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Assessing the Influence of Project Management Practices on the Performance of Building Projects in the Ghanaian Construction Industry

By

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DECLARATION

I hereby declare that this research is my own work towards the award of a Masters of Science degree in Project management and that, to the best of my knowledge, it contains no materials which have been accepted for the award of any other degree at this university or elsewhere, except where due acknowledgment has been made in the text.

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ABSTRACT

Construction projects executed are caused by myriad factors. The primary focus of project management practices mainly affects the performance and productivity of construction projects in the Ghanaian construction industry. The main objectives of the study were; to identify the project management practices carried out by the organizations for management of the selected building projects; to determine the PM practices that significantly influence the performance of building projects managed by the organizations; and to access project management practices that influence performance of building projects in the Ghanaian construction industry. Semi-structured personal interviews and structured questionnaires were administered and distributed to selected organizations to identify practices that have been performed in the management of construction projects. The study developed performance indices to measure time, cost, and quality performance, as well as a pairwise analysis using independent t-tests to test significant performance differences, and a multiple regression analysis using the Statistical Package for Social Sciences. The results indicated; Significant cost performance differences between the categories of projects in all organizations, although there was no significant difference in quality performance in all three categories of analyzed project categories. Existing differences between the performance of a particular pair of project categories from organization to organization the corresponding material project management practices. Important recommendations proposed; Competitive selection of consultants for a contract or a group of contracts, previous work experience with the customer should always be among factors with high attention. In order to minimize delays in the recognition of payment statements after their issue, the number of persons involved in the process of verification and validation should be reduced.

A link should be established between the regional / local client offices and the national headquarters of the organizations to enable effective monitoring of the projects.

Keywords: Accessing, project management practices, influence, performance, building projects, Ghanaian construction

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DEDICATION

This thesis is dedicated to my sweet daughter Amanda Nhyira Norman and My son Andre Afena Norman.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The building industry is very important since economic growth and development has increased the demand for the construction of infrastructure all around the world. The construction industry thus controls the basic living conditions for the sustainability and development of human life in the world. Over the past years, the construction industry development has raised attention of many from and around the world. As a result, a great deal of pressure is on every government to help in bringing about the changes needed for developing its construction industry.

According to Baiden (2000), inadequate information and bad project management practices result not only in project delays but project cost overruns and terminations which negatively impact the project teams reputation as well. To improve on these success factors and reduce the probability of failures, the potential success factors and uncertainties must be identified, assessed and monitored throughout the life of the project.

The Ghanaian construction industry plays an important role in the country's economy but has been plagued with poor publicity about cost overruns, uncontrolled and unrealistic schedules, accidents, poor workmanship, conflicts between project team members, abandoned and unfinished private and public construction projects. It is common today for buildings to collapse, roads to be cracked, bridges to tip over and what could come next, as shown by some pitfalls for the construction industry in Ghana, which have left a bad impression in the minds of the public.

There is a need and urgency to prevent the failure of projects, in particular due to poor project management practice in the industry (Amoa-Mensah, 2005).

World Bank (2004) claimed projects are much more complicated than ever due to capital investment, multi-discipline involvement, far-flung project participants, tight schedules, strict quality standards, rising costs, environmental shocks, increasing stakeholder power and ICT advances hence, Project success can be assessed based on how well the resulting product or service supports organizational control. It is important that the project manager understands the corporate governance / organization policies and procedures that relate to the product or service object. To ensure the success of the project, the project manager must have the required project management skills and be able to apply them in project execution to ensure successful project implementation (Ward, 2001).

The research will also gain access to the Ghanaian construction industry compared to the following. The scale of capital investments, as they involve multiple disciplines, widely dispersed project participants, tighter schedules, strict quality standards, escalating costs, environmental shocks, increasing power of stakeholders and advances in ICT. Project success can be assessed based on how well the resulting product or service supports organizational control. And finally, opportunities to involve and use project managers to ensure the success of projects in the industry.

This study explored three organizations in Ghana which are considered PM organizations in the sense that they have a staff in the management of construction projects. Each organization is differentiated by the type of funding it provides for its development programs and certain

specific organizational goals. However, the job of carrying out construction projects is common. They include in particular:

i) Establishment of Ghana Education Trust Fund ("GETFund")

(ii) the establishment of the Joint Confederation ("Joint Fund") of the district meetings: and

iii) Organization of the Social Investment Fund (SIF).

There are certain main organizational goals that are peculiar; While the "GETfund" organization has the sole aim of complementing education at all levels in Ghana, the "Joint Fund" organization aims to improve housing, sanitation and primary health care in addition to improving Ghana's educational institutions. The SIF organization also has the main objective of reducing poverty in rural and urban areas. Every year, construction projects are carried out to facilitate the achievement of these and other goals. Despite minor differences in specific organizational, goals is the complementing and improvement of educational institutions among the organizations usual. This common feature is used to track the research goals. The focus is therefore not on the distinguishing features.

1.2 STATEMENT OF PROBLEM

The Ghanaian construction industry plays an important role in the country's economy but has been plagued with poor publicity about cost overruns, uncontrolled and unrealistic schedules, accidents, poor workmanship, conflicts between project team members, abandoned and unfinished private and public construction projects. It is common today for buildings to collapse,

cracked roads, breaking bridges and what could come next, as shown by some pitfalls for the construction industry in Ghana, which have left a bad impression in the minds of the public; there is a need and urgency to prevent the failure of projects, in particular due to poor project management practice in the industry (Walker, 2001).

Most of these project execution companies fail to proactively address the uncertainties. As a result, project delays and budget overruns usually occur because of a potential risk. Stoekel (2002) stated, insufficient information and ineffective project management not only led to project cost overruns, delays in completion, but also to completion and had a negative impact on the reputation of the project team. In order to increase the chances of success and reduce possible mistakes, the success criteria and the uncertain factors should be carefully identified, evaluated and monitored.

There are several project management activities within a project. Various ways of carrying out these activities arise and are accepted as everyday practices. The need to address certain environmental and social challenges that a given organization may face can lead to the adoption of specific PM practices. The effort to measure project performance in the country has shown little or no help in this direction. There is a link between PM practices and the successful completion of construction project work (Ramabadron, 2007). Certain building practices do not necessarily have a significant satisfactory impact on project performance, while others do. Therefore, there is a need to promote best practice and a second look at others that are opposed to the success of construction projects in Ghana.

1.5 RESEARCH QUESTIONS

For the purpose of this research the following research questions were proposed.

- What Project Management (PM) practices have been adopted by the construction firms in Ghana for management of the selected building projects?
- What PM practices significantly influence the performance of building projects managed by Ghanaian construction firms?
- How PM practices that influence performance of building projects in the Ghanaian construction industry can be accessed?

1.3 AIM

The principal aim of this research was to find out the project management practices adopted within the construction industry and how these impact the successful delivery of projects in the construction industry in Ghana.

1.4 OBJECTIVES

The specific objectives of this research were:

- To identify the project management practices followed by the construction organizations for management of selected building projects
- To find out the PM practices that significantly influence the performance of building projects managed by the organizations

- To access project management practices that influence performance of building projects in the Ghanaian construction industry

1.5 SIGNIFICANCE OF STUDY

Though the Ghanaian construction industry is key to the country's economy, it's relevance is least desired hence, the need and urgency to prevent the failure of projects, in particular due to poor project management practice in the industry.

Through research, the findings can help relevant parties, such as builders or government and contractors, effectively and timely solve problems associated with poor management practices to create a win-win situation for all parties in the Ghanaian construction industry. It is hoped that the relevant parties will adopt and implement the necessary action plan to ensure the successful implementation of construction projects in the industry, to create a friendly and enjoyable working environment for all involved and to serve as a basis for improvement, time, cost and efficiency of quality in the construction industry.

1.6 SCOPE OF STUDY

The focus of this research was to understand how building project management practices impact performance in the Ghanaian construction industry. The research also targeted the main parties in the Ghanaian construction industry. These includes contractors who perform the work on site and ensure good project management practices to ensure construction progress. Therefore, they are the most important party in finding the right information in this research. The research also, looked at the Ghanaian construction industry today under the following

headings: Financial Resources; Physical resources; Competition; Training Academy of the Construction Industry Council Coordination and Cooperation ; Communication between government and industry; Long-Term Vision and Policy for Industry; and Government Intervention.

1.7 RESEARCH METHODOLOGY

The research for this study was carried out using the following approaches:

This included secondary data and information from various sources used to conduct the research. The sources include books, magazines, magazines, newspapers, dissertations, conference papers, journals, information from the Internet, etc. These materials served as background information to fully understand the information needed for discussion and analysis in research. The information was a problem related to project management practices in global construction industries.

The main method of collecting primary data from contractors was the questionnaire survey. The questionnaires were named after the problems of project management practices in both sectors, private and public, to achieve the objective of the study.

1.8 ORGANIZATION OF THE STUDY

This research was categorized into five chapters, Chapter One of the discuss thesis and the whole overview of the study background, statement of problem, research questions, aim, objectives, significance of the study, scope of the study, research methodology, and organization of the study.

The second chapter dealt with the relevant literature review on Project Management practices with the focus on accessing the extent of influence on the performance of building projects.

The third chapter dealt with how research methods was identified for the research. The fourth chapter presented findings on data analysis and discussion, finally the last chapter provided conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Phua & Rowlisson (2004) contended construction is an important sector that contributes significantly to the economic efficiency of all countries. The construction industry needs to be dynamic in order to respond to the changes that the world is constantly facing, as well as the social, economic and technological challenges that affect all sectors. The possibilities and problems in construction differ from those of the last century. The requirements of customers, companies and employees vary from time to time, and so the vision of the construction industry is evolving, to keep up, the management also has to change (Ramabadron, 2007).

Every construction company needs to have a strategic plan and vision that points the way to achieving its goals. The key to this is successful management by identifying the needs and goals that the company wants to achieve. To do this, project management has to be planned on many levels, such as implementation, organization, delegation, decision-making and performance. The survival and progress of a business depends on how well the project management is implemented and how experienced the company is in this area.

2.2 CONSTRUCTION INDUSTRY DEVELOPMENT

In the words of Merrit & Rickets (2007) the construction industry can be defined to include those organizations involved in the design, manufacture, remodeling, renovation, maintenance, facility management, demolition and recycling of civil engineering works, including the

provision of resources. It includes all internal and external stakeholders who, in one way or another, promote industry policies, procedures, practices and cultures. Ofori (2000) described the development of the construction industry as "a conscious and controlled process to improve the capacity and effectiveness of the construction industry to meet national demand for construction products and support sustainable national economic and social development goals".

2.2.1 Construction as a Vital Sector

The construction sector is an important part of industry and the gross income of a country (*c.f* Phuya & Rowlinson, 2004). For example, in terms of performance, construction is the largest single production in the US economy, accounting for almost 10 percent of gross national product (AsiaConstruct13, 2007). Construction projects require expert management because they are complicated and face many challenges and constraints, such as costs, time constraints, material and environmental regulations, or customs regulations (Partiff & Sanvido, 1993). In construction projects, several activities take place and take place simultaneously, but are connected and integrated. Therefore, we need thorough and effective communication and cooperation to manage and control these activities. Project management is critical when the project is exposed to internal or external changes and when we need to implement alternative solutions or contingency plans. Project managers face many challenges and must always be creative and flexible to deal with difficult and sometimes unforeseen circumstances.

World Bank (2004) admitted today, companies compete with each other to produce high-quality products and deliver them at the right time with minimal budgets. The best way to

achieve this is project management. Effective project management is perhaps the most important factor determining the success of local projects. Successful project management required the integration of many different activities, teams, inputs and outputs, with the goal of delivering products that meet the defined quality criteria on time and within the agreed budget. The use of project management in the organization helped in many ways, for For example, to reduce costs, improve timing, and focus on results and quality, all through good collaboration throughout the organization. For example, State of Project Management Survey (2006), concluded that the implementation of PM methods offered value to an organization. However, organizations should also ensure that common sense is applied to all methods (Fox, 2003).

2.2.2 The Impact of the Construction Industry on Project Managers

Sarantakos (2005) suggested Customers, Contractors and Governments are responsible for making the necessary changes, and project managers representing clients or contractors at the project level are able to change the industry from scratch. Project managers in the construction sector are responsible for the overall success of the client's physical development, taking into account the cost, time, quality, environmental and safety requirements. They need to be technically competent and able to adapt to the changing industry environment by relying on knowledge and skills acquired through education and experience. They also need to be supplemented with non-technical knowledge and skills to fulfill their changing responsibilities. Knowledge management in project-based industries such as construction is facing difficulties that are often not encountered in non-project industries. Project-based organizations work on

lifecycles that are often long and non-repetitive, typically organized into teams that have been specifically designed for the project, and that are often resolved after a project is completed Bryde (2003) as cited by Cooper (2008).

Robert (2006) concludes people from different companies meet for the first time as a project team, which essentially represents a form of temporary organization. This means creating the right culture of knowledge sharing, accessing explicit knowledge from different repositories, and accessing and internalizing learning from past projects. However, most of these learning opportunities are tacit and stored in people's memories. In addition, the prevailing supply chain and procurement practices in construction hinder effective learning practices. Instead, it allows industry to re-invent the wheel, and the experience of good practice is wasted if it does not repeat itself in future projects (Bubashit et al, 2004).

The main responsibilities of project managers are generally accepted to control financial and material resources to bring a project to a successful conclusion in terms of cost, time and stakeholder satisfaction. Fox International (2003) identified cultural factors as crucial factors in the development of the construction industry

2.3 THE IMPACT OF PROJECT MANAGERS ON THE CONSTRUCTION INDUSTRY

Oppong (2003) stated Project managers can play a crucial role in the development of the construction industry; successful project managers often become senior managers in their organizations responsible for strategic and policy decisions. They bring out the positive attitude and spirit of various projects that ultimately enrich the entire industry. The traditional role of

project managers in controlling time, cost, quality, safety and environmental issues can now be complemented by their role as drivers of change to ensure the continuous development of the industry in which they operate (cf. Austin & Newtin, 2011). The extension of their existing role can only be realized if they know the needs of the industry as a whole therefore, the industry's long-term vision and policy must be publicly publicized so that various stakeholders can think about and determine what it means for themselves as individuals. Apart from the public, such a vision needs a trailblazer to encourage stakeholders to commit to it. Project leaders play a key role in supporting such a vision and will be an important part of the construction industry to achieve their realization (Xio & Proverbs, 2003).

2.3.1 Communication

Snow (2013) noted the act of transmitting information either verbally or in written form. Smith (2013) corroborated this view, when they said they would have good writing, oral, and listening skills.

2.3.2 Empowerment

In the words of Barnes (2011), empowering of project managers is critical for them to assume leadership position, because they then do not play the roles of implementers or managers only, but also take decisions and delegate authority. They have more and more freedom and flexibility of action. By empowering project managers, project standards can be enforced, discipline maintained, and all aspects of the project.

2.3.3 Influencing

Project managers must have the ability to influence other team members in a very personal way. Marshall (2011) believed one of the ways of influencing other team members is in the form of feedback provided to subordinates. Drawn from Dave (2012), daily site visits, indicating interest, concern, and appreciation for performance also influence other team members in order for productivity to be achieved. It is through this in the meantime that the work and key expectations are being communicated through all levels of the project.

2.3.4 Team Building

According to Kwakye (2012), project managers have the ability to build teams. Team building is essential to make everyone believe in the team. Smith (2013) recommended following the Xerox model which includes: (a) communication of vision; (b) development of a mission statement; (c) definition of goals; (d) development of norms; (e) development of roles; (f) development of communication processes; and (g) development of work processes. McDonald (2012) believed team building to be key to removing barriers to proper collaborative working. Alarcon (2011) said that team members would like to work together for the success of the project.

2.3.5 Problem-Solving Skills

Problem solving refers to the ability to analyze adverse conditions and sources of conflict, identify emperical solutions, and then implement them. Problem-solving skills are essential for any project manager, specifically in construction projects, where eruption of problems across

the life cycle is routine. According to Skoyles (2011), project managers who are also leaders must have the ability to make informed judgments.

2.3.6 Conflict Resolution

Wand & Champman (2012) defined conflicts as differences of ideas, beliefs, and opinions on any specific conflict resolution. This is because of the frequency of occurrence of conflicts in construction projects. A conflict results in the breaking of personal and professional relationships, creates tension, reduces the effectiveness of the team, and finally leads to compromise in goals of the construction project (*c.f* Songer, 2006).

2.3.7 Goal Setting

Planning is one of the key leadership skills that project managers are looking for is construction and goal setting. Planning is the ability to set goals and then formulate action steps to achieve that goal. Turner & Drew (2012) in fact, considered planning to be the expression of a leader.

2.3.8 Visioning

The difference between project managers and project managers who are leaders is the ability to develop a vision for the entire project. It is said that this is the achievement of this vision. It aids in describing what an organization or projects wants to achieve (Xio & Proverbs, 2003).

2.3.9 Sense of Responsibility

Serpell & Alacron (1998) suggested a strong sense of responsibility is another key feature of the project manager. This sense of responsibility is aimed at the team, its performance and the

performance of the project manager, the overall success of the project, budget compliance, schedules, quality and safety requirements.

2.3.10 Ethics

Project managers are also moral beings who make morally correct decisions. Such behavior then regulates the behavior of other individuals in the projects. Therefore, compliance with a range of professional ethics and standards in project management is crucial (Saaty, 2009). Ethical behavior also translates into business benefits. These include reasonable cost management, maintaining quality and competitiveness, and creating customer satisfaction.

2.3.11 Initiative

Project leaders who take the initiative are also leaders. This initiative is the key to identifying new ideas, procedures, sharing ideas, solving problems and overcoming obstacles. Schönberger (2009), refers to the ability to anticipate and prevent events and problems before they occur.

2.4 PROJECT MANAGEMENT

Baiden-Amissah (2009) defined PM as "Project management is the planning, organization, guidance and control of corporate resources for a relatively short-term goal set to meet specific goals." In addition, project management uses the system approach to management by having functional staff (the vertical staff) Hierarchy Assigned to a Specific Project (The Horizontal Hierarchy)" (see *www.hiphing.com*). Wong (2007) showed that, project management serves to control the key elements, the empirical ones Provide information on how to achieve the

project goals efficiently, ie use the company's resources for a given activity within time, cost, and performance limits Customer Relationships.

2.4.1 Overview of Project Management

In the words of Chan & Tan (2000)ach definition will vary according to the goals and needs of the organization. Sometimes project management is confused with strategic management, because both have mission, vision and goals. The difference is that project management is unique within a limited time. This requires the development of new methods and mechanisms to achieve the goals. on the other hand, strategic management has more common decision-making and an unlimited schedule that includes brainstorming across all levels of the organization (McCaffer, 2000). The researcher believes that each of the previous definitions adds value to project management in its own way. All inspired the seeker to define PM as "project management as an art, charisma and professional experience that provides all the means to succeed. Construction project management has the same main tasks as project management, which are cost, time and performance but under construction PM its cost, time and quality as Choudburry & Phata (2003) mentioned, which have not fundamentally changed but can be referenced in another area for people and the importance of working through others, including in construction project management, customer satisfaction is a key to project success as well the goals and goals of the company.

2.4.2 History of Project Management

Wong & Ng (2007) in a study of ancient civilizations, argued the construction of great monuments has been of great importance, such as the great projects of the Romans and the

Egyptian pyramids. This complex work required sophisticated and effective management. This shows that the science of project management has long been known and practiced differently. It also shows that effective management and design techniques can deliver excellent and long-lasting results. However, in those epochs, little attention has been paid to those who have finished this work or how long it has taken from the point of view of time, effort and budget. In the late 19th century, management principles began to develop more effectively due to the increasing complexity of construction (Ward & Hannafin, 2012). Large projects included thousands of workers, large quantities of materials, machinery and equipment. From that point on, we started to see the project management of engineers and architects ourselves. Later techniques were applied to even more complicated projects (Egan, 2008). In the 1950s, Taylor's work was considered a core element of modern project management and included the work breakdown plan and resource allocation. Work Breakdown Structure (WBS) is "a delivery-oriented, hierarchical decomposition of work that must be performed by the project team to achieve project goals and deliver the required results". This approach has arranged tasks to produce the result of maximum output with minimal input besides many people criticized this approach because they saw people as machines rather than humans. Although Taylor was pragmatic in his field, he analyzed the various aspects of work patterns and behaviors. His study confirmed that alternative working methods could lead to a remarkable increase in productivity and a reduction in labor and material costs. others, such as Weber, who came from the same school of thought, dealt with the description of the bureaucratic structure (Egan, 2008). At the same time, two other vital methods were developed: the "Critical Path Method" (CPM) of DuPont Corporation and Remington Rand Corporation and "Program

Evaluation and Review Technique" (PERT). This approach developed the management principles that focused on the pyramid structure. This method emphasizes delegation and encourages the delegation of authority from the top of the pyramid to the line of staff, but still with formalization and specialization. The classical approaches were seen as rigid and inflexible because they focused on the internal characteristics of the organization rather than the external influences and did not take into account the social and environmental aspects of the work (Fox, 2009). As a result of these many studies, the behavioral school appeared between 1930 and 1970. Many psychologists devoted their studies to the behavior of superiors and subordinates in an organization. Taking values and motivations into account, McGregors focused on the social approach in 1960 and developed "Theory X" and "Theory Y," both describing the behavior of people in organizations. Theory X emphasized that people do not like work and prefer to be judged and not responsible; As a result, employees must be controlled, threatened or punished so that they can achieve organizational goals. Theory Y. on the other hand, explained that not all individuals do not like their work. This refers to the type of individual and claims that threats are not the only way to encourage employees to achieve organizational goals and objects; Work on complacency can be more effective in producing better outcomes. However, the behavioral approach does not specifically consider environmental factors, but generally treats them. Looking at the organization as a closed system, there is still a big gap and many approaches between the classical and the behavioral approaches. Later, other fields were developed, such as marketing approaches, industrial psychology and human relations, areas that became the backbone of corporate governance (*c.f* Gowan & Mathieu, 2005).

2.5 PROJECT LIFE CYCLE

The Project Life Cycle is "The Sequence of Phases in which the Project Will Develop" (Fox, 2007). Project lifecycles can have different names, but they all share the same basic structure. Sometimes there are different names for each phase or phase. Here, the four phases of the project lifecycle are explored, although some authors consider them to be more than four, but these are the most common stages that many projects go through. Some authors of this topic consider controlling and monitoring as the fifth level, but the researcher believes that controlling and monitoring the project is not a phase in itself, but a process that must be specific to the entire life cycle of the project rather than a project Phase also as cited by Serpell & Alarcon (1998):

2.5.1 Initiation Phase

At this stage, the customer or sponsor identifies needs and describes all requirements and specifications, and the project team is determined with the project diagram (Fox, 2008). This phase is considered as the conceptual phase, the basic creation of the project. This usually includes the feasibility study, the project description documents and the identification of requirements. At this stage, the team has important activities to accomplish and prepare for:

• Interviews and meetings with the client, funders or stakeholders to identify needs and goals.

• Research and plan to compile all the information needed for all phases of the project.

• Creation of all relevant documents such as feasibility documents, project concept and project diagrams.

• Gather and carefully study all standards, regulations, and rules required for the project (Fox, 2007).

At this stage, the project may still have some issues like:

• Frustration due to the delay in starting the project.

• Missing transforming the perfect team with the right people, a difficult and important part of this phase.

• Different viewpoints between the manager, the stakeholders, the funder or the clients; If not resolved, conflicting views can destroy a project before it begins.

• Lack of clarity in visualizing the final goal of the project, an extremely important creation Formulating questions and answering questions from senior managers of the organization will help to build a smoothly functioning team and pave the way to achieving the project goals (McCaffer, 2000).

2.5.2 Planning Phase

Edum-Fotwe (2000) stated, the planning phase is the most important and challenging phase of the project. If the project is well planned right from the start, it helps to avoid many problems and confusion later. This phase includes:

• Study and create business requirements.

• Studying details of the project, such as costs, schedule and start and end of various activities.

• Plan the resources you need and deploy them.

• Identify the type of work needed to use work structure.

The reason we create a project structure is to precisely organize the scope of the project, using the hierarchical structure that allows us to divide the project into smaller parts at each level. Work breakdown structure also helps in the allocation of resources, assignment of responsibilities and control and monitoring of the project. WBS is used in planning because it helps the project manager monitor success, risk, cost, and time to ensure that the project stays on track (Gammon, 2006). Managers and planners should create a comprehensive diagram of the project plan that looks like a road map of the entire project. The project plan is the map that shows project activities and tasks that need to be delivered in a given time, recognizing the resources and milestones needed. It tells the project manager at all stages whether he is on the right path or whether there have been some changes on the way. Even though the project is large, several plans should be prepared outlining resources, finances, quality and communication plan. Critically, a risk plan should be prepared to rescue the project as needed (Wong, 2007).

2.5.3 Execution Phase

The third phase is also referred to as the execution or operation phase. Here, the real body of the project is built and prepared to be handed over to the customer. It can consume a lot of energy because it is long and full of details. In this phase we have to use many processes like (Harvis & McCaffer, 2002).

2.5.4 Closing Phase

The final phase is the last phase in the life cycle of a project. At this stage, the project is completed (Walker, 2007); This process requires many procedures such as:

- Handling and delivery of the project to the owner or customer.
- Delivery of all required documents to the customer with complete information required by the customer.
- Release personnel and equipment used in the project with full stakeholder reports.
- Identify all activities and tasks that should be stopped and those that need to be continued after the project has been completed and for how long.
- Termination of all contracts with the suppliers and determination of whether the project was within the framework, the budget and the achievement of the objectives.
- Identify the lessons of the project by documenting all levels of success, failure, and accomplishments for use in future projects as claimed by Hong Kong Housing Authority (2000).

Project management is the science and the art of planning, organizing and managing resources to best achieve project goals. Project management is a long process that requires the involvement of many people and an efficient plan; Without them, a project can end in chaos (Shehar, 2007):

• The construction industry has been subject to criticism in recent years as it is always conservative and lacks innovation, new ideas and creative methods in the implementation of construction projects in order to implement them in the new ways of technology.

• The starting point and the end point of each phase of the project lifecycle are crucial as they are the main reason for deciding the project. Between the various phases are decision points that explicitly decide whether the next phase should take place and whether the previous stage has been completed in the right way as planned from the beginning (*c.f* McDonakd & Smitters, 2012).

2.6 PROJECT MANAGEMENT FUNCTIONS

Wong & Ng (2007) conteded Project management has developed a lot in recent decades, but the main functions of the project and its life cycle are still the basics of project management. Understanding the project management functions is critical to effective execution and compmetion of the project, because without this understanding it is very difficult to develop a plan that meets the needs of the project at each stage, so that every phase is carefully studied (Wong, 2007).

2.6.1 Time Management

Time management means defining the time it takes for the team to complete an activity. This helps the manager to see what activities have been done, how long they have lasted, and when

they started and ended. Time management will also help by comparing the time scheduled for this activity with the time actually spent implementing that time (Sadeh, 2000)).

2.6.2 Cost Management

Cost management is a process required to organize expenses within the project. It helps to keep the project on track by constantly checking the expenses and keeping all the records needed to compare it to the budget actually planned. This process ensures that the manager keeps track of all expenses (Hing, 2007).

2.6.3 Quality Management

This process is needed at this stage to ensure that what the team produces is exactly what has been agreed with the customer or customer. Quality management is needed not only at this stage but throughout the project. At this point, it must be ensured that the expectation of our work is planned from the beginning (CIRC Report 2001).

2.6.4 Change Management

Change Management is a process that helps to manage all the changes needed in the project. Effective change management allows all changes to be recorded, approved and carefully reviewed. This can help managers track changes and control their impact before the project is impacted and can ensure that the required changes are made easily and benefit the project (*c.f* Stoekel & Quirke, 2002).

2.6.5 Risk Management

Songer et al., (2006) notes the risk process is the process of identifying and controlling risks in the run-up to problems. Risk management helps to quantify the risk and identify potential impacts on the project, and to identify the actions needed to minimize risks and prevent adverse consequences. Risk management is needed at all stages of the project; Alertness management will help to eliminate the uncertainties. Training Academy of the Education Information Council (Xio, 2003).

2.6.6 Software Management

The development and use of software, such as Microsoft Project (MS Project) and Primavera, has been instrumental in automating many static calculations in complex projects, as templates for most charts, diagrams, and reports after input by data can easily create various types of project management planning and monitoring tools such as GANTT charts, PERT charts and CPM charts (Ling et al., 2002). Software can also be used to create the PSP forms and can help the user create accurate records and reports such as schedules, budgets, and timeline changes, all of which are helpful in monitoring a project (McCaffer, 2000).

2.6.7 Leadership

According to Sadeh (2000), Project management is important because it brings leadership and direction to the projects, and without project management, a team can be like a ship without oars; Move, but without direction, control or purpose. Leadership enables and allows a team to

do their best job in that, project management provides leadership and vision, motivation, roadblock removal, coaching, and inspires the team to do their best work (Xio & Proverbs, 2003). Project managers serve the team, but also ensure clear responsibilities. With a project manager, there is no confusion about who is responsible and has everything under control, what happens in a project. Project managers enforce processes and keep everyone else in the team on their toes because ultimately, they are responsible for whether the project fails or succeeds (Sadeh, 2000).

2.6.8 Quality Control

Project management is crucial as it ensures the quality of everything delivered, the projects are usually under enormous pressure to complete. Without a dedicated project manager who has the support and buy-in of the executive, the tasks are underestimated, the schedules streamlined and the processes accelerated. Gowan & Mathieus (2005) confirms a dedicated project management ensures that a project has not only the time and resources available, but also that the output undergoes a quality review at each stage. Good project management requires gated phases in which teams can evaluate results in terms of quality, applicability, and RoI (Parfitt, 2003). Project management is central to quality assurance, as it allows a staggered and graduated process that allows teams to review and test their results every step of the way.

2.6.9 Continuous Overview

Project management is crucial as it ensures that the progress of a project is properly tracked and reported (Sidwell, 2002). Status reports may sound boring and unnecessary - and if everything goes to plan, it may just feel like documentation for the documentation. However,

continuous project oversight to ensure that a project is in line with the original plan is critical to keeping a project on course. With proper oversight and project reporting, it is easy to see when a project is about to deviate from its planned course. The sooner you are able to detect project deviations, the easier it is to correct the course. Not only is this data invaluable to tracking progress, it also helps customers gain the trust of other stakeholders in their organization, giving them an easy overview of the progress of a project (Sadeh, 2000).

2.6.10 Managing and Learning from Succes and Failure

Project management is important because it learns from the successes and failures of the past. Project management can break bad habits, and when you deploy projects, it's important not to make the same mistakes twice. Project managers use retrospectives or post-project reviews to think about what went well, what did not go so well, and what should be done differently for the next project (Songer, 2006).

This creates valuable documentation that will in future be a record of "dos and don'ts", allowing the organization to learn from mistakes and success. Project management aims to control the key elements that provide empirical information in order to efficiently achieve the project goals. Walker (2008) defined project management as "the use of resources in the enterprise for a given activity in terms of time, cost, and performance." A fourth key factor is good customer relationships. Walker added time and performance to customer relationships as the fourth major factor. Still, we need to know the key drivers of project success, which are the key elements for businesses to make a difference in this highly competitive environment. In Ghana, however, there are specific success factors that need to be investigated; Ghana has

unique features that set it apart from other places, and this research will focus on these and highlight failures in the management of construction projects.

A study by AsiaConstruct13 (2007) concluded the construction sector is an important part of industry and gross income; For example, the construction industry is the largest single production in the US economy at around 10 percent of gross national product. Today, the construction sector is growing and has become very important in the Ghanaian economy.

2.7 THE ROLE OF THE PROJECT MANAGER IN THE CONSTRUCTION INDUSTRY

To understand project management, we first need to understand the project and the management. A project is temporary and that means it has a definite beginning and end, in other words, time is limited but does not necessarily mean a short time; the duration of a project depends on the project type (Parfitt & Sanvido, 1993). Unique means that each project varies and each feature has some peculiarities. Even though the project has repetitive elements, it is still unique as it has a changing owner, design location and facilities. A project has to be developed step by step, which means continuous and steady work and growth (Wong, 2007).

2.7.1 Financial Resources

Phua (2004) stated, the availability of finance and the availability of investment are the two variables that strongly influence the construction industry. The Ghanaian construction industry is run by companies and faces fierce competition with other sectors for finance and investment. Since Ghana is a developing country, one can expect new construction projects and

infrastructure work to increase in the future. As the country grows, investments are likely to be diverted to development and refurbishment projects. Project managers have a great deal of influence on these two variables, so their role in this regard is very important.

2.7.2 Physical Resources

The availability of materials and the availability of equipment / machines are very important variables for the industry. In the past, materials had to be procured worldwide, but with the rapid rise of China, many building materials can be sourced from China at a lower cost and with reasonable quality (Wong, 2000). In recent years, much prefabricated in China. Since Ghana needs to import virtually all of its materials, a cheap and reliable source is very important to the development of the industry. Project leaders can influence the performance of the industry through their control of the supply chain, especially at the stage of negotiating delivery times, checking the quality and progress of factory production, and meeting the specifications for on-site delivery and installation (Xio & Proverbs, 2003).

Attention to these details sends a clear message to existing and potential suppliers that multicriteria must be met; This price alone will not be enough to satisfy a demanding market that Ghana is beginning to become(Oppong, 2003).

2.7.3 Competition

There is fierce competition in the market, especially old and the emerging contractor everywhere. The construction industry in Ghana is controlled by several key players, displacing many small to medium-sized companies (Hong, 2007). Contractors in Ghana are also

exposed to fierce competition due to the influx of contractors from China, Italy and Lebanon. The prevailing norm of tendering policy with the lowest bid leads to cutthroat competition. Project managers working on behalf of building customers have a significant influence on the level of competition by including high bidder numbers for projects (Baiden-Amissah, 2009). Many observers believe that this is overly competitive and not in the interests of the health of the industry as a whole or the customers to whom it serves.

The project managers have considerable influence through other measures to increase their competitiveness. For example, careful selection of production methods can save personnel, reduce overall costs and reduce risks and environmental damage. Labor productivity can thereby be increased. Leading companies are adopting better practices by facing international trends and are proud to announce their good results (Gammon, 2007).

2.7.4 Coordination and Cooperation (Cultural Factor)

Phua & Rowlinson (2004) indicated problems of lack of coordination and cooperation have long been recognized by industry; partnerships and other management strategies were promoted with the hope of creating cooperation, trust and better working relationships, which in turn should improve overall performance. A culture of damage has long prevailed in the industry, and contractors have implemented projects at very low contract prices with the intention of filing claims to cover their costs. Project managers can have an important impact here by adhering to high ethical standards of behavior and by being honest with key stakeholders. As leaders, project managers can serve as role models for others and avoid fraudulent practices that undermine the trust of all (*c.f* McDoald & Smithers, 2013). Given that all projects involve a

large number of different specialists at both the design and construction stages, project managers play a unique role in coordinating them to ensure fair play and equitable solutions to the problems that arise (Phua, 2004).

2.7.5 A Learning Culture

University graduates not only qualify with their degrees, but also with recognition from appropriate professional institutions. In order to maintain their professional competence and to develop themselves within the industry, they also expect a continuous professional development (Wong, 2000). However, workers and tradespeople are not given sufficient training, especially when there is an influx of unskilled Chinese mainland workers. With their unique status in project teams, project managers can improve the attitudes and behavior of team members to find new ways to solve design issues. Success can help to increase the confidence that is required to ensure that the industry is attractive to new employees and retain existing talent. As industry's workload increases, project managers can exert their influence by raising the entry standards for required qualifications and substituting pre-fabrication for traditional methods to avoid recruiting many unskilled workers into the industry. Ghana has gotten over the stage where it has to compete by cheap labor (Wong & Ng, 2007).

2.7.6 Communication betweeen Governmet and Industry

Ward & Hannafin (2007) noted the communication between government and contractors; Availability of information; the concern of the government for its image; and use of construction IT. At the moment, there is not enough communication between the government and the industry. Regulations and policies are sometimes not effectively passed on to the

industry. Government agencies have less flexibility in contracting. The widespread use of information technology in industry is just beginning to emerge. It is hoped that the Construction Industry Council will assume the role of communication between the government and industry (Morledge, 2006). One possibility is to provide the government with performance data on projects. In addition, project managers can be more active in implementing knowledge management practices so that learning opportunities are not wasted.

2.7.7 Long-term Vision and Policy for the Industry

Short-term thinking and durability has been prevalent in the Ghanaian construction industry for many years. The development was piecemeal and was not planned far. Problems have arisen in the past because there is no long-term vision for planning and development (Momoya, 2006). Many infrastructure works are still subject to government approval of developments such as the development of Prampram Airport, the olympic sports stadium in Amasaman, which has been delayed for years due to numerous consultations and mismatches. Project managers play an important role in several ways. They can contribute through their membership of specialist institutions and make suggestions for long-term changes in the industry. Meeritt (2001) claim drivers of innovation by introducing new technologies and procurement systems and facilitating research studies on projects is key.

2.7.8 Government Intervention (Traditional Factor)

According to Xio (2003), the only two variables that contribute to this factor are: government intervention; and encouragement for the proprietary development of the contractor through a ladder of opportunities for prime contractors and subcontractors. For the past twenty years, the

government has had a significant impact on the industry. The Hong Kong government was a big customer for public housing and infrastructure projects such as the new airport extensions and the ongoing port expansion project. The government can also help industry through laws and regulations by introducing stringent laws to enforce industrial safety, when project managers seize the opportunity to enable subcontractors to develop their expertise, they play again a unique role in promoting improvements through the organization of on-site training workshops (Chan & Tam, 2000).

2.8 MEASUREMENT OF PROJECTS PERFORMANCE

More than one method of measuring project performance was investigated. Belassi (2006), discussed project success using time, cost, and quality as fundamental criteria. These three indicators were also selected in line with the policy needed to develop Key Performance Indicators (KPIs) as advocated by Collin (2002): only a limited, manageable number of KPIs are available for regular use; too many (and too complex) KPIs can be time consuming and resource intensive ". For the performance measurement to be effective, the indicators must be accepted and understood throughout the company. Atkinson (2009) confirms the broad use and understanding of the three chosen criteria in the assertion that "while other definitions of project management have been developed, the three basic criteria called the" iron triangle "are always included in the alternative definitions.

2.8.1 Use of Project Performance Indices

Chan (2004) after establishing the criteria to measure the performance of the project, developed a method to measure each of criteria. The developed method involved the use of an

11-point scale, 0.5 - 1.5, indicating the index of a project. Therefore, each respondent had to state the time, cost and quality performance achieved by a selected project on the respective index scale. The indices were developed on the basis of the design time-of-use index (ratio of planned construction time to actual construction time), which was developed in a construction-time study by Walker (2007). Based on the same trend, the cost-performance index was also developed to allow respondents to estimate the cost of the project by sharing the initial cost of the project with the final cost of the project. Quality performance was similarly measured on an 11-point scale, with each respondent, in his own estimation, indicating the extent to which the expected quality of the project was achieved; whether the quality was as expected or above expectations. The method of measuring quality performance is subjective and was adopted on the basis of Chan (2004) work, in which respondents had to state their satisfaction with quality on a 7-point scale. The purpose of developing the indices to measure all performance indicators was to enable efficient and simple regression analysis.

2.8.2 Differences in the Performance of Projects

To identify the existence of significant differences between the performance of project categories from organization to organization, hypothesis testing was required. To carry out the test, therefore, the independent T-test method was used. This involved pairwise testing (ie two categories of projects simultaneously, each category representing projects within an organization). In order to establish a set of significant project performance practices, several analytical methods were explored before the multiple regression analysis was chosen.

Blismas (2004) identified significant contributors to project delivery by performing a case analysis in which the factors were organized using the computer-aided NVivoTM software for qualitative data analysis in matrices and groups. The software worked by creating nodes for the construction of matrices that were used to reduce the data to a manageable format.

Oppong (2003) identified a number of factors that contribute to construction delays in the causes of building delays. He conducted a survey to find out from the three main parties of the Ghanaian construction industry (consultant, client and contractor) how to place the factors on a scale of 1 - 5 points. He used relative import indices and significance tests to perform the analyzes to determine the significant factors. • In a construction time performance study, Walker (2005) used ANoVA to determine factors that influence construction time performance. He also used a regression analysis to develop a model for the prediction of construction days.

CHAPTER THREE

RESEARCH METHOD

3.1INTRODUCTION

The aim of this study is to assese the influence of Project Management Practices on the performance of Building Projects in the Ghanaian Construction Industry. The chapter details how research methods was identified and implemented.

3.2 GENERAL APPROACH FOR RESEARCH

The two main methods, qualitative and quantitative, were combined in this study. First, qualitative data were collected on the project management practices carried out in the selected organizations through interviews and table-based studies (*c.f* Lucey, 3002). Second, the qualitative data on the practices were organized into categorical statements and assigned numerical values to allow quantitative measurement. Bertelsen et al., (2003) noted the impact of PM practices on the performance of cases of completed projects was thus determined by quantitative analysis methods; multiple regression analysis. Data for measuring project performance and the impact of practices were obtained through survey questionnaires. Thus, the qualitative was brought into the quantitative domain by gradual transformation (Sarantakos, 2005).

3.3 IDENTIFICATION OF PM PRACTICES

Data on PM practices conducted in the organizations were identified using semi-structured questionnaires and desk-based studies. This was after the following relevant research papers

were investigated for the purpose of choosing the appropriate method. A study of organizational learning practices in a project management environment by Kotnour (2000), using a questionnaire to study the organizational learning practices of practicing project managers (Ward & Chapman, 2001).

3.4 RESEARCH STRATEGY

The research strategy details the practical steps the researcher undertook to conduct the study, to investigate the research objectively (*c.f* Morlege et al., 2006). The main tool for collecting data on projects and measuring the impact of identified practices on performance was a structured survey questionnaire. Walker (2005) used a questionnaire to investigate the construction time of projects where the sample size was based on the ability to meet the requirements of the statistical method chosen to answer the research question. Merrit & Rickets (2001) suggested to the question "Which PM practices affect project performance?, and to answer, a regressional analysis had to be performed. Data from all projects was categorized according to the organization they belong to to identify effective PM practices in each organization.

3.5.1 Research Approach

Each construction project had to have qualities that enabled effective measurement of the impact of PM practices on project performance to minimize certain identified extraneous impacts (*c.f* Bryde, 2003). The following variables therefore had to be kept constant as far as possible. The type of research approach used is the traditional implementation process to collect empirical data and information. Both primary and secondary sources considered relevant for the study's objective.

3.5.2 Research Design

The research used a descriptive survey, as performed to collect data from components of a population to determine the current status of that population relative to one or more variables (*c.f* Bell, 2007). These technique is also an ideal tool for questioning "why, how and what" regarding general activities and practices with little or no control to better understand the project management practices in building projects (Lucey, 2002). Further, limits were selected on the basis of comments obtained from the pilot-based interview and questionnaire in order to "minimize the impact on performance of price volatility differences between different economic seasons, nature of the procurement method on performance, the project would have under the traditional procurement method, the impact of the design, each project required completely new work" (*see www.hiphing.com*).

3.5.3 Sources of Data

Both primary and secondary data relevant for the study was obtained to provide detail information for this research (c.f Bell et al., (2007) . The primary data sources will be derived from, interviews and observations self-designed set of questions while secondary data sources will be derived from articles, books journals and other available sources (Sadeh, 2000). A semi-structured questionnaire comprising of open and close-ended questions have been designed for the study. The questionnaires will be used to collect information on demographic and socioeconomic characteristics, among other vital information for the study. The Secondary Data collected from the field are two-fold. The first was data from some of the existing PM practices of the selected organizations in the Buildig Industry. The second set of data consisted

of parameters required to measure the performance of selected cases of substantially completed projects, and then ranked the importance of the identified PM practices for the overall performance of construction projects within the selected organizations (*c.f* Baiden-Amissah, 2009).

3.6 POPULATION OF THE STUDY

Population can be explained as the totality of a well-defined gathering of individuals/entities with shared characters; a selective group of individuals of focus for a study (Groove, 2011). The population this study will centered on project consultants, engineers, architects and surveyors who are lincesed with relevant professional experience in building projects in Ghana.

3.7 SAMPLE SIZE

A study by Peck (2008) stated, a sample is asset of data collected and/or selected from a statistical population through procedure. For this study, the sampling techniques used in the selection of respondents were random and convenient sampling techniques. To appropriately obtain a true representation of information relevant for the study *(c.f* Sarantakos, 2005) In order to obtain a sample, both Random and Purposive sampling techniques was adopted to determine key stakeholders as contacts for the sudy due to their direct involvement and role on the performance of building projects in the construction industry.

Table 1: Sample Size of the Orgaizations

Orgaization	**Number**
GetFund	24
CommonFund	22
Social Investment Fund (SIF)	20
Total	**66**

Source: Field Survey, 2018

3.8 RESEARCH INSTRUMENTS

Shenhar et al., (2007) notes interviews, and questionnaires as key research tools to collect the data relevant for the theme. Security and confidentiality, was adhered to during researchers' interactions with interviewers have used carefully designed detailed questionnaire guides that focus exclusively on the critical questions needed to obtain comprehensive and valid information about the respondent's experiences and opinions in aid of the study.

3.9 DATA ANALYSIS

Further detail analysis was undertaken using Microsoft Word Package and Statistical Package for the Social Science (SPSS) based on the findings within the themes to ensure validity and reliability of the information obtained. The study developed performance indices to measure time, cost, and quality performance, as well as a pairwise analysis

using independent t-tests to test significant performance differences, and a multiple regression analysis using the Statistical Package for Social Sciences.

3.10 ETHICAL CONSIDERATIONS

Appropriate permission was sought from Consultants, Project Managers, and all concerned for ethical clearance. Every contacted respondent express concern was duly approved and briefed at every phase to afford the researcher the opportunity to discuss the purpose, benefit and data collection timelines for the study.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1 INTRODUCTION

The aim of this study is to assese the influence of Project Management Practices on the performance of Building Projects in the Ghanaian Construction Industry. The focus is on the data collected from the field as well as the analysis and interpretations concentrating on the stated objectives and questions of the research in relation to the relevant literatures and researcher's interpretations.

4.2 PRACTICES IDENTIFIED

The key PM activities preseted in Table 4.1. The available different ways to perform these activities are defined as PM practices. Most exercises were identified in a personal interview. Some of the identified practices were inherent in an organization. other practices were common to two or more organizations. The identified practices are the ones currently existing. However, respondents' comments found that some practices that currently apply to two or more organizations have been adopted by other organizations. For example, one interviewee noted, "The practice of engaging external project consultants through competition was not initially done by the 'SIF' organization." Table 4.1 shows the main identified PM practices and the potential impact some of them may have on project performance, as the interview indicates.

4.3 MEASURING TIME, COST AND QUALITY PERFORMANCE

The performance of the construction projects is, as already mentioned, measured against the three criteria; Time, Cost and Quality, was measured by indices on an 11-point scale of 0.5 to 1.5. The time and cost indices were determined by calculation from the formula, while the quality performance was subjectively measured by each respondent, which in his own estimation indicates the extent to which the quality of the project deviates from the expected; the margin of deviation is given as a percentage. The formula and the indices are given below in Table 4.2.

$$\text{Time Performance Index} = \frac{\text{Planned Contract Period}}{\text{Actual Construction Period}}$$

Table 4.1 Time Performance Index

Project Completion Status Achieved	Completed behind schedule					Completed on schedule	Completed ahead of schedule				
Index	0.5 and below	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5 and above

Source: Field survey, 2018

$$\text{Cost Performance Index} = \frac{\text{Initial Project Cost}}{\text{Final Project Cost}}$$

Table 4.2 Cost Performance Index

Project Cost Status Achieved	Completed above initial estimated cost					Completed As estimated	Completed below initial estimated cost				
Index	0.5 and below	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5 and above

Source: Field survey, 2018

Table 4.3 Measure of Quality Performance

Project Quality Status Achieved	Below expectation by about					As expected	Above expectation by about:				
Margin	50% and below	40%	30%	20%	10%		10%	20%	30%	40%	50% and above

Source: Field survey, 2018

The time performance, cost performance, and quality performance represent the dependent variables in the regression analysis carried out for determination of PM practices influencing performance of the projects (*c.f* Cooper, 2008). The PM practices are thus the independent variables and these are indicated in Appendix I. The indices represent the points on the regression Y-axis whilst the points of ranking indicating the level of effect of each PM Practice on overall performance, as in Appendix I, represent points on the regression X-axis.

4.4 RESPONSE TO DATA COLLECTION

A total of 108 questionnaires were distributed. Each questionnaire was developed to receive data on a project. Therefore, information on 108 projects was expected. The response rate was 61%. The data comes from 22 projects of the "Joint Fund" organization, 20 from the organization "SIF" and 24 from the organization "GETFund". Several contacts were made both personally and by telephone to obtain the remaining questionnaire. The non-response could be partly due to respondents' complaints about the type of data requested; Data on completed projects. Such data had to be retrieved from archives, resulting in remarkable unwillingness. The response rate, however, is acceptable and was used for the analysis. The number of projects received also corresponds to the requirement of the statistical method used for the analysis.

Most interviewees were senior executives who were seen as leaders in their respective companies. No respondent also showed a lack of understanding of the concepts studied; PM practices and project performance. It was therefore expected that these background

characteristics of the respondents provided reliable data, as it was expected that the provision of answers would be accompanied by sufficient experience in project management in the construction industry and the element of authenticity.

Appendix II shows the indices and points that indicate the extent of the impact of PM practices achieved by each project on a project-by-project basis. The table forms the basis for the regression analysis.

In each organization, information about a project's performance and PM practices represents the results of a single respondent. The performance indices and points for indicating the impact of PM practices on performance are regression graph points. The performance indices are points that appear on the y-axis and the points of action of the PM practices are points on the x-axis. In a multiple regression analysis, three dependent variables and forty-nine independent variables are used.

4.5 GENERAL DEVELOPMENT OF THE PROJECTS

A calculated index of less than 1.0 indicates an underperformance or below the trend, while 1.0 or above corresponds to the trend. To understand the performance trends of all projects, see Tables below for a descriptive summary of the performance indexes project by project.

Table 4.4 Time performance trend of projects

Time Performance Index	**No. of Projects obtained under:**					**overall Trend Performance**		
	GETFund	**Common Fund**	**SIF**	**Total**	**Percentage**		**No.**	**%**
0.5	13	3	-	16	24.2	Completed behind schedule	58	87.9
0.6	7	12	-	19	28.8			
0.7		4	8	12	18.2			
0.8	2		7	9	13.6			
0.9	-	2	-	2	3.0			
1.0	2	1	5	8	12.1	Completed on schedule	8	12.1
Total	**24**	**22**	**20**	**66**	**100**		**66**	**100**
Mean Index	**0.60**	**0.65**	**0.81**					

Source: Field survey, 2018

Table 4.5 Cost performance trend of projects

Cost Performance Index	**No. of Projects obtained under:**					**overall Trend Performance**		
	GETFund	**Common Fund**	**SIF**	**Total**	**Percentage**		**No.**	**%**
0.6	5	-		5	7.6	Completed above initial budget	39.3	59.1
0.7	14	--		14	21.2			
0.8	2			2	3.0			
0.9		12	6	18	27.3			
1.0	3	10	9	22	33.3	Completed as budgeted	22	33.3
1.1			5	5	7.6	Completed below initial budget	8	7.6
Total	**24**	**22**	**20**	**66**	**100**		**66**	**100**
Mean Index	**0.73**	**0.95**	**1.00**	**-**	**-**			

Source: Field survey, 2018

Table 4.6 Quality performance trend of projects

Cost Performance Index	**No. of Projects obtained under:**					**overall Trend Performance**		
	GETFund	**Common Fund**	**SIF**	**Total**	**Percentage**		**No.**	**%**
0.9	-	-	10	10	15.2	Below expectation	10	15.2
1.0	10	17	2	29	43.9	As expected	29	40.9
1.1	4	5	5	14	21.2	Above expectation	27	41.9
1.2	10	-		10	15.2			
1.5	-	-	3	3	4.5			
Total	**24**	**22**	**20**	**66**	**100**		**66**	**100**
Mean Index	**1.10**	**1.02**	**1.05**		**-**		**-**	**-**

Source: Field survey, 2018

In terms of construction time, cost and project quality, 87.9%, 59.1% and 15.2%, respectively, were below trend. The obtained trend shares show that the project performance prevails below the trend in the projects. However, the quality trend of all projects is better than the cost and time performance. This could be due to the fact that customers are more likely to look for projects of satisfactory quality than projects built before or after the schedule and as planned or

under budget (Bubashit et al., 2004). There are indications that while time and costs are at risk, quality is difficult to sacrifice.

4.6 DIFFERENCES IN THE IMPLEMENTATION OF PROJECTS FROM ORGANIZATION TO ORGANIZATION

Although it is not the goal of research to determine which category of projects performs better than the other, it is very useful to find out if project performance varies from organization to organization. An independent t-test was adopted to obtain a two-sample t-test at a significance level of = 0.05 to pair the existence of any significant difference between the performance of the categories of construction projects; The performance of project categories in two organizations was compared at the same time. Tables 4.4 - 4.6 give the results of the test. The null hypotheses required to perform the test are as follows:

The performance of the construction projects within the organization "GETFund" does not differ significantly from the performance of the projects within the organization "Common Fund" (Phua & Rowlinson, 2004).

i. e. Ho ; $\mu g - \mu c = 0$

Performance of the building projects within 'GETFund' organization does not differ significantly from performance of the projects within the 'SIF" organization.

i. e. Ho ; $\mu g - \mu s = 0$

Performance of the building projects within 'Common Fund' organization does not differ significantly from performance of the projects within the 'SIF" organization.

i. e. Ho ; $\mu c - \mu s = 0$

The null hypothesis is rejected when either $t \geq t\alpha/2,m + n - 2$ or $t \leq - t\alpha/2,m + n - 2$

Where μg represents sample mean for GETFund organization

μ**c** represents sample mean for Common Fund organization

μ**s** represents sample mean for SIF organization

t represents the calculated *t*

$t\alpha/2,m + n - 2$ represents *t* obtained from tables

The t-tests were performed 2-tailed with an alpha significance level of 0.05. Therefore, a calculated significant value less than 0.05 means that there is a significant difference between the performance of the two grouping variables to be tested. Table 4.4 shows that both the significant values and the t-values show that the duration of projects within the "GETFund" organization does not differ from that of the "Common Fund" organization, whereas between the "GETFund "and" SIF "organizations, "there is a significant difference in the temporal performance of the respective categories of projects" (*see www.hiphing.com*). Similarly, the "Joint Fund" and "SIF" organizations show significant differences between the timelines of their respective projects.

Table 4.5 shows that the cost performance of projects within one organization is different from the other two. In terms of quality performance, Table 4.6 reflects the lack of general differences between organizations. While the quality performance of projects managed by the GETFUND organization differs from that of the Joint Fund organization, there is no significant difference between the GETFund and the SIF and the Joint Fund. and the "SIF". The occurrence or non-occurrence of differences in performance may be due to a number of factors. However, the focus is on aspects of PM practices within organizations.

Table 4.7 Independent Samples T-Test with Time performance as Test Variable

Grouping Variable	**t-test for Equality of Means**				**Conclusion**	**Decision**
	tα/2,m + n – 2	**T**	**df**	**Sig. (2-tailed)**		
'GETFund' and 'Common Fund' Organizations	2.021	-1.294	44	0.202322	Fail to Reject Null Hypothesis	Time Performance difference NoT SIGNIFICANT

'GETFund' and 'SIF' organizations	2.021	-5.101	42	0.000008	Reject Null Hypothesis	Time Performance difference SIGNIFICANT
'Common Fund' and 'SIF' Organizations	2.021	-4.117	40	0.000187	Reject Null Hypothesis	Time Performance difference SIGNIFICANT

Source: Field survey, 2018

4.6.1 Release of Funds for Payments

A common practice at the GETFund and Common Fund organizations is the release of funds for projects on a regular schedule. Irregularities and delays are usually associated with the disbursement of funds in this way, and the projects experience delays due to customers' insolvency. The GETFund and the Joint Fund organizations have shared this practice of periodic release of project funds and this could explain why no significant differences are found between the timelines of their respective projects.

There is a significant difference between the time performance of "SIF" projects and the other two organizations. one observation that can be attributed to this difference is that the "GETFund" and "Joint Fund" organizations make payments when funds are released that enable SIF organizations to make payments from a central source when projects require funds to proceed, because the budget for this specific project was originally set by the organization. The practice is intended to minimize the occurrence of delays in payments, which are usually associated with irregularities in the periodic release of funds for the project.

Financing the entire project

While the GETFund and the Joint Fund organizations fund a single project, with only funding from a single source of the organization, the SIF organization supports the funding of the project with partial contributions from the project end-users.

By supplementing project costs with end-user contributions, it is intended to minimize potential bottlenecks in project funding and reduce the associated delays in project progress. Funding projects that are differentiated by the other organizations' "SIF" organization explains why the timing of their projects differs from the other two organizations.

Project identification in the preliminary design phase

The identification of construction projects, as carried out in the GETFund and the Joint Funds organizations, will be carried out either by the end-users or by the organization's implementation of an annual development program. It is not known that end-user identification follows a specific set procedure. Within the SIF organization, however, end users are fully

involved in the identification of projects. This identification process follows the established integrated functions formally performed by the organization's officers in conjunction with the end users. This practice of identifying projects, which is carried out differently by the organization "SIF", may also explain the temporal differences in performance occurring in Table 4.4

Take feedback from completed projects

In reporting completed projects to improve the performance of subsequent projects, the 'SIF' organization uses the desk & field appraisal and project evaluation methods and not the project progress reports that were generated during the project's execution. The use of feedback assessments and / or evaluations tends to improve project performance. The temporal performance of a project fed with information by this method would therefore differ from a project using a varying method.

Table 4.8 Independent Samples t-test with Cost performance as Test Variable

Grouping Variable	t-test for Equality of Means				Conclusion	Decision
	tα/2,m + n - 2	T	df	Sig. (2-tailed)		
GETFund and Common Fund organizations	2.021	-8.04176808	44	3.5138E-10	Reject Null Hypothesis	Cost Performance difference SIGNIFICANT
GETFund and SIF organizations	2.021	-8.76774276	42	4.8821E-11	Reject Null Hypothesis	Cost Performance difference

						SIGNIFICANT
Common Fund and SIF organizations	2.021	-2.504	40	0.016455	Reject Null Hypothesis	Cost Performance difference SIGNIFICANT

Source: Field survey, 2018

4.6.2 Evaluation of work done for payments

In contract management, contractors normally arrange for the evaluation of the work for the subsequent review and approval of the consultant. This is observed within the GETFund organization. Within the organization of the Joint Fund, the consultant will often conduct a full interim evaluation on behalf of the contractor after the contractor has requested it. The SIF organization does the same, but only when the work reaches a defined phase.

4.6.3 Variations in the Original Scope of the Work

Table 4.5 indicates that the cost-effectiveness of the category of projects within one organization differs from that of other organizations. It is observed that the different amount of original work is handled differently by all organizations, and therefore the significant

difference in the cost performance of the projects of all organizations can be partly attributed to it. Similarly, Walker (1995) found that the scope of the work has an impact on project performance. The extent to which the organization "GETFund" extends the scope of work largely depends on the quality and design requirements of the customers. While the scope of the work of the SIF organization largely depends on the budget, the variations of the Joint Fund organization are sometimes determined by the end users. The problem of variation plays an important role in the cost-effectiveness of the projects of all organizations and is advocated by Chan and Chan (2004), in which the cost of the project was defined with variation as a major component from which the project costs originate.

4.6.4 Consultant Selection

When selecting project consultants, the organization "GETFund" is predominantly used (ie non-competitive). The organization of the "Common Fund" often combines both competitive and non-competitive methods for selecting individual-contract advisers, while the SIF has recently observed advisors selecting, mostly by competitive method, either an individual contract or a number of contracts , No selection method is considered the best for all situations. The selection system for consultants was found to be different for all organizations and this could also explain the difference in cost performance observed in all organizations.

4.6.5 Determining the Winning Bid

The merit point system for bids is mainly used by the GETFund organization. Within the "Joint Fund", the determination of the winning bid is largely based on the project costs

estimated by the adviser. The basis for selecting the successful bid, as it is done within the SIF organization, is slightly different from the two methods above, as this is mainly influenced by the organization's budget set for the specific project. The price of the successful bid has a lot to do with the cost of a particular contract and therefore this difference in practices across organizations could be responsible for the observed cost performance differences.

Table 4.9 Independent Samples t-test with Quality performance as Test Variable

Grouping Variable	t-test for Equality of Means				Conclusion	Decision
	tα/2,m + n - 2	T	df	Sig. (2-tailed)		
'GETFund' and 'Common Fund 'organizations	2.021	3.555	44	0.001	Reject Null Hypothesis	Quality Performance difference SIGNIFICANT
'GETFund' and 'SIF' organizations	2.021	1.044	42	0.302	Fail to Reject Null Hypothesis	Quality Performance difference NoT SIGNIFICANT

'Common Fund' and 'SIF' organizations	2.021	-0.592	40	0.557	Fail to Reject Null Hypothesis	Quality Performance difference NoT SIGNIFICANT

Source: Field survey, 2018

The quality of the projects was subjectively measured and the satisfaction with the quality was evaluated. Ultimately, the client's satisfaction with the quality of the project being carried out is the one that all parties involved in a project pay close attention to (Parfitt & Sanvido, 1993). If the customer is satisfied, other members of the project team would always be satisfied. Therefore, most of the quality performance practices were expected to be dominated by the customer, as the customer's main concern is usually quality.

4.6.6 Pre-financing of Construction Works

When pre-financing construction works, it was pointed out that either the contractor would use his own capital or the principal would pre-finance the contractor's mobilization money. The GETFund and SIF organizations usually use the combination of these two types of refinancing. However, the advance of the mobilization loan by the client to the contractor is more frequent within the "SIF" organization than in the "GETFund" organization. The organization of the

"Joint Fund" has this practice of the client, which together with the "SIF" organization provides pre-financing loans.

If the customer continues the mobilization, he should have requested more from the contractor than he would have done from the beginning of the project. The expectation can or may not be realistic and this can affect the quality of the work done. The quality performance difference resulting from the significance check in Table 4.6 could be attributed to this phenomenon. This observation supports Naoum's (1994) finding that customer expectations have an impact on project performance.

4.6.7 Remuneration of Payment Certificates

In a normal process of recognizing payment certificates, the client's team has appointed persons to check and confirm each other before the contractor receives the payment. The GETFund and SIF organizations have in common that the involvement of their national / regional headquarters / secretariat is crucial in this process. However, the contractors have reported that this process was not marked by delays and is therefore generally motivated to do satisfactory work. This may also contribute to the reasons why there is no significant difference between the quality performances of their respective projects. In the organization of the Joint Fund, the participation of the national headquarters / secretariat of the organization is not part of the process. However, contractors usually report delays in this process and are usually not motivated to carry out satisfactory work if the payment is unduly delayed. The significant differences in performance between the respective projects of the "GETFund" and the "Joint Fund" can be attributed to these events.

4.6.8 Create and Execute Site Statements

In all organizations, the advice of the counsultant is usually given verbally and in writing. If the instruction is oral, the contractors are contractually obliged to confirm prior to execution that they will serve as an appropriate reference in the event of a poor performance of the instruction. Most contractors who work on the GETFund organization often say they have confirmation before executing the construction site instructions, while those working on the Common Fund seldom do so. This may be responsible for the existence of significant differences between the quality performances of their respective projects. In some cases, it is also reported that contractors accept instructions from the site supervisor from the customer's team without the agreement of the project's consultant. This procedure is not adhered to by the GETFund organization.

4.7 DETERMINATION OF SIGNIFICANT PM PRACTICES

Mansfield et al (1994) indicated the differences in performance between some paired organizations and the lack of performance differences of some paired organizations all have an impact on specific PM practices. The step-by-step methodology used a regression analysis to identify PM practices that significantly impact the performance of construction projects in each of the three organizations. Table 4.7 show PM practices that significantly affect time tracking, cost performance and quality performance in each of the organizations. The regression was performed with an α-significance level of 0.05. The beta coefficients give an indication of the contribution of each of the significant PM practices, the significant independent variables, in a

model. For each organization a model is developed. The significance values denoted by (Sig.) Are all less than 0.05, the significance level at which the regression was performed. And this shows that they have a significant impact on each dependent variable. The adjusted R-squared value also shows the percentage of variation of a dependent variable that explains the model.

The regression analysis yields the following PM practices that significantly affect the time performance of projects received by the GETFUND organization:

1. "The contractor will first prepare the claims for each interim evaluation for the subsequent review of Consultant ";

2. "The contractor confirms all instructions, verbally or in writing before execution";

3. "Advisor preparing the offer by the client within a certain period of time"; and

4. "Selection of the contractor by pre-qualification based on previous work experience with the customer"

A positive beta indicates that there is a positive relationship between PM practice and performance and a negative beta value negative relationship. As a result, it has been found that the PM practice "Advisor preparing the offer for a certain period of time" as conducted within the "GETFund" organization has a negative relationship to time performance. The consequence of this is that in construction projects where the time performance was poor, consultants were first and foremost encouraged to create bids within a certain period of time.

on the other hand, for projects that have increased timeliness, contractors usually prepare their claims first for each interim evaluation so that the consultants can subsequently review them.

PM practices that have a significant impact on the timeliness of projects within the "Joint Funds" organization include "Assessment and Awarding of Contracts by Credit Point System" and "Selection of Contractors through pre-qualification based on previous work experience with customers ". , The latter also emerged within the "GETFund" organization as a significant PM practice, which similarly had a significantly positive relationship to the time performance of the respective projects. Thus, there is an indication to both organizations that customers are more comfortable working with contractors they have already worked with to achieve a satisfactory performance. The question that both organizations have a common PM practice that affects time recording may partly explain why there were no different timelines for the projects managed by the GETFund and the Joint Funds organizations.

In managing the projects within the "SIF" organization, two PM practices were identified: "The end users themselves are allowed to identify the project" and "The client and the consultant jointly review the work at all local events to monitor progress "have a significant effect on the time performance; their effects are negative. It can therefore be concluded that the poor implementation of the projects audited in the SIF organization is mainly due to the existence of these practices, with all other factors being equal.

The observation of all three organizations did not result in any of these two major PM practices of the "SIF" organization within the other two organizations. A review of the T-tests also shows that the time-out of projects within the "SIF" organization differs from that of projects within

the other two organizations. Therefore, the significant PM practices within the "SIF", which are different from the other two organizations, could partly responsible for the time differences identified in Table 4.4 of all the PM practices carried out by the GETFund organization in the management of the construction projects, it was observed that the "pre-financing of construction work through its own capital base" had the greatest impact on the cost effectiveness of the respective projects. However, the relationship is negative and shows that the practice was more important as the cost of the projects was reduced. Within the organization of the "Joint Fund", the selection of staff for projects based on the project's specialization requirements proved to be the most significant PM practice, contributing to higher cost performance. one explanation for this could be the fact that specialized construction professionals have more experience and are therefore able to work efficiently, ultimately leading to cost reductions. The PM practice of "allowing end users to identify projects before execution" was the only practice that significantly impacted the cost-effectiveness of projects within the SIF organization. In addition, it has been found that the practice has a downward relationship with cost performance.

A thorough examination Table 4.7 shows that none of the key PM practices that affect cost efficiency are common to at least two of the organizations. Accordingly, the t-test showed that the costs of projects within one organization differed from the other two. As a result, the cost effectiveness of each project differs significantly from one organization to another, as significant PM practices that affect the cost-effectiveness of projects vary from organization to organization.

From the regression analysis it was found that the PM practice "time to prepare the bid after completion of the draft" has the biggest impact on the quality of the projects within the GETFund organization. It is important to note that the customer normally controls the time to prepare the bids. The selection of project consultants is also carried out by the customer. This competitive measure has had a negative impact on the quality of projects within the GETFund organizations. It has been found that practices related to payments to contractors that are largely controlled by the client have a significant impact on the quality of the projects received from the GETFund and the Joint Funds. The PM practices that affect the quality of the projects received by the "SIF" organization are: "Customer and consultants jointly review the work on each site visit to monitor progress" and "Contractor will guide the project team of the project Clients through, without confirming the consultant "It must also be noted that these practices are also dominated by the customer.

An observation of the nature of all PM practices that significantly relate to the quality performance of projects received from all three organizations shows the existence of a common feature; the dominance of the customer. Therefore, this is an indication that the customer plays an important role in realizing a particular quality performance of a project. This can be explained by the common characteristic of the customer, which is involved in the practices that influence the quality of the projects in all organizations.

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CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study is to assese the influence of Project Management Practices on the performance of Building Projects in the Ghanaian Construction Industry. To achieve this goal, four goals were:

i. Identification of the project management methods used to manage the selected construction projects in the organizations
ii. Measuring the time, cost and quality of the construction projects carried out in the organizations
iii. Determine if the performance of construction projects managed by one organization differs significantly from the performance of construction projects managed by another organization
iv. Identify PM practices that significantly impact the performance of construction projects in organizations

5.2 IDENTIFIED PM PRACTICES

Table 4.1 shows the performance index that prevail in the organizations. While some of the practices of one organization are unique, other two or all organizations are common. PM practices such as: The pre-financing of contractors works with money as the pre-mobilizations provided by the customer; Project funds received quarterly; The monitoring of the progress of

work between the project consultant and the local customers, in accordance with the specially developed project monitoring progress report format, was specific to the GETFund, Common Fund and SIF organizations. The practice of bearing the entire project cost with the support of local customers is identified as a "SIF" organization. other PM practices: "selection of project consultants in the competition", "selection of contractors through open tenders", etc. are common to all three organizations.

5.3 MEASUREMENT PROJECT PERFORMANCE

A trend of project performance was obtained by calculating the time, cost and quality performance of the projects within each organization. In terms of time, 87.9% of the 66 projects received by the organizations were below trend; These projects were completed behind schedule. In addition, 50.1% of the projects were over budget; performed under the trend. In terms of quality performance, only 15.2% of projects were below trend. Satisfaction with the overall quality of the projects was high.

5.4 COMPARING THE PERFORMANCE OF THE PROJECTS BETWEEN THE ORGANIZATIONS

The observation of the existence or non-existence of significant differences between the projects studied in the three organizations was done in pairs using the independent t-test. Where a significant difference was noted, it was also observed that the respective significant PM practices also varied and vice versa.

5.4.1 Time Difference of the Projects

From Table 4.4 it can be seen that the test for equivalence of the averages with the time performance as a test variable indicates that the time duration of the projects within the "GETFund" organization does not differ significantly from those within the "Common Fund" organization. The temporal performance of the projects received by the "SIF" organizations differs significantly from all other organizations. It was found that the differences that emerged stem from different practices regarding the release of project funds, the total funding of projects and the recognition of payment certificates

5.4.2 Different costs of the projects

The independent T-test in Table 4.7 shows that there are significant differences in the cost-effectiveness of projects in all three organizations. It was found that the significant differences found were due to differences in practice relating to the change in the original scope of the contract, the selection of the consultant, the award decision and the interim evaluation of the works.

5.4.3 Difference in Quality Performance of the Projects

The quality of the projects within the "GETFUND" organization was significantly different from the projects managed by the "Joint Fund" organization, as shown in Table 4.5. This significant difference is mainly due to the practice of pre-financing the works, paying payment and carrying out works.

5.5 IMPORTANT PM PRACTICES AFFECTING PROJECT PERFORMANCE

5.5.1 Significant PM practices with Respect to the Temporal Performance of the Projects

The regression analysis in Table 4.7 (a) showed that the model indicative of significant PM practices in terms of temporal performance represented 84.7%, 76.4% and 89.3% of the temporal changes of the projects under the "GETFund", the joint fund, can explain "and" SIF "organizations.

Not all significant PM practices are positively proportionate to the time performance of projects within the GETFund organization. However, it was noted that all major PM practices related to the timely implementation of projects within the organization of the "Joint Fund" had a positive relationship, while the organizations within the "SIF" organization had negative relationships.

A common PM practice, where pre-qualification contractors were selected, largely based on previous work experience with customers, had a significant impact on the timeliness of the projects studied within the GETFund and the Joint Funds organizations. However, between the organizations "GETFund" and "SIF" as well as between the organizations "Joint Fund" and "SIF", all PM practices that significantly relate to the temporal performance of their respective projects differed from organization to organization.

5.5.2 Key PM Practices in Relation to the Cost of the Projects

The regression analysis in Table 4.7 showed that the model indicating significant PM cost performance practices represented 58.5%, 80.5% and 97.0% of the quality variations of GETFund, the Common Fund. examined projects "and" SIF "organizations.

Not all key PM practices are positively proportionate to the cost performance of projects within the GETFund organization. However, all the major PM practices regarding the cost-effectiveness of projects within the "Joint Funds" organization proved positive, while the single key PM practice within the "SIF" organization was negatively related to the cost development of the respective projects. All PM practices that significantly affect the cost effectiveness of each project varied from organization to organization.

5.5.3 Key PM Practices Related to Project Quality

The regression analysis in Table 4.7 showed that the model indicating significant PM performance-related PM times represented 84.7%, 76.4%, and 89.3% of the time evolution of projects under the "GETFund", the joint fund, can explain "and" SIF "organizations.

Not all major PM practices are in a positive relationship with the quality performance projects within the GETFund and SIF organizations. However, the significant PM practice regarding the timing of projects within the organization of the "Joint Fund" showed a positive correlation with the quality of the respective projects.

Involving the client in the project management process is seen as a common feature that dominates PM practices that affect the quality of projects in all organizations.

5.6. SUMMARY

Since the objectively measured performance of the projects shows a significant difference from organization to organization, it is observed that the corresponding significant PM practices that affect the corresponding performance also vary from organization to organization and vice versa.

5.7 RECOMMENDATION

5.7.1 Specific recommendations

The function of identifying projects through systematic procedures should be encouraged for each individual project. This should not just be left to the end users of a project. This should be organized into an integrated function involving project financiers and end users as well as project consultants.

1. In the competitive selection of consultants for a contract or set of contracts, prior work experience with the customer should always be one of the factors to be given high attention. Pre-mobilization of contractors should motivate them to perform satisfactory work, and this should therefore be practiced in each project.
2. In order to minimize delays in the recognition of payment certificates after they have been issued, the number of people involved in the process of review and confirmation should be reduced only those who would be held accountable in the

event of a false payment. Contractors should always confirm oral instructions given by the client's advisor or team members prior to execution.

3. A link between the regional / regional / local organizations the offices of the clients and the national headquarters should be highlighted and always work to enable effective monitoring of projects. This should be practiced in evaluating construction works for payment at certain stages of the project should be carried out as far as possible according to projects manager and that, it is believed, will always urge contractors to work at an increased pace.

4. The source of funds for every project should be well defined at the beginning of every project. If possible a project account should be opened for every project and the cost as pre-determined be lodged in to ensure fund availability as and when required so that projects could be finished in time. To avoid cost overruns in projects, Project managers should be included in cost determination at the beginning of projects. Engineers and architect should come out with a well detailed drawings with specifications well spelt out to help quantity surveyor to come out with the right cost of projects. This will help avoid unneccessory claims that usually results in cost overruns and conflicts the impead progress.

5. To ensure quality of of works, total quality management could be employed in all projects. Qualified project managers should be employed and entrusted the responsibity to train and ensure all involved in the project understand the importance of quality in project execution. Since most of our artisans and labourers who are normally directly

involve in the works execution usually lack formal education and training more serminars should be organized for them to explain quality requirement requirement to them.

6. For successful delivery of projects, construction companies should be mandated to employ qualified project managers to ensure proper management practices are carried out and measured throughout the project execution process.

5.7.2 Recommendation for Further Studies

For further studies, it is recommended that more performance measures recently developed in other research (eg end-user benefits, national infrastructure benefits, etc.) be included in the measurement. Thus, the projects should not necessarily be organization-based. This should lead to the development of a predictive model for the determination of PM practices that promote increased project performance and those that contribute to poor project performance.

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APPENDIX 1: QUESTIONNAIRES

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI, GHANA

Msc PROJECT MANAGEMENT

EMPIRICAL ASSESSMENT OF HOW PROJECT MANAGEMENT PRACTICES HAS IMPACTED THE SUCCESS FACTORS IN THE CONSTRUCTION INDUSTRY OF GHANA

Dear Participant,

I am a post-graduate student from the above university carrying out a study on the stated topic. You are requested to fill this questionnaire to help me complete my thesis. The information gathered with this questionnaire is wholly for academic purpose. Please tick the alternative information that is most appropriate and will take 5-10 minutes to respond to these questionnaires.

Thank you for participating in my research.

SECTION A: BACKGROUND OF RESPONDENT

1. To which of the following status in your firm do you belong?

[ ] Senior staff

[ ] Junior Staff

2. Before reading this questionnaire, to what extent had you encountered the concepts, Project Management (PM) Practices and Project Performance

[ ] Had read and understood concepts deeply

[ ] Had read but understood concepts narrowly

[ ] Had not read but understands concepts from practice

(3) Within *your organization* why would a PM practice affect the performance of a given building project more significantly than another PM practice would? *(Please tick as many as are applicable*

[ ] Due to ability of PM practice to accelerate achievement of set project objectives

[ ] Due to the consultant's ease of carrying out the PM practice

[ ] Due to consultant and contractor being commonly familiar with the PM practice

[ ] Due to ability of the PM practice to facilitate achievement of client's own goals

[ ] Please state if other reason.....

……..

(4) Could difference in project performance from organization to organization be engendered by PM practices varying from organization to organization?

[ ] Yes

[ ] No

(5) Which of the following would you say makes your organization regard a given PM practice more relevant to project performance whilst a similar organization would regard the same practice less relevant to project performance?

[ ] Due of ability of the PM practice to enhance achievement of peculiar organizational goals

[ ] My organization being used to applying the PM Practice more frequently than other organizations

[ ] Please state, if other reason …….

……...……..……

…….

(6) Why would you recommend that the PM practice carried out for management of a given project executed within your organization be generally adopted for management of projects of similar nature within other organizations?

[ ] Due to ability of practice to contribute to project success

[ ] Due to ease with which practice can be implemented

[ ] Carrying out practice paves way for winning subsequent jobs from client

[ ] The practice accelerates achievement of client's goals

[ ] Would not recommend for any practice to be carried out by another organization

[ ] Please state if other reason

……

……

…….....**.....**

SECTION B: PERFORMANCE INFORMATION ON A SELECTED PROJECT

7) Please select one building project, executed within *your organization,* satisfying the following criteria and provide the subsequent performance information on it

(i) The building project should be education related and substantially completed (i.e. either practically completed, handed over or commissioned)

(ii) Building project should have been substantially completed after year 2002

(iii) Building project should have been executed under traditional procurement method

(iv) Building project should have started as a new construction.

SECTION B: IDENTIFY THE PROJECT MANAGEMENT PRACTICES CARRIED OUT BY THE CONSTRUCTION INDUSTRY IN GHANA.

1. Project management practices. Please tick as appropriate.

1= Not at all, 2 = little extent, 3 = some extent, 4 = Great extent, 5 = Very great extent

	1	*2*	*3*	*4*	*5*
A. Identification of Projects before execution					
End users themselves being allowed to identify the project					
The project being determined in line with government's annual development plan					
Project being identified through collaboration of client's project officers and project end users					
Determining the project to be executed based on political considerations					
If other (please specify)					
B. Selecting Project Consultant					
Selecting project consultant by direct appointment (i e, not competitively)					
Selecting project consultants competitively					

Basing consultant to be selected on project financial seize					
Selecting consultant largely based on previous working experience with client					
Basing consultant selection on project's specialization requirements					
If other (please specify)					
C. Preparing bids for invitation					
Consultant preparing the bid under given time period by client					
Basing time for preparation of bid on completion of design					
If other (please specify)					
D. Selecting Project Staff					
Appointing staff for the project based on educational qualification and experience					
Choosing staff for projects based on specialization demands of project					
Selecting managers/coordinators for the project based on integrity and					

leadership qualities					
If other (please specify)					
E. Entire Financing of project					
Bearing entire cost of project through combination of project funds and project end users contributions					
Bearing entire project cost with project funds only					
Bearing entire cost of project with funds provided by project end users only					
If other (please specify)					
F. Awarding of Contract					
Assessing and awarding of contract by merit point system					
Awarding of contract mainly based on tender price submitted by contractor					
Awarding of contract largely based on consultant's pre-determined time and cost estimate of project					
Setting award price of contract based on client's pre-determined budget					
If other (please specify)					

G. Selecting Contractor					
Selecting the contractor on open competitive basis					
Selecting the contractor through prequalification based on previous working experience with client					
The contractor being selected on negotiated contract basis					
If other (please specify)					
H. Pre-financing construction work					
Client providing advance mobilization to pre-finance from project fund to contractor					
Client having no advance mobilization facility; (i. e. contractor being expected to pre-finance)					
End users of project taking up part or whole of cost of mobilization					

If other (please specify)					
I. Monitoring progress of works					
Monitoring progress of works solely by consultant's routine visits					
Monitoring progress of works with occasional involvement of client's project team					
Client and consultant jointly inspecting works on all occasions of site visit to monitor progress					
Carrying out progress site meetings only in response to peculiar problems at site					
If other (please specify)					
J. instructions and variation					
Ordering work variations only through written instructions from consultant					

Ordering variations by means of verbal and written instructions from consultant					
Client project team giving site instructions without knowledge of project consultant					
All site instructions given verbally by consultant					
If other (please specify)					
K. Obtaining Project funds for payment					
Client obtaining project funds on annual basis					
Client obtaining project funds on quarterly basis					
Client obtaining project funds from established budget as and when needed					
If other (please specify)					

L. Payment to contractor					
Procedure for payment involving both client team members and consultant					
Procedure for payment involving only client's team members					
If other (please specify)					
M. Interim valuing of works					
Consultant carrying out every interim valuation on behalf of contractor after application for interim payment certificate					
Contractor first preparing claims for every interim valuation for subsequent vetting of consultant					
Some interim valuations being carried out entirely by consultant on behalf of contractor and some being vetted after contractor has prepared					
If other (please specify)					

N. Carrying out site instructions					
Contractor confirming all instructions, verbal or written before executing					
Considering consent of client before carrying out any variation					
Contractor confirming only verbal instructions before carrying out					
Contractor carrying out consultant's instructions immediately they are issued					
Contractor carrying out instruction from client's project team without confirming from consultant					
If other (please specify)					

2. **Measurement of time performances**

In the table below, please indicate the time performance of the selected project by ticking its corresponding time performance index obtained. (Alternatively you may provide the figures in the formula below)

$$\text{Time Performance Index} = \frac{\text{Planned Contract Period}}{\text{Actual Construction Period}}$$

Project Completion Status Achieved	Completed behind schedule					Completed on schedule	Completed ahead of schedule				
Index	0.5 and below	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5 and above
Please Tick											

3. **Measurement of cost performances**

   In the table below, please indicate the cost performance of the selected project by ticking its

Corresponding cost performance index obtained. (Alternatively you may provide the figures in the formula below)

$$\text{Cost Performance Index} = \frac{\text{Initial Project Cost}}{\text{Final Project Cost}}$$

Project Cost Status Achieved	Completed above initial estimated cost					Completed As estimated	Completed below initial estimated cost				
Index	0.5 and below	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5 and above
Please Tick											

4. **Measurement of quality performances**

In the table below, please indicate the quality performance of the selected project by ticking its corresponding quality performance margin obtained.

Please note that quality performance margin is, in your own estimation, the extent to which the quality of the project deviated from what was expected.

Project Quality Status Achieved	Below expectation by about	As expected	Above expectation by about:

Margin	50% and below	40%	30%	20%	10%		10%	20%	30%	40%	50% and above
Please Tick											

Thank you for taking the survey.