

APPRAISAL OF COST CONTROL PRACTICES OF BUILDING INFRASTRUCTURE
PROJECTS DELIVERY: A CASE OF WORKS DEPARTMENT OF TEMA
METROPOLITAN ASSEMBLY.

By

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ABSTRACT

The overall goal of this study was to appraise cost management practices on infrastructure projects delivery at MMDAs a case of Tema Metropolitan Assembly (TMA). The specific objectives were to identify the cost management practices applied on infrastructure, the challenges in the application of cost management practices applied on infrastructure projects and the best practices in cost management practices for TMA. The objectives informed the thematic areas for the literature review. Both known and new concepts were reviewed to give further clarity to the study. An exploratory design was effectively utilized for this research. Primary data were collected through the use of structured questionnaires, data gathered were analyzed and findings discussed. It was revealed that the largely employed cost management practices at the Works Department of Tema Metropolitan Assembly are the Budget planning, Cost tracking and Project change controlling. Despite the Knowledge and importance the organization attaches to cost management practices on their infrastructure projects, major challenges such as Errors in design, Weak Funding, Inaccurate cost estimates, Over emphasizing on results while ignoring the process of PCC, Improper Management of Funds, Lack of technical details and precise requirements in contracts, Using obsolete Methods and Concepts, Lack of consistency in cost management by managers , Difficulty in monitoring different sources of day-to-day cost data, Serious decision failure, exorbitant marketing expenses, Non-availability of project management training facilities for professionals, Lack of recognition of Project Management practices by top management, Lack of electronic data management system in the organization to capture knowledge or experienced gained from previous projects were identified which has negative effects on the application of cost management practices in TMA. It is recommended that Works Department of TMA should develop cost control philosophy to enhance infrastructures delivery in the assembly.

KEYWORDS: Cost Management Practices, Infrastructure, Projects Delivery

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Abbasi, Y. G. and Al-Mharmah (2000). Project management practice by the public sector in a developing country. *International Journal of Project Management* Vol 18, No. 2, pp 105-109 61

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DEDICATION

I humbly dedicate this work to my parents (Mr. and Mrs. Neequaye Kotei) for their assistance in making my Masters' Degree education a reality.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

In Ghana, Metropolitan, Municipal and District Assemblies (MMDAs) performs an active role to the central government in the national development through the provision of infrastructure facilities. The provision of public infrastructure is facilitated through the activities of the Works department of the MMDAs to ensure grassroots participation and the accomplishment of the efficient and effective utilization of state resources.

Infrastructure projects are usually with brief duration undertaking to come out with peculiar item or provision, brief durations suggest that the project must be completed with a specified duration, and also indicates the item or provision varies in a unique different to other alike items or provisions (Ackah et al., 2016). The management of project refers to the use of application of ideas, experience, equipment and skills of events to accomplish a project objective. The implementation is usually done via the use and combination of procedures in project management (Project Management Institute, 2004). According to Kerzner (2018) a lot of the up-and-coming businesses after the Second World War have concentrated on project management. The extensive application of projects in institutions required a defined procedure to effectively handle short duration exercise regarded crucial to the institutions planned goals. This has resulted more academics and experts in the area to device appropriate procedure to effectively handle these Projects. Originally, emphasis of studies has paid much attention to the execution of single projects (Too and Weaver, 2014). Project investigation universal currently extents different level of examination.

In most top organizations project management practices is regarded as worldly accepted tool for organization performance. Study conducted by Ibbs and Reginato (2002) revealed

that project management practices are seen by organization as an effective tool used in the project lifecycle processes. These practices are planning, designing, and managing activities. Asare (2017) was of the view that most developing countries are in their early phase of development of their project management practices. Advancing the scope, Sukhoo et al (2004), argued that the challenges confronting developing nation are partially due to lack of experienced staff, tough economic and social situations, feeble political establishments, intensely rooted cultural and religious beliefs. These underlined issues one way or the other have negative effect. Abbasi and Al-Mharmah (2000), also augured that project handling exercise implementation in Ghana is in its primary stages of growth and since it's a current practice is geared towards achieving prearranged purpose within precise cost and time parameters, through judicious utilization of rare resources with the help of integrated planning and control. Kloppenburg (2012) explained that project management has contributed a lot to successes of most organizations by enabling them to become efficient and effective in execution of their products and services, more precise in planning and forecasting and enhanced output. There is high debate stating project management exercises could differ from institution to institution. Different project managers also debated that due to expert practice in related business are essential to adhere to laid regulations, project management activities do not necessarily differ from institution to institution. Highly acceptable act should not be negotiated on and therefore requires best activities. According to Ramabadron *et al.* (1997), the great performance attained could suggest the type of practices to be mostly employed. A notable issue of concern in building infrastructure delivery in Ghana is cost control. It is against such bedrock that this study intends to appraise cost control practices on building infrastructure projects delivery at

MMDAs with empirical evidence from the Tema Metropolitan Assembly (TMA) in the Greater Accra Region of Ghana.

1.2 Problem Statement

Developing nations depend solely on projects to meet their corporative objectives and shortfall of these project management acumen and expertise goes a long way to affect all sphere of their development. Unwillingness on the part of donor communities' to provide aid for projects is as a result of unsatisfactory outcomes of project (Hekala, 2012). Some of this reason manifests itself in one or the other; and include disappointment in projects outcomes. Irrespective of the substantial amounts received and invested into projects over the years the effects were not seen. This affects the numerous segments of the economy. Good governance plays a role in efficient and effective project management (World Bank Report, 2006).

Establishments including MMDAs embark on building infrastructure projects in Ghana. The need to undertake such research of appraising the cost control practices of MMDAs infrastructure projects will strengthen these practices within the works departments of the above mentioned organizations and make them one of the leading institution for enforcing effective project management practices in the country which will lead to building awareness among employees to apply project management practices effectively, facilitating the work flow, improving performance and productivity, quality and efficiency of project, developing project management skills, tools and techniques ,encouraging team work rather than individual work, and finally avoiding problems which will hinder project's goals.

1.3 Research Questions

Below are the research questions that informed the study;

1. What are some of the best practices in cost management?
2. What cost management practices are applied on infrastructure projects in MMDAs?
3. What are some major challenges in application of cost management practices on infrastructure projects in MMDAs?

1.4 Aim of the Study

The aim of the study is to appraise cost management practices in infrastructure projects delivery at MMDA a case of Works Department of Tema Metropolitan Assembly (TMA).

1.4.1 Objectives of Study.

For above stated aim of the research to be achieved, the following specific objectives are

1. To identify the cost management practices applied on infrastructure projects in Tema Metropolitan Assembly;
2. To identify the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly; and
3. To identify best practices in cost management practices for TMA.

1.5 Significance of the Study

The study was to find out effectiveness of project management practices on infrastructure projects in MMDAs which would serve as a checklist for project managers and

practitioners from project initiation, planning, execution and monitoring stages to improve efficiency and prevent project failures.

The study would help determine the level of application of the concept and major challenges faced by practitioners in adopting it within MMDAs in Ghana. Prescription or recommendation would pave way for further research into the ever changing or unstable aspect of project management processes and consequently give policy direction. Project consultancy firms would have the opportunity to overcome some major challenges faced during execution of project on infrastructure delivery.

Secondly, the study seeks to highlight the best practices in cost management. The study would thus be significantly useful for the Works Department of MMDAs in Ghana by informing them on the need to adhere to proper cost management.

Thirdly, the findings of the study will go a long way to add to the extant literatures which can be used for further research, since it goes into detail by analysing cost management on infrastructure delivery within MMDAs. Considering the significance to policy, the study will provide guidelines for the Ministry of Local Government, regarding the cost management practices and challenges within various MMDAs in Ghana. An effective cost management practice is expected to lead to the effective infrastructure delivery at the local level of government.

1.6 Scope of Study

The contextual coverage of this research is to outline best practices in project management, to identify project management practices applied on infrastructure projects and to identify major challenges in application of project management practices on MMDAs infrastructure projects. For purpose of this research Works department of Tema

Metropolitan Assembly in the Greater Accra Region in Ghana is chosen as the study area. This department of the assembly is in-charged of all major projects within the assembly.

1.7 Research Methodology

The study was conducted using exploratory research design. As stated by (Gay, 2010, Cheruiyot, 2014), exploratory study includes gathering data to answering questions about the present position of the study. It is cost-effective hence suitable for a study of this nature.

Population under study consisted 30 staff who are involved in infrastructure delivery at TMA. These are individuals with more than six (6) months affiliation with the organization and are directly or indirectly involved in project execution. The research work used primary source of data, through field survey using structured questionnaire. The primary data gave genuine and precise first-hand information relevant to this study. A questionnaire was developed based on Project Management Practices defined in PMBOK guide. There are other best practices guide such as Project cycle Management Guidelines (PCM), Project and Program Management for Enterprises (P2M), Organization Project Management Maturity Model (OPM3), International Competence Baseline (ICB) etc. This study ought to use PMBOK (Project Management Book of Knowledge) guide because it is also globally known and gives the basics of project management which is applied in a broad area of projects. Moreover it is one of the most extensively used guides in project management. The obtained data was processed and analyzed using statistical software known as Statistical Package for Social Sciences (SPSS Version 22.0).

1.8 Organization of the Study

The research study has been captured in five chapters and these are as follows: The first chapter will give an overview of the study, which included background of the study, the objective of the study and significance of the study. It was preceded by Chapter two which contains relevant literature of the subject matter. The Third Chapter entails necessary research procedures to carry out the study. The content of this chapter was the study type and design, the population for the study, sample size and sampling techniques to be used. The next chapter, which is the fourth highlight an analysis of the result in the findings. The fifth chapter provide a summary of the findings, draw a conclusion and make recommendations to ensure an improvement in cost management on infrastructure delivery at TMA.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature spines on the background on project management practices. It first begins with a review of existing literature on project management for the purpose of explaining how projects and project management has been defined by key researchers working in this area of study. This will be followed by a brief description of types of projects, project management practices in organizations, the techniques and tools for project management practice. It also reviews literature on best practices in project management and the application of project management best practice methodology guideline and its benefits. Finally, Challenges of projects management practices.

2.2 Overview of Project Management

2.2.1 Project Definition

It is defined in numerous ways as far as study literature is concerned. The following definitions were cited by these authors: Cooke-Davies (2001) views project to be human activity and its lawfully be regarded as project if it entails a peculiar area of work which is challenged regarding the amount and duration, the reason emanate or change an item or provisions to attain it useful modification defined by quantitative and qualitative purposes. In Bradley's submission, he defined projects as per (Bradley, 2002) report as a industries situation which takes into accounts threats and rewards associated to a business venture, taking into accounts exclusive targets, predetermined duration, through known means with known tasks. Based on definitions by different several authors above, it can be deduced that there is common understanding with various views that projects are with

regards to outcome, having a beginning and end, are short-term are undertaking to meet the establishment's planned goals. The various short-term activators contribute important task with regards to the current establishments and an increasing attention is documented in the importance the various brief duration activators within establishments.

2.2.2 Project Management Definitions

There have been several definitions regarding project management, so far as study literature is concerned. The following definitions were cited by these researchers: The management of Project refers to the use of application of ideas, experience, equipment and skills to project events to accomplish project objectives. The implementation is usually done via the use and combination of procedures in project management processes (PMI, 2004). Adding to the scope, (Ohara, 2005) was of the view that Project management is seen as a professional ability to offer project product by exercising due care and diligence with the aim of achieving an organizational mission through a concerted efforts of a committed project members, efficiently applying the most suitable technical and decision-making procedures and skills and creating the best effective and efficient interruption and execution directions. Hoppa and Spearman (2011) stated that project management principle and its techniques can be applied to various projects ranging from single task, renovations of office or complex establishments and projects complications like the design and construction of hospital or airport complexity. In modern world every project needs or requires application of basic science and art of the management of the project. The degree of technological advancement nowadays needs a high level of sophisticated tools and the number of peoples needed always depends on the nature of project and its size. According to Hopp et al (2006), management process should

emphasis on approach and systematic study of management and its function identification in an organization on to examining its details. They continue to say that project manager or coordinating the process is interrelated duties.

2.3 Types of Projects

Projects are usually embarked on in several and different conditions and can be distinguished regarding capacity, range, business etc. These differences make it challenging to produce a sole detailed classification to assignments (Shenhar and Dvir, 2004). There exist two recognized methods for the taxonomy of projects. These are a) the goal and method stated by Tuner and Cochrane (1993) and b) the (Shenhar and Dvir, 2004) four dimensional NCTP technologies (T), pace (P), novelty (N) and complexity (C) framework. This grouping is established on the principle of how the goals and methods are defined. Beside the two recognized methods, Khazanchi and Zigur (2004) came out with classification of project with respect to the complexity. The complex defines terms of characteristics of personal features, resources, skills, gender, culture, team size and language (Khazanchi and Zigur, 2004). According Khazanchi and Zigur (2004) the classification is as follows: Lean, Hybrid and Extreme.

2.3.1 Lean Projects

These are projects with little capacity, thin scope and comparatively little risks. Due to their nature they are subdivided into manageable parts. Actually the objectives of these projects are actualized within the shortest possible time with the assistance of a known methodology and their goals are usually unambiguous (Khazanchi and Zigurs, 2004).

2.3.2 Hybrid Projects

These projects technically differ in terms of their complexity nature, scope and risks. Due to its complex nature, they require the services of management methodologies to articulate effective linkage between people and the activities. In practice these projects require unique attention to be assigned to the technologies that improve coordination (Khazanchi and Zigers, 2004).

2.3.3 Extreme Projects

These projects are technically different and critical in terms of complexity, scope and risk. Such projects require intense activity and the involvement of many teams and stakeholders. This type of project requires a communication management approach to better understand the problem before starting work at all stages of the project (Khazanchi and Zigers, 2004).

2.4 Project Management Practices and Application in Organization

Bryde (2003) stated that the difference with instructional could be attributed to management practice and is a constituent of optimum practice results. The actor wide variety in the project management could not be solely attributed to the institution but the nature of institutional desire could also have influence.

Similar outcome was identified by (Sharma and Gadenne, 2002), a study in its assessment of the influence of quality with regards to managerial practices with the construction industry with fourteen participants, the results varied significantly with organization. However, it much thought be emphasis that the main target was geared towards the quality not the actual project assessment.

Similar study by Gowan and Mathieu (2005) with 449 subjects identified that the good Information System (IS) project performance rely greatly on the degree of intervention of particular project management practices. The results of the study suggest that the management practice is largely influence by the type of institution. This will hence have a subsequent relation to the project management group composition too.

The current different of practices within individual organizational setting require identity and deeper investigation. Subsequently, the influence of these practices on performance of the projects implemented becomes very necessary for investigations. Performance of project should not be determined with reference to time or quantity. There exist three basic project tasks to the overall project assessment. Instances where teams or organizations adopts different practices, there is the argument of the best practice. Ramabadron (1997) defines best practices as the right procedures of undertaking tasks to get high results. The aim of every project managers is to complete a task successfully and it is for this reason that some practices are undertaken. To see whether some practices are best or not, the need to assess the performance of executed projects under these practices is highly imperative.

There are several ways with which organizations mostly adopt project management practices.

According to Cleland & Ireland (2002) “There has been no identified profession or industry where project management practices will not work”. Furthermore, the use of these practices usually outlines workers duties to facilitate the tasks entrusted to them within the institution.

More to this, the practice pays strict attention to the peculiar and the most important work. Generally, According to (Cleland & Ireland, 2002) and others, Project management could be correctly applied when:

- a) When resource are shared with various sections within the institution
- b) Needed level of efforts are centered to major activities
- c) When separate sections desire integration of systems and sub-systems
- d) Attending to ad hoc, complicated, not familiar, exclusive, or infrequent; events, challenges and opportunities.
- e) Dealing with projects that need much of resources and skills from various sources.
- f) Dealing with projects that need a lot of resources, skills and technology.
- g) When it is require to have unified administration of a project-based contract in order to prevent the client work with many different serviceable units.
- h) When there is a necessity to handle change.

2.5 Best Practices in Project Management

Best practice in project management is seen as effective and efficient processes, method applied in particular condition for the purpose of attaining an organizational objective. It is based on technical skills, experiences and methodology applied in the process of developing and achieving set standard way of performance. Best practice is dependent on experience and it describes the process of developing and following a standard way of doing things. Guidelines and international standards are the generally best practice terms in project management and both are looking to improve project management. When

dealing with projects both guidelines and international standards are methods that contribute to achievement of goals. Guidelines are open to interpretation while standards definitive, objective and robust (Ahlemann,et al., 2009, pp. 293). Expanding the scope (Ahlemann, et al., 2009) Standards and guidelines are meant to add value to project management in organization. In practical terms project managers are not able to differentiate between different theories and concepts. Standards are in practical terms expected to be bias free and definitive and guidelines are provided by professional bodies and are subjected to interpretations. In real terms guidelines are churned into standards a typical example is Project management institute (PMI's) body of knowledge.

2.5.1 Advantages of best Practices in Project Management

Project management has received international recognition and it is widely recognized, accepted and applicable in several circumstances in an organization. According to the Global Working Group (Nielson and Loranger, 2006) the characteristics common to global standards are usefulness, acceptability and relevance

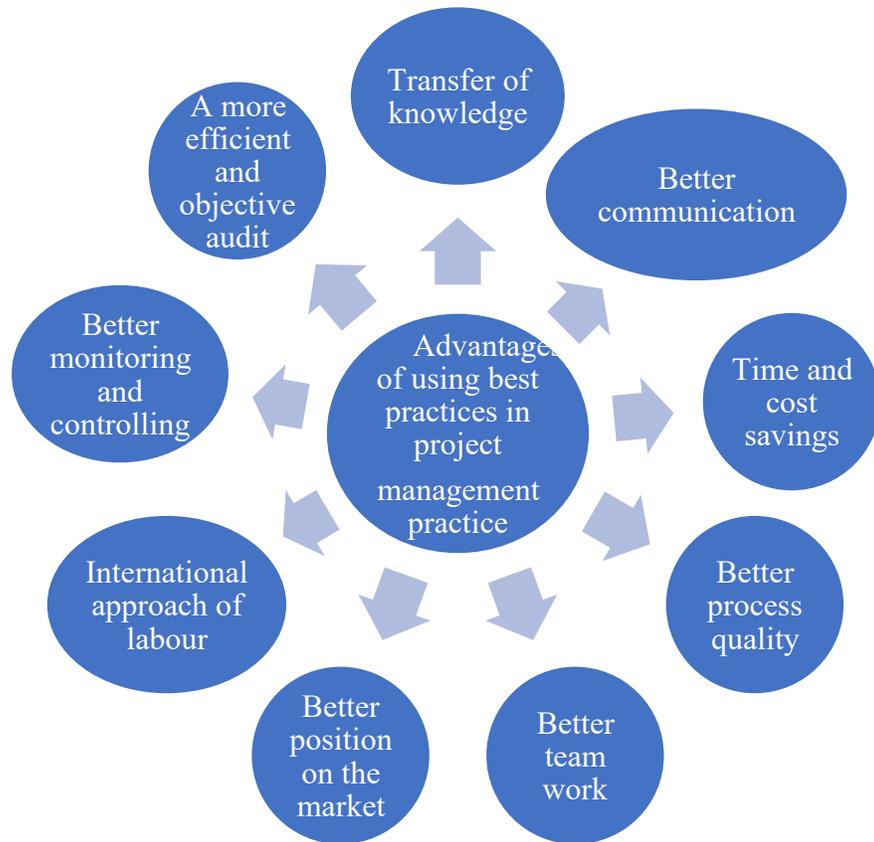


Figure 2.1: Advantages of using best practices in project management practice.

PMI (2014)

2.5 Application of Project Management Best Practice, Methodology, Guidelines and Its Benefits

Project management standards are well defined as a mix of similar work methods, processes and procedures that analyze how to plan, develop, and develop a continuous implementation plan until success is completed. This project is a scientifically proven, systematic and disciplined approach to design, implementation and perfection (McConnell, 2010). Global Working Group (Nielson, 2006), stated that PMBOK is widely accepted and applicable in several projects in organizations. It again states that PMBOK

has received international recognition and it is widely accepted and applicable in several projects in organizations. It gives the basics of project management which is applied in a broad area of projects and it is one of the most extensively used guides in project management (Nielsen, 2006).

Table 2.1 Project Management Most Used Methodologies and Guidelines

International Methodologies and guidelines	Description
PMBOK	PMBOK Guide to the Project Management Body of Knowledge developed by the Project Management Institute (PMI); at the same time ANSI standard for project management (an American national standard)
ISO 10006	Standard for quality management in project management developed by the International Standards Organization (ISO)
ICB	International Competence Baseline developed by the International Project Management Association (IPMA)
P2M	A Guidebook of Project & Program Management for Enterprise Innovation developed by ENNA
PRINCE	Project Management Standard give out by the British Office of Government Commerce (GOC)
OPM3	Organizational Project Management Maturity Model developed by PMI
PCM	Project Cycle Management Guidelines developed by the European Commission

Source: Author's Construct, (2019)

2.6 Cost Control

According to Tonchia (2018), a variety of meanings have become the rule, the subordinate's management includes what is being done according to what has been recorded, what has been appointed and the principles that are given. Its purpose is to point out errors so that they can be fixed and prevent repetition. This is an invalid link to the concept of rights. In the world of project management, administrators have very little to

say about what to do, set their actions or ideas, or try to force it to behave in a certain way, all of which make the mistake of managing. There are common explanations included. In project management, the term "management" is intended to operate a ship. One of the main objectives is to provide a continuous course of courses with the aim in mind - to bring the ship to a safe harbor as promised at the beginning of the trip. Cost control is part of the entire investment management process in a project or contract. It recognizes carefully the planning of resource distribution and commitment in relation to the appropriate policy on the procurement of materials. The entire management process should take into account the agreed objectives and business needs of the job. Successful missions include identifying a specific destination, mapping courses to get there, checking the location of your trip, and focusing on what is happening.

2.6.1 Components of cost control

Cost Management is the process of monitoring project status, updating project costs, and managing base cost changes. The main benefit of this process is to provide a way to identify specific people in the program, which can be improved and minimized. The inputs, tools and techniques, and outputs of this process are depicted in Figure 2-2.

(PMBOK® Guide) – Fifth

Edition

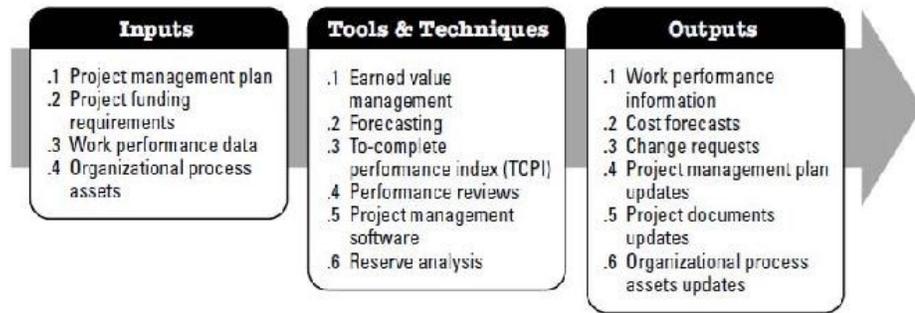


Figure 2.2: Cost Control: Inputs, Tools & Techniques, and Outputs; Project Management Institute, (2013)

2.7 Theoretical Review

2.7.1 Agency Theory

The agency theory of financial management is based on the existence of a relationship between principals (owners of an organisation) and agents (managers of the organisation) (Mastilak, Matuszewski, Miller and Woods, 2018). While the principals are usually responsible for the provision of the resources needed by the organisation in order to undertake its various activities, the agents are usually responsible for making decisions as to how such resources needed to be used (Bosse and Phillips, 2017; Mastilak, Matuszewski, Miller and Woods, 2018; Parker, Dressel, Chevers and Zeppetella, 2018).

The agency theory seeks to address challenges that may arise as a result of conflict in opinion between the principals and the managers of the organisation (Mastilak, Matuszewski, Miller and Woods, 2018; Parker, Dressel, Chevers and Zeppetella, 2018).

The major sources of conflict between principals and managers of an organisation stems from a situation where the principals are unaware of significant decisions taken by managers regarding the use of the resources of the organization (Mastilak, Matuszewski, Miller and Woods, 2018; Parker, Dressel, Chevers and Zeppetella, 2018) or where the

managers failed in their fiduciary duty – failing to act in the interest of their principals (Darayseh and Chazi, 2018).

Thus, the agency theory usually proposes that in order to solve principal-agent conflicts, either: a) principals compensate the managers of the organisation enough, thereby, giving the managers the needed motivation and incentive to strive to increase the wealth of the principals willingly, or b) the principals scrutinise meticulously and also monitor all decisions and actions of the managers of the organisation to ensure such decisions and actions are in the interest of the principals (Darayseh and Chazi, 2018; Mastilak, Matuszewski, Miller and Woods, 2018; Parker, Dressel, Chevers and Zeppetella, 2018).

2.7.2 Stakeholders Theory

The idea of stakeholder theories is that managers are fundamentally obliged to increase investor interest in ways that are still allowed by law or social characteristics. The stakeholder hypothesis was presented by Edward Freeman in 1988. Stakeholders are a meeting that is more extensive than investors. Investor recommendations are the prevailing economic hypothesis used by companies. Expand the wealth of investors where the motivation behind the company is reflected in our laws, economic and money-related hypotheses, administrative practices and dialects. Business schools have a fundamental hypothesis for investors. Nobel laureate Milton Friedman (1970) unequivocally shares the increase in investor performance.

2.7.3 Resource Dependency Theory

This theory is based on the basic principles of good business management and is extremely applicable to the leadership of a quality assurance team in the workplace. The theory

argues that programs to access certain resources are key to managing a good business. Companies are trying to reduce the uncertainty of external pressures to ensure the availability of the resources necessary for survival and development. The resources approach emphasizes that, as a non-executive director of an organization, it improves the company's ability to protect itself from the outside world by reducing ensuring external influences to ensure the availability of resources for livelihoods and development. The certification office in this regard is seen as a tool to facilitate access to key resources for organizational success.

2.8 Challenges of Cost Management in Ghana

2.8.1 Lack of Project Management Skills

Ghana continues to participate in project management due to lack of knowledge and ignorance with the resources needed for new technologies in the growing area of project management (Bryd, 2008). Although more money, time and other material is invested in public projects, projects still suffer from major failures due to the Prime Minister's bad practices, poorly integrated planning and control systems, responsibilities and responsiveness (Daa, 2018). In addition to these factors, other important aspects of the long-term project proposal support process, poor governance, lack of ownership and project ownership, poor pricing and timely planning are among others (Hwang and Ng, 2013).

2.8.2 Unclearness of the Project Requirements

The ambiguity of the project requirement has proved to be one factor affecting the success of the project. It has been found that when project requirements are not properly described,

tasks are difficult to complete (Amponasah, 2012). The ambiguity of project requirements can be due to different perspectives of stakeholders.

2.8.3 Weak Funding

Ghanaian government sector have limited resources and poor incentives to provide effective and efficient public service authorities due to lack of basic services and poor management of some existing projects. This is particularly the case for the District Assembly Common Fund (DACF) from the government (Mansa, 2007). In addition, experience in some areas has been poor to generate revenue for MMD. Therefore, an obstacle for MDD is to complete its tasks within the agreed time frame. For example, Mansa's (2005) study showed that after a survey of six MMDAs, the implementation of a medieval development plan due to poor funding of the project failed. Similarly, in the study of the factors that prevented the implementation of the project in Ghana's auto neighborhood, poor funding was the main cause of the project's failure in the Assembly (Robichaud and Anantatmula, 2010). In a study in South Africa on why the project failed, scientists failed to implement the Communities project due to financial shortages (Norton et al, 2012).

2.8.4 Lack of Proper Planning

Lack of proper planning is also one of the factors that prevent projects from being completed. A project plan is associated with step-by-step use of the project to help achieve the project's goals and objectives (Damien, 2012). Poor planning does not provide a concrete framework for implementing the project. Therefore, at certain times of the

project, owners and team members do not have clear instructions on what to do, when, and how (Besner and Hobbs, 2006).

2.8.5 Poor Communication

Communication involves the transfer of information from one party to another. Communication is an important driving force in the project management process as long as the project succeeds. According to the survey, insufficient communication of stakeholders in the project is one of the main reasons for the project's failure (Asare, 2017). Lack of effective communication means behavior, need and understanding that all project stakeholders need to be poor (Backlund, et al., 2014). For example, a study by Backlund, Chron er, and Sundqvist, (2014) showed that lack of effective communication was an important factor leading to poor performance of the ECG project. This suggests that effective communication tools need to be created to increase the success of the project.

2.8.6 Lack of Proper Control Mechanisms

Managing projects in progress does not allow project managers to detect any deficiencies in project execution. Due to poor monitoring systems, projects and staff and teams do not provide the necessary control to ensure that projects meet certain conditions (Mansa, 2007). Indicators are usually not available to review results and are usually the reason for project failure: this proved to be the main reason why a project failed in MMDAs (Backlund, Chron er, and Sundqvist, 2014). Medium-term development plan (MTDP) problems were identified through a survey of six district assemblies. Mansa (2007) argues

that implementation problems include a weak institutional environment, low human resources and financial resources for MDD, down-to-earth leadership and disputes, low stakeholder commitment and unclear teamwork;

And they contributed to the failure of the project in the district assembly.

2.8.7 Improper Management of Funds

Another of the main reasons for project management in Ghana is the misuse of project funding. In a study of the impact of management practices on project success building, Mansa (2006) points out that some contractors bid for some construction, despite disappointments. Therefore, when there is a delay in the release of funds for the project, the success of the project is compromised. Despite the plethora of scholarly projects worldwide and its important success factors, there is very little or no documentation on project management implementation and important performance factors for projects that MMDA operates in Ghana. Frye (2013) further drew attention to the lack of experience of project management success in Ghana on project management practices and important success factors in using Ghana as a case study.

2.8.8 Unstable Political Environment and Corruption

According to Andersen (2008), poor performance of project in most less developed countries could be attributed to external conditions. The study further stated that the market environments in most of these countries are not stable. Again, most of these countries are normally affected by political stability, corruption and others (Jekale, 2004). Somuga (2002) revealed that construction materials appreciated by 400% over two years due to change in

government initiative.

In a similar instance in Ethiopia, construction materials also increased twice the original price following inflation issues (Cusworth and Frank, 1993). The prevalence of externalities is the underpinning cause of difficulty in scheduling and management of construction projects to the under trained project manager in less developed countries.

2.8.9 Using obsolete Methods and Concepts

Most organizations now use initial PCC processes that rely primarily on manual, paper-based information, attitudes, and past work experience (Willoughby, 2003). Willoughby (2003) refers to the use of cost control document and paper equipment where the area administrator, magnetic inspector or cost engineer uses cost-effective analysis and access to calculations and calculations rather than using appropriate tools.

2.8.10 Lack of knowledge on the use of available tools and technology

Knowledge is regarded as a key element in the good work of the organization and as a competitor in the field of construction (Ademola et al., 2012). Cost management can be considered as "knowledge management" as technology and management knowledge and its lack of impact on PCC practices (Ademola, 2012) Using the cost or engineer most computers and laptops have, the current technology and log Use complex techniques that can be used in management exercises. General Forum The struggle to always research and understand cost management methods with complex processes and tools is a challenge for some experts (Ademola, 2012).

2.8.11 Over emphasizing on results while ignoring the process of PCC

Managers are only concerned about cost patterns over a given or predetermined period. Managers cannot explore cost changes and how to handle the change management process.

This means that managers of some organizations simply overlook cost control in construction (Beekmans, 2009). The PCC process should not be active, but it should always be active, live, and operational, especially when executing. Nonetheless, the real-time basis is that PCC regularly monitors and reports on cost variations, so the PCC process is not just a series of cost changes, but a commitment for costs incurred in the construction project. Claims also (Bahauddin et al., 2012); Ferry et al., 1999). Most contractors are not willing to invest in cost management practices or pay professionals to handle the cost of the organization. This can be seen as a way for the company to waste money or reduce unnecessary expenses during construction, though it could have saved the organization significant money by conducting cost control. Cost managers must perform PCC processes at the beginning of the project and must have the PCC function active at all times (Song et al, 2014).

2.8.12 Lacking PCC processes and systems suitable to the enterprise

As mentioned earlier, construction companies' managers are very cautious about cost control issues and emphasize this as needed. Managers always prioritize a page at any time, but without following a specific cost management approach that will eventually be badly executed. Most cost managers always remember the need to focus and manage the cost of construction, but many construction projects are not willing to spend too much time developing cost control templates for use in the PCC process. Because of this, it

takes a lot of time to create a project cost management process. In spite of this fact, several aspects of construction work are particularly drawn to where there is a cost difference or is likely to occur. Procedures and proposed structures can be implemented long-term with corporate executives at all levels. At the start of construction, PCC should flow for a long time rather than just once. Simplifying cost management is also very important; particularly cost control over delivery of construction projects (Song et al, 2014; Adjei et al., 2015).

2.8.13 Abandonment of complicated strategies

More often than not, most site managers, quantity surveyors or cost engineers find it difficult to integrate residual knowledge with previous savings (Robichaud and Anantatmula, 2010). Strategic methods in which computers use basic mathematics, for some professionals, are difficult to manage daily activities (Robichaud and Anantatmula, 2010).

2.8.14 Lack of consistency in cost management by managers

Many construction companies will take the initiative to complete or complete the PCC process in the case of costs, forecasts or costs of consideration. This is a common practice for most builders. On the contrary, the organization is only performing or entrusting the project as planned. Although cost managers are aware of the content of the PCC process, they are unable to make the concept of other members of the organization meet the project cost goals. Instead of engaging in cost management exercises for construction projects, managers often do it at regular or occasional times when needed. Not only are there PCC processes and systems, but there are also the number of sickness cost managers, which is

the lack of continuous interoperability of PCC processes when delivering construction projects (Song, 2014; Adjei et al. 2015).

2.8.15 Serious decision failure, exorbitant marketing expenses

It is also an important part of PCC's work. The project chemist or cost engineer must implement cost control training so that other members of the project can think about and develop a series of options. Corrective action is considered to be a critical term used to address construction cost variability. Other solutions need to be identified to address the cost problems identified (Adjei et al., 2017). Failure to make effective decisions and improvements will affect your organization, leading to high project costs. Depending on whether the agency's cost managers are knowledgeable and the PCC's experience in decision making and cost management. Decision errors, including loss of funds or loss of opportunity due to delays in decisions, will have a direct impact on the expenditure of the organization. The mistakes of the first small decisions made by managers must eventually be met by the organization (Song, 2014; Adjei et al., 2015).

2.8.16 Difficulty in monitoring different sources of day-to-day cost data

Ling et al (2009), advocate that "accurate and realistic assessment" helps organizations to build construction contracts, it will also provide a path to maximum return and ultimately a powerful idea for PCC. Will help too. The method used to monitor construction costs can be considered as the most difficult operation. It is the responsibility of staff that oversees ongoing vigorous construction projects to cope with key spending figures in the construction area. In parallel with the production process, the pay values of each component should be monitored in order to identify the cost position of any promotion.

The monitoring process may involve collecting large amounts of data from many different sources or sources. A well-established standardized process can help reduce development and also ensure that data is perfect in PCC practices (Ashworth & Hogg, 2002).

2.8.17 Variations in contract

Ashworth & Hogg (2002) stated: "The evaluation of contract amendments is by nature budgetary and it is important that these plans be updated gradually with more detailed information on the scope of the reference or the daily work. Charanangam and Supressert (2001) recommended that specific support systems be available at all management levels and provide up-to-date information on various aspects of project performance. By focusing on the most important elements of performance information, it is possible to improve the productivity of managers. "The methods of income pricing are two indicators of widely used to report on the status of projects largely integrated in costs). Regarding the capacity of the organization's employees, PCC practices need to be better created: the higher the efficiency of managers, the greater the progress and development of all construction companies. All companies today are trying to satisfy the customer with efficient production and execution of the project. Therefore, if the contractor's cost manager can work very efficiently, reduce costs and obtain profitable construction.

2.9 Empirical Review

Carter (2012) investigated the challenges faced by infrastructure companies in sub-Saharan Africa as they strive to provide high-quality construction. As part of this study, 100 questionnaires were sent to project managers and subcontractors to publicize the

impact of casting on technical human resources. Local construction companies have shown that they face many problems in obtaining the necessary projects compared to foreign companies, including skilled workers. The survey revealed that each organization employs a limited number of employees. Therefore, the role of the project manager was to find a way to carry out the project within the constraints imposed by these resources.

Mokk et al (2015) studied the role of management skills in the management of European infrastructure projects. This study emphasized that management skills and training levels improve the performance of construction companies in terms of quality and time required to complete the project. As a result, training allows people to make better decisions and provide better products and services. The study also noted that the project manager considered the relevance of the employee's project work while making decisions regarding the planning and construction of road structures. This study also noted that clear understanding and documentation was part of the project and was the planning process for each core activity. Ghura (2013) emphasizes that staffing and timely and appropriate planning are the costs of road construction projects. Therefore, it was important for project managers to understand the number of team members needed to perform the tasks assigned to them.

A study by Lehmann (2013) sought to establish the development of project management skills in a large Swedish organization. The study points out that the lack of qualified personnel needed to work on the project infrastructure is another challenge for road construction. It was very important for the success of the project. According to the study, the time required to complete the skills and performance of a member depends on the participation of a member in a particular project. Some of the on-site construction companies were short of this shortage, so the project was completed well after the

scheduled start time. Therefore, this study recommends that project leaders provide a list of skills required to carry out the project and thus identify the project staff. In addition, this study has shown that skilled personnel can help achieve the quality, productivity and efficiency of road construction projects.

David (2013) examines the secrets of successful management of an infrastructure project in Colombia. This study describes different ways to use technical resources to perform various business tasks to improve management and productivity. The Colombian government has modified the financing of road construction projects and confirmed that the contractual infrastructure projects are not intended for road construction.

The offer must be valued close to the satanic value and not the "lower". Prevent bidders from getting the right contractor for the right contract by mistake. In addition, the Colombian government has promulgated public and private laws governing investors and the funds needed for their implementation. However, this study did not address moderation and other important factors that affect the performance of infrastructure projects.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this study is to appraise cost management practices on infrastructure projects delivery at MMDAs a case of Tema Metropolitan Assembly (TMA). To achieve this objective, the researcher took several steps which formed the research methodology. This chapter presented a detailed description of the various steps taken by the researcher during the course of the study. Where necessary, the reason or reasons why such steps were taken were provided by the researcher.

3.2 Research Approach

This research used a deductive approach. This is a form of isolated research. For example, questionnaires are theory-based and can be replicated. According to Saunders, Lewis, Thornhill (Saunders et al., 2016), this approach is relevant for the design of quantitative research. However, you can also implement an inductive approach that uses data to develop the theory. Quantitative studies are usually conducted using questionnaires, structured interviews or structured observations, usually resulting in large samples and very general results. It also allows to measurement of concepts quantitatively and to generalize research findings to MMDAs in Ghana.

3.3 Research Strategy

A survey strategy methodological approach adopted in the study to appraise cost management practices on infrastructure projects delivery at MMDA a case of Works Department of Tema Metropolitan Assembly (TMA). The survey strategy was adopted

because it will allow the researcher to gather information from a large sample of people relatively quickly and inexpensively. Conducting surveys allows the collection of a sizeable amount of data from a defined population in a highly economical way (Quinn, 2010). The survey method is used to collect data from a sample of individuals systematically and also provide important information for all kinds of research including preferences, and behaviors; depending on the purpose and source (Arttachariya, 2012). It is also economical as compared to the complete enumeration of the entire population (Quinn, 2010). It also allows to measurement of concepts quantitatively and to generalize research findings to MMDAs in Ghana. This is a research approach that deals with the study of a relatively large proportion of the final population to infer on the population that uses the sample results. This was mainly concerned about the use of the administration questionnaire. In this study, the participants answered the questionnaires administered in interviews. After the selected participants answered the questions, the respondents analyzed, described and discussed the answers. In order for the survey to be credible and valid, it was important that the questions be properly written and read in a clear and incomprehensible manner.

In addition, another consideration was the open questions of the open, closed, partially open, or classified (Jackson, 2009). Open-ended questions were the types that respondents did not give them choices to choose, but allowed for a greater range of responses from participants who used their own intuitive knowledge. The closed question format suggested that the Respondents answer options that the Respondents could choose, which greatly limited the answers the participants could give. In most cases, researchers preferred the use of a Likert scale, because it is very easy to analyze statistically (Jackson, 2009). This is also included accurately in this study.

The survey strategy was employed because it allows for a variety of methods to select participants, collect data, and utilize various methods of instrumentation.

3.4 Research Method

An imperative section of every research study hinges on the capacity come out with an appropriate methodology which displays the logical link between the data collected, the analysis and conclusions to be drawn. The methodology must satisfy the most suitable methods of investigation, the nature of the research instruments, the sampling plan and the types of data to be gathered. This study employed a quantitative method. Thus, quantitative research method focuses on using statistical, mathematical or numerical analysis of data to derive meaning to social phenomena.

3.5 Research Instrument

In an attempt to collect information from the respondents (sample members), researchers usually adopt certain ways or means (McCarthy, et al., 2017; Veal; 2017). The means through which a researcher collects data from the members of the population is known as the data collection instrument (McCarthy, Whittaker, Boyle and Eyal, 2017; Veal; 2017). There are a number of data collection instruments available to researchers, but being a quantitative study, this study adopted the questionnaire. A questionnaire can be seen as a list of open or close ended questions printed on a sheet or sheets of paper which is given out to the members of a sample to provide answers for (Krosnick, 2017; Oppenheim, 2017; Brace, 2018).

The first section of the questionnaire solicited information on the biographic data of respondents, such as gender, age, educational background and other socio-economic

characteristics. The second and third sections will deal with all the issues relating to the various research objectives.

The adoption of the close-ended questions made it easier for the responses to be coded and analyzed systematically (Babbie, 2015). It also made it easier for the researcher to collect the data within a short period of time. The respondents will be basically ticking the appropriate answers after reading the questions and with the response choices given; there will be no need to further explain the questions to the respondents. However, questionnaires can be limiting by suggesting ideas to the respondents to which he or she will not otherwise have thought about. Again, respondents could answer questions any how or even misinterpret some questions. All in all, comparing both the merits and the demerits of using questionnaires, the merits far out-weigh the demerits in a study like this, and thus it is expected that the use of the questionnaires will have a good influence on the study.

All the items used in measuring the variables were adapted from previously validated instruments (Creswell, 2013). They were modified such that the focus was from the Ghanaian perspective and in the Ghanaian context. The model was also scored on the Likert scale on five points, starting with 1, indicating a disagreement out of 5 indicating its approval. Each measure was ordered by summing the total score for each question on a given scale and reporting the total score as a composite score for the measure.

3.6 Target Population

The population of a research refers to the total number of elements (people, animals, objects or events) that could provide the kind of information needed by a researcher in order to answer research questions (Etikan, Musa and Alkassim, 2016; Ary, Jacobs, Irvine and Walker, 2018; Nardi, 2018; Chow, Shao Wang and Lokhnygina, 2018). This group of elements usually possess specific characteristics or knowledge or other attributes that enable them to provide the kind of information the researcher needed (Ary, Jacobs, Irvine and Walker, 2018; Nardi, 2018; Chow, Shao Wang and Lokhnygina, 2018).

The importance of identifying the appropriate population hinges on the fact that, it determines the validity and reliability of the findings of the study (Yin, 2017; Chow, Shao Wang and Lokhnygina, 2018).

Taking the above into consideration, it could be deduced that the population of this study comprises the 30 staff who are involved in infrastructure delivery at the Works Department of the Tema Metropolitan Assembly (TMA).

3.7 Sampling Technique

Due to the fact that the sample is meant to be a representation of the entire population, researchers usually adopt a specific method in selecting the members of the sample (Moradi, Enkavi and Tajkhorshid, 2015; Castillo, Dorman, Gaunt and Hardcastle, 2016; Marczyk, DeMatteo and Festinger, 2017). The method adopted by a researcher in selecting the sample of a study is known as the sampling technique (Castillo, Dorman, Gaunt and Hardcastle, 2016; Marczyk, DeMatteo and Festinger, 2017). The sampling techniques used in selecting the members of the population, in many ways, influences the credibility of the final findings of a study (Marczyk, DeMatteo and Festinger, 2017;).

There are several sampling techniques adopted by researchers, usually based on the research design and the objectives of the study (Castillo, Dorman, Gaunt and Hardcastle, 2016; Marczyk, DeMatteo and Festinger, 2017). However, such considerations and rules of thumb are discarded when the entire population of a study also forms the sample, as is the case with this study. In that case, the researcher adopts what is known as census technique (Moradi, Enkavi and Tajkhorshid, 2015; Marczyk, DeMatteo and Festinger, 2017; McCarthy, Whittaker, Boyle and Eyal, 2017). Census refers an attempt to list all elements in a group and to measure one or more characteristics of those elements. (Marczyk, DeMatteo and Festinger, 2017; Veal, 2017). Therefore, this study employed census approach.

3.8 Data Collection

This study basically relied on primary data. Primary data was collected through the use of structured questionnaires which were administered using both face-to-face and self-administration. The questionnaires were be distributed to the participants sampled from the TMA. The task of designing a questionnaire involves the development of a wording that is precise, concise and unambiguous which for that matter allows respondents to successfully answer the questions that it seeks to ask (Arttachariya, 2012).

In view of this, Arttachariya (2012), suggest that the questionnaires for a study should be pretested for the purposes of re-wording, deleting, and or adding new items should it be necessary for better comprehension of the questionnaire by respondents. For these reasons, the questionnaires for the study were pre-tested. The researcher personally distributed the questionnaires to a total of 30 respondents. The feedback were then analyzed and the necessary changes subsequently effected.

3.9 Data Analysis

This section discuss the descriptive and statistical methods that were used to analyze the data gathered for the study. For this study, the survey data collected was analyzed using the Statistical Package for Social Sciences (SPSS, Version 22). The demographic characteristics of the respondents were also analyzed using tables, and other descriptive statistics such as the frequency, percentages, mean, and standard deviation. The study further used principal component to identify the most severe challenges in the application of project management in infrastructure delivery.

3.10 Ethical Considerations

Two ethical contemplations were made during the procedure of this investigation. Right off the bat, the analyst found a way to guarantee the anonymity of the individuals who gave data during the information gathering process. This was done so as to acclimate with one of the significant morals of scholarly investigate, which underscores the need to ensure the character of the individuals who gave data during the information accumulation arrange. This is more often than not to guarantee that such people don't endure any type of damage, badgering, terrorizing or different because of their choice to partake in the information accumulation process.

Also, the analyst, however much as could reasonably be expected, found a way to recognize crafted by different specialists who were counseled throughout this investigation. The references segment gives a full rundown of every single prior work which were referenced over the span of this investigation.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter consists of primary data collected through the administering of questionnaires and is analyzed to appraise cost management practices on infrastructure projects delivery at Metropolitan Municipal and District Assemblies (MMDAs) with empirical evidence from the

Works Department of Tema Metropolitan Assembly (TMA) in the Greater Accra Region of Ghana. The results of the analysis are presented and discussed below. The Chapter is presented in four major sub headings. The first section deals with the demographic information of respondents who were included in the study; the second section deals with cost control management practices employed on infrastructure delivery in TMA; the third section deals with the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly (TMA) while the final section contains strategies to enhance cost management practices on infrastructure projects in Tema Metropolitan Assembly (TMA).

4.2 Demographic characteristic of the respondents

The study captured some demographic information of respondents who participated in the study. These includes role of respondents in the Works Department, respondent's level of education, years of service in the assembly number of times been involved in infrastructure delivery of the Assembly in the past 5 years and infrastructure delivery philosophy of the Tema Metropolitan Assembly (TMA). This is because the study

recognized the relevance of demographic factors as most of these influences the variables under the analysis. Summary of the demographic characteristics is presented in charts below.

4.2.1 Position of the Respondents

The study found great importance in determining the role of the respondents the credibility of data gathered for the study. The study envisaged to gather data from technical staff of the Works Department since they are involve in the infrastructure project formulation and implementation in the Assembly. The result is presented in the diagram below. According to the Figure 4.1, Out of the 30 respondents 10% were Quantity Surveyors and Project Managers respectively. The result as presented also shows that 20% of the respondents were Architects, 40% were Engineers and the remaining 20% also indicated other positions. The result indicates that the study was conducted among varied positions within the Works Department of the TMA who are involved in the infrastructure delivery in the assembly. However, the results showed that Engineers dominate the staffs of the Works Department. This group of individual has the capacity to provide reliable data to appraise cost control practices employed on infrastructure delivery.

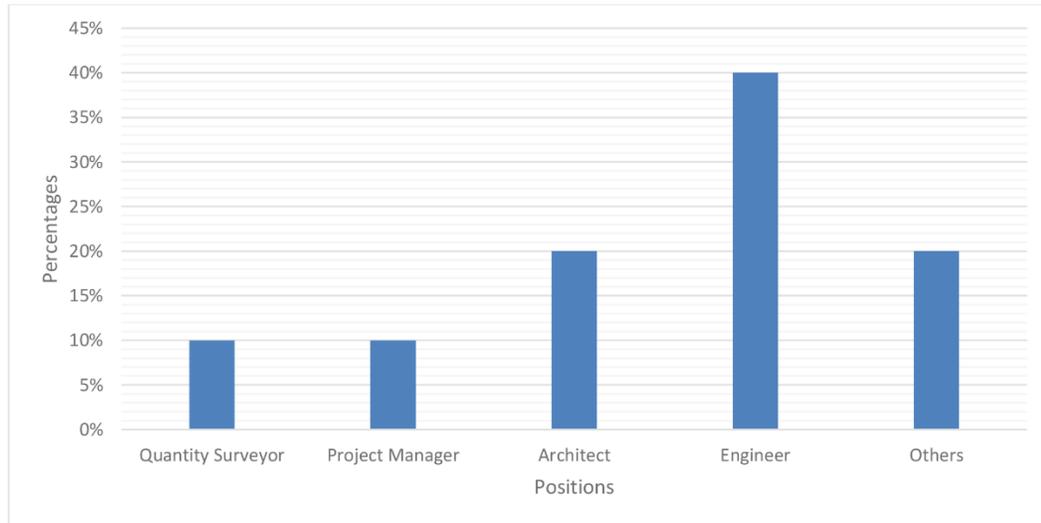


Figure 4.1 Position Distribution of the Respondents

4.2.3 Education of Respondents

Educational level of respondents was also captured in the study. The result as presented in

Table 4.1 reveals that 20% of the respondents were Master's Degree holders, 46.7% were Bachelor's Degree Holders, 23.3% indicated Higher National Diploma (HND) and the remaining 10% indicated City& Guilds. The results reveal that the respondents have sufficient education and could understand the subject under investigation. This suggested that majority of the respondents from the department had higher educational background and possess the requisite skills and techniques when it comes to projects implementation. It also reveals that management of the organization employs staffs with the requisite knowledge and academic backgrounds in project for all project activities embarked on. This conformed to Enhassiq et al., (2009) who stated, novice should not be in-charge of infrastructure projects, because required skills, ideas, and years of service are necessary for proper and well-planned practices.

Table 4.1 Education of Respondents

Level of Education	Frequency	Percent
Masters	6	20.0
Bachelor's Degree	14	46.7
HND	7	23.3
City & Guilds	3	10.0
Total	30	100.0

4.2.4 Experience of Respondents

Table 4.2 below shows the experiences of respondents who were captured as the number of year's respondents have been working with the Works Department of the Tema Metropolitan

Assembly (TMA). The study showed that 10% have been working with the Works Department between 1 year and 2 years. 20% have been working with the Works Department between 3 years and 4 years. The remaining 70% have been working with the Works Department above

5 years. The result shows majority of the respondents has been working with the Works Department of the TMA for over 5 years, the years of service in the department could provide reliable information for the study.

Table 4.2 Experience of Respondents

Experience		Frequency	Percent
	1-2	3	10.0
	3-4	6	20.0
	Above 5 years	21	70.0
	Total	30	100.0

4.2.4 Respondents Involvement in Infrastructure Delivery

The study measured respondent's involvement by the number of times respondents were involved in infrastructure delivery in the Works Department of the Tema Metropolitan Assembly (TMA). Table 4.3 below shows the involvement of respondents w infrastructure delivery with the Works Department of the Tema Metropolitan Assembly (TMA) in the past five years. The study showed that 40% have been involved in infrastructure projects between 2 and 5 time and 6-10 times respectively. 20% also indicated they have been involved in infrastructure delivery with the Works Department of TMA over 10 times. The remaining 70% have been working with the Works Department above 5 years. The result shows majority of the respondents have been involved in infrastructure delivery with the Works Department of the TMA for more than 5 times, this shows that the sampled respondents are actively involved in infrastructure delivery of the TMA.

Table 4.3 Respondents Involvement in Infrastructure Delivery

Involvement in Infrastructure Delivery	Frequency	Percent
2-5 times	12	40.0
6-10 times	12	40.0
More than 10 times	6	20.0
Total	30	100.0

4.2.5 Infrastructure Delivery Philosophy

The study inquired whether the Works Department of the Tema Metropolitan Assembly (TMA) has infrastructure delivery philosophy which guide/ regulates the provision of infrastructure within the Tema Metropolitan Assembly (TMA). The Figure 4.2 below shows that 70% of the respondents included in the study indicated that Works Department of the Tema Metropolitan Assembly (TMA) does not have any infrastructure delivery philosophy which guide/ regulates the provision of infrastructure within the Tema Metropolitan Assembly

(TMA). However, some 30% indicated otherwise that the Works Department of the Tema Metropolitan Assembly (TMA) has infrastructure delivery philosophy which guide/ regulates the provision of infrastructure within the Tema Metropolitan Assembly (TMA) and the philosophy is to provide Pro-poor infrastructure for Community development within the Tema Metropolitan Assembly.

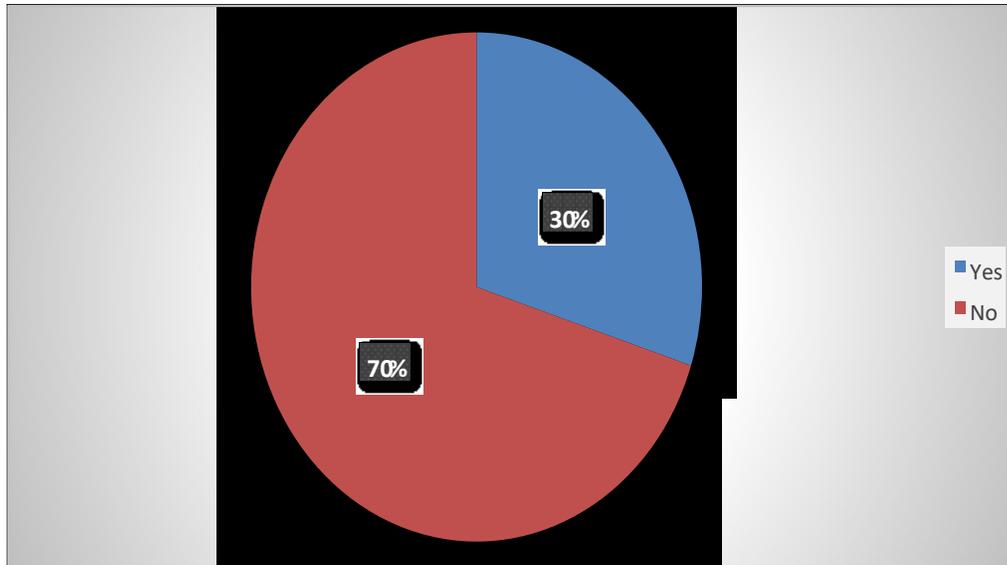


Figure 4.2: Infrastructure Delivery Philosophy

4.3 Infrastructure Cost Control Practice

4.3.1 Cost Control Philosophy

Cost control in infrastructure delivery remain an important component of project management. Controlling cost in infrastructure projects commerce at the project inception to competition with the agreement of the final account. It has therefore become paramount among quantity surveyors to employ varied procedures or methods to control cost during pre-contract and post contract stage s of infrastructure delivery. According to Work Breakdown Structures (2018), controlling projects is to not only look back on project performance but also to look forward. This is only possible through adopting the correct cost control philosophy, for which the correlation between all cost control aspects must be well understood. The study examines the existence of cost control philosophy at the Works Department of TMA. The results as presented in Figures 4.3 indicates that 30%

indicated that the Works Department of TMA has an cost control philosophy towards enhance infrastructures delivery in the assembly, 20% indicated otherwise that the Works Department of TMA has no cost control philosophy towards enhance infrastructures delivery in the assembly and the remaining 50% also indicated they do not know if the Works Department of TMA has any form of cost control philosophy towards enhance infrastructures delivery in the assembly. The results is an indication that the Works Department of TMA does not have any well-known cost control philosophy among project staff towards enhance infrastructures delivery in the assembly.

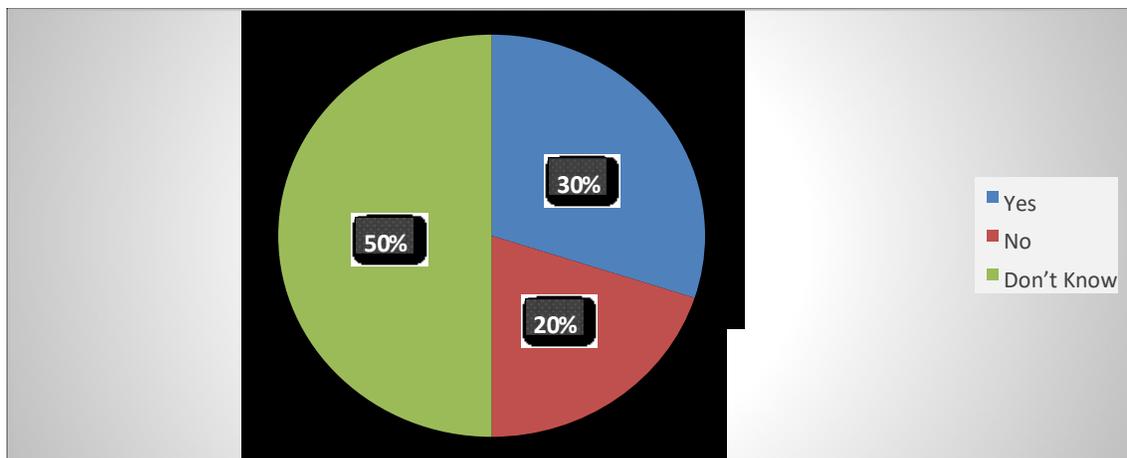


Figure 4.3 Infrastructure Cost Control Practice

4.3.2 Cost Management Practices

The study envisaged to evaluate the cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. After review of literatures, six (6) cost management practices were identified and respondents were asked to rank the extent of application at TMA. These practices include Budget planning, Cost tracking, Time management, Project change controlling, Value Analysis and Value Engineering and

Earned value use. The mean values of the practices represent the average usage or the extent to which respondents agree the practice is employed at TMA while the standard deviation represents the degree of dispersion of the observations for each practice. The mean and standard deviation on the Budget planning was found to be (Mean=4.30, Std. dev. =1.29). This implies that the respondent agree that the Works Department of Tema Metropolitan Assembly to a large extent employ Budget planning as a cost management practice. The mean and standard deviation for Cost tracking was (Mean=4.10, Std. dev. =1.156). This implies that on the average that the respondent agree that the Works Department of Tema Metropolitan Assembly to a large extent employ Cost tracking as a cost management practice. The mean and standard deviation for Time management was (Mean=2.60, Std. dev. =1.122). This implies that on the average that the respondent agree that the Works Department of Tema Metropolitan Assembly to a little extent employ Time management as a cost management practice.

The mean and standard deviation for Project change controlling was (Mean=3.70, Std. dev. =0.915). This implies that on the average that the respondent agree that the Works Department of Tema Metropolitan Assembly to a large extent employ Project change controlling as a cost management practice. The mean and standard deviation for Value Analysis and Value Engineering was (Mean=2.70, Std. dev. =1.132). This implies that on the average that the respondent agree that the Works Department of Tema Metropolitan Assembly to a little extent employ Value Analysis and Value Engineering as a cost management practice. And finally for Earned value use scored a mean of 2.60 and a standard deviation of 1.33 indicating that respondents agree that the Works Department of Tema Metropolitan Assembly to a little extent employ Earned value use as a cost management practice. The result as discussed above revealed that the largely employed

cost management practices at the Works Department of Tema Metropolitan Assembly are the Budget planning, Cost tracking and Project change controlling.

Table 4.4 Cost Management Practices

	Mean	Std. Deviation
Budget planning	4.30	1.291
Cost tracking	4.10	1.155
Time management	2.60	1.221
Project change controlling	3.70	.915
Value Analysis and Value Engineering	2.70	.915
Earned value use	2.60	1.133
Valid N (listwise)		

4.4 Challenges in the Application of Cost Management Practices

The study also investigated the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. In this regards, the respondents were asked to use a Likert Scale of 1 to 5 to indicate the extent to which the level of severity each challenges in the application of cost management practices applied on infrastructure projects by ticking the appropriate boxes. 1 means very low, 2 means low 3 means moderate 4 means high and 5 means very high. 23 factors were identify to militate the application of cost management practices applied on infrastructure projects. There is therefore the need to identify the most severe challenges in the application of cost management practices applied on infrastructure projects. Most studies adopt the relative severity index, however, this study intends to employ different technique to identify the

most severe challenges. In this case, the factor analysis was performed to examine the underlying challenges in the application of cost management practices TMA. The goal is to reduce the number of challenges and the fact that some of these challenges may be interrelated.

4.4.1 Varimax Rotation of Variables

Hair *et al.* (2010) in an exploratory factor analysis, suppose that in a perfect world, variables must have a load of more than 0.5 to be saved for analysis. On the other hand, more normal quantities in the social sciences are low for targeting variable loads of more than 0.40. If the variable has a load of less than 0.40, it is not possible to identify with other things, or to suggest another element to be investigated. Varimax rotation of the variables tends to produce several factors in the group. There are seven methods to reduce data when running factor analysis, however, the researcher adopted principal component method of extraction to conduct the data reduction and identify which items within the variables could be retained for further analysis. The principal component method of extraction reflects the direct grouping of components that explains the difference between the variables. Prior to the factor analysis, the within-correlation test was also conducted to confirm the assumption of inter relating variables. According to (Hair et al., 2006), it is not possible to extract from the data when there is no inter correlation between them. However, the results of the Pearson correlation analysis showed some variables had a VIF values greater than 10 and tolerance values greater than 0.10, this confirms the existence of multicollinearity in the data set. Again, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy are both tests that can be used to determine the factorability of the matrix as a whole, the Bartlett test of

Sphericity revealed [Appox: Chi – square = 14.120, Df. .29, $p < 0.001$] and the KMO measure of sampling adequacy (0.786) revealed strong relationship within the study variables and therefore allowed the adoption of exploratory factor analysis.

4.4.2 Factor Extraction

Table 4.5 displays the total variance explained at seven components of challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. Thirteen items were extracted since their eigenvalues were greater than 0.7. The thirteen items constituted six components, after extracting thirteen factors, 96.366 percent of the total variation was accounted for leaving only 3.634 percent unexplained variation. The implication is that the thirteen identified factors constitute the most severe challenges in the application of cost management practices TMA.

Table 4.5 Factor Extraction

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.909	47.430	47.430	10.909	47.430	47.430	5.179	22.516	22.516
2	4.321	18.787	66.217	4.321	18.787	66.217	4.810	20.914	43.430
3	2.753	11.971	78.189	2.753	11.971	78.189	4.279	18.606	62.035
4	2.153	9.359	87.548	2.153	9.359	87.548	3.159	13.734	75.769
5	1.256	5.461	93.009	1.256	5.461	93.009	2.602	11.311	87.080
6	.772	3.358	96.366	.772	3.358	96.366	2.136	9.286	96.366
7	.485	2.108	98.474						
8	.351	1.526	100.000						
9	7.851E-16	3.413E-15	100.000						
10	5.736E-16	2.494E-15	100.000						
11	4.196E-16	1.824E-15	100.000						
12	3.717E-16	1.616E-15	100.000						
13	2.126E-16	9.243E-16	100.000						
14	1.579E-16	6.866E-16	100.000						
15	6.103E-17	2.654E-16	100.000						
16	3.042E-17	1.323E-16	100.000						
17	-	-	100.000						
18	8.673E-17	3.771E16							
19	1.926E16	8.373E-16	100.000						
20	-	-							
21	2.900E-16	1.261E-15	100.000						
22	3.502E16	-	100.000						
23	-	1.523E15							
24	4.551E16	1.979E-15	100.000						
25	-	-							
26	7.567E16	3.290E-15	100.000						
27	-	-							
28	8.993E16	3.910E-15	100.000						

Extraction Method: Principal Component Analysis.

4.4.3 Extracted Challenges in the Application of Cost Management Practices

The thirteen identified factors constitute the most severe challenges in the application of cost management practices TMA includes Errors in design, Weak Funding, Inaccurate cost estimates, Over emphasizing on results while ignoring the process of PCC, Improper Management of Funds, Lack of technical details and precise requirements in contracts, Using obsolete Methods and Concepts, Lack of consistency in cost management by managers , Difficulty in monitoring different sources of day-to-day cost data, Serious decision failure, exorbitant marketing expenses, Non-availability of project management training facilities for professionals, Lack of recognition of Project Management practices by top management, Lack of electronic data management system in the organization to capture knowledge or experienced gained from previous projects.

The result of Amponsah (2012); Kulshreshtha et al (2008); Damian (2012) indicated that unclarity of the project requirement has been found to be a factor that affects the success of the project. It was found that, when the project requirements are not properly spelled out, it is difficult to complete projects. Unclearness of project requirements could be as a result of different stakeholders' viewpoint.

Table 4.6 Rotated Component Matrix

	Component					
	1	2	3	4	5	6
Q10.1		.598	-.582	.083	.254	.114
Q10.2		.621	.028	-.012	.531	-.233
Q10.3		-.142	.053	.155	-.896	.187
Q10.4		.697	.168	.140	.218	.438
Q10.5	.552	.569	.156	.135	.108	.559
Q10.6	.831	.143	.401	-.153	.239	-.108
Q10.7	-.068	.357	.912	.030	-.093	.114
Q10.8	-.273	.256	-.216	.693	-.280	.487
Q10.9	.183	.152	.529	.071	-.364	.707
Q10.10	.349	.542	.682	.130	.124	.286
Q10.11	.105	.067	.227	.956	-.059	-.078
Q10.12	.621	.120	-.043	.723	-.006	-.053
Q10.13	.091	.859	.415	.232	.141	.046
Q10.14	.193	.884	.252	-.117	-.007	.158
Q10.15	.119	.452	.263	-.203	.691	.300
Q10.16	.865	.347	.261	.191	.078	.102
Q10.17	.886	.213	-.059	.329	.031	.237
Q10.18	.461	.243	.815	.217	.080	.041
Q10.19	.016	-.252	.323	.732	-.332	.430
Q10.20	.377	.075	.855	.164	.261	.159
Q10.21	.454	.402	.334	.484	.243	.477
Q10.22	.408	.685	.075	.065	.424	-.184
Q10.23	.826	.196	.232	-.157	.411	.143

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization..

Rotation converged in 11 iterations.

4.5 Ways of Improving in Cost Management in Infrastructure Delivery

Amidst the numerous identify the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. There is the need to identify best practices that could enhance cost management practices on infrastructure projects in Tema Metropolitan Assembly. Table 4.7 presents analysis of some effective ways of overcoming some of the above challenges in the application of

cost management practices in TMA. The mean values of the practices represent the average usage or the extent to which respondents agree the practice should be employed at TMA while the standard deviation represents the degree of dispersion of the observations for each practice. Among them the most had their extent of agreement with the cost management practices. MMDAs should be encouraged to use cost management techniques in dealing with projects recorded the highest mean 4.23, followed by Capacity building should be encouraged among academia, industry, clients, and government in the area of project management practice for improvement of efficiency and productivity of the MMDAs with a mean of 4.11, improving the capability of professionals in industry by introducing cost management as part of the curricula of tertiary education recorded a mean of 3.67 and finally Professional institutions including GhIS, GhIE, and GIA should partner in forming PM institutions, which will regulate the practices of PPM which also scored a mean of 3.52.

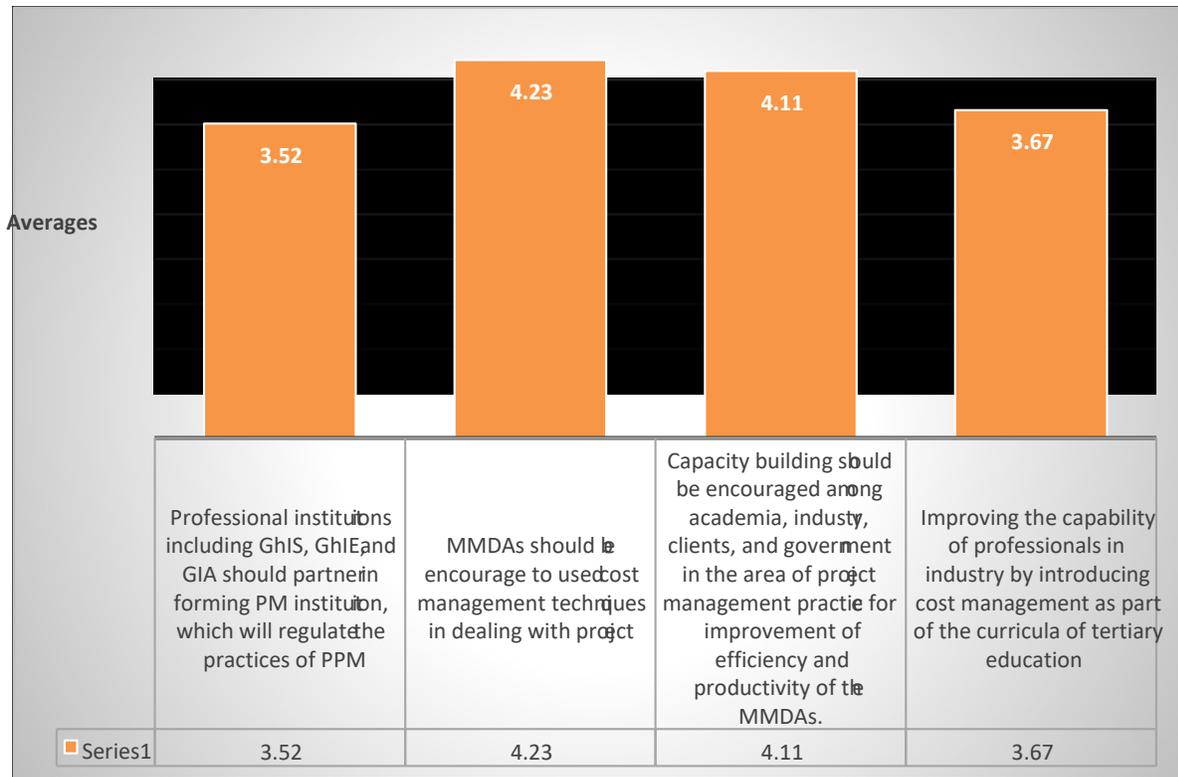


Figure 4.4 Ways of Improving in cost management in Infrastructure Delivery

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

In this chapter, the summary and conclusions of the results are presented in sections 5.1 and 5.2 respectively while some strategic recommendations are presented in section 5.3.

5.1 Summary

The overall goal of this study was to appraise cost management practices on infrastructure projects delivery at MMDAs a case of Tema Metropolitan Assembly (TMA). The specific objectives of this study involved evaluating the cost management practices applied on infrastructure projects in Tema Metropolitan Assembly; identifying the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly; and identifying best practices in cost management practices for TMAs. The researcher was guided by these set of objectives in order to achieve the ultimate goal of this study.

These objectives informed the thematic areas for the literature review. Both known and new concepts were reviewed to give further clarity to the study. Next was the methodology which gave directions on how to collect the data and the choice for a particular approach. An exploratory design was effectively utilized for this research because of the researcher's quest to unearth all possible cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. Primary data source were used to aid in achieving the research objectives. The primary data were collected through the use of structured questionnaires, data gathered were analyzed and findings

discussed in the earlier chapter. However, a summary of the key findings have been discussed below.

The study envisaged to evaluate the cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. Six (6) cost management practices were identified at TMA. These practices include Budget planning, Cost tracking, Time management, Project change controlling, Value Analysis and Value Engineering and Earned value use. However, the result revealed that the largely employed cost management practices at the Works

Department of Tema Metropolitan Assembly are the Budget planning, Cost tracking and Project change controlling.

The study also investigated the challenges in the application of cost management practices applied on infrastructure projects in Tema Metropolitan Assembly. 23 factors were identify to militate the application of cost management practices applied on infrastructure projects, factor analysis was performed to examine the underlying challenges in the application of cost management practices TMA. The goal is to reduce the number of challenges and the fact that some of these challenges may be interrelated. Thirteen items were extracted since their eigenvalues were greater than 0.7. The thirteen items constituted six components, after extracting thirteen factors, 96.366 percent of the total variation was accounted for leaving only 3.634 percent unexplained variation. The thirteen identified factors constitute the most severe challenges in the application of cost management practices TMA includes Errors in design, Weak Funding, Inaccurate cost estimates, Over emphasizing on results while ignoring the process of PCC, Improper Management of Funds, Lack of technical details and precise requirements in contracts, Using obsolete Methods and Concepts, Lack of consistency in cost management by

managers , Difficulty in monitoring different sources of day-to-day cost data, Serious decision failure, exorbitant marketing expenses, Non-availability of project management training facilities for professionals, Lack of recognition of Project Management practices by top management, Lack of electronic data management system in the organization to capture knowledge or experienced gained from previous projects. The final objective was to identify best practices in cost management practices to improve infrastructure delivery. It was identified that cost management practices will improve if MMDAs are encouraged to use cost management techniques in dealing with project, also capacity building should be encouraged among academia, industry, clients, and government in the area of project management practice for improvement of efficiency and productivity of the MMDAs, improving the capability of professionals in industry by introducing cost management as part of the curricula of tertiary education and again, professional institutions including GhIS, GhIE, and GIA should partner in forming PM institution, which will regulate the practices of PPM.

5.3 Conclusion

The application of cost management practices and tactics in developing country which Ghana is not an exception is in its preliminary stages of growth. In attempt of this study to assess the cost management practices on electricity infrastructure projects in Ghana, there was enough evidence of knowledge among project management staffs at TMA. It was revealed that the largely employed cost management practices at the Works Department of Tema Metropolitan Assembly are the Budget planning, Cost tracking and Project change controlling. Despite the Knowledge and importance the organization attaches to cost management practices

on their infrastructure projects, major challenges such as Errors in design, Weak Funding, Inaccurate cost estimates, Over emphasizing on results while ignoring the process of PCC, Improper Management of Funds, Lack of technical details and precise requirements in contracts, Using obsolete Methods and Concepts, Lack of consistency in cost management by managers , Difficulty in monitoring different sources of day-to-day cost data, Serious decision failure, exorbitant marketing expenses, Non-availability of project management training facilities for professionals, Lack of recognition of Project Management practices by top management, Lack of electronic data management system in the organization to capture knowledge or experienced gained from previous projects were identified which has negative effects on the application of cost management practices in TMA.

5.4 Recommendation

Based on the findings of the study, the following recommendations are made for consideration by the appropriate authorities:

- i. The results is an indication that the Works Department of TMA does not have any well-known cost control philosophy among project staff towards enhance infrastructures delivery in the assembly. It is recommended that Works Department of TMA should develop cost control philosophy enhance infrastructures delivery in the assembly.
- ii. It is recommended that Professional institutions including GhIS, GhIE, and GIA should partner in forming PM institution, which will regulate the practices of PPM.

- iii. Government and stakeholder should ensure that contractors are paid on time to avoid delays on projects which directly affect the success of projects.
- iv. Stakeholders should ensure collaborative efforts towards project right from the initial stage to completion.
- v. The existence of an effective mechanism to ensure that projects are completed or there is always continuity of projects to avoid projects being abandoned.
- vi. Entrenchment of legislation to ensure the continuity of project is not affected by change of government.
- vii. Roles and duties of project participant should be clearly defined before the inception of the project by indicating the type procurement system to be adopted for the project.
- viii. Capacity building should be encouraged among academia, industry, clients, and government in the area of cost management practice for improvement of efficiency and productivity of the infrastructure delivery.

5.5 Further Studies

The study recommends that future studies should consider expanding the scope of the study to include other MMDAs, in order to make the findings much more representative. Future study could consider examining the effects of challenges in the application of cost management practices on infrastructure projects, using the mixed method approach.

5.6 Limitation of the Study

This study, like other research studies, has its own limitations within which the findings can be generalized. The major limitation of this study is that the findings reported in this research is limited to occurrences at the Case Study focus. Thus, the findings cannot be interpreted to include what pertains at every Metropolitan Assembly in Ghana.

REFERENCES

- Abbasi, Y. G. and Al-Mharmah (2000). Project management practice by the public sector in a developing country. *International Journal of Project Management* Vol 18, No. 2, pp 105-109
- Ackah, W.B., (2016). *Pan–Africanism: Exploring the Contradictions: Politics, Identity and Development in Africa and the African Diaspora*. Routledge. Across Four Approaches, Theoretical and Practical Research in Economic Fields.
- Ademola, G.O., James, S.O. and Olore, I., (2012). The roles of record keeping in the survival and growth of small-scale enterprises in Ijumu Local Government Area of Kogi State. *Global Journal of Management and Business Research*, 12(13).
- Adjei Boakye, E., Jenkins, W.D., Osazuwa-Peters, N., Wang, M., Lee, M.J., Chen, B., Agamah, E.S. and Sharma, A., (2015). Incidence of second primary neoplasms among cancer survivors in the United States, 2000 through 2015.
- Ahlemann, F.; Teuteberg, F.; Vogelsang, K., (2009) “Project management standards – Diffusion alliance case study. *Journal of Construction Engineering and Management*, 13310, 807-815.
- Amponsah, B., (2012). Associations between seasonal variations in day length (photoperiod), sleep timing, sleep quality and mood: a comparison between Ghana (5) and Norway. *Journal of sleep research*, 21(2), pp.176-184.
- Andersen, S.W., (2008). Can project management support poverty reduction in Africa. Project Management Institute.
- PMI Aram software consultancy* (2014). "Primavera P6 Professional Project Management."
- Gowan Jr, J. and Mathieu, R.G., (2005). The importance of management practices in IS project performance: An empirical study. *Journal of Enterprise Information Management*, 18(2), pp.235-255.

- Arttachariya, P., (2012). Environmentalism and green purchasing behavior: A study on graduate students in Bangkok, Thailand. *BU Academic Review*, 11(2), pp.1-11.
- Ary, D., Jacobs, L.C., Irvine, C.K.S. and Walker, D., (2018). *Introduction to research in education*. Cengage Learning.
- Asare, A.B., (2017). *Project Management for Developing Countries: Back to Basics*.
- Ashworth, A., Hogg, K. and Higgs, C., (2002). *Willis's Practice & Procedure for the Quantity Surveyor*. (11th Editi.). *UK: Blackwell Science*.
- Babbie, E.R., (2015). *The practice of social research*. Nelson Education.
- Backlund, F., Chron er, D. and Sundqvist, E., (2014). Project management maturity models–A critical review: A case study within Swedish engineering and construction organizations. *Procedia-Social and Behavioral Sciences*, 119, pp.837-846.
- Bahauddin, K.M. and Uddin, M.H., (2012). Prospect of solid waste situation and an approach of Environmental Management Measure (EMM) model for sustainable solid waste management: case study of Dhaka city. *Journal of Environmental Science and Natural Resources*, 5(1), pp.99-111.
- Baker, B., (2018). Project Quality Management Practice & Theory. *American Journal of Management*, 18(3).
- Bakkour, W. and Ghura, V., (2013). Medial eyebrow defects: reconstruction with whole eyebrow subcutaneous island pedicle. *Ophthalmic Plastic & Reconstructive Surgery*, 29(4), pp.330-332.
- Beekmans, K., (2009). *Marokko voor beginners*. Atlas Contact.

- Besner, C. and Hobbs, B., (2006). The perceived value and potential contribution of project management practices to project success. *Project management journal*, 37(3), pp.37-48.
- Brace, I., (2018). *Questionnaire design: How to plan, structure and write survey material for effective market research*. Kogan Page Publishers.
- Bradley, L. (2003). Improving employees' work-life balance in the construction industry: Project
- Bradley, R.H. and Corwyn, R.F., 2002. Socioeconomic status and child development. *Annual review of psychology*, 53(1), pp.371-399.
- Brunekreeft, G. Keller, K. (2000). Elektrizität: Verhandelter versus regulierter
- Bryd, J.A.,(2008). Immunological cell and serum metabolite response of 60-week-old commercial laying hens to an alfalfa meal molt diet. *Bioresource technology*, 99(3), pp.604-608.
- Bryde, D.J., (2003). Modelling project management performance. *International Journal of Quality & Reliability Management*, 20(2), pp.229-254.
- Carter, R., (2012). *Vocabulary: Applied linguistic perspectives*. Routledge.
- Castillo, J.M., Dorman, C., Gaunt, B., Hardcastle, B., Justice, K. and March, A.L., (2016). Design research as a mechanism for consultants to facilitate and evaluate educational innovations. *Journal of Educational and Psychological Consultation*, 26(1), pp.25-48.
- Cheruiyot, B. K. (2014). *The Effects Of Customer Relationship Management Practices In Center for Applied Macroeconomic Analysis, Crawford School of Public Policy*,

- Chow, S.C., Shao, J., Wang, H. and Lokhnygina, Y., (2017). *Sample size calculations in clinical research*. Chapman and Hall/CRC.
- Cleland, D.I. and Ireland, L.R., (2002). *Project management: strategic design and implementation* (Vol. 4). New York: McGraw-Hill.
- Conflict, Revista de Management Comparat International / Review of International Comparative Management*, Volume 10, Issue 5, (2009), Editura ASE, București, pp. 1035 -1042
- Cooke-Davies, T.J., (2001). *Towards improved project management practice: Uncovering the evidence for effective practices through empirical research*. Universal-Publishers.
- Crawford, L., Pollack, J. and England, D., (2006). Uncovering the trends in project management: Journal emphases over the last 10 years. *International journal of project management*, 24(2), pp.175-184.
- Creswell, J.W., 2013. Steps in conducting a scholarly mixed methods study.
- Cusworth, J.W. and Frank, T.R., (1993). Management projects in developing countries. *Harlow: Longman*.
- Daily Graphic, (2007) Former Deputy Minister of Finance and Economic Planning, Professor
- Damian, P., (2012). Environmentalism and green purchasing behavior: A study on graduate students in Bangkok, Thailand. *BU Academic Review*, 11(2), pp.1-11.
- Darayseh, M. and Chazi, A., (2018). Bank specifics, economics environment, and agency theory: Determinants of banking performance in GCC. *The Journal of Developing Areas*, 52(4), pp.199-212.

- Das, M., (2018). Environmental impact of trawling on the continental shelf of Bay of Bengal. *Sustainable Water Resources Management*, 4(4), pp.1091-1104.
- David, J., (2013). Secrets Behind Successful Management of Infrastructure projects in Columbia. *European Journal of Business Management*
- Sonuga F., Aliboh O., and Oloke D. (2002). Particular barriers and issues associated with projects in a developing and emerging economy. Case study of some abandoned water and irrigation projects in Nigeria. *International Journal of Project Management*, 208, 611-616.
- Estache, A. and Fay, M., (2007). Current debates on infrastructure policy. The World Bank.
- Etikan, I., Musa, S.A. and Alkassim, R.S., (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), pp.1- 4.
- Ferry, B., Roozendaal, B. and McGaugh, J.L., (1999). Basolateral amygdala noradrenergic influences on memory storage are mediated by an interaction between β - and α 1 adrenoceptors. *Journal of Neuroscience*, 19(12), pp.5119-5123.
- Freeman, R.E., (1988). Divergent stakeholder theory. *Academy of management review*, 24(2), pp.233-236.
- Friedman, M., (1970). A theoretical framework for monetary analysis. *Journal of Political Economy*, 78(2), pp.193-238.
- Frye, N., (2013). *The stubborn structure: Essays on criticism and society*. Routledge.
- Gay, P., (2010). Performativities: Butler, Callon and the moment of theory. *Journal of Cultural Economy*, 3(2), pp.171-179.

- Gopalasamy, P, and Mansor, Z, (2013). An Investigation on Project Management Standard
- Gowan Jr, J A, and Mathieu, R G, (2005). The importance of management practices in IS Project
- Gower, D. G. (1992). Project management – an overview. Association of Project
- Growitsch, C., Wein, T. (2004). The Contestable Market Theory: Efficient Advice Guide, 4th Ed., PMI, Pennsylvania.
- Gyan-Baffour (2013) Opening remarks at a ceremony for project managers, organized by the African Development Bank AfDB, in Accra, Ghana. Available at:graphic.com.gh/index.php?option[accessed February, 2013] handbook 2: 324-373.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2012) Multivariate data analysis with readings. 7 ed. Upper Saddle River, N.J: Pearson/Prentice Hall.
- Harmon, W. (2006). *A handbook to literature*. Prentice Hall.
- Hekala, W., (2012). Why donors should care more about project management. Devex.
- Hopp, W.J. and Spearman, M.L., (2011). *Factory physics*. Waveland Press.
<http://www.projectcontrolsonline.com/Tools/Safran.aspx>.
https://en.wikipedia.org/wiki/project_appraisal.
- Hwang, B.G. and Ng, W.J., (2013). Project management knowledge and skills for green construction: Overcoming challenges. *International Journal of Project Management*, 31(2), pp.272-284.

- Ibbs, C.W. and Reginato, J. (2002), *Quantifying the Value of Project Management: Best Practices for Improving Project Management Processes, Systems, and Competencies*, Project Management Institute, Newtown Square, PA.
- Jackson, D., (2009). *Manual for the dimensional assessment of personality pathology—basic questionnaire. Port Huron, MI: Sigma.*
- Jekale, W. (2004). *Performance for public construction projects in developing countries:*
- Kerzner, H., (2018). *Project management best practices: Achieving global excellence.* John Wiley & Sons.
- Khazanchi, D. and Zigurs, I., (2006). Patterns for effective management of virtual projects: Theory and evidence. *International Journal of e-Collaboration (IJeC)*, 2(3), pp.25-49.
- Khodakarami, V., Fenton, N. and Neil, M., (2007). Project Scheduling: Improved approach to incorporate uncertainty using Bayesian Networks. *Project Management Journal*, 38(2), pp.39-49.
- Kloppenborg, T.J. and Laning, L.J., (2012). *Strategic Leadership of Portfolio and Project Management: Bridging the Gaps Between Setting and Executing Strategy.* Business Expert Press.
- Krosnick, J.A., (2017). Designing rating scales for effective measurement in surveys. *Survey measurement and process quality*, pp.141-164.
- Kulshreshtha, A., Jarouliya, U., Bhadauriya, P., Prasad, G.B.K.S. and Bisen, P.S., (2008). Spirulina in health care management. *Current pharmaceutical biotechnology*, 9(5), pp.400-405.
- Ling, F.Y.Y., Low, S.P., Wang, S.Q. and Lim, H.H., (2009). Key project management practices affecting Singaporean firms' project performance in China. *International Journal of Project Management*, 27(1), pp.59-71.

- Malan, A., Pretorius, L., & Pretorius, J. (2007). A frame work for increasing project maturity management: *Journal emphases over the last 10 years. International Journal of Project Management, Vol. 24*, p. 175–184.
- Mansa, R.F., (2007). *Roll compaction of pharmaceutical excipients and prediction using intelligent software* (Doctoral dissertation, University of Birmingham).
- Mastilak, M.C., Matuszewski, L., Miller, F. and Woods, A., (2018). Self-Fulfilling prophecy? An examination of exposure to agency theory and unethical behavior. In *Research on Professional Responsibility and Ethics in Accounting* (pp. 111-152). Emerald Publishing Limited.
- McCarthy, C.J., Whittaker, T.A., Boyle, L.H. and Eyal, M., (2017). Quantitative approaches to group research: Suggestions for best practices. *The Journal for Specialists in Group Work, 42*(1), pp.3-16.
- McConnell E. (2010). Project Management Methodology: Definition, Types, McKibbin, W. and Henckel, T. (2010). The Economics of Infrastructure in a Globalized World: Mixed Methods Research, 1 January, pp. 77-100 model for analysis. *International Journal of Project Management, 22*, 655-667.
- Moder, J. J. (1988). "Network techniques in project management." Project management
- Moder, J., (1983). Project management with CPM, PERT and precedence diagramming.
- Mok, K.Y., Shen, G.Q. and Yang, J., (2015). Stakeholder management studies in mega construction projects: A review and future directions. *International Journal of Project Management, 33*(2), pp.446-457.
- Moradi, M., Enkavi, G. and Tajkhorshid, E., (2015). Atomic-level characterization of transport cycle thermodynamics in the glycerol-3-phosphate: phosphate antiporter. *Nature communications, 6*, p.8393.
- Nardi, P.M., (2018). *Doing survey research: A guide to quantitative methods*. Routledge.

- Năstase, M., (2009). Leadership development within SME's: solving the organizational conflict. *Revista de Management Comparat Internațional*, 10(5), pp.1035-1042.
- Neafsey, D.E., Juraska, M., Bedford, T., Benkeser, D., Valim, C., Griggs, A., Lievens, M., Abdulla, S., Adjei, S., Agbenyega, T. and Agnandji, S.T., (2015). Genetic diversity and protective efficacy of the RTS, S/AS01 malaria vaccine. *New England Journal of Medicine*, 373(21), pp.2025-2037.
- Newbery, D.M. (2000). Privatization, Restructuring and Regulation of Network
NGO information and support center, 2013 [online]. Available at:
www.3sektorius.lt [Accessed 28 December 2014]
- Nguyen, N. M. (2007). The Challenges of transferring modern project management Principles.
- Nielsen, J. (2006), April. Towards a framework for network management applications.
- Nielsen, J. and Loranger, H., (2006). *Prioritizing web usability*. Pearson Education. NJ:
Pearson education.
- Norton, M.I., Mochon, D. and Ariely, D., (2012). The IKEA effect: When labor leads to love. *Journal of consumer psychology*, 22(3), pp.453-460.
- Ohara, S. (2005). *Project and Program Management for Enterprise Innovation*. PMAJ. Patel,
- Oppenheim, L., (2017). The Science of International Law: its task and method. In *The Nature of International Law* (pp. 93-356). Routledge. p.105–109.
- Parker, D.W., Dressel, U., Chevers, D. and Zeppetella, L., (2018). Agency theory perspective on public-private-partnerships: international development project. *International Journal of Productivity and Performance Management*, 67(2), pp.239-259.

- Pinto, J. K. (2007). *Project Management: Achieving Competitive Advantage*. Upper Saddle River,
- PMI (2004) A Guide to the Project Management Body of Knowledge PMBOK.
- PMI. (1996) A Guide to the Project Management Body of Knowledge. Upper Darby, PA, Project Practices in IT Organization.
- Project Management Institute [PMI]. (2008). *A Guide to the Project Management Body of Knowledge*.
- Project Management Institute, (2004). *A guide to the project management body of knowledge (PMBOK guide)* (Vol. 2). Project Management Inst.
- Quinn, R.E., (2010). *Deep change: Discovering the leader within* (Vol. 378). John Wiley & Sons.
- Ramabadron, R., Dean Jr, J.W. and Evans, J.R., (1997). Benchmarking and project management: a review and organizational model. *Benchmarking for Quality Management & Technology*, 4(1), pp.47-58.
- Ramabadron, R., Dean, J.W. Jr. and Evans, J.R. (1997) *Benchmarking and project management: a review and organizational model*. Benchmarking for Quality Management & Technology, 4, 47-58.
- Robichaud, L.B. and Anantatmula, V.S., (2010). Greening project management practices for sustainable construction. *Journal of management in engineering*, 27(1), pp.48-57.
- Saunders, M., Lewis, P. and Thornhill, A., (2016). Research methods for business students *Harlow, Essex: Pearson Education Limited*.
- Schindler, P. S., & Cooper, D. R. (2005). *Marketing research*. Tata McGraw-Hill Education.
- Schlichter, J. (1999). Surveying project management capabilities. *PM NETWORK*, 13, 39-40.

- Sharma, B. and Gadenne, D., (2002). An inter-industry comparison of quality management practices and performance. *Managing Service Quality: An International Journal*, 12(6), pp.394-404.
- Shenhar, A.J. and Dvir, D., (2004). Project management evolution: past history and future research directions. *Innovations: project management research*, pp.57-64.
- Söderlund, J., (2004). On the broadening scope of the research on projects: a review and a model for analysis. *International Journal of Project Management*, 22(8), pp.655-667.
- Sonuga, F., Aliboh, O. and Oloke, D., (2002). Particular barriers and issues associated with projects in a developing and emerging economy. Case study of some abandoned water and irrigation projects in Nigeria. *International Journal of project management*, 20(8), pp.611-616.
- Song, J.Z., Bai, P., Hang, Z.H. and Lai, Y., (2014). Acoustic coherent perfect absorbers. *New Journal of Physics*, 16(3), p.033026.
- Sukhoo, A., Barnard, A., Eloff, M.M. and Van der Poll, J.A., (2004). A survey of project management tools, techniques and methodologies used in Mauritius: The current status.
- Sukhoo, A., Barnard, A., Eloff, M.M. and Van der Poll, J.A., (2004). An evolutionary software project management maturity model for Mauritius. *Interdisciplinary Journal of Information, Knowledge & Management*, 2.
- Teddlie, C. and Yu, F., (2007). Mixed methods sampling: A typology with examples. *Journal of mixed methods research*, 1(1), pp.77-100.
- Tonchia, S., (2018). Linking performance measurement system to strategic and organisational choices. *International Journal of Business Performance Management*, 2(1-3), pp.15-29.

- Too, E.G. and Weaver, P., (2014). The management of project management: A conceptual framework for project governance. *International Journal of Project Management*, 32(8), pp.1382-1394.
- Torrise, G. (2009). Public infrastructure: definition, classification and measurement
- Turner, J.R. and Cochrane, R.A., (1993). Goals-and-methods matrix: coping with projects with ill defined goals and/or methods of achieving them. *International Journal of project management*, 11(2), pp.93-102.
- Veal, A.J., (2017). *Research methods for leisure and tourism*. Pearson UK.
- W. G. and Pinto, J. K. (2012) Eds..The Wiley Guide to Managing Projects. New Jersey, John Wiley and Sons, Inc. Cited in Crawford, L.,
- Walliman, N. (2006) Social Research Methods, London, SAGE Publications
- Willoughby, B., (2003). *The star makers: on set with Hollywood's greatest directors*. Merrell Pub Limited.
- World Bank, (2006). *Hypocrisy trap: The World Bank and the poverty of reform*. Princeton University Press.
- Xu, Z., Ming, X.G., Song, W., He, L. and Li, M., (2014). Collaborative project management: A systemic approach to heavy equipment manufacturing project management. *Systemic Practice and Action Research*, 27(2), pp.141-164.
- Yin, R.K., (2017). *Case study research and applications: Design and methods*. Sage publications.
- Zigurs, I. and Khazanchi, D., (2008). From profiles to patterns: A new view of task-technology fit. *Information systems management*, 25(1), pp.8-13.

APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,

KUMASI

DEPARTMENT OF BUILDING TECHNOLOGY

Dear Respondent,

I am an MSc student of the Department of Construction Technology and Management, KNUST, undertaking this research study as part of the requirement for the award MSc degree in Project Management. The aim of the research is to appraise cost management practices on infrastructure projects delivery at MMDA a case of Works Department of Tema Metropolitan Assembly (TMA).

Attached is a copy of my questionnaire. I will be very grateful if you could answer this questionnaire to aid the study. All information collected will be confidential and would be used only for academic purposes. Thank you for your time and contribution in advance.

Yours faithfully

KOTEI MANASSEH NEEQUAYE

Mobile:

Dr. De-Graft Owusu-Manu

Project Supervisor

Department of Construction Technology and Management,
KNUST

A: GENERAL INFORMATION OF RESPONDENT/ORGANIZATION

1. Position of Respondents Quantity Surveyor Project Manager
Architect Engineer Others (please specify)
2. Gender Status. M F
3. Please state your Highest Education/Training Level.
 Masters (i.e. MSc, MA, MBA, etc.)
 Under graduate degree (BSc, BA, etc.)
 HND
 City & Guilds
 Other _____ (please specify)
4. How long have you worked in the TMA?
 Less than 1 year
 1 – 2 years
 2 – 3 years
 3 – 5 years
 More than 5 years
5. How many times have you been involved in infrastructure delivery of the Assembly in the past 5 years?
 Less than 2 times
 2 – 5 times
 6 – 10 times
 More than 10 years
6. Does the Assembly have infrastructure delivery philosophy?
 Yes No I don't know
7. What is the major infrastructure delivery philosophy of the Assembly?
 We have not set our philosophy yet
 Our Philosophy is to provide Pro-poor infrastructure for Community development
 Encourage Community dwellers in determining our infrastructure needs.
 Involve community dwellers in decision-making for infrastructural development
 Utilize local skills and knowledge for community development
 Other _____

B: INFRASTRUCTURE COST CONTROL PRACTICE

8. Is there any infrastructure delivery cost control philosophy at TMA? [] Yes [] No [] I don't know

9. If Yes, what infrastructure delivery cost control philosophy is currently employed at TMA?

.....

10. On a scale of 1-5 where 1-Very Little Extent, 2- Little Extent, 3-Moderate Extent, 4- Large Extent and 5-Very Large Extent.

To what extent is TMA able to:	1	2	3	4	5
Budget planning					
Cost tracking					
Time management					
Project change controlling					
Value Analysis and Value Engineering					
Earned value use					

C: CHALLENGES IN APPLICATION OF COST MANAGEMENT PRACTICES ON INFRASTRUCTURE PROJECTS IN MMDA

11. You are please to indicate the extent to which the level of severity each factor has on cost management Practices on infrastructure projects at TMA by ticking the appropriate boxes.

1 = Very Low, 2 = Low, 3 = Medium, 4 = High, 5= Very High

Please tick one circle per line to indicate the extent to which you agree or disagree with the following statements.

S/N	Major challenges in the application of Cost Management Practices on infrastructure projects.	(1)	(2)	(3)	(4)	(5)
1	Lack of Proper Planning					
2	Poor Communication					
3	Errors in design					
4	Lack of Project Management Skills					
5	Unclearness of the Project Requirements					
6	Weak Funding					
7	Inaccurate cost estimates					
8	Lack of knowledge on the use of available tools and technology					
10	Over emphasizing on results while ignoring the process of PCC					
11	Lack of Proper Control Mechanisms					
12	Improper Management of Funds					
13	Unstable Political Environment and Corruption					
14	Lack of technical details and precise requirements in contracts.					
16	Using obsolete Methods and Concepts					
17	Abandonment of complicated strategies					
18	Lack of consistency in cost management by managers					
19	Difficulty in monitoring different sources of dayto-day cost data					

SN	Major challenges in the application of Cost Management Practices on infrastructure projects.	(1)	(2)	(3)	(4)	(5)
20	Serious decision failure, exorbitant marketing expenses					
21	Non-availability of project management training facilities for professionals					
22	Lack of recognition of Project Management practices by top management					
23	Lack of project managers empowered with authority to manage projects					
24	Lack of the application of project management tools and techniques					
25	Lack of electronic data management system in the organization to capture knowledge or experienced gained from previous projects.					

12. On a scale of 1-5 where 1-Very Little Extent, 2- Little Extent, 3-Moderate Extent, 4- Large Extent and 5-Very Large Extent , suggest some effective ways of overcoming some of the above challenges in the application of cost management practices in TMA.

	1	2	3	4	5
Government Institutions must be strengthened by the enforcement of the implementation especially in the MMDAs					
Professional institutions including GhIS, GhIE, and GIA should partner in forming PM institution, which will regulate the practices of PPM					
MMDAs should be encourage to used cost management techniques in dealing with project					
Capacity building should be encouraged among academia, industry, clients, and government in the area of project management practice for improvement of efficiency and productivity of the MMDAs.					
Improving the capability of professionals in construction industry by introducing cost management as part of the curricula of tertiary education					

THANK YOU