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# Impact of Project Management Practices on Evaluating Project Performance: Evidence from GETFund and District Assembly Common Fund

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***Abstract***

*The focus of this treatise is on the relationship that exists between Project Management Practices carried out by Project Management Organizations on project performance. Two organizations tangled in the management of projects were carefully chosen as project management organizations for the treatise. These are 'GET Fund' group and 'Common Fund' body. Three criteria for evaluating project performance were recognized for their extensive application in project management description and general understanding amongst practitioners. These comprise: time, cost and quality criteria. Structured interviews were carried out within the selected organizations for identification of practices undertaken in the management of evaluating projects. Other momentous project management practices were also captured in relevant literature.*

*Structured questionnaire was established to gather information for evaluating of the project performance and determination of project management practices significantly relating to project performance. Performance indices were adopted for the evaluation of the time, cost and quality performance. To test for significant differences between the performances of the categories of projects, each belonging to one organization, the pair-wise analysis, using independent t-tests, was used. Multiple regression Analysis has been used to determine the relationship between the significant project management practices on evaluating performance.*

*Substantially, significant difference between the time performances of the categories of projects was observed. There was significant cost performance difference of the categories of projects across all the organizations whilst there was no significant difference in quality performance across all the three pairs of categories of projects analyzed. It was recognized that as significant difference exists between the performances of a given pair of categories of projects from organization to organization the corresponding significant project management practices also vary from organization to organization and vice versa.*

*Keywords: Project Management Practices, Evaluating Project Performance, Project Management Practices Emerging Economy, Project Management for Development, District Assembly Common Fund*

## 1.0 INTRODUCTION

This research work focuses on the impact of project management practices on evaluating project performance with a spotlight on two organizations (Ghana education trust fund and district assembly common fund). The drive of this treatise is to; ascertain the project management practices carried out within project management organizations that influence project performance. It is the belief of the researcher that the findings of this treatise will be beneficial to management and those who've been task with project management within Get fund and District assembly common fund since they will appreciate the concept and come up with ways on how to make good use of project management practices in order to achieve quality performance with regards to building projects. The findings and study recommendations are not limited to these two organizations but any other organization, policy makers or a government which sees value in it. For researchers and scholars, this treatise will also contribute to the existing body of knowledge regarding project management practices and building project performance. Furthermore, with the information that project management managed by one organization differs significantly from similar ones managed by another organization, and that is influenced by variations in project management practices carried out. In the long run organizations involved in project management in the country would have enhance quality of project management practices.

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Finally, to the individual, academia and the general public will also get to know the role of project management practices on building project performance and will also use the findings herein as reference to other studies and further research.

1.1 Background to the Study

Managing projects is one of the oldest and most respected accomplishments of mankind highlighted by the achievement of the builders of pyramids, the architects of ancient cities, the mason and craftsmen of Great Wall of China and other wonders of the World. Project make up around fifty percent of all work carried out and as a result is deemed the vehicle for the execution of organizational growth. The accomplishment of project through the application and integration of the project management process of initiation, planning, executing, monitoring, controlling and closing, is known as project management (Peter, 2005). Project management integrates these functions progressively through the project life cycle with the aim of satisfying the stakeholders and constituents according to the project's established requirements. Stakeholders are those who have a direct stake in the project while the project's constituents are those who may be impacted by the consequences of the project.

Project success is typically generated when the stakeholders and constituents express their collective satisfaction according to the degree of their involvement. Project management also includes planning, organizing, directing and controlling activities in addition to motivating what are usually the most expensive resources on the project. Project management is essentially about managing a project from its conception to its completion and needs to be discussed in terms of various stages of a project life cycle. A project could be viewed as a system, which is dynamic and ever changing from on stage to another in a life cycle (Atkinson, 1999). Considering a generic project, its status changes from that of an idea or a concept through to feasibility studies, execution and finally completion (Peter, 1918). Also, projects are nowadays far more complicated than ever before. They involve large capital investments and embrace several disciplines, widely dispersed project participants, tighter schedules, stringent quality standard and so on. This coupled with high-speed development in Information and Communication Technology (ICT), these factors have greatly influenced project management practices in taking advantages of newly developed management tools and the latest technology. The creative concept of project management is universal and generic. This cut across all cultural, natural and logistic barriers, some corporate cultures are much more supportive of project techniques than other Top managers who plan to introduce the project management discipline, or who wish to improve existing project performance, needs to take cognizance of cultural, structural, practical and personal elements.

Project management as an instruct grew out of the need during World War II for a system to concert the schedule, cost and specifications of large projects and developed in a limited number of Engineering based industries during the 1950s, 1960s and l970s. More recently, the demand for project managers has flourished, as project works has increased dramatically in a broad range of industries. In the recent decade the use of project management techniques in general business methods (planning, scheduling, and controlling) have risen sharply. Project management is now understood as a critical part of any successful, competitive business (Hoboken 2010).

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (Project Management Institute, Inc., 2008). Project management typically involves a onetime project rather than an ongoing activity, and resources manage to include both human and financial capital. Project management is often closely associated with engineering projects, which typically have a set of components that have to be completed and assembled in a set fashion in order to create a functioning product. Project management best practices currently, has attracted a lot of attention in the project management literature (Thomas & Mullaly, 2008). The current focus on Project management best practices seems to be driven by the belief that organizations will adopt project management only if it can be shown to generate value.

According to Githenya & Ngug (2014), building projects are a mix of complex processes; they further advocate the notion that, building projects are considered implemented if the work is done on schedule, on budget and achieve the set goals; as well as accepted by the client. Execution of building projects is undertaken through management practices carried out by various project managers daily.

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Specific project objectives are set to be achieved at the end of the project. The objectives may vary from one project to the other.

In order to achieve set project objectives, specific Project Management (PM) practices are carried out daily by project managers. It has been argued that the Project management practices may vary from organization to organization. Other project managers however argue that since professional practice within the construction industry is required to follow set down guidelines and ethics, Project management practices may not necessarily vary from organization to organization; the purpose of adopting a particular practice may therefore be due to peculiar environmental and social demands of the project at hand. Highly satisfactory performance cannot be compromised on and so is the need for optimum practices.

Two organizations, that is Ghana Education Trust Fund (GET Fund) and District Assembly Common Fund have been carefully chosen for the study. The Ghana Education Trust Fund (GET Fund) is a public trust set up by an Act of Parliament in the year 2000. Its core mandate is to provide funding to supplement government effort for the provision of educational infrastructure and facilities within the public sector from the pre-tertiary to the tertiary level. The District Assembly Common Fund on the other hand is established by the District Assembly Common Fund Act 1993, (Act 455) under Article 242. The purpose of setting this fund is to provide resources to support the developmental activities such as improving housing schemes, sanitation management and primary health care in addition to improving Ghana's educational facilities of the local government. It is a fund created out of the consolidated fund to channel resources from the central government to the local governments for development.

These two organizations are regarded as Project Management organizations in the direction of having been personally involved in the management of construction projects. Each organization is distinguished from each other by the kind of funding sourced for their development programs and certain peculiar organizational goals. However, the mission of executing building projects is common amongst them. The factors that affect the individual set project objectives are the ones that confront or promote the project success, outcome or performance. Although project performance is influenced by several factors [Blismas et al., 2004], this study focuses on the relationship that exists between PM practices and project performance. Performance of a project therefore needs to be measured to pave way for knowing the optimum practices among the lot. Therefore, the study critically looked at what Project Management Practices have contributed on building project Performance.

## 1.2 Problem Statement

Within the sphere of a given project there are several project management activities. Several ways of carrying out these activities emerge and become accepted as day to day practices. The need to meet certain environmental and social challenges, as may be faced by a particular organization, may cause the adoption of certain PM practices. Personnel involved in project management may also adopt certain PM practices and stick to them for purposes which may however not relate to the project success. Several practices are therefore carried out in the management of projects but not recognized as PM practices. The need to obtain successful projects calls for the need to also undertake optimum practices. Knowing the success, or outcome or performance of a project has a great deal of relevance to knowing the optimum practices. The effort put into the measurement of project performance in the country has portrayed little or no help in this direction. The possible, simple and most understanding way of measuring project performance with hard data is therefore needed in this regard. Performance of group of projects managed by an organization may differ from performance of another group of projects with similar characteristics but managed by other organization. The kind of project management practices carried out by different organization for achieving project success may also influence variation in the performance of the project.

The significance of such differences in performance of groups of projects is therefore for determination of characteristics of influential project management practices. Certain project management practices adopted do not necessarily have significant influence on project performance whilst some have. There would therefore be the need to promote optimum practices and a second look taken at others that confront the success of building projects. Since project management improves an organisations chances of achieving the desired result, gain a fresh perspective, prioritise the organisations resources and ensure their efficient use and also set the scope, schedule and budget accurately from the start. Ghana education

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trust fund and district assembly common fund are two crucial project management organisations in the country considering the role they play towards national development. However empirical literature on project management practices reveals that, there's been only one study which focused on Ghana education trust fund and district assembly common fund. Mensah (2007), conducted a study on the effect of project management practices on building project performance, his study focused on the project management practices, the impact of project management practices on building performance and difference in the managerial style by different organisation. The study however did fail to bring into light the challenges these organisations face when implementing project management practices. This has ccreated a knowledge gap on the topic "project management practices on building performance taking into consideration Ghana education fund and district assembly common fund, hence the need for this study.

## 2.0 THEORETICAL FOUNDATION

### 2.1 Foundation of the study

As given away by the Institute of project management practitioners, a project is a group of tasks, performed in a definable time period, in order to meet a specific set of objectives. Project has the following characteristics. It is likely to be a onetime program, it has a life cycle with a specific start and end date, it has budget and likely to require the use of multiple resources, most of which may be scarce and have to be shared among others. It may require the establishment of a special organization or the crossing of traditional organizational boundaries (Harvey, 1999). Akarakiri (2007) defines project as any scheme, or part of a scheme for investing recourse which can reasonably be analyzed and evaluated as independent unit. Spinner (1997) also defines project as series of task or activities that have several distinguishing characteristics. Such as: Having specific starting and ending date

- Achieving a specified result on product
- Well defined objectives
- A unique, non-repetitive endeavor

Chapman (2003) defines project as the investment of capital in a time bound intervention to create assets. Hamburger (1990), further define project as an assignment that has to be undertaken and completed within a set time, budget, resources and performance specification designed to meet the needs of stakeholders and beneficiaries. Although there are numbers of general definition of the term project; it must be recognized at the outset that projects are distinct from other organizational processes. As a rule, a process refers to ongoing, day-today activities in which an organization engages, while producing goods and services, processes use existing systems properties and capabilities in a continuous, fairly repetitive manner.

Projects, on the other hand, take place outside the normal, process oriented world of the firm. Certainly, in some organizations, such as construction, day-to-day processes center on the creation and development of project. Nevertheless, for the majority of organizations project management activities remain unique and separate from the manner in which more routine, process driven work is performed (Kerzner, 2003). Project work is continuously evolving, established its own work rules, and is the antithesis of repetition in the work place. As a result, it represents an exciting alternative to business as usual for many companies. The challenges are great, but so are the rewards of success. First, we need a clear understanding of the properties that makes projects and project management so unique. Consider the following definitions of projects:

- A project is a unique venture with beginning and end, conducted by people to meet established goals within parameters of cost, schedule and quality.
- Projects are goals oriented, involve the co-ordinate undertaking of interrelated activities, are of finite duration, and are all, to a degree, unique.

A project is also considered to be any series of activities and tasks that have a specific objective to be completed within certain specifications, with defined start and end dates that consume human and non-human resources which are multi-functional. (Turner, 1993)Organized work towards a predefined goal or objective that require resources and effort, a unique (and therefore risky) venture having a budget and schedule. Probably the simplest definition is found in the project management Body of Knowledge (PMBOK) guide of the Project Management Institute (PMI). PMI is the world's largest professional project

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management association, with over 200,000 members' worldwide as of 2005. In their PMBOK guide, a project is defined as "a temporary endeavor undertaken to create a unique product or service (PMI, 2005).

Furtherance to this, the institute of project management practitioners also defines project management as the application of processes, methods, knowledge and experience to achieve specific project objective according to the project acceptance criteria within agreed parameters. Although quality management is a portion of the management of a whole project, the idea in the work of Das *et al.* [2000] describing quality management practices, is worth noting. Quality management practices are described as "the decisions and actions involving quality planning, leadership and quality training. The emphasis in this definition is the concept of management practices involving decisions and actions. This chapter is devoted to the literature review on project management practices on building project performance. The study reviewed related literature such as those which impinged on the research problem, definition and concepts of project management practices, and its management and improvements.

2.1.1The overlaps between project and project management

It was suggested earlier that there is an overlap between project management and projects, in that the former is a subset of the latter. Yet confusion does exist between the two in practice. This confusion could have arisen because of three factors: Time frame--project success is often commented on at the end of the project management phase. At this time knowledge about the project management success will be known because the budget, schedule and quality criteria can be measured. Here each of the parties will be able to compare original data requirements to what is achieved. In terms of quality standards it could be monitored by the amount of rework or by the degree of client satisfaction. The long-term indicators will not have been realized yet and consequently they cannot be measured. Therefore, it is convenient to judge success at this time by whether the project management criteria have been satisfied rather than the project criteria. So project management success becomes synonymous with project success, and the two are inseparable.

Confusion of objectives--the objectives of project success and project management success are often intertwined. Instead of clearly identifying the two as separate groups they are shown to be a single homogenous set. Because of this lack of distinction the two sets of objectives are seen to be correlated. For example 'completion to budget' might be placed alongside 'profitability' as objectives. Budget is primarily a project management issue, yet profitability is a project objective. To suggest that a client instigates a project just to see it completed to budget reduces the importance of the project objectives.
Ease of measurement--two of the objectives within project management are common across all projects and are easy to measure quantitatively.

These are compliance with budget and schedule. Because of these readily identifiable measures it is easy to concentrate on project management and its success rather than the wider context of the project. Many of the project objectives will tend to be either qualitative and not easily measured in any objective manner, or longer-term and not measurable immediately. This makes it convenient to use measures of project management success as a means of determining overall project success. The confusion outlined above can be avoided by an improved appreciation of the role of project management within the project. The role of project management is to use the resources available effectively to accomplish a set goal within certain criteria. This role of project management needs to be placed within the context of a wider project

2.2 Development of the study

Most of the business sectors, like management consulting, information technology and construction, are progressively project-based, of which construction is undoubtedly the most complex and largest one (Adeleke et al., 2018; Whitley, 2006). The significance of contractors and project managers has been extensively recognized in project-based industry sectors, particularly in the building construction industry (Adeleke et al., 2019; Papke-Shields et al., 2010). Due to that, a great amount of research exertion has been made to deeply investigate both contractors and project managers towards their performance to the clients. These investigations as a whole underwrite to an up-to-date understanding of current knowledge of contractors and project managers as well as broader project management (Meng & Boyd, 2017; Adeleke et al., 2015). Likewise, the success of every construction project

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is the sole objectives of project investors, including the contractors, and clients. The importance of project success has become the basis of almost every study to investigate the factors that influence the success of every construction project. In addition, the clients of public projects are developing various delivery and procurement methods that consider the project characteristics and the most appropriate contractor for each project. Prior studies have focused on both delivery methods and contractor selection procedures.

To ensure project success, the most frequently employed method is by identifying the critical factors influencing project performance and developing a pre-qualification model for selecting the most appropriate contractor or delivery method based on the relationship between project performance and the project characteristics affecting it. Construction work is described as civil engineering jobs and all kinds of new buildings such as hospitals, schools, homes, hotels, factories, and others (Wells, 2000). The construction industry plays a big role in the nation by contributing significantly to Gross Domestic Product (GDP), employment, capital and interaction between various economies (Adeleke et al., 2017; Hillebrant, 2005). This study aims to shed a light on the importance of resolve cost, schedule and project quality in influencing building projects from the global perspectives.

Practitioners involved in project management teams usually find themselves being part of one of the parties to a building project. The parties to building a project or contract are categorized into three groups (client, contractor and consultant) form an integral part of the project management team in the construction industry. They all come together to take decisions and carry out activities for the purpose of achieving satisfactory project performance. Sharma and Gadenne (2002), in their search into an inter industry comparison of quality management practices and performance found out that there is a strong link between quality management practices and performance. This discovery gives rise to strong evidence on the impact of project management on building project performance. An investigation into this relationship is very pertinent and imperative.

This research attempts to bridge the gap within the growing body of knowledge in this domain. It targets building construction projects in Ghana. The objectives of this research are twofold: Firstly, to evaluate the impact of project management on building project performance., knowledge of contractors and project managers about project management performance on building projects; secondly to analyze the relationship between project management performance in terms of resolve cost, schedule and quality on building projects. This research mirrors the shift in building construction from planning till the closing phase of the projects, which implies that the construction industry is replacing traditional management philosophies with new management paradigms. It provides researchers and practitioners with deeper insights gained from construction practice today. Although it is based on construction projects, its findings may also be useful for project management in other industry sectors.

The extant literature has indicated the essence of integration in attaining a better project success and performance. Aronson et al. (2013), for instance, outlined the various impacts of the leader's activities and project spirits on the success of construction projects. In the same manner, Ozorhon et al. (2014) enumerated certain enablers in construction innovation, such as leadership and integration. Furthermore Crawford (2005) indicated that project directors that are utilizing better integration and scope practices are always the top players in the industry. Therefore, this study intends to contribute to filling the identified study gap through a conceptual framework that will picture the essentials of project management performance. The rationale for this framework is to bring about a reflection of the relationship between project management performance and building project considering the perceptions of the construction practitioners.

## 2.3 Different Theories

### 2.3.1 The Differences in Project Management Practices

Cost and time are directly measurable, unlike quality or beauty, which exist in the eye of the beholder and are therefore complex to measure. Definitions of quality include "meeting customer requirements" (Chase, 1998) or "reduced defects and rework" (McKim and Kiani, 1995), and quality has even been related to cost and time and defined as "completion on time and budget" (Hoonakker et al., 2010). Quality can also be divided into internal quality, emphasizing requirements (Voss and Blackmon, 1994), and external quality, emphasizing customer satisfaction (Fynes and De Burca, 2005). Numerous studies have looked into the factors that create success or failure, often referred to as critical success

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factors (Chua et al., 1999) or critical failure factors (Jha and Iyer, 2006). Ensuring success can be seen in two ways: the factors creating failure should be avoided while the factors creating success should be achieved. Some variation can be expected in both the success and the failure factors of different projects, so it is impossible to find a universal list of success or failure factors (Toor and Ogunlana 2009). Nevertheless, a number of studies have tried to identify some general tendencies. Below is a literature review of previous research studies. The studies are divided in four groups, each of which contains a research study of failure factors and success factors. The four groups are (1) cost, (2) time, (3) quality and (4) the combination of cost, time and quality.

The cause of variation in the project management may not be only due to the kind of organization but also the type and purpose of project and most importantly the level of performance desired. This observation falls in line with the finding made by Sharma Gadenne (2002) in a study into the effect of quality management practices on performance. As given away by Bryde (2003) Management practices vary from organization to organization and the performance of the outcome is what makes a practice optimum. Furtherance to this, Gowan and Mathieu in an empirical study of system managers found out that the good Information Systems (IS) project performance depends on a greater degree on the intervention of specific management practices (formal project methodologies and outsourcing). The project performance was however in the context of meeting project target dates only. These findings give an indication that the kind of project management practices engaged in the management of a project depends on the kind of organization. This will hence have a subsequent relation to the project management team. The practices present within different organizations therefore require identification and further examination. Subsequently, the influence of such practices on the performance of the corresponding projects executed becomes highly necessary to determine.

The performance must also not be looked at with a highlight on time only or quality only. The effect will have to incorporate both time and quality not leaving out cost too. These three basic project objectives are fundamental to the totality of project performance. When practices vary from organization to organization or from project team to project team the question of which practices are the best subsequently arises. The goal of every project manager is to achieve satisfactory performance and it is for this purpose that certain practices are undertaken. In determining whether certain practices are best or not, the need to measure the performance of the projects executed under such set of practices is highly imperative.

2.3.2 The Influence of Project Management on evaluating project Performance

The construction industry experiences a high number of unsuccessful projects (Zwikael and Globerson, 2004), even though several studies have documented the factors that affect project success, often called the critical success factors. According to Zwikael and Globerson (2006), one explanation can be found in the very general formulations of critical success factors, and Murphy et al. (1974) found a direct relation between success and clarity on the one hand and consensus regarding success criteria on the other. It follows that site managers need more specific guidance to fulfill the criteria and thus to achieve successful projects (Zwikael and Globerson, 2006).

To ensure more concrete guidance, this study focused on the underlying processes that ensure high performance (Cheng and Tsai, 2003) and their relative importance. Improving the constructionprocesses will indirectly lead to increased performance and project success (Kivrak et al., 2008). Thus, looking at how the conditions under which a process is completed affect project success constitutes an attempt to dig one level deeper into the issue. The result is list of process factors ranked in relation to their importance and their effect on success. Construction managers can use the importance ranking to determine how to allocate limited resources to fulfill the criteria and thus obtain project success (Chua et al., 1999). To ensure project success, the first step is to identify what project success is and how it is measured.

Several studies have come up with a variety of definitions. Most define project success as the fulfilment of project requirement, for example Tuman (1986), and most researchers agree that project success can be identified by measuring the three key performance parameters: cost, time and quality (Ashley et al., 1987; Liu and Walker, 1998; Wuellner, 1990). Ashley et al. (1987) defined project success in terms of five key criteria: "Results are better than expected or normally observed in terms of cost,

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schedule, quality, safety, and participant satisfaction". While cost, time, and quality are known as the "iron triangle", several attempts have been made to expand the concept by adding additional parameters such as environmental sustainability, market entry, safety and organizational and stakeholder benefits (Atkinson, 1999; Chua et al., 1999; Liu and Walker, 1998). The added parameters tend to have a long-term focus that goes beyond the success of the individual project or to be somehow included in one of the original parameters. To evaluate the performance of construction projects, numerous studies have measured cost, time and quality, but most of the studies produced disappointing results. The majority of construction projects seem to suffer from cost overruns, time overruns and poor quality. For instance, Love et al. (2005) looked into the cost and time performance of 161 Australian constructions projects and found the average overruns to be 12.6% with regard to cost and 20.7% with regard to time. Barber et al. (2000) measured the costs of quality failures in two major road projects and found the direct cost to be between 3.6% and 6.6 % of the total contract sum. By adding the cost of delay, such as site costs, general overheads, liquidation damages and cost of work acceleration, Barber et al. (2000) calculated the total cost of delay to be between 16 and 23 % of the total project costs. The size of the indirect cost is in accordance with the claim of Burati et al. (1992) that the direct measureable cost is "only the tip of the iceberg.

The purpose of project management on a building project is undoubtedly to add value to projects by delivering successful projects in terms of agreed project objectives. Generally, project management literature suggests that project management processes are geared towards the delivery of successful projects (Zulu 2007). The Construction Industry Council (2007), for example, describe the purpose of construction project management as intending to add significant value to the project delivery process through the use of management principles suited to projects. The general definitions of project management also suggest that project management is designed to deliver value in projects. In an effort to understand the impact of project management processes on performance, many studies have examined project management factors that contribute to successful projects. For example Pocock and Kim (1997) were concerned with organizational aspects of project management and how this influences project management results.

While Pinto and Mantel (1990), and Sherman and Wideman (2000) modelled factors, within project management processes and practices that would influence project results. These studies and many others [Yeo 2002; Milis and Mercken 2002; Pheng and Chua 2006; Olander and Landin 2005 and Fortune and White 2006] were concerned with the understanding of factors in project management that contribute to successful project performance. An examination of these studies show that the methods used in evaluating the relationship between critical success factors and project performance has mostly involved the assessment of the direct relationships only. Such an approach limits the understanding of how these project management variables interact with each other and collectively impact on project performance. This research departs from the simplified perspective of the direct relationship between project management variables and project performance and examines both the direct and indirect impact of project management variables on project performance.

The study tries to measure project management performance through project success, as suggested in the previous related studies (Demirkesen & Ozorhon, 2017; Mir and Pinnington, 2014). Majority of the previous studies on project success-focused mainly on timely completion (Meng & Boyd 2017), completion that are under budget (Bassioni et al., 2004; Berssaneti and Carvalho, 2015), quality criteria (Chou et al, 2013), customer satisfaction (Gayatri & Saurabh, 2013; Cserhati and Szabo, 2014; Nassar & Abourizk, 2014), as well as safely completed work (Almahmoud et al, 2012). Based on these reviewed previous works, this study also adopts the factors that are mostly discussed to measure project management performance in order to determine project success. The attributes of influencing project performance have been defined extensively.

The study conducted by Ling et al. (2004) presented the project attributes affecting project performances, which were divided into three categories: (i) project attributes, (ii) owner and consultant attributes, and (iii) the contractor attributes. The project attributes include the gross floor area of the project, the form of contract, the type of building, the level of design and construction complexity, the percentage of repetitive elements, the time given to contractors to prepare their bids, the number of bidders, the bid evaluation and selection criteria, the author report a positive influence of cost, time and

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quality on construction projects. Alhazmi and McCaffer (2000) also outlined the type of project, degree of flexibility and complexity, time constraints, method of payment, as well as the integration of the design and construction as project features that are important in positively influencing project performance. Quality, cost, and time are the major project performance attribute that requires measurement and continuous improvement.

The Quality Performance Index (QPI) is a measure of consistency in the application of the project standards and procedures, and the compliance of the delivered product with the project specifications. Inconsistency in the application of project processes will lead to rework, poor quality audits, and a high number of Non-Conformance Reports (NCRs). From the contractor's perspective, the QPI is best measured by the Construction Field Rework Index (CFRI) as defined in Fayek et al. (2003). The costs resulting from rework caused by change orders do not contribute to the quality performance and are excluded in the QPI calculations. These aforementioned project performance attributes have a significant relation to construction projects (Nassar & AbouRizk, 2014).

Others, such as Lo et al., (2006) also identified poor performance (in terms of time delays and cost overruns) as a common phenomenon in construction projects delivery, and some of the reasons behind these identified anomalies have been attracting the attention of construction researchers and practitioners. Earlier, Mansfield et al. (1994), for instance, identified four important issues that are mostly responsible for time delays and cost overruns. Their study beamed their searchlight on finance and payment problems, changes in site conditions, poor contract management, and material shortage. According to Kaming et al. (1997), the predominant factors that are capable of influencing time delays include design changes, inadequate planning, poor labour productivity, as well as a shortage of resources. Frimpong et al. (2003) also affirmed that there is a positive relationship between cost and time in construction project delivery in Ghana.

2.3.3 Factors Affecting Cost Performance

The success factors for cost performance were identified by Iyer and Jha (2005) using a questionnaire study that involved 112 respondents and included 55 factors to reveal the high impact factors affecting cost performance in construction projects in India. On the basis of their study, Iyer and Jha (2005) found that the top three success factors were (1) the project manager's competences, (2) top management support, and (3)the project manager's coordinating and leadership skill. In a questionnaire study based on 31 factors and 109 respondents, Elinwa and Buba (1993) identified the failure factors for the cost performance of construction projects in Nigeria. The study revealed that the top three failure factors were (1) the cost of materials, (2) price fluctuations, and (3) financing and payments for completed work.

2.3.4 Factors affecting Time Performance

Factors affecting time performance: The success factors for time performance were examined in a questionnaire study conducted by Jha and Iyer (2006). The study included 112 participants who ranked 55 factors. The findings revealed the top three factors to be (1) project manager's competences, (2) supportive owners and top management, and (3) monitoring, feedback, and coordination. Chan and Kumaraswamy (1997) looked into failure factors for time performance in Hong Kong construction projects by conducting a questionnaire survey involving 148 respondents and including 83 factors categorized into eight key categories. They found the most important categories to be contractor-related, design team-related and labour-related. Moreover, the top three factors that influenced time were found to be (1) poor site management and supervision, 2) unforeseen ground conditions, and 3) low speed of decision-making.

2.3.5 Factors affecting quality performance

Hoonakker et al. (2010) looked into success factors by conducting a mixed research study, they used nine interviews with different contractors to identify critical factors and followed this up with a questionnaire distributed to 148 contractors. Their study identified both indicators and influencers of quality. The top three indicators were (1) overall customer satisfaction, (2) management commitment to quality, and (3) requests to come back and do more work. The top three influencers were (1) employee involvement and collaboration, (2) management commitment, and (3) skilled workforce. Jha and Iyer

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(2006) looked into the failure factors affecting quality. They based their study on a questionnaire survey with 112 participants who were asked to rank 55 identified failure factors.

2.3.6 Certain Organizational practices and attributes

Every company has its own unique personality, just like people do. The unique personality of an organization is referred to as its practices. In groups of people who work together, organizational practices is an invisible but powerful force that influences the behavior of the members of that group. So, how do we define organizational practices?

Organizational practices are a system of shared assumptions, values, and beliefs, which governs how people behave in organizations. These shared values have a strong influence on the people in the organization and dictate how they dress, act, and perform their jobs. Every organization develops and maintains a unique culture, which provides guidelines and boundaries for the behavior of the members of the organization. Several research works have identified certain practices and attributes within an organization, specifically project management firm or team. These practices are carried out for the purpose of successfully managing projects. In research conducted into the organizational learning practices in project management environment, it was concluded that project organizations should focus on building knowledge because increased knowledge is associated with increased project performance [Kotnour, 2000]. Increased knowledge implies not encountering the same problems over and over again and not reinventing solutions to problems.

This knowledge helps the organization to better plan a project and meet cost, schedule, and performance requirements. The learning process must be made to include the practice of taking feed backs for executed projects. In support of this practice Loo [2003] stresses that taking feedbacks from projects and learning from experiences have a significant influence on project performance. How important therefore do project managers take knowledge building as an important practice in the management of projects? The presence of encountering the same problems over and over again is an indication of how often low significance is placed on knowledge building, which should include organizational learning and taking feedbacks from projects. Having certain identified best project management practices within a particular project management organization enhances successful project management. What therefore are some of these practices identified? A study conducted by Bryde (2003) affirms, that: "it is the performance that makes a practices optimum", measurement of project performance is required for determination of optimum practices within a given organization.

2.3.4 Practices in Management of Project Funding

Client organizations that are entrusted with the management of funds for projects are important organs to consider in the process of project management. The need to have satisfactory project performance makes efficient management of funding for projects imperative. In a research into the management of UK Local competitive funding, it was found out that increasing bureaucratic processes put an excessive demand on time and resources (Loader, 2002). Funds usually applied for the execution of projects therefore require efficient management. The level of bureaucracy involved may be a factor for contractors to consider when bidding for projects. A fore knowledge of the nature of funding source for the project then becomes necessary for putting up strategies to manage building projects. In situations where need for job pushes contractors to bid in spite of foreseeable unfavorable conditions of a given funding source for a project, there is likely to be a subsequent poor performance on the part of the contractor.

When projects are faced with the difficulties of irregularity and delay of release of funds for payment of works, the performance is threatened. The kind of practices engaged in managing project funding source is therefore necessary in the discussion of the subject of performance. Funding source is therefore necessary in the discussion of the subject of performance in the practices undertaken in the coordination of projects funding sources. The presence of some or all of these features in a client's organization has the tendency to yield certain project management practices cultivated with the view of curtailing the challenges posed. The influence of such practices on project performance can therefore not be overlooked when seeking for project success.

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2.3.4 Limitations of Current Practices and Previous Studies: Knowledge Gap

The review of literature revealed that although many studies on project success factors have been done, these focused primarily on indigenous firms working in their home countries _Konchar and Sanvido 1998; Chua et al. 1999; Ling 2004; Fortune and White 2006_. For example, Ling (2004) investigated how the characteristics of projects, clients, consultants, and contractors affect project performance when AEC firms are undertaking projects in their home countries. There appears to be little study on predicting success of projects outside of one's home country international projects. These projects are more difficult to manage than domestic projects because of multiple ownership, elaborate financial provisions. Gunhan and Arditi (2005), and higher uncertainty, complexity, and cost (CII, 2004).

Factors affecting foreign AEC firms' project success in international markets can be investigated from several angles: market entry modes; business strategies adopted at the organizational headquarters level; and PM practices adopted at the construction site. Market entry modes have been previously investigated (Gunhan and Arditi 2005; Ling et al. 2005), and so have organizational level management strategies (Ling et al. 2005, 2006; Gale and Luo 2004). However, these did not focus on how PM practices adopted at the construction site project level can be used to predict the success of an international project. The extent to which foreign firms' PM practices can be used to predict the success of an international project remains unclear. This study therefore aimed to fill the gap by exploring how project success in China can be predicted, based on the PM practices adopted by Singaporean AEC firms. In this study, it is hypothesized that some PM practices adopted by foreign firms in China could be used to predict project performance. PM practices were operationalized from the nine PM functions, and their role in predicting project performance _Table 1_ was tested in the field work.

2.3.5 Project Management Functions as Practices

The daily project management functions carried out is for the purposes of managing projects to achieve satisfactory project performance. Each project team member has a function to perform within the project management process. A combination of these functions results in a set of evolved practices within a project's life time. The study of project management practices can therefore not be carried out without taking a look at common project management functions present within the building industry. Harris and McCaffer [2005] stress that during the project definition stage, safety measures must be established. The ability of a project manager to carry out the project definition function comprehensively therefore undoubtedly results in best practices. This function is however frequently overlooked in the construction industry. For the project definition function, a good definition of scope must allow all the parties in the project to understand what is needed and to work towards meeting those needs. The frequency and the extent, to which construction professionals from the parties of consultant and contractors are usually involved in this project development stage, if present, are therefore necessary to know as a PM practice. This will give way to further investigation about how each party regards the importance of the project definition function to the project performance.

2.3.5 The Function of Setting Organizational Matters

The establishment of management structures for the management of a project is one of the important activities required for accomplishing goals. The type of building project tool also provides a checklist of recommended activities and milestones to define a project scope, which is intended to promote best practices in the building industry. Harris and McCaffer [2005] stress that during the project definition stage, safety measures must be established. The ability of a project manager to carry out the project definition function undoubtedly results in best practices. This function is however frequently overlooked in the construction industry.

For the project definition function, a good definition of scope must allow all the parties in the project to understand what is needed and to work towards meeting those needs. The frequency and the extent, to which construction professionals from the parties of consultant and contractors are usually involved in this project development stage, if present, are therefore necessary to know as a PM practice. This will give way to further investigation about how each party regards the importance of the project definition function to the project performance. Kotnour (2000) Asserts that some of the internal organizational matters such organizational learning practices increase project success too. The tendency

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to have project success increased therefore lies in the ability of the manager to develop certain strategies within the organization. The activity of setting a project organizational structure is, for instance, one of the major organizational matters whose influence on project performance may be significant. It is not only construction companies that are required to set up organizational structure for the management of a project. The nature and functions of organizational structures set up by client organizations especially structures meant to execute payments to contractors therefore require critical examination in order to determine their effect on project success.

2.3.6 The Function of Programming

The process of managing building projects requires development and monitoring of the program for the works involved in order to attain success. Harris and McCaffer [2005] buttress that both establishing a challenging but achievable program and driving the project to that program are important activities to carry out as far as achievement of project success is concerned. Whilst establishing of works program at the initial stage of the project is usually carried out promptly, the monitoring of the program to achieve project's objectives often experience bottlenecks. The method of monitoring progress of works may have a link with how a project's program is driven to achieve project objectives. How works progress monitoring is carried out is therefore worth investigating.

2.3.7 The Function of Quality Management

According to Das et al. [2000], quality management practices comprise two sets of activities: the first set comprise decisions and actions internal to the firm. The second deals with other organizations external to the firm. Prominent among the decisions and actions included in the first set is quality planning and leadership and quality procedures. Crosby [2000] also discussed the steps in quality management. Some of the steps as may be present within the construction industry include: having the commitment of management, establishing quality improvement teams, measuring quality, evaluation of cost of quality, ▪ creating quality awareness within the organization, embarking on regular corrective actions, training of supervisors and error cause removal.

2.3.8 Performance Measures

Every project is unique, and project performance is measured in terms of successful completion of the project (Cheng, Ryan, & Kelly, 2012). Project information can be used to analyze and monitor project success or project performance to establish a knowledge base and enhance the process of managing future projects (Todorović et al., 2015). According to the Standish Group International (2015), 29% projects are deemed to be successful, 52% are "challenged" projects, and 19% are considered a failure. The rate of project success has declined from 34% in 2004 to 19% in 2015. Project performance has been traditionally defined and evaluated on the basis of the amount of resources required for completion of the project (Razmdoost & Mills, 2016). In accordance with the "iron triangle," a project is considered a success when the estimated schedule is met, the cost is very close to the initial planned budget, and all deliverables meet the requirements of project stakeholders (Berssaneti & Carvalho, 2015). The short-term aspects of project performance are focused on iron triangle which are crucial for clients to achieve immediate project success. However, long-term competitive advantage of projects is also significantly important for clients and project stakeholders (Berssaneti & Carvalho, 2015; Mir & Pinnington, 2014; Yang, Chen, & Wang, 2014; Yang et al., 2013).

The stakeholder salience theory suggests that the interests of various stakeholders have a strong influence on project performance (Berssaneti & Carvalho, 2015). Typically, compliance with cost, schedule, and quality performance has often been used to measure project performance. Project management processes have a significant impact on the time and the cost of the project (Almahmoud, Doloi, & Panuwatwanich, 2012), but time and cost alone are not sufficient to assess project performance (Nixon et al., 2012). Project performance should be measured through time, cost, and quality because project completion on time, within budget, and within quality parameters is considered the three primary objectives of project success (Meng, 2012). Cost overrun and time delays are common in projects (Ibbs, Wong, & Kwak, 2001) due to adoption of poor project management practices (Wright, Cho, & Hastak 2014). Thus, other dimensions, such as quality performance and stakeholder satisfaction, must be considered in

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order to fully measure project performance (Almahmoud et al., 2012; Berssaneti & Carvalho, 2015; Yang, Huang, & Hsu, 2014; Yang et al., 2013; Yeung, Chan, Chan, Chiang, & Yang, 2012). Project performance should be measured according to the schedule, planned budget, quality specifications, and stakeholder satisfaction (Berssaneti & Carvalho, 2015). Literature on project management suggests that new models of project performance should be multi-dimensional (Todorović et al., 2015).

Project performance depends on leadership competence, organizational control processes, and the perceived relevance of prior performance (Chen, 2015). In terms of control process, process-oriented performance increases the possibility of integrating the best available resources required to meet the project objectives (Razmdoost & Mills, 2016). Further, there are two key aspects which improve project performance during execution: a) project management processes; and b) the working relationship between project stakeholders (Meng, 2012). Both are related to project leadership. In this study, measures of overall project performance were based on dimensions of schedule performance, cost performance, quality performance, and stakeholders' satisfaction.

Schedule Performance: Performance with respect to time has a significant influence on projects (Sunindijo, 2015) and can significantly contribute to overall project performance (Ahadzie, Proverbs, & Sarkodie-Poku, 2014). Meng (2011) argues that schedule is a key factor affecting project performance as it requires collaboration among stakeholders across projects, and this collaboration is also time-consuming. Schedule performance can be affected by many factors that lead to revised schedule actions such as schedule estimates, schedule control mechanisms, quality estimates, design documents, environmental factors, project management, and leadership skills (Sunindijo, 2015).

Cost Performance: Cost can only reflect efficiency of a project but has significant impact on project stakeholders (Razmdoost & Mills, 2016). Similar to schedule performance, cost performance can be affected due to poor project planning, poor cost estimates, and inefficient cost control mechanisms that lead to revised project budget (Sunindijo, 2015).

Quality Performance: Mir and Pinnington (2014) argue that in addition to schedule and cost performance, quality performance is a critical dimension of project performance. Quality performance is about meeting the aesthetic, functional, and legal requirements of a project and project outcomes. Project requirements may be simple or complex. Quality is accomplished if a completed project conforms to the specified requirements. To improve project performance, project managers should focus on required quality parameters in all project activities and processes.

Stakeholder Satisfaction: The performance of a project depends on effective communication and coordination among all project stakeholders. Project performance cannot be absolutely measured until the project outcome is delivered and used by the customer or client (Razmdoost & Mills, 2016). For successful accomplishment of a project, project managers need to focus on customer benefits, customer needs, and stakeholder expectations (Berssaneti & Carvalho, 2015), in addition to cost, time, and quality specifications (Attakora Amaniampong, 2016). Project stakeholders articulate requirements during the initial planning phase and expectations during the project implementation phase. The cost and time have significant impact on project efficiency and project stakeholders (Razmdoost & Mills, 2016).

Project performance indicators are the influential forces that either facilitate or impede project success Lim and Mohamed 1999. Konchar and Sanvido _1998 measured success in terms of unit cost, construction speed, delivery speed, cost growth, schedule growth, and several quality measures. Chan and Chan 2000 produced a consolidated framework that included the additional dimensions of user expectation, participant's satisfaction, environmental performance, health and safety, and commercial value. To this list, Ling et al. 2004 added owner's satisfaction and owner's administrative burden. From these studies, this research chose five performance measures to ascertain project success.

Define roles and responsibilities: The right person in the right place at the right time can improve project performance. Defining clear roles and responsibilities is important in projects which steer almost all other factors towards project success, either directly or indirectly (Anantatmula, 2010). Day (1998) suggests that project managers should clearly define the roles and responsibilities of project team members to avoid any conflict. Unclear roles and responsibilities is one of the key problems in managing project activities (Elonen & Artto, 2003). During the initiation of a project, it becomes crucial to identify and reduce fundamental causes of conflicts, gaps, and duplication in the roles and responsibilities of the project team, which are critical for project performance (Elbarkouky & Fayek, 2011). Improvement in

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performance of projects is not possible without clear definition of roles and responsibilities (Anantatmula, 2010). However, unclear roles and responsibilities affect project performance and may lead to project failure. Frequent and rapid changes in roles and responsibilities, just as with organizational structure, are not vital in project performance (Elonen & Artto, 2003) The project manager should be able to recognize the strengths of individuals and align these strengths with specific responsibilities in the project team. Defining roles and responsibilities unambiguously has become essential for project managers to manage projects. Thus, the relationship between defining roles and responsibilities and project performance needs to be examined.

2.3.9 PM Practices Affecting Project Success

The definition of a project has suggested that there is an orientation towards higher and long-term goals. Important parameters within the goals will be return on investment, profitability, competition and market ability. A range of variables and factors will affect the ability to achieve these goals, which have been identified by various authors. The following list has been derived from the writings of Cash and Fox, Baker et al., Kerzner, Wit and KumarT: Objectives; Project administration; Third parties; Relations with client; Human parties; Contracting; Legal agreements; Politics; Efficiency; Conflicts and Profit. The current literature, for example, Morris and Hugh, would imply that the success of a project is dependent on having: a realistic goal; competition; client satisfaction; a definite goal; profitability; third parties; market availability; the implementation process; and the perceived value of the project. Only two of the items from this list would lie directly within the scope of project management as previously defined. These are the definitions of a goal and the implementation process.

This would indicate that project management and its techniques are only a subset of the wider context of the project. Project management plays a role in project success but that role is affected by many other factors outside the direct control of the project manager. This would start to explain why projects can succeed or fail independently of the project management process. The definition of project management suggests a shorter term and more specific context for success. The outcomes of project management success are many. They would include the obvious indicators of completion to budget, satisfying the project schedule, adequate quality standards, and meeting the project goal. The factors which may cause the project management to fail to achieve these would include: Inadequate basis for project; Wrong person as project manager; Top management unsupportive; Inadequately defined tasks; Lack of project management techniques; Management techniques misused; Project closedown not planned; Lack of commitment to project.

These factors would suggest that successful project management requires planning with a commitment to complete the project; careful appointment of a skilled project manager; spending time to define the project adequately; correctly planning the activities in the project; ensuring correct and adequate information flows; changing activities to accommodate frequent changes on dynamic; accommodating employees' personal goals with performance and rewards; and making a fresh start when mistakes in implementation have been identified. The narrow definition of tasks in successful project management provides an indicator of why project management success and project success are not directly correlated.

A project may still be successful despite the failings of project management because it meets the higher and long-term objectives. At the point when the project management is completed the short-term orientation could be one of failure but the long-term outcome could be a success, because the larger set of objectives are satisfied instead of the narrow subset which constitutes project management. The majority of literature on project management stresses the importance of techniques in achieving project objectives. They stress how successful implementation of techniques contributes to a successful project. Avots ~ and Duncan and Gorsha both claim that project management is an important part in project success. Avots ~, in studying the reasons for project management failure, argued that failure could be avoided by paying careful attention to the project management factors which caused failure. Duncan and Gorsha identified three problem areas which indicate the success of a project. These are under-costing, overspending and late delivery. It is suggested that project planning is needed to overcome these problems.

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Lackman has discussed the different tools available to a project manager to achieve success. These include work breakdown structures, client information sheets and project plans, among others. The early development of strategies, philosophies and methodologies of project implementation has been stressed by Kumar as the most important factoring achieving success. He suggested that by gathering sufficient site information and being aware of project considerations and constraints; it is possible to tailor strategies and methodologies which are specific to a certain situation. Such well-defined strategies will assist in providing a satisfying and successful implementation of a project. The concentration on techniques may be considered as the 'hard' issues in project management. They are the easily measured and quantified concepts of time and cost. Other writers have incorporated what might loosely be called people skills alongside these more administrative functions. These people skills are 'soft' issues in management.

For example, Randolph and Posner N, Posner and Jaafari stressed personal, technical and organizational skills as being necessary to help control projects and achieve successful results. Implicit in all the above literature is the claim that projects end when they are delivered to the customer. That is the point at which project management ends. They do not consider the wider criteria which will affect the project once in use. Two writers who have made a distinction between these orientations are Wit 2 and Nicholas TM. They make a distinction between project success and the success of project management, bearing in mind that good project management can contribute towards project success but is unlikely to be able to prevent failure. They also emphasize that a project can be a success despite a poor project management performance. If, as this argument implies, project management is purely a subset of the project as a whole, then it is suggested that the broader decisions in selecting a suitable project in the first place are more likely to influence the overall success of the project than can be achieved merely through the techniques of project management.

The techniques may help to ensure a successful implementation of the project, but if the project is fundamentally flawed from the start, it would be unlikely that techniques alone could salvage it. The techniques may help to identify the unfeasible nature of the project, and indicate that it should be abandoned or changed. cases, the project was instigated at the behest of the client, and the financial and other rewards for the client hinge on its successful implementation. The client cannot expect to abdicate responsibility by passing all duties to the project team. It has already been intimated that the team will be orientated towards objectives which are only a subset of the overall aims of the project. The client must ensure that an emphasis on the subset does not threaten the achievement of the wider aims from which it is drawn. Facilitating the team is important for the client, but in the final analysis the project was not instigated to facilitate the team.

The project originates from a requirement to meet a need that exists for the client. That initial need must be kept in focus by all those involved on the project. The user is the group or individual who makes use of the completed project or product. In some situations, this might be the client, but for goods sold on the open market the end user and client may be two distinct groups. Project success will be considered by the users as the ability to satisfy their needs. These needs may take the form of practical requirements and be in vivid contrast to those of the client. Satisfying end users' needs is one facet of quality assurance that has come to the fore recently. Oakland 15 defines quality as "the satisfaction of user's needs". Success for the user will be oriented towards long-term utilisation of the project outcome rather than project management techniques. As such, the project team concerned with the development, may have little or no direct contract with the user, who may remain unaware of the management processes and whether these have been successful or not.

The parent organisation will be involved in the project by providing resources. They may also exercise a controlling influence over the project in determining factors such as profitability, market share, quality and scope of service. Their responsibility towards the project is important and the commitment and support of a parent organisation is a vital requirement to project success. Unless the parent organisation is willing to commit company resources and provide any necessary administrative support, project management can be very difficult. In this role they will have two differing interests in the project. In allocating resources, they will have an interest in the efficient use of the resources during development. The project team will be responsible for the planning and control of the use of these resources, consequently the parent organisation will be interested in the success of the project management

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process. The team will be accountable for their use of these resources, and if they fail to be effective they must expect to give an account for their actions.

The parent organisation will have a second concern, because they will want a return on their allocation of resources to the project. There will be an interest in the success of the project as a whole as well as the project management aspects. The project team will shape the implementation of the project. It is important for the team to employ the correct management techniques to ensure that planning, controlling and communication systems are all in place. Without these systems the co-ordination and control of all individuals and resources within the team is difficult. The orientation of the project team will be towards the task rather than the people. This will be particularly true as deadlines for achieving work are stressed and become paramount in people's thinking.

The scope of interest here will be the completion of work and delivery of the project. Any rewards for theteam will occur at the end of this management phase, therefore their primary concern will be to reach the end of this phase successfully. The context of the producer can be viewed from two aspects. In the first instance the producer will have a taskoriented view of the project similar to the rest of the project team. The producer's commitment to the project will end once it is handed over to the client. The commitment is therefore towards short-term rather than long-term goals. In the second instance the producer is a user of the project in the sense that information generated by the project team is used to manufacture the end product.

The producer will now be concerned with the ease of final assembly, but again in the short-term context of the project development and not the longer-term use. This discussion has highlighted how the various individuals involved in a project will have different orientations towards the final project outcome. Success will be viewed differently by each group because their expectations for the project will vary. To return to the quote from Kerzner 3 which opened this section, it would seem inappropriate to place all the responsibility for integration on the project team. Because the involvement of the project team is concerned with only a small subset of the total project it would seem more logical to make an individual who has a wider view responsible for the project. The client has the longer term and wider orientation and there is a logical argument for making the client responsible for the end project.

Previous studies have also identified a number of project success factors which include adequate communication with project team members and project stakeholders with a clear focus on what is expected and to manage unexpected problems (Ahmed & Mohamad, 2016; Anantatmula, 2010; Muller et al., 2012; Müller & Turner, 2010a, 2010b; Nixon et al., 2012). In other words, communicating expectations emphasizes the responsibilities of project team members and stakeholders in terms of desired work ethics, deliverables, and work performance. However, project deliverables must be deliberated with the customer in the early stages to clearly define project boundaries that determine what is included and what is not included in the project scope. Given a clear distinction between the project and project management it would imply a requirement for a corresponding distinction between the individuals responsible for success in both areas.

Kerzner 3 states that "the major factor for the successful implementation of project management is that the project manager and team become the focal point of integrative responsibility". This would suggest that the focus for success in both spheres should lie with the project management team and would tend to exclude the client from any role in project success, contradicting the earlier assertion that the early decision making on a project dictates success. The client is responsible for these decisions and therefore has an important role in determining success. The completion of a project requires input from a variety of groups including the client, the project team, the parent organisation, the producer and the end user. Each party has a role in defining and determining success. They all have specific tasks and responsibilities that they must fulfil in order to achieve success (KumarT). The client is expected to be the main party concerned about the success of the project in the long term.

Projects are temporary unique (Yang et al., 2011) and these characteristics require additional effort to generate trust between the project stakeholders (Grabher, 2002). Consequently, project managers need to be attuned to the cultural, organizational and social environments surrounding projects (Wideman, 1990). Therefore, the main theoretical background for this study draws on stakeholder theory, which is a recognized framework for analyzing the behavioral aspects of the project management process (Sutterfield et al; 2006). Taking into account the needs and requirements of both primary and secondary

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project stakeholders as an essential contributing element to better project performance provides a solid basis for stakeholder identification, classification and assessment (Cleland, 1986; Donaldson and Preston, 1995; Eskerod et al., 2015; Olander, 2007; However, project managers have mainly focused on technical skills and rigid procedures, and the political and social issues around megaprojects have been overlooked and stakeholders poorly managed (Flyvbjerg, 2013).

Research has narrowly focused on those actors important to the project's economic interests, such as suppliers, sponsors and customers (Aaltonen and Kujala, 2010; Eskerod et al., 2015), overlooking the human social needs around project developments. In fact, current project stakeholder practices represent mainly a 'management-of-stakeholders' approach where stakeholders are seen as providers of resources (Huemann et al., 2016). This approach offers an instrumental perspective to stakeholder management which aims to make the stakeholders comply with project needs (Derry, 2012; Eskerod and Huemann, 2013). However, especially in the last decade, the literature shows a growing interest for more ethical and sustainable projects and a conscious endeavor for fairness and engagement of all stakeholders through a 'management-for-stakeholders' approach (Eskerod and Huemann, 2103; Eskerod et al., 2015; Freeman et al., 2007). The seminal work of Freeman (1984), notes that the management-for-stakeholders approach offers an inclusive and holistic perspective which aims to engage with a broader group of stakeholders, who could be harmed by the organization's strategy, by meeting or exceeding their needs and expectations and balancing the projects' economic, ecologic and social interests.

Due to a project's limited resources, project managers cannot always address the concerns of every potential stakeholder and the prevalence of the instrumental perspective in stakeholder management is thus evident (e.g. Bourne and Walker, 2005; Johnson et al., 2005; Mitchell et al., 1997). However, it is believed that a broader view that takes into account the 'less important' secondary actors is highly essential in the context of major PIC projects. Nevertheless, although the literature on megaprojects is moving forward, there has not been an academic effort to identify, summarize and articulate the underlying assumptions that make the 'management-for-stakeholders' approach beneficial (or not) to megaproject performance. What is noticeable is the inefficiency of the classic stakeholder's methods to capture and include the views of a broader range of stakeholders. This has not only prevented a more inclusive approach to stakeholder engagement, but has reinforced the lack of public support that megaprojects are historically facing.

Therefore, by undertaking a Systematic Literature Review (SLR) of stakeholder management practices in PIC, the authors try to identify those assumptions worthy of being challenged (Alvesson and Sandberg, 2011) by proposing future theoretical and empirical developments in the project stakeholder management field. Whilst different studies provide valuable insights into local community influence on project outcomes (e.g. Eesley and Lenox, 2006; Teo and Loosemore, 2011), they overlook the literature concerning the outcomes of megaprojects affecting the local communities' social needs in such projects. Reviewing the literature focusing on local communities in megaprojects is important from both theoretical and managerial perspectives, because they can negatively impact the project (Olander and Landin, 2008; Teo and Loosemore, 2014).

The project manager should be efficient in documenting the expectations of stakeholder or customers to achieve desired outcomes and avoid uncertainties. In projects, the process of managing communication ensures timely collection, generation, storage, and disposition of project information. Nonetheless, it is critical to clarify what is expected from external and internal stakeholders, including project team members (Anantatmula, 2008b). Project managers should effectively communicate to create a bridge between diverse stakeholders involved in a project, share various levels of expertise, establish different cultural and organizational backgrounds, and build an environment of trust to achieve project outcomes (PMI, 2013). The project manager should communicate customer expectations with the project team to identify roles and tasks, define the level of accountability, define responsibilities of individual team members, and create an environment of trust among team members to support the team in times of crises (Thamhain, 1999).

After defining performance measures, the next step is to review PM actions that affect project success. The U.K.-based Chartered Institute of Building published a code of practice for PM _CIOB 2002_ and the U.S.-based Project Management Institute _PMI_ has its guide to PM body of knowledge _PMI 2004_. This study adopted the PMI's nine PM knowledge areas and correspondingly, identified PM actions

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following PMBOK and PMI 2004_. The PM functions or knowledge areas are: project scope; time; cost; risk; quality; human resources; communications; procurement management; and integration of these functions. Knowledge, skills, tools, and techniques are applied to manage these functions in an iterative process. PM practices within each PM knowledge area that may affect project success were then systematically identified. Altogether, 78 PM practices were operationalized.

The context of the producer can be viewed from two aspects. In the first instance the producer will have a task oriented view of the project similar to the rest of the project team. The producer's commitment to the project will end once it is handed over to the client. The commitment is therefore towards short-term rather than long-term goals. In the second instance the producer is a user of the project in the sense that information generated by the project team is used to manufacture the end product. The producer will now be concerned with the ease of final assembly, but again in the short-term context of the project development and not the longer-term use.

This discussion has highlighted how the various individuals involved in a project will have different orientations towards the final project outcome. Success will be viewed differently by each group because their expectations for the project will vary. To return to the quote from Kerzner which opened this section, it would seem inappropriate to place all the responsibility for integration on the project team. Because the involvement of the project team is concerned with only a small subset of the total project it would seem more logical to make an individual who has a wider view responsible for the project. The client has the longer term and wider orientation and there is a logical argument for making the client responsible for the end project.

2.3.8 Project Performance

Poor performance, such as time delays and cost overruns, are not uncommon in construction projects (Lo et al., 2006), and the reasons behind these problems have attracted the attention of construction practitioners and researchers. For example, Mansfield et al. (1994) identified the four most important factors leading to time delays and cost overruns as finance and payment problems, poor contract management, changes in site conditions, and shortages of materials. The study by Kaming et al. (1997) showed that the predominant factors influencing time delays are design changes, poor labour productivity, inadequate planning, and resources shortage, while cost overruns are generally attributable to material price increases, inaccurate material estimation, and project complexity. Similarly, Frimpong et al. (2003) suggested that time delays and cost overruns arise primarily as a result of payment difficulties, poor contractor management, material procurement problems, poor technical ability, and escalation of material prices. On the other hand, some researchers have analysed the major causes of quality defects, one of which Atkinson (1999) identified as human error and another of which Love and Li (2000) described as poor workmanship. These studies discussed project performance from a negative perspective.

Combined with project success-specific studies, such as Wit (1988), Munns and Bjeirmi (1996) and Chua et al. (1999), these studies also contributed to the identification of time, cost and quality as the three most important indicators to measure construction project performance. Other studies, such as Chan and Kumaraswamy (1997) and Assaf and Al-Hejji (2006), have categorised the factors that influence poor performance. For example, Assaf and Al-Hejji (2006) grouped 73 delay factors into nine categories: project related, client-related, design-related, contractor-related, consultant-related, materials-related, labour-related, equipment related, and external factors. These studies also divided the related and external factors. These studies also divided thecauses of poor performance into external causes and internal causes. External causes, which are usually beyond the control of project teams, may include adverse weather conditions, unforeseen site conditions, market fluctuation, and regulatory changes. Internal causes of poor performance may be generated by the client, the designer, the contractor, the consultant and various suppliers who provide labour, materials and equipment. These studies looked at the internal project participants in isolation.

A few studies, such as Odeh and Battaineh (2002), have considered the contractual relationship as one of the causes of poor performance. However, there is a lack of systematic investigation of the influence of supply chain relationships on project performance although some studies have paid attention to the influence of one particular relationship indicator on project performance, e.g. the influence of

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mutual objective setting on project performance by Swan and Khalfan (2007). The concept of supply chain management has originated and flourished in manufacturing (Vrijhoef and Koskela, 2000). According to Christopher (1992), a supply chain is a network of organisations involved through upstream and downstream linkages in the different processes that deliver value in the form of products and services to end users.

Christopher (2005) defined supply chain management as the management process of the relationships between different customers and suppliers to deliver better value at less cost to the supply chain as a whole. Both Christopher (2005) and Jespersen and Skjøtt-Larsen (2005) viewed the customer–supplier relationship as the essence of supply chain management. Through the adoption of supply chain management, industry sectors, such as manufacturing, have achieved significant improvement in business performance. Effective supply chain management depends on the collaboration between supply chain partners (Horvath, 2001). Learning from these sectors, the construction industry has gradually accepted supply chain collaboration as a strategy (Briscoe and Dainty, 2005). Compared to a supply chain in manufacturing, a construction supply chain is more complex and involves a larger number of key participants, such as project client, consultants, main contractor, specialist contractors, and various suppliers.

Throughout a construction supply chain, project client is the end customer while the end suppliers provide labour, materials and equipment. Main contractor is both the supplier of project client and the customer of specialist contractors. Client–main contractor relationship is upstream while main contractor– specialist contractor relationship is downstream. Generally, client–main contractor relationship is considered as the main relationship in a construction supply chain (Cox et al., 2006). According to Love et al. (2004), the customer–supplier interfaces link the parties involved in a project together as a construction supply chain. More importantly, the customer– supplier relationship has been interpreted by Saad et al. (2002) and Fernie and Thorpe (2007) to be central to construction supply chain management. As a result, supply chain relationships distinguish one construction supply chain from another. Supply chain relationships in construction are quite diverse, among which three distinct forms are the traditionally adversarial, the short-term collaborative, and the long-term collaborative relationships.

The traditional adversarial relationship has been criticised by a number of authors, e.g. Larson (1997), Gardiner and Simmons (1998), Wood (2005), and Thomas and Thomas (2005). For example, Larson (1997) saw this relationship as characterised by a focus on win–lose, suspicion of each other, withholding or manipulating information, ineffective problem solving, and unfair risk allocation. Thomas and Thomas (2005) pointed out that this type of relationship often leads to selfish objectives, a lack of trust, confrontation, poor communication, problem escalation, and a lack of continuous improvement. A consensus is that traditional ways of thinking and working form a barrier to construction supply chain management (Vrijhoef and Koskela, 2000; Saad et al., 2002). Successful application of supply chain management in construction requires a major shift from the traditional adversarial to the collaborative relationships in its projects (Egan, 2002). On the other hand, partnering is widely recognized as a collaborative supply chain relationship. According to the Trusting the Team report by Bennett and Jayes (1995) and the Partnering Toolkit report by the Construction Industry Institute (CII) in 1996, partnering can be classified into project partnering focused on a single project and strategic partnering based on multiple projects. Project partnering describes a shortterm collaborative relationship while strategic partnering represents a long-term collaborative relationship. Many existing studies, such as Hellard (1995), Crane et al. (1999), Black et al. (2000) and Chan et al. (2004), have investigated the critical success factors for construction partnering.

According to Hellard (1995), the key elements of successful partnering are commitment, equity, trust, mutual objectives, effective problem solving, timely communication, and continuous measurement and improvement. Chan et al. (2004) identified the top five critical success factors for construction partnering as communication for effective problem solving, sharing culture, clear definition of responsibilities, commitment to win–win attitude, and regular monitoring of the partnering process. The common factors identified by all these studies, from both positive and negative perspectives, can be considered as key indicators of supply chain relationships in construction, including mutual objectives,

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gain and pain sharing, trust, no-blame culture, joint working, communication, problem solving, risk allocation, performance measurement, and continuous improvement.

On the other hand, improving project performance is a common issue in almost all organizations. Project performance cannot be completely assessed until the project is delivered and used by the customer (Razmdoost & Mills, 2016). Assessing project performance involves detailed analysis of all aspects of a project (Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2015). As ongoing research efforts are aimed to develop theories and models for improving project performance (Williams, 2005), it is necessary to improve understanding of critical competencies that must be utilized in a project context (Loufrani-Fedida & Missonier, 2015). In addition to promoting trust, p roject managers need to be aware of project activities and take steps to make decisions in accordance with the given situation. Project priorities should be identified and must be adhered to. In addition, unambiguous roles and responsibilities should be assigned to the right people in the right projects at the right time. Moreover, project managers must communicate with all project stakeholders to integrate the project into the wider spectrum of the organization in order to benefit both the customer and the organization (Kloppenborg, Shriberg, & Venkatraman, 2003). Thus, project managers should keep motivating project stakeholders to accomplish organizational objectives through projects (Lunenburg, 2011).

The concept of project performance has been a subject of utmost concern to most stake holders in the construction industry. Projects are expected to perform to achieve set objectives. Satisfactory achievement of the set objectives makes a project successful. Project performance has been considered to be tied to project success and this is also tied to project objectives [Chan & Chan, 2004]. Project success has been measured based on different dimensions. There are three basic objectives of Construction projects; time, cost and quality. These objectives are the adopted dimensions for measurement of project performance in this study.

Measuring the success based on these objectives is considered to yield effective results since project participants are more familiar with the three basic project objectives. The overall performance of any project is invariably an aggregation of the performance of individual objectives. Based on the widely used and base on an overriding factor for measuring project performance based on the three basic objectives emanates from the qualitative finding by Phua & Rowlinson [2004] out of their research into how important cooperation is to construction project success. They identified three factors – adherence to project budget, time and quality requirements as being consistently indicated by interviewees to be the overarching criteria of assessing construction project success. Hence it is highly useful to adopt these objectives to form the basis for the measurement of the building projects performance in subsequent analysis.

2.4 Historical Thinking

It has been recognized over the decades that project management is an efficient tool to handle complex activities. Avots ~ has suggested that it is more efficient than traditional methods of management, such as the practice of functional divisions in a formal hierarchical organization, for handling such situations. The process of bringing new projects on stream and into the market imposes demands on established organizations and necessitates different management techniques from those required to maintain day-to-day operations. In such circumstances, where companies have a finite, unique and unfamiliar undertaking, the techniques of project management can be successfully implemented. These undertakings would call for more and faster decision-making techniques than possible in a normal operation and making the right choices will be critical to company success. The use of project management has become associated with such novel complex problems, which are inevitably called a project.

Consequently, the success of project management has often been associated with the final outcome of the project. Over time it has been shown that project management and project success are not necessarily directly related. The objectives of both project management and the project are different and the control of time, cost and progress, which are often the project management objectives, should not be confused with measuring project success. Also, experience has shown that it is possible to achieve a successful project even when management has failed and vice versa. There are many examples of projects which were relatively successful despite not being completed on time, or being over budget. All

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of which turned out to be relative successes, even though the project control aspect of them failed. It can therefore be argued that the relationship between the two is less dependent than was first assumed, and in order to measure project success a distinction should be made between the success of a project and the success of the project management activity.

Construction projects take place all over the world. Construction entails building works, water works civil works, road works and many others. Every single construction project has the following constraints; time, cost and quality. It is often common to experience delays during construction projects. These delays do not always result from a single catastrophic event and can cause substantial damages to a project and the firms undertaking the project. The construction industry has been frequented with occasional delays and disruptions causing time and cost overruns. Globally, delay in construction projects is one of the most common, costly, complex and risky problems encountered in construction projects success. These delays and disruptions are sources of potential risks that current studies are looking into ways to manage such as technical, social, economic, legal, financial, resource, construction and commercial (Kikwasi, 2012).

Clients finance projects with the sole purpose of reaping benefits from the investments. The construction industry is known to be a time-consuming and material depleting industry, due to its complexity and volatility occasioned by varied needs, wants and preferences. No investor would invest in a project that seem to last forever, with indefinite cost or budget. There is thus a direct co-relation between time and cost of project. Projects are deemed thus because they have definite start and finish time, consume resources and meet certain criterion in satisfaction to the beneficiaries. In a construction project, contracts are based on price or cost and time period needed to finish a project (Waihenya, 2011).

In Kenya, building and construction industry has been robust (Kenya facts and Figures, 2012; Kenya National Bureau of Statistics, 2012). Foreign investors have shown a lot of keenness to have a stake in Kenya, considering it is a business hub in east and central Africa, and a center from which they can operate within Africa. As a result of this, Nairobi and its environs have witnessed a boom in construction projects. These projects are government, private individuals, private companies and international businesses and institutions sanctioned. Construction industry has recorded bleak performance with regards to the basic factors that add to effective culmination of these activities, some of which are extremely unpredictable in nature. One of these components is delays in completion of these projects where the developers fail to deliver the completed houses on time (Oguoko, 2014).

Customers count on polished skill and commendable project administration skills of the developers as they buy the units off plan. Beautiful earth-shattering functions are conducted at the beginning of these projects yet years down the line, the developers have a perimeter wall fence and a gate house to show as progress. Cost management in these projects is a major indicator of performance especially in cases where banks have financed it. In most cases the developers invite investors to buy the unit while still under construction which increases their liquidity. Poor cost management may arise due to improper financial plans made in the initial project document which may result in stalling of construction until intervention by financiers come through. Some of the project management factors that impact on budget performance include: experience of the project manager, rate of project team workmanship, frequency of control meetings as well as control system budget (Towey, 2013).

Project make up around fifty percent of all work carried out and as a result is deemed the vehicle for the execution of organizational growth. The accomplishment of project through the application and integration of the project management process of initiation, planning, executing, monitoring, controlling and closing, is known as project management (Peter, 2005). Project management integrates these functions progressively through the project life cycle with the aim of satisfying the stakeholders and constituents according to the project's established requirements. Stakeholders are those who have a direct stake in the project while the project's constituents are those who may be impacted by the consequences of the project. Project success is typically generated when the stakeholders and constituents express their collective satisfaction according to the degree of their involvement.

Project management also includes planning, organizing, directing and controlling activities in addition to motivating what are usually the most expensive resources on the project. Project management is essentially about managing a project from its conception to its completion and needs to be discussed in terms of various stages of a project life cycle. A project could be viewed as a system, which is dynamic

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and ever changing from on stage to another in a life cycle (Atkinson, 1999). Considering a generic project, its status changes from that of an idea or a concept through to feasibility studies, execution and finally completion. (Peter, 1918). Also, projects are nowadays far more complicated than ever before. They involve large capital investments and embrace several disciplines, widely dispersed project participants, tighter schedules, and stringent quality standard and so on.

This coupled with high-speed development in Information and Communication Technology (ICT), these factors have greatly influenced project management practices in taking advantages of newly developed management tools and the latest technology. The creative concept of project management is universal and generic. This cut across all cultural, natural and logistic barriers, some corporate cultures are much more supportive of project techniques than others. Top managers who plan to introduce the project management discipline, or who wish to improve existing project performance, needs to take cognizance of cultural, and structural, practical and personal elements. Since project management demands quality information, discipline, goal orientation and requires steam working skills, rather than rigid functional divisions. Its primary focus is on what is yet to be done, and who will do it, rather than the achievements of the past. It is much about mobilizing the energies of diverse team members as it is about procedures, tools and techniques (Harvey, 1999). For the benefit of project management to be realized, the researcher examined the relevant project management variable on the performance of a construction firm in Lagos using Blackstone construction firm as a study area.

According to Amoah Mensah (2005) in his study on the role of African Quantity Surveyors in the achievement of NEPAD agenda mentioned delayed payment of client, inadequate contract information and performance appraisal as some of the bottleneck of optimal realization of the success of construction projects. The World Bank, in tracking the performance of the District Assemblies' Common Fund (DACF) Projects, identified that the Ministry of Finance has never released the full allocation to the Administrator of the Common Fund. A key finding that stood out as major drawback on the success of the DACF projects is the late release of funds for the projects. It was also indicated that GET Fund projects have suffered similar drawbacks. These findings indicate that building projects in the country have experienced performance problems and therefore there is the need to identify PM practices contributing to such drawbacks.

Other literatures also abound with indication of projects in the construction industry having performance problems. Post [2001] also attributes the problem of poor project performance to the dominance of the low-bid system of procurement. He argues that this system gives less attention to the quality and performance of the winning contractor. In light of these Kashiwagi & Parmar [2004] suggested that past performance information should stand as a key indicator for predicting future performance in the construction industry. Xiao & Proverbs [2003] also contends that contractor performance is critical to the success of any construction project as it is contractors who convert designs into practical reality. The problem of poor project performance is being attributed to a number of factors here and their effect on project performance has to be ascertained. Project managers have been called upon to be critical about the contractor selection process since it is important to project success. Clients in the building industry also select project consultants through a process, thus, based on certain criteria. Ignoring the crucial nature of the project consultant selection procedure may also affect project success. The attributes of project consultants therefore surely has something to do with the problem of project performance. Poor performers produce poor performance whilst good performers produce good performance. Construction professional advisors must therefore know the performers to maintain and the ones to eliminate.

2.4.1 Project Management Structure and Project Success

The organizational structure adopted for management of building projects is an important area to consider for the success of projects. Weaknesses in this area of project management lead to poor project performance regardless of organizational facilitators such as senior management commitment and leadership style [Cooper, 2008]. Bryde [2003] in his investigation into the formalization of project management activities included the structuring of the project, among four broad areas, that define the success of projects. Loo [2003] also grouped project management activities that facilitate project success under two main areas, which require the establishment of organizations structure for their effectiveness.

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The areas cover technical (e.g. planning, controlling, and procedures) and people (e.g. leadership, communication, and conflict management).

Getting an organization structure alone is not enough. As much as having an organization structure is important for the achievement of project success as emphasized by Bryde [2003], Loo [2003], also the relevance of the presence of an organization structure to a building project of a particular size should not be given less attention. Another aspect that requires consideration in the project management process is about which of the parties to a building contract should always operate not without project organization structure.

2.4.2 Project Performance Measurement

In this study, overall project performance is determined based on the performance of the individual basic project objectives: Time performance, Cost performance and Quality performance. Two main research works that have developed formulae for the measurement of project performance have been identified. Chan & Chan [2004] made use of Key Performance Indicators (KPIs) in his study into the use of key performance indicators for measurement of construction success. Four major areas, among others, determined the formulae that were adopted for the measurement of project performance. Secondly, Ling et al. (2002), in developing models for predicting the performance of Design-Build and Design-Bid-Build projects, made use of the performance metrics for measurement of project performance This gives rise to the need to highlight on certain characteristics of the project management team members too; their competence, experience, knowledge and skills.

2.4.3 Project Cost and the Effect of Certain PM practices

Cost has been defined as the degree to which the general conditions promote the completion of a project within the estimated budget [Bubashit and Almohawis, 1994]. It covers overall costs incurred from project inception to completion. This highlights the importance that has to be attached to every project management activity carried out through every stage of the project development up to completion. Chan and Chan [2004] also argues that cost is not only confined to the tender sum and that it is the overall cost that a project incurs from inception to completion, which includes any cost arising from variations, modifications during construction period. These cost variables give indication of certain additional practices that when engaged in during the project management process would have both direct and indirect implications for the project cost performance. The number and manner in which variation orders are issued by consultants during construction is an important practice to look at. Clients who often engage in the habit of agitating for numerous design changes before practical completion also play great role in the influences on project cost. The way contractors respond to variation orders may also have implications for the project performance. In predicting the performance of design-build and design-bid-build projects, Ling et al. [2002] identified certain variables that affect cost performance. These include: the number of repetitive elements contained in a project, the extent of design completion when bids are invited, and the level of paid-up capital of contractors engaged.

These variables bring to bear certain related practices that may affect the performance of project cost. For instance, the kind of procurement method usually adopted by clients; traditional procurement or design and build will determine the extent of completion of designs to be used for bidding. Moreover, the kind of project consultants selected by clients for design of a particular kind of project will also have influence on the way the design will be made (i. e. whether repetitive elements will be brought into the design or not). The attitude of client towards the project cost will also determine whether he or she will adhere to the advice given by designers concerning the cost advantage of having repetitive elements in designs. How contractors are usually selected (i. e. always selecting through competitive tendering or negotiated tendering) will also determine the kind of contractors that are employed to execute the projects.

The presence of certain features within a particular contract also goes a long way to determine the kind of contractors that would tender for the job and eventually win. For instance, the availability of certain facilities (such as payment of advance mobilization by client) within a given building contract may attract contractors who have low level of paid up capital or low level of ability to pre-finance a project. The level of financial capability of the winning contractor would have bearing on project performance.

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2.4.4 The Effect of Certain PM practices

The extent to which projects are monitored, the experience of project consultants, quality and past performance record of contractors [Kashiwagi & Parmar, 2004] and the number of variation orders issued all have effect on quality. How all these factors can be competently coordinated would be relevant to achieving satisfactory quality performance. The project management team leader has the responsibility to ensure that these factors are combining well to yield good quality performance. Those procedures comprise the concept of procurement form and the method of tendering. The fragmented nature of the construction industry and the fact that every building project is unique places great responsibility on the project management team in setting up the building process that will bring the project to a successful conclusion.

The emphasis here is on process and procedures having influence on quality of a building project. The subsequent issue that arises is how often project managers, having a sense of the uniqueness of every project, tailor certain PM practices to correspond with the uniqueness of a project in order to yield good quality performance. Some of the procedures to be given recognition may therefore include the selection procedure of organizations required to perform the design and supervision and those responsible for the construction of the particular project too. Usually, the construction team would be appointed under competition through competitive tendering process. Sometimes, a contractor may be appointed by negotiation on the basis of a fee. In cases where the design and construction is done as a complete package, both may be let by competition.

In a research work into the factors that influence quality performance of building projects, Chan and Tam [2000], using factor analysis and stepwise regression analysis, identified project management action by the project team as the most powerful predictor of client's satisfaction with quality. An emphasis therefore needs to be given to the significant practices that are usually adopted by members of the project management team for the quality management of building projects. Other factors mentioned that need to be given the necessary attention included: effectiveness of the construction team leader, the client's emphasis on quality, and the client's emphasis on time.

2.5 Summary

Main findings from the literature include the fact that project management practices involve carrying out the day-to-day management activities and decisions to meet set project objectives. These practices may vary from organization to organization. Optimum practices depend on the level of performance of the outcomes realized. This necessitates finding out of the relationship between PM practices and project performance. Project performance is considered to be tied to project success and this also is associated with project objectives. Project performance is therefore measured using certain criteria developed based on the project objectives. Project performance has been measured with several dimensions such as: Cost, time, quality, benefit to end users, benefit to national infrastructure, Environmental impact, health and safety requirements etc. Three basic project objectives, time, cost and quality, have been selected as the criteria for measuring project performance. These are considered to be the overarching criteria for assessing project performance.

3.0 RESEARCH METHODOLOGY

This chapter explains the way the research was carried out. This includes: research approach, research design, population and sample size of the study, sample and sampling techniques, and data collection procedure instrument.

3.1 Research Design

As asserted by Saunders et al. (2009), research methodology is a general plan of how researchers go about answering research question(s). The study adopted a mixed-method technique, thus both quantitative and qualitative techniques was used to collect primary data. Combining qualitative and quantitative approaches within the same piece of research enabled the researcher to provide richer detailed analysis. Linking qualitative and quantitative data also ensured the overall effectiveness of the research process as one can enhance the findings of the other.

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First there was collection of qualitative data on the project management practices carried out within the selected organization through interview. Secondly the qualitative data on the practices were organized into categorical statements and assigned numerical values to enhance quantitative measurement. The impact of the project management practices on measured performance of cases of completed projects was determined through quantitative analytical methods and multiple regression analysis. This study adopted a case study strategy to answer the research questions. Case study was adopted because it helped the researcher to conduct empirical investigations into the phenomenon using GET fund and district assembly common fund as evidence. This helped the researcher to gain a rich understanding of purchasing as a major factor in organizations productivity. It was also used because; case study approach has the capability to generate answers to the questions, why? What? and How? Data for the measurement of project performance as well as the impact of the practices thereof were obtained through survey questionnaires.

3.2 Ethical Considerations

The principal researcher formally sought the consent of all respondents and observed all the necessary protocol. A formal letter was sent by the researcher to inform the authorities of Ghana Education trust fund and district assembly common fund about the researcher's interest to conduct a study in their institution. The researcher ensured that information given by any respondent was treated and confidentially to the extent that no any piece of information was taken out of concealment. The identities of key informants were not disclosed in the report since the research is to appraise what pertains and not to use personal opinions of individuals.

3.3 Research Methods

Researchers around the world have employed two main research approaches, namely the quantitative and the qualitative research methods (Adams et al., 2007). The qualitative method presents a descriptive and non-numerical approach to collect the information in order to present understanding of the phenomenon (Berg 2004). Adams et al., (2007) argue that qualitative method employs methods of data collection and analysis that are non-quantitative, aims towards the exploration of social relations, and describes reality as experienced by the respondents. Babbie (2012) points out that qualitative method is an active and flexible method that can study subtle nuances in the attitudes and behaviors for investigating the social processes over time.

On the other hand, Adams et al., (2007); Hussey and Hussey (2009) and Bryman (2012) point that the quantitative approach uses different types of statistical analysis and provides stronger forms of measurement, reliability and ability to generalize. Quantitative approaches refer to the research that is based on the methodology principles of positivism and neo-positivism and adheres to the standards of a stick research design developed prior to the actual research (Adam et al., 2007). Moreover, Berg (2004) argues that the quantitative method can deal with longer time periods with larger number of samples leading increasing the generalization capacity. However, some researchers found that the qualitative approach suffers from a number of problems. First, it uses and selects a small sample which will not represent the entire population. Second, transparency and reliability are still low in qualitative methods (Berg, 2004).

Finally qualitative methods are time consuming; it may result in inefficient tools to get adequate explanations (Bergs, 2004). Quantitative research design is used in this study. The quantitative method of data collection was adopted because of the availability of data, convenience as well as the nature of the research design which required past and documented facts as basis for performance evaluation. The justification for adopting a quantitative method in this study stems from three plausible reasons (i) the fact that existing theories make it easier to formulate hypotheses that can be tested using statistical tools; (ii) provides a framework for addressing the relationship among variables in the study; and (iii) useful for dealing a cause and effect relationship.

Furthermore, this study applied deductive positivism approach whereby the pre-existing theoretical basis is identified and relied upon in developing the hypotheses, the empirical findings demonstrate whether the tested hypotheses are accepted or rejected. To achieve this objective, this study used the multiple regression as the main tool of analysis in which the researcher pursued the positivist

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understanding of the conduct of methodological processes that is "unaffected by the individual perceptual differences (Ardalan, 2012). Hair et al., (2009) stated that "the appropriate method of analysis when the research problem involves a single metric variable presumed to be related to two or more independent variables". Therefore multiple regression analysis is chosen as the main tool of analysis in this study. Multiple regression models are one of the most common methods of analysis that have been used by previous researchers (Rant, 2011; Al-Sahafi, 2015; Asm'a Al Amarneh, 2014).

3.4 Samples Size

The sample size chosen was based on its ability to conform to the requirement of statistical method for answering the research questions. In order to answer the question: "which PM practices affect project performance?" there was the need to perform regression analysis. Data from all the projects were to be categorized according to which organization they belonged for identification of effective PM practices within each organization. Stratified sampling, where each of the organizations would not be over or underrepresented, was therefore adopted; 30 projects were expected from each organization. In all two major case studies examined: Blismas et. al. (2004) and Chan and Chan (2004), the choice of cases was not based on any statistically derived method. Blismas et. al. (2004) in studying factors influencing project delivery, asserted that: "case studies are not to be viewed as single samples of a population; the aim is not to draw inferences from a sample to a population, but to make findings about linkages and relationships of theoretical importance". On this basis and in line with the aim of this study a sample of projects was chosen. The cases of projects are from the building sector of the construction industry. Each building project had to exhibit qualities that would enable effective measurement of the effect that PM practices have on project performance minimizing certain identified extraneous influences.

3.5 Questionnaires

A questionnaire is an instrument in written form that has a number of items and administered to several people to collect data for surveys. The researcher employed questionnaires as a data collection method for the management and other staffs in selected departments. The questionnaires are close ended questions of which Respondents ticked the applicable answer per their view. The close ended questions are important because the researcher had various views with respect to some particular questions. Questionnaire provided an efficient means by which statistically quantifiable information were collected. The responses were arranged in categories, analyzed and presented mainly in a narrative form.

3.6 Interviews

This is the process where verbal questioning is used as the main technique in data collection. It is another instrument adopted by the researcher to gather information about or from an individual usually through oral interaction with that individual. The method will therefore be used to enable the researcher to ask questions that the questionnaires did not cover. Though interview is conducted by most people in various forms, it should be noted that interviews conducted by a researcher should employ empiricism in the data collection exercise.

3.7 Data Validity and Reliability

The researcher carried out a pilot study to pretest the validity and reliability of data collected using the questionnaire. According to Berg (2004) validity is the degree by which the sample of test items represents the content the test is designed to measure. Content validity which was employed by this study is a measure of the degree to which data collected using a particular instrument represents a specific domain or content of a particular concept. Mugenda and Mugenda (2009) contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field. According to Shanghverzy (2003), reliability refers to the consistency of measurement and is frequently assessed using the test-relicts reliability method.

Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures. The researcher selected a pilot group of 5 individuals each from the target population of the staff working in the two organizations to test the reliability of the research instrument. The pilot data was not included in the actual study. The pilot study

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allowed for pre-testing of the research instrument. The clarity of the instrument items to the respondents was necessary so as to enhance the instrument's validity and reliability. The aim was to correct inconsistencies arising from the instruments, which ensured that they measure what was intended.

## 4.0 DATA ANALYSIS AND DISCUSSION

### 4.1 Data and Information Description

This chapter covers the findings and analysis of data collected based on the questionnaires distributed and conducted with top management. Data gathered from the field are two-fold. The first was data of some of the existing PM practices of the selected organizations. The second set of data was on parameters required for measurement of the performance of selected cases of substantially completed projects and subsequent ranking of the importance of the identified PM practices on the overall performance of building projects within the selected organizations. The analysis is carried out mainly by the use of significant testing and multiple regressions.

### 4.2 Context of Research Sites

The data was collected from the Ghana Education Trust fund and the district assembly common fund. The principal researcher with the help of two research assistants distributed the structured questionnaires to the two organizations. The questionnaires were dropped at the two organizations with respondents who showed interest in participating in the study. The essence of dropping the questionnaires was to ensure privacy and comfort so as to draw objective responses to the questions contained in the questionnaire. Again, the presence of the researcher and the research assistants could have influenced the responses to the questions to please the researchers. Respondents were given 'enough' time (i.e. Two days) to respond to the questionnaire. Also, additional information that improved PM practices was retrieved from the two organizations (Get fund and District assembly common fund) through face to face interview. Some of the practices identified were peculiar to one organization. Other practices were also common amongst the two organizations. The practices identified are those currently existing. Base on the comments coming from the interviewees, it was realized that some of the practices common to the two organizations was adopted by other organizations.

#### 4.2.1 Analysis of Interviews

Table 5.1 indicates the key Project management practices identified and the possible influence that some of them may have on the performance of the projects as observed from the interviews.

Table 5.1: Key project management practices

| | Major Identified Project Management Practices | | |
|---|---|---|---|
| Organization | Project activity | | |
| PM activity | GET Fund | COMMON FUND | COMMENT |
| Project Identification at Predesign Stage | 1. Project identification usually carried out by local school clients (i. e. project end users.)<br>2. Projects required for fulfillment of specific annual educational development programs are however identified by organization's head. | 1. Occasionally, end users are extensively involved in the identification process.<br>2. Projects mostly identified in accordance with clients annual infrastructure development programs. | Project may perform better in the long run by involving end users in project identification process since this increases interest in ensuring progress of works.<br>However Unnecessary interruption is possible |

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| | | | |
|---|---|---|---|
| Selection of consultants for projects | 1. Competitive selection of the consultant is not frequent.<br>2. Consultants are mostly appointed directly by local client (end users) for individual project. | 1. Consultant selection is mostly done competitive through assessment of expression of interest and proposals.<br>2. Local Client's in-house construction professionals sometimes serve as sole consultants for certain projects. | Competitive selection of consultant may not be necessary for the success of every individual project. Engaging client's team members as project consultant is usually helpful for small-sized projects |
| Selection of contractors to execute projects | Contractors bid and are usually selected on open competitive basis irrespective of working experience with | Contractors bid and are usually selected on open competitive basis irrespective of past working experience | Projects usually executed by contractors with past working experience with client are said to perform satisfactorily |
| Preparation of bids by consultants | Preparation of bids is mostly based on complete design and within a given time scale by client | Preparation of bids is mostly based on complete design and within a given time by scale by client | |
| Determining Winning Bid | Mostly by Merit point System (Price of bid carrying highest point) | Winning bid determined largely based on "Engineer's Estimate" (i.e. cost of project as determined by consultant) | Cost of the project has the largest influence in determination of winning bid |
| Financing of entire project | Project funds is used to bear entire project cost | Project funds is used to bear entire project cost | Supplementing cost of project with end-user's contributions minimizes possible shortage of project funds and subsequent delay of project's progress |
| Releasing project funds for payment of works executed | Release of funds by organization is made annually; release of any requested amount exceeding annual budget is made in the following year | Release by project financier is expected to be made quarterly; number of releases within a year is however usually less than four | Releasing funds according to a periodic schedule is mostly characterized by irregularity and this in turn delays construction |
| Monitoring of work progress | Monitoring is largely carried out through routine inspection normally conducted by project consultant; occasional visit by organization's technical team is usually done as a response to peculiar problems at certain project sites | Monitoring is largely carried out through routine inspection by consultant. Occasionally, Client's monitoring team is involved | Monitoring through inspection of the works only in response to peculiar problems may result in poor quality |

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| | | | |
|---|---|---|---|
| Valuations of Works for payment | Contractors mostly carry out entire valuation of works for vetting of consultant | Consultants mostly carry out entire valuation of works on behalf of contractor after request is made | Consultant carrying out entire valuation on behalf of contractor facilitates quicker payment although this is not in favour of normal contract procedures.<br>Vetting of contractor's submitted claims is however claimed to improve cost performance |
| Honoring Payment Certificates | Endorsement and cross-checking is done through formally defined procedure involving appointed individuals from client team. (Involvement of organization's funding secretariat (head office) in the payment procedure is indispensable) | Endorsement and cross-checking is done through formally defined procedure involving appointed individuals from local client's team. | Delayed payment is claimed to be not necessarily due to bureaucratic payment procedures.<br>Delayed payment, contributing to delayed construction, is said to emanate from non-cooperativeness |
| Making variations in scope of work | Extent to which variations, mostly additions, is made not based on budgeted amount for the project | Allowing for upward variations is not based on project's budgeted amount<br>Sometimes variations are influenced by end users | Additions made not based on original project budget is<br>claimed to contribute to poor cost performance |
| Issuing of Consultant's Instructions | Use of both verbal and written instructions | Use of both verbal and written instructions | Giving instructions only<br>verbally is mostly characterized by lack of<br>records and this usually<br>results in unbudgeted costs |
| Educating end users of project on contractual matters | No specific fora or seminars for education | Occasional seminars by project consultants and for a by client | Educating end users is said to<br>minimize unnecessary interruption of work whiles<br>increasing quality of progress<br>monitoring |

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| | | | |
|---|---|---|---|
| Taking feedbacks from completed projects for improvement of subsequent ones | Through the use of periodic project progress reports on completed projects. | Through the use of periodic project progress reports on completed projects. | Appraisals are more oriented towards taking feedback than does progress reports |

4.2.2 Measurement of Performance (Time, Cost and Quality)

The performance of evaluating projects, consist of three key categories that is; time cost and quality. The time, cost and quality performance of every project were measured by means of time, cost and quality performance indices respectively on a point scale ranging from 0.5 to 1.5. The time and cost performance indices were obtained by computing from formula whilst the quality performance was subjectively measured by each respondent indicating, in his or her own estimation, the extent to which the quality of the project deviated from what was expected; the margin of deviation being in percentage.

Table 5.2: Time Performance (Y1) Index

| **Project Completion Status Achieved** | **Completed behind Schedule** | Completed on Schedule | | | |
|---|---|---|---|---|---|
| **Index** | 0.5 And below | 0.6 | 0.7 | 0.8 | 0.9and above |
| Time performance index = Planned Contract Period / Actual Construction Period | | | | | |

Table 3: Cost Performance (Y2) 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 | 0.9and above |
| Cost performance index = Initial project cost / Final project cost | | | | | |

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Table 4: Quality Performance (y3) Index

| **Project Quality Status Achieved** | **Below Expectations** | | As Expected | | | Above Expectations | | |
|---|---|---|---|---|---|---|---|---|
| **Margin** | 50% and below | | 10% | 20% | 30% | 40% | 50% and above | |
| **Index** | 0.5 and below | 0.6 | 0.7 | 0.8 | 0.9 | 1 | 1.1 | 1.2 and above |

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. The indices represent the points on the regression Y-axis whilst the points of ranking indicating the level of impact of each PM Practice on overall performance.

4.2.3 Response to Data collection

In all, 50 questionnaires were distributed. Each questionnaire was designed to obtain data on one project and therefore information on 50 projects was expected. The response rate was 61%. Data were obtained on 22 projects from 'Common Fund' organization, and 28 from 'GET Fund' organization. Several contacts were made both personally and by means of telephone in order to retrieve the remaining questionnaire. Non-response could be partly attributed to respondents' complaints about the nature of data being requested; data on completed projects. Such data had to be retrieved from archives and this yielded considerable unwillingness. The response rate is however acceptable and was used for the analysis. Also, the number of projects obtained meets the requirement of the statistical method used for the analysis.

Most of the respondents belonged to the senior staff level, regarded as the senior management level, in their respective firms. No respondent also indicated lack of understanding of the concepts under study; PM practices and project performance. These background characteristics of the respondents were therefore expected to yield reliable data since the provision of answers, to a large extent, was expected to be approached with enough experience in project management in the construction industry and the element of genuineness. Appendix II shows the indices and points indicating level of effect of PM practices as obtained project by project within each organization. The table forms the basis for the regression analysis. Within each organization, information about the performance and PM practices on a project represents what was obtained from a single respondent. The performance indices and points for indicating levels of PM practices' effect on performance represent regression plot points; the performance indices are points occurring on the y-axis and points of effect of the PM practices represent points on the x-axis. Three dependent variables and forty-nine independent variables are used in a multiple regression analysis.

5.2.4 General Trend Performance of the Projects

A computed index of less than 1.0 indicates underperformance or below trend whilst 1.0 or above is according to trend or above trend respectively. In order to know the trend of performance of all projects obtained tables 5.3 (i) – (iii) below gives a descriptive summary of the performance indices obtained project by project. Response rate is however acceptable and was used for the analysis. Also, the number of projects obtained meets the requirement of the statistical method used for the analysis. Most of the respondents belonged to the senior staff level, regarded as the senior management level, in their respective firms. No respondent also indicated lack of understanding of the concepts under study; PM practices and project performance. These background characteristics of the respondents were therefore expected to yield reliable data since the provision of answers, to a large extent, was expected to be approached with enough experience in project management in the construction industry and the element of genuineness. Appendix II shows the indices and points indicating level of effect of PM practices as obtained project by project within each organization. The table forms the basis for the regression analysis.

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Within each organization, information about the performance and PM practices on a project represents what was obtained from a single respondent. The performance indices and points for indicating levels of PM practices' effect on performance represent regression plot points; the performance indices are points occurring on the y-axis and points of effect of the PM practices represent points on the x-axis.

Table 5.5: Time performance trends of projects

| Time performance trend of projects | No. of Projects obtained under: | | Percent % | | | Overall Trend Performance % | |
|---|---|---|---|---|---|---|---|
| Time Index Performance GET Fund | GET Fund | Common Fund | Total | | | | |
| 0.5 | 13 | 13 | 16 | 24.2 | | | |
| 0.6 | 7 | 12 | 19 | 28.8 | Completed behind schedule | 58 | 87.9 |
| 0.7 | | 4 | 12 | 18.2 | | | |
| 0.8 | 2 | | 9 | 13.6 | | | |
| 0.9 | | 2 | 2 | 3 | | | |
| 1 | 2 | 1 | 8 | 12.1 | Completed on schedule | 8 | 12.1 |
| Total | 24 | 22 | 66 | 100 | | | |
| Mean Index | 0.6 | 0.65 | | | | | |

Table 5.6: Cost performance trends of projects

| Cost Performance index | No. of projects obtained under | | | Percentage % | | Overall trend Performance | |
|---|---|---|---|---|---|---|---|
| | Get Fund | Common Fund | Total | | | No | Percentage % |
| 0.6 | 5 | | 5 | 7.6 | Completed above initial budget | 39 | 59.1 |
| 0.7 | 14 | | 14 | 21.2 | Completed above initial budget | | |
| 0.8 | 2 | | 2 | 3 | Completed above initial budget | | |
| 0.9 | | 12 | 18 | 27.3 | Completed above initial budget | 22 | 33.3 |
| 1 | 3 | 10 | 22 | 33.3 | Completed as budgeted | | |
| 1.1 | | | 0 | 7.6 | completed below initial budget | 0 | 7.6 |
| Total | 24 | 22 | 46 | 100 | | | 100 |
| Mean index | 0.73 | 0.95 | | | | | |

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Table 5.7: Quality performance trends of projects

| Quality Performance index | No. of projects obtained under | | Percentage (%) | | Overall trend Performance | | |
|---|---|---|---|---|---|---|---|
| | Get fund | Common fund | Total | | | No | Percentage % |
| 0.9 | 0 | 0 | 0 | 15.2 | Below expectation | 10 | 59.1 |
| 1 | 10 | 17 | 27 | 43.9 | As expected | 29 | |
| 1.1 | 4 | 5 | 9 | 21.2 | Above expectation | 27 | |
| 1.2 | 10 | 0 | 10 | 15.2 | Above expectation | | 33.3 |
| 1.5 | 0 | 0 | 0 | 4.5 | Above expectation | | |
| Total | 24 | 22 | 46 | 100 | | 66 | 100 |
| Mean index | 1.10 | 1.02 | | | | | |

Regarding construction time performance, cost performance and quality performance of the projects, 87.9%, 59.1% and 15.2% performed below trend respectively. The trend percentages obtained indicates that project performance below trend is prevalent amongst the projects. However, trend of quality performance of all the projects is better than cost and time performance. This may be due to the inclination of clients towards attaining projects of satisfactory quality rather than projects constructed on or ahead of schedule and as budgeted or below budget. There is an indication that whilst time and cost objective can be compromised on, quality is difficult to sacrifice. The mean indices obtained play significant role in the determination of differences in the performance of the projects from organization to organization.

4.2.5 Determination of Differences in Performance of the Projects from Organization to Organization

While it is not the aim of the research to identify which organization's category of projects performed 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 perform a two-sample t statistic test, at a significance level of α = 0.05, to determine the existence of any significant difference between the performance of the categories of building projects pair-wise; performance of categories of projects within two organizations were compared at a time. Tables 5.4 to5.6 gives results of the test. The null hypotheses required for performing the test are as follow:

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

i. e. $H_o$; $\mu_g - \mu_c = 0$

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 $\mu_g$ represents sample mean for GET Fund organization

$\mu_c$ represents sample mean for Common Fund organization The $t$- tests have been conducted 2-tailed at an α-significance level of 0.05. Hence, a computed significant value less than 0.05 imply that there is significant difference between the performances of the two grouping variables under test. From Table 5.4, significant values as well as $t$ values obtained indicate that the time performance of the projects within the 'GET Fund' organization does not differ from that of 'Common Fund' organization

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Table 5.2 shows that the cost performance of the projects within one organization differs from the other two. With regards to quality performance, Table 5.3 reflects lack of general differences amongst the organizations whilst the quality performance of projects managed by the 'GET Fund' organization differs from that of the 'Common Fund' organization. The occurrence or non-occurrence of performance differences may be due to a number of factors. However, the focus here is on the aspects relating to PM practices undertaken within the organizations.

Table 5.8: Independent Samples T-Test with Time performance as Test Variable

| Independent Samples T-Test with Time performance as Test Variable Grouping Variable | | | t-test for Equality of Means | | Conclusion | Decision |
|---|---|---|---|---|---|---|
| $t_{\alpha/2,m+n-2}$ | | | T | | df | Sig. (2-tailed) |
| 'GET Fund' and 'Common Fund' Organizations | 2.021 | -1.294 | 44 | 0.202322 | Fail to Reject Null Hypothesis | Time Performance difference NOT SIGNIFICANT |

4.2.6 Release of Funds for Payments

A common practice witnessed among the 'GET Fund' and 'Common Fund' organizations is the release of funds for the projects according to a periodic schedule. Irregularities and delays are found to be usually associated with the disbursement of the funds. This way and projects subsequently experience delays due to inability of clients to honor payment certificates. The 'GET Fund' and 'Common Fund' organizations have this practice of periodic release of project funds in common and this may explain why there is no significant difference found between the time performances of their respective projects. When projects require funds to continue, budget for that particular project would have been initially established by the organization. The practice is said to minimize the occurrence of delay in payment usually associated with irregularities in periodic release of funds for the project.

4.2.7 Financing of Entire project

Whilst the 'GET Fund' and 'Common Fund' organizations finance an entire project with only funds marked from a single source of the organization, other organization supports the financing of the project with part contributions from the project end users.

Supplementing cost of project with end-user's contributions is said to minimize possible shortage of project funds and thus subsequent delay of project's progress is curtailed. The financing of projects carried out differently by other organization from the other two organizations (Get Fund and Common fund) explains why the time performance of its projects also differs from the other two organizations.

4.2.8 Project Identification at Pre-design Stage

Building projects identification, as carried out within the 'GET Fund' and 'Common Fund' organizations, is either by the end users or as a result of fulfilling an annual development program by the organization. The identification by the end users only is not known to follow a specific laid down procedure. However within other organization, end users are extensively involved in identification of projects. This identification procedure follows laid down integrated functions, which are to be formally carried out by appointed organization's officers in conjunction with the end-users. Practice of identification of projects carried out differently by other organization may also explain the time performance differences occurring in table 5.4

4.2.9 Taking Feedback from Completed Projects

In taking feedback from completed projects for performance improvement of subsequent ones the two organizations use the methods of Desk & Field Appraisals and Project Evaluation rather than reference to project progress reports prepared during execution of the project. The use of appraisals and/or evaluation for taking feedback is said to be more oriented towards project performance

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improvement. The time performance of project fed with information through this method would therefore perform differently from a project in which a different method is used.

Table 5.9: Independent Samples t-test with Cost performance as Test Variable

| Independent Samples t-test with Cost performance as Test Variable Grouping Variable | t-test for Equality of Means | | Conclusion | | Decision | |
|---|---|---|---|---|---|---|
| $t_{\alpha/2,m+n-2}$ | T | | df | | Sig. (2-tailed) | |
| GET Fund and Common Fund Organizations | 2.021 | -8.04177 | 44 | 3.51E-10 | Reject Null Hypothesis | Cost Performance difference SIGNIFICANT |

4.2.9.1 Valuation of work done for payments

In contract administration, normally, contractors are required to initiate valuation of works for subsequent vetting and approval of consultant. This is witnessed within the GET Fund organization. Often, within the Common Fund organization, the consultant carries out an entire interim valuation on behalf of contractor after request is made by the contractor. The interim valuation of works within a project is very crucial in the determination of the ultimate cost of the project and how this is carried out is equally important. As observed, the process and condition for valuation of works across all the organizations is not the same and this could also account for the significant difference in cost performance of their respective projects.

4.2.9.2 Making Variations in Original Scope of Works

Table 5.4 gives an indication that the cost performance of the category of projects within one organization differs from the other organizations. Varying original scope of works is observed to be carried out differently by all the organizations and therefore the significant difference in cost performance of the projects from all the organizations could be partly attributed to this. The extent to which the 'GET Fund' organization adds onto scope of work is mostly based on quality and design requirements of clients. With Chan and Chan (2004) study in which they defined Cost of project with variation as a major component from which the cost of project is determined.

4.2.9.3 Consultant Selection

In selecting consultants for projects, the 'GET Fund' organization mostly appoints (i.e. non-competitively). The 'Common Fund' organization often combines both the competitive and non-competitive methods to select consultants for individual contracts. No method of selection is said to be best for all situations. The consultant selection system was found to be different for all the organizations and this could also account for the cost performance difference observed across all the organizations.

4.2.9.4 Determining Winning Bid

The Merit Point System in evaluation of bids is mostly used by the GET Fund organization. Within the 'Common Fund' determining winning bid is largely based on cost of project as estimated by consultant. The basis for selecting winning bid as is done within the other organization is slightly different from the above two methods as this is mostly influenced by organization's budget established for the particular project. The price of winning bid has a lot to do with the cost performance of a given contract and therefore this difference in the practices across all the organizations could account for the cost performance differences observed.

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Table 5.10: Independent Samples t-test with Quality performance as Test Variable

| Grouping Variable | t-test for Equality of Means | | Conclusion | | Decision | |
|---|---|---|---|---|---|---|
| $t_{\alpha/2,m+n-2}$ | T | | df | | Sig. (2-tailed) | |
| GET Fund' and 'Common Fund 'Organizations | 2.021 | 3.555 | 44 | 0.001 | Reject Null Hypothesis | Quality Performance difference SIGNIFICANT |

The quality performance of the projects was subjectively measured and it was satisfaction with quality that was rated. The satisfaction of, most importantly, the client with the quality of the project executed is what all parties within a given project ultimately give high consideration therefore when the client is satisfied other members within the project team would invariably be satisfied. Hence, most of the practices relating to quality performance were therefore expected to be client-dominated since the ultimate concern of the client is usually said to be quality.

4.2.9.5 Honoring of Payment Certificates

In a normal process of honoring of payment certificates, the client's team has appointed individuals who cross-check and endorse before contractor receives payment. The GET Fund organization has it in common that the involvement of their national/regional head office/secretariat in this process is central. Contractors have however reported that this process has not been characterized by delays and hence they are usually motivated to execute satisfactory work. This may also add to the reasons why there is no significant difference between the quality performances of their respective projects. With the Common Fund organization, the involvement of national head office/secretariat of the organization is not integral in the process. However, contractors usually report delays with this process and are usually not motivated to execute satisfactory work where there is excessive delay with payment. The significant quality performance difference between the 'GET Fund' and 'Common Fund' organizations' respective projects may be attributed to these occurrences.

5.2.9.6 Issuing and execution of site Instructions

Across all the organizations, site instructions from consultant are normally issued by both verbal and written means. Where the instruction is verbal, contractors are contractually required to confirm before execution to serve as adequate reference in the event of poor execution of the instruction. Before execution of the site instructions, most contractors working on the GET Fund organization are said to frequently seek confirmation whilst those working on 'Common Fund' seldom do so. This may be responsible for the existence of significant difference between the quality performances of their respective projects. In some instances, it is also reported that contractors take instructions from construction supervisory personnel from the client's team without the approval of consultant on the project. This practice is not observed with the GET Fund organization

4.2.9.7 Determination of Significant PM practices

The obtained performance differences between some paired organizations as well as the lack of difference in performance of some paired organization have all been observed to have influences from certain PM practices. A regression analysis was performed, using the stepwise method, to determine the PM practices that significantly affect performance of the building projects within each of the two organizations. Tables 5.7 to 5.9 indicate PM practices that significantly influence Time performance, Cost performance and Quality Performance within each of the organizations. The regression has been run at a α-significance level of 0.05 to .75.

The Beta coefficients give an indication of the contribution of each of the significant PM practices, the significant independent variables, in a model. A model is developed for each organization. The significance values denoted by (Sig.) are all less than 0.05, the significance level at which the regression was run. And this is what indicates that they have significant effect on the individual dependent variables. The adjusted R-square value also shows the percentage of variation of a dependent variable that the

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model explains. For instance, from Table 5.7, it was found that the 84.7% of variation in time performance of building projects obtained from the 'GET Fund' organization can be explained by the model.

Table 5.11: Regression Analysis of Time performance (Y1) on PM practices

| Regression Analysis of Time performance ($Y_1$) on PM practices: *Summary Organization* | *Variable* | *Significant PM Practice* | *Beta* | *Sig.* | *Adjusted R-square of model* |
|---|---|---|---|---|---|
| GET Fund | $X_{41}$ | Contractor first preparing claims for every interim valuation for subsequent vetting of consultant | 0.843094 | 1.87E-05 | 0.847 |
| $X_{45}$ | | Contractor confirming all instructions, verbal or written before executing | 0.287525 | 0.003805 | |
| $X_{10}$ | | Consultant preparing the bid under given time period by client | -0.17349 | 0.0191 | |
| $X_{23}$ | | Selecting the contractor through pre-qualification based on previous working experience with client | 0.141051 | 0.041205 | |
| Common Fund | $X_{18}$ | Assessing and awarding of contract by merit point system | 1.095824 | 4.58E-05 | 0.764 |
| $X_{23}$ | | Selecting the contractor through pre-qualification based on previous working experience with client | 0.473741 | 0.00056 | |
| $X_{30}$ | | Client and consultant jointly inspecting works on all occasions of site visit to monitor progress | -0.00074 | . | |

Dependent Variable: Time performance

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From the regression analysis the PM practices significantly affecting the time performance of the projects obtained from the 'GET Fund' organization include:

1. "Contractor first preparing claims for every interim valuation for subsequent vetting of Consultant";
2. "Contractor confirming all instructions, verbal or written before executing";
3. "Consultant preparing the bid under given time period by client"; and
4. "Selecting the contractor through pre-qualification based on previous working experience with client"

A positive Beta-value gives an indication that there is a positive relationship between the PM practice and the Performance and a negative Beta-value negative relationship. Thus, the PM practices, "Consultant preparing the bid under given time period by client", as carried out within the 'GET Fund' organization was found to have a negative relationship with Time performance. The implication is that on building projects that the time performance was poor, consultants were mostly made to prepare bids under a given time period. On the other hand, on projects that there was increased time performance contractors usually first prepare their claims, for every interim valuation, in order for consultants to subsequently vet.

The PM practices that were found to have significant influence on time performance of projects within the 'Common Fund' organization include "assessing and awarding of Contract by merit point system" and "Selecting contractors through pre-qualification based on previous working experience with client". The latter also occurred within the 'GET Fund' organization as a significant PM practice similarly having a significant positive relationship with time performance of the respective projects. Thus, for both organizations, there is an indication that clients are more comfortable working with contractors that they have previous working experience with in order to realize satisfactory performance. The issue of both organizations having a common significant PM practice affecting time performance may partly explain why there was no difference in the time performance of projects managed by both the 'GET Fund' and 'Common Fund' organizations as obtained from the *t*-test.

Table 12: Regression Analysis of Cost performance (Y2) on PM practices: Summary

| Regression Analysis of Cost performance ($Y_2$) on PM practices: *Summary Organization* | *Variable* | *Significant PM Practice* | *Beta* | *Sig.* | *Adjusted R-square of model* |
|---|---|---|---|---|---|
| GET Fund | | | 0.585 | | |
| $X_{26}$ | | Contractor pre-financing works from own capital base | -0.84637 | | 1.26E-05 |

| | | | |
|---|---|---|---|
| $X_{23}$ | Selecting the contractor through pre-qualification based on previous working experience with client | 0.632258 | 1.60E-05 |
| $X_{25}$ | Client providing advance mobilization to pre finance from project fund to contractor | 0.248441 | 0.000636 |
| $X_{22}$ | Selecting the contractor on open competitive basis | 0.288068 | 0.003258 |
| Common Fund | | 0.805 | |
| $X_{13}$ | Choosing staff for projects based on specialization demands of project | 1.224745 | 1.70E-05 |
| $X_4$ | Determining the project to be executed based on political considerations | 0.5 | 0.009679 |
| $X_1$ | End users themselves being allowed to identify the project | -0.1 | . |

Dependent Variable: Cost performance

Of all the PM Practices carried out by the 'GET Fund' organization in the management of the building projects practices: "Contractor pre-financing works from own capital base" was observed to have the most significant influence on cost performance of the respective projects. The relationship is however negative, portraying that the practice was more prominent as the cost performance of the projects reduced. Within the 'Common Fund' organization choosing staff for projects based on specialization demands of project stood out as the most significant PM practice contributing to increased cost performance. An explanation to this could stem from the fact that specialized construction professionals have more experience and are therefore able to work efficiently eventually resulting in cutting down cost. The PM practice of "end users themselves being allowed to identify projects before its execution" was found to be the only practice significantly impacting cost performance of projects within other organization. Moreover, the practice was identified to have a downward relationship with cost performance.

A thorough examination of Table 5.7 (b) shows that none of the significant PM practices affecting cost performance is common amongst at least two of the organizations. Correspondingly, the t-test indicated that cost performance of the projects within one organization differed from the other two. The implication here is that as the significant PM practices affecting cost performance of the projects differ from organization to

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organization the cost performance of the respective projects also differs significantly from one organization to the other.

Table 5.13: Regression Analysis of Quality performance (Y3) on PM practices

| *Organization* | *Variable* | *Significant PM Practice* | *Beta* | *Sig.* | *Adjusted R-square of model* |
|---|---|---|---|---|---|
| GET Fund | | | 0.484 | | |
| $X_{11}$ | | Basing time for preparation of bid on completion of design | -1.2397 | 0.00000763 | |
| $X_6$ | | Selecting project consultants competitively | -1.07882 | 0.00000904 | |
| $X_7$ | | Basing consultant to be selected on project financial size | 2.046036 | 0.00004692 | |
| $X_{40}$ | | Procedure for payment involving both client team members and consultant | -1.06366 | 0.00013642 | |
| $X_{11}$ | | Client obtaining project funds on annual basis | 0.30839 | 0.00177555 | |
| Common Fund | | | 0.87 | | |
| $X_{41}$ | | Procedure for payment involving only client's team members | 1.001 | 0.00036416 | |

From the regression analysis, the PM practice of "Basing time for preparation of bid on completion of design" was identified to have the most significant influence on the quality of Performance of the projects within the 'GET Fund organization". It is important to note that the client normally controls time for preparation of bids. Selection of project consultants is also done by the client. This activity, undertaken competitively, was found to have negative influence on quality performance of the projects within the GET Fund organizations. Practices related to making payment to contractors, which is largely controlled by the client, were found to have significant impact on quality performance of the projects obtained from both the 'GET Fund' and 'Common Fund' organizations.

An observation of the nature of all the PM practices significantly relating to quality performance of the projects obtained from all the two organizations reveal the presence of a common characteristic; the dominance of the client. Hence here is an indication that the client has a major role to play when it comes to realization of a given quality performance of a project. The subjective nature of quality of projects is also revealed here since it is the client who would eventually determine whether the quality performance of the project has been satisfactory. Furthermore, from the t-test, there was no significant difference in quality performance of the projects across all the two organizations except between the GET Fund and Common Fund organization. This may be explained by the presence of the common characteristic of client having major involvement in the practices influencing quality performance of the projects within all the organizations.

Thus as the PM practices exhibited a common characteristic, the quality performance thereof likewise exhibited no much difference across all the organizations.

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## 5.0 CONCLUSION

### 5.1 Summary

The principal aim of this research is to find out the project management practices carried out within the PM organizations that affect building projects performance. This chapter is mostly concerned about the summary, conclusion, and recommendations of the study that will be of great benefit to the Ghana Education trust fund and District assembly common fund in the evaluation of the efficient project management practices on building project performance.

### 5.2 Findings and Discoveries

This section repeats in less detail the major findings of the study. It was discovered during the study in relation to the question as to What are the project management practices been adopted by Get Fund and Common Fund? What is the impact of project management practices on building project performance? What are the challenges (Get Fund and Common Fund) encounters in adopting project management practices?

Identified PM practices: Table 5.1 indicates the identified project management practices prevailing amongst the organizations. Whilst some of the practices are peculiar to one organization others are common to two or all the organizations. PM practices such as: Contractor pre-financing works with money either than advance mobilizations provided by the client; obtaining project funds quarterly; and monitoring progress of works jointly between project consultant and local clients in conformance with specially developed project monitoring progress reporting format were peculiar to the 'GET Fund', and 'Common Fund' organizations respectively. Other PM practices: "selecting project consultants competitively", "selecting contractors through open competitive tendering" etc. are common amongst all the two organizations. From the questionnaires, all the practices possessed some amount of potential effect on project time, cost and quality objectives.

Measured project performance: A trend of project performance was obtained from computation of time, cost and quality performance of the projects within each organization. With regards to time performance 87.9%, out of the 50 projects obtained from the organizations, was below trend; these projects completed behind schedule. Also, 50.1% of the projects was completed above budget; performed below trend. With regards to quality performance only 15.2% of the projects performed below trend. Satisfaction with the general quality of the projects was found to be high.

Comparison of Performance of the Projects between the Organizations: The observation of existence or no-existence of significant differences between the projects studied within the two organizations has been done pair-wise using the independent t-test. Where significant differences found were also observed that the respective significant PM practices also varied and vice versa.

Difference in Time Performance of the Projects: From table 5.4, the test for equality of means with time performance as the test variable indicate that the time performance of the projects within the 'GET Fund' organization does not differ significantly from those within the 'Common Fund' organization. The time performance of the projects obtained from the other organizations is significantly different from all the other organizations. The difference occurring have been observed to emanate from differences in practices regarding: release of project funds, entire financing of project and the honoring of payment certificates

Difference in Cost Performance of the Projects: The independent t-test in table 5.5 indicates that there is significant difference in the cost performance of projects across all the two organizations. The significant difference observed have been found to emanate from differences in practices concerning: varying of original scope of works, consultant selection, determination of winning bid and the interim valuation of works.

Difference in Quality Performance of the Projects: The Quality performance of the projects studied under the 'GET Fund' organization is not significantly different from the projects within other organization. This is similar with the projects studied under the 'Common Fund' organizations. The Quality performance of the projects within the 'GET Fund' organization studied significantly differed from the projects Managed by the 'Common

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Fund' organization as shown in Table 5.6. This significant difference is observed to mostly stem from the practice relating to pre-financing of the construction works, the honoring of payment certificates, and execution of site instruction.

Significant PM Practices relating to Time Performance of the Projects: The regression analysis in table 5.7 (a) revealed that the model indicating significant PM practices relating to time performance can explain 84.7%, 76.4% and 89.3% of variation in the time performance of the projects studied under the 'GET Fund' and Common Fund' organizations respectively. Not all the significant PM practices have positive relationship with the time performance of the projects within the 'GET Fund' organization. However, all the significant PM practices relating to time performance of the projects within the 'Common Fund' organization were found to exhibit positive relationships? A common PM practice of selecting contractors through pre-qualification largely based on previous working experience with client was observed to have significant effect on the time performance of the projects studied under both the 'GET Fund' and 'Common Fund' organizations. However, between the 'GET Fund' and the 'Common Fund' organizations, all the PM practices significantly relating to time performance of their respective projects varied from organization to organization.

Significant PM Practices relating to Cost Performance of the Projects: The regression analysis in table 5.7 (b) revealed that the model indicating significant PM practices relating to cost performance can explain 58.5%, 80.5% and 97.0% of variation in the quality performance of the projects studied under the 'GET Fund', ' and Common Fund' organizations respectively. Not all the significant PM practices have positive relationship with the cost performance of the projects within the 'GET Fund' organization. However, all the significant PM practices relating to cost performance of the projects within the 'Common Fund' organization were found to exhibit positive relationship? All the PM practices significantly relating to cost performance of the respective projects varied from organization to organization.

Significant PM Practices relating to Quality Performance of the Projects: The regression analysis in table 5.7 (c) revealed that the model indicating significant PM practices relating to time performance can explain 84.7%, 76.4% and 89.3% of variation in the time performance of the projects studied under the 'GET Fund', and Common Fund' organizations respectively. Not all the significant PM practices have positive relationship with the quality performance projects within the 'GET Fund' and other organizations. However, the significant PM practice relating to time performance of the projects within the 'Common Fund' organization exhibited positive relationship with quality performance of the respective projects. The involvement of client in the process of management of the projects is observed as a common characteristic dominating the PM practices affecting quality performance of the projects within all the organizations.

## 5.3 Limitation to the Study

The study undertaken by the researcher faced with some challenges. Firstly, the process of gaining information and authority to administer questionnaires to the Ghana education trust fund and district assembly common fund was very bureaucratic, and thus prevented the researcher from getting adequate information for the data analysis. As an alternative however, the researcher relied on close friends as employees of the case study to administer the questionnaires.
Notwithstanding these challenges, the validity and reliability of the study were not be compromised.

## 5.4 Recommendations

The function of identifying projects through systematic procedures should be encouraged on every individual project. This should not be left in the hands of only the end users of a project. This should be organized into an integrated function where project financiers and end users as well as project consultants are involved. In the competitive selection of consultants for a contract or group of contracts, previous working experience with client should always be among factors given high attention. Giving advance mobilization to contractors is said to motivate them to execute satisfactory work and this should therefore be possibly practiced on every project. In order to minimize delay in the honoring of payment certificates after they have been issued, the number of persons involved in the process of checking and endorsing them should be reduced; only those who would be held responsible in the event of wrong payment should be involved. Contractors should always

confirm verbal instructions, whether given by the consultant or client's team members, before the execution. A linkage between organizations' regional/district/local client's offices and national head offices should be emphasized and always made to function in order to facilitate effective monitoring of projects. The practice of valuation of works for payment at defined stages of the project should be, as much as possible, carried out by project managers and this, is believed, will always urge contractors to work at an increased pace.

5.5 Further Study and Research

For further studies, it is recommended that more performance metrics recently developed in other research works (like: benefit to end users, benefit to national infrastructure etc.) be included for measurement. With this, the projects should not necessarily be organization-based. This should lead to the development of a predictive model for determining PM practices that promote increased project performance as well as those that contribute to poor project performance.

5.6 Conclusions

Based on the findings of the study a conclusion of the study is drawn. Despite the presumed efficiency in project management practices, the study concludes that there are some weaknesses in the project management practices in the institution but can minimized through transparency and accountability.

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