

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
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COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

**A MODEL FOR PREDICTING THE PERFORMANCE OF PROJECT
MANAGERS AT THE CONCEPTUAL PHASE OF MASS HOUSING
BUILDING PROJECTS (MHBP_s) IN GHANA**



By

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**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR A DEGREE OF MASTER OF PHILOSOPHY IN CONSTRUCTION
MANAGEMENT**

NOVEMBER, 2014

DECLARATION

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

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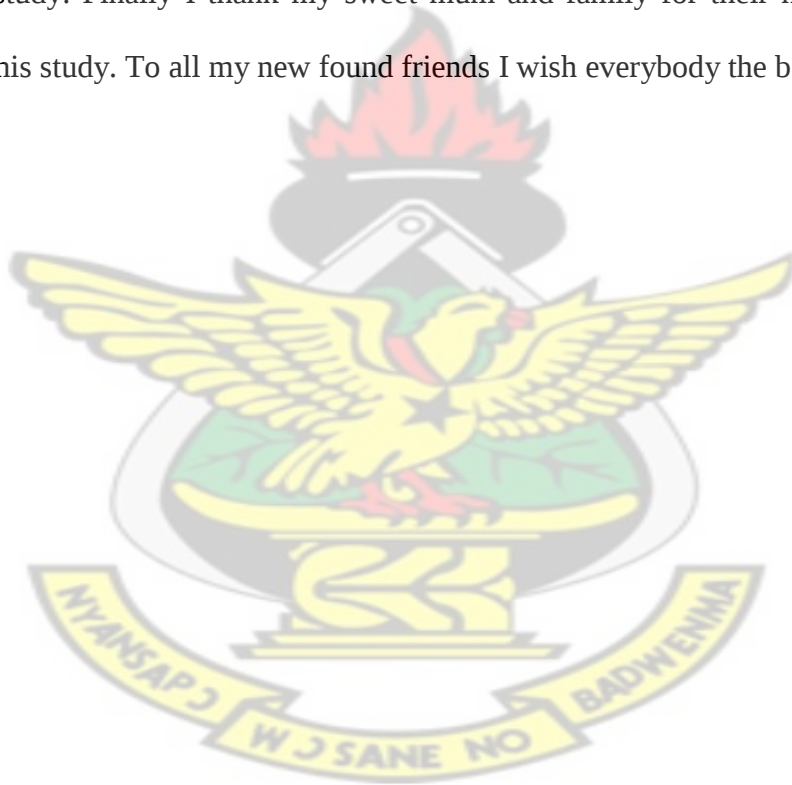
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DEDICATION

This thesis is dedicated to the memory of my late father

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ABSTRACT

In recent years, performance – based competency standards are gaining prominence over knowledge based competency standards as a criteria for evaluating and certifying project managers (PMs). Moreover project management is a new concept in many developing countries such as Ghana; however, empirical evidence proves that, it provides a better alternative in the successful management of construction projects. Hence many researchers are calling for unique competencies of a PM commensurate with the type of project as well as the project life cycle. This study as a way of complementing to a research agenda of unraveling the appropriate competencies of the PM along the project life cycle will focus at the conceptual phase of Mass Housing building Projects (MHBP) in Ghana.

In the study a preliminary interview was conducted and subsequently the largely tested organizational theory of job performance was adopted in designing 120 questionnaires to be answered by CEO's of Property Developers in Ghana to determine the high performing skills they demand from PMs at the conceptual phase. The data from the quantitative enquiry was then subjected to multiple regressions (backward elimination method). An R^2 value of 53.2 % was derived which suggests 53.2% of the findings can predict the performance of PMs at the conceptual phase of MHBP in Ghana. The validated findings indicates; *knowledge in conceptualizing project execution plan, knowledge in computer application, ability to resolve dispute amicably among project team members, commitment in ensuring the proposed project is functionally feasible, commitment in data collection during preliminary site investigations, knowledge in statutory obligations and experience in team leadership*. The findings provide empirical evidence that can be adopted by CEO's of MHBP in Ghana when recruiting PMs into their establishments.

Key words: Conceptual phase, Model, MHBP, Competencies of Project managers', Performance, Ghana.

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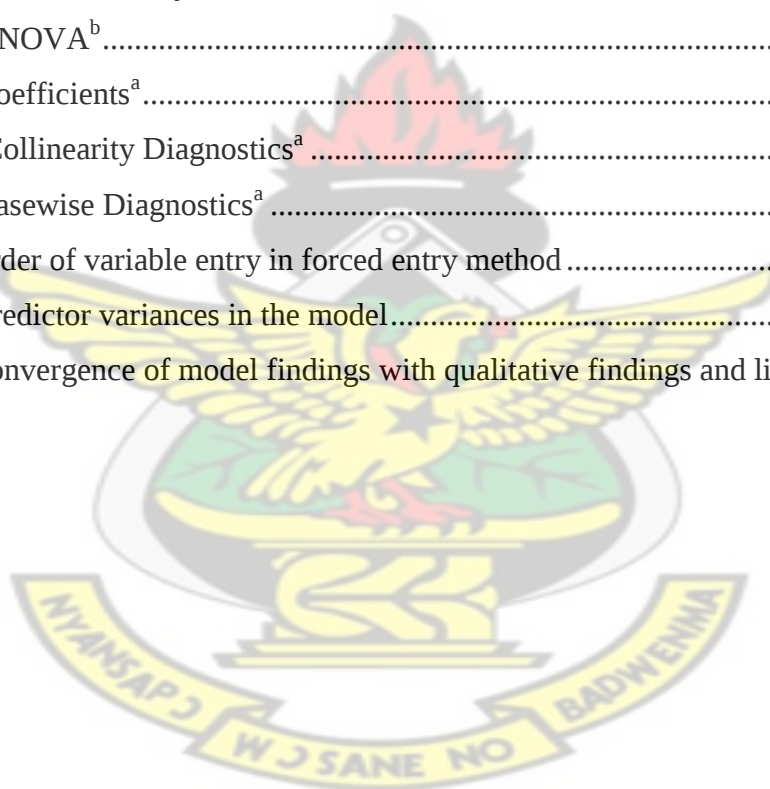
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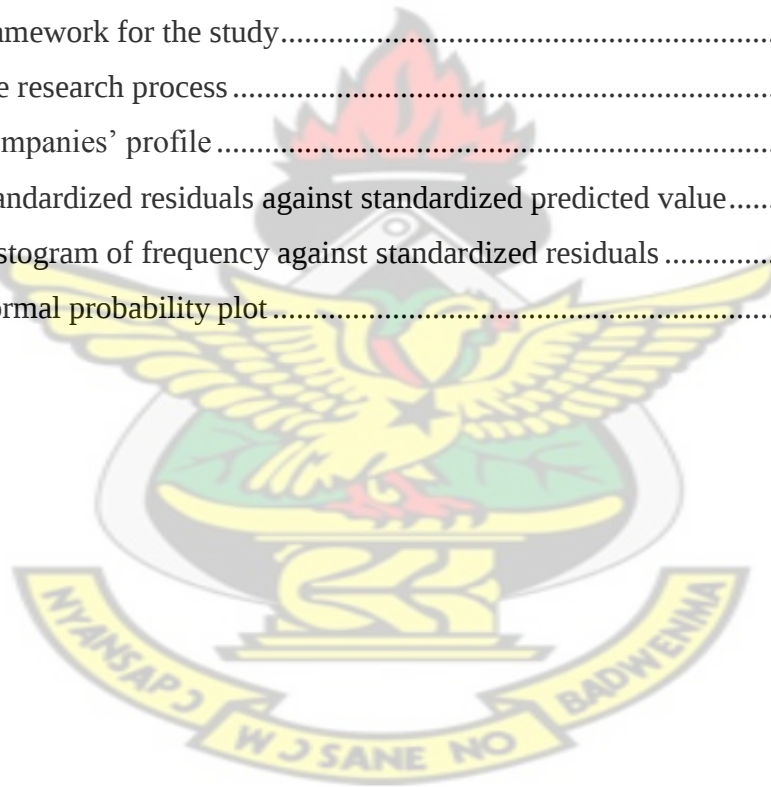
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CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION

The first chapter explains the general overview of the thesis in relation to the background as well as the research problem. The research questions which the study attempts to address are highlighted and the aims and objectives are subsequently presented. A commentary is then made on the research methodology adopted with the scope of the study. The chapter concludes with an elucidation of the organization of the study in the succeeding chapters.

1.2 THE BACKGROUND OF THE STUDY

In the construction industry, the significance of focusing on advancing the competency of project managers (PM) stems from the impact of projects on a company's business as every project forms a large proportion of the overall company's turnover. The failure of a single project can therefore trigger the failure of the whole company (Madter et al., 2012; Kangari, 1988; Jannadi, 1997). Since 1959 when Gaddis (1959) pioneered the requirement profiles of an ideal PM this arena has enthusiastically been pursued by academics and researchers at least for the developed economies over the years. (see for example, Feng Zhang et al., 2012; Leybourne 2007; Pettersen, 1991). However for developing economies such as Ghana, this is still an emerging phenomenon (See for example, Ahadzie 2008b; Ahadzie 2007; Wachira, 2000; Ahadzie and Amoah – Mensah, 2010). Project management is a new concept in many developing countries such as Ghana however empirical evidence proves that, it provides a better alternative in the successful management of construction projects. (Ahadzie and Amoah –Mensah, 2010; Abbasi and Al-Mhamara, 2000; Odusami et al., 2003). The successful outcome of a project depends to a large extent on the competency of the PM. (Bon – Gang and Wei, 2012; Avots,1969;

Belassi and Tukel, 1996; Crawford, 2000;). Frank (2002), further affirmed that, the PM has about 34 – 49% influence on the successful outcome of a project. In brief, the PM is responsible for meeting project objectives, for schedules, budgets, and assessing alternatives, for assessing risks and deciding how to accept, avoid, remove, or ameliorate them, and for leading the initiative to successful completion.(Baca, 2007; Divincenzo, 2006; Dunn, 2001; Zielinski, 2005). While there is general agreement that a project's success hinges on the abilities of the PM, there remains a challenge as to the appropriate performance indicators of a PM to ensure effective project delivery. In the context of this study, the PM should be considered as a singular individual who engineers the successful outcome of the project from inception to completion in line with the positing of Goodwin (1993) who noted that, the inherent philosophy of project management is based primarily on an independent individual, the PM who is responsible for the triumph of the project.

In recent years, knowledge based competency standards are giving way to performance – based competency standards as a criteria for evaluating and certifying PMs. (Crawford, 2005; Webster, 2004). These knowledge based competency standards for PMs certification are based on the premise that management practices are context independent and has universal application. However, many researchers disagree with this stands and call for unique competencies for various kinds of projects and even must endeavour to have project management phase specific skills at the various phases of the project life cycle. (See for example; Crawford, 2005; Omnidvar, 2011; Ahadzie, 2007; Stretton, 1995; Ahadzie 2008b). It has been observed that, published project management knowledge and competency standards (i.e. Project Management Institute, PMI 2002; Project Management Institute. PMI 2000; Australian Institute of Project Management, AIPM 1996) do not specify the competencies requirement at each phase of a project or in certain kinds of projects (Omnidvar, 2011). This apparent significant deficiency in the lack of project

management phase specific skills requirement of a PM especially in mass housing building projects (MHBPs) was partly addressed by Ahadzie (2008b) in concentrating on the skills requirement of a PM at the construction phase of MHBPs. This was subsequently followed in 2013 by the same author at the design phase. However what Ahadzie, (2008b) and Ahadzie (2013) failed to acknowledge were that, the success of the other phases of the project life cycle (i.e design, procurement, construction, operational and facility management) are very much dependant on the successful outcome at the conceptual phase. Hence the imperativeness to focus on the conceptual phase not only to complete the competency profiles of PMs for MHBPs but also to ensure the success of the proceeding phases. This thesis will therefore place a spot light on the conceptual phase of the project life cycle to identify appropriate PMs performance skills to further enhance their professional development. The identification and development of appropriate PMs' performance skills, could serve as very significant steps in the improvement of human resource management (HRM) practices in the construction industry in many developing countries such as Ghana (Ahadzie, 2007). Besides Real Estate developers in Ghana could use the identified performance profile as a criterion when selecting and recruiting PMs at the conceptual phase.

1.3 THE PROBLEM STATEMENT

Rhodes (1994) stated that “conceptualizing is surely the art of the future: not only the skill that managers will need in future, but the skill of handling the future itself.” The diversity of the project system and the need to ensure that all the elements of a project function together as an integrated whole requires high degree of conceptual skill on the part of the PM. (Goodwin, 1993; Burke, 1999). However many researchers have different views on the main criteria for the selection of PMs (Elsaaba, 2001). Nonetheless many researchers are of the common acknowledgement that the conceptual phase is the most significant

phase in the project life cycle. For instance Kellog et al., (1981), argued that, at the construction phase, the choice available of improving performance is greatly limited as the only choice available to the PM of improving performance lies in effective employment of labour and material during executing of the project. Though significant improvement can be achieved, productivity henceforth is very much likely to be very infinitesimal and therefore suggested that, the sooner in the life of a project the concepts of productivity and quality are infused, the greater the opportunity for performance improvement. Jump (1992) emphasized that an error at the conceptual phase perpetuates throughout the life of the project and possibly the whole life of the asset. From the foregoing, the conceptual phase is therefore a very vital phase in determining the success or failure of a project, hence the need for that phase in the project life cycle to be investigated to determine the PMs' performance indicators.

The conceptual phase is where the PM is able to envision the project as a whole. It includes recognizing how the various functions of a project depend on one another and changes in one part have repercussions on the whole part (Elsaaba, 2001). According to Morris et al., (1996) the conceptual phase is where the project is first identified and its feasibility concluded. He went on to add that, it involved high – level risks and should thoroughly be examined before detailed planning is implemented. Therefore the conceptual phase is worth the study in that, the client as well as the PMs' ambivalence about the viability or otherwise of the project are answered before a decision is made on whether to abandon the project altogether or proceed to the next phase (i.e the design phase). Besides for a PM to have clarity of the project aims and objectives and to plan adequately, he/she must be very abreast with the skill requirement at the conceptual phase. It can summarily be said that the conceptual phase is the birth place of all projects including MHBPs hence the need to investigate the performance criteria for assessing PMs

at that phase. Furthermore a study at this phase, serves as a continuous investigation to previous studies of the project management life cycle mainly in the construction phase by Ahadzie (2007) and then recently the design phase by the same author as noted above with the sole aim of setting up PMs performance indicators at each phase to serve as benchmarks for employers of PMs.

1.4 THE RESEARCH QUESTIONS

The study is based primarily on the following research questions:

- What are the suitable performance indicators for evaluating the performance of PMs at the conceptual phase of MHBPs in Ghana?
- How should the performance indicators identified be incorporated at the conceptual phase of the project life cycle?
- What are the roles of PMs at the conceptual phase of MHBPs in Ghana?

1.5 THE AIM OF THE STUDY

The aim of the study is to establish competency profiles that can be used to predict the performance of PMs at the conceptual phase of MHBPs in Ghana.

1.6 THE OBJECTIVES OF THE STUDY

The objectives of the research are:

- To identify essential performance variables of PMs in MHBPs.
- To identify the appropriate variables for predicting the performance of PMs on MHBPs.
- To identify predictive performance model at the conceptual phase of MHBPs.
- To use statistical tools to develop a model based on the variables identified above.

1.7 THE RESEARCH METHODOLOGY ADOPTED

Competency – based approaches are being increasingly proposed by researchers as a better alternative for confirming excellent performance of managers as they provide a better alternative to the traditional measuring techniques of the iron triangle of time, cost and quality. (See for example, Ahadzie 2008b; Ahadzie 2007; Dainty et al. 2004; Cheng et al. 2005; Larson and Bruss, 2005). A theory based in organizational psychology of job performance was adopted. The theory of job performance according to Motowidlo (1997) and Van Scooter (1996) noted that task performance behaviours should be distinguished from contextual performance behaviours. (See also Borman and Motowidlo, 1997; Borman et al, 1995). Task performance behaviours deal with job knowledge and task proficiency required for undertaking technical functions in an organization while contextual performance behaviours deal with interpersonal skills which assists the psychological and social environment as well as technical functions of the organization. (Van Scooter, 1996; Borman and Motowidlo, 1993; Borman et al, 1995; Ahadzie, 2008b; Ahadzie 2007). The premise of considering both behaviours (i.e Task performance behaviours and contextual performance behaviours) laid in the reasoning that, individual's contribution to organizational effectiveness went beyond the mere task only which they were employed to perform but also to other things that were not related to their main task functions. (See for example, Ahadzie 2008b) (See detailed discussion at the research methodology section in chapter three).

An elaborate literature was reviewed to identify the appropriate methodologies in addressing the research questions as well as in the selection of the suitable instruments in data collection, to ensure easy analysis and interpretation. Registered Ghana Real Estate Developers constituted the sampling frame. GREDA is a body of house building companies in Ghana recognized by the Government of Ghana with the main objective of

lessening the housing deficits in Ghana (Bank of Ghana, 2007; Ahadzie, 2007; Ahadzie and Amoah – Mensah, 2010).

A qualitative and quantitative approach was employed in soliciting relevant data from registered GREDA members. The qualitative approach employed interviewing top ten GREDA companies' senior managers. The primary data from this preliminary approach was then analyzed with nvivo 8 qualitative software packaged. The second quantitative approach involved administering structured questionnaire after piloting to solicit performance indicators used by CEO's in MHBPs to assess the PMs performance at the conceptual phase. The CEO's of the registered GREDA members were contacted to respond to the questionnaires. The data from the quantitative approach was then analyzed using multiple regressions (backward elimination method) with the aid of Statistical Package for Social Sciences (SPSS) software. The findings from both approaches were compared and validation made.

1.8 THE ORGANISATION OF THE STUDY

The study was organized into five chapters. Chapter one dealt with the general overview of the research including background of the study, the problem statement, the aim and objectives of the research, the research methodology, and the organization of the study. Chapter two would look at relevant literature on project and conceptual phase management in construction. Chapter three would touch on the research methodology incorporating the philosophical stand, design of the research instrument, sampling procedure and the procedure for the collection of data. Chapter four would focus on the presentation of the data, their analysis as well as the discussion of the findings. Chapter five would give the summary of the study, review the research objectives and make conclusions and recommendations.

1.9 SUMMARY

The background of the study and the problem statement has been look at. The aim and objectives of the study have also been presented as well as the research methodology and organization of the study. The next chapter would review relevant literature on project management and conceptual phase management.

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CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

The chapter is divided into three main sections, 2.1, 2.2 and 2.3 respectively. The first main section 2.1 begins with an overview of the evolution of project management. Thereafter an understanding to terms such as project management, project, project life cycle and the project manager are pursued. The succeeding section 2.2 reviews the state of Ghana, her economy as well as project management practices. Subsequently, a brief history of mass housing delivery from pre – independent Ghana to present day Ghana is touched on. The major section concludes with a search of a definition of mass housing. In the final section 2.3, the conceptual phase of project management would be reviewed. Some of the topics that would be reviewed include; the boundary of the conceptual phase, its significance in the project management process, its contents, the tasks involved at that project life cycle stage, the relevant tasks that should be undertaken to ensure success and the chapter concludes with a proposition of the role of the PM at the conceptual phase of MHBP.

2.1. UNDERSTANDING THE CONCEPT OF PROJECT MANAGEMENT

2.1.1 INTRODUCTION

This main section of the literature review would begin with a review of a brief history of project management. Thereafter the definitions of project management provided by scholars are considered and a brief description of what makes a project or project management successful is touched on. Following from there an understanding of what actually the word “project” as well as “project life cycle” is explored. The main section

ends with a search for a definition of the project manager and the recommended professional background.

2.1.2 THE EVOLUTION OF PROJECT MANAGEMENT

As this study is intended to unravel the relevant skills of the PM at the conceptual phase of MHBPs there is the need to be briefed about the origin of project management practices, therefore this sub – section would dwell on the brief history of project management.

Project management has been practiced for thousands of years since the beginning of civilization itself; however, it was during the industrial revolution era that organizations started applying systematic project management tools and techniques to complex projects. Until 1900, civil engineering works were generally managed by architects and engineers. The actual origin or the circumstances which lead to project management is contentious among scholars. Snyder and Kline (1987) noted that the modern project management era started in 1958 with the development of critical path method and program evaluation review technique (CPM/PERT). Morris (1987) argued that the origin of project management came from the chemical industry just prior to World War II. Some literatures pointed the origin of project management to Henri Fayol's (1916) five functions of a manager: to plan, to organize, to coordinate, to control, and to direct or command. At least it can be inferred from the scholars above that, project management started somewhere in the industrial revolution era between 1900 to late 1950s in the western countries where construction and engineering works were at their peak.

The industrial revolution marked the beginning of what is referred to today as the modern organization in early 50s. This was the era in which the economic activity was in full swing in many western countries, with engineering and construction project making a major impact on the environment. This rapid growth demanded a tool and technique which was capable of organizing and managing projects at various locations (Abbasi and Al-

Mharmah, 2000). During this era, network analysis and planning techniques, like PERT and CPM formed the focus of development in project management. In 1960s, these techniques continued to be popular in the construction industry (Crawford et al 2004). Development in the field of project management in the 1960s also included the formation of two major professional associations. These were, the International Project Management Association (IPMA) which was founded in Europe in 1965. The vision behind the formation of IPMA was to promote project management and to lead the research in the development of the profession (IPMA, 2009). Another professional body was given birth in 1969, the Project management Institute (PMI) in United States. This was formed to serve the interests of the project management industry. The assumption of PMI is that the tools and techniques of project management are common and they can be used across different industries (PMI, 2009). However this premise is in serious contention among scholars lately (cf Omnidvar et al., 2011). Shenhar (1996) noted that the focus on teamwork was the defining feature of project management in the 1970s. While Stretton (1994) added the 70's era had an emphasis on work breakdown structures and systems concepts.

The 1980s were typified by a focus on project organization, project risk and the external influences (Crawford et al. 2006). This era also realized the development of the international standards for project management. Although project management grew in terms of a profession until 1980 but until then it was perceived as the sole domain of engineers, synonymous in the civil engineering industry (Van Der Merwe, 2002). Winter et al., (2006a and b) conducted a research on the future direction in the field of project management and suggested five future directions for project management. According to Winter et al. (2006 a and b) one of the possible direction in the future was that; concept and methodologies that focused on product creation would give way to concepts and

frameworks which focus on value creation as the prime focus of projects, programs and portfolio.

A brief history of project management has been looked at, this then paves the way to try to understand the whole concept of project management which is explored in the proceeding sub – sections, firstly project management.

2.1.3 PROJECT MANAGEMENT

Project management has been defined by scholars and recognized professional bodies as follows;

- Project Management is described as a collection of tools and techniques to direct the use of diverse resources toward the accomplishment of a radically distinctive, intricate, one time task within time, cost and quality constraint. Each task requires a particular mix of these tools and techniques structured to fit the task environment and life cycle (from conception to completion) of the task (Oisen, 1971)
- Project Management is expressed as planning, organizing, monitoring and controlling of all the aspects of a project and the motivation of all the involved stakeholders to achieve the project objectives safely and within agreed time, cost and performance criteria. (APM, 1995).
- Project management is termed as an application of tools, dexterity, knowledge and proficiency to project activities to meet project requirements. Project Management is achieved through the practical application and consolidation of the project management processes of initiating, controlling, planning, monitoring, executing, and closing in no particular order. (PMI, 2004).
- Project management was also articulated as a professional's capability to deliver, with due diligence, a project product that fulfilled a given mission, by organizing a

dedicated project team, effectively combining the most appropriate technical and managerial methods and techniques and devising the most efficient and effective breakdown and implementation routes (Ohara, 2005).

The main theme running through these definitions provided above was the application of the appropriate managerial tools and techniques to meet the project requirements which in most cases were the traditional golden triangle of scope, time and cost. Although this may seem true in some cases and appropriate in the short run when time to market is critical, there are many examples where this approach was simply not enough (Shenhar et al., 2001). Therefore many researchers are of the view that, the traditional criteria of measuring project success or project management success are inadequate. (See for example; Shenhar et al., 2001; De Wilt, 1988; Pinto and Slevin 1988). In going forward the call is made towards adequate and exhaustive evaluative criteria to ensure effective project management or project success in line with Dainty et al. (2003) and Pinto and Slevin, (1988). Therefore the parameters to measure project or project management success should include but not limited to the following; technology transfer, health and safety, cost, risk containment, time, quality, environmental friendliness, and the satisfaction of the project stakeholders (Dainty et al, 2003). The figure below depicts the project success criteria perceived by Pinto and Slevin (1988).

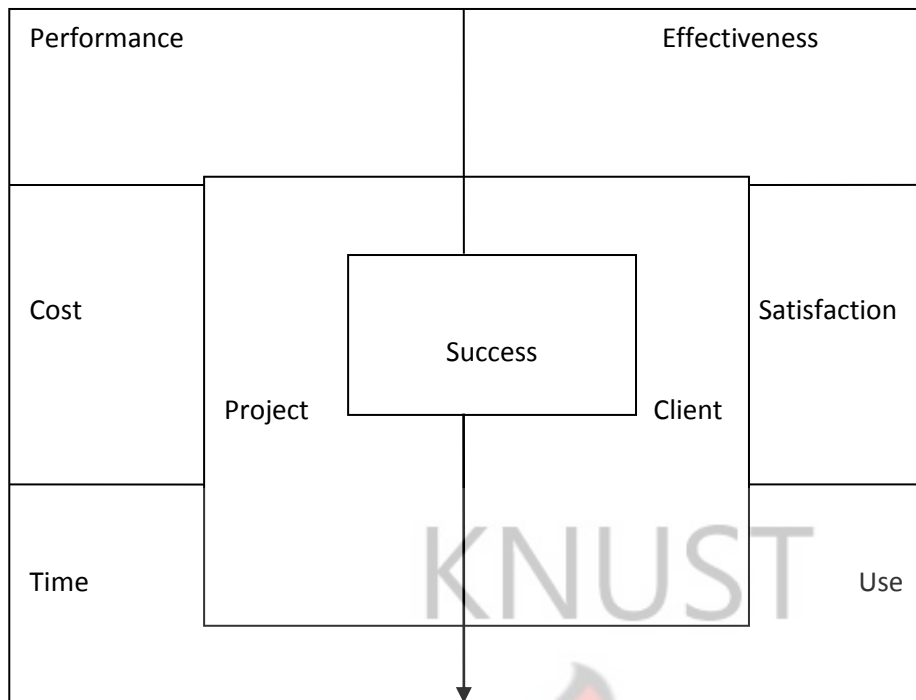


Figure 2.1: Pinto and Slevin's Model of Project Success Criteria

2.1.4 WHAT IS A PROJECT

A project can be defined as an initiative to bring about change. This is done in order to achieve specific objectives, within some boundaries of time, in a given situation. A project is normally allocated a budget. (Martin and Yorke, 2002) listed the attributes of projects as illustrated below. A project:

- has an unambiguous aim that can be accomplished within a limited time frame;
- has an unambiguous end when the final result has been accomplished;
- is given the required resources to achieve its predefined objective;
- has a sponsor/client who expects the results to be delivered on time; and
- is done once and would not normally be repeated again.

Other researchers has definitions of a project with the main echoing elements of uniqueness, timeframe, a sponsoring agent, application of resources among others as further illustrated below.

- Project is defined as a temporary endeavour undertaken to create a unique product or service. Temporary had the understanding that, it had a prescribed ending point, and unique meant it differed in some distinguishing way from all similar products or services (PMI, 1996, p.4)
- Project has been termed as a human endeavour and may legitimately be regarded by its stakeholders as a project when it has encompassed a unique scope of work that was constrained by cost and time, the purpose of which is to create or modify a product or service so as to achieve beneficial change defined by quantitative and qualitative objectives (Cooke-Davies, 2001).
- Project is further described as a “value creation undertaking based on specifics, which is completed in a given or agreed timeframe and under constraint circumstances which can be external or resource restrained”. (Ohara, 2005, p.15)
- A project is regarded as a business case that indicates the benefits and risks of the venture, demonstrates a unique set of deliverables, with a finite life-span, by using identified resources with identified responsibilities (Bradley, 2002).

The understanding from the above definitions were that projects were unique in their output, having a definite starting and ending point, were temporary in nature; resource constrained and was carried out to manifest an organization’s strategic objectives.

2.1.5 THE PROJECT LIFE CYCLE

For better comprehension of project life cycle, the author needed to define life cycle in the context of project management. A definition of life cycle was stated by (Global Knowledge, 2006) as “Life cycle implies two things: that a process is unending and that the sequence of events is obligatory or mandatory”. However the dictionary meaning of “life cycle” didn’t have the same meaning in projects. Life cycle in this instance is neither a perpetual circle of events nor is the sequence of events rigidly fixed; otherwise this would have strongly contradicted the project’s definition, which assumed a finite period as explained above.

Generally, project life cycles have phases, which are sequential, and their ends are punctuated by either technical information transfer or technical component hand over. To achieve its objectives, a project must go through a specific process. This process is described as project life-cycle comprising several phases (Morris 1983 and Barnes 1990). The construction of permanent facilities has five phases in its life cycle. They are; conceptual, detailed engineering, procurement, construction, and start – up. According to (PMI, 2004) a project has three main phases namely; initial, intermediate and final phases respectively. These main phases are further divided into pre - feasibility, feasibility, development, execution and testing, launch and post implementation review as illustrated in figure 2.2 below. The project life cycle varies according to industry as depicted in table 2.1 below. The general characteristics depicted by life cycles, according to (PMI, 2004) is that, cost and staffing levels are low at the start, rise during the middle phases, but subsides as the project comes to an end. A project phase is generally concluded with a review of the work accomplished and the outcome of the deliverables (PMI, 2004).

Table 2 1: Project Life Cycle; Definition in various industries by various authors

	PROJECT LIFE CYCLE				
AUTHORS/ PROJECT	1	2	3	4	5
Heisler 1994 (Non- construction)	Conceptual & definition	Execution	-	-	Close - out
Barrie & Paulson 1992 (General)	Concept & feasibility studies	Engineering & Design	Procurement	Construction	Start – up Operation
Austen & Neale 1986 (Building)	Briefing	Design	Tendering	Construction	Commissioning
Morris 1992 (General)	Prefeasibility & feasibility	Design	Manufacture/ procure	Erect / install	Test/ handover

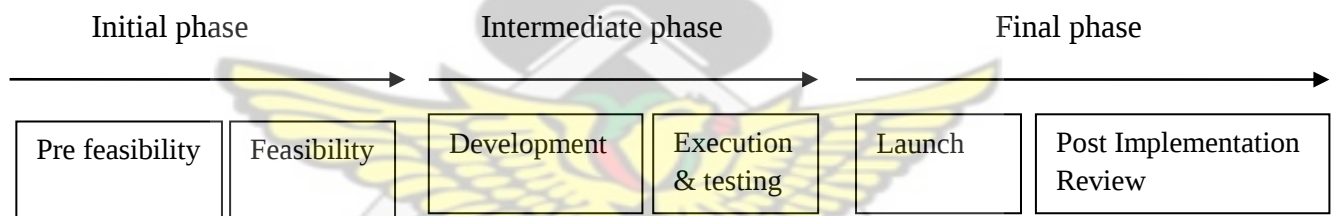


Figure 2.2: Project Life Cycle
(Source: Labuschagne and Brent, 2004)

2.1.6 THE PROJECT MANAGER

The PM's role of ensuring project success becomes much more onerous by the day. This is attributable to rising demand for high technical skills, unparalleled communication dexterity, excellent interpersonal skills, and high leadership qualities among others. (Gillard, 2009). According to (Gillard, 2009) the PM task is challenged and made much difficult by some of the following reasons;

- The project team is often large in number and consists of multi – faceted mix of multi – disciplinary; inter organizational, geographically disbursed members, internally employed personnel and out sourced or contract staff.
- He/she must cope with tenuous lines of authority and power
- He/she must interact with multipartite, diverged groups and stakeholders both within and without the employing organization, often with conflicting interest relevant to the project at hand.

The causes of the PM's challenges are further illustrated by (Zielinski, 2005) when he noted *“Project managers must simultaneously satisfy the needs of often finicky clients, adhere to tight deadlines, and marshal limited or sometimes nonexistent resources to get the job done, while shepherding, motivating and cajoling a diverse universe of personalities up and down the organizational food chain. They are held accountable for project results, but often have little power over personnel or resource matters—and they must find a way to get things done without ruffling too many feathers, because the next project on the docket might involve many of the same people.”*

Therefore the author can say that, the challenges encountered by the PM as illustrated above requires a resilient, task oriented and a tenacious personality with finesse among other qualities to ensure success given the intricacies of projects management. From the background of the challenges faced by the PM we can concur with the following researchers that, the PM is responsible for meeting project aims, for meeting schedules, budgets, and evaluating alternatives, for assessing risks and deciding how to admit, avert, remove, or extenuate them, and for leading the initiative to successful completion (Baca, 2007; DiVincenzo, 2006; Dunn, 2001; Zielinski, 2005).

From the beginning of the 1990s the business climate in the construction industry had witnessed unprecedented dynamics as organizations responded to increasing competition

within a stagnant or declining market (Gretton, 1993). Equally, the renewed call for quality, productiveness and performance is contributing in many organizations, and particularly construction establishments, to question traditional philosophies and principles associated with their management processes and business practices (Hayden, 1996). Within such a dynamic industrial environment, project managers increasingly find themselves accountable not just for the technical content of the project as expressed by the engineering and construction accuracy, reliability of the facility, and within-cost performance. Project managers find themselves confronted by issues, and undertake extra roles, that have previously not been part of their responsibility (Gilleard, 1996, Shenhar et al., 1997). Both Celan and Dorman (1995) and Russell and Jaselski (1997) recognized this changing role for construction project managers and argued that they must supplement their traditional functions with other non- engineering knowledge and skills to meet today's professional demands for which they become responsible.

Underlying most project-management training efforts today are standards and practices created by the Project Management Institute (PMI). The group's Project Management Body of Knowledge (PMBOK), a distillation of the skills, knowledge instruments and techniques generally accepted as best practice in the discipline, serves as a training design for many business organizations and educational institutions. The PMBOK particularized five key processes for the effective management of most projects (initiating, planning, executing, monitoring and controlling, and closing), as well as nine supporting knowledge areas (project integration, scope, time, cost, quality, human resource, communications, risk and procurement management). The PMBOK Guide is a recommended text in some universities offering project management education, which inspired a research investigation into how well project management literature and university education equips potential project managers in the area of human skills by Pant and Baroudi (2008). The

study noted that the PMBOK Guide predominantly emphasizes the required technical skills at the expense of the human skills. The study further highlighted the need for a balance between technical and soft skills within project management education in universities and suggested that educators within this discipline should recognize the importance of incorporating greater human skills aspects into their educational curricula. (Pant & Baroudi, 2008).

There is a general consensus among recognized professional institutions and researchers that, the PM could come from any professional background but they added that, he/she must possess the requisite technical skills to successfully manage the project from conception to completion. (CIOB, 2002; Ogunlana et al. 2002; all cited in Ahadzi et al., 2008). DiVincenzo, (2006p.23) was explicit when he pointed out that any individual aspiring to be a project manager should take classes that emphasizes communication, should have a firm mathematical background, and a familiarity with personal computer usages. He further stated that the potential project manager needs to have *“at least a bachelor's degree, although it need not be in a business- or management-related concentration. In fact, a degree in a specific subject area is helpful for providing expertise and guidance on projects that require background knowledge.”*

2.1.7 THE SECTION MAJOR SUMMARY

This major section 2.1 started with a brief review of the evolution of project management practices. It was found that the application of project management principles started at the revolution era somewhere between 1900s to the late 1950s. The late 1950s to 1980s saw the coming to being of professional project management bodies such as International Project Management Association (IPMA), Project management Institute (PMI) as well as network analysis and planning techniques namely PERT and CPM. It was also reviewed

that the possible likely future direction of project management would be an emphasis on concepts and frameworks which focused on value creation.

The following sub – section looked at the numerous definitions given to project management by various researchers and project management professional bodies. It was found that the main theme running through these definitions were the application of the appropriate managerial tools and techniques to meet the project requirements which in most cases were critiqued not to be enough by other authors.

With the project life cycle it was found that, every project under went phases which made up the project life cycle. The phases of the projects were sequential, and their ends were terminated by either technical information transfer or technical component hand over.

The PM was found to be the individual who was accountable for the success or otherwise of a project. The challenges which made his role much demanding were also reviewed. A critique was made on the PMBOK guides for PMs as they were found to be more technically focused with a much neglect of the human management aspects. The professional background as well as the recommended educational level of the PM was also considered.

2.2 A LOOK AT THE STATE GHANA AND MANAGEMENT PRACTICES

2.2.1 INTRODUCTION

This second major section 2.2 begins with a brief review into the current state of the economy of Ghana. Thereafter the project manager and project management practices in the Ghanaian context are pursued. Mass housing delivery from the beginning of independent Ghana to the present state is looked at. The major section finally ends with a search for a definition of mass housing for this study.

2.2.2 THE ECONOMY OF GHANA

Ghana which means “ warrior king ” is a sovereign state and unitary presidential constitutional republic located on the Gulf of Guinea and Atlantic Ocean in West Africa. She consists of ten territorial administrative regions bordered by Burkina Faso to the north of the country , Ivory Coast to the west, Togo to the east and the Gulf of Guinea and Atlantic Ocean to the south. (Jackson, 2001).Ghana’s population as at 26th September 2010 according to the Ghana Statistical Service stood at 24,658,823. From the final results, Greater Accra (16.3%) and Ashanti (19.4%) regions had the greater share of the population while upper East (4.2%) and Upper West (2.8%) regions had the smaller share of the population. Ghana has the same land mass as the United Kingdom with an approximate land area of 238,537 square Kilometers and the northern half containing savannas and wildlife and the southern half containing great industrial mineral and fossil fuel wealth, gold, petroleum and natural gas. (Worldbank.org, 2013)

During the later decades of the twentieth century, Ghana encountered an extended period of political instability and economic downturn. Recently, however, there has been stability and growth that many neighbouring countries can envy. Very recently, oil has been found in commercial quantities off-shore, so the economic future looks better than it has for many a decade. In 2008, the GDP stood at \$16.124 billion, a considerable growth from \$4.977 billion in 2000 and \$8.872 billion in 2004, showing a growth rate of 7.2 per cent per annum. Per capita GDP stands at \$716.3. (ISSER, 2010). Industry, including construction, electricity, mining and manufacturing account for about 30% of the GDP.(US Dept of state, 2010).The Ghanaian economy is resource rich and diverse with the exports of industrial minerals, cocoa, petroleum and natural gas (Reuters.com, 2013). Besides industries such as information and communications technology, electricity production, retailing and tourism are some of the sources of foreign exchange

(Ictworks.org, 2013; Statsghana.gov.gh, 2012). The Ghanaian economy is the 4th largest economy in sub-Saharan Africa behind Nigeria, South Africa and Angola and 7th largest economy on the Africa continent behind South Africa 1st, Nigeria 2nd, Egypt 3rd, Algeria 4th, Morocco 5th, Angola 6th and Ghana 7th with Ghana having more than twice the GDP purchasing power parity per capita output of all the countries in West Africa including East Africa and Central Africa (Britishcouncil.org, 2013; Worldfolio.co.uk, 2012).

2.2.3 PROJECT MANAGER AND PROJECT MANAGEMENT PRACTICES IN GHANA

The United Nations (UN) (2001, P.3) categorized countries into developed and less developed or developing countries. Countries in North America, Europe and the former USSR, Japan, Australia and New Zealand, are all categorized as developed countries, whereas all others including Ghana are regarded as developing countries. Compared with the developed countries, the less developed countries have, in general, a lower human development index (which measures a country's performance in three areas: education, health and society purchasing power), a lower level of industrialization, a lower level of average income per inhabitant, and a higher level of population growth (Caiden and Wildavsky, 1980). Developing countries encounter a lot of constraints examples of which are social, economic, administrative and political in nature. These constraints make the management of projects very laborious and very challenging. According to Stuckenbruck and Zomorrodian (1987) the following constraints which are a common phenomenon in developing countries such as Ghana make the management of projects very difficult. Some of the constraints include; a heavy concentration of political power and lack of public participation in policy decision, administrative incapacity and its irresponsiveness to public needs, shortage of skilled manpower most especially at managerial levels, severe national debt and illiteracy.

Generally in Ghana, many projects fail to meet their anticipated targets due to probably some of the constraints alluded to above. Many scholars blame project failures in Ghana to poor and inefficient management practices (See for example: Edmonds and Miles, 1984; Ofori, 1989, Konadu – Agyemang, 2001). The genesis of project management practices in Ghana can probably be traced to the late 1950s by the then defunct State Housing Corporation (SHC). The SHC engaged an architect who was responsible for the successful management of the project from inception to completion. A worth noting phenomenon was that, labour (artisans and labourers) was engaged full time by the SHC. (Ahadzie and Amoah – Mensah, 2010).

From the 1960s onwards registered contractors were introduced into the construction industry. The contractors now became responsible for the management of the projects from beginning to end which was previously the responsibility of the architect. The new role of the architect was just supervisory. A significant point worth noting is that, the labour requirement for the projects were now employed by the contractor and not the SHC. (Ahadzie and Amoah – Mensah, 2010).

The conventional system of management of housing delivery in Ghana begun in the late 1970s. This was the era when speculative housing had been introduced into the Ghanaian market by some private and some quasi – government organizations such as the Social Security and Insurance Trust (SSNIT). The notable change was the appointment of external consultants to see to the design aspects for these organizations. Under these new arrangements, contractors were appointed to take responsibility for the management of the construction process. The consultants were liable for failures in the design whilst the contractor for failures in only the management of the physical implementation. (Murdoch and Hughes, 1992; cited in Ahadzie and Amoah – Mensah, 2010). See figure 2.3 below.

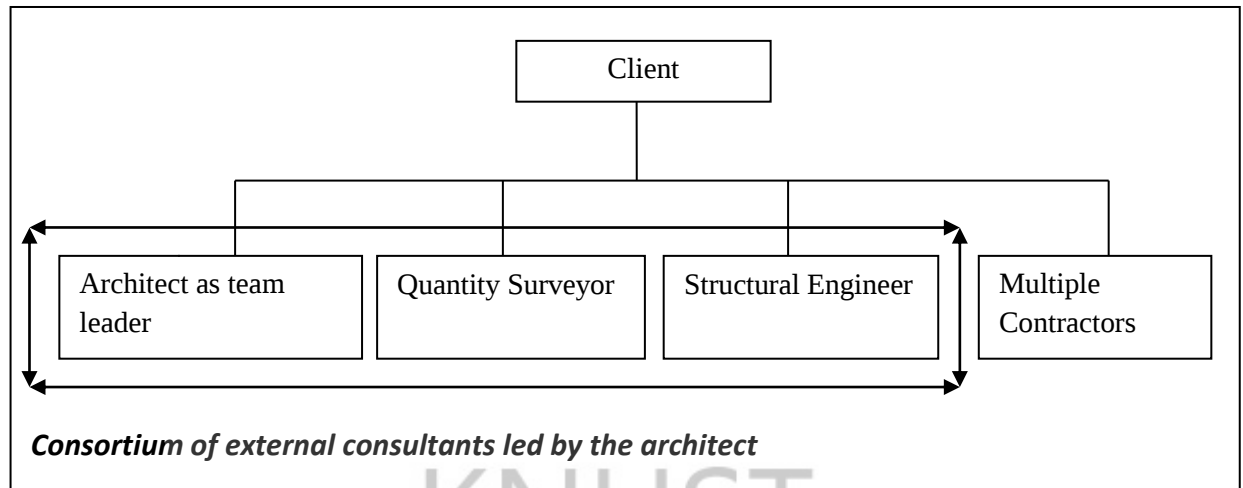


Figure 2.3: typical organizational structure involving external consultants and multiple contractors.

Source: Ahadzie and Amoah – Mensah (2010) also cited in Ahadzie (2007)

In the late 1980s due to high over – runs of cost and time sometimes running over 100%, SSNIT as well as the then Government became alarmed. In their search for a solution abandoned the organizational structure in figure 2.3 above and introduced a new concept of management of projects. This was when Ghana saw the birth of a new project manager to manage largely MHBPs. The introduction of the PM in the management process saw a dramatic success in many of the projects undertaken. Notable ones include the Sakumono estates, Ashongman estates and Teshie Nungua estates all in the Greater Accra Region.(Ahadzi and Amoah – Mensah, 2010).The successful outcome of the afore mentioned MHBPs lays credence to the fact that the Project Managers’ option of management of projects is a better choice in MHPBs in Ghana hence the need for more research to develop competency benchmarks for further enhancement.

2.2.4 MASS HOUSING DELIVERY IN GHANA

This section would pursue a definition of mass housing for this research but before that, let's look at mass housing delivery from the pre – independence era to present day Ghana. Housing is vital in the social and economic requirements of people, as a country's growth is reflected in its people attaining a standard of living. The role it plays in enabling both growth and regeneration will therefore need to be closely aligned, as the capacity to deliver housing of the right type, in the right place, and to an acceptable standard, is essential to the health and sustainability of cities and national economy (Ajanlekoko, 2001).

There is a general disagreement among researchers as to the exact housing deficit figure in Ghana. (See for example; Mahama and Antwi, 2006; Bank of Ghana, 2007). Nonetheless what is non – contentious among these researchers is that, there is a need of housing among Ghanaian citizens and this need keep on rising by the day as demand for housing increasingly exceed supply. MHBPs have become the natural choice for meeting large housing and speculative needs because they can lead to mass-scale delivery of house-units within the shortest possible time when well-managed (see Youngha Cho, 2003, Roy et al, 2003).

According to UN – Habitat (2011), there are many public and formal sector players in housing provision but no dedicated ministry of housing as the Ministry of Water Resources, Works and Housing are in charge of housing policy. Most of the institutions set up for the supply of housing to the majority are no longer operating or have switched to dealing with a few middle- and high income clients. Some NGOs are becoming involved in housing supply but on a small scale. In Ghana, the majority of housing is provided by the people for themselves through local contractors on land alienated to them by local land-holding chiefs under customary ownership.

During pre – independence era in Ghana, housing policies interventions didn't consider the needs of the larger population. The colonial governments concentrated on providing police and army barracks, residential bungalows for senior civil servants and single rooms for civil servants and miners. (Owusu and Boapeah, 2003). The only mass building projects during this period came to being after a catastrophic plague and earthquake occurrence in 1924 and 1939 respectively. In reaction the then government established the New Zongo Estates in 1929 and the development of James Town and Labadi in 1939 to provide housing for the victims of this misfortune. (Sonsore, 2003).

Post – independence Ghana housing policies focused mainly on direct housing construction, provision of subsidized housing loans, the provision of subsidized construction finance and housing market liberation. (Boamah, 2010). In about three decades after independence in 1957, state housing was delivered mainly through Tema development corporation (TDC) and the state housing corporation (SHC) now known as the State Housing Company Limited. For example, between 1957 to 1966 the TDC and SHC respectively provided 10,700 and 1,052 low – cost housing units. In furtherance, between 1972 to 1979, TDC added 7,380 subsidized housing units to the national housing stock. (Boamah, 2010). Konadu (2001) noted that from 1955 to 1981 the SHC in all delivered 23,000 housing units. In present day, there are no more public housing units in Ghana as these housing units were either sold to the sitting tenants or to the general public and the institutions fully or partially – liberalized. The housing sector in 1987 was liberalized necessitating the urgent establishment of a housing agency to replace the defunct SHC and TDC. This occurrence led to the establishment of Ghana Real estate developers Association (GREDA) in 1988. According to Bank of Ghana (2007), GREDA has from 1999 to 2007 delivered 10,954 housing units.

A National Social Security Scheme known as Social Security and National Insurance Trust (SSNIT) was established in 1972 under the National Redemption Council Decree (NRCD) 127 to administer social security schemes in Ghana. This law has been amended and the Trust now operates under the new Pension Act 2008 (Act 766). However through a deregulation in its investments portfolio in 1988 and with the support of the then government, SSNIT has been able to deliver 7,168 flats. It has developed estates in Dansoman and Sakumono suburbs of Accra, Asuoyebua in Kumasi, Takoradi, Sunyani, and all the regional capitals. (UN – HABITAT, 2001).

On January 27th 2011, the then president of Ghana John Evans Atta Mills cut the sod for the commencement of the well talked about STX housing projects which was expected to have been the biggest investment made by the government in the housing sector. The project was expected to deliver 30,000 housing units for security personnel over a construction period of 5 years. Sadly however, almost three years on, the company is yet to build a single housing unit as the project is frustrated as a result of a turf of war between the Korean and their Ghanaian partners over ownership and control of the company. (myjoyonline.com, 2012; Daily graphic 2012).

The Ghanaian government in her frustration contracted a Brazilian construction firm (OAS construction) to construct 5,000 affordable housing units across the regions of Ghana and it's underway at Prampram in the Greater Accra Region (www.ghanabusinessnews.com, 2013). It is hoped that this project would not turnout like the affordable housing project fiasco which was started in 2001 and abandoned in 2008 as up to the time of this research not a single housing unit has been completed.

Currently, the housing supply institutional framework is focusing on improving materials and encouraging private developers in the hope that they will lead to high-quality housing

for workers in secure employment. Apart from some upgrading of poor neighbourhoods, little in policy addresses the needs of the majority of urban dwellers; to obtain a foothold in the city at a price affordable on low incomes (UN – HABITAT, 2011)

2.2.5 IN PURSUIT OF A DEFINITION OF MASS HOUSING

The distinguishing characteristics between the traditional “one off” projects and MHBPs have been well documented by Adinyira et al. (2013). In that study, some of the running themes of MHBPs giving rise to the distinctions are multiple standardized design units, multiple interdependent sub- contracting, virtual team participants and multiple geographical locations of sites. The tasks undertaken were found to be repetitive in nature. Some of these distinguishing features have been captured in Ahadzie et al. (2006a) definition of MHBPs as “the *design and construction of speculative standardized multiple house-units usually in the same location and executed within the same project scheme*” (Ahadzie et al, 2006a). Benros and Duarte (2009) supported this definition as according to them the designs for the individual housing units are standardized and replicated all over the housing estate site in many mass housing schemes. According to Pine (1993) generic products are a result of mass production principle adopted in any manufacturing or production industry of which housing is a part. The basic assumption in the production of a generic housing unit is that the house owner’s needs can be standardized or generalized and a single design brief will be satisfactory.

The speculative and standardized elements in the definitions above have the understanding that; at the start of the design of the housing units the eventual owners of the housing units are unknown and most of the housing units at the end of the day will very much appear or be the same. These speculative and standardized elements in MHBPs are raising contention among mass housing researchers as it creates the impression that, individual

eventual owners of the housing units are of the same religious background, have the same household sizes, and have the same sense of beauty and culture. (cf. Folaranmi, 2012: Folaranmi 2011a). Kadiri (2005) noted that, the failure of most mass housing projects can be attributed to the repetition of the same housing type in spite of the social – cultural differences that prevail. The need to move in the direction of customer satisfaction in contemporary times which is a critical success criterion of project management and by inference project success as alluded to above are well supported by many researchers. Demchak (2000) noted that, the need to assert identity is fundamental to human existence, and influences how they shape their public and private environments of which a house is a major part. Customer customization that fulfills customers' specific needs and expectations will be the best answer for current trends in the housing market (Barlow et al., 2003; Dikmen, Birgonul, & Kiziltas, 2005). If the interest of prospective house owners are not sought during housing provision then house owners would always make changes or modifications to their houses which is a sign of non satisfaction among the house owners (Folaranmi, 2012)

From the foregoing MHBPs in the context of this thesis and based on the mass housing market in Ghana should be defined as *“a minimum construction of 10 residential or domestic units based preferably on customized customer designs in the same or several geographical locations executed within the same project scheme and under the same management contract”* (cf. Folaranmi, 2012: Adinyira et al. 2013: Ahadzie et al., 2006a; Edmond and Miles, 1984: United Nations Economic Commission for Africa)

The main reason for lack of customer customization can be traced to the absence of the prospective owners at the major stages of the construction process as a result they cannot decide about many aspects about their future dwellings. (Martinez, Montoiro, Nunez, Balaguer, Navarro, Bosch & Barcena's: 2007). The preparation of design brief is time

consuming and to imagine the preparation of individual design briefs for masses of customers can be very difficult. This challenge can be overcome according to Niemeijer and Vries (2007) by first involving the prospective client at the design stages and through the construction processes. These processes according to them can be made possible, simpler and less cumbersome by the use of network computers. The figure below is a customer customization process for mass housing units in Nigeria by Adedayo (2011a), nonetheless due to the similarities between both countries as they are all developing countries, the processes can be adopted in Ghana to ensure desired customer house and by extension customer satisfaction.

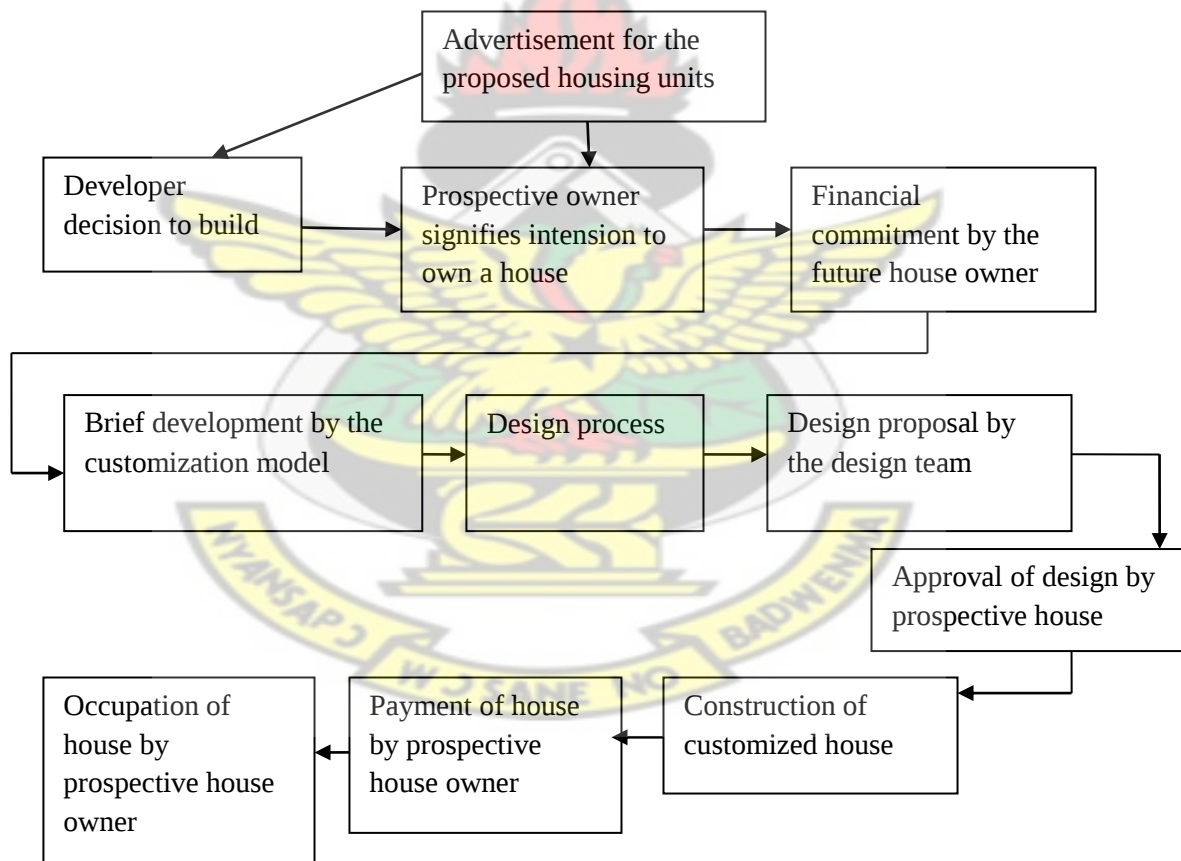


Figure 2.4: Proposed process for customized housing unit for mass housing in Nigeria
Source: Adebayo (2011a)

From the discussion so far under this sub section it is recommended that, to ensure high turnover of mass housing producing companies in Ghana, prospective customer

participation in the housing construction process should be given a high priority. According to (Yeboah, 2003) Ghanaians living abroad now own half of the new housing stocks in Accra. This revelation should motivate mass housing producing companies such as GREDA to ensure maximum satisfaction of clients most notably for expatriate who will like to settle in Ghana as well as Ghanaians living abroad who have developed new tastes and preferences by the inculcation of customer desired housing principles.

2.2.6 THE MAJOR SECTION SUMMARY

The section has touched on the current state of the Ghanaian economy as well as project management practices and the project manager in the Ghanaian context. Mass housing delivery from pre – independence through to post – independence to the current situation in Ghana has been given a brief review. The section finally concluded with a definition of MHBPs in the context of this study which it's argued should reflect customer customization to ensure customer satisfaction. The next major section will highlight on the conceptual phase and its management practices.

2.3 THE CONCEPTUAL PHASE MANAGEMENT OF MHBPs

2.3.1 INTRODUCTION

It must be stated from the onset under this major section that, searching through the literature, there was no universally stipulated role of the PM at the conceptual phase of MHBPs. This revelation adds to the need of this thesis which is expected to unravel some of as well as indicate the most significant behaviours of the PM that guarantees success at this earliest phase of mass housing development. To understand the competency profile for a particular role, it is essential to identify in what areas of work (job-task competencies) managers need to be competent, together with the behaviour (behavioural competencies) that enables them to be effective. These functions should be used as the common language

enabling the organization to identify human resource requirements and development (Brophy and Kiely, 2002).

In effect, project management competencies are reviewed to appreciate the vital need of PMs competence/competency to an organization. Thereafter a definition in the context of this study is searched and noted. Immediately following is the exploration of the boundary limits of the conceptual phase, to ascertain the borders this study is limited to. After knowing the limits of the conceptual phase, the significance of putting the spot light on this particular phase is argued. Furthermore, the main contents at this phase are reviewed. Finally having gotten a substantial idea of what I am dealing with, the role of the PM is then proposed.

2.3.2 PROJECT MANAGEMENT COMPETENCIES

Due to the incessant competition in contemporary times among organizations, there is a constant search for competent personnel and for that matter in the construction industry competent project managers to remain competitive and to have a competitive edge (Omidvar, 2011). There is growing awareness in organizations in the construction industry of the relationship between project manager competencies and project success, which have focused on ensuring that the project manager acquires the core competencies or skills necessary to adequately fulfill his or her role (Matter et al. 2012). Competency frameworks can assist job holders to contribute more effectively to their personal development by enabling understanding of effective performance requirements for a job role (Brophy and Kiely, 2002; Gibb, 2003). Thus, they can be used to underpin performance management and development functions (Brophy and Kiely, 2002). Competence of project management personnel is important as they are seen as having a major impact on project performance and therefore on business performance. (Beer et al. 1990; Pinto et al., 1995). Although competency models are dynamic and difficult to

identify (Fowler et al, 2000), not recognizing and embedding them can have a detrimental effect on organizational competitiveness (Lampel, 2001). The strong correlation between PMs and competence is simply emphasized by one senior manager as: *“The key to project success is to pick the right project manager”*. (Toney, 1997). The role of a competent PM in the successful outcome of projects is a unanimous voice among researchers; however the definition of competence or competency has to be put into proper perspective.

Competency has different meanings, and continues to remain one of the most diffuse terms in the management development sector, and the organizational and occupational literature (Collin, 1989). Competence or competency is the ability of an individual to do a job properly. Competency is a set of defined behaviours that provide a structured guide enabling the identification, evaluation and development of the behaviours in individual employees (Francoise, 2005; Tett et al., 2000; Boyatzis, 1982). The term "competence" first appeared in an article authored by (White, 1959) as a concept for performance motivation. Since then it has been used widely leading to considerable misunderstanding.

In the view of Crawford, (2005), the construct competence should be a composition of input based competencies, output based competencies and personality based competencies. According to him input based competencies are the knowledge, skills, experience, personality traits, attitudes and behaviours that a person brings to a job which contribute to him/her being competent. Output based competencies refer to the demonstrable performance in the work environment in accordance with occupational, organizational and professional competency standards. The personality based competencies deal with the core personality characteristics ensuring that the individual can do a particular job. In his view only two of these elements are present in project management standards namely output based competencies and input based competencies. This further re – emphasis the stands

that project management standards alone are inadequate in ensuring the competency of PMs.

There is such confusion and debate concerning the concept of 'competence' that it is impossible to identify or impute a coherent theory or to arrive at a definition capable of accommodating and reconciling all the different ways that the term is used. (Francoise, 2005). This apparent dilemma can probably be traced to the UK and USA approach of explanations of competency (Collin, 1989). Nonetheless considering the aim of this thesis which is to develop a model for predicting the performance of PMs at the conceptual phase of MHBPs, two definitions is adopted: these definitions are selected because they are person related. The first definition goes "*an identifiable aspect of prospective work behaviour attributable to the individual that is expected to contribute positively and/or negatively to organizational effectiveness.*" (Tett et al., 2000 cited in Ahadzie 2007). Second, the characteristics of a person which causes superior performance.(Boyatzis, 1982). Spencer and Spencer (1993) argued that, in dealing with complex situations as apparent in MHBPs where for example the PM has to coordinate the works of different functional leaders, personal competency of the PM is most relevant. However it must be noted that person related competencies have been criticized by Lindsay (1997) arguing that person-related competency concentrates on project managers' competency as individuals and does not focus on organization context, hence cannot fulfill all required characteristics of a competent project manager.

Competency models are an established resource in helping to refocus employees on what it takes to succeed in today's workplace environment (Brophy and Kiely, 2002). In that regards, a holistic model encompassing all the arguments of most researchers as well as introducing new arguments have been proposed by Omidvar (2011). In his model which has its foundations from (Crawford, 2005) model, he proposed that in addition to the

Crawford (2005) model there should be an inclusion of contextual competencies of the PM. These according to him comprise client related competencies, environmental related competencies, organizational related competencies and sub – contractor/ supplies related competencies.

2.3.3 THE BOUNDARY OF THE CONCEPTUAL PHASE

The needs of society are the genesis of a project. How it develops thereafter is very much dependent upon the sum of forces containing it (Walker, 1984; Morris, 1991). RIBA (1967) pointed out that the conceptual phase of a project is the phase up to a point in time when detailed engineering starts and a “freeze” of the conceptual phase is installed thereon. Numerous authors also suggested a "freeze" when pursuing the detailed engineering, less it could play havoc in terms of variations of work content and duration slippage (Endres, 1991; Tatum, 1987; Rowing, 1987). The start of a conceptual phase is distinct but it is not the case for its "finishing" point. This is so since the conceptual phase is the framework into which the other phases must conform. The phases may be distinct. They are not separate, but integral parts of the project life-cycle. The phases are overlapping and interdependent rather than discrete (Khan, 1991). The phases flow into one another organically (Heisler 1994).

2.3.4 THE SIGNIFICANCE OF THE CONCEPTUAL PHASE

"if there are mistakes at this stage, they are present for the life of the project and possibly for the life of the asset itself" (pp. 85). (Jump, 1992).

The conceptual phase presents the most important point in the project life-cycle. It is the stage that has the most influence on the course of events to come – detailed engineering, procurement and construction. How productive these phases are very much depends upon

the decisions in the conceptual phase (Kellog et al., 1981; Hillet al., 1990; Jump, 1992; Shafer, 1994) as illustrated in figure 2.5 below.

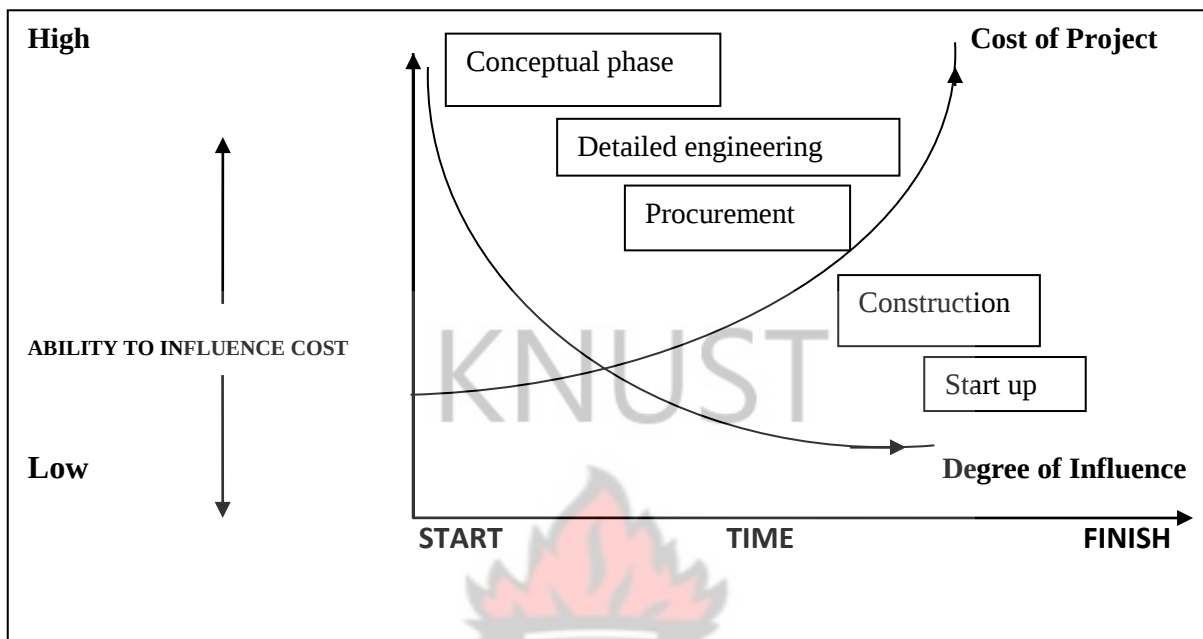


Figure 2.5: Ability to influence final cost over project life-cycle (Adapted from CII 1990)

It can be observed from figure 2.5 that the conceptual phase presents the greatest opportunity for improvement of performance: either productivity or quality. The influence of the conceptual phase is the greatest, yet with minimal cost (Smith 1992; Hill et al., 1990). In the conceptual phase, a project is defined in broad terms and determines to a significant if not major degree, the cost of physical construction through, amongst other things, choice of material, the date of commencement and completion. It is here that the ultimate success or failure of a project is predetermined. At the engineering phase, the choice available to improve performance is decidedly narrowed. Finally, during construction only effective employment of labour and equipment offers any hope of improving productivity as the project is executed. Though much improvement could be achieved at this stage, productivity henceforth is likely to be marginal. The sooner in the

life of a project that the concepts of productivity and quality are infused, the more opportunity there is for performance improvement (Kellog et al., 1981).

Finally the relevance of the conceptual phase in impacting on the cost of a project has been expressed by Shafer (1994) as;

"While capital is largely spent during the delivery stage, the key decisions that will influence the final cost are primarily made during the front-end engineering. Front-end engineering decisions can influence the cost of projects by three to four times the amount that occurs in similar decisions made during delivery. The relation between timing and the ability to influence costs and value is well documented project management principles. During the front-end, the maximum impact on value can be obtained at the lowest cost. The final cost is 75 to 80 per cent determined by the end of the concept development, and 90 - 95 per cent determined by the time scope is developed and delivery begins"

2.3.5 THE CONTENTS OF THE CONCEPTUAL PHASE

The conceptual phase expresses the needs of client organization for the constructed facility. The needs are stated in broad terms rather than specifics and operational details are prepared in the later phases. In a project environment the conceptual phase is at a macro level, hence of a strategic importance. The defined broad terms then form the main agenda against which the other phases are streamlined. Conformity is a necessary must for successful outcome (Kellog et al., 1981; Jump 1992).

2.3.6 THE CONCEPTUAL PHASE TASKS IN THE BUILDING INDUSTRY

According to the Simon Report (1944), the term conceptual phase refers to elements such as design brief, selection of consultants, sketch plan and preliminary approximate cost. The Aqua Group (1987) commended that an addition of statutory requirements and planning would make the Simon Report contemporary for today's basic good practice.

Birrell (1989) stated that the conceptual phase comprises: establishing how to satisfy the needs of the client; putting up appropriate financial arrangements; the appropriate contractual relations with other parties; resolution of issues related to governmental regulations; and conceptual design proposals that takes into consideration overall conceptual phase needs. It was stressed that it takes an iterative process to come up with the final proposition which is later delivered for further actions of other downstream phases. Murray et al. (1990) indicated the conceptual phase contains the client's requirements in terms of finance, timetable, budget, preliminary design, environmental issues and finally definition of value of money and quality.

Tatum et al. (1987) stated that the conceptual phase should comprise issues such as: defining scope of work; provide data concerning the site and process design; equipment procurement policy; stating the construction methods; determining of site and local constraints; accounting for resources availability; developing project execution plan; defining site layout; and finally ensuring constructability being incorporated in the conceptual phase. CMC (1991) interpreted the conceptual phase of having elements of: trade-off analysis; general description of structures; schedule for design, procurement, construction and start-up; conceptual cost estimating; implementation plan of project management; and equipment purchasing and installation policy.

Khan (1991) argued that the conceptual phase comprises the inception, formulation and approval processes. The inception is the phase where a need has been identified and ideas have been recognized. Formulation means developing a plan or method. The project idea has to be set out in detail and has many specific terms. These entail conducting feasibility studies, exploring alternatives, and identifying strategies for maximizing objectives. Then there are the needs of technical, economic, financial, social, organizational and political appraisals. Approval processes can then follow involving securing authorization from competent authorities. Heisler (1994) stated that conceptual phase comprises staffing plan, preparation of scope book, development of contracting methods, project schedule, and project financing, attending to issues of licensing and permits, dealing with long lead time items, and addressing the important factor of quality assurance manual.

2.3.7 THE ROLE OF THE PM AT THE CONCEPTUAL PHASE OF MHBP

Before I go any further it must be noted that, the major role of the PM be it in MHBP or general construction is to work primary in the best interest of the client and to ensure the successful deliverance of the project from conception to completion. (Formoso et al., 2002; Ling, 2003; Ogunlana et al., 2002). The reviewed literature give the indication that to ensure satisfaction of the client and to successfully management at the conceptual phase the following roles of the PM are proposed.

Client requirement definitions Management

- The PM must understand thoroughly the client's needs and requirements and constrains such as timetable, budgets, tastes etc and should communicate it effectively to the project team professionals. (Ogunlana et al. 2002; Ling 2003; Formoso et al., 2002; Murrey et al. 1990)

Project team management

- He/she must assist the client in the competent recruitment of the project team professionals. He/ she must establish management processes such as dispute resolution mechanisms, team decision making processes, establishing communication networks among others. Having an effective communication link between the client and the project team professionals. (Simon report, 1944)

Project delivery management

- Setting up management control systems (Al- seidary, 1985)

Planning management

- Establishing deadlines for all the phases of the project life cycle. Staffing plan, establishing the project life cycle phases deliverables, project execution planning, procurement of materials planning, labour equipment etc.(Heisler, 1994, Aqua Group, 1987)

Feasibility Management

- Conducting feasibility studies with the project team to ensure the project is financially, functionally, technically, economically, politically as well as environmentally feasible. (Khan, 1991)

Statutory Regulations management

- Ensuring that, the project meets the licensing and permits of a particular nation/government as well as the particular locality the project is located.(Heisler, 1994; Birrel, 1989; Aqua Group, 1987)

Cultural Management

- To understand the local environments of the people in terms of traditional way of life, local site conditions and if possible involve the local people in the construction process. (Tatum et al., 1987)

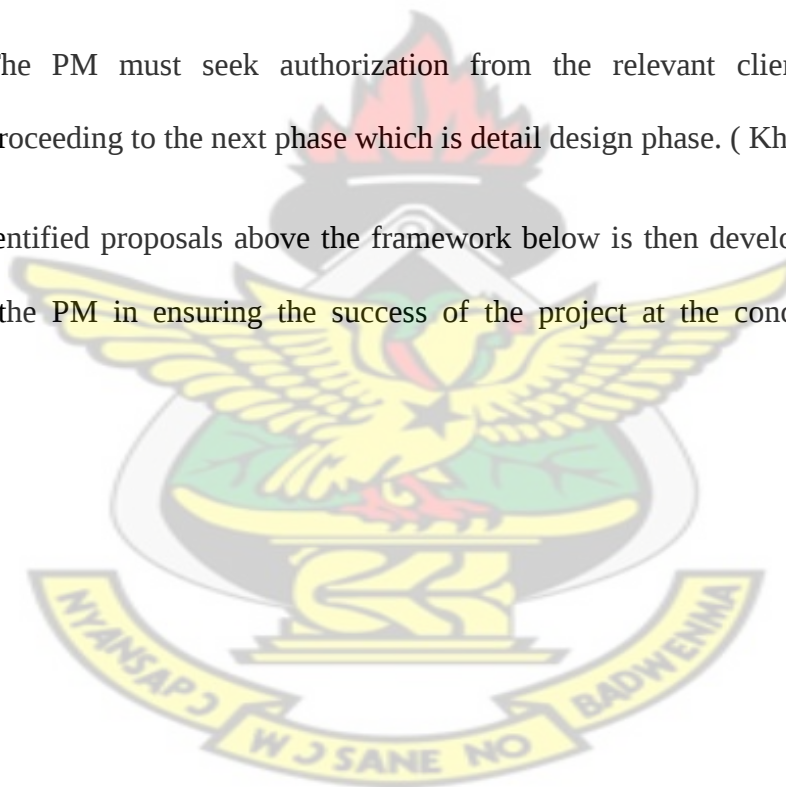
Project quality Management

- Developing a quality assurance manual (Heisler, 1994; Murrey et al., 1990)

Authorization Management

- The PM must seek authorization from the relevant client/clients before proceeding to the next phase which is detail design phase. (Khan, 1991)

From the identified proposals above the framework below is then developed to stand for the role of the PM in ensuring the success of the project at the conceptual phase of MHBPs.



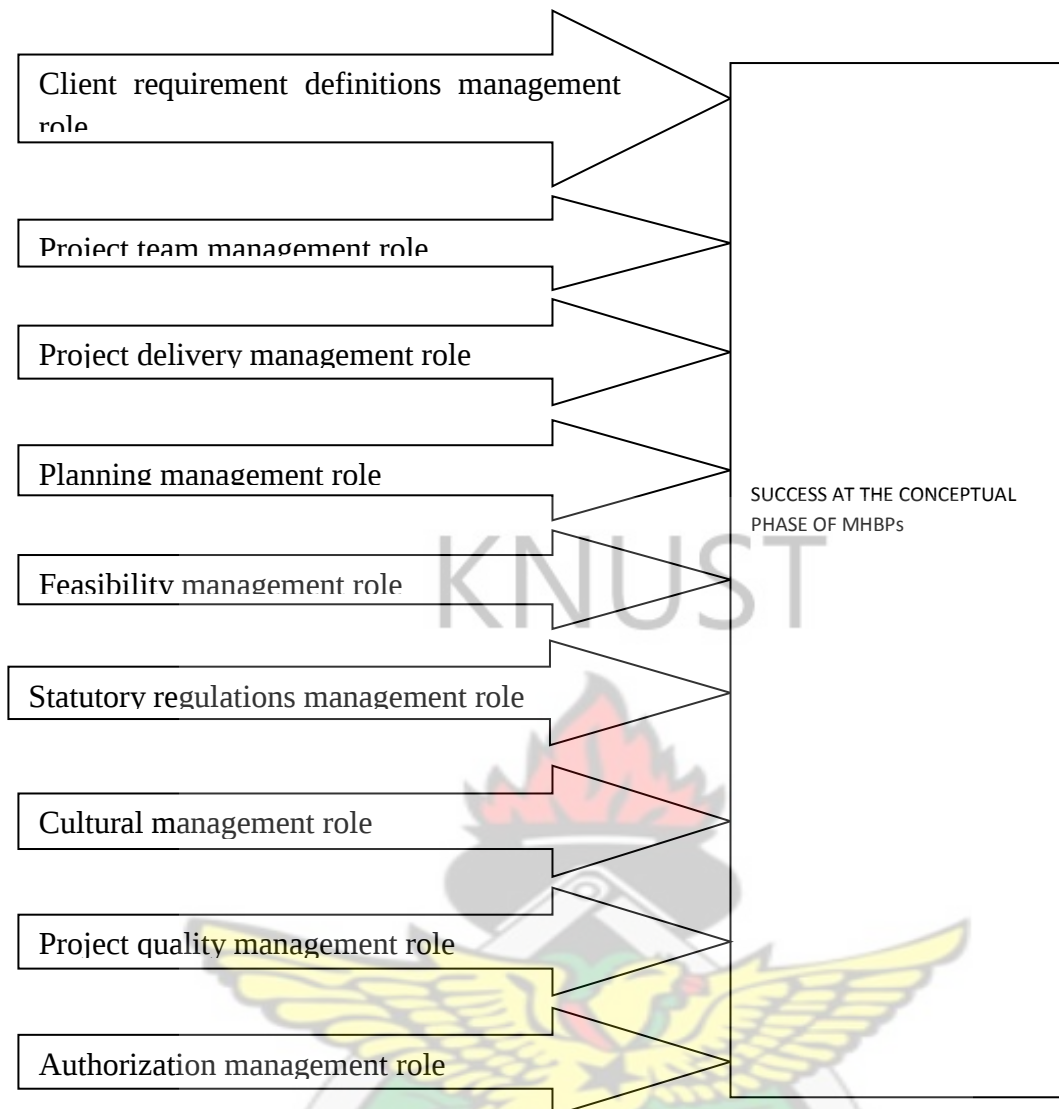


Figure 2.6: Proposed role of the PM at the conceptual phase

2.3.8 THE MAJOR SECTION SUMMARY

This major section has focused primarily on the conceptual phase with its management practices. The boundaries of this phase has been noted, its major significance in providing the highest opportunity in cost reduction as well as its significances in determining the major cost component of a project soon after its phase completion has been identified. The section concluded with a proposal for the PMs role at the conceptual phase. The proceeding chapter will touch on the theoretical framework of the study, questionnaire design, data collection and the statistical tool that would be used in the analysis of the data.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter seeks to explain the methods selected in order to address the research aim and objectives. It will begin with a brief look at the paradigms in research and the subsequent paradigm adopted for this study. A competency based conceptual model and an abridged competency model at the conceptual phase will be elucidated. Thereafter, the theoretical framework of adoption is explained. Following the theoretical framework is the research design. The research process, the questionnaire design, data collections processes, the sample size determination and a two staged primary data collected would be explained.

3.2 THE RESEARCH PARADIGM

This section discusses the two main research paradigms (positivism – quantitative approach and constructivism – qualitative approach) and the hybrid of the two known as the mixed method. Subsequently the research paradigm for this study is disclosed and argued in relation to the objectives, the aim and the purpose of this thesis.

In practice the differences between the two main paradigms are influenced by the ontological, epistemological or axiological assumptions underlying a research, (Keraminiyage et al, 2005) hence these terms need to be defined and the distinctions explained. But before that, a definition for the term ‘paradigm’ is provided.

A Paradigm is a philosophical position of defining reality (Saunders et al., 2007) that has an agreement within a defined group of people at a specific time. Alternatively it is a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research (Bogdan & Biklen, 1998) or the philosophical intent or motivation for undertaking a study (Cohen & Manion, 1994).

The term “ontology” is concerned with the researcher’s beliefs about the nature of the social world and what can be known of it (Ritchie and Lewis, 2003). The ontological arguments of positivism are that, there is only one truth with an objective reality existing independently from human perception (Healy and Perry, 2000). On the contrary, constructivism advocates there are multivariate truths and realities with subjective reality. (Krauss, 2005; Lythcott and Duschl, 1990)

The term “epistemology” is concerned with ways of knowing and learning about the social world and focuses on questions such as: how we can know about reality and what the basis of knowledge is (Trochim, 2000). The epistemological position of positivism recommends the application of natural science methods to the study of social reality and that, the world conforms to fixed laws of causes and effects. It emphasizes on objectivity, and therefore argues that, a researcher can remain unbiased and objective in a research situation. (cf. Baiden, 2006; Bryman, 2004; Fitzgerald and Howcroft, 1998). Contrary to the epistemological position of positivism, constructivism propounds the application of scientific models to social researches. In constructivism, there is the belief of the non – existence of a universal truth and greater accent is placed on realism. The interpretations and understandings are the researcher’s own perspectives and point of reference. The researcher becomes so involved in the research situation such that, the values and beliefs of the researcher become the driving force of the interpretation of the findings. Therefore with constructivism, the findings will be inappropriate in generalization. (cf. Baiden, 2006; Bryman, 2004; Fitzgerald and Howcroft, 1998).

3.2.1 POSITIVISM

Positivism is sometimes referred to as “scientific method” or “science research”. It is based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, August Comte, and Emmanuel Kant (Mertens, 2005). It reflects a

deterministic philosophy in which causes probably determine effects or outcomes (Creswell, 2003). Positivism may be applied to the social world on the assumption that the social world can be studied in the same way as the natural world and that there is a method for studying the social world that is value free. Also explanations of a causal nature can be provided (Mertens, 2005). Positivists aim to test a theory or describe an experience “through observation and measurement in order to predict and control forces that surround us” (O’Leary, 2004).

3.2.2 CONSTRUCTIVISM

The opponent of positivism is constructivism which grew out of the philosophy of Edmund Husserl's phenomenology and Wilhelm Dilthey's and other German philosophers' study of interpretive understanding called hermeneutics (Mertens, 2005, citing Eichelberger, 1989). Constructivist approaches to research have the intention of understanding “the world of human experience” (Cohen & Manion, 1994). Constructivist believes that “reality” is not objective and exterior, but is socially constructed and given meaning by people (Easterby-Smith et al, 2002). Constructivists do not generally begin with a theory (as is the case with most positivists) rather they “generate or inductively develop a theory or pattern of meanings” (Creswell, 2003) throughout the research process. The constructivist researcher is most likely to rely on qualitative data collection methods.

3.2.3 THE MIXED METHOD

The mixed method of knowledge claims arise from actions, situations, and consequences (Creswell, 2003). The main pre – occupation of a mixed method researcher or a ‘pragmatist researcher ’ as known by some scholars , is on ‘what works’ and the search of the most appropriate solutions to problems rather than taking an entrenched inclination to a particular research philosophy which might not be the most suitable method considering

the problem under investigation. In other words the emphasis is on the problems and not on the methods (Tashakkori and Teddlie, 1998). Thus it can therefore be said that, the mixed method approach of research inquiry provides the researcher multiple choices however whichever choice or choices chosen should be made in the best interest of the research problem under inquiry.

3.2.4 THE RESEARCH PARADIGM ADOPTED

In qualitative inquiry, the researcher explores into new territories therefore more open ended questions are asked. The main interest of the researcher is to know among other things how humans interact with their surroundings through symbols, rituals, social structure, social rules and so forth (Berg, 2007). Similarly, Leedy et al., (2005) reported that, in conducting a study which little information existing on a topic, when variables are unknown, when relevant theory base is inadequate or missing, a qualitative study can help define what is important, as according to their words '*what is important to be studied*'. Accordingly, at the time of the study literature had scanty information in the roles of PMs at the conceptual phase of MHBPs and by extension the significant variables which ensured the performance of PMs. In surmounting this challenge therefore prompted a qualitative method in the form of open ended interview questioning to provide some variables to work with. The identified variables eventually formed some of the basic variables in designing and constructing closed ended questionnaires. In furtherance, the posed researched questions are exploratory in nature and therefore demanded a content analysis research methodology (cf. Berg, 2007; Easter – Smith, 2002) which is a form of qualitative research methods, as according to Yin (1994) the relationship between the research questions and the research methodology is important in selecting the appropriate research methodology.

In the view of Creswell (2003), if the problem of a study is to identify factors that influence an outcome or an inquiry into understanding the best predictors of outcomes then there is the need of quantitative methods application. In the same vein, because the aim of this study is predictive in nature, *(To establish competency profiles that can be used to predict the performance of PMs at the conceptual phase of MHBPS in Ghana)* some application of quantitative methods in the form of closed ended questioning was paramount.

From the arguments so far, it is apparent objective one *(to identify essential performance variables of PMs in MHBPs)* would best be addressed with the adoption of qualitative and quantitative inquiries in the nature of interview and closed ended questioning. In addition, objective two would appropriately be addressed with the adoption of quantitative methods in the characteristics of the design of closed ended questionnaires with their administration, collection and analysis to develop the model. The final objectives three and four were well covered with the application of the appropriate statistical analysis which is quantitative methods approaches (Creswell, 2009).

The combination of the two approaches in the study gave the opportunity for each of these two methods to benefit from each other thereby avoiding the shortfalls in each approach. (Mingers, 1997; Morgan, 2006). In addition, Creswell and Clark (2007) argued that, the mixed approach ensures a more holistic inquiry in scrutinizing a research problem than either one of qualitative or quantitative method. The collaborative strengths of the two main traditional research paradigms is noted by Sena (2008) as ‘ *Qualitative and quantitative research should not be seen as competing or contradictory, but instead as complementary strategies appropriate to different types of research questions*’.

3.3 COMPETENCY BASED CONCEPTUAL MODEL

This section illuminates the adopted conceptual model for the study “competency based conceptual model (CBCM) for the project life cycle of MHBPs” proposed by Ahadzie, (2007) and the abridged CBCM at the conceptual phase and the subsequent theoretical framework.

The CBCM for the project life cycle of MHBPs suggested by Ahadzie (2007) drew on three main frameworks; the well acclaimed organizational theory of job performance by (Borman& Motowidlo, 1997; Van Scooter, 1996), the traditional success criteria of projects, in particular Pinto and Slevan (1988) model and a framework for project lifecycle proposed by Lim and Mohammed (1999). The significance of adopting this model is reflected in its multidisciplinary nature. Furthermore, according to Omnidvar, (2011) and Stretton, (1994) there is the need of establishing project management practices unique to projects as well as specific to project phases. Accordingly the CBCM proposes project management practices specific to MHBPs with the adoption and modification of Pinto and Slevan (1988) model to establish life cycle phase’s specific PMs performance competences. The project lifecycle framework incorporation in the CBCM addressed the issue of linking the potential performance behaviours of a PM to the various phases of the project lifecycle. However the contention with the separation of the required PMs behaviours in mass housing to the project life cycle phases lies in the fact that, there is a greater likelihood of the appropriate competencies of a PM required at each phase to be much different from each other, therefore the need for the separation to ensure detailed scrutiny and perspective (cf. Belout and Gavreaus, 2004 cited in Ahadzie 2007; Ahadzie, 2013). This model is very much appropriate to mass housing industry as according to Ahadzie, (2013) the PM is engaged from conception of a project through to operational stages of MHBPs therefore the greater need to establish his/her competency profiles at

each phase which this position was confirmed by the qualitative findings. Regrettably however, due to time and monetary constraints, the conceptual phase segment of the competency based conceptual model was the main emphasis of this thesis. See figure 3.1 below.



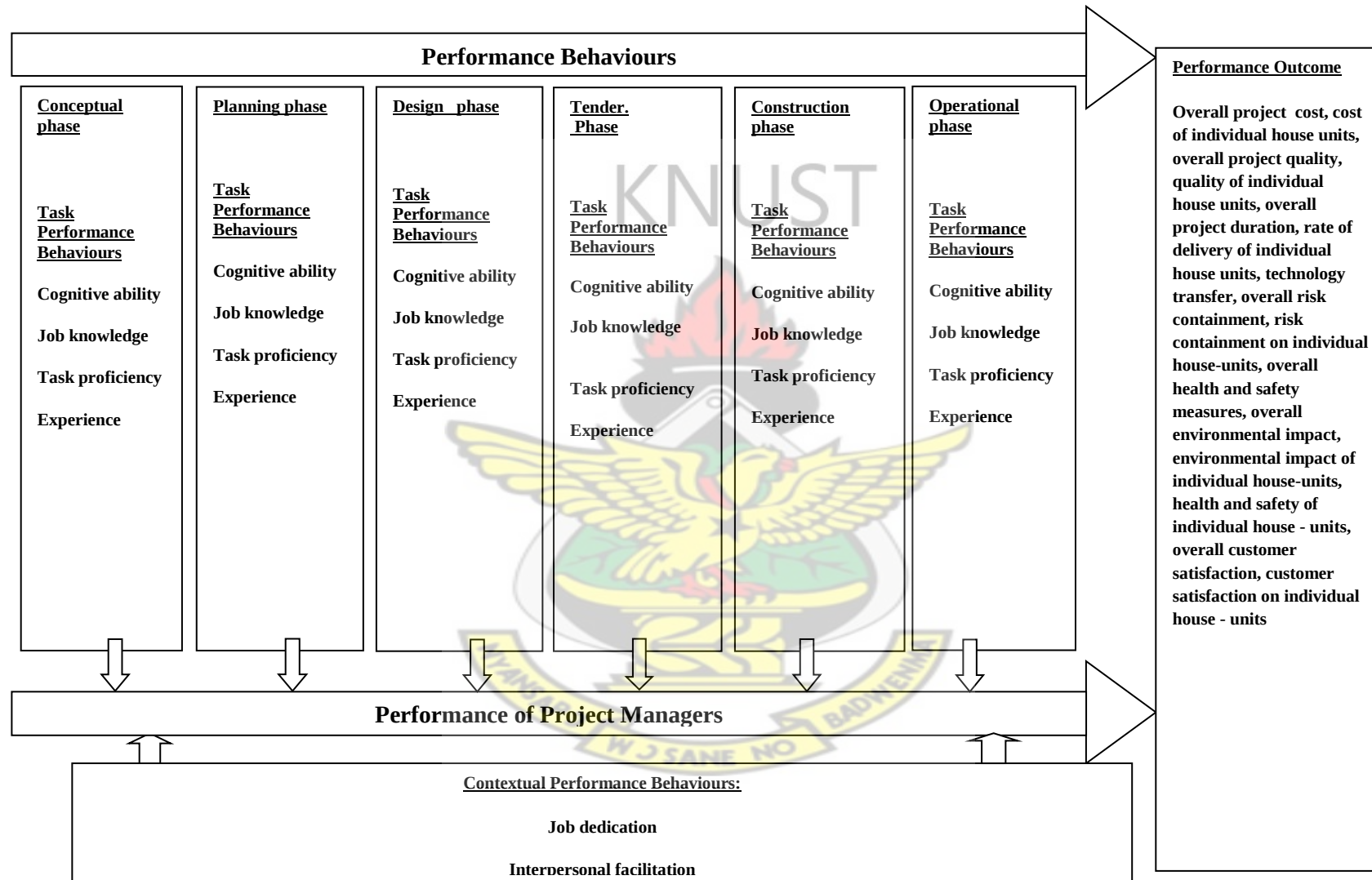
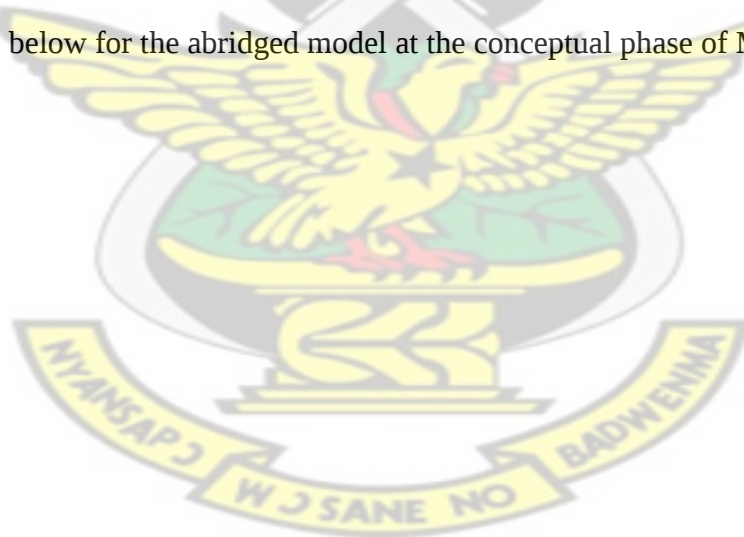


Figure 3.1: Competency - based conceptual model for the project lifecycle of MHBPs (Source: Ahadzie, 2007)

3.3.1 ABRIDGED COMPETENCY MODEL AT THE CONCEPTUAL PHASE

From the figure above, the main focus of the study was at the conceptual phase. The reason being that, the design and construction phases have been researched into already leading to the establishment of strong performance outcomes of the PM and secondly the conceptual phase is the genesis of all the proceeding phases. (See; Ahadzie, 2007; Ahadzie, 2013). Additionally, a focus at the conceptual phase is based mainly of its immerse significance in the project management phases processes. The major importance of the conceptual phase in effective project management delivery had been well articulated in the literature section 2.3.4. The highly significant nature of the conceptual phase which all the other phases take their form and frame from logically presupposes that, an error at this phase triggers series of errors at the proceeding phases hence the central need of inquiry to establish predictive performances indicators to ensure a holistic project success. See figure 3.2 below for the abridged model at the conceptual phase of MHBPs.



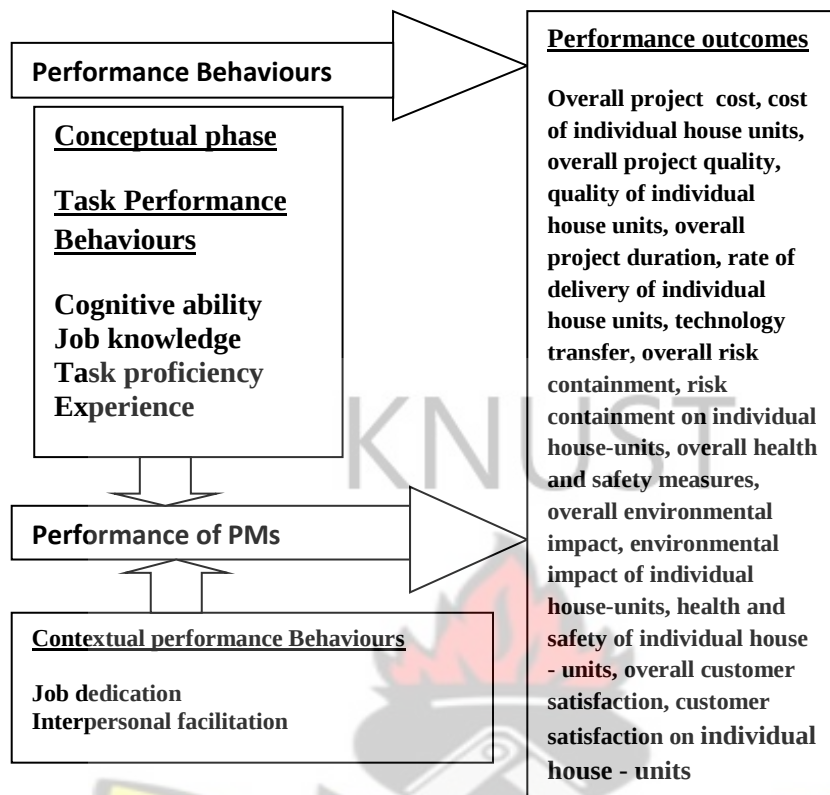


Figure 3.2: Abridged model at the conceptual phase of MHBPs (Adapted from Ahadzie, 2013)

3.3.2 THE THEORETICAL FRAMEWORK

Theoretical frameworks are important in a study as they add to the development and comprehension of a phenomenon under investigation by explaining it to the simplest form possible (Camp, 2000). Its relevance is further shown in the link between theory and practice in a study as shown in Kerlinger's definition of a theory as "*a set of interrelated constructs (variable), definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena*" (Kerlinger, 1979, pp. 64)

Human behavioural competencies are psychologically propelled and multivariate besides considering unraveling the managerial role of the PM at the conceptual phase needed the application of psychologically based constructs from the human resource discipline

(Ahadzie 2013). Though it must be stressed that, there are a number of psychologically based constructs from the human resource discipline which have been applied successfully by scholars and could have appropriately been adopted (See for example; Skipper and Lansford, 2006; McCelland, 1973; Dulaimi and Langford, 1997). However to ensure continuity to the previous studies in the construction and design phases as alluded to in section 1.1 and considering the ultimate goal of these series of PMs performance phase specific research agenda (which is to establish a comprehensive performance profile of a PM in MHBPs for all the various phases) and to corroborate or otherwise of the robustness of the theory of job performance in MHBPs, this study aligned with the application of the theory of job performance. (Borman & Motowidlo, 1997; Van Scooter et al, 1996; Ahadzie et al, 2013; Ahadzie et. al 2008).

There is a general agreement among scholars that, in conceptualizing performance of an individual one has to differentiate between the behavioural action aspects from the outcome aspects. (Campbell, 1990; Campbell, McCloy, Oppler, & Sager, 1993; Kanfer, 1990; Roe, 1999). Nonetheless there is contention as to whether the behavioural aspect should be known as “performance” or rather the “outcome” aspect. However for this thesis performance refers to the outcome aspects of the individual that encourages organizational growth. The behavioural aspect refers to what the individual does in a work situation that contributes to the organizational goals while the outcome aspects refer to the consequence or result of the individual’s behaviour. Moreover only actions which can be measured are considered to constitute performance (Campbell et al., 1993). In most situations performance behavioural aspects relates empirically to the performance outcome aspect (Sabine et al., 2002). Because not any action but only actions relevant for organizational goals constitute performance, there is a need for criteria in evaluating the degree to which an individual’s behaviour

performance leads to organizational goals. Therefore the application of the theory of job performance attributes.

The theory of job performance is multidisciplinary consisting of two theories; the theory of task performance and the theory of contextual performance. The former theory according to Borman and Motowidlo (1993) tries to evaluate the technical skills of an individual relevant for the job while the later dwells on the interpersonal demeanor towards others in an organization. It was later on established that, though these theories are significantly different from each other, nonetheless they are not mutually exclusive. As according to Van Scooter and Motowidlo (1996), both theories have to be considered when evaluating the performance of an individual. See figure 3.3 below.

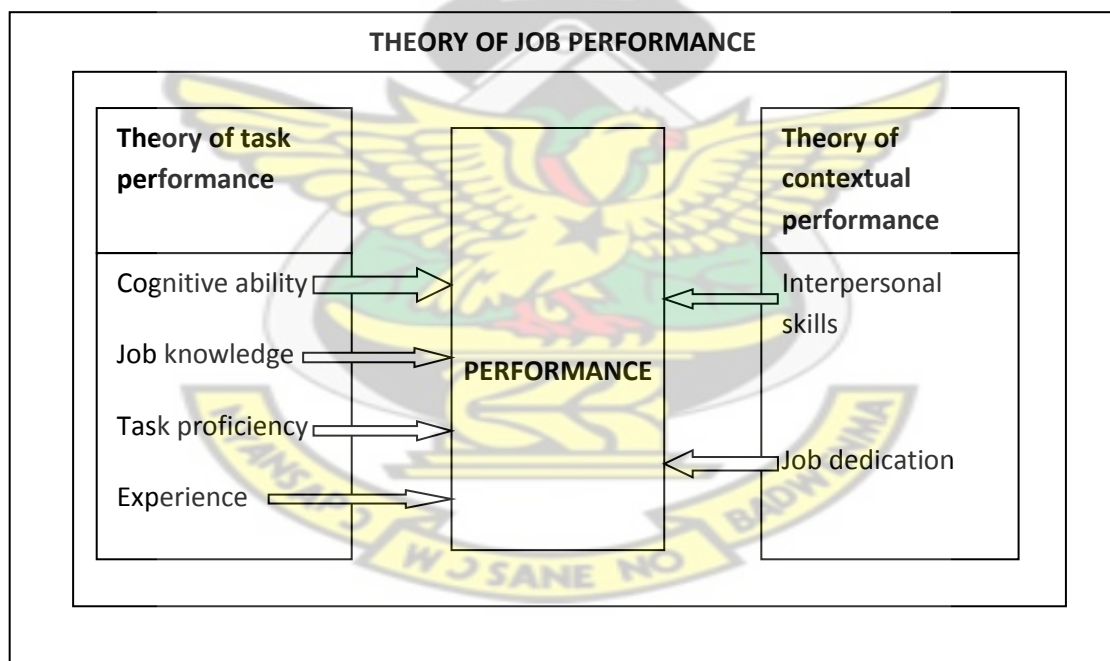


Figure 3.3: The theory of job performance framework (Adapted from Ahadzie, 2013)

In addition task performance behaviours were found to be varying across jobs while contextual performance behaviours were generic to jobs. They further noted that task performance behaviours should concentrate on; *the cognition, job knowledge, task*

proficiency and *job experience* of the individual while the contextual behaviours should tackle the *interpersonal skills* and *job dedication* of the person towards performance. Based on these phenomena of the two theories comprising the theory of task performance, the characteristics which may influence the performance of the PM at the conceptual phase has been operationalised. See table 3.1 below. The contention is that, the application of the theory of job performance is robust enough to identify the relevant behavioural measures that will promote superior performance of the PM at the conceptual phase (cf. Ahadzie, 2007).



Table 3 1: Operational measures for questionnaires

Independent Variables	Dependant Variable
<u>Contextual Performance Behaviours</u> Job Dedication • Commitment in ensuring speedy completion of final design brief • Ensuring design brief conforms with buyers needs • Strong goal orientation to achieve value for MHBPs • Ensuring the project is financially feasible • Commitment in ensuring the proposed project is technically feasible • Commitment in ensuring the proposed project is functionally feasible • Commitment in data collection during preliminary site investigations such as buried water pipes, electrical cables etc. • Pushing project professionals to deliver on time • Commitment in securing statutory requirements Interpersonal Skills • Having the ability to communicate effectively the buyers needs to his superiors • Understanding and appreciating different and opposing perspectives on issues by other members of the project team • Providing information timeously to project team members • Appreciating the strengths and weaknesses of project team members • Directing the project team members to a common project objective • Ability to resolve disputes amicably among the project team members • Ensuring a cordial working relationship among the project team members • Being sensitive to the needs of project team members • Ability to communicate effectively with project stakeholders <u>Task Performance Behaviours</u> Cognitive Ability • Ability to interact and understand the needs of buyers • Having the ability to make meaningful suggestions based on site investigation report • Having the ability to introduce novelty during the project brief stages • Having the ability to anticipate potential problems • Having the ability to envision the whole project from the perspective of his superiors • Having the ability to ensure team members understand their roles • Having a mental stamina throughout the conceptual phase processes • Ability to recall vividly the buyers needs and constrains Job Knowledge • Knowledge in site investigation and reporting • Knowledge in selecting a design brief that will be most appealing to majority of prospective buyers • Knowledge of conceptualizing neighbourhood social facilities, road networks etc. incorporation • Knowledge in computer applications such as ms project and ms word • Knowledge of conceptualizing performance –based serial contract packaging • Knowledge in acquiring litigation free land • Knowledge of multiple routine housing units contract packaging • Knowledge in attending to issues of licensing and permits from local authorities • Knowledge in conceptualizing project execution plan • Knowledge in conceptualizing safety requirements • Knowledge in housing market dynamics • Knowledge in conceptualizing a total quality assurance policy • Knowledge in conceptualizing environmental impact assessment • Knowledge in setting up a dispute resolution mechanism • Knowledge in local cultures • Knowledge of statutory obligations Task Proficiency • Technical quality of site investigation report • Functional quality of site investigation report • Technical quality of the final design brief • Function quality of the final design brief • Technical quality of total quality assurance policies • Functional quality of total quality assurance policies • Technical quality of environmental impact assessment incorporation • Functional quality of environmental impact assessment incorporation • Technical quality of dispute resolution mechanisms • Functional quality of dispute resolution mechanisms Job experience • Experience in conceptual phase management • Experience in a management position not necessarily in MHBPs • Experience in successful management of MHBPs • Experience in team leadership	Performance of Project Managers

3.4 THE RESEARCH DESIGN

Research design is a plan of information required to answer research problems or questions and how such information can be collected (Frazer and Lawley, 2000 cited in Adinyira, 2010). Yin, (2003) described a research design as that which guides researchers when collecting and eventually analyzing data. There are five main research options available in the view of Bryman, (2004) namely; cross – sectional, longitudinal, experimental, case study and comparative research designs. On the other hand Yin, (2003) has a classification of research design as; survey, experiment, archival analysis, history and case studies.

The ultimate research design selected by a researcher should ideally according to Yin, (2003) depend on; the focus of the research whether on contemporary or historical phenomena, the control the investigator has over actual behavioural events and the type of research questions under investigation. Bryman, (2004) added that the option chosen should reflect the emphasis the researcher places in the following ways; whether the results are intended to be generalized to a larger population; establishing causal relation between variables; appreciation of social phenomena and their interconnections; understanding meanings and behaviours in their natural context.

From the insight so far the research is most suited for a cross – sectional research. This is because, considering the philosophical position espoused in section 3.2.4 it would have been very contradictory to have chosen any design option apart from cross – sectional design which has the quantitative form of a survey on a sample at a single point in time and a qualitative interview characteristic of a focused group at a single period. Secondly, considering the research questions which needed answers to the questions of ‘ what’ and ‘how’ a multiple research design choice is most appropriate as according to Yin, (2003) a choice should be influenced by the type of research questions of a study. Thirdly, the

researcher did not have control over behavioural events which would have been appropriate for experimental study when the researcher has some kind of control of events such as in a laboratory situation as recommended by Yin, (2003). Finally the results are intended to be generalized and to establish causal relations among the independent and dependant variables therefore the need of cross – sectional design which requires survey research on a sample at a single point in time (Bryman, 2004). Therefore the framework for the study is shown below.



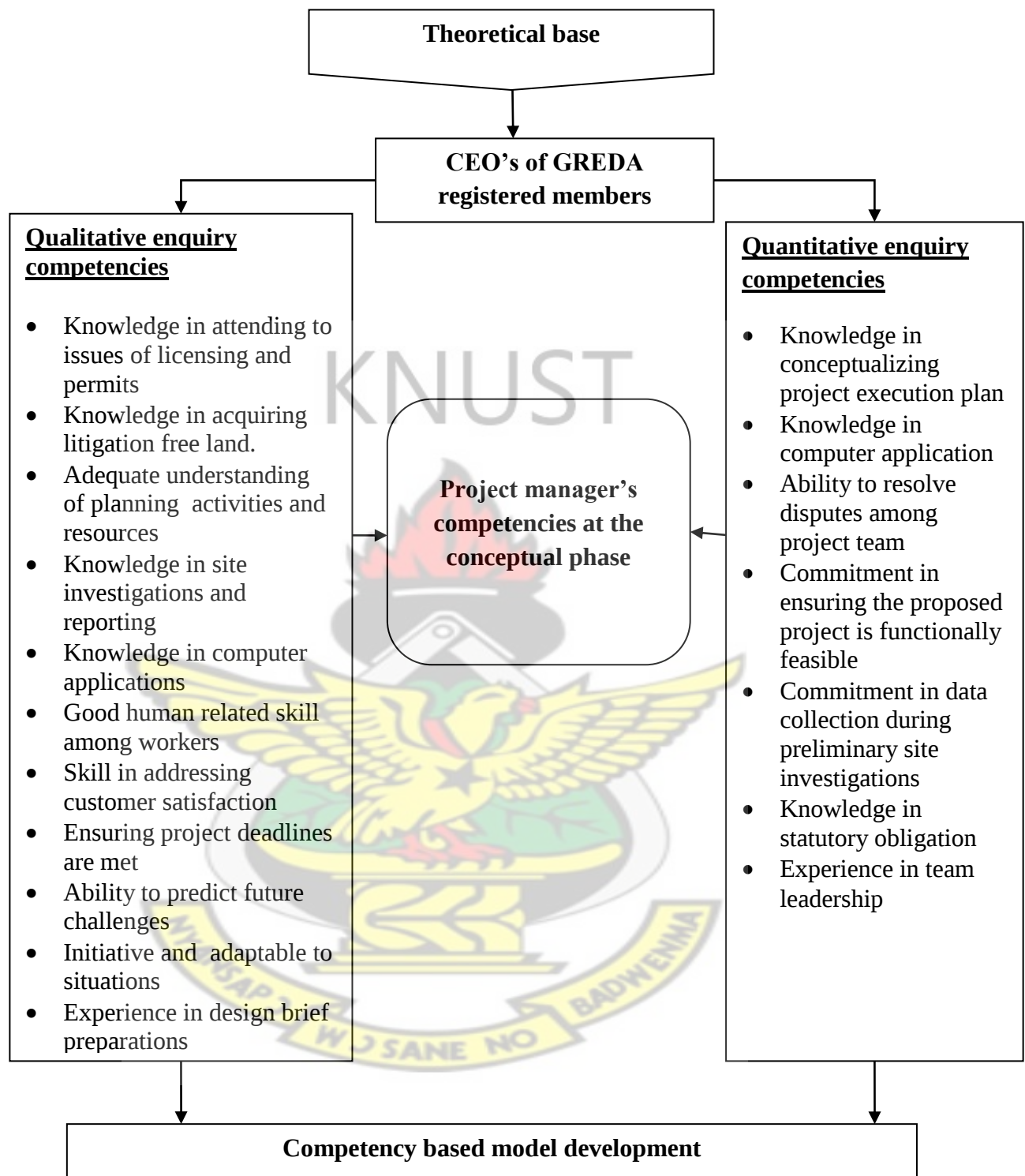


Figure 3.4 Framework for the study

The variables in figure 3.4 were derived from the qualitative enquiry first and then the quantitative enquiry (see section 4.1 and 4.2). The upper part of the figure 3.4 “**theoretical base**” represents a review of related literature to understand the research gap. The

quantitative competences then informed the questionnaire development with the subsequent discovery of the quantitative competencies (see research process and figure 3.5). The competencies from both approaches then form the competencies required of the PM at the conceptual phase. (See figure 3.4 and chapter 4)

3.5 THE RESEARCH PROCESS

The review of related literature and the subsequent preliminary survey consisting of interviewing selected top ten senior managers of GREDA registered developers served as the background of the research. The revelations from this preliminary survey justified the need for this research. The contention that PMs were engaged from the conception to the operational phases of the project management process in MHBPs was confirmed. This significant revelation then paved the way to further explore those performance indicators of the PM which ensure success at the very initial stages of the project management phase.

The revelations from the preliminary survey further lead to the realization of the appropriateness of the research questions and objectives of this study. In addition, the questionnaires design and structure were all informed significantly from the preliminary interview and detailed review of literature. The researcher then proceeded to the field to collect primary data from a list of registered GREDA companies in MHBPs based in the Greater Accra region of Ghana. (See figure 3.4 for the research process)

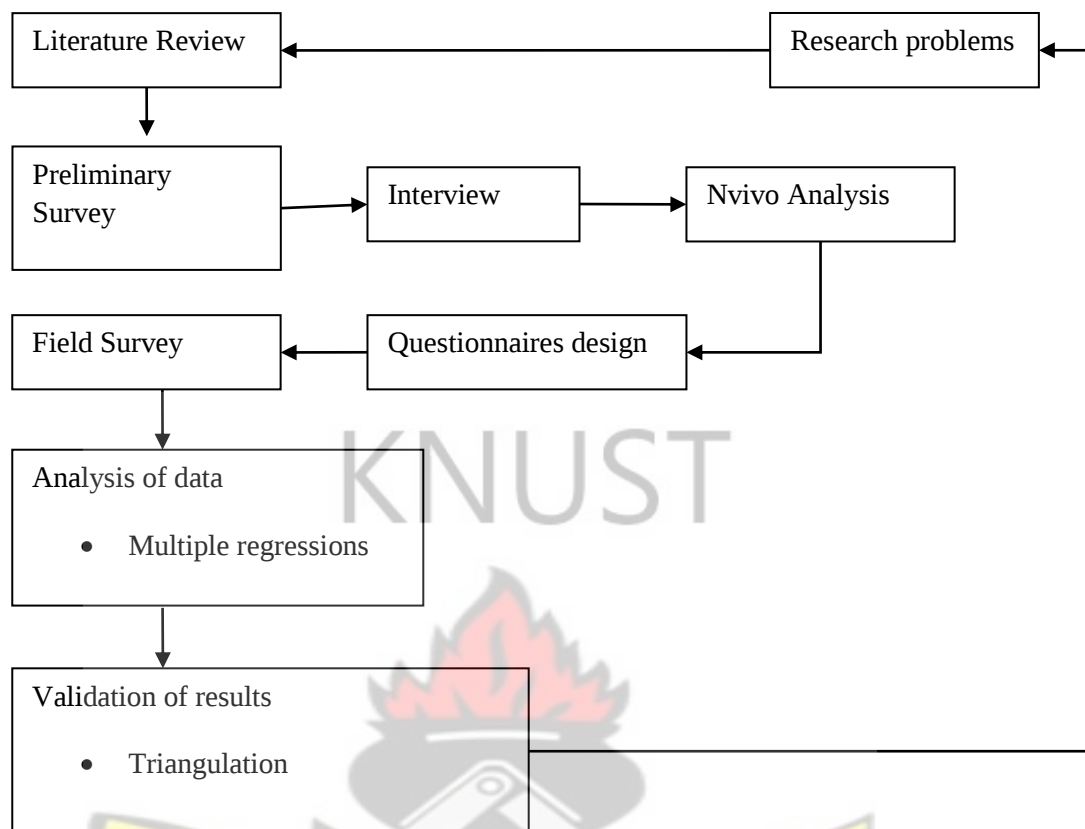


Figure 3.5: the research process

3.6 QUESTIONNAIRES DEVELOPMENT

A crucial part of good research design concerns making sure that the questionnaire design addresses the needs of the research. This involves moving from the research aims to deciding what are the right questions to put on a questionnaire is a key aspect that needs to be addressed by the researcher. Ideally the method of analysis and the statistical software to be used in the statistical analysis is certainly an important consideration at the questionnaire design stages. (Burgess, 2001). A questionnaire as a survey instrument can be very beneficial to a study particularly respondents can be more truthful than they would normally be in a personal interview essentially when talking about sensitive or controversial issues (Leedy, 2005 et al).

The questionnaire was designed into three main sections with a preamble to explain the major purpose of the study to the prospective respondents. Section A is the demography section which is added to ascertain the reliability or credibility of the responses that will be given from the participants. Descriptive statistics was used in the analysis of this section. The subsequent section B was designed to solicit the social and non- job specific measures which would ensure high performance of the PM at the conceptual phase. The section C segment was purposely designed to solicit mainly the technical, job descriptive skills of the PM. The final section D inquired about the general performance of a PM the respondents have engaged in the last five years. The section D part was analyzed using descriptive statistics however the independent variables were analyzed with multiple regressions. The following sub section looks at the questionnaire into much detail however a definition of a “variable” should be pursued as a prelude to proper comprehension of the dependant and independent variables found in the questionnaires development discussions (See appendix for the research instruments).

3.6.1 DEFINITION OF A VARIABLE

Before illustrating on the main independent and dependant variables identified in the questionnaires, there is the need to define variable or construct as used by other category of scholars. A variable (or construct as called by psychologists) refers to a characteristic or phenomenon of an individual or an organization that can be measured or observed and that varies among the people or organization being studied (Creswell, 2007a). Characteristically, a variable will differ in two or more categories or on a continuum of scores and its measurable. A variable has two distinguishing characteristics; temporal ordering and their measurement (See for example; Isaac and Michael, 1981; Kerlinger, 1979; Thorndike, 1997). Temporal ordering means one variable precedes the other in time and one variable can probably influence the other. The word “probably” is used because in

studies dealing with humans and the natural setting, researchers argue that it is difficult if not impossible to proof causation (Rosenthal and Rosnow, 1991; Creswell, 2009).

3.6.2 THE INDEPENDENT VARIABLES – CONTEXTUAL PERFORMANCE BEHAVIOURS

Independent variables as noted above are those variables that probably cause or affect outcomes. They are sometimes known as treatment, manipulated, antecedent, or predictor variables (Creswell, 2009). In answering the objectives of this study relevant independent variables reflecting the indicators that promote success at the conceptual phase of MHBPs were operationalized and listed for the survey participants to respond by rating them. The Likert rating scales was adopted in the ratings. The respondents were to rate the independent variables on a five point Likert rating scale of 1- 5, in that 1 stands for not very important and 2,3,4,5 stands for not important, average, important and very important respectively.

The section B part of the questionnaire dealt with contextual performance behaviours which are likely to engender success of the PM at the conceptual phase of MHBPs. Contextual performance behaviours consists of voluntarism, persistence, compliance, self – discipline among others on the part of the PM that ensures a lively social environment in an organization (Motowidlo, Borman and Schmit, 1997; Podsakoff and Mackenzie, 1997). In all a total number of 18 contextual performance behaviours were identified with 9 from *job dedication construct* and 9 from *interpersonal facilitation constructs*. These constructs were necessary in the questionnaires because according to Borman and Motowidlo (1997) technical and proficiency skills on the job need to be complemented with the appropriate demeanor and social skills of an individual to ensure a holistic performance of the individual which by extension engenders organizational growth (See figure 3.3 above)

3.6.3 INDEPENDENT VARIABLE – TASK PERFORMANCE BEHAVIOURS

The subsequent section C segment of the questionnaire dealt with the task performance behaviours of the PM. Task performance behaviours was included in the questionnaire to discover the prominent technical abilities and skills of a PM that will ensure his high performance (Hattrup, O’Connell, &Wingate, 1998; Motowidlo & Van Scotter, 1994). Under task performance, the main constructs included; *cognitive or mental ability, job knowledge, task proficiency and job experience*. A total number of 38 task performance variables were realized of which 8 were from cognitive ability constructs, 16, 10, and 4 under job knowledge, task proficiency and job experience respectively.

3.6.4 THE DEPENDANT VARIABLES – PERFORMANCE OF PROJECT MANAGERS

Dependant variables are defined as those variables that depend on the independent variables; they are the outcomes or results of the influence of the independent variables. They have other names as criterion, outcome or effective variables (Creswell, 2009). The final part of the questionnaire gave the respondents the opportunity to rate the performance of project managers they have engaged in the last five years. They were to rate the PM on a performance scale of very low, low, average, high and very high.

3.7 DATA COLLECTION

This section presents the methods used for the collection of qualitative preliminary data for the first phase and then the quantitative data collection for the second phase.

3.7.1 THE PRELIMINARY INTERVIEW

Purposive sampling technique was used extensively for the selection of the first phase samples. Purposive sampling is a non – probability sampling technique used to choose people or units for a particular purpose (Leedy et al, 2005). The top ten experienced

GREDA registered companies managers in a senior position were interviewed. The companies included: **Regimanuel – Gray Ltd., Devtraco Ltd., Dream Properties, Buena Vista Homes, Koans Building Solutions, Lakeside Estate, Trasacco Estates Development Co. Ltd., Blue Rose Ltd., Castle Gate Estates Ghana Ltd. and West Bay Properties.** The managers from these companies were purposely contacted because it was expected they would be more experienced enough to contribute adequately to the preliminary study which was required to justify the research and to inform the appropriateness of the study aims and objectives as mentioned in the research process section. Due to compliance to ethical considerations, the researcher could not record nor videotape the interview. Hence the author depended on field notes writing and strong human memory. Nonetheless the interview was successful and the data was screened and analyzed with nvivo statistical tool. (See appendix for the open ended interview guild)

3.7.2 THE SECONDARY PHASE METHODS

The preliminary survey interviewing espoused above laid the background to the next phase of the research process. Closed ended questionnaires were then designed and structured to reflect the preliminary results and literature. These questionnaires were purposively piloted among 5 property developers in the Kumasi metropolitan area. The piloting was essential as the aim was to detect any flaws in the questioning and correct those flaws prior to the main survey (Burgess, 2001; Leedy, 2005). A notable person who participated in the piloting was one director of a leading real estate developers firm in Kumasi, who has considerable experience in mass housing and project management in Ghana. His contention with the questionnaires was the provision of prospective buyer's needs and requirements considerations. According to him MHBPs was speculative hence no need to consider buyers tastes and preferences. Nonetheless this provision was allowed in the questionnaire. The amended questionnaires after the pilot study were then

distributed to the research participants. A period of 5 weeks was allowed for the questionnaire distribution and collection which started late February and completed in March 2014. All reasonable efforts were employed to increase the response rate by regular visits to the offices of the prospective respondents for reminders as well as regular phone calls and emails. Nonetheless all un-retrieved questionnaires after the fifth week were considered unresponsive.

The sampling frame for the research participants was obtained from a registered list of GREDA members on line (www.gredaghana.org/greda/members.asp accessed on the 20/03/14). In all there were 169 of them, however a total number of 159 were used eliminating the ten already purposely selected for the interview. GREDA is an umbrella body of real estate developers in Ghana duly recognized by the Government of Ghana. As real estate developers, there are in a better position to have greater insights into mass housing and should be able to evaluate the performance indicators of the PM at the conceptual phase. The contention is that, their senior managers who engages the services of PMs in mass housing should be adequately equipped in their perceptions and evaluations of the PM's competencies at the conceptual phase. The study was geographically limited to Greater Accra because from the registered list over 95% of the registered companies were located in the Greater Accra region specifically, Greater Accra and Tema metropolis (www.gredaghana.org/greda/members.asp accessed on the 20/03/14). Though the scope of the study was for the whole of Ghana, the greater Accra region has the highest concentration of GREDA members therefore the focal point.

3.8 SAMPLE SIZE DETERMINATION

A common goal of survey research is to collect data representative of a population. Commonly a researcher uses information gathered from the survey to generalize findings from a drawn sample back to a population, within limits of a random error (Bartlett et al,

2001). One of the benefits of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would have been prohibitively expensive to study (Holton and Burnett, 1997). The significance of sampling is well noted however the challenge now is how large should the sample be to be able to make legitimate inferences to a general population?

According to Israel (1992), there are varied methods that can be used in the determination of a sample size. This could include using censuring for a smaller population, application of statistical formulae, using well established sample determination tables and the application of a sample size of a study similar to what one is studying. Whatever method is used the researcher should try to use a sample size that would be representative enough to the population of inquiry.

Therefore the well acclaimed Kish formula (Kish, 1965) was used to determine the minimum statistically acceptable sample size.

The formula states that;

$$n = a / (1 + a/N)$$

where;

n is the sample size

N is the total population

a is given by s^2/v^2

v is the standard error of the sampling distribution

s is the maximum standard deviation of the population element

$$s^2 = P*(1-P)$$

P is a proportion of population elements belonging to the defined class

at 95% confidence interval , v is given as 0.05 and P is 0.5;

$$S^2 = 0.5 (1-0.5)$$

$$S^2=0.25$$

$$\text{Therefore; } a=0.25/0.05^2$$

$$a=100$$

$$n=100/(1+100/159)$$

$$n= 61.34, \text{ approximate minimum sample size} = 61$$

The kish formula can only give the minimum acceptable sample size. However because the survey was a voluntarily one it was highly anticipated that the response rate would be far less than 100%. Therefore they would be a justifiable need to oversample to cater for uncooperative subjects. Fink (1995) argues oversampling can add costs to surveys but it is often necessary. Previous studies involving these subjects yielded a response rate of around 55% out of 110 questionnaires distributed (See Ahadzie et al. 2013; Ahadzie, 2007). Therefore a readjusted sample size of 120 was adopted. Besides, Salkind (1997) recommends increasing sample size to about 40 – 50% to cater for unresponsive subjects as well as the imperfect systems of quantitative surveys. In situations where a researcher wishes to use multiple regression for the analysis of data, there is the requirement of ensuring there are at least ten observers to each independent variable to avoid over fitting of results and thus warranting generalizability. (Miller et al., 1973; Halinski, et al. 1970)

3.9 DATA ANALYSIS

The qualitative primary data for the first phase survey inquiry explained under research design were analyzed with the use of Nvivo qualitative computer software. The second phase primary data were subsequently analyzed with the use of SPSS multiple regression with the choice of backward elimination approach. Had it not been for some misfits considerations structural equation modeling (SEM) statistical technique would have been used instead of the later?

Structural equation modeling (SEM) is a general term that has been used to describe a large number of statistical models used to evaluate the validity of substantive theories with empirical data. Statistically, it represents an extension of general linear modeling procedures, such as the ANOVA and multiple regression analysis (Pui – Wa and Qiong, 2007). According to Kline (2005), some of the primary advantages of SEM over other general linear modeling such as multiple regression analysis are its ability to be used to study the relationship among latent (unobserved) constructs indicated by multiple measures. Nonetheless SEM application in research is in contention among other researchers (See for example; MacCallum, 2000; Martens, 2005). Therefore SEM was not adapted for the quantitative data analysis due to the following further considerations;

- There is no consensus among researchers as to the acceptable minimum sample size in SEM probably due to its large sample size requirement (Weston et al. 2006). But in the view of Kline, (2005) SEM should have a recommended minimum sample size of over 200 ($N > 200$). The recommended sample size by Kline, 2005 exceeds the population size of this study (registered GREDA members) of 159 members making SEM application grossly unsuitable.
- SEM is a model testing procedure and not a model building one. Besides a tested model through SEM might not have strong predictive properties relative to a model developed through multiple regressions (MacCallum et al, 2000; Kline, 2005; Sewall Wright, 1921; Judea Pearl, 2000). Reflecting on the major aim and objective three of this study the most appropriate statistical tool for analysis was multiple regressions.

Multiple regressions is a statistical tool that can be used to examine how multiple independent variables are related to a dependent variable. If there is a relationship, using the information in the independent variables will improve the accuracy in predicting the

values in the dependent variables (Higgins, 2005). A typical multiple regressions formula is given by;

$$Y = a + b_1X_1 + b_2X_2 + K_XK + c \dots\dots\dots (3.1), \text{ where}$$

Y = A predicted value of Y (which is the dependent variable) in this case the performance of project managers

a = The “ Y intercept”

b_1 = the change in Y for each 1 increment change in X_1

b_2 = the change in Y for each 1 increment change in X_2

x = an X score (X is the independent variable) for which tries to predict a value of Y . In this case the contextual and task performance behaviours.

K = the number of independent variables

C = the error of the random variable

The multiple regressions techniques can only be applicable after the following assumptions and requirements were met since the purpose of the study is to make inferences from a sample to a general population (Campbell et al, 2008):

- Y is measured as a continuous level variable – not a dichotomy or ordinal measurement
- The independent variables can be continuous, dichotomous, or ordinal
- The independent variables are not highly correlated with each other
- The number of independent variables is 1 less than the sample size n (preferably n is far greater than the number of independent variables)
- There should be the same number of observations for each variable – any missing values for any variable in the regression should be removed from the analysis

The suitability of a multiple regression equation is tested by statistical criteria such as F – test and the coefficient of determination (R^2). The F – test determines if the model can be generalized to the population from which the sample was taken. The predictive strength of a developed regression model can be assessed by examining the magnitude of R^2 . The closer the R^2 to one the higher the predictive strength of the regression equation (Kleinbaum et al, 2007).

In regression there are three main methods; namely hierarchical or block wise entry, forced entry and stepwise methods (Field, 2009). In most cases, especially when there are large numbers of independent variables, we might use statistical criteria to include or exclude independent variables, especially if we are interested in the optimum equation to predict the dependent variable (Abdel- Salam, 2008; Grafarend, 2006).

The stepwise method in SPSS is the same as the forward method, except that each time a predictor is added to the equation, a removal test is made of the least useful predictor. The backward method (a type of stepwise method) is the opposite of the forward method in that the computer begins by placing all predictors in the model and then calculating the contribution of each one by looking at the significance value of the t- test for each predictor. This significant value is then compared against a removal criterion. If a predictor meets the removal criterion (i.e if it is not making a statistically significant contribution to how well the model predicts the outcome variable) it is removed from the model and the model is re – estimated for the remaining predictors. The contributions of the remaining predictors are then reassessed. Field (2009) noted that when a decision is made in selecting the stepwise method comprising the forward and backwards methods, it is much preferable to select the backward option to the forward option. This according to him is because of what is known as the *suppressor effects* which occur when a predictor has a significant effect but only when another variable is held constant. Forward selection

runs the risk of making type two error (i.e. missing a predictor that does in fact predict the outcome) (Field , 2009). Therefore backward selection method was used for the multiple regression analysis.

Qualitative inquiry is interpretive inquiry, with the enquirer typically involved in a sustained and intensive experience with the participants. This introduces a range of strategic, ethical, and personal issues into the qualitative research process (Locke et al., 2007). With these concerns in mind, inquirers explicitly identify reflexively their biases, values, and personal background, such as gender, history, culture, and socioeconomic status that may shape their interpretations formed during a study (Creswell, 2009). In avoiding some of the challenges in qualitative inquiry such as putting a check on inquirer's biases in the interpretation of the interview conducted, nvivo 8 computer software was used in the interpretation of the interview conducted. The field notes were screened and coded into themes to reflect the specific views of the interviewees. The key findings were then categorized and arranged for interpretation.

3.10 CHAPTER SUMMARY

This chapter has discussed the research approach, methods, design and processes of adoption. The thesis adopts both research philosophies of positivism and constructivism. The theoretical framework and the questionnaire design have been explained. A cross-sectional design was used due to the wide range of designs adopted. This was done to allow the needed flexibility to collect and analyze the needed data, which were mainly qualitative for the first phase proceeded with quantitative data to come up with the right conclusions in view of the research questions, aim and objectives. The sampling frame, the sample size and the tools which were used for the analysis has been determined. This

importantly sets the background for the next chapter which explains in detail the analysis of the data collected and the subsequent discussions of results.

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CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.0 INTRODUCTION

This chapter covers the main objective of this thesis which is the development of a predictive model for the PMs performance at the conceptual phase. The first phase interview data collected (see research methodology) is discussed first. Thereafter, the independent variables (consisting *contextual* and *task performance behaviours*) are regressed against the dependent variables (project manager's performance) using "backward elimination method" (a form of stepwise method). The regression analysis choices enquired included; *descriptive statistics, correlations, R^2 , ANOVA, coefficients, multicollinearity, linearity, collinearity diagnostics etc.* The findings from the substantive model are then converged against the theoretical framework adopted. Subsequently, a detailed discussion of the findings is then pursued in relation with literature. The chapter closes with a validation of the substantive model.

4.1 QUALITATIVE DATA ANALYSIS

This sub-section is dedicated to the discussion of the preliminary interview conducted. In order not to influence the findings and prevent research biases Nvivo 8 was used to analyze the interview data.

4.1.1 THE COMPANIES' PROFILE

The first enquiry purposely selected top ten GREDA companies in the category of A1 which is in the highest classification scale in GREDA membership classification. To qualify for this category one company must have build at least 25 housing units with a minimum turnover of just over GHC1,300,000.00 per annum (about USD 500,000.00 at current rates) (GREDA, 2013). The relatively larger annual turnovers and extensive

experience in MHBP logically suggested they were greatly involved in MHBP therefore their inputs would be much credible. Questions one to four of the interview guide (see appendix for interview guide) was structured with the objective to access the credibility of the informants to the interview. From the survey three of the respondents were architects, two were project managers, two were civil engineers, and two were quantity surveyors and one land economist. The respondents personally had been involved in MHBP from a minimum of 8 years to a maximum of 20 years. Each of the company contacted had a number of employees ranging from 25 to 60 excluding casual workers and sub-contractors. On the average each of the ten companies surveyed build about 21 housing units in a year. The professional background of the respondents as well as their level of experience and the magnitude of MHBP involved by the companies were found to be satisfactory. Therefore the responds received can be credible and reflective enough for the purpose of the first enquiry (See figure 4.1 below.).

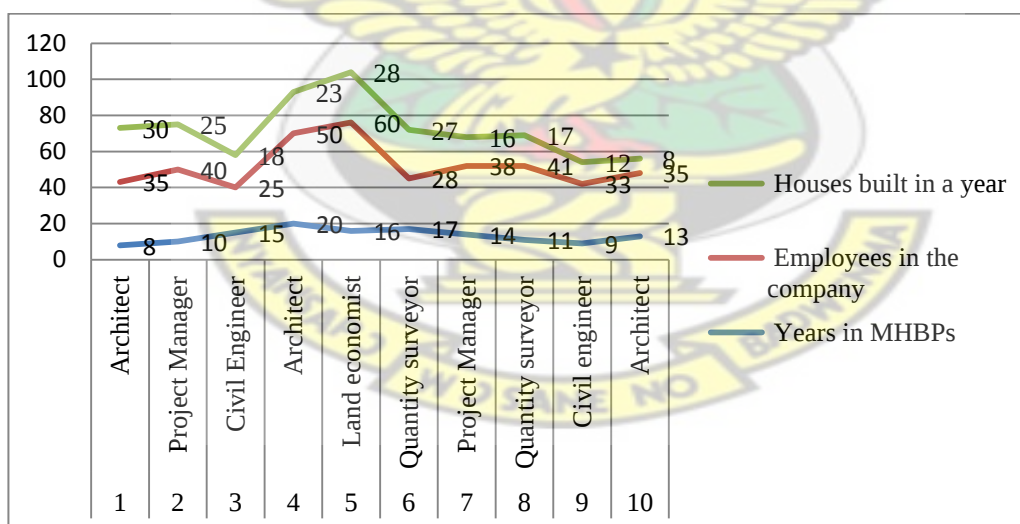


Figure 4.1: companies' profile

4.1.2 THE PM RESPONSIBLE FOR PROJECTS FROM CONCEPTION TO FINISHING.

From the survey it was found out that all the ten senior managers interviewed indicated that project managers were involved from conception to finishing in all the mass housing building projects that they have been involved. This revelation confirms Ahadzie (2007) and Ahadzie (2013) positing that the PM is engaged from the conception to the completion stages of MHBPs in Ghana. Notably, it was discovered that, the project manager's position was a recognized permanent staff position hired to ensure project success from beginning to end. Comments from respondents;

"Project managers are responsible for effectively and efficiently managing the project in terms of time, quality and cost. The success or failure of building the housing units depend to a large extent on their ability to manage various resources adequately." (Informants' view)

The organizational leadership role of hiring a PM in MHBPs was explicitly stated by one of the key respondent as; *"As a CEO of my company, I need someone who would be a link from the sub – contractors that we engage and the casual workers on the housing units to me. This linkage is provided by the PM."* The centrality of engaging a PM in projects is firmly attested by literature (See for instance; Gillard, 2009; Zielinski, 2005; Ahadzie and Amoah – Mensah, 2010)

4.1.3 THE NAME DESIGNATION OF A PM

Moving on, it was revealed that several name designations were accorded to the PMs. Five of the respondents called the person who played a project management role in MHBPs as 'Project managers' and the remaining names were 'engineer' and just simply 'site engineer'. It was realized that, people who did similar jobs across companies could have

different job title designation and also the name designation was not a matter of concern for the senior managers as noted by the informants.

“The name designations are not relevant as the most important thing is results. In MHBPs, there are varied challenges cumulating from acquiring litigation free land to fighting land encroachers which should be our concern and not on how a staff should be called.”(informants’ view).

The revelation is in line with Walker (2002) arguments that, the name and title designation of a PM should not be a matter of contention but rather they should be emphasizes on his duties and roles on the job.

4.1.4 IMPORTANCE OF ENGAGING PMs AT THE CONCEPTUAL PHASE OF MHBPS

The senior managers deemed it mandatory to use project managers from the conceptual phase of MHBPs onwards. This is perhaps as the result of the skills, knowledge, experience and inspiration project managers bring on board. *Comments from respondents.*

“A Project Manager is a key figure of any project beginning. They are primarily responsible for the overall success of delivering a project, reaching set targets both safely and correctly. Initial project process challenges must be overcome by the PM since his main job description is to management the building of the housing units successfully. They should be able to perform effectively within tight time-scales when time to complete is a priority, keep within strict budgets and ensure quality specifications are met. To overcome certain task, project managers can show initiative and be able to find ways to best adapt to situations.”(Informants’ View).

The views expressed above are in strong agreement with many scholars in project management research. For instance Baca, 2007 and Divincenzo 2006 argued that a PM on a project has a diversity of responsibilities ranging from taking a leadership role, ensuring project deadlines and budgets are met, assessing risks and taking the right one to ensuring the project comes out well. Goodwin, (1993) noted that the PM has the solo personnel responsible for the success or otherwise of a project. Due to the growing competitive global economy, employers as revealed from the comments above continuously insist on employees who are better prepared, adaptable, responsible and amenable to meet the rising competitive global economy of which a PM is not an exception (Tierney, 1998). The PMs role in project management from the views gathered can be likened to the popular saying but with little alteration as “he should be a jack of all trade and master of all if possible”.

4.1.5 PMs JOB DESCRIPTION AT THE CONCEPTUAL PHASE

The survey further discovered the role of the project manager to include the following: planning, leading, team building, organizing, reporting among others. As noted by respondents;

“Planning the works of the housing units, ensuring competent artisans are employed, He must be able to work amicably with all the workers in the company, having the ability to comprehend thoroughly all the intricacies and predict future challenges. He should have the skill and knowledge in selecting a final design brief that would be most appealing to majority of clients especially expatriates. He should have the ability to envisage the whole projects from the perspective of his superiors. He can have an input in the preliminary activities such as assisting in the design brief preparations and the preliminary estimation of the individual housing units as well as the entire housing units. The PM and the other senior managers must attend to issues of licensing and permits from the relevant

authorities, attending to issues of getting land which are dispute free and within the demarcation for domestic development from the Town and country department”(Informants’view).

The views espoused above have some competence requirements which are beyond the scope of this study hence would not be commented on such as “*ensuring competent artisans are employed*”. The senior managers’ in MHBPs expects the PM to have competences at the conceptual phase to range from social skills to task specific skills to issues of meeting government regulations. The issue of taking measures which would eventually guarantee customer satisfaction in MHBPs argued for by researchers such as Demchak, (2000) and Dikmen et al. (2005) came out as a major concern which PMs need to address if MHBPs is to experience success. Measures taken at the conceptual phase which will ensure customer customization and satisfaction is proposed by Adedayo (2012). The neglect of this requirement is argued by Kadiri, (2005) to be a major cause of MHBPs failures. The other major job requirement was found to include; ensuring government regulations are met in terms of housing such as getting the right permits and licenses from the right authorities. Issues of land litigation were a major concern of these senior managers and they were of the view that the PM must have sound knowledge and skills in the acquisition of land which is litigation free. As commented by one key informant;

“Before I was successful in building this gated community of over 80 housing units, in the beginning, I used to confront so called land guards with the security agencies with gun shots

The main legislative for urban planning and development by the government of Ghana has provided the processes that a prospective house builder and by extension MHBPs must

fulfill to acquire the right permits. These legislative include the Town Planning Ordinance produced in 1954, the Local Government Act (an informal series of planning standards and development guidelines produced in 1990) and the National Building Regulations produced in 1996. These legislatures need to be properly understood by PMs in particular section 2 onwards of the National Building Regulations which provides the processes an individual has to go through to acquire legitimate titles to lands.

4.1.6 PMs TECHNICAL SKILLS AT THE CONCEPTUAL PHASE OF MHBP

The study further probed into technical requirements of the PM and the following were discovered in the respondent's comments;

The PM should be able to plan and allocate labour adequately to ensure efficiency and high productivity. He must have knowledge in preliminary site investigations and surveys. He should have the technical abilities to spot errors in the preliminary estimates, final design briefs etc. He should have the technical competence of drawing up an execution plan for the housing units. He must have sound knowledge in the use of computer applications such as ms project and ms word. (Informants view)

There is overwhelming consensus among researchers that while there is no compelling necessity for project managers to be a technical specialist, they should have some degree of technical skill encompassing the technological discipline on which the project is based (CIOB, 2002; Ogunlana et al., 2002; all cited in Ahadzi et al., 2008). Technical skill is defined by Katz, (1991) as an understanding of and proficiency in a specific kind of activity, particularly one involving methods, processes, procedures, or techniques. It involves specialized knowledge, analytical ability within specialty, and facility in the use of tools and techniques of a specific discipline. Divincenzo (2006) in adding to the relevance of technical skills noted the PM must have some knowledge in computing. The

planning of work activities by the PM was another major technical requirement identified. This agrees with the very basic principles of project management managerial methods of which planning form a significant part. (PMI, 2004; Ohara, 2005)

4.1.7 PMs HUMAN RELATED SKILLS AT THE CONCEPTUAL PHASE

The skills required to management persons in a project is a well acknowledged fact among numerous scholars. Katz, (1991) noted effective administration rests on human skills, conceptual skills and technical skills which can be developed independently. El-Sabaa (2001) added that the human skills of PMs have the optimum influence on project management practices and technical skills the least. Belzer (2001) identified human skills in managing projects as ‘the missing link’, critical to project success. Kloppenborg and Petrick (1999) insisted on competence in the management of the team in a project. There are other studies which discovered the significance of human related skills in project management such as Loo (2002); Thite (1999) and Zimmerer et al. (1998). The managers interviewed were of the firm opinion as with the scholars above that the PM at the conceptual phase requires all the human skills necessary to be successful in managing stakeholders of a particular project as commented below;

“The PM must have an extraordinary good human relation with all workers, prospective buyers and as well as to his superiors” (Informants view).

4.1.8 THE ROLE OF THE PM IN DESIGN BRIEF PREPARATIONS

The inquiry further probed into the probable success driven behaviours of the PM at the design brief stages in MHBPs. It was revealing to discover that, though the design brief stages was elaborately dominated by the architect, the managers are of the view that the PM could still play a subtle role in assisting the architect particularly when experienced to ultimately come out with a design brief that will be most acceptable to majority of the

project stakeholders in particular buyers. The arguments was that as the design brief is the blueprint of the detailed design and also ultimately the eventual form of the character of the whole project greater collaboration on all members of the project team with the PM taking a directory leadership role would be worthwhile. As noted by the managers;

“Assisting the architect to preliminary address all issues relating to mass housing such as the provision of recreational centers, scrutinizing and liaising with the architect to eliminate all errors with the main goal of selecting a design brief which is economic and is most likely to satisfy majority of customers, an experienced PM is very vital in the design brief preparation and is a vital resource to the architect. He should be present during the design brief meetings so that he can make meaningful inputs” (informants view)

4.1.9 THE ROLE OF THE PM IN ENSURING OVERALL MHBP_s SUCCESS

The litmus tests for every successful project in most literature include the end satisfaction of the traditional constrain of time, the cost to complete and the quality of the final product. These success measures can be seen in the definition of project management (PMI, 1996; Cooke- Davies, 2001; Bradley, 2002). Besides as already reviewed in the literature, there is a call by other scholars to broaden the measures to include others such as; technology transfer, health and safety, risk containment, environmental friendliness, and the satisfaction of the project stakeholders (Dainty et al., 2003; Shenhar et al. 2001; Pinto and Slevin, 1988). Ahadzie, (2007) discovered 15 success measures in MHBP_s in Ghana see figure 3.3 at chapter 3. Since the successful role of a PM is measured based on the final outcome meeting the success parameters it's logically argued that the PM's role must be geared towards meeting these measures. This was realized during the survey as the managers agreed on competences of the PM meeting the conventional measures of time, quality and cost and also others proposed by the scholars above. As noted in their comments;

“addressing issues of procurement of resources, ensuring there is value for money for all the individual housing units, ensuring housing units are completed within a reasonable time when the housing units are needed as quickly as possible, ensuring completed housing units are to the required quality and specifications, ensure the housing units are completed within the budgeted cost and ensure customer satisfaction” (Informants view).

The customer satisfaction variable was found because of the competitive nature of the mass housing industry in Ghana. *“A satisfied customer is likely to promote sales of our housing units”* as commented by one informant. This reality conforms to Adedayo, (2012) proposition of ensuring customer customization. Time of completion of the housing units however was realized not to be a major concern for these managers until there was interest shown by prospective buyers when the buyer committed themselves to buying by making some pre-determined initial deposit of finance.

This section has discussed the analyzed interview data gathered. The proceeding section will analyses and discuss the quantitative data solicited in order to make a robust comparison leading to validation of the results.

4.2 QUANTITATIVE DATA ANALYSIS

Having discussed the first phase data, this section is dedicated to the analysis of the second phase data. Multiple regressions – backward elimination method was used to analyze the independent variables. However descriptive statistics was used in the analysis of both the demographic data and the dependent variables (performance of project PMs in Ghana)

4.2.1 ANALYSIS OF DEMOGRAPHIC DATA

The demographic data analysis has the singular aim to understand the profiles of the respondents and their respective companies. The background knowledge of the respondents and their companies would help in assessing the confidence that can be placed

in the data collected. Table 4.1 shows the total number of questionnaires that were retrieved. All of the questions in the questionnaires were answered as shown in the missing data row in table 4.1.

Table 4.1: Statistics

		GREDA membership category of respondents	Years of respondents involvement in MHBP	Total number of employees in respondents company	Number of houses sold in a year	number of housing units built in a year
N	Valid	65	65	65	65	65
	Missing	0	0	0	0	0

Table 4.2 shows the GREDA membership category of the respondents companies. Majority of the respondents companies belong to the categories of A1 and A2 representing 50.8% and 44.6% respectively. In the GREDA classification scale members of these categories have the highest turnovers hence it can be inferred that the respondents companies are very active in MHBP. In addition table 4.3 indicates the number of employees in the respective firms. It is realized majority of the developers have over 31 employees representing 87.7%. Besides table 4.4 shows that on the average just over 20 housing units are sold each year by the developers. Considering Ghana as a developing country and for majority of the developers to be able to sell on the average 2 housing units within a month can therefore be concluded that the respondents companies are well into MHBP.

Table 4.2: GREDA membership category of respondents companies

	Frequency	Percent	Valid Percent	Cumulative Percent
category A1	33	50.8	50.8	50.8
category A2	29	44.6	44.6	95.4
category A3	3	4.6	4.6	100.0

Table 4.3: Total number of Employees in Respondents Companies

	Frequency	Percent	Valid Percent	Cumulative Percent
21-30 employees	8	12.3	12.3	12.3
over 31 employees	57	87.7	87.7	100.0
Total	65	100.0	100.0	

Table 4.4: Number of houses sold in a year

	Frequency	Percent	Valid Percent	Cumulative Percent
11-15 houses	8	12.3	12.3	12.3
16-20 houses	15	23.1	23.1	35.4
21-25 houses	19	29.2	29.2	64.6
over 26 houses	23	35.4	35.4	100.0
Total	65	100.0	100.0	

Table 4.5 reveals that the managers contacted had been involved in MHBPs for a considerable length of time. 20% of the respondents have been involved in MHBPs for about 11 to 15 years and 80% of them from about 16 years to over 21 years. This supposes the respondents have considerable experience in MHBPs.

Table 4.5: Years of Respondent's involvement in MHBPs

	Frequency	Percent	Valid Percent	Cumulative Percent
11-15 years	13	20.0	20.0	20.0
16-20 years	22	33.8	33.8	53.8
over 21years	30	46.2	46.2	100.0
Total	65	100.0	100.0	

Table 4.6 indicates the average number of houses built in a year. It is interpreted that since on the average 20 housing units are built in a year with a corresponding over 20 housing units sold on the average in a year (see table 4.4); there is sufficient demand for mass housing in Ghana laying credence to rising deficits of housing in Ghana as GREDA companies purposely built for the middle to the upper classes and not the lower classes who need houses but cannot afford (Bank of Ghana, 2007; UN – habitat, 2011).

Table 4.6: Number of housing units built in a year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11 - 15 units	18	27.7	27.7	27.7
	16 - 20 units	14	21.5	21.5	49.2
	over 20 units	33	50.8	50.8	100.0
	Total	65	100.0	100.0	

4.2.2 PERFORMANCE LEVELS OF PMs IN MHBPs IN GHANA

The current state of PMs performance in MHBPs in Ghana was sought to understand the latest opinions of real estate developers on the performance of PMs they had hired. The PMs performance was found by Ahadzie (2007) to be fairly satisfactory as in that study majority of the real estate developers considered the performance of the PMs to be average with a percentage range of 50 – 69%. Subsequently Sarkodie - Poku (2013) found their performance to have increased to a percentage range of 70 – 90%. The current study revealed an average performance of the PMs with range of 50 – 69% and a frequency of

33 (see table 4.7). This finding goes to support the need for this current study as the PMs performance in MHBPs in Ghana currently is not making progress but in fact declining.

Table 4.7: Project managers' performance in MHBPs in Ghana

Levels of performance	Percentage	Frequency	Percent	Valid Percent	Cumulative Percent
Low(1)	10-29%	0	0	0	0
very low(2)	30-49%	1	1.5	1.5	1.5
Average(3)	50-69%	33	50.8	50.8	52.3
High(4)	70-90%	25	38.5	38.5	90.8
Very high(5)	Over 90%	6	9.2	9.2	100.0
Total		65	100.0	100.0	

4.2.3 ANALYSIS OF INDEPENDENT VARIABLES

The independent variables were analyzed with multiple regression statistical technique with the selected option of backward elimination method in SPSS. The backward elimination method was preferred to the forward elimination method with the supporting reasons already explained in the research methodology section 3.9.

In regression a good strategy to adopt is to measure predictor variables for which there are sound theoretical reasons for anticipating them to predict the outcome variable first before the other variables with less theoretical grounding (Field 2009). Considering the theory of job performance which noted that tasks performance behaviours explain about 50% of the performance of an individual whiles 30% is explained by contextual performance behaviours, also previous studies by Ahadzie (2007) to a large extent supporting the percentage allocations of the performance behaviours of the theory. In compliance with Field (2009) and previous research therefore in entering the data, task performance behaviours variables were entered first before contextual performance behaviours. Specifically the order were; *job knowledge* variables followed by *job experience*, *task*

proficiency, cognitive ability and then the contextual performance behaviours of *job dedication* and *finally interpersonal skills*. The order of entering is considered very important as according to Field (2009) the predictors included and the order in which they are entered can have a significant impact on the final model. The *job knowledge* performance behaviours were entered first because from the previous studies these variables were the strongest predictors in relation to the others (See Ahadzie, 2007; Ahadzie et al, 2013). In SPSS there is a default criterion of 0.05 probability of entry and 0.1 probability of removal for the backward elimination method. This criterion was adopted when entering the data. Entered variables that did not meet these mathematical criteria were excluded and the remaining variables entered and reassessed until a model was obtained which had the minimum number of variables that had met the mathematical criteria of $p < 0.05$ for entry.

4.2.4 INTERPRETING MULTIPLE REGRESSION RESULTS

Having selected all the relevant options (for instance; *estimates, confidence intervals, Durbin – Watson, casewise diagnostics* etc.) and returning to the main dialogue box of the SPSS, the author clicked the **ok** button to run the analysis. After adding and eliminating variables based on the mathematical criteria of $P < 0.05$ for entry, the SPSS spewed out the following outputs the authors attention now is to make meaning out of the information given (See Field, 2009 for how to use SPSS).

4.2.4.1 DESCRIPTIVES STATISTICS

The information produced under this section was accessed through the multiple regression options; *Linear Regression - statistics dialogue and descriptive boxes*. The *descriptive option* produced the information in table 4.8 and table 4.9. (Note: the figures in the brackets represent the codes of the identified variables) Table 4.8 gives the mean and standard deviations of each variable that passed the criterion of $p < 0.05$ for entry. The table

further shows that, the average performance of PMs in Ghana is 3.55 which is above average and confirms the results of the dependent variable analyzed in section 4.2.2. The second table 4.9 shows three main things. First, it shows the value of Pearson's correlation coefficient between every pair of variables. (For example; it shows that *knowledge of conceptualizing project execution plan* predicts the performance of a PM best with a correlation of 0.43 which is also significant at $p<0.05$). Secondly the one – tailed significance of each correlation is displayed (i.e. *knowledge in computer application is significant at $p<0.05$*). Finally the table shows the number of cases contributing to each correlation which is 65.

Table 4 .8: Descriptive Statistics

	Mean	Std. Deviation	N
project managers performance in Ghana(PMP)	3.55	.685	65
knowledge in computer applications(TJ ₄)	3.94	.846	65
knowledge in conceptualizing project execution plan (TJ ₉)	1.60	.657	65
knowledge of statutory obligations(TJ ₁₆)	1.94	.726	65
experience in team leadership (TE ₄)	2.72	.910	65
ability to resolve disputes among project team members(CI ₆)	1.92	.797	65
commitment in ensuring the proposed project is functionally feasible(CJ ₆)	2.17	1.098	65
commitment in data collection during preliminary site investigations(CJ ₇)	2.00	.707	65

Table 4.9: Correlations

		PMP	TJ ₄	TJ ₉	TJ ₁₆	TE ₄	CI ₆	CJ ₆	CJ ₇
Pearson Correlation	PMP	1.000	.356	.430	-.182	-.151	-.150	-.230	.322
	TJ ₄	.356	1.000	.096	.096	-.083	.062	-.073	.052
	TJ ₉	.430	.096	1.000	.079	.099	-.030	.074	.269
	TJ ₁₆	-.182	.096	.079	1.000	-.097	-.197	.111	-.122
	TE ₄	-.151	-.083	.099	-.097	1.000	-.181	.188	.073
	CI ₆	-.150	.062	-.030	-.197	-.181	1.000	.015	.194
	CJ ₆	-.230	-.073	.074	.111	.188	.015	1.000	.101
	CJ ₇	.322	.052	.269	-.122	.073	.194	.101	1.000
Sig. (1-tailed)	PMP	.	.002	.000	.074	.115	.117	.032	.004
	TJ ₄	.002	.	.224	.225	.254	.311	.282	.340
	TJ ₉	.000	.224	.	.267	.216	.407	.280	.015
	TJ ₁₆	.074	.225	.267	.	.221	.058	.189	.167
	TE ₄	.115	.254	.216	.221	.	.075	.066	.282
	CI ₆	.117	.311	.407	.058	.075	.	.452	.061
	CJ ₆	.032	.282	.280	.189	.066	.452	.	.213
	CJ ₇	.004	.340	.015	.167	.282	.061	.213	.
N	PMP	65	65	65	65	65	65	65	65
	TJ ₄	65	65	65	65	65	65	65	65
	TJ ₉	65	65	65	65	65	65	65	65
	TJ ₁₆	65	65	65	65	65	65	65	65
	TE ₄	65	65	65	65	65	65	65	65
	CI ₆	65	65	65	65	65	65	65	65
	CJ ₆	65	65	65	65	65	65	65	65
	CJ ₇	65	65	65	65	65	65	65	65

4.2.4.2 MODEL SUMMARY

This section accesses the overall model obtained to ascertain its predictive success to a project manager's performance at the conceptual phase. Table 4.10 is the *model summary* and it was produced from using the *Model fit option* in multiple regression. It should be noted that there are nine models in table 4.10 but only the ninth model was selected because this was the only model with the minimum number of variables that met the set criteria. The other models had higher numbers of variables which some of their variables did not meet the set criteria therefore were not selected (see Field, 2009).

The column labeled R shows the value of the multiple correlation coefficients between the seven predictors and the outcome (performance of project managers). The next column gives the value of R² which is a measure of how accurate the variability in the performance of a PM is accounted for by the seven extracted predictors. In other words 0.532 or 53.2% variation in the performance of PMs is accounted for by the predictors identified. It can therefore be interpreted that 0.468 or 46.8% of the variance is accounted by other variables and not the extracted variables in model nine. (Kleinbaum et al, 2007) The adjusted R² gives a rough idea of how well the model can generalize to the population and ideally its value is required to be close to the value of R² (Miles, 2001; Grafarend, 2006; Brace et al, 2003). Stein's formula will be used at the validation section 4.4 to ascertain its likely value in a different sample. The change statistics column shows whether the change in R² is significant. Also it shows the difference made by adding new predictors to the model. Finally the Durbin – Watson statistics shown at the extreme end of the table informs whether the assumptions of the independent errors are well- founded. According to Field (2009) values less than 1 and greater than 3 should be a cause for concern. Fortunately the value is 2.316 which fall between these two extremes hence no cause for alarm

Table 4 .10: Model Summary^j for backward elimination method

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	.755 ^a	.570	.438	.514	.570	4.329	15	49	.000	
2	.755 ^b	.570	.449	.509	.000	.000	1	49	.999	
3	.755 ^c	.570	.460	.504	.000	.008	1	50	.927	
4	.754 ^d	.569	.469	.499	-.001	.153	1	51	.697	
5	.752 ^e	.566	.476	.496	-.003	.320	1	52	.574	
6	.750 ^f	.562	.481	.494	-.004	.504	1	53	.481	
7	.742 ^g	.550	.476	.496	-.012	1.470	1	54	.231	
8	.734 ^h	.539	.473	.498	-.011	1.338	1	55	.252	
9	.730 ⁱ	.532	.475	.497	-.007	.794	1	56	.377	2.316

a. Predictors: (Constant), the ability to communicate effectively with project stakeholders, knowledge in conceptualizing project execution plan , having the ability to communicate buyers needs to superiors, commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, appreciating the strengths and weaknesses of project team members, providing information timeously to project team members, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective, ensuring a cordial working relationship among the project team members

b. Predictors: (Constant), the ability to communicate effectively with project stakeholders, knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, appreciating the strengths and weaknesses of project team members, providing information timeously to project team members, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective, ensuring a cordial working relationship among the project team members

c. Predictors: (Constant), the ability to communicate effectively with project stakeholders, knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data

collection during preliminary site investigations, providing information timeously to project team members, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective, ensuring a cordial working relationship among the project team members

d. Predictors: (Constant), the ability to communicate effectively with project stakeholders, knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective, ensuring a cordial working relationship among the project team members

e. Predictors: (Constant), the ability to communicate effectively with project stakeholders, knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective

f. Predictors: (Constant), knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, sensitivity to the needs of project team members , directing the project team to a common project objective

g. Predictors: (Constant), knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members, directing the project team to a common project objective

h. Predictors: (Constant), knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members, understanding and appreciating different and opposing perspectives to issues by project team members

i. Predictors: (Constant), knowledge in conceptualizing project execution plan , commitment in ensuring the proposed project is functionally feasible, knowledge in computer applications, knowledge of statutory obligations, experience in team leadership , commitment in data collection during preliminary site investigations, ability to resolve disputes among project team members

j. Dependent Variable: project managers performance in Ghana

4.2.4.3 ANALYSIS OF VARIANCE (ANOVA)

The ANOVA table 4.11 below is very important in regression analysis. This is because it tests the model overall to ascertain whether the model is significant at better predicting the outcome than using the mean as an accurate guess. The most vital part of the table is the F – ratio and the associated significance value of the F- ratio. From table 4.11, F is 9.269 and significant at $p < 0.05$ (because the value in the column labeled *Sig.* is less than 0.05). The F-ratio represents the ratio of the improvement in predicting a result from fitting the model, relative to the inaccuracy that still exists in the model (Field, 2009). The results can be interpreted as; there is less than 5% chance that an F – ratio of 9.269 would happen if the null hypothesis were true (Miles, 2001). Therefore we can with much confidence assert that the regression model gives a significant prediction of the performance of the PM at the conceptual

Table 4 .11: ANOVA^b

	Model	Sum of Squares	Df	Mean Square	F	Sig.
9	Regression	16.003	7	2.286	9.269	.000 ^a
	Residual	14.059	57	.247		
	Total	30.062	64			

a. Predictors: (Constant), commitment in data collection during preliminary site investigations, knowledge in computer applications, experience in team leadership , knowledge of statutory obligations, commitment in ensuring the proposed project is functionally feasible, knowledge in conceptualizing project execution plan , ability to resolve disputes among project team members

b. Dependent Variable: project managers performance in Ghana

4.2.4.4 PARAMETERS OF THE MODEL

The ANOVA showed the overall goodness of the model however it did not show how the individual predictors contributed to the model. The second column of table 4.12 shows estimates for b – values and these values indicate the individual contribution of each predictor to the model. The b – values shows the relationship between the outcome and each predictor. A positive b – value tells a positive relationship between that particular

predictor and the outcome; while a negative value shows a negative relationship. Another important value which needs interpretation in the table is the Y intercept constant of 3.102 (Miles, 2001). This value means that, even if PMs were not engaged by senior managers the performance of MHBPs would be expected to be around 3.102 which is just above average hence the need for PMs to increase performance. The extracted variables *knowledge in computer application*, *knowledge in conceptualizing project execution plan* and *commitment in data collection during preliminary site investigation* had a positive b-value and therefore shows positive relationship with the performance of PMs. The practical meaning is that the more these variables are done very well by PMs the higher will be their expected performance. The other four variables *knowledge of statutory obligations*, *experience in team leadership*, and *commitment in ensuring the proposed project is functionally feasible and ability to resolve disputes amicably among project stakeholders* had a negative relationship with the performance of PMs (Field, 2008; Brace et al., 2003)

The b – values give more information about the model than what is known above. They indicate the degree of which each predictor affects the outcome if the *effects of all other predictors are held constant*. For instance the b –value of *knowledge in computer application* from table 4.12 is 0.258. This value indicates that when *knowledge in computer application* increases by one unit, the performance of a PM will increase by 0.258 units provided all the other variables are kept constant. Likewise a 0.394units increment in PMs performance for every one unit increment in *knowledge in conceptualizing project execution plan* provided all the other variables are kept constant (Miles, 2001; Abdel – Salam, 2008; Kleinbaum et al., 2007).

From the discussion so far it would be appropriate to state the model equation for predicting the performance of PMs at the conceptual phase as in multiple regressions the

model takes the form of an equation. Considering equation 3.11 in section 3.11 our model equation becomes;

$$Y_p = 3.102 + TJ_4 (0.258) + TJ_9 (0.394) - TJ_{16} (0.255) - TE_4 (0.171) - CI_6 (0.259) - CJ_6 (0.115) + CJ_7 (0.257) \dots\dots\dots (4.1)$$

Where Y_p = *Predicted performance outcome*, TJ_4 = *Knowledge in computer application*, TJ_9 = *knowledge in conceptualizing project execution plan*, TJ_{16} = *knowledge of statutory obligations*, TE_4 = *Experience in team leadership*, CI_6 = *Ability to resolve disputes amicably among the project team members*, CJ_6 = *commitment in ensuring the proposed project is functionally feasible*, CJ_7 =*commitment in data collection during preliminary site investigations*,

The associated *standard errors* (see table below) to the b – values indicate the extent the b – values would vary across different samples and they are used to determine whether or not the b –values differ significantly from zero. If a t – test associated with a b – value is significant (if the value in the column labeled *Sig.* is less than 0.05) then the associated predictor is making a significant contribution to the model. Also the *standardized beta* values are all measured in standard deviation units and so are directly comparable; hence they provide an easier insight into the important predictors to the model. From table 4.12 therefore *knowledge in conceptualizing project execution plan* is the highest contributor to the model followed by *knowledge in computer application*.

Table 4.12: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
9	(Constant)	3.102	.474		6.547	.000	2.153	4.051					
	TJ ₄	.258	.075	.319	3.454	.001	.109	.408	.356	.416	.313	.963	1.038
	TJ ₉	.394	.100	.377	3.944	.000	.194	.593	.430	.463	3.572E-1	.898	1.114
	TJ ₁₆	-.255	.090	-.271	-2.824E0	.007	-.436	-.074	-.182	-.350	-2.558E-1	.894	1.118
	TE ₄	-.171	.072	-.227	-2.370E0	.021	-.316	-.027	-.151	-.300	-2.147E-1	.892	1.121
	CI ₆	-.259	.083	-.301	-3.117E0	.003	-.426	-.093	-.150	-.382	-2.823E-1	.877	1.140
	CJ ₆	-.115	.059	-.184	-1.956E0	.055	-.233	.003	-.230	-.251	-1.772E-1	.926	1.080
	CJ ₇	.257	.094	.265	2.718	.009	.068	.446	.322	.339	2.462E-1	.863	1.158

a. Dependent Variable: project managers performance in Ghana

4.2.4.5 TESTING FOR NO MULTICOLLINEARITY

Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model. If there is perfect collinearity between predictors then their b – values would be interchangeable therefore regression coefficients no longer become unique (Field, 2009; Brace et al. 2003). One vital need for checking the multicollinearity between predictors is to ensure the predictors are not making similar accounts to the variance in the outcome. Bowerman & O’Connell, (1990) and Myers, (1990) suggested that if the largest VIF of a regression is greater than 10 then there is a cause for concern. In addition Bowerman & O’Connell, (1990) further added if the average VIF is substantially greater than 1 then the regression may be biased. Field, (2009) said tolerance below 0.1 indicates a very serious problem whiles Menard, (1995) noted tolerance below 0.2 indicates a potential problem.

Now for the model table 4.12 the VIF values are all far below 10; the average VIF is 1.109 (not substantially greater than 1) and the tolerance statistics are all very much above 0.2; hence we can confidently confirm that there is no collinearity within the data. In addition SPSS produces table 4.13 which is a table of eigenvalues of the scaled, uncentred cross-products matrix, condition indexes and variance proportions. The variance proportions vary from 0 to 1 and the test is; highest values of each predictor should be distributed across different dimensions (or eigenvalues) (See Hutcheson and Sofroniou, 1999). For table 4.13 it is realized that each predictor has its variance loading onto a different dimension except *knowledge in conceptualizing project execution plan and experience in team leadership* (i.e. starting from the lowest row in table 4.13; *knowledge in computer application* has 55% on dimension 7, *knowledge in conceptualizing project execution plan* has 34% on dimension 5, *knowledge in statutory obligation* has 33% on dimension 4, *experience in team leadership* has 48% on dimension 5, *ability to resolve disputes*

amicably among project team members has 24% on dimension 3, commitment in ensuring the proposed project is functionally feasible has 52% on dimension 2 and finally commitment in data collection during preliminary site investigation has 82% on dimension 6). The multicollinearity tests have substantially confirmed the non existence of collinearity among the predictors.

Table 4.13 : Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions							
				(Constant)	TJ ₄	TJ ₉	TJ ₁₆	TE ₄	CI ₆	CJ ₆	CJ ₇
9	1	7.266	1.000	.00	.00	.00	.00	.00	.00	.00	.00
	2	.190	6.178	.00	.00	.01	.03	.01	.20	.52	.03
	3	.163	6.679	.00	.00	.13	.15	.00	.24	.31	.00
	4	.135	7.343	.00	.01	.24	.33	.06	.08	.00	.08
	5	.106	8.277	.00	.01	.34	.02	.48	.01	.11	.00
	6	.077	9.710	.00	.00	.27	.03	.06	.16	.00	.82
	7	.049	12.143	.01	.55	.01	.30	.16	.19	.04	.03
	8	.014	23.126	.98	.43	.00	.14	.23	.12	.01	.03

a. Dependent Variable: project managers performance in Ghana

4.2.4.6 CASEWISE DIAGNOSTICS TESTS

When the *casewise diagnostics* option in the *Linear Regression: Statistics dialog box* in SPSS is changed from a default criteria of 3 to 2(as was the case for this work and recommended by Field (2009)) we would anticipate 95% of the cases to have standardized residuals within ± 2 . He further added if this condition is not met then 99% of the cases should lie within ± 2.5 . The researcher had a sample of 65 therefore we would expect about 3.25 cases (5%) to have standardized residuals outside the former limits (See Field 2009, p. 244 and 228). From the casewise diagnostics table 4.14 the first condition was not met as less than 5% (2 cases) of standardized residuals lie outside the ± 2 first condition. Nonetheless the second condition was absolutely met as more than 99% in fact 100% of

the cases had standardized residuals lying within ± 2.5 . Therefore the collected sample conforms to an accurate model.

Table 4.14: Casewise Diagnostics^a

Case Number	Std. Residual	project managers performance in Ghana	Predicted Value	Residual
8	2.169	5	3.92	1.077
43	2.454	5	3.78	1.219

a. Dependent Variable: project managers performance in Ghana

4.2.4.7 VERIFYING ASSUMPTIONS OF THE MODEL

The final stage of regression requires the checking of the assumptions of the model. According to Field (2009) a graph of ZREID (the *standardized residuals, or errors*) and ZPRED (the *standardized predicted values of the dependent variable based on the model*) should look like a random array of dots evenly dispersed around zero. (This graph can be gotten from the linear regression: Plot option in SPSS). The graph is used to check the assumption of linearity and homoscedasticity of the model. If the graph takes the form of a funnel then there are chances of heteroscedasticity in the data. On the other hand if it takes the form of a curve then the data has broken the assumption of linearity. Figure 4.2 shows the graph for the data and it's important to note how the dots are evenly dispersed throughout the plot. In the view of Field (2009) this is the pattern of dots which represent the assumption of linearity and homoscedasticity.

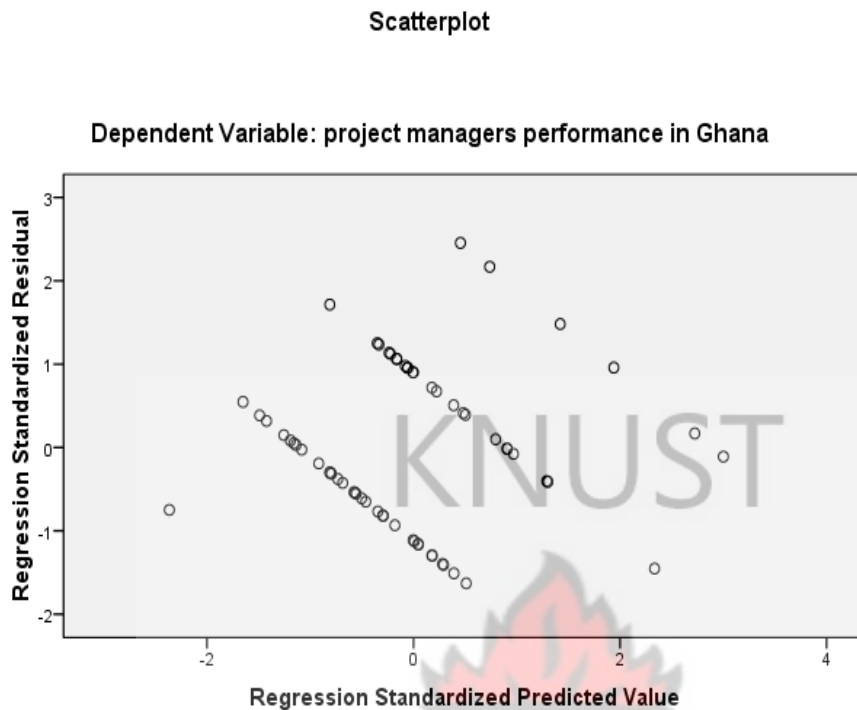


Figure 4.2: standardized residuals against standardized predicted value

In checking the normality of the residuals the histogram and normal probability plot is scrutinized. A normally distributed histogram has a shape similar to a shape of a bell. As noticed from our histogram in figure 4.3 it is realized the histogram has a shape quite close to that of a bell hence suggesting normality of the data. In furtherance, the normal probability plot is also a source for ascertaining normality. The straight line in the normal probability plot (see figure 4.4) shows a perfect normal distribution and the points indicates the observed residuals. It can therefore be reasoned that a perfectly normally distributed data will have all points lying on this line. This is quite the situation for the data seen in figure 4.4. The histogram and the normal probability plot have been observed to be largely normally distributed therefore the data can accurately be assumed to be normally distributed (Miles, 2001).

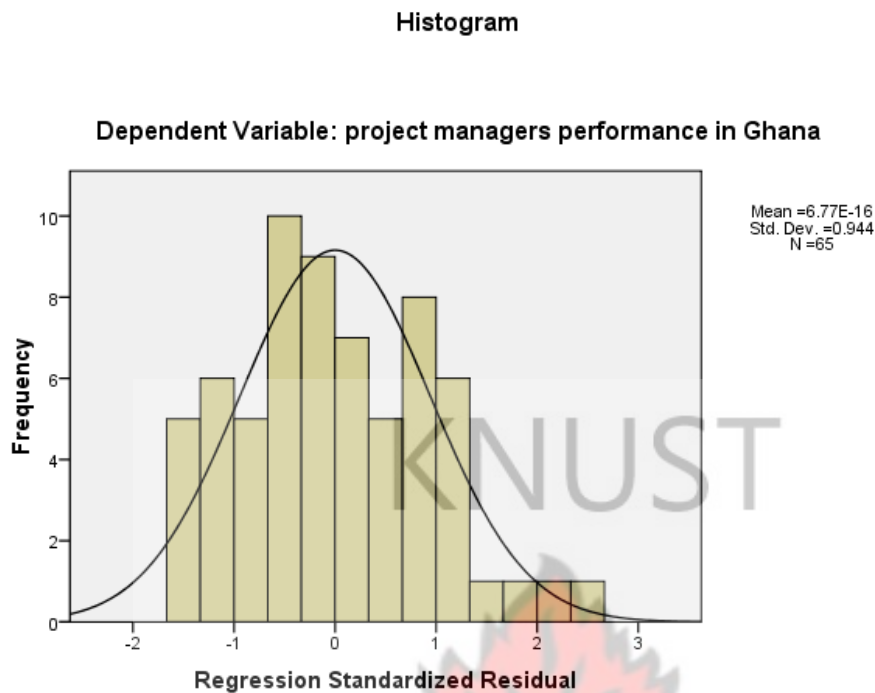


Figure 4 .3: histogram of frequency against standardized residuals

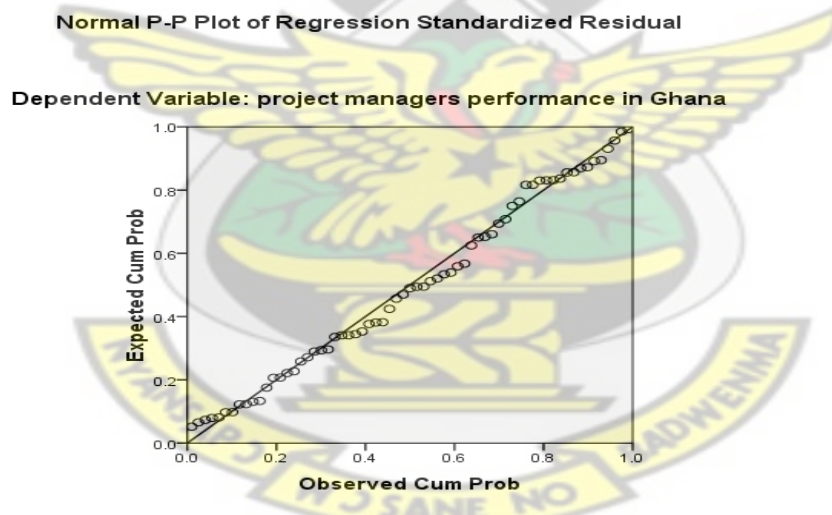


Figure 4.4: normal probability plot

4.3 DISCUSSION OF RESULTS

The preceding section has explained the best model for predicting the performance of the PM at the conceptual phase derived through the backward elimination method. This section discusses the extracted variables from the model in relation to literature. The section commences the discussion by comparing the findings with the theory of adoption.

Thereafter the individually identified predictive variables from the regression model are touched on.

4.3.1 COMPARISON OF QUANTITATIVE FINDINGS WITH THE THEORITICAL FRAMEWORK

There is a strong correlation in research between PMs competencies and project success. (cf. Bon – Gang and Wei, 2012, Ahadzie, 2008, Crawford, 2000). This fact has been supported in earlier studies by Borman and Motowidlo (1993) and later Conway (1996). The later scholars developed the organizational theory of job performance which argued that managerial competencies should be categorized into task and contextual competencies. They further posited that task managerial competencies is most probable of predicting over 50% of the variance of the performance of a manager and that contextual performance predicts approximately 30% of the other variance . They further added that task competencies are made up of *cognitive ability, job knowledge, task proficiency* and *job experience* constructs while contextual competencies comprise of *job dedication* and *interpersonal facilitation* constructs. The position of the theory has subtly been supported by Ahadzie (2008) in which he found task competencies to predict approximately 55% of the variance in the performance of a PM and 24% in contextual competencies. Subsequently the same author found quite non – supporting results when the same theory was applied at a different phase in MHBPs (See Ahadzie et al, 2013). His explanation for the non – supporting findings was attributed to the level of management control that the PM didn't have at the design phase. He further acknowledged that the non – supporting empirical evidence of the study should not be wakeup call to question the theory.

The individual's variance of the predictors in the model is specified in table 4.16. These variances were gotten from table 4.15. The R^2 changes of the *model summary* in table 4.10 could not be used because it does not indicate exactly the variance contribution of each

predictor in the model because of the regression method used (backward elimination method). Hence 'forced entry method' (another method in regression) was adopted to extract the individual variances of the predictors in the model. It must be emphasized that the order of entry of the predictors followed the criteria of strong predictors first in line with Field (2009). In determining the levels of predictive strengths of the extracted variables (as already explained) the coefficient table 4.12 (from either the b – values column or beta column) was used. It must be emphasized that both methods of regression (forced entry and backward elimination method produced the same final R^2 of 53.2% confirming the accuracy of the processes used)

Table 4.15: order of variable entry in forced entry method

Order of entry	Variable	R^2	R^2 change
1st	Knowledge in conceptualizing project execution plan	0.185	0.185
2nd	Knowledge in computer application	0.286	0.101
3rd	Commitment in data collection during preliminary investigations	0.328	0.042
4th	Commitment in ensuring proposed project is functionally feasible	0.394	0.066
5th	Experience in team leadership	0.412	0.018
6th	Knowledge in statutory obligations	0.453	0.041
7th	Ability to resolve disputes among project team members	0.532	0.079

Table 4.16: Predictor variances in the model

Performance domain	Variables included	Variance of variables (%)	Total variance accounted (%)
Contextual performance behaviours			0.150
Job dedication	Commitment in ensuring the proposed project is functionally feasible	0.066	
	Commitment in data collection during preliminary site investigations	0.042	
Interpersonal facilitation	Ability to resolve dispute amicably among project team members	0.079	
Task performance behaviours			0.382
Cognitive ability		NILL	
Job knowledge	Knowledge in computer application	0.101	
	Knowledge in conceptualizing project execution plan	0.185	
	Knowledge in statutory obligation	0.041	
Task proficiency		NILL	
Job experience	Experience in team leadership	0.018	

Table 4.16 summarizes the variables accounted in the optimum regression model. Further examination of the table indicates task performance competencies accounted for 0.382 or 38.2% while contextual competencies registered 0.15 or 15%. The results quite disagree with the theory of job performance which predicts over 50% for task competencies and at least 30% for contextual competencies. Nonetheless the findings can be said to be dependable as according to Salkind, (2008) it is almost impossible to achieve excellent correlation in behavioural management studies concerning human beings. The registration of contextual competencies in the model seems to suggest the PM has higher autonomy at the conceptual phase which was found not to be the case at the design phase (See Gellanty

and Irving, 2001; Ahadzie et al, 2013; Sarkodie – Poku, 2013). Also from the table two task performance constructs; *task proficiency* and *cognitive ability* did not record any variance. The probable reason especially for the absence of *cognitive ability* can be attributed to Ahadzie, (2008) explanation when he noted the constructs *cognitive ability* and *job experience* were likely to be submerged by the level of *job knowledge* construct. This explanation the researcher stands to agree with because it was realized the construct *job knowledge* always accounted significantly (therefore submerging the other constructs notably *cognitive ability*) in all the three MHBPs phases studies conducted. The logical explanations for the absence of *task proficiency* at the conceptual phase could be traced to probably the absence of clear cut tasks obligations of the PM at the conceptual phase; as the project is at its very embryonic stages where its shape and form is still being developed (Walker, 1984). The later phases (design and construction) reasonably recorded this construct which is commensurate with the presence of arguably vivid work task obligations of the PM (See Ahadzie et al, 2013; Ahadzie, 2008).

4.3.2 IMPORTANCE OF THE FINDINGS AT THE CONCEPTUAL PHASE OF MHBPS

The variables that were registered in the regression model are then examined in much detail. The following findings in the context of MHBPs at the conceptual phase in Ghana were what senior managers considered most significant to ensure MHBPs success.

4.3.2.1 Knowledge in conceptualizing project execution plan

The property developers in Ghana considered project execution planning at the conceptual phase as the most important knowledge requirement in the model. This variable recorded the highest variance of 18.5% and was significant at $p < 0.05$. Knowledge in project planning by the PM is a unanimous requirement among project management scholars. Birrel (1989) noted that the conceptual phase consisted of numerous activities in addition

to appropriate financial planning arrangements. Tatum et al. (1987) noted the conceptual phase is made up of activities such as determining of site and local constraints to setting up a project execution plan. Khan (1991) argued that the conceptual phase comprises the inception, formulation and approval processes. The inception is the phase where a need has been identified and ideas have been recognized. Formulation means developing a plan or method. The PM is expected among other requirements by his superiors to have adequate planning knowledge in areas such as; procurement of materials, human resource recruitment and allocation, and plant acquisition and allocation. (Ohara, 2005; Heisler, 1994; CMC, 1991). The challenge for the PM however is how to plan for things that are more abstract or translucent as the conceptual phase is where many ideas are still coming together to form the project blueprint.

4.3.2.2 Knowledge in computer application

The use of technology as a leverage for competitive advantage has become more important now to effective delivery of projects. The project manager is required to be astute regarding options that can be deployed for effective technological innovation to optimize the project's performance (Edum -Fotwe et al., 2000). In the view of Pine (1993) generic products are a result of mass production principle adopted in any manufacturing or production industry of which housing form part. As a consequence the houses in mass housing schemes do not meet the needs of the house buyers while the reverse is what is observable when it is houses built by house owners personally (Adedayor, 2012). In solving the problem the use of computers was advocated by Niemeijer and Vries (2007) to customize the house through design. Other researchers are in agreement such as Adedayor (2012); Cuperus (2003), Duarte (2005); Hofman and Halman (2006); Lim and Khalid (2003). These researchers have sought to provide methods of providing customized

housing units for the prospective house buyers, the common factors in the options provided by these researchers are the use of computers, internet and the house buyers.

It is therefore not surprising that knowledge in computing recorded the second major requirement for predicting the performance of project managers' at the conceptual phase. The recommended computer application methods are applied at the design brief stages which is within the conceptual phase (Adedayor, 2012). Therefore extensive knowledge in computing by the PM is very obligatory as developers would like to satisfy their customers so that they can ensure organizational growth and sustainability as a satisfied customer is a strong marketing tool (DiVincenzo, 2006p.23).

4.3.2.3 Ability to resolve dispute amicably among project team members

Effective project integration requires the project manager to act quickly to resolve internal and external conflicts before they start to threaten project budget, scheduling and performance specification (Ogunlana et al, 2002). Studies have shown that managing relationships is critical to project success (Acharya *et al.*, 2006a; 2006b; Le-Hoai *et al.*, 2010; Lewis, 1993). The importance of the PMs understanding of conflicts resolution in projects is argued by Goodwin (1993) who insisted over 70% of the PMs time is spent on communication on which conflict resolution forms a larger proportion. The essential need to ensure conflict free projects especially at the conceptual phase were one of the major concerns of the senior managers. This finding supports Kerzner (1979) who sees project management as being the same as conflict management. Definitely projects cannot thrive in a project environment where project team members are at each other's throats and most especially at the conceptual phase where the project shape and form emanates from. Ahadzie (2008) found similar findings at the construction phase. This finding suggests that in MHBPs where there are likely to be mass number of people working under the PM

(Gillard, 2009), requires a disputes resolution mechanism which the PM should be conversant with as its most likely disputes will occur.

4.3.2.4 Commitment in ensuring the proposed project is functionally feasible

The adaptability of a building describes its physical and morphological characteristics, and the flexibility of a building describes its functional characteristics. The functional characteristics involve alteration in the physical characteristics of the building – dimensions, form, openings, etc. – while the latter does not. These two attributes of the adaptability and flexibility of a building relates directly to the two types of requirements for the spaces in residential units according to Cagdas (1996). This finding is a major challenge to the PM as at the end of the day his performance partly will be evaluated based on how adaptable and flexible the housing units provided are. This finding is in line with current trends in MHBP (See for example; Adedayo, 2012). Although, it is acknowledge the eventual uses of a mass housing unit and the resulting required room-level configurations are increasingly according to Wu, (1999) becoming unpredictable; nonetheless he noted it will be irresponsible for designers to ignore the capacity for future adaptations when designing mass housing layouts. Greater efforts is therefore required to design a building that not only serves its present functions well but is also adaptable and flexible to serve possible future user needs (West & Emmitt, 2004).

The function of housing has shifted from just provision of shelter to people to serving multiple purposes, the spatial capacity of plan organizations to support various user activities has become as important a quality parameter in mass housing designs as other more traditional evaluation criteria such as gross area, materials used and detailing (Ozsoy, Atlas, Ok, & Pulat Gokmen, 1996). To achieve this, the configuration of the unalterable elements of the unit must be composed and dimensioned to allow for adaptation to a wide variety of room/ space arrangements to fulfill different user spatial requirements (Saari,

Kruus, Hamalainen, & Kiiras, 2007). Further Beadle et al. (2008) argued that “adaptable buildings have the ability to change use with market conditions, enabling them to have a longer useful life”.

4.3.2.5 Commitment in data collection during preliminary site investigations

A preliminary site investigation should not only focus on the ground conditions but also of the environment required for any engineering or building structure. It is an information gathering process by which geological, geotechnical and topography, social, environmental, economic and other related information are gathered and analyzed (Moore, 2002; Oyedele et al 2010; Khan, 1991). The possible environmental impact of the MHBPs, the economic viability as well as social issues has to be addressed based on preliminary site investigations. Pre – project site investigations is very relevant in every project endeavour of which MHBPs is not an exemption. Therefore the PM has to ensure all necessary feasibility studies are carried out and the data analyzed to ascertain the project viability and impact in relevant areas. In areas where there are predicted challenges measures could be fore-prepared to ensure uninterrupted project process in order to meet project deadlines. (Riki 2004; Glasson et al 2013; Larry 1999;Murray et al. 1990)

4.3.2.6 Knowledge in statutory obligation

The Aqua group (1987) noted that to make the Simon Report (1944) relevant for modern needs of basic best practices at the conceptual phase the report has to be supplemented with the addition of meeting statutory requirements. Birrel (1989) insisted that among other essential activities at the conceptual phase issues relating to government regulations need to be addressed (Heisler, 1994). It was not out of place that the senior managers require the PM to have sufficient knowledge in statutory obligations. This could largely be attributed to rampant litigations arising from land acquisitions (UN – habitat, 2011).

According to Ghana's Land Administration Project report (2010) the backlog of land cases in the courts pending as at June 2009 was 11,920 cases. Land litigation is a common reality for many in Ghana. New land-acquirers may be doused into litigation, especially in the Accra region, where land is controlled by families (UN – habitat, 2011). Therefore the senior managers would expect the PM to have adequate understanding of matters on acquiring legitimate titles to lands to ensure MHBP's success. Furthermore as noted earlier, the PM is mandated to have unquestionable authority on housing legislatives including; Town Planning Ordinance produced in 1954, the Local Government Act and the National Building Regulations.

4.3.2.7 Experience in team leadership

It is quite common practice to analyze one's previous experience and performance before a job is offered. Given the central and demanding role of the PMs' job, it is quite understandable that the senior employers were very keen to know the performance of the projects previously managed by the prospective candidates before a job is offered. It is necessary for today's project managers not only to organize technologies but also to be capable of organizing individuals and co-coordinating work flow between functional specialists in a typical project team (Gillard, 2009; Ohara 2005; Chan, 1991; Baca, 2007; Chan, 1992). Leadership has many definitions in literature. For instance Katz and Kahn (1978) defined leadership as an incremental influence over and above that which is formally prescribed in the work unit. Kezsbom and Donnelly (1992) described leadership as a social influence process in which the leader seeks the participation of individuals in an effort to obtain organizational objectives. The later definition seems to be much appropriate in MHBP's as senior managers are constantly in search of an experienced leader at the conceptual phase whose leadership role of the project team will lead to organizational growth. Bresnen et al, (1986) and Bresnen et al, (1987) established a

positive correlation between PM's leadership orientation and project effectiveness. However these findings were based on the duration of the project, the size and labour force composition.

4.4 VALIDATION OF THE MODEL

The main objective of validation is to establish the reliability of the research findings. It also provides evidence for their generalizability (Field, 2009; Creswel, 2009). In other words validation is necessary to determine whether the findings do not only represent the characteristics of the samples but also the general population. Field (2009) has emphasized that once regression stepwise – backward elimination option has been used it is obligatory to check for cross – validity. With multiple regressions according to Field (2009) one way to ensure that the derived model also represent the entire population is to use mathematical approaches such as Wherry's equation or Stein's formula (See Stevens, 2002). The latter option is preferred because the former informs nothing about how accurate the model would predict an entirely new set of data. To determine the potential cross – validity of a regression model, there is the need to examine the adjusted R^2 . The adjusted R^2 informs roughly about how much variance in the outcome (performance of PMs) would be accounted for if the model had been derived from the general population. Using the Stein's equation to calculate the adjusted R^2 value:

$$\text{Stein's formula: } adjusted R^2 = 1 - \left[\left(\frac{n-1}{n-k-1} \right) \left(\frac{n-2}{n-k-2} \right) \left(\frac{n+1}{n} \right) \right] (1 - R^2) \dots\dots\dots$$

(4.2)

Where; R^2 = unadjusted R^2 value, n = number of participants, k = number of predictor's in the model.

Therefore using equation 4.2; $adjusted R^2 = 1 - \left[\left(\frac{65-1}{65-7-1} \right) \left(\frac{65-2}{65-7-2} \right) \left(\frac{65+1}{7} \right) \right] (1 - 0.532) \dots (4.2)$

Stein's adjusted $R^2 = 0.40$ or 40%

Thus considering the small number of participants an adjusted R^2 value of 40% is fairly appreciable. The model is therefore fairly robust indicating the potential of cross – validity.

Hereafter the validity of the variables in the model is accessed by comparing the model findings with the qualitative findings discussed in section 4.1. It should be remembered that the qualitative enquiry consisted of 10 respondents who were eliminated from the quantitative survey. This then provides firm grounds for the findings of both approaches to be compared to establish validity of the model (Creswel, 2009). Mixed research paradigm has the advantage of comparing the findings of both approaches in order to establish validity. Results validation can also be ascertained through comparison of research findings with existing literature or theory. In furtherance the analysis of the questionnaire can also serve as a source of validation. (Fellows et al. 2003; Creswel 2009; Brinberg and McGrath, 1985). Therefore the findings in the model were compared with the qualitative findings and existing literature (see table 4.17 below). It is realized majority of the findings in the model are consistent with the preliminary qualitative enquiry. In addition the model as explained above has passed all the necessary statistical tests (i.e. Normal distribution, linearity, homoscedasticity, casewise diagnostics, multicollinearity and Durbin – Watson tests). Therefore the legitimate conclusion is that the model is robust enough for application in the Ghanaian mass housing building industry.

Table 4.17: convergence of model findings with qualitative findings and literature

Findings in the model	Convergence with qualitative findings	Convergence with literature
Knowledge in conceptualizing project execution plan	Convergent (see section 4.1.5)	Khan (1991); Tatum et al, (1987)
Knowledge in computer application	Convergent (see section 4.1.5)	Niemeijer and Vries (2007); Adedayor, (2012); Duarte (2005)
Ability to resolve dispute amicably among project team members	Non convergent	Ogunlana et al,(2002); Le-Hoai et al., (2010); Kerzner (1979)
Commitment in ensuring the proposed project is functionally feasible	Convergent (see section 4.1.7 & 4.1.8)	West & Emmitt, (2004); Cagdas, (1996); Ozsoy, Atlas, Ok, & Pulat Gokmen, (1996)
Commitment in data collection during preliminary site investigations	Convergent (see section 4.1.5)	Moore, (2002); Riki (2004); Larry (1999)
Knowledge in statutory obligation	Convergent(see section 4.1.4	Birrel (1989); Aqua group (1987); Heisler (1994)
Experience in team leadership	Non convergent	Kezsbom and Donnelly (1992); Bresnen et al, (1987); Chan, (1992)

4.5 SUMMARY

The chapter was dedicated primarily for the development of the predictive model for PMs performance. The predictors of the model included both contextual and task performance variables of: *knowledge in conceptualizing project execution plan, knowledge in computer application, ability to resolve dispute amicably among project team members, commitment in ensuring the proposed project is functionally feasible, commitment in data collection during preliminary site investigations, knowledge in statutory obligation and experience in team leadership*. The model was determined to have met all relevant tests of regression such as *linearity, homoscedasticity and Durbin – Watson*. Subsequently the model was compared against the theory of application to determine convergence and discussed in relation to relevant literature. The chapter closed after ascertaining the validity of the model. The next chapter ends the thesis after presenting its recommendations and conclusions.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter brings the thesis to an end after briefly recapping the issues covered. The chapter begins by presenting the research questions. Thereafter the research objectives are revisited to access the level they have been addressed. Conclusions and recommendations to the research are then delivered.

5.1 RESEARCH QUESTIONS

In order to pursue this research the following research questions were asked;

- What are the suitable performance indicators for evaluating the performance of PMs at the conceptual phase of MHBPs in Ghana?
- How should the performance indicators identified be incorporated at the conceptual phase of the project life cycle?
- What are the roles of PMs at the conceptual phase of MHBPs in Ghana?

5.2 REVIEW OF RESEARCH OBJECTIVES

The main objective of this thesis was to develop a model for predicting the performance of PMs at the conceptual phase in MHBPs in Ghana. Hereafter the minor objectives are reviewed to ascertain whether the main objective had been adequately addressed.

5.2.1 Objective 1: To identify essential performance variables of PMs in MHBPs

This objective had sufficiently been addressed by the review of relevant literature and the pursuance of chapter 3 and 4.

5.2.2 Objective 2: To identify the appropriate variables for predicting the performance of PMs on MHBPs

The operational measures, the qualitative study and the theory of adoption had adequately addressed this objective at the conceptual phase. (See chapters 2, 3 and 4).

5.2.3 Objective 3: To identify predictive performance models at the conceptual phase of MHBPs

In contemporary time's competency – based models are gaining prominence over knowledge based models. (Brophy and Kiely, 2002) This study has developed a competency based model for the PM at the conceptual phase. The review of literature had addressed relevant managerial practices in the Ghanaian MHBPs industry. (See section 2.3.7 and 4.2.4.4).

5.2.4 Objective 4: To use statistical tools to develop a model based on the variables identified above

Multiple regression statistical tools were used in the development of the optimum model at the conceptual phase. Specifically the backward elimination method was used in the substantive model development after which statistical tests proved its goodness of fit (see chapter 4).

5.3 CONCLUSIONS

The main conclusions include the following;

- The study revealed that the best predictors of PMs performance at the conceptual phase are: *knowledge in conceptualizing project execution plan, knowledge in computer application, ability to resolve dispute amicably among project team members, commitment in ensuring the proposed project is functionally feasible, commitment in data collection during preliminary site investigations, knowledge in statutory obligation and experience in team leadership.*
- To attain holistic success of MHBPs preceding managerial competences of the project life cycle is very vital and most significantly the conceptual phase.
- Based on the validity of the model which can predict approximately 53.2% of the variance of the performance of PMs at the conceptual phase and the convergence of the findings of the two research approaches the model is robust enough for application in the Ghanaian mass housing building industry

5.4 CONTRIBUTION TO KNOWLEDGE

The establishment of guidance about learning and training has been seen as extremely applicable to the professional development of human resource management personnel (Gibb, 2003). Further managerial competencies are becoming progressively authoritative consequence in a variety of contexts including education, organizations and practitioner groups (Lyon, 2004).

Until now there was no empirical evidence of the competency requirement of PMs at the conceptual phase of MHBPs in Ghana. Therefore the findings from this study will further provide guide lines to senior managers of MHBPs in Ghana when recruiting PMs. Secondly PMs in the context of the Ghanaian mass housing industry are now aware of the competencies required of them by their superiors at the conceptual phase. Owing to the greater significance of the conceptual phase the findings when adopted will go a long way to ensure a holistic MHBPs success as proceeding phases of a project lifecycle own much of their success to the preceding phases (Kellog et al., 1981; Hillet al., 1990; Jump 1992; Shafer 1994).

5.5 LIMITATIONS OF THE FINDINGS

Any other research is without limitation and this thesis is not an exemption. The following are the limitations of the study.

- As is the case with most quantitative study the expected maximum required responds rate was not met.
- The quantitative data could be biased due to the non – usage of a recording device in the data collection period.
- The researcher was seriously challenged in the gathering of the qualitative and quantitative data as most of the respondents were difficult to locate.

However the findings were determined to be credible due to the determination of the goodness of fit of the model by using statistical tools and their subsequent validation.

5.6 RECOMMENDATIONS FOR INDUSTRY

Based on the findings in section 5.3, the researcher recommends the following for industry;

- The findings could serve as one of the empirical basis for MHBPs CEO's when recruiting PMs into their establishments (Madter et al. 2012; Lampel, 2001; Toney, 1997)
- GREDA the umbrella body of real estate developers in Ghana can partner with training institutions to run refresher courses for their PMs who are already in the industry on the identified findings.
- The findings could form part of a project life cycle competency - based performance measures which can be developed as a curriculum by tertiary institutions for the training of PMs in Ghana.
- PMs who were not aware of these competencies at the conceptual phase can now adopt these findings to enhance their professional development and those who are already practicing these competencies can do so with much confidence.

5.7 RECOMMENDATIONS FOR FURTHER STUDY

The study was focused at the conceptual phase of the project life cycle. The design and construction phases have been studied already. This leaves other phases (i.e planning, tender, and operational) which need to be researched into in order to develop a complete MHBPs life cycle competencies for the PM.

5.8 SUMMARY

The chapter has briefly recapped the research objectives and the level they have been accomplished. The conclusions and limitations to the study have been presented. Recommendations for future research have been offered.

In a final word this research has developed a model for predicting PMs performance at the conceptual phase in the context of MHBPs in Ghana. The findings could benefit real estate developers CEO's in Ghana when recruiting, academics in the development of curricula and PMs as a bench marks for their professional growth.



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APPENDICES

APPENDIX 1: INTERVIEW GUIDE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY – KUMASI
COLLEGE OF ARCHITECTURE AND PLANNING
DEPARTMENT OF BUILDING TECHNOLOGY

INTERVIEW QUESTIONS TO SENIOR MANAGERS OF REAL ESTATE DEVELOPERS IN GHANA

**PROJECT TOPIC: A MODEL FOR PREDICTING THE PERFORMANCE OF
PROJECT MANAGERS AT THE CONCEPTUAL PHASE OF MASS HOUSING
BUILDING PROJECTS IN GHANA**

INTRODUCTION

These interview questions forms a preliminary part of a Master of Philosophy program being pursued by Danladi Roger at the Department of Building Technology, KNUST. The significance of the study is to identify the behaviours of Project Managers that promote success of Mass Housing Building Projects (MHBPs) in Ghana notably at the conceptual phase (i.e. before detailed working drawings are prepared). These interview questions are intended to solicit your perceptions of the behaviours of PMs that engender success of MHBPs with much attention at the beginning of projects before detailed working drawings commences.

KEY OBJECTIVE OF THE STUDY

- To identify behaviours of Project Managers that promotes success of MHBPs in Ghana with particular emphasis at the conceptual phase.

RELEVANCE OF THE STUDY

- The findings would provide empirical behaviours of PMs that ensure projects success. The found behavioural success parameters may then form part of the basics for senior managers when recruiting PMs into their establishments.
- The findings would inform aspiring PMs as well as the experienced ones on the required core competencies required of them by their superiors.

I recognize that, these interview questions would take part of your busy schedule nonetheless I would be very glad if you could spare me a little of your precious schedule in answering the questions in the over leaves. You are well assured of the strictest confidentiality to any answers given.

Contact No. 0243408256

Thank you.

1. May you please state your professional background?

.....

2. How long have you personally been involved in the implementation of Mass Housing Building Projects (MHBPs)?

.....

3. How many employees do you have in your company?

.....

4. How many houses do your company built on an average in a year?

.....

5. Do you appoint an individual who is responsible for the success of the housing projects from conception to finishing?

.....

6. If yes, what name designation do you give him?

.....

7. Do you appoint project managers for your housing projects and if yes at what level?

.....

8. Do you think it is important to appoint project managers at the conceptual phase of MHBPs?

.....

9. If you appoint project managers at the conceptual phase, what would be his job description?

.....

10. In your opinion what are the desired technical requirements of PMs at the earliest phase (before detailed working drawings commences) of MHBPs to ensure project success?

.....

11. In your opinion what should be the social behaviours of PMs in ensuring the success of MHBPs at the conceptual phase?

.....

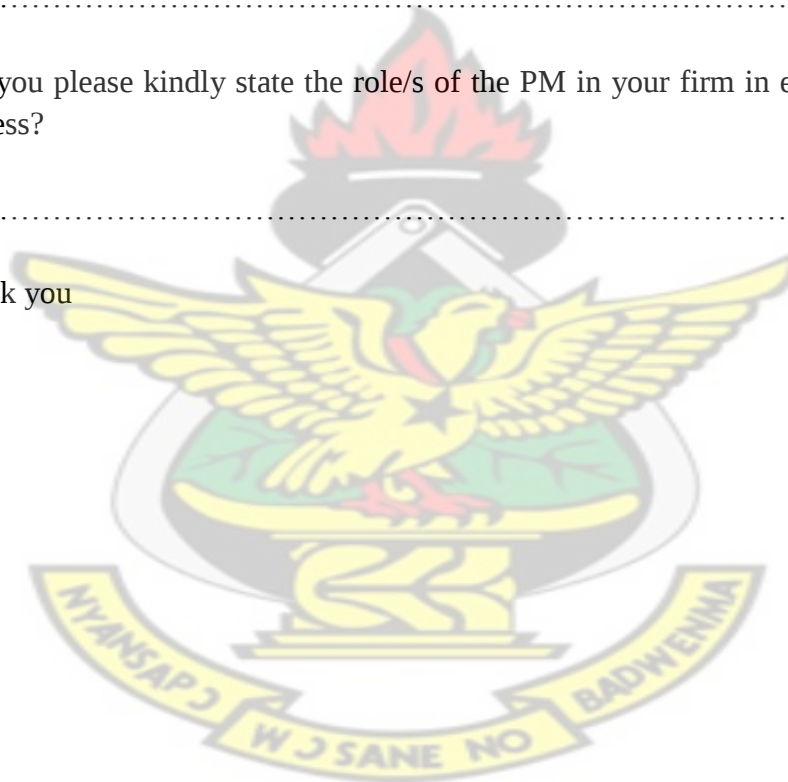
12. In your opinion what should be the role of the PM in design brief preparations in MHBPs?

.....

13. Can you please kindly state the role/s of the PM in your firm in ensuring MHBPs success?

.....

Thank you



APPENDIX 2: QUESTIONNAIRE

Preamble

My name is Danladi Roger from the Department of Building Technology KNUST. I am conducting a Postgraduate research with the title *“A Model for Predicting the Performance of Project Manager’s at the Conceptual Phase of Mass Housing Building Projects (MHBP’s) in Ghana.”* Please find a questionnaire to be completed by Managing Directors or Senior Managers in mass housing building projects (MHBP’s) in Ghana. The definition of a project manager for the purpose of this study is an individual who is responsible for the successful management of projects at the conceptual phase of MHBP’s.

KEY OBJECTIVE OF THE STUDY

To identify behaviours of Project Managers that promotes success of MHBP’s in Ghana with particular emphasis at the conceptual phase.

RELEVANCE OF THE STUDY

- The findings would provide empirical behaviours of PMs that ensure projects success. The found behavioural success parameters may then form part of the criteria for senior managers when recruiting PMs into their establishments.
- The findings would inform aspiring PMs as well as the experienced ones on the required core competencies required of them by their superiors at the conceptual phase.
- Educational institutions that train project managers can use the findings to develop curricula relevant to industry.

I recognize that, these questionnaires would take part of your busy schedule nonetheless I would be very glad if you could spare me a little of your precious schedule in selecting the appropriate box to each item provided below. You are assured of the strictest of confidentiality to answers given. For further enquiries, recommendations and contributions to this research, please contact the researcher below.

Thank you.

Danladi Roger A.
Dpt. Of Building Technology
Private – mailbag
KNUST- Kumasi
Email: rogarly@yahoo.com
Mobile: 0243408256

SECTION A: DEMOGRAPHY

Please select the appropriate options

1. What is your GREDA membership category?

- ☐ Category A1 ☐ Category A2 ☐ Category A3 ☐ Category A4
☐ Category B1 ☐ Category B2

2. How long have you been involved in MHBPs?

- ☐ under 5 years ☐ 6 – 10 years ☐ 11 – 15 years ☐ 16 – 20 years
☐ over 21 years

3. What is the total number of employees in your company?

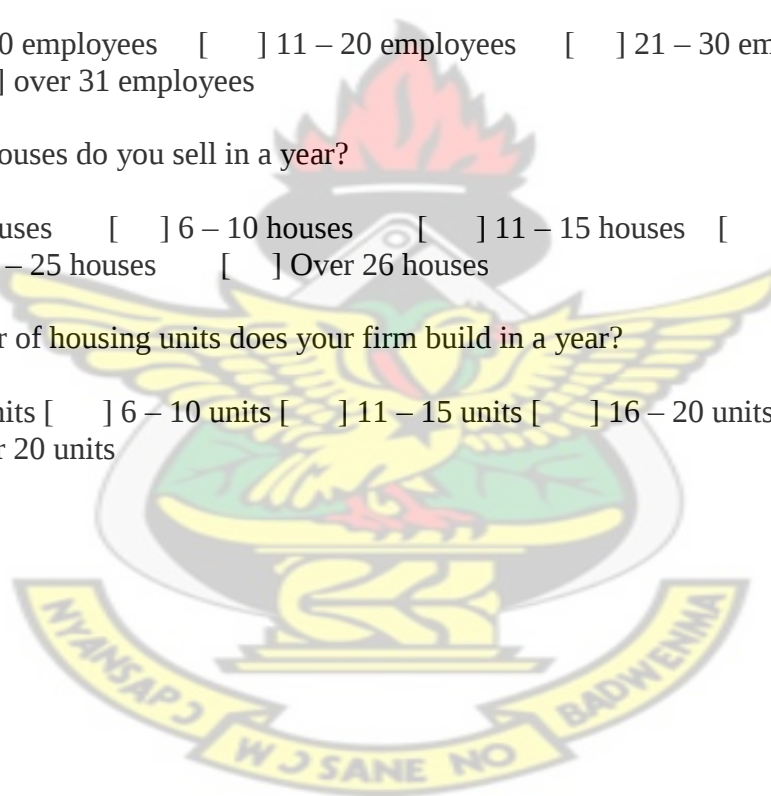
- ☐ Up to 10 employees ☐ 11 – 20 employees ☐ 21 – 30 employees
☐ over 31 employees

4. How many houses do you sell in a year?

- ☐ Under 5 houses ☐ 6 – 10 houses ☐ 11 – 15 houses ☐ 16 – 20 houses
☐ 21 – 25 houses ☐ Over 26 houses

5. What number of housing units does your firm build in a year?

- ☐ Under 5 units ☐ 6 – 10 units ☐ 11 – 15 units ☐ 16 – 20 units
☐ Over 20 units



SECTION B						
CONTEXTUAL PERFORMANCE BEHAVIOURS						
What would you say about the importance of the following behaviours of Project Managers at the conceptual phase of mass housing building projects (MHBPs) in Ghana?						
Please tick the appropriate boxes						
1= not very important, 2= not important, 3 = average, 4= important, 5= very important		Levels of importance				
Job Dedication		1	2	3	4	5
1. Commitment in ensuring speedy completion of final design brief						
2. Ensuring design brief conforms with buyers needs						
3. Strong goal orientation to achieve value for MHBPs						
4. Ensuring the project is financially feasible						
5. Commitment in ensuring the proposed project is technically feasible						
6. Commitment in ensuring the proposed project is functionally feasible						
7. Commitment in data collection during preliminary site investigations such as buried water pipes, electrical cables etc.						
8. Pushing project professionals to deliver on time						
9. Commitment in securing statutory requirements						
Interpersonal Skills						
1. Having the ability to communicate effectively the buyers needs to his/her superiors						
2. Understanding and appreciating different and opposing perspectives on issues by other members of the project team						
3. Providing information timeously to project team members						
4. Appreciating the strengths and weaknesses of project team members						
5. Directing the project team members to a common project objective						
6. Ability to resolve disputes amicably among the project team members						
7. Ensuring a cordial working relationship among the project team members						
8. Being sensitive to the needs of project team members						
9. Ability to communicate effectively with project stakeholders						

SECTION C						
TASK PERFORMANCE BEHAVIOURS						
What would you say about the importance of the following behaviours of Project Managers at the conceptual phase of mass housing building projects (MHBPs) in Ghana?						
Please tick the appropriate boxes						
1= not very important, 2 = not important, 3= average, 4= important, 5= very important						
Cognitive Ability		Levels of importance				
		1	2	3	4	5
1. Ability to interact and understand the needs of buyers						
2. Having the ability to make meaningful suggestions based on site investigation report						
3. Having the ability to introduce novelty during the project brief stages						
4. Having the ability to anticipate potential problems						
5. Having the ability to envision the whole project from the perspective of his superiors						
6. Having the ability to ensure team members understand their roles						
7. Having a mental stamina throughout the conceptual phase processes						
8. Ability to recall vividly the buyers needs and constrains						
Job Knowledge						
1. Knowledge in site investigation and reporting						
2. Knowledge in selecting a design brief that will be most appealing to majority of prospective buyers						
3. Knowledge of conceptualizing neighbourhood social facilities, road networks etc. incorporation						
4. Knowledge in computer applications such as ms project and ms word						
5. Knowledge of conceptualizing performance – based serial contract packaging						
6. Knowledge in acquiring litigation free land						
7. Knowledge of multiple routine housing units contract packaging						
8. Knowledge in attending to issues of licensing and permits from local authorities						
9. Knowledge in conceptualizing project execution plan						
10. Knowledge in conceptualizing safety requirements						
11. Knowledge in housing market dynamics						
Job Knowledge continued		1	2	3	4	5
12. Knowledge in conceptualizing a total quality assurance policy						
13. Knowledge in conceptualizing environmental impact						

assessment					
14. Knowledge in setting up a dispute resolution mechanism					
15. Knowledge in local cultures					
16. Knowledge of statutory obligations					
Task Proficiency					
1. Technical quality of site investigation report					
2. Functional quality of site investigation report					
3. Technical quality of the final design brief					
4. Function quality of the final design brief					
5. Technical quality of total quality assurance policies					
6. Functional quality of total quality assurance policies					
7. Technical quality of environmental impact assessment incorporation					
8. Functional quality of environmental impact assessment incorporation					
9. Technical quality of dispute resolution mechanisms					
10. Functional quality of dispute resolution mechanisms					
Job experience					
1. Experience in conceptual phase management					
2. Experience in a management position not necessarily in MHBPs					
3. Experience in successful management of MHBPs					
4. Experience in team leadership					
SECTION D					
Project Managers Performance in Ghana					
How would you say about the performance of project managers' you have engaged in recent times?					
1= very low, 2= low, 3=average, 4=high, 5=very high			Level of performance		
	1	2	3	4	5
1. Project manager's performance					