghana, the practice in MHBP' is

for the PM to be appointed at an early stage to provide key management decisions throughout the project life cycle (i.e. to provide some advice on the decision to build, help acquire the land including associated feasibility studies, identify appropriate procurement routes, supervise and manage physical construction till completion and provide the necessary advice on the facilities management.

Ahadzie and Amoa-Mensah (2010) further indicated that, the role of the PM in MHBPs became evident in the late 1980's when the Social Security and National Insurance Trust (SSNIT) appointed their first PM on a MHBP in Ghana. This is an indication that the role of the PM's was realized years ago to be a vehicle to successful implementations of MHBP's. Ahadzie et al. (2008b) asserted that, in most developing economies, MHBPs are of significant value towards advancing project management knowledge and practices are the determinant of project success.

For successful implementation of MHBPs, the PM role becomes very critical and which cannot be compromised. Therefore the development of the appropriate competencies and evaluative criteria for and by PMs cannot therefore be down played.

Moving forward Ahadzie et al. (2009) argued that competency profiles identified in the Ghanaian context provide important guidelines to both aspiring and experienced PMs on the expectation of employers of them in terms of their managerial skills in MHBPs in Ghana. Therefore, it has become imperative in the construction industry for identifying key success criteria so that construction executives and project managers can appropriately plan resource allocation, Cox et al.(2003) cited in (Ahadzie et al ,2008b).

Against this backdrop, the subject matter of this study is to develop a model for predicting the performance of project Managers in MHBPs at the tendering phase in Ghana which will add to the knowledge towards enhancing appropriate project management practice in MHBPs in Ghana.

1.2 PROBLEM STATEMENT

“The first steps to achieving accountability for performance must be to clarify objectives and develop a recognized approach to measuring and reporting performance.”(Dallas, 1996:13 Cited in Fisher, 2007).In this context, a PM is held to be largely accountable for delivery of a project on time, within budget and to the desired performance or quality determined by the client (CIOB, 2002; Project Management Body of Knowledge (PMBOK), 2004; Burke, 2006; Kerzner, 2006; Lock, 2007).

Therefore, successful delivery of the project often depends upon the PM’s capacity to plan, organize, coordinate and control. In other words, the PM is largely responsible for achieving all the project objectives. Therefore, the identification and development of appropriate competencies for the project manager cannot be over-emphasised.

Performance variables or indicators should reflect the various phases of project life cycle. Ahadzie et al. (2006) indicated that linking these behavioural measures to the various project phases offer potential opportunity for continuous performance improvement throughout the whole project lifecycle.

Taken into consideration the speculative nature of MHBPs, PMs are normally expected to assist and coordinate the activities within the various phases of these projects from inception to completion as well as facility management (Ahadzie, 2008a). It is therefore appropriate to conclude that PMs will require different performance variables or indicators at various phases of the project life cycle towards engendering professional development.

Drawing on the conceptual framework that guides the predictive model by Ahadzie (2007) reflects both the elements of performance behaviors and outcomes in predicting the performance of the PMs at the conception, planning, design, tendering, construction and operational phases of the project life cycle. In-depth work has been undertaken on the construction phase of the whole project lifecycle. Subsequently, Sarkodie-Poku (forthcoming, 2013) has also gathered empirical data for the design phase. Therefore, a decision was taken to undertake studies on one of the critical phase in the project lifecycle thus the tendering phase. The decision to concentrate attention on the tendering phase was provoked by the critical role the tendering phase plays to the success or otherwise of construction projects. The tendering process has a great impact on the success of the subsequent processes in the project lifecycle.

The tendering process therefore needs to be adequately planned and controlled more effectively, in order to achieve the project objectives. The study on the performance criteria for assessing PMs at the tendering phase of MHBPs is therefore a needed intervention and as follow up to previous research of the construction phase of MHBPs in Ghana.

1.3 RESEARCH QUESTIONS

This study attempts to answer the following key research questions:

- What are the roles of PMs at the tendering phase of MHBPs in Ghana?
- What are the appropriate performance indicators for assessing the performance of PMs at the tendering phase of MHBPs in Ghana?
- How should the performances indicators be incorporated into a model at the tendering phase of the project life cycle?

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1.4 AIM OF STUDY

The aim of this study is to identify a model, which can be used to predict the performance of PMs at the tendering phase of MHBPs in Ghana to help improve their performance.

1.5 OBJECTIVES OF STUDY

To help achieve the aim of the study the following objectives were outlined:

1. To review existing conceptual model for predicting the performance of PMs in MHBPs at the tendering phase by adopting a theoretical framework from literature.
2. To identify from literature key indicators or variables for PMs performance in MHBPs at the tendering phase.
3. To develop the substantive model for predicting the potential performance of PMs in MHBPs at the tendering phase.

1.6 SCOPE OF STUDY

A decision was taken to limit the research to the property developers in Accra, the majority of the entire membership of GREDA are operating in Accra.

1.7 RESEARCH METHODOLOGY

To help deal with the research questions outlined above, it was considered necessary to adopt appropriate research methodology for the study.

In doing so, an elaborate literature review on the state of project management practices in general and specific to MHBPs in Ghana was undertaken. Also, literatures on competencies of project managers were reviewed to help structured appropriate questionnaire for the survey.

Quantitative research method was used; questionnaires were administered to senior managers of registered GREDA companies to collect relevant data for the study. The data was analysed using multiple regression analysis and descriptive analysis. Subsequently, the findings were discussed and appropriate recommendations made.

1.8 LIMITATIONS OF THE STUDY

This research study is not without any limitations; however, these constraints do not by any way invalidate the conclusions and recommendations made in this study. The following are some of the challenges confronted during the survey;

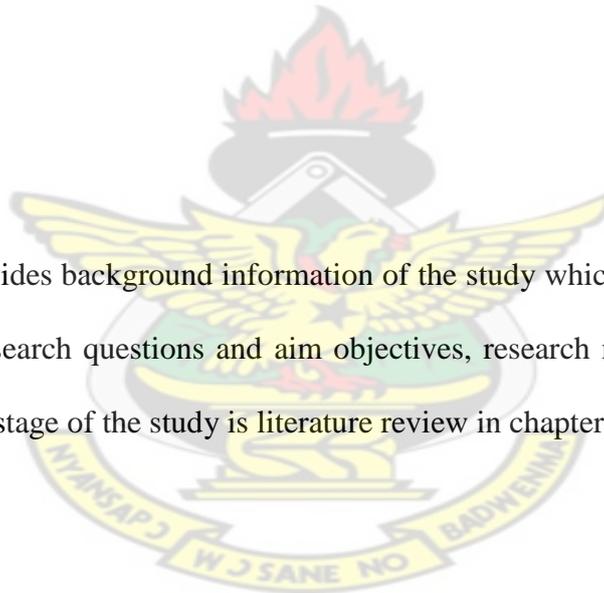
- Failure on the part of some respondents to answer the questionnaires even though they initially agreed to be part of the study.
- Some of the registered members of GREDA are inactive.

1.9 ORGANISATION OF STUDY

This study has been grouped into five chapters. The first chapter provides background information of the study which includes introduction, problem statement, research questions and objectives, research methodology and scope of the study. The literature on procurement and tendering, housing development in Ghana, project management, performance measurement ,competencies of project managers was reviewed in chapter two. Research design, sampling frame, questionnaire administration and data analyses which form the methodology of this study are captured in chapter three. Chapter four analysed the data while chapter five presents a summary of the findings, recommendations and the conclusion of the study.

1.9 SUMMARY

This first chapter provides background information of the study which includes introduction, problem statement, research questions and aim objectives, research methodology and scope of the study. The next stage of the study is literature review in chapter two.



CHAPTER TWO: LITERATURE REVIEW

2. Introduction

This chapter focuses on the literature review on the subject. The broad areas of this chapter includes: overview of procurement and tendering phase of the project life cycle, housing development in Ghana, overview of procurement and tendering phase of MHBPS, the role of the project manager in the tendering phase . Also, this chapter considers performance measurement and competencies required by PMs at tendering phase of MHBPS, overview of the model for predicting the performance of PMs in MHBPs. The idea of this chapter is to unearth all the variables in the subject to enable analysis and discussion of the situation in the study area.

2.1 OVERVIEW OF PROCUREMENT AND TENDERING PHASE OF THE PROJECTLIFE CYCLE

2.1.1 Conceptual Definition of Procurement

Procurement and Tendering phase of a project life cycle are vital to the success or otherwise of a project. According to Weele (2010) procurement is the acquisition of goods or services. It is therefore, important that the goods, services and works are procured at the right quality, in the right quantity and at cost that the purchaser gets value for money. In project management terms, procurement refers to obtaining goods, works and services from outside the client organization.

Procurement in the context of construction, is obtaining the whole spectrum of goods, materials, plant and services in order to design, build and commission a building that delivers the best possible value for money for the client over its life cycle (Cartlidge, 2009). Again, procurement in the domain of construction refers to the process that is used to deliver construction projects, (Ashworth and Hogg, 2007). Therefore, procurement process spans a life cycle from identification of the need, through pre-contract (selection of suppliers/contractors), to post-contract award management and eventual disposal. The tendering process is the subject matter of this study which is an important part of the procurement process.

Tendering is the process of selecting the most suitable supplier, contractor or consultant to supply goods, execute works or offer services for the clients and meeting the client's objectives in terms of quality, cost and time. According to Brook (2008) the key to a successful project often lies with the understanding and cooperation that is essential from all participants. Therefore it is essential for the client or his agent to select a winning team. He also stated that, the documentation is a vital link between design and construction. That is to say that tendering simply put is the process between design and construction in a project life cycle.

Thus, the tendering phase of project lifecycle is therefore crucial to successful implementation of a project. According to Harris and McCaffer (2002) clients or promoters of the construction industry from the private sector tend to employ competitive tendering procedure in the award of contracts as is the practice from the public sector. The tendering process is therefore, intended to be an unbiased means of selecting a contractor to carry out work (Brook, 2008). Brook(2008) further stated that the prime aim of the tendering process is

to select the right contractor who will give the client good value for money. The overriding objective of the tendering process for the client is to get value for money at the end of the project lifecycle, which support the vital role of the PMs in project implementation.

2.2 HOUSING DEVELOPEMNET IN GHANA

People satisfy their needs sequentially. These needs primarily include basic needs such as food, clothing, housing and many more. However, one of the greatest desires of an individual is to own a house and this, when achieved, gives the individual a sense of well-being and self-fulfillment (Harris and McCaffer, 2002).The housing need is therefore highly placed in the hierarchy of an individual's needs.

Having a decent accommodation is every man and woman's dream. Indeed, it ranks high among the list of basic necessities of life namely food, shelter and clothing. In fact the extent to which a nation is able to provide decent affordable housing to its citizens is one of the barometers for judging the level of development of the country and the quality of life for the people (Osei, 2004).

Housing is both a form of shelter to which one can retire after a hard day's work and cradle in which the family and its values are nurtured. Nothing is more reassuring and rewarding than a place where one can call a home. Housing is also a store of value and therefore a measure of wealth and progress in life. This yearning or desire to own a home is not peculiar to Ghanaians. Our cousins across the Atlantic Ocean refer to homeownership as the 'American dream', (Asiedu-Mante, 2004).

According to the Bank of Ghana (2007) the housing industry in Ghana possibly commenced in the late fifties to early sixties as Ghana attained independence from colonial rule. The report further stated that in furthering the agenda of housing development in 1960-65 National Development Plan, provision of housing was central as two main state bodies were formed to address housing issues: the State Housing Corporation (SHC) and the Tema Development Corporation (TDC).

Bank of Ghana (2007) argued that the resources allocated in the form of subventions, loans or grants for these ventures began to dwindle as Ghana's economic fortunes began to take a down turn. The vision of the state however, did not yield the needed results to provide the citizen with the basic necessities of life. There is insufficient housing in Ghana as a result Ghana suffers from severe housing deficits (Boamah, 2010).

The housing sector in Ghana has been described by various bodies as a sector in crisis. 'The issue of shelter and access to decent accommodation is a critical problem facing Ghanaians' (Mahama, 2004). According to Dauda (2013) the housing deficit in Ghana now stands in excess of 1.5 million houses. Dauda (2013) further stated that a national housing policy has been drafted to tackle head on the country's' housing deficit. Tettey (2013) argued that to help solve the housing deficit in the country, the Ministry of Water Resources, Works and Housing had reviewed the draft national policy which, according to him was ready for Cabinet approval. Tettey (2013) stated further that, the country was only able to produce around 40,000 units per annual, as against an annual requirement of 120,000 units.

To improve the housing delivery in the country, the government should aim at enhancing private sector participation in the development process of the country, it is prudent for government to identify, promote and develop efficient avenues in the private sector which have the potential of improving the housing delivery system in Ghana. The liberalization of the housing sector in 1987 led to the formation of the Ghana Real Estate Developers Association (GREDA) in 1988, (Boamah, 2010). The responsibility of housing delivery was therefore taken up by the private sector.

The role of private real estate developers in recent times has also boosted the supply of houses to meet the housing stock deficit in the country (Bank of Ghana, 2007). Bank of Ghana (2007) indicates that under the umbrella of the Ghana Real Estate Developers Association, private real estate developers have constructed over 10,954 new homes between the time the formation of the association in 1988 and at the time of the research. Ghana has made some progress in housing delivery, especially the contribution of estate developers under the umbrella of the Ghana Real Estate Developer Association.

2.3 THE ROLE OF THE PROJECT MANAGER IN THE TENDERING PHASE OF HOUSING PROJECTS

2.3.1 Definition of Project Management

According to the CIOB (2002) PMs stem from various backgrounds and are required to govern a project throughout its life cycle. In order to be able to adequately manage a project, the PMs must possess the relevant leadership skills and competencies which will allow them to be capable PMs (O'Rourke et al., 2010). The role of the PM is therefore relevant to the

successful delivery of projects. PMs are engaged from inception to completion of projects. Their roles include development of project charter, selecting of both design and construction teams and seeing to the successful implementation of the project.

The PMs' role in the tendering phase will among other things include helping the client decide on the appropriate tendering method, facilitating the preparation of documentations, making appropriate recommendation for award of contract to suppliers, contractors and consultants. The primary role of the PM is advising the client on issues relating to tendering and coordinating the activities of the team towards achieving project set objectives. Harris and McCaffer (2002) outlines the function or role of the PMs in implementation of a project which include the development of design and technical direction of the works as well as the preparation of specifications, bills of quantities, drawings and other contract/tender documents.

The Project Management Institute (PMI) describes project management as “the application of knowledge, skills, tools, and techniques to project activities to meet project requirements” and characterized “high quality projects [as those that] deliver the required product, service, or result, within scope, on time, and within budget” (PMI, 2004). According to Tinnirello (2000) project management is defined as “the knowledge, tools, and techniques for controlling requirements, setting a realistic scope, creating feasible schedules, defining responsibilities, and managing expectations”. Also, Kerzner (2001) characterized project management success as the completion of an activity within the allocated time, at or under budget, to specified performance levels and the satisfaction of the client. Morris (2003) critiquing these definitions as focusing too strongly on implementation tools and processes,

argued for an expanded definition of project management that emphasizes the importance of a broader business context and strategy as well as the leadership of people.

The historic development of project management as a discipline is traced by (Healy, 1997). Healy (1997) states that its roots are placed in North America, more specifically on large-scale oil pipeline and air force projects where a single project manager had overall responsibility for the whole project in addition to being a hub to foster integration in the project team. It was not until the 1970's and 1980's, however, that it achieved greater diversity of adoption Kerzner (1979) in Healy (1997) management, information technology, engineering, and manufacturing (Cleland, 1995; Greer, 1992; Kerzner, 2001; Tinnirello, 2000).

2.4 PROJECT MANAGEMENT PRACTICES IN THE GHANAIAN MASS HOUSE BUILDING INDUSTRY

According to Tipple and Korbe (1998) cited by Ahadzie and Amoa-Mensah (2010) some of the earliest and notable Ghanaian MHBPs were implemented using pre and post-independence state agencies like the Gold Coast Housing Corporation and later the State Housing Company (SHC) through the GoG's direct housing provision programme. Ahadzie (2010) stated that the management approach adopted then was the architect as the team leader was responsible for both supervision and management of the physical construction from inception to completion. The architect was then responsible for planning, coordinating and controlling all activities from inception to project completion on behalf of the client.

Ahadzie and Amoa-Mensah (2010) mapped management practices in Ghana to the 1970s, which places the responsibility for the management of design and construction in the hands of

different parties, namely the consultants and contractors respectively, has become the conventional system for the management of housing delivery in Ghana. The practice where design is separated from construction is until recent, the widely used practice in the housing delivery in Ghana.

However, with the changing practice of procurement of works, clients are more informed and demanding value for money. They are, exploring alternative methods of procuring works. Hence, the gradual practice of project management practices in the housing delivery in Ghana. In recent times, contractors have been blamed for the poor performances and severely criticized for having limited knowledge in the application of requisite management techniques, Ofori, (1989); Ahadzie et al., (2004) cited by (Ahadzie, 2010).

There is therefore the need to develop appropriate knowledge and skills in project management technique for efficiency in delivery of housing in the sector. Ahadzie et al. (2008b) asserted that MHBPs represent one of the largest project-based sectors of the construction industry in most developing economies. They further argued that the key to achieving project management success on MHBPs is for PMs to have the requisite knowledge and skills.

Hence, the need for this study to identify the appropriate competency profiles for PMs at the tendering phase in MHBPs in Ghana.

2.5 PERFORMANACE MEASUREMENT AND COMPETENCIES REQUIRED BYPROJECT MANAGERS AT TENDERING PHASE OF MHBPS

2.5.1 The Definition of Concepts

Meyer and Semark (1996) described competence as the demonstration of an integration of knowledge, skill, personal attributes and value orientation. Wisner (1994) argued that competencies provide a common cultural thread, a language for success, a framework for thinking about excellence and a way of communicating the future. Holmes and Joyce (1993) defined competence as action, behaviour or outcome which a person should be able to demonstrate, or the ability to transfer skills and knowledge to new situations within an occupational area.

Competence therefore is a combination of knowledge, skills and behaviours to improve individual performance. RICS (2012) asserted, that to be competent is to have the skill or ability to perform a task or function. According to Shafiei and Said (2008), individual competence refers to the set of skills that an individual must possess in order to be capable of satisfactorily performing a specified job.

Heusden (2004) on the other hand, defines competence from professional stand point, as the ability to perform well in a professional situation that involves the accomplishment of a certain task or the dealing with a problem, in a manner that can be observed and be judged by others. Against this backdrop, a competent professional is one that is capable of applying the necessary skills with effective behaviour in the work environment.

According to Nkado (2000) competencies are the manifestation of knowledge acquired through education, training and self-developing. PMs can therefore acquire the requisite competencies through education, continuous professional development and self-improvement.

2.5.2 Importance of Performance Measurement

Performance measurement has been given an important place in most organisations as it helps accomplish continuous improvement (Martinez, 2005; Baldwin et al., 2001). According to Parker (2000) performance measurement enables managers to make decisions based on facts rather than on assumptions and faith. Therefore, Performance measurement has become an integral part of planning and controlling organisations, (Barnard, 1962, cited in Neely, 1999).

Performance measurement is defined as “the process of determining how successful organizations or individuals have been in attaining their objectives and strategies” (Kagioglou et al., 2001). Love and Holt (2000) outlined the importance of performance measurement as: ensuring that customer requirements are properly met (and if not, why); enabling the establishment of achievable business objectives and monitoring compliance; providing standards for business comparisons; providing transparency and a scoreboard for individuals to monitor their own performance; identifying quality problems and those requiring priority attention; giving an indication of the costs of poor quality; justifying the use of resources; and providing feedback for driving the improvement effort.

By considering the above, it can be said that Performance measurement is an important aspect for organisations to evaluate their actual objectives against predefined goals and to

make sure that the organisation is doing well in the competitive environment (Kulatunga et al, 2006).

However, performance measurement is not without any limitations. According to Martinez (2005) cited in Kulatunga et al. (2006) the use of complicated and excess performance measures creates negative effects due to their considerable consumption of time, investments and commitment of people, whilst also sometimes limiting the freedom of managers due to their rigidity. In addition, the inappropriate selection of performance measures - setting unrealistic and incorrect targets/norms - can generate misleading information (Kulatunga et al., 2006).

Hence, it can be said that the use of Performance measurement not only has positive impacts on organisations but also has negative impacts. The solution is not to avoid the use of Performance measurement, but to develop a system which is user friendly and which minimises the negative impacts by providing more positive impacts.

Ahadzie et al. (2005) contended that, performance measures are widely held as a viable option for providing appropriate evaluative criteria against which effective managerial performance can be validated; research towards PMs' performance measures has not been vigorously pursued in construction. Ahadzie et al. (2005) further argued that, PMs' performance measures are important prerequisite for identifying appropriate evaluative criteria for improving the performance of construction PMs.

2.5.3 Competencies of Project Managers

In order to survive in a competitive market, many organizations today are looking for the “competitive advantages” (Omidvar et al., 2011). One of these “competitive advantages” is having competent personnel and competent project managers (Omidvar et al., 2011). In contemporary human resource management (HRM) practice, establishing competency of an individual is considered as a resourceful and robust tool (Collin, 1997). Fugar (2011) stated that, companies are beginning to appreciate that to stay on top in a competitive global economy they must make developing and retaining their people a priority.

One of the factors that influence project success is the employment of competent project managers. Crawford (2000) argued that a competent project manager is a factor that affects project success. Therefore, this leads to the development of some standards for assessing project manager’s competencies (Crawford, 2000). Project manager’s competency standards illustrate some evaluative criteria, which not only can be used for measuring manager’s performance, finding training and development needs, setting of goals among project managers and acting as the basis for succession planning Dainty et al.(2004) but can also be used for predicting performance Motowidlo et al. (1997) and providing a performance management system.

According to Omidvar, et al.(2006) competency-based standards which have been developed by project management institutes are as per following sequence: “Project Manager Competency Development Framework” which is carried out by “Project Management Institute” in 2002, “IPMA Competence Baseline Version 3.0” which is published by “International Project Management Association” in 2006 “AIPM professional competency standards for project management” which is developed by “Australian institute of Project

management” in 2008, , and “APM Competence Framework” which is developed by Association for Project Management in 2008”.These standards are prepared based on collective opinions of experienced practitioners in project management and their understanding on competencies required for effective project managers (Crawford, 2005). On the other hand, some researchers have investigated effectiveness of project managers based on other point of views. For example Fraser and Zakaria (2003) examined project manager’s effectiveness based on stakeholder’s perception. Crawford (2005) conducted a research for project management competency based on senior management perception. A number of national and international organizations have identified, and periodically review and update, professional standards of performance in project management. In fact, an international working group aimed at developing global standards for project management recently identified 11 major guides to project management standards (Global Performance Based Standards for Project Management, 2003).

Crawford (2004) also identified recognized project management standards as inadequate for developing and evaluating project managers performance for two main reasons. First, she criticized recognized standards for representing insufficient models of competence. Based on the work of Boyatzis (1982) and Spencer and Spencer (1993), Crawford (2004), developed a model of competence that integrates knowledge, skills, demonstrable performance, and core personality characteristics.

Crawford (2004) argued that two of the most influential project management standards, the PMBOK® and APMBOK, address only the knowledge aspect of competence, while a third, Australia’s National Competency Standards, draws from knowledge but focuses only on

demonstrable performance. Again, Crawford (2004) indicated that most standards are not based in empirical research but rather in an “assumption that there is a positive relationship between standards and effective workplace performance”. It is evident that, there is a need to look beyond currently established project management standards and practices and investigate further, through empirical research, the appropriate evaluative competencies of the PM.

2.6 COMPETENCIES OF PROJECT MANAGERS AT THE PROCUREMENT AND TENDER PHASE OF PROJECT LIFECYCLE

Procurement and Tendering phase of project lifecycle is the lifeline to project success. Hence, in order to execute these activities PMs must possess relevant skills. According to Barber (2004) skills sets should be developed independently of one another in order to be able to adapt these skills suitably to individual projects. As indicated by the PMBOK (2004) it does not mean that the skills described should always be uniformly applied on all projects. Each project is unique and therefore the project manager must recognise what skills are required and apply them accordingly to suit their current project (O’Rourke et al., 2010). By extension, PMs require unique competencies at the tendering phase of MHBPs. Being competent are the capacity to undertake the functional role to a pre-defined standard.

According to RICS (2012) procurement and tendering phase of a project lifecycle covers how a project is structured and delivered in terms of risk allocation and contractual relationships and how tendering processes are used to establish a contract price.

The aim of this study is to identify the appropriate competencies required by PM for predicting performance at the tendering phase of MHBPs.

The Royal Institution of Chartered Surveyors (2012), Assessment of Professional Competency, outlined the competencies required by PMs at the procurement and tendering phase of project lifecycle. The RICS (2012) argued that the competencies are not just a list of tasks or functions; they are also based upon attitudes and behaviours. The core competencies require by PMs at the procurement and tendering phase of project lifecycle by RICS are as follows:

- PMs are expected to have knowledge in the main types of procurement used in both the public and private sectors, both nationally and internationally
- PMs are required to demonstrate knowledge and understanding of tendering and negotiation processes involved in procurement and tendering.
- PMs are expected to have knowledge and understanding of ancillary processes such as partnering and framework agreements.
- PMs are required to apply their knowledge in implementing of procurement routes such as traditional, design and build, management forms, term and serial contracting and other types.
- PMs are expected to apply their knowledge in producing and/or compiling tender documentation such as letter of invitation, form of tender, health and safety documentation, design documentation and contractual details (please note, pricing documents are covered under the Quantification and Costing of Construction Works)
- PMs are required to demonstrate knowledge in carrying out of tendering and negotiation processes such as single and two stage tendering, the use of codes of practice and electronic tendering.
- PMs are expected to have knowledge and give advice in evaluating the appropriateness of various procurement routes.

- PMs are required to have management ability in managing the tendering and negotiation process.
- PMs are expected to have the ability in preparing procurement and tendering reports.

Also, Project Management Core Competencies, (1998) have the following as Core Competencies required by project managers at the procurement and tendering phase of the project lifecycle.

- PMs are expected to have knowledge in the usage of the project plan and input from the procurement authorities to develop a procurement strategy that details what to procure, how to procure it (type of contract), when to procure it and at what cost, as well as the procurement strategy.
- PMs are required to have the ability to develop and manage, through early liaison with the procurement authorities, agreements with external vendors and contractors.
- PMs are expected to demonstrate knowledge in identification and use the internal and external organizational processes needed to acquire goods and services through contracts.
- PMs are required to possess the ability to liaison with the procurement authorities, prepare procurement support documentation such as specifications, statement of work, request for information, request for proposal, evaluation criteria and vendor lists.

The functions and tasks of PMs at the tendering phase identified above that relate to the tendering process were incorporated into the questionnaire to ascertain senior managers' perception of the standards established by the professional bodies if they meet their expectations and to help establish the appropriate competencies.

2.7 AN OVERVIEW OF THE MODEL FOR PREDICTING THE PERFORMANCE OF PROJECT MANAGERS IN MASS HOUSE BUILDING PROJECTS IN GHANA.

The above research topic was originally undertaken by Dr. D.K Ahadzie for his degree of Doctor of Philosophy. He set out with a research aim, which was to identify through the development of a relevant predictive model, appropriate performance measures for PMs in MHBPs in the Ghanaian construction industry.

To help address the main research questions; he adopted research approach, which would enable him collect appropriate data, analysis and interpretation of the findings for the benefit of practitioners and researchers.

Ahadzie (2007) argued that in Ghana, 'the practice in the house building industry is for the PM to be appointed at an early stage to provide key management decisions throughout the project lifecycle (i.e. to provide some advice on the decision to build, help acquire the land including associated feasibility studies, identify appropriate procurement routes, supervise and manage physical construction till completion and provide the necessary advice on facilities management)' (Ahadzie et al., 2004). Ahadzie (2007) then defined the PM in the context of his studies, 'as the individual that has the authority and responsibility for the management of MHBPs from inception to completion and who works in the interest of the key stakeholder (herein identified as the property developer).'

'Drawing from organisational psychology literature, an evidence based practice theory that has been argued for having the potential of measuring the PMs' performance from a

multidimensional perspective was therefore explored for potential application in his research (Ahadzie et al., 2006b).” According to Ahadzie (2007) the theory posits that a robust way of understanding the domain of managerial performances is to separate the competencies into contextual and task performance behaviours (Borman and Motowildo, 1993; Motowildo et al, 1997; Scullen et al, 2003). “While task performance behavior sare job-specific and formally recognised and/or rewarded such as the manager’s job description, contextual performance behaviours refers to those discretionary job-related acts such as working hard and helping others, which informally contribute to organizational effectiveness but are not formally recognised as part of the job (Motowidlo and Borman, 1997; Organ and Paine, 1999).”

Subsequently, Ahadzie (2007) developed a conceptual framework which could be used to evaluate and isolate the competency profiles of PM for the various phases of the project lifecycle. It is also argued that there is a need to link PMs’ performance measures to the various project phases. This is vital in identification of evaluative criteria, which are critical for the PMs’ performance improvement at the various project phases (Ahadzie et al., 2005).

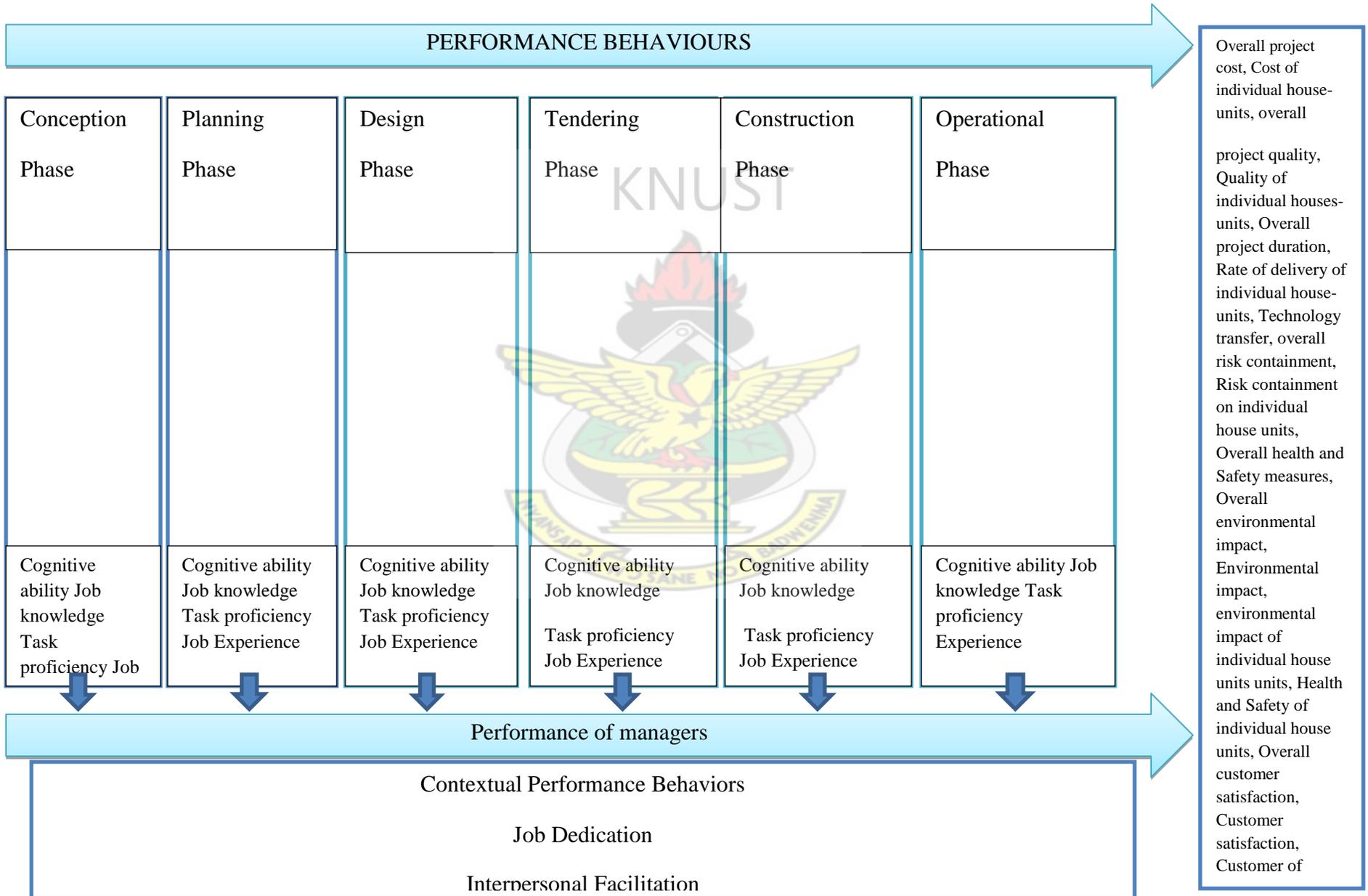
Figure 2.1 below shows the conceptual framework developed by Ahadzie, et al. (2008c) for the project phases which identified; the conception, planning, design, tendering, construction and the operational phases. Also, the performance behaviours under contextual and task performance behaviours were also identified in the figure. The contextual performance behaviours are job dedication and interpersonal facilitation whereas the task performance behaviours are cognitive ability, job knowledge, task proficiency and job experience. The figure further, indicates the performance outcomes that contribute to successful implementation of MHBPs. Ahadzie et al. (2009) indicated that a significant contribution of the conceptual model, is that, it reflects both the elements of performance behaviours and

outcomes in predicting the performance of PMs at the various phases of the project lifecycle indicated above.

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Figure 2.1 Competency – based Conceptual model for the project lifecycle of MHBPSs



According to Ahadzie (2007) competency-based measures are increasingly being recognised as a viable option for engendering the managerial excellence of PMs. The contextual-task framework was used in developing a conceptual model that reflected the various phases of the project lifecycle in MHBPs.

Following the conceptual framework, Ahadzie (2007) gathered empirical data for the construction phase. Subsequently, Sarkodie-Poku (forthcoming, 2013) has also gathered empirical data for the design phase. To this end a decision was taken to undertake this study at the tendering phase of the project lifecycle as a step toward developing a holistic model for predicting the performance of PMs in MHBPs.

2.8 SUMMARY

The broad areas discussed in this chapter includes: overview of procurement and tendering phase of the project life cycle, housing development in Ghana, overview of procurement and tendering phase of MHBPS, the role of the project manager in the tendering phase . Also, this chapter considered performance measurement and competencies required by project managers at tendering phase of MHBPS. The idea of this chapter was to review the current knowledge available on this study and to help develop appropriate questionnaire for the study in the next chapter.

CHAPTER THREE: RESEARCH METHODOLOGY

3. INTRODUCTION

This chapter describes the methods adopted in this study. It gives an outline of the theoretical framework of the study. This is followed by the design of the questionnaire, the sampling framework and the administration of the questionnaires. The chapter concludes with the statistical tools employed for the analysis of the data obtained. This will present the basis upon which the eventual findings can be assessed.

Quantitative research is “objective” in nature. It is defined as inquiry into a social or human problem, based on testing a hypothesis or a theory composed of variables, measured with numbers and analysed with statistical procedures, in order to determine whether the hypothesis or the theory holds true Creswell (1994) cited by (Naoum,2013). Quantitative data are, therefore not abstract; they are hard and reliable; they are measurements of tangible, countable, senate features of the world, Boouma and Atkinson (1995) cited by (Naoum,2013).

On the other hand, qualitative research is ‘subjective’ in nature. It emphasises meanings, experiences (often verbally described), description and so on (Naoum, 2013).Against this backdrop, a quantitative research approach was used in eliciting the relevant data from property developers in Ghana.

3.1 Theoretical framework of study

This part discusses the theoretical framework underlying this study. The theoretical framework hinges on applied psychology theoretical framework of theory of the job performance. Campbell (1990) defines performance as those actions or behaviors under the control of the individual, that contribute to the organization's goals, and that can be measured according to the individual's level of proficiency. Murphy also defines performance as behaviors that are related to the goals of the organization. According to Campbell (1990); and Murphy (1989) argued that, researchers agree that job performance can be defined on a micro level as actions and behaviors of an employee that contribute to the goals of the organization. Rotundo (2000) explains that although researchers provide their own conceptualization of job performance, a typical definition focuses on behaviours or actions of individuals, not results or outcomes of these actions and behaviours.

Griffin et al. (2000) suggest that task performance and contextual performance are two distinct dimensions of behaviour at work that can contribute independently to effectiveness outcomes for organisations , Contextual performance is important because it represents a type of behaviour that is largely under the motivational control of individuals.

The term "task performance" refers to the core technical behaviours and activities involved in the job, whereas "Contextual performance" refers to behaviours that support the environment in which the technical core operates (Griffin et al.,2000).The theory of contextual performance states that the criteria for evaluating job performance are interpersonal facilitation and job dedication (Van Scotter and Motowidlo, 1996).

Based on these criteria, detailed attributes that may impact the performance of project managers at the tendering phase of MHBPs are operationalised.

Based on applied psychology theory of job performance adopted, a multi-dimensional competency-based conceptual model developed by Ahadzie et al. (2006) was adopted.

According to Ahadzie et al. (2008b) contend that the current and evolving criteria such as health and safety, technology transfer, environmental friendliness, risk containment, client satisfaction and stakeholder's satisfaction have become an accepted part of these emerging frameworks,

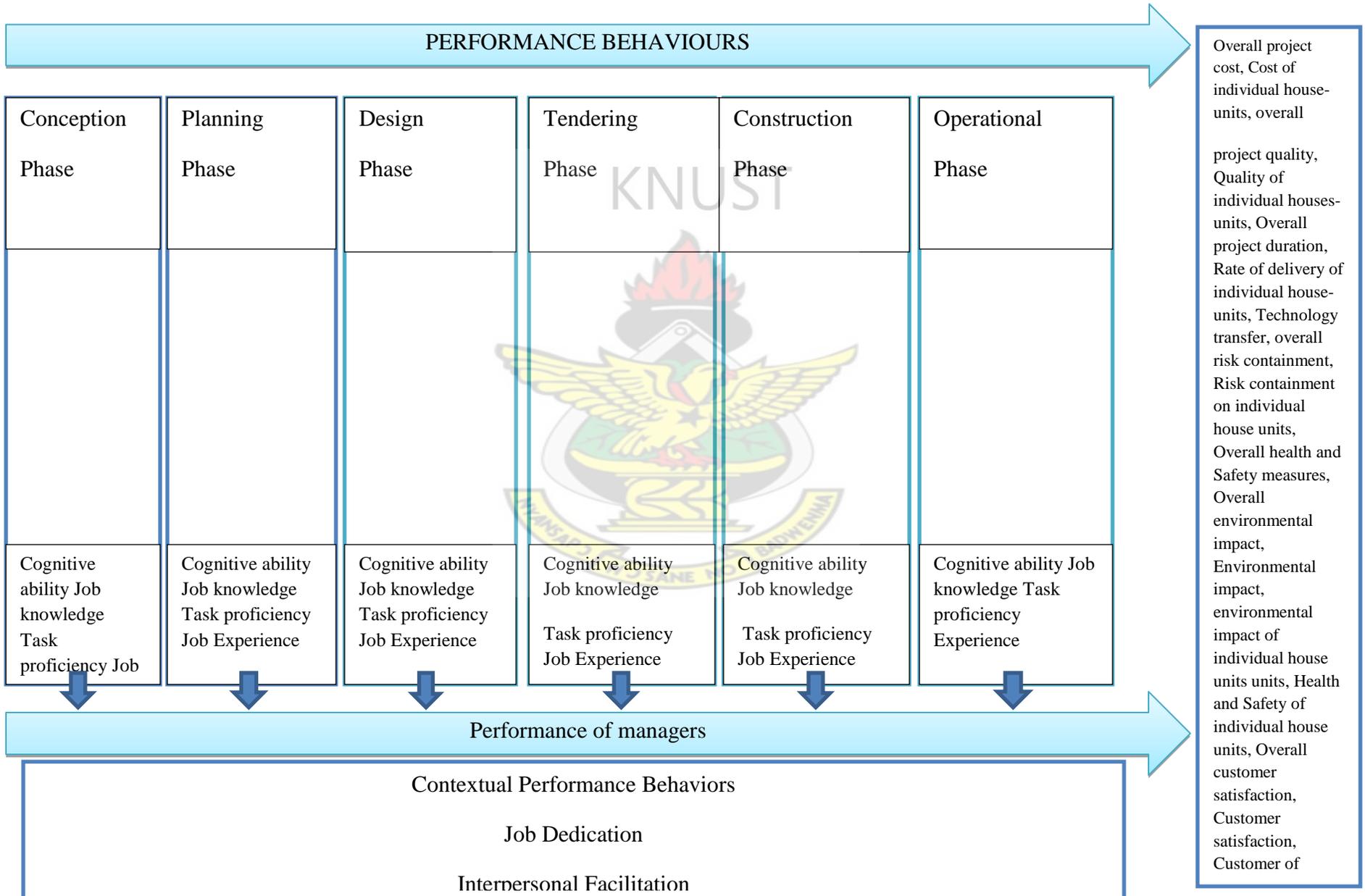
Based on the theory of job performance improvement and the criteria of effective project management and project success, it is argued that an appropriate methodology for developing robust evaluative criteria is for the measures to be based on both performance outcomes and the elements of task and contextual performance behaviours (Ahadzie et al., 2005).

Figure 3.1 below indicates the conceptual model developed by Ahadzie et al.(2008c) for the project phases which identified; the conception, planning, design, tendering, construction and the operational phases.

Further, the performance behaviours under contextual and task performance behaviours were also identified in the figure. The contextual performance behaviours are job dedication and interpersonal facilitation and the task performance behaviours are cognitive ability, job knowledge, task proficiency and job experience. The figure again, indicates the performance outcomes that contribute to successful implementation of MHBPs.

Ahadzie et al. (2005) proposed that more appropriate and robust approach is for PMs' performance measures to be based on both the elements of performance outcomes and behaviours and also linked to the various project phases.

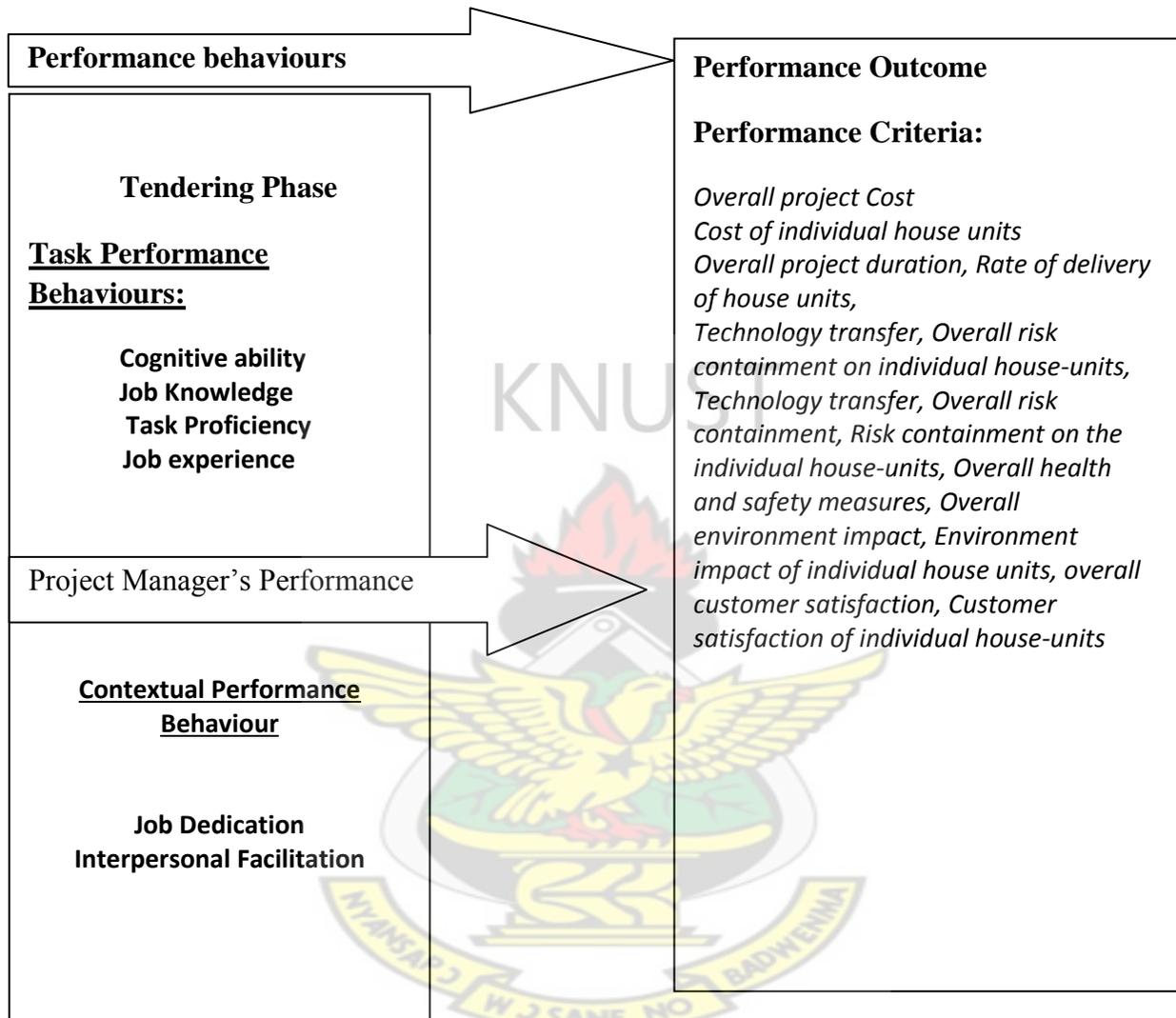
Figure 3.1 Competency – based Conceptual model for the project lifecycle of MHBP



A decision was taken to focus attention on the tendering phase of the conceptual model adopted. The decision to focus on the tendering phase comes from the background that effectiveness of the tendering process in the building industry has critical influence on the success of the subsequent processes in the project life cycle. ‘On the premise that behavioural competencies are likely to develop and change as a project progresses, the model depends on the project lifecycle framework so that the potential behavioural performance of PMs can be predicted at the conception, planning, design, tendering, construction and operational phases of the project lifecycle’ (Ahadzie, 2007).

Figure 3.2 below indicates the abridge version of conceptual model at the Tendering phase adopted from (Ahadzie, 2007). The framework identified both the performance behaviours under the contextual and task performance behaviours. The constructs under contextual performance behaviours are job dedication and interpersonal facilitation, whereas task performance behaviours are cognitive ability, job knowledge, task proficiency and job experience respectively. On the other hand variables for performance outcomes were also identified for successful implementation of MHBPs.

Figure 3.2: Abridge version of conceptual model at the Tendering phase adopted from (Ahadzie, 2007).



Based on contextual and task performance criteria, detailed attributes or key indicators that may influence the performance of the PMs at the Tendering phase of Mass house building projects are operationalised. The conceptual model affords the opportunity for the variables to be defined in basic behavioural terms. Ahadzie et al., (2006) argued that linking these behavioural measures to the various project phases offer potential opportunity for continuous performance improvement throughout the whole project lifecycle. It is indeed important to identify the vital management

attributes and skills that would ignite superior performance by PMs throughout the entire lifecycle of MHBPs.

3.2 DESIGN OF QUESTIONNAIRES

In designing the questionnaire the objectives of the study were taken into account questionnaire.

This was done to ensure that the appropriate questions were asked.

In this regard, an appropriate research technique based on the conceptual model to collect the relevant data reflecting the competency of profiles of PMs at the tendering phase of MHBPs, the behavioural measures identified from literature and operationalised were listed for the respondents to rank them. The appropriate ratings were extracted using likert rating scales. The criteria were to be ranked per their level of importance by the respondents on five point Likert rating scale of 1-5 where;

1 =not very important, 2=not important, 3= average, 4=important and 5=Very important

The questionnaire was developed into sections, namely the background information, contextual and the task performance behaviours. From the literature, the variables identified for the performance behaviours were operationalised at the relevant performance domain for the respondents to rank them.

For instance these questions were listed from the RICS (2012) identified from the literature under the task performance domain in the job knowledge construct are;knowledge of evaluating

the appropriateness of various tendering methods for mass house building projects and knowledge of preparing tendering reports for mass house building projects.

3.2.1 Background Information

The first section of the questionnaires dealt with the background information of the respondent. As part of the background information respondents were asked to provide their perception of PMs performance on MHBPs in Ghana. The potential success criteria identified for MHBPs in the conceptual model which has been adopted from Ahadzie (2007) formed the basis of the dependent variable for this study.

3.2.2 Contextual Performance - Independent Variables

Contextual performance behaviours form the second section, which respondents considered importance in accessing the performance of the PMs at the tendering phase of MHBPs. In all of eleven (11) independent variables were operationalised from job dedication and the interpersonal facilitation constructs. Five out of the total variables were identified under job dedication and six under interpersonal facilitation.

The identified contextual performance behaviours were to help in obtaining the relevant behavioural measures that are important towards enhancing the necessary environment within which technical and specific functions relating to MHBPs are carried out. According to Allen and Rush (1998); Ostroff (1998), contextual behaviours are important for achieving organisational outcomes and particularly for supporting long-term success. Common examples

of contextual performance behaviours include helping co-workers, volunteering for tasks, and defending organisation (Borman and Motowidlo, 1993).

3.2.3 Task Performance – Independent Variables

The third and final section considered task performance behaviours respondents considered important in accessing the performance of the project managers at the tendering phase of MHBPs. On the whole a total of 27 independent variables were operationalised from task performance. Five of the total variables were identified under cognitive ability, ten were under job knowledge, eight were under task proficiency and four under job experience construct.

Table 3.1 – Abridged version of the operational measures for questionnaire

Dependent variable	Independent variables
	Contextual performance behaviours
Perception of Managing Directors of Real Estate companies of performance outcome of project managers engaged in MHBPs.	<p>Job dedication</p> <ul style="list-style-type: none"> • Commitment to the speedy production of tender documents • Close attention to important specification requirements • Committed to planning, scheduling, and monitoring activities • Initiative to offer suggestions to improve tendering processes • Persistence towards meeting overall tendering objectives <p>Interpersonal Facilitation</p> <ul style="list-style-type: none"> • Effective time management practice in the tendering process • Providing timely and unambiguous tendering information for tenderers/procurement managers • Smooth and cordial working relationship with procurement managers • Display of good oral and written communication skills • Ability to lead the team towards a common goal • Ability to accept corrections readily

	<p>Task performance behaviours</p>
	<p><i>Cognitive ability</i></p> <ul style="list-style-type: none"> • Being mentally alert to managing the tendering process • Having strong memory of the tendering information • Being mentally quick to pointing out tendering challenges • Being creative and innovative in making suggestions for solving tendering problems • Being proactive of the potential client expectation of tendering process outcome <p><i>Job knowledge</i></p> <ul style="list-style-type: none"> • Knowledge of procurement plan relevant to mass buildings projects • Knowledge of economical tendering process for mass house building projects
	<p>Task performance behaviours (Cont'd)</p>
	<p><i>Job Knowledge (Cont'd)</i></p> <ul style="list-style-type: none"> • Knowledge of procurement support documentation such as specifications, statement of work, request for information, request for proposal, evaluation criteria and vendor lists of mass house building projects • Knowledge of internal organisational processes needed to acquire works through contracts for mass house building projects • Knowledge of characteristics of contract types of mass building projects • Knowledge of main types of tendering methods for mass house building projects • Knowledge of negotiation processes involved in tendering for mass house building projects • Knowledge of contract administration in tendering in tendering of mass house building projects • Knowledge of evaluating the appropriateness of various tendering methods for mass house building projects • Knowledge of preparing tendering reports for mass house building projects

	<p>Task proficiency</p> <ul style="list-style-type: none"> • Technical quality of the level of project information for the tendering of the mass house buildings • Functional quality of the level of project information for the tendering of the mass house buildings • Technical quality strategies for managing the tendering process • Functional quality strategies for managing the tendering process • Functional quality strategies for managing the tendering process • Technical quality of the tendering documents for the mass houses • Functional quality tendering documents for the mass houses • Technical quality of time schedule for delivery for the tendering process • functional quality of time schedule for delivery for the tendering process
Task performance behaviours (Cont'd)	
	<p>Job Experience</p> <ul style="list-style-type: none"> • Experience in managing the tendering process of mass house building projects • Number of years of practice in managing tendering process of mass house building projects • Experience on attainment of success in management of mass house building projects • Track record in providing useful packaging of contracts for mass house building projects

3.3 Sampling Framework

The term ‘sample’ means a specimen or part of a whole (population) which is drawn to show what the rest is like (Naoum, 2013).

Registered members of Ghana Real Estate Developers Association (GREDA) were chosen for the sampling frame for the study from the list of registered members of GREDA. Ghana Real Estate Developers Association is a major stakeholder assisting the government alleviate the housing delivery problem and duly recognised by the Government of Ghana.

Members of GREDA being the main property developers in Ghana, their members are better placed to have detailed knowledge of the sector based on their rich experience and should be in a better position to evaluate the jobs behaviours relevant to the PMs' performance in MHBPs. The perception of senior managers would provide useful information about their expectation of PMs their employ.

According to Rotundo (2002) the most common way to measure job performance is a supervisor or manager's rating of an employee's (ratee's) job performance. A decision was taken after careful study of the list of the registered GREDA members nationwide, to limit the survey to Greater Accra region. The membership from the other regions was found to be relatively insignificant.

3.3.1 Determination of sample size

The membership of GREDA in Greater Accra region was fixed at 365 after omitting those contacts were not available.

The KISH formula was used in determining the sample size.

$$\text{KISH formula: } n = \frac{n'}{[1 + n'/N]}$$

n = Sample size required

N = total sample size

$$n' = S^2 / V^2$$

V = Standard error of the distribution assumed to be 0.05

S = Maximum standard derivation in the population of the elements (total error of 0.1 at a confidence interval of 95%)

P = Portion of population elements that belong to the defined class

$$S^2 = P (1 - P)$$

$$0.5 (1 - 0.5) = 0.25$$

$$\text{Hence } n' = (0.25) / (0.05)^2 = 100$$

$$n = \frac{100}{[1 + 100/365]}$$

$$n = 79$$

$$\text{Allowing 30\% for non response} = (130/100) * 79 = 102$$

Given a response rate of 50%, the sample size was increased to 120 from previous studies of (Dansoh, 2005 and Ahadzie, 2007). The active members of GREDA whose contacts have been updated online were selected as respondents, (www.gredaghana.org).

3.4 PRE-TESTING OF QUESTIONNAIRE

Due to limited time available for the questionnaire administration, pre-testing of questionnaire would not be conducted. This however, in any way did not affect the validity of the questionnaire.

3.5 QUESTIONNAIRE ADMINISTRATION

Three weeks was allowed for the distribution of the questionnaires. The data collections started in the beginning of February 2013. Questionnaires which have been answered were collected at the end of the third week. In order to increase the response rate, additional week was allowed to retrieve the rest of the questionnaires. The data collection ended in the last week of February 2013, questionnaires that have not been retrieved were considered non-responsive.

The 131 GREDA members selected for the survey were contacted via telephone and email. The administration of the questionnaire was not without any challenges. Some of the challenges confronted with were difficulties in locating physical addresses of the respondents. Also, some of the respondents later failed to answer the questionnaire, notwithstanding the earlier acceptance to be part of the survey, when the author initially communicated with them. Above all these challenges some property developers sent completed questionnaire via email to the author. The persistence calls and visits to the offices of the respondents yielded good results in the retrieval of completed questionnaires.

In all 131 of the questionnaires were administered to Managing directors and senior managers of real estate companies registered with GREDA in the Greater Accra region. In a whole, 83 of the questionnaires representing 63.36% of the total administered were obtained.

3.6 STATISTICAL TECHNIQUE USED – REGRESSION ANALYSIS

According to Sykes (1993) regression analysis is a statistical tool for the investigation of relationships between variables; it is used when we want to predict the value of a variable based on the value of another variable. The variable we want to predict is called the dependent variable (or sometimes, the outcome variable).

Linear regression is a statistical technique that is used to learn more about the relationship between an independent (predictor) variable and a dependent (criterion) variable. When you have more than one independent variable in your analysis, this is referred to as multiple regressions.

3.6.1 Multiple regressions Analysis

Multiple regression analysis is a powerful technique used for predicting the unknown value of a variable from the known value of two or more variables- also called the predictors (Choudhury, 2009). Multiple regression can be seen as a more complex model as it employs more than one independent variables as a predictor of the dependent variable. Also, multiple regression examines the contribution of each independent variable to the prediction (Hinton et al, 2004).

In classic linear regression model, the relationship between the predicted outcome y_p , and the predictor variables, x_1, x_2, \dots, x_k is defined as;

$$y_p = \alpha + \beta_1 x_1 + \dots + \beta_k x_k + c \dots \dots \dots 3.1$$

Where

α is a constant on the y-axis – geometrically, it represents the value of $E(Y)$ where the regression surface (or plane) crosses the y-axis.

β_1 to β_k are coefficients – partial slope coefficient (also called partial regression coefficient, metric coefficient). It represents the change in y_p associated with a one-unit increase in x_1 when all the others are held constant.

c is error of the random variable – this error term may be conceived as representing the effects on Y of variables not explicitly included in the equation, and a residual random element in the dependent variable.

k is number of independent variables

To apply the equation, each x_1 score for individual case is multiplied by the corresponding β_1 value, the products are added together, and the constant α is added to the sum. The result is y_p , the predicted Y value for the case.

For a given set of data, the values for α and the β_1 s are determined mathematically to minimize the sum of squared deviations between predicted y_p and the actual Y scores. Multiple regression is a more complex model as it employs more than one independent variable as a predictor of the dependent variable, also can examine the contribution of each independent variable to the prediction. Multiple R and R^2 measure the strength of the relationship between the set of independent variables and the dependent variable (Hinton et al., 2004).

3.6.2 Multiple Regressions - Stepwise Method

In complex regression situations, when there is a large number of an explanatory variable which may or may not be relevant for making predictions about the response variable, it is useful to be able to reduce the model to contain only the variables which provide important information about the response variable (Larsen, 2008). Stepwise regression is therefore used to find the most parsimonious set of independent variables that are most effective in predicting the dependent variable.

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3.6.3 Multiple regression-Stepwise and SPSS

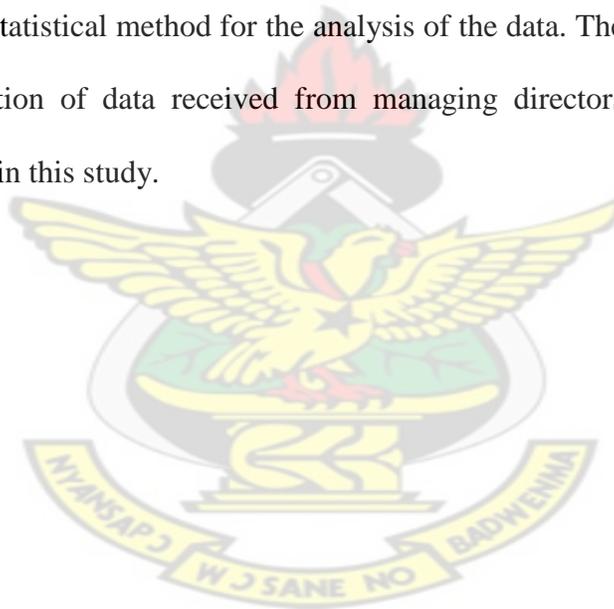
SPSS was used to perform the multiple regression analysis (stepwise). Subsequently the following steps were used to conduct the stepwise regression analysis:

1. Select the analyse menu
2. Click on regression and then on linear... to open the Linear Regression dialogue box
3. Select the dependent variable (i.e performance outcome) and click on the button to move the variable into the Dependent: box
4. Choose the variables for any analysis from the list in the variable box.
5. Select the independent variables and click on the button to move the variables into the Independent(s): box.
6. In the Method: drop-down list, ensure Stepwise is selected.

7. Click on the Statistics... command push button to open the Linear Regression: Statistics sub-dialogue box and ensure the Estimates and ensure the Estimates and Model fit check boxes are selected.
8. Click on Continue and then OK

3.7 SUMMARY

This chapter has discussed some vital information with regards to the research methodology for the study. The survey features including the sampling framework, the sample size, questionnaire administration and the statistical method for the analysis of the data. The next chapter will be the analysis and interpretation of data received from managing directors belonging to GREDA referred as respondents in this study.



CHAPTER FOUR: ANALYSIS AND INTERPRETATION OF DATA

4. INTRODUCTION

This chapter seeks to analysis the data collected and interpretations of the findings. The first section deals with the background information of the property developers and the respondents view on the performance of PMs on MHBPs. The second section deals with the multiple regression analysis on the data obtained from respondents in SPSS technique using the stepwise selection method. The third and final section deals with the discussion of the results from the findings.

4.1 ANALYSIS OF THE BACKGROUND DATA

In analysis the background information obtained from the respondents from Tables 4.1 to 4.7. The results were analysed using the descriptive statistical analyses. This was done to obtain the background knowledge of the respondents. These information would aid generate confidence in the data received.

4.1.1 Respondents Experience as Greeda Members

Table 4.1 shows the summary of the number of years respondents had been members of GREDA. Respondents with up to five years maximum as members of GREDA represent 10.80% of the total responses. Respondents with over five years experience constituting the majority of 89.20% (i.e. 1.20+24.10+28.90+34.90). The indication is that majority of the respondents have

considerable experienced as GREDA members. This is to conclude that the majority of the respondent with reasonable experience and knowledge in the activities of GREDA.

Table 4.1 Respondents Experience as GREDA Member

No. of Years	Response	Percentage (%)
OVER 20YRS	1	1.20
16-20YRS	20	24.10
11-15YRS	24	28.90
6-10 YEARS	29	34.90
UP TO 5 YRS	9	10.80
Total	83	100.0

4.1.2 Respondents Experience in Implementation of MHBPS

From Table 4.2, 89.20% representing the major of the respondents indicated that they have over five years' experience in the implementation of MHBPs, (i.e. 1.20+25.30+26.50+36.10). On the other hand, 10.80% of the respondents indicated that they have up to 5 years experienced in the implementation of MHBPs. From the table major of the respondents representing close to 90% have appreciable experience in implementation of MHBPs. Therefore, it is reasonably fair to conclude that the respondents are experienced in implementation of MHBPs and the data is reliable.

Table 4.2. Respondents Experience in Implementation of MHBPs

No. of Years	Response	Percentage (%)
OVER 20YRS	1	1.2
16-20YRS	21	25.3
11-15YRS	22	26.5
6-10 YEARS	30	36.1
UP TO 5 YRS	9	10.8
Total	83	100.0

4.1.3 Overall Turnover of the Property Developer in the Last Five Years

To ascertain the liquidity of the respondents they were asked to indicate the annual turnover of their organisation in the last five years. From table 4.3, 51.80% indicated an annual turnover of GHS 10 million, 34.90% indicated an annual turnover of between GHS11.00 – 20.00 million, and 7.2% indicated an annual turnover of over GHS 20 million. This is indicative that most of the respondents are indeed active in the business of implementing MHBPs and have no problem with liquidity. .

Table 4.3 Overall Turnover of the Property Developer in the last Five Years

Amount	Response	Percentage (%)
OVER (GHS 20m) or (US \$ 10.5)	6	7.2
(GHS 11m - GHs 20m) or (US\$ 5.77 - US\$ 10.5)	29	34.9
Up to (GHs 10m) or (US\$ 5.25)	43	51.8
22	1	1.2
No Response	4	4.8
Total	83	100.0

4.1.4 The Average Quantity of House-Units Built by Respondents

To establish the activeness of respondents in implementation of MHBPs, they were asked to indicate the average quantity of house units built per year. From table 4.4, 10.80% of the respondents indicated that they build an average of up to 40- 60 house-units per year, 54.20% of the respondents indicated that they build between 20 and 40 house-units per year, 1.20% of the respondents indicated that they build between 60 and 80 house-units per year, 2.40% responded that they build between 80 and 100 house-units per year and the remaining 31.30% stated that they averagely build up to 20 house units. These results suggest that majority of the property developers averagely build 40 house-units per year which represents 85.05% (i.e. 54.20% + 31.30%)

Table 4.4. The Average Quantity of House-Units Built by Respondents

Quantity	Response	Percentage (%)
Up to 20 house units	26	31.3
20-40 house-units	45	54.2
40-60 house-units	9	10.8
60-80 house-units	1	1.2
Over 100 house units	2	2.4
Total	83	100.0

4.1.5 Type of MHBPS Built by Respondents

Respondents were asked to provide details of the type of MHBPs on which they are mostly building. The results indicated that, 36.3% normally engaged in multi-storey blocks, 21.30% of the respondents had been engaged on terraces. Over, 84% indicated that they have experience of building semi-detached and detached house units. The major of the respondents are engaging in semi-detached housing units. This is consistent with the findings from Ahadzie (2007), who indicated most property developers are engaged in semi-detached and detached house units.

Table 4.5. Type of MHBPs Built by Respondents

Type	Response	Percentage (%)
Multi- Storey	29	36.3
Terrace	17	21.3
Semi detached	67	83.8
Detached	66	82.5

Note: Percentages do not add to 100 due to multiple responses by the respondents

In summary the results suggest that the respondents have considerably experience in the implementation of MHBPs. Further, the findings indicate that most of the respondents are active in implementing. It is therefore, fair to conclude that the respondents to this survey have appreciable experienced in the construction of MHBPs to provide data which is reliable.

4.1.6 General Perception of Respondents of the Performance level of PMs in MHBPS in Ghana

Respondents' perception of the performance level of PMs in MHBPs in Ghana was solicited as part of the survey. This kind of knowledge was considered relevant to provide some idea into how the respondents perceived the performance of PMs in the present construction environment in Ghana. The respondents were asked to rate the level of performance of PMs from low to very high, where low represents a percentage of 40-49%, average = 50-59%, High = 60-79% and very high 80-100%. The summary of the results is presented in Table 4.6 It is revealing that about 59% of the respondents perceived the performance level of project managers in MHBPs in

Ghana to be above average. The interpretation to the results could mean that the respondents are satisfied with the performance of PMs; however they think that it could get better.

Table 4.6: Perception of respondents on the performance level of PMs in MHBPs

Performance Level	Response	Percentage (%)
Very High (80-100%)	0	0
High (60-79%)	49	59.0
Average (50-59%)	31	37.3
Low (40-49%)	3	3.6
Total	83	100.0

4.1.7 Opinions of Respondents of Factors of Importance to Evaluating the Performance of PMs

The survey also solicited opinion from the property developers on any addition factor(s) of importance to evaluating the performance PMs in MHBPs in Ghana. The opinions of the respondents were grouped into four categories from the data collected. The following were the groupings, appropriate academic qualification, higher professionalism, good interpersonal relationship and ability to use appropriate software's. Table 4.7 presents a summary of the results. 9.6% of the respondents indicated that PMs need to require appropriate academic qualification. 26.50% considers higher professionalism as important factor in evaluating

PMs.8.4% of the respondents indicated that good interpersonal relationship is an important attribute of in evaluating performance of PMs 2.40% of the respondents indicated that ability to use appropriate software's is an important skill in evaluating performance of PMs. Unfortunately 53.0% of the respondents did not share their opinions on what in their view is/are importance in evaluating performance of PMs.

Table 4.7 Opinions of Respondents of Factors of Importance to Evaluating the Performance of PMs

Response	Frequency	Percentage (%)
Appropriate academic qualification	8	9.6
Higher professionalism	22	26.5
Good interpersonal relationship	7	8.4
ability to use appropriate soft wares	2	2.4
No Response	44	53.0
Total	83	100.0

4.2 MULTIPLE REGRESSION ANALYSIS

According to Choudhury (2009) multiple regression analysis is a powerful technique used for predicting the unknown value of a variable from the known value of two or more variables- also called the predictors.

Sykes (1993) also asserts that regression analysis is a statistical tool for the investigation of relationships between variables. It is used when we want to predict the value of a variable based on the value of another variable. The variable we want to predict is called the dependent variable (or sometimes, the outcome variable), (Sykes, 1993).

Multiple regression analysis was the technique chosen for developing the predictive model. Multiple regressions was chosen ahead of other methods (e.g. logistics regression and discriminant analysis and artificial neural networks) for the good reason that multiple regression is by far the most widely used multivariate technique to analyse the relationship between several independent variables and a single dependent variable Hair et al. 1998 cited by (Ahadzie,2007).

In a classic linear regression model, the relationship between the predicted outcome y_p , and the predictor variables, x_1, x_2, \dots, x_k is defined as:

$$y_p = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + c \dots \dots \dots 4.1$$

Where α is constant on the y-axis

β_1 to β_K are coefficients

C is error of the random variable

K is number of independent variables

In this thesis, the independent variables were represented by the 38 operationalised measures identified for both contextual and task performance behaviours and the dependent variable (yp) is defined as measure of the PM's performance outcome.

4.2.1 Stepwise Selection Method

The stepwise multiple regression is a method of selecting independent variables (predictor variable) in order to construct the linear relation with the dependent variable (predicted variable) (Wongbuddha and Bookkamana, 1999). In complex regression situations, when there is a large number of an explanatory variable which may or may not be relevant for making predictions about the response variable, it is useful to be able to reduce the model to contain only the variables which provide important information about the response variable (Larsen, 2008).

With the huge numbers of independent variables identified for this study, it was decided to use the stepwise selection technique in this analysis. To begin with, each variable is entered in sequence and its value assessed. Each time a new variable is added to the model, the significance of each of the variables already in the model is re-examined (Larsen, 2008). If adding a variable contributes significantly to the predictive qualities of the model, then it is retained, but all other variables in the model are then retested to see if they are still contributing to the success of the model. Variables are removed from the model if they become insignificant as other predictors are added. This process of sequential entry leads to development of models at each stage.

Table 4.8 Model Summary^g

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.565 ^a	.319	.310	.474	.319	36.483	1	78	.000	
2	.618 ^b	.382	.366	.454	.063	7.866	1	77	.006	
3	.656 ^c	.431	.408	.439	.049	6.543	1	76	.013	
4	.693 ^d	.480	.453	.422	.049	7.132	1	75	.009	
5	.714 ^e	.510	.477	.413	.030	4.454	1	74	.038	
6	.735 ^f	.540	.502	.403	.030	4.732	1	73	.033	2.532

a. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements

b. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements, Task performance behaviours-Cognitive ability-Having strong memory of tendering information

c. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements, Task performance behaviours-Cognitive ability-Having strong memory of tendering information, Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems

d. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements, Task performance behaviours-Cognitive ability-Having strong memory of tendering information, Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems, Contextual performance behaviours-job dedication-commitment to the speedy production of tender documents

e. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements, Task performance behaviours-Cognitive ability-Having strong memory of tendering information, Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems, Contextual performance behaviours-job dedication-commitment to the speedy production of tender documents, Task performance behaviours-Cognitive ability-Being metallyalert to managing the tendering process

f. Predictors: (Constant), Contextual performance behaviours-job dedication-close attention to important specification requirements, Task performance behaviours-Cognitive ability-Having strong memory of tendering information, Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems, Contextual performance behaviours-job dedication-commitment to the speedy production of tender documents, Task performance behaviours-Cognitive ability-Being metallyalert to managing the tendering process, Task performance behaviours-Task proficiency-Technical quality strategies for managing the tendering process

g. Dependent Variable: Q6. What is your perception of the performance outcome of PMs you have engaged in MHBP during the tendering phase in recent times. Given your rich experience in handling MHBP what will be your view if you were to rate the overall performance of PMs

4.3 SUMMARY OF RESULTS FOR THE REGRESSION ANALYSIS

4.3.1 Model summary

The table 4.8 shown above represents the Model Summary which reports six (6) variables accounted in the model out of the total examined, representing approximately 50% of the variance in the performance outcome. Table 4.8 also shows that model number 6 is the optimum model as it included the smallest possible set of predictor variables. The first column show the model numbers in the table, the number representing the variable extracted after the analysis.

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Their value in the Model Summary table shows the amount of variance in the dependent variable that can be explained by the independent variables. It also indicates a high degree of correlation between the observed value and the predicted value of the criterion variable (i.e. the performance outcome). R square (R^2) value indicates how much of the dependent variable, can be explained by the independent variable for by the model. Also R-square (R^2) is used in regression analysis to indicate how well the model predicts responses for new observations. R^2 is a measure of the extent to which the total variation of the dependent variables explained by the regression (Sykes, 1993).

The adjusted R^2 is adjusts for a bias in R^2 as the number of variables increases.

4.3.2 Analysis of variance (ANOVA)

The ANOVA tests the significance of each regression model to see if the regression predicted by the independent variables explains a significant amount of the variance in the dependent variables (Hinton et al., 2004).

Thus, using the adjusted R2 table 4.8 and the analysis of variance (ANOVA) (Table 4.9), the following statistical information was extracted from table 4.9:

(Adjusted R2 = 50.20; F6, 73 = 14.260, $p < 0.0005$) (4.2)

Granted that, $p < 0.0005$, the study reported that the model number six (6) which accounted for six variables out of the total tested accounting for 50.20% of the variance in the performance outcome.

The p-value which explains the overall significance of the model gives a value of less than 0.0005, which confirms that the model is significant (Table 4.8)

Durbin-Watson Statistic is used to test for the presence of serial correlation among the residuals. The Durbin-Watson test the correlation between errors, also recorded a reasonable value of 2.53. The results indicated that the residuals from the model are independent of each other.

The developed model suggests that 50.20% of the variance in the PMs Performance outcome can be explained by the six variables namely: close attention to important specification requirements of MHBPs, having strong memory of tendering information of MHBPs, Being creative and innovative in making suggestions for solving tendering problems for MHBPs, commitment to speedy production of tender documents of MHBPs, Being mentally alert to managing the tendering process of MHBPs, technical quality strategies for managing the tendering process of MHBPs.

Table 4.9 ANOVA

ANOVA^g

Model		Sum of Squares	Df	Mean Square	F	Sig.
6	Regression	13.861	6	2.310	14.260	.000 ^f
	Residual	11.827	73	.162		
	Total	25.687	79			

4.3.3 Coefficients of Optimum Regression Model

Table 4.10 Coefficients provides us with information on each predictor variable. This gives us the information we need to predict dependent variable from independent variables shows the coefficients of the optimum regression model. The estimated regression co-efficient (beta-value) is a measure of how strongly each of the predictor variable influences the criterion variable in the model.

Thus, the model equation using the respective co-efficient is derived as

$$Y_p = 3.744 + (-0.158)(\text{close attention to important specification requirements of MHBP})$$

$$-0.192 (\text{having strong memory of tendering information of MHBP})$$

$$+0.253 (\text{Being creative and innovative in making suggestions for solving tendering problems for MHBP})$$

-0.180 (commitment to speedy production of tender documents of MHBPs)

+0.205(Being mentally alert to managing the tendering process for the MHBPs)

+0.145(technical quality strategies for managing the tendering process of MHBPs)

R2 adjusted = 50.204.3

The aim for equation 4.3 is to identify the independent variables which have both positive and negative relationship with the performance outcome:

The positive regression co-efficient of the variable, close attention to important specification requirements of MHBPs, Being creative and innovative in making suggestions for solving tendering problems for MHBPs, Being mentally alert to managing the tendering process for the MHBPs, technical quality strategies for managing the tendering process of MHBPs) have positive relationship with the performance outcome identified as the performance of PMs at the tendering phase of MHBPs. This indicates that to aid enhance their managerial performance in realising the performance outcome; PMs should among other things have the capacity of improving their knowledge base and skills in these independent variables.

The negative regression co-efficient of the variable ‘having strong memory of tendering information of MHBPs , commitment to speedy production of tender documents of MHBPs, Being mentally quick to pointing out tendering challenges of MHBPs ’ suggests that it has a negative influence on performance outcome.

Table 4.10 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
€ (Constant)	3.744	.336		11.157	.000	3.075	4.413		
Contextual performance behaviours-job dedication-close attention to important specification requirements	-.158	.086	-.245	-1.833	.071	-.329	.014	.352	2.844
Task performance behaviours-Cognitive ability-Having strong memory of tendering information	-.192	.077	-.257	-2.504	.015	-.345	-.039	.598	1.671
Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems	.253	.078	.313	3.222	.002	.096	.409	.668	1.496
Contextual performance behaviours-job dedication-commitment to the speedy production of tender documents	-.180	.065	-.316	-2.763	.007	-.310	-.050	.483	2.071
Task performance behaviours-Cognitive ability-Being metallyalert to managing the tendering process	-.205	.077	-.315	-2.648	.010	-.360	-.051	.445	2.249
Task performance behaviours-Task proficiency-Technical quality strategies for managing the tendering process	.145	.067	.213	2.175	.033	.012	.278	.655	1.526

a. Dependent Variable: Q6. What is your perception of the performance outcome of PMs you have engaged in MHBPs during the tendering phase in recent times. Given your rich experience in handling MHBPs what will be your view if you were to rate the overall performance of PMs

4.3.4 Collinearity Diagnostics

Collinearity (or multicollinearity) is an undesirable situation where the correlations among the independent variables are strong. In some cases, multiple regression results may seem paradoxical. For instance, the model may fit the data well (high F-Test), even though none of the independent variables has a statistically significant impact on explaining the dependent variable. When two independent variables are highly correlated, they both convey essentially the same information. When this happens, the independent variables are collinear and the results show multicollinearity. To help check multi collinearity among the variables, diagnostic test were also conducted on the model.

As the name suggests, a variance inflation factor (VIF) quantifies how much the variance is inflated.

Tolerance and variance inflation factor (VIP) were undertaken to assess whether high correlations exist among the set of the predictor variables in the regression model (Table 4.11). The tolerance value can vary between 0 and 1. The closer to zero the tolerance value is for the variable, the stronger the relationship between this and the other predictor variables Brace et al. (2003) cited in (Ahadzie, 2007). Table 4.11; show an average VIF value is closer to 1. These tests statistics indicates the absence of multicollinearity in model.

Table 4.11 CollinearityDiagnostics^a

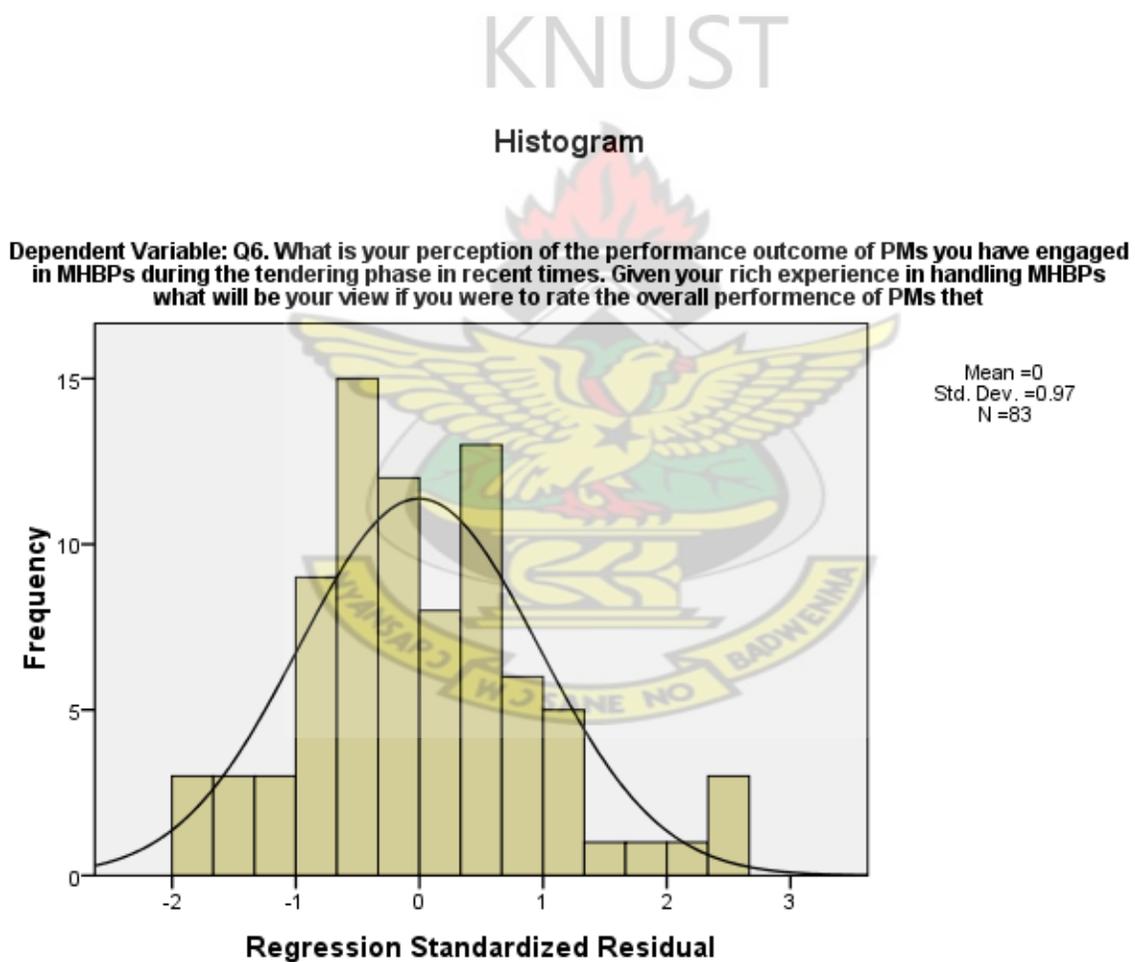
Model Dimension	Eigenvalue	Condition Index	Variance Proportions							
			(Constant)	Contextual performance behaviours-job dedication-close attention to important specification requirements	Task performance behaviours-Cognitive ability-Being strong memory of tendering information	Task performance behaviours-Cognitive ability-Being creative and innovative in making suggestions for solving tendering problems	Contextual performance behaviours-job dedication-commitment to the speedy production of tender documents	Task performance behaviours-Cognitive ability-Being metallyalert to managing the tendering process	Task performance behaviours-Task proficiency-Technical quality strategies for managing the tendering process	
6	1	6.875	1.000	.00	.00	.00	.00	.00	.00	.00
	2	.036	13.907	.14	.04	.02	.02	.36	.02	.05
	3	.026	16.226	.05	.02	.07	.26	.00	.03	.37
	4	.024	16.905	.00	.08	.25	.03	.22	.09	.27
	5	.018	19.442	.02	.00	.37	.03	.22	.49	.04
	6	.012	23.913	.44	.28	.02	.17	.18	.28	.23
	7	.010	26.837	.34	.58	.28	.49	.02	.09	.04

a. Dependent Variable: Q6. What is your perception of the performance outcome of PMs you have engaged in MHBPs during the tendering phase in recent times. Given your rich experience in handling MHBPs what will be your view if you were to rate the overall performance of PMs

4.3.5 Residual Analysis

Residual Analysis was undertaken to confirm the goodness of fit of the model.

Figure 4.1 shows a histogram of the residuals with a normal curve superimposed. The pattern shows suggests a reasonably normal residual. This is in line with the assumption that residuals are normally distributed at each level of Y and constant in variance across levels of Y. These results provide reasonable compelling evidence that the substantive model developed is valid.



Fig

Figure 4.1: Histogram of Frequency against Regression Standardised Residual

Fig 4.2 – Normal; probability plot of regression standardized residual

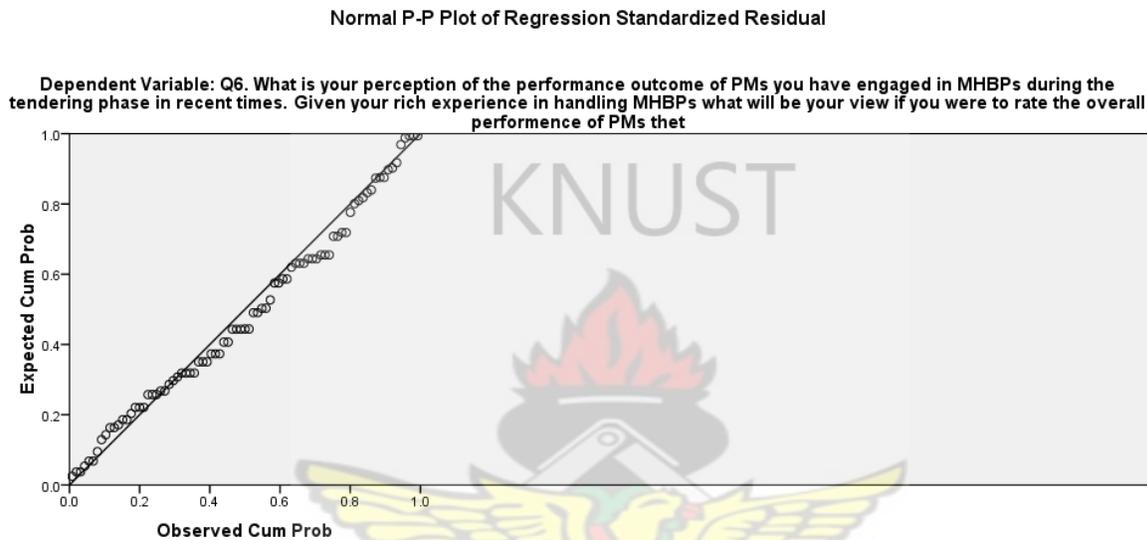


Figure 4.2 which show the normal probability plot indicate that the points lie close to a straight line and this indicates that the residuals are close to normal distribution.

4.4 DISCUSSION OF THE RESULTS

As already stated, the main aim of this study was to help develop a model for predicting the potential performance of PMs at the tendering phase in MHBPs in Ghana. The drive for the development of the model emanates from the fact that project managers play a very critical role in the implementation of MHBPs in the construction industry most particularly at the tendering phase which has been the focus of this study.

4.4.1 Concurrence of research finding with the Adopted Theoretical Framework

For convenience of the discussion of the results of this study, the independent variables have been re-arranged into the theoretical framework adopted, which is to distinguish contextual performance behaviours from task performance behaviours (table 4.8).

Table 4.8 indicates both aspects of contextual and task performance behaviours which were accounted for in the model.

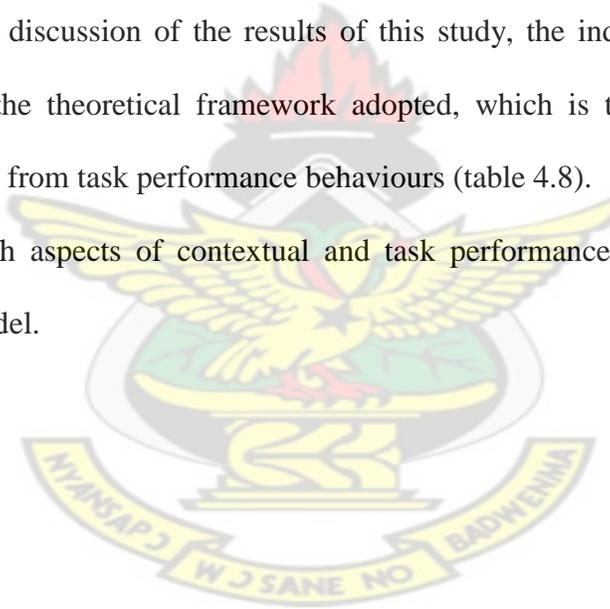


Table 4.12 Independent variables accounted for in the optimum regression model

Performance Domain accounted	Variables Included	% Variance of Variable	% Total % variance
Contextual Performance Behavior			36.80%
Job dedication	close attention to important specification requirements Commitment to the speedy production of tender documents	31.90% 4.90%	
Interpersonal Facilitation	Nil		
Task Performance behaviours			17.20%
Cognitive ability	Having strong memory of tendering information Being creative and innovative in making suggestions for solving tendering problems Being mentally alert to managing the tendering process	6.30% 4.90% 3.00%	
Job Knowledge	Nil		
Task Proficiency	Functional quality strategies for managing the tendering process	3.0%	
Job experience	Nil		

An observation of table 4.11 which is re-arranged from the regression model summary shows that contextual performance behavior accounted for about 37% of variance in the model. This result is supported by Griffin et al. (2000) who asserted that Contextual performance is important because it represents a type of behaviour that is largely under the motivational control of individuals. Again, Griffin et al. (2000) argued that “Contextual performance” behaviours support the environment in which the technical core operates. Also, Arvey and Murphy (1998) argued that personality variables might be more critical for predicting contextual performance. The findings suggest that the theoretical basis of this research is potentially very important for understanding the PMs’ performance domain in MHBPs.

However, from Table 4.8, the task performance behaviours recorded a total variance of over 17.00%. The task performance behaviours accounted for in the model, task proficiency accounted for about 3.00%. From Table 4.8 again, it is surprising to note that job experience and job knowledge did not register in the findings. On the other hand, cognitive ability registered 14.20% in the model. Arvey and Murphy (1998) suggest that cognitive abilities might be more relevant for predicting task performance. Also, Ahadzie (2007) argued that cognitive ability is expected to predict task performance behaviours. In this event the cognitive ability accounted strongly in the task performance construct.

4.4.2 Relevance of the findings at the Tendering phase in the Implementation of MHBPs

The findings from the analysis provide very valuable insights worth considering at the tendering phase in the implementation of MHBPs in Ghana. These variable identified among other things can be used to predict the performance of PMs at the tendering phase of MHBPs.

4.4.2.1 Close attention to important specification requirements of MHBPs (31.90%)

Specifications provide written technical information mainly on the quality of materials and workmanship (Harris and McCaffer, 2002). Also specification would be a contract document in its own right if the contractor tenders on the basis of drawings and specification only (Brook, 2008). Paying close attention to important specification requirements of MHBPs accounted significantly in the model. As a performance construct under job dedication in the contextual performance domain, close attention to important specification requirements of MHBPs is crucial to the successful implementation of MHBPs. Griffin et al. (2000) argued that Contextual performance is important because it represents a type of behaviour that is largely under the motivational control of individuals.

Again, Project Management Core Competencies (1998) required PMs to liaison with the procurement authorities; prepare procurement support documentation such as specifications, statement of work, request for information, and request for proposal, evaluation criteria and vendor lists. This indicates that this attribute of PMs is important for predicting the performance of PMs. According to Weele (2010) a specification is important since they are the input for consecutive stages of purchasing process model.

4.4.2.2 Having strong memory of tendering information (6.30%)

Project Management Core competencies (1998) require PMs to possess thinking skills “to arrive at accurate conclusions and solutions by visualizing new potentials and by identifying, defining and analyzing problems and situations using rational and intuitive processes”. Therefore, having strong memory of tendering information in the tendering phase of MHBPs as a project manager is a great asset. It is performance construct under cognitive ability in the task performance domain. Arvey and Murphy (1998) asserted that cognitive abilities might be more relevant for predicting task performance. This attribute as a project manager is a prerequisite to the successful implementation of MHBPs.

4.4.2.3 Being creative and innovative in making suggestions for solving tendering problems for MHBPs (4.90%)

Being creative and innovative in making suggestions for solving tendering problems for MHBPs is an important ability for a project manager. Also performances construct under cognitive ability in the task performance domain. According to Project Management Core competencies (1998) PMs needs thinking skills “to arrive at accurate conclusions and solutions by visualizing new potentials, and by identifying, defining and analyzing problems and situations using rational and intuitive processes”. Therefore, it is an important ability for PM to the successful implementation of the tendering phase of MHBPs.

4.4.2.4 Commitment to speedy production of tender documents of MHBPs (4.90%)

According to Project Management Core competencies (1998) PMs need “to achieve expected results through the successful and timely completion of activities and delivery of products and services”. Therefore, commitment to speedy production of tender documents of MHBPs is a great attribute of PMs to the successful implementation of the tendering phase of MHBPs.

4.4.2.5 Being mentally alert to managing the tendering process of MHBPs (3.00%)

Being mentally alert to managing the tendering process of MHBPs is an important ability for a project manager. Also performances construct also under cognitive ability in the task performance domain. According to Project Management Core competencies (1998) ,PMs needs thinking skills “to arrive at accurate conclusions and solutions by visualizing new potentials, and by identifying, defining and analyzing problems and situations using rational and intuitive processes”.

The tendering process involves preparation of tender documents which includes critical documents which have great impact on the outcome of the tendering process and subsequent processes. Therefore, it is an important for project managers to have this attribute for successful implementation of the tendering phase of MHBPs.

4.4.2.6 Technical quality strategies for managing the tendering process for MHBPs (3.0%)

PMs prepare tender documents solely on the basis of their technical knowledge and information contained in the project proposals, with the benefit of contextual knowledge. It is performance construct under task proficiency in the task performance domain, technical quality strategies for managing the tendering process for MHBPs, is an important function to the quality production of tendering documents for successful implementation of the tendering phase of MHBPs. Project Management Core competencies (1998), asserted that PMs should, “identify which quality control standards — for example, ISO 9000 and ISO 10000 — are relevant to the project, and determine how to satisfy them”. This is to help PMs produce quality tender documents.

4.5 SUMMARY

This chapter has so far presented an analysis of the data obtained from the respondents. The background data was discussed from the descriptive analysis. Also, multiple regressions have been discussed and all the relevant results obtained from the SPSS output have been analysed. The next and also the final chapter will consider conclusions from the study and makes relevant recommendations.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5. INTRODUCTION

This chapter presents the summary of the study, conclusions that have been reached and recommendations made. Also presented in this chapter are areas for further research which were identified during the course of this study.

5.1 RESEARCH QUESTIONS

In undertaking this study three research questions were asked, namely:

- What are the roles of PMs at the tendering phase of MHBPs in Ghana?
- What are the appropriate performance indicators for assessing the performance of PMs at the tender phase of MHBPs in Ghana?
- How should the performances indicators be incorporated at the tender phase of the project life cycle?

5.2 REVIEW OF OBJECTIVES

The objectives of this study were indicated in chapter one to help achieved the aim of the study which was to develop a model for predicting the performance of PMs at tendering phase in MHBPs in Ghana. A reviewed of the objectives are hereby undertaken to ascertain the extent to which they have been achieved through the various stages of this study.

Objective 1: To review existing conceptual model for predicting the performance of PMs in MHBPs at the tendering phase by adopting a theoretical framework from literature.

Extensive literature review was undertaken in chapter two of this study, in creating a deeper understanding of conceptual model with particular reference to the tendering phase of MHBPs. This objective was mainly accomplished through performance variables identified for the tendering phase in the job performance applied psychology domain adopted and which was developed by Ahadzie (2007) thus contextual performance and task performance construct from which the conceptual model was developed.

Objective 2: To identify from literature key indicators or variables for PMs performance in MHBPs at the tendering phase.

Elaborate literature review was undertaken; subsequently key indicators or variables for PMs performance in MHBPs at the tendering phase were identified. In all 38 variables were identified for both contextual and task performance. Questionnaire was developed and opinions of senior managers were sought from registered GREDA companies.

Objective 3: To develop the substantive model for predicting the potential performance of PMs in MHBPs at the tendering phase.

This objective was realized through the theoretical framework adopted which helped in identification of the independent variables and the dependent variable. Subsequently the multiple

regression analysis was used, adopting the stepwise approach. Six variables emerged in the model as variables for predicting the performance of PMs in MHBPs at the tendering phase.

5.3 CONCLUSIONS

Based on the findings of this study, the following conclusions were reached:

- I. The emerged model accounted for six of the variables for predicting of the performance of PMs at the tendering phase in MHBPs are :close attention to important specification requirements of MHBPs, having strong memory of tendering information of MHBPs, Being creative and innovative in making suggestions for solving tendering problems for MHBPs, commitment to speedy production of tender documents of MHBPs, Being mentally alert to managing the tendering process of MHBPs, technical quality strategies for managing the tendering process of MHBPs.
- II. The constructs under contextual performance behaviours are job dedication and interpersonal facilitation, whereas task performance behaviours are cognitive ability, job knowledge, task proficiency and job experience respectively. On the other hand variables for performance outcomes were also identified for successful implementation of MHBPs.
- III. Eleven (11) independent variables from contextual performance behaviours were identified from job dedication and the interpersonal facilitation constructs. Five out of the total variables were identified under job dedication and six under interpersonal facilitation. The identified contextual performance behaviours were to help in obtaining the relevant behavioural measures that are important towards enhancing the necessary environment within which technical and specific functions relating to MHBPs are carried out.

- IV. On the whole a total of 27 independent variables were identified from task performance. Five of the total variables were identified under cognitive ability, ten were under job knowledge, eight were under task proficiency and four under job experience construct.
- V. The developed model establishes that 50.20% of the variance in the PMs performance outcome at the tendering phase in MHBPs can be accounted for by the six variables.
- VI. From the findings it was observed that both contextual and task performance behavior variables were identified in the model.

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5.4 RECOMMENDATION FOR FURTHER STUDIES

This is a follow-up study to previous study at the construction phase of the project life cycle in MHBPs in Ghana by (Ahadzie, 2007). The adopted theoretical framework that anchors this study was developed for all the phases of the MHBPs namely the: conception, planning, design, tendering, construction and operational phases.

The purpose of this study is to inform project managers and potential ones of the competencies expected of them, which will inform their training and continued professional development of each phase of the project lifecycle. This would provide complementary information for the housing industry in Ghana. Studies on the construction phase, design phase and presently the tendering phase has been completed, it is therefore recommended that further studies should be undertaken for the development of models at each of the remaining phases for holistic implementation of MHBPs.

5.5 RECOMMENDATIONS TO STAKEHOLDERS

The following recommendations were made to improve the performance of project managers in the implementation of MHBPs. The recommendations were made based on the findings from this study from performance behaviours identified which are the expectation of project managers by employers. Based on the findings of this study the following recommendations were made to improve the performance of project managers and potential ones in the implementation of MHBPs in Ghana.

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5.5.1 Recruitment and Hiring of Project Managers (Guidelines for Employers)

One of the factors that influence project success is the employment of competent project managers. Crawford (2000) points out that a competent project manager is a factor that affects project success. Therefore to have competitive advantage in the business environment, employers are seeking to hire competent project managers. These findings would be used as a benchmark or guidelines for employers engaging the services of project managers in implementation of MHBPs in Ghana.

5.5.2 Curriculum Development for Training of Project Managers (Training Institutions)

With the acute housing situation in Ghana and the high demand especially in the MHBPs, there is the need to have solid training of project managers with the relevant academic and professional qualifications and certification. According to Boamah (2010) there is inadequate

housing in Ghana and even most of the available houses are poorly developed and lack the basic amenities required to make them habitable. The findings of this study would form part of the human resource development training for PMs with specific skills application for the Ghanaian housing sector.

5.5.3 Career Development for Project Managers (Continuous Professional Development)

Project management is internationally acclaimed management tool that is critical for success in the current work environment. Brill and Walker (2006) stated it in unambiguous terms that, there is a need to look beyond currently established project management standards and practices and investigate further, through empirical research, the core competencies of the effective project manager in the workplace. From literature, it is revealing that enough have not been then in investigating through empirical research the core competencies of the PMs. Ahadzie (2007) also identified the lack of appropriate professional institutions to help unify the activities of PMs and also govern their professional examination, certification and accreditation practices in Ghana.

The aim of this study is to identify the competencies and training needs required of project managers operating in Ghana unique context. These findings would serve as a guide for professional development; stakeholders should promote the formation of professional institution to train, develop and harmony the practice of project management in Ghana.

5.6 SUMMARY

This chapter presented the conclusion part of this study. The objectives of the study were reviewed and limitations of the study were also discussed. Again, recommendations were made for the stakeholders in the industry from the findings of the study. Also, recommendation for further research which were identified during the course of this study was made.



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APPENDIX A: QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

QUESTIONNAIRE TO MANAGING DIRECTORS AND SENIOR MANAGERS OF REAL ESTATE COMPANIES IN GHANA

Project Topic: A Model for Predicting the Performance of Project Managers at Tendering Phase in Mass House Building Projects in Ghana.

INTRODUCTION

My name is David Nartey Korda, MSc. (Procurement Management) student at the Department of Building Technology, KNUST-Kumasi. Please this questionnaire forms part of my MSc.(Procurement Management) dissertation being undertaken by me. The reason of this questionnaire is to ascertain in order of importance, the indicators that can be used in assessing the performance of Project Managers at the TENDERING PHASE of Mass House Building Projects in Ghana.

The expected outcome of the research is to help provide a comprehensive data for Project Managers to have a clear idea of what managing directors/senior managers of real estate companies expect of them in the management of MHBPs. Managing directors/senior managers may also use the findings to establish appropriate guidelines for interviewing and/or engaging the services of *project managers* who have the appropriate skills and competencies.

We shall therefore be very grateful if you would spare some of your precious time to complete the attached questionnaire. We assure you that all answers provided will be treated with the

strictest confidentiality. We wish to take this opportunity to thank you in advance for your cooperation.

If you require clarification and any further information, please do not hesitate to contact us on the addresses below:

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BACKGROUND INFORMATION

Please tick (☐) the appropriate box

1) How long have you been a member of GREDA?

- Over 20 years
- 16-20 years
- 11- 15 years
- 6-10 years
- Up to 5 years

2) Please indicate how long you have been involved in the construction of Mass House Building Projects (MHBPs)

- Over 20 years
- 16-20 years
- 11- 15 years
- 6-10 years
- Up to 5 years

3) Please indicate the overall value of MHBPs that you have worked on in the last 5 years

- Over (GH¢20m) or (US\$ 10.50m)
- (GH¢11m-GH¢ 20m) or (US\$ 5.77m – US\$ 10.5m)
- Up to (GH¢10m) or (US\$ 5.25m)

4) Which of the following type of MHBPs do you often undertake? Please tick as many options as applicable to you.

- Multi-storey
- Terrace
- Semi-detached
- Detached

5) Which of these indicate the average quantity of house-units you handle/year?

- Up to 20 house-units
- 20-40 house-unit
- 40-60 house-units
- 60-80 house-units
- 80-100 house-units
- Over 100 house-units

6) What is your perception of the performance outcome of PMs you have engaged in MHBPs during the tendering phase in recent times. Given your rich experience in handling MHBPs, what will be your view if you were to rate the overall performance of PMs that you often engaged.

- Very High (80-100%)
- High (60- 79%)
- Average (50-69%)
- Low (40-49%)
- Very Low (less than 40%)

7) Is there anything that you would like to add which is of importance to evaluating the performance of PMs at the tendering phase of MHBPs?

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Please indicate the level of importance of the following performance behaviours by ticking the appropriate box.

Note: Not very important =1, Not important=2, Average=3, Important=4 and Very important=5

Contextual performance behaviours	1	2	3	4	5
Job Dedication					
Commitment to the speedy production of tender documents					
Close attention to important specification requirements					
Committed to planning, scheduling, and monitoring activities					
Initiative to offer suggestions to improve tendering processes					
Persistence towards meeting overall tendering objectives					
Interpersonal Facilitation					
Effective time management practice in the tendering process					
Providing timely and unambiguous tendering information for tenderers/procurement managers					
Smooth and cordial working relationship with procurement managers					
Display of good oral written communication skills					
Ability to lead the team towards a common goal					
Ability to accept corrections readily					

Please indicate the level of importance of the following performance behaviours by ticking the appropriate box.

Note: Not very important =1, Not important=2, Average=3, Important=4 and Very important=5

Task performance behaviours	1	2	3	4	5
Cognitive ability					
Being mentally alert to managing the tendering process					
Having strong memory of the tendering information					
Being mentally quick to pointing out tendering challenges					
Being creative and innovative in making suggestions for solving tendering problems					
Being proactive of the potential client expectation of tendering process outcome					
Job knowledge	1	2	3	4	5
Knowledge of procurement plan relevant to mass buildings project					
Knowledge of economical tendering process for mass house building projects					
Knowledge of procurement support documentation such as specifications, statement of work, request for information, request for proposal, evaluation criteria and contractors lists of mass house building projects					
Knowledge of internal organizational processes needed to acquire works through contracts for mass house building projects					
Knowledge of characteristics of contract types of mass house building projects					
Knowledge of main types of tendering methods for mass house building projects					
Knowledge of negotiation processes involved in tendering for mass house building projects					
Knowledge of contract administration in tendering of mass house building projects					
Knowledge of evaluating the appropriateness of various tendering methods for mass house building projects					
Knowledge of preparing tendering reports for mass house building projects					

Please indicate the level of importance of the following performance behaviours by ticking the appropriate box.

Note: Not very important =1, Not important=2, Average=3, Important=4 and Very important=5

Task performance behaviours	1	2	3	4	5
Task proficiency					
Technical quality of the level of project information for the tendering of the mass house buildings					
Functional quality of the level of project information for the tendering of the mass house buildings					
Technical quality strategies for managing the tendering process					
Functional quality strategies for managing the tendering process					
Technical quality of the tendering documents for the mass houses					
Functional quality tendering documents for the mass houses					
Technical quality of time schedule for delivery for the tendering process					
functional quality of time schedule for delivery for the tendering process					
Job Experience	1	2	3	4	5
Experience in managing tendering process of mass house building projects					
Number of years of practice in managing tendering process of mass house building project					
Experience on attainment of success in management of mass house building projects					
Track record in providing useful packaging Contracts for MHBP					

Thank you very much for your time.