THE EFFECTS OF SCOPE MANAGEMENT ON PROJECT SUCCESS IN CONSTRUCTION PROJECT MANAGEMENT

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DECLARATION

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

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ABSTRACT

In project management, a well-defined scope of a project enhances the changes of completing the project successfully within the time scheduled, budget allocated and the desired quality. During the pre-planning phase of a project, scope definition is undertaken and is a period in which a considerable amount of resources and time is needed in activities leading to the final investment decision. Defining the scope of a project is proven to be an effective way to decrease significant risks that could arise and enhance the chances of success of the project during its implementation. It is supposed that during pre-planning, projects with a well-defined scope are less likely to run into surprises like cost overruns, scope creep, schedule slippages and deliverables that are of poor quality. In this thesis, by gathering relevant research findings, aims to investigate the effects scope management have on project success in the Ghanaian construction industry. Three objectives were set on which literature review was conducted which includes: To determine the significant effects project scope definition has on construction project performance; to identify the challenges experienced in project scope management; and to determine ways of improving scope management for successful project delivery. Quantitative research method was adopted in conducting the study. The study was limited to five D1K1 construction firms in the Greater Accra region of Ghana, in which 48 out of 55 questionnaires were retrieved from Engineers, Quantity Surveyors and Project Managers. The analysis carried out was on their mean scores, standard deviation and Relative Importance Index (RII). The findings of the research indicated that: More accurate estimation of tasks, risks, timelines and costs; Appropriate resource allocation; Project quality enhancement; Prevention of budget overrun; and Prevention of delay in project schedule are significant effects project scope definition has on construction project performance. It was recommended that organizations put in their best to enhance effective project scope management through organizing workshops and interview with stakeholders. Moreover, project scope should be documented in a comprehensive way and it should be accessible to everyone within the project team. Also management in organization should ensure that all works essential to attain project objective are considered and well-articulated before the commencement of project.

KEYWORDS: Project management, Project Scope Management, Project Success, Construction Project.

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Finally, my acknowledgement cannot be complete without mentioning the tremendous support and admonishing of my family, whose motivation and encouragement sustained me to surmount every difficulty in life including those encountered in this research.

DEDICATION

This dissertation is dedicated to the Almighty God for his mercies, my mom and late dad who laid the foundation for my education, all my family members, friends and loved ones.

CHAPTER ONE

1.1 BACKGROUND TO THE STUDY

In project management a well-defined scope of a project enhances the changes of completing the project successfully within the time scheduled, budget allocated and the desired quality. During the pre-planning phase of a project, scope definition is undertaken and is a period in which a considerable amount of resources and time is needed in activities leading to the final investment decision. Defining the scope of a project is proven to be an effective way to decrease significantly risks that could arise and enhance the chances of success of the project during its implementation (Weijde, 2009). Mainly in infrastructural projects, for the overall duration of a project it is essential to include the time for pre-planning. This aid in the management of infrastructural delivery time expectations and influence the success of the project (Weijde, 2009).

The efforts of project pre-planning focuses on detailed project definition to enhance the visibility of what is required to be achieved to meet the requirements of project beneficiaries. Also during project definition care is taken to minimize spending much time since the product has to be delivered to the client on time. It is supposed that during pre-planning, projects with a well-defined scope are less likely to run into surprises like cost overruns, scope creep, schedule slippages and deliverables that are of poor quality (Morris, 2010). All possible risks are recognized by thoroughly defining a project and proactive action can then be undertaken to minimize the possibility of its occurrence, or the reduction of the risk impact if it occurs. Therefore, the definition of a project scope is seen as a technique for managing risk (Morris, 2010).

According to PM4DEV (2008), scope defines a project boundaries in relations to what will be delivered or not deliver. It describes all the works of a project to aid project team in setting up control systems which may result in improved outcome of project. In addition scope management are processes needed to make certain project involves all works needed to execute a successful project (Horine, 2013). According to The British Standards Institution (2013), infrastructural project execution is subject to various requirements to accomplish a good quality result and defining the scope of a project is one of the numerous requirements. Turner (2009) defines project scope as activities required to be performed to accomplish a project anticipated result. The result entails delivering the project within the right quality which fulfills the requirements of the client in time and budget (Meredith & Mantel, 2009; Heldman, 2009).

1.2 STATEMENT OF THE PROBLEM

One of the most respected and oldest accomplishment of mankind is managing project. Project takes up a 50% constituent of all works undertaken and as a result it is considered the vehicle for organizational growth execution. In project management the principal test of effective performance is achieving the appropriate result and which is accomplished through scope fulfillment (Peter, 2009).

According to Harrington and McNellis (2013), the primary reason for project failure is the inability to manage and control the scope of the project. In addition, Knapp (2011) asserted to the fact that the failure to define clearly and manage the scope of a project are among the most common reasons project could fail. However, at the course of a project there could be occurrence of change which will alter the quality of the project. Even the smallest changes could result into unplanned problematic circumstance to the project (Knapp, 2011).

In other to deliver a successful project which is within budget and on time, the efficient project manager has come to the realization that it is relevant to control the scope rigorously. An increase in scope which do not involve an equivalent adjustment to the timeline or cost of the project could end in late delivery of a project or the project being over budget (Knapp, 2011). According to Baca (2010), changes in scope of a project brings disturbance to the outcome of project. Mochal (2012) asserted that without scope change management, project results in completing more work than the originally agreed or budgeted for. Thus project could end up in distress.

Furthermore, Assaf & Al-Hejji, (2009) credited the failure of project to insufficient project elements definition and poor pre-project planning. He further asserted that seventy percent of poor time performance of construction projects is as a result of project scope changes. Likewise in Africa, project is mostly not executed on time and encounter poor definition of scope and cost overruns and 50% of these project fails in meeting expectations. According to Associated Press (2009) half of private firm of World Bank projects succeed while half fail.

At the start of this research study a preliminary study into scope management was conducted which shows that lot of attention is given to project failures as a result of improper scope management and on managing scope changes. However, there is little knowledge area on the impact project scope definition has on construction project performance. It is against this backdrop that this research is being carried out to examine significant impact project scope definition has on construction project performance and ways to improve project scope management to enhance construction projects success in Ghana.

1.3 RESEARCH AIM

The aim of the study was to investigate the effects scope management have on project success in the Ghanaian construction industry.

1.4 OBJECTIVES OF THE STUDY

The following objectives were set to achieve the stated aim:

1. To determine the significant effects project scope definition has on construction project performance;
2. To identify the challenges experienced in project scope management; and
3. To determine ways of improving scope management for successful project delivery.

1.5 RESEARCH QUESTIONS

1. What are the significant impact project scope definition has on construction project performance?
2. What are the challenges experienced in project scope management?
3. What are the ways of improving scope management for successful project delivery?

1.6 SCOPE OF RESEARCH STUDY

The scope of the research study geographically was limited to five D1K1 construction firms in the Accra metropolis in Greater Accra Region. Accra was selected due to the numerous daily construction projects undertaken. Also according to Ahadzie (2010), construction firms in Ghana are more predominant in Accra and Kumasi metropolis.

Moreover, the metropolis of Accra was selected due to its propinquity to researcher and which subsequently amended the hardship the research experienced financially in the aspect of data collection. Also, it ensured the ease in the retrieval of questionnaires from respondents. Respondents who in the researcher's opinion are involved directly in project management process in infrastructural projects were involved in the study. Further the research targeted four major parties in the construction industry which include project managers, architects, contractors and quantity surveyors.

1.7 SIGNIFICANCE OF THE RESEARCH

In project management, a well-defined scope of a project enhances the changes of completing the project successfully within the time scheduled, budget allocated and the desired quality. During the pre-planning phase of a project, scope definition is undertaken and is a period in which a considerable amount of resources and time is needed in activities leading to the final investment decision. Defining the scope of a project is proven to be an effective way to decrease significantly risks that could arise and enhance the chances of success of the project during its implementation.

This research examined ways of improving scope management for successful project delivery. The study helped identify significant impact project scope definition has on construction project performance. It further helped identify challenges experienced in project scope management and ways to improve project scope management for successful project delivery.

Moreover, whiles this research study is exclusive to Ghana, there will be possibility that a lot of countries which are developing will find findings of the study useful towards construction project management improvement.

Further, this study findings will give contribution to knowledge and also to literature in the subject area under study. Also serve as the bases for researcher to conduct further study and also by consultants, students and clients interested in conducting studies which are similar in related field.

1.8 RESEARCH METHODOLOGY

The research study adopts quantitative research approach as the research methodology, where by administration of questionnaires to respondents was adopted in retrieving data from the field. The process of the research study was initiated by review of literatures. In the course of review of literatures, information pertaining to the study was retrieved from earlier studies including journals, thesis and from internet. Moreover, information for the development of the questionnaire was from findings in the literature review to solicit data from the field survey. The data retrieved was quantified and further subjected to analysis.

1.9 RESEARCH ORGANIZATION

The study comprised of five chapters: the first chapter presented the introduction of the research which is composed of a brief background to the study, statement of the problem, research aim and objectives, scope of the research and justification of the study; the second chapter reviewed the vital literatures pertaining to the research study's topic. The research methodology of the study was dealt with in the third chapter which comprise of the procedures in field survey and sources of data collection. Further, fourth chapter introduce the result of data analyzed and the discussions of the results. The final chapter covered summary of research study by concluding and giving recommendations centered on the obtained results from the research study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter deals with literature review of project scope management. It begins with the general overview of scope management and project success. It further dealt into the significant effects project scope definition has on construction project performance, the challenges experienced in project scope management and ways of improving scope management for successful project delivery in the construction industry.

2.2 DEFINITION OF TERMS

2.2.1 What is a Project?

Project is temporary endeavor carried out in creating a product or a service which is distinctive. Temporary means project has its beginning and an end (Project Management Institute, 2010). The IPMA's (International Project Management Association) definition in the APM (Association for Project Management) BOK; states that "a project has a clear objective and deliverables, with a defined start and end, that must be completed on time, within budget (cost) and to the agreed quality and, of course, it must deliver the agreed benefits" (Association for Project Management, 2010). Another perspective of project definition is "a project is simply a defined set of deliverables that will be accomplished by a defined set of tasks to which resources and time have been allocated" (Morgan, *et al.*, 2009). Furthermore, a project can be described as a distinctive, temporary effort to obtain a required result.

From another perspective according to Westland (2009), project can be attributed to having unique characteristics, timescale, limited resources and a budget. Also, due to the uncertainty around a project it is deemed to have some level of risk and further

result in positive change in an organization. Projects comes in different sizes, varies in schedule and cost. Whiles some projects take years in completion, others take fewer days.

In addition, the project can be described as a system requiring resource investment that can be fairly analyzed and assessed as an autonomous Akarakiri unit (2009). The project may require the establishment of a special organization, it may also be a one-time programme, it may have a life cycle with a accurate beginning and end date with a budget that is probable to involve multiple use. These resources could be scarce and may be required to be shared among others. Smith (2009) concluded that projects can be characterized in six elements which are described in the figure below.

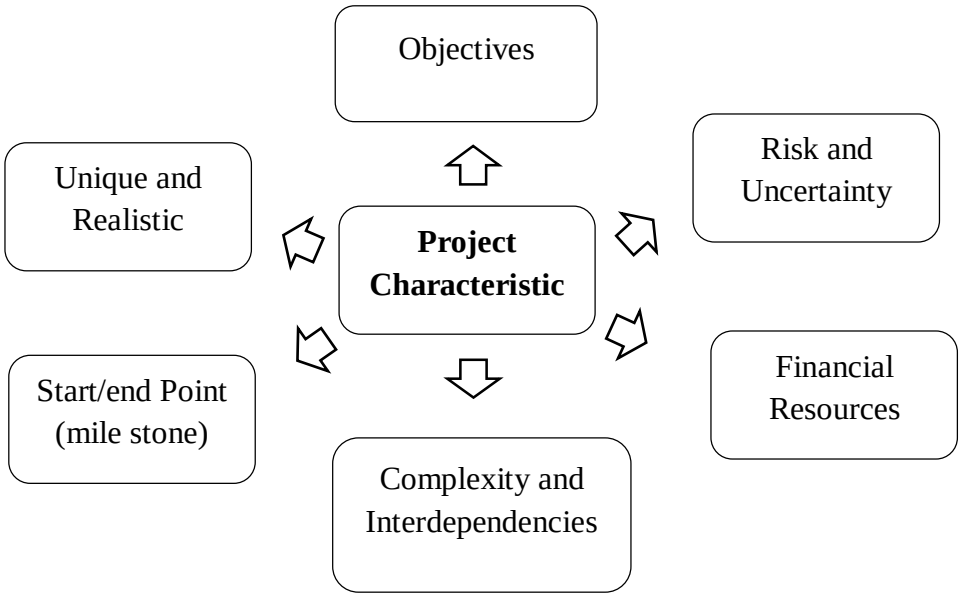

Figure 2.1 Characteristic of a project (Smith, 2009)

Moreover, the PMBOK describes a project to have 42 different processes which are grouped in 5 process groups which involves: the initiating process group; planning process group; executing process group; monitoring and controlling process group; and closing process group (Project Management Institute, 2010).

According to PMI (2010), the initiating process group consists of processes to be used in defining a project or a new phase of an existing project. Also, the Planning process group consist of processes dealing with establishing the scope of the project, refine the objectives and define the course of action necessary to achieve the project objectives. Executing process group presents how a project should complete actions stated in the project management plan to fulfil the project objectives. The monitoring and controlling process group deals with processes that track, review and regulate the progress and performance of the project. Identification and initiation of any changes during the project and finally the closing process group is the processes dealing with the finalization of all activities in the other four process groups to formally close the project or phase (PMI, 2010).

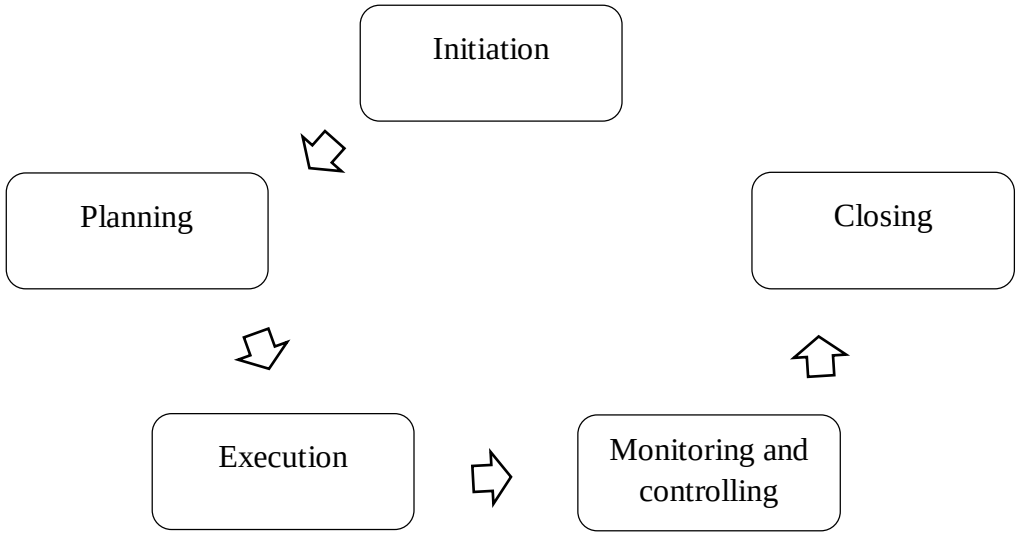

Figure 2.2 Project processes/ Project lifecycle (PMI, 2010)

2.2.2 What is Project Management?

The APMBOK describes project management work to include the planning and execution of a project task given from the project sponsor or similar. The project management task is to balance the dimensions of the project, scope, time, cost and quality in order to deliver the required benefits (Association for Project Management, 2010). According to Westland (2009), Project management is the activity of organizing and managing project resources and constraints with the aim of producing a successful completion and achievement of specific project goals and objectives. Wysocki (2009) defines project management as a set of skills, tools and processes needed to undertake a project successfully. Project management is a specialized field within the area of management and incorporates general management functions of planning, organizing, directing, and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives (Kerzner, 2009).

No organization can survive without successful project management input (Scott-Young & Samson, 2008). Project management facilitates the process of change and creates value (Bredillet, 2010); it is a key driver of business innovation and change that positions organizations to gain competitive advantage (Shenhar *et al*., 2007) and improve project culture, effectiveness, and efficiency (Martinsuo *et al*., 2006).

In addition, project management delivers desired outcomes, enhances project quality and a means of solving problems, provides a better control of scope changes, fosters relationship among all project stakeholders, reduces power struggles among key players, enhances the rapid delivery of projects, and ultimately leads to profitability (Sauser *et al*., 2009). These outcomes notwithstanding, organizations must be committed to a culture of effective practices by creating an enabling working environment that encourages team cohesiveness (Reed, 2008).

2.2.3 Construction Project Management

Construction projects management shares similarities with other types of projects management in different industries. Irrespective of this similarities there are some difference in managing projects from others. Managers are mostly altered in the various stages of a project in construction. They also have specialization in a particular project stage due to these differentiation, PMI made a guide available which will supplement management in construction. Additional four knowledge areas are included in the guide which includes: Environmental Management, Safety Management, Claim Management and Financial Management of construction projects (Morris, 2010). In construction project management has the primarily aim of coordinating professionals present in the team undertaking the project. This is to enhance their ability to give in the best contributions and commitment to attain an efficient and effective project performance (Ireland, 2008).

Also there is the need in managing construction project to understand the process of construction and design of the project. More so, for a successful construction project management there should be an effective communication and efficient management of team. According to Chen *et al*. (2009), in construction the functions of project management can be summarized which involves: (i) Project objectives and plans specification in terms of project scope definition, budget preparation and scheduling, participants of project selection and setting project required performance; (ii) Project resource efficient utilization maximization by compliance with prescribed schedules and plans for materials, labor and equipment; (iii) Execution of various project operations through appropriate planning, control and coordination throughout the project life cycle; (iv) Effective communications development and appropriate mechanisms establishment to resolve conflicts amongst various project participants.

2.3 OVERVIEW OF PROJECT SCOPE MANAGEMENT

Setting the scope early in the project is important, by focusing on the most important parts of the scope the project can gain solidness early while effectively using the resources. The project scope management is defined by PMBOK as: "the process required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. It is primarily concerned with defining and controlling what is and what is not included in the project" (Sikdar, 2009). Project scope is a statement that defines the boundaries of the project. There have been various names given to scope. It is referred to as functional specification in the systems industry, statement of work in the engineering profession amongst others (Wysocki, 2009).

However, whatever its name is it is important that the scope is correct since it defines what the project is really about. Scope management includes all those processes that are absolutely and necessary required to ensure that the project is streamlined to only the required necessary work in order to achieve a necessary product or service. Scope means what is needed to be done and scope management is the managing of what needs to be done (Wysocki, 2009).

In addition, according to the Project Management Body of Knowledge (2013) project scope involves managing the work that must be done to deliver a product with specified features and functions which can be visualized by creating a Work Breakdown Structure (WBS). Meredith and Mantel (2009) argue that scope can be defined as the requirements and expectations set by the client combined with time, cost and quality. Pettman (2017) states that scope includes objectives, goals, tasks, phases, resources, budget and schedule of a project. According to Turner (2009) scope is an initial, high-level description of the way in which the goal of a project will be reached. This description or statement of scope should include the work required to solve the problem

and achieve benefits, the work that falls outside the project and also interface with other projects.

However, management of scope is described by several authors, according to Rijkswaterstaat (2015) Scope management is an effective management of changes and controlling the project to ensure the assignment is up to date. Nahod (2012) argued that scope management deals with the analysis and approval of changes in construction projects. Nevertheless, Turner (2009) states that performing scope management includes ensuring that an adequate amount of work is done, unnecessary work is not done and the work which is done delivers the desired performance improvement.

There are five fundamental processes relating to scope management defined by PMBOK (2013) which are:

2.3.1 Collection of Requirements

Collection of requirements is the process whereby the customer and stakeholder expectation of the project is recorded. The captured information must be elicited and analyzed in concrete detail. Requirement becomes the foundation of the work to be done and serves as a guide to the cost schedule and the quality of the project. Requirements is usually classified into project requirement which include project management requirements amongst others and the product requirement which include technical detail of the product such as the security and performance requirements. The project charter serves as a foundation for collecting requirements because it holds documented information on stakeholder and customer expectations and needs. Requirement is usually collected in the form of interviews, by the use of focus groups and through facilitated workshops.

Other methods maybe through group creativity techniques such as brainstorming among others. Requirements can further be collected through questionnaires, surveys, and observations. Another modern method of obtaining results is through the feedback on prototypes .This helps at an early stage to have a good picture on the product.

The main output of collecting requirements is to produce the requirement documentation, which describes how collected information qualifies the business need for the project. Another output of this process is the requirement management plan, which effectively describes how requirements will be managed and analyzed (PMI 2008).

2.3.2 Scope Definition

Scope definition is the process of implementing a detailed documentation and description of the project. Define scope process usually qualifies major deliverables assumptions and initial constraints documented during the project initiation stage or phase. Defining the scope needs high-level documents such as the project charter and the requirement documentation to fundamentally expand the project details. This process makes use of expert judgment, product analysis and facilitated workshops in essentially defining the scope. The major outcome of this process includes but is not limited to the project scope statement and an update to other various documents such as the project charter and the requirements document.

2.3.3 Formulation of Work Breakdown Structure (WBS)

This is a process of subdividing the project goals and deliverables and work to be done into smaller, more manageable units. Creation of the WBS requires the scope statement, requirement documentation and organizational process assets. The method used to

breakdown and subdivide task and deliverables into smaller units is known decomposition.

The result of this process is the WBS, which effectively divides goals and tasks by setting milestones, cost estimates schedule activities among others (PMI 2008).

There are various identified ways of creating the WBS. Sometimes organizations have already developed and established guidelines. It is important to follow these guidelines in developing the WBS. Another approach is by analogy where a similar projects starting point may be used. Another method is by using the top down approach where the largest items of the project are broken down into subordinate items. One other possible method is to use the bottom-up approach where the team first identifies tasks related to the project (PMI, 2008).

2.3.4 Verification of Scope

Scope verification involves the official acceptance of the completed project scope by the customer or stakeholders. This process is involved with formalizing the acceptance of the project deliverables. Reviews are made with the customer concerning deliverables and the sponsor to ensure that the scope is in line with the initial goals of the sponsor. Several documents may be used to achieve this process including project management plan, requirements documentation and validated deliverables. The main method of achieving this process is by review and inspection (Schwalbe, 2008).

2.3.5 Control of Scope

This is the process of monitoring and controlling the status of the project scope. Control is used to monitor the actual changes as they occur and integrated into the change control process. Controlling scope is a challenge to many projects (Schwalbe 2008). Scope management has strong relations to the other knowledge areas.

According to Dekkers and Forsellius, scope management interacts and interfaces with the other 8 knowledge areas which includes: project integration management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management and project procurement management (Dekkers and Forsellius, 2007). The most important interactions occur with time, cost, quality and risks management knowledge areas. There can be no changes without affecting the time, cost, quality and risks of the project and vice versa (Dekkers and Forselius 2007).

2.4 GENERAL OVERVIEW OF PROJECT SUCCESS

In recent time, organizations activities are becoming more project based, the implication is that organization tends to split routine work into programs of project in order to quickly achieve organizational goal of value added. Good management of these projects is essential if the organization is going to succeed. Equally important to individual project success is ensuring that the right projects are carried out. Directing all the projects successfully will ensure we are doing the right projects (Judges and Muller, 2010).

Project success is another key project term. The PMBOK (Project Management Body of Knowledge) describes its view of project success: "Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction" (Project Management Institute, 2010). The APM defines project success as the fulfilment of success criteria agreed with the project sponsor at the outset of the project (Association for Project Management, 2010).

Although process defines the road map to achieving project success, success provides the vision for the process (Bredillet, 2008). Success is the ultimate goal of every project and a function of skillful leadership that creates knowledge work (Zand, 2010). The traditional definition of project success, also called project management success, holds that a project is a success if the project meets the technical performance specifications and satisfies all project stakeholders (Thomas and Fernández, 2008); if the project objectives are accomplished (Kerzner, 2006); if all of the stakeholders are satisfied with the results (Hedeman *et al*., 2005); if a project is on target (scope), on time (schedule), and within budget (cost) (Phillips, 2009; Scott-Young and Samson, 2008).

The point of departure is that project success is no longer viewed as just completing the project on time and within a budget; rather, it also means ensuring that the product ultimately satisfies the end user (Shenhar *et al*., 2007). Defining a project on the basis of satisfying the triple constraints of scope, schedule, and cost without looking at the overall business impact on the initial idea could lead to overall customer dissatisfaction.

On the other hand, the new approach to project success, according to Shenhar and Dvir (2007) refers to business-related processes that are designed to deliver business results rather than a collection of project activities that have to be completed on time. According to Khang and Moe (2008), as well as Yu *et al.*, (2005), overall project success is measured against the realization of the customer's objectives and goals, as well as the satisfaction of the end users and key stakeholders. Khang and Moe further argued that the modern approach to project success links the traditional project purpose to the final product and long-term goals.

However, Gelbard and Carmeli (2009) emphasized that a productive working relationship, a focus on the overall project goal, and consistency of the approach in managing the project from the initiation to the closeout phase are key to success. Consistency in this perspective applies to the incorporation of standardized tools and technology, proven project methodology into the management of project within the project life cycle.

2.4.1 Scope Management and Project Success

Project success factors can be divided into two major categories as suggested by Parviz and Ginger (2008) which are those that deal with things and those that deal with people. Factors which deal with thing include quantification of performance of planning procedures, cost management, schedule management, scope management, risk management policies, change management and integration efforts. On the side of people issues to deal with are the feelings, priorities and perceptions. It is important that people issues received the necessary attention for them not to lose the morale. According to Parviz and Ginger (2008) project team morale is important especially when the project scope has been increased or changed in way that team has to redo some work that was already done.

If stakeholders have different understanding of project success can end up with different people pulling the project in different directions. Effectiveness in project management refers to the success of the project (Hyva¨ri, 2006). Stakeholders may have different understanding because there is no clear information about where the project is heading and its requirements. Harrington and McNellis (2013) state that one of the most common reasons for project failure is the inability to properly define or effectively manage scope. It is important to make all stakeholders understand project scope effectively for them to support project implementation.

A study done by Fageha and Aibinu (2013) indicates that adequate front-end project planning with clear project scope definition can alleviate the potential for cost overrun, inadequate project planning and poor scope definition can lead to expensive changes, delays, rework, cost overruns, schedule overruns, and project failure. It adds that the purpose of project definition is to provide adequate information that is needed to identify the work to be performed in order to avoid major changes that may negatively affect project performance (Gibson *et al*., 2006).

However, changes often reflect the uncertainties that occur during the early stages of the project Fageha and Aibinu (2013). Therefore, having a well-defined project during the pre-project planning stage is crucial for successful project execution and for achieving a satisfactory project outcome. And this cannot be done without involving all stakeholders in defining the project from early phases. It is irrational to get stakeholders' opinions about the project outcome after the completion, when their involvement is limited. Incomplete project definition can occur when the input of one or more stakeholder is intentionally or unintentionally omitted (Fageha and Aibinu, 2013).

Failure to consider and clarify stakeholders' expectations and concerns at early stage in the project can result in extraordinary risks being ignored and may lead to difficulties in running the project, and hence poor performance (Atkinson *et al*., 2006). Therefore, project scope definition is critical for enhancing satisfaction of stakeholders as well as successful implementation of construction project (Heywood and Smith, 2006).

2.5 PROJECT SCOPE CHANGE MANAGEMENT

A scope change is defined as an alteration or a modification to the defined conditions, assumptions or requirements as stated in the beginning of a project, which lead to a change in activities (Gokulkarthi and Gowrishankar, 2015; Nahod, 2012). Two categories of scope change are defined; rework and change orders. Rework refers to re-doing a process or activity because of quality defects, variance, poor design or on-site management. The baseline requirements are still satisfied by the new alternative. The process of rework is relatively simple, but the costs can be very high since it is most of the time accompanied by the demolition of what has already been built (Hao *et al*., 2008).

Also, a change order refers to a change generated by an unanticipated cause that cannot easily be replaced by an alternative. It has to be negotiated case by case and requires a common agreement on paper between all involved actors. Dealing with these changes includes coordinating all aspects relating to the change orders such as documentation, drawings, processes, information, costs, schedule and personnel (Hao *et al*., 2008).

However, it is important to manage scope change because it can negatively influence the quality of the end result of a project (Ndihokubwayo and Haupt, 2009; Sweis *et al*., 2008; Hwang and Low, 2012). The need for managing scope change is researched by several authors ((Arain and Low, 2005; Gokulkarthi and Gowrishankar, 2015; Ndihokubwayo and Haupt, 2009). Gokulkarthi and Gowrishankar (2015) listed the following as consequences of scope change:

Additional works; Cost and time overruns; Disputes between actors; Need to hire additional specialist equipment and personnel; Lowering professional reputation actors; Degradation of quality standards; Adjustment in contract duration; Delay in payment

of contractor; Schedule delay; Poor professional relations; Decrease in productivity; and Decrease in quality end result.

Moreover, the organization PMI defines scope change management in their PMBOK as “Influencing the factors which create scope changes to ensure that changes are beneficial. Determining that a scope change has occurred and managing the actual changes when and if they occur (PMI, 2010)”. Any proposed changes to the project need to go through the stages of identification, evaluation, approval, rejected or deferred. The process should also be properly documented and effectively communicated. According to PMI (2010), the project must have an effective change control process that is actively used and should include:

- Change Request: a stakeholder reports an issue and provides relevant information for a decision. The issue is tracked in a change log.
- Initial evaluation: a quick evaluation whether the issue is worthwhile to investigate further.
- Detailed evaluation: a detailed evaluation if the change to the projects four dimensions is worthwhile the benefit the change is providing.
- Recommendation: A recommendation to the project sponsor is made out of the findings from earlier evaluation. The sponsor then takes decisions which have to be properly communicated (and documented).
- Update plans: If a change is approved the plans have to be accordingly adjusted.
- Implement: The necessary actions to implement the changes are made.

There are many areas in which a project can fail. Burke (2011) describes common failure sources of a project and one of these causes of failure is originating from the Scope of the project. According to him the scope can be compromised by: (i) Misinterpretation; (ii) Mixing and confusing tasks, specifications, approvals, and special instructions; (iii) No good structure like when using Work Breakdown Structure (WBS); (iv) A misuse of WBS; (v) A wide variation of how to describe work details; (vi) Failing to get a third-party review, or verification from important stakeholders; (vii) Not working closely with client; (viii) Poor estimation; (ix) Inadequate planning; (x) Insufficient reviews and controls; (xi) Incomplete information for decisions; (xii) Lack of understanding of project management techniques.

2.6 SIGNIFICANT EFFECTS PROJECT SCOPE DEFINITION HAS ON CONSTRUCTION PROJECT PERFORMANCE

The scope of work is defined very early in the project planning and estimation phases. Fageha and Aibinu, (2013) state that an incomplete scope definition in early stages of a project's life cycle is a common source of difficulty in project implementation process. The project scope has to be well defined so that it can be used as an appropriate way to achieve project deliverables. The project scope draws a line in which project manager and stakeholders will follow to know the direction to take or not to take. Karl (2014) adds that a well-defined scope sets expectations among the project stakeholders. It identifies the external interfaces between the system and the rest of the activities. The scope definition helps the project manager assess the resources needed to implement the project and make realistic commitments. In essence, the scope statement defines the boundary of the project manager’s responsibilities.

The scope is the most important element to understand about any project. All planning and allocation of resources are done to this understanding. Harrington and McNellis (2013) adds that project scope definition ensures that a project focuses only on the work required for successfully completing a project. The process identifies and averts work that falls outside the scope and that contributes to delays and overruns. It includes processes for defining and approving initial scope, and identifying, authorizing, and managing changes to scope. All these will be done to ensure that the project will operate within its set limits for it to be completed successfully.

In addition, according to PMI (2008) project scope definition ensures; (i) Better communication to project sponsors, stakeholders and team members; (ii) More accurate estimation of tasks, risks, timelines and costs; (iii) Increased confidence that 100% of the work is identified and included; (iv) A foundation for the control process within the project; (v) Appropriate resource allocation; (vi) Enhance the quality of project; (vii) Enables project managers to allocate the proper labor and costs necessary to complete the project.

According to Karl (2014) a well-defined scope can help to avoid common problems like: Requirements that constantly change; Requirements that need a rethink mid-project; The final outcome not being what the client expected; Budget overrun; and Delay in project schedule. Effective scope management can help to avoid some of these issues by clearly defining and communicating the scope to all parties involved in the project. Project scope helps to distinguish what is and is not involved in the project and controls what is allowed or removed as it is executed.

Nevertheless, scope management establishes control factors that can be used to address elements that result in changes during the lifecycle of the project. Project scope definition is critical because without it project managers would have no clue what time, cost or labor was involved in a project. It forms the basis for every decision a project manager will make on a job and when it needs to change, proper communication will ensure success every step of the way (Karl, 2014).

2.7 CHALLENGES EXPERIENCED IN PROJECT SCOPE MANAGEMENT

Scope describes the boundaries of the project in terms of what it will or will not deliver. It defines all project work thus help project team set up control systems that could bring a better project outcome. Further scope management are processes required to ensure the project includes all the work and only the work that is required to complete the project successfully, deliverables include: scope statement; work breakdown structure and formal acceptance (Horine, 2013).

Al Humaidan, (2011) attributed project failure to inadequate pre-project planning and poor project definition of project elements. 70% of poor time performance of construction projects is due to changes in project scope (Assaf and Al-Hejji, 2009). Like elsewhere in the world, Africa projects are often not completed in time and experience inadequate scope definition and cost overruns (Associated Press, 2009). Rwelamila and Puurushottam, (2012) claimed that during project lifetime the bottlenecks experienced in scope management involves the following presented in Table 2.1.

Table 2.1: Challenges experienced in project scope management

1	Decision-making within the steps takes too much time
2	Lack of information due to bad communication and different composition of the team in project phases
3	Knowledge shared among project team members of different project teams is not correctly documented
4	The stakeholders are not involved thoroughly in the process: The stakeholders are informed instead of involved
5	Lack of overview of possible risks that can result in scope change
6	Responsible actor for scope management not assigned or documented in the project documents
7	Scope management tasks associated with scope are not documented
8	It is not always possible for the contractor to execute the scope as defined by the client
9	The contractor is not involved
10	The WBS is not connected to roles and responsibilities are not assigned to actors within the project
11	No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract
12	Verification does not take place on a regular basis
13	The stakeholders are not involved in validating the projects deliverables
14	The client is not completely informed about the state of verification of the contractor's activities which provides the input for validation
15	The scope state is not always tracked in a tool which makes monitoring difficult
16	Lead time of the formal scope change procedure is long

2.8 WAYS OF IMPROVING SCOPE MANAGEMENT IN CONSTRUCTION PROJECT

Project scope has impact on project success. It is therefore important that project scope determined by the decision-maker is attainable. There are evident that unreasonable project scope is one of the causes of project failure. Unreasonable scope happened when scope is set beyond the available resources; this includes luxurious specification and large size or volume. The larger projects have a lower likelihood of success. Perhaps, trade-off between project scope and the project resources is the best option to increase the possibility of project success (Luong and Ohsato, 2008).

According to Turner (2009) in construction project scope management, organizing workshops and interview with stakeholders ensures thorough stakeholder involvement, and improve the collection of project requirements. He further adds that, a first identification of scope management steps creates a solid basis for the next step. Also, in case of large projects, it should be decided whether a specific scope manager is needed. Meredith and Mantel (2009) asserted that Scope should be documented in a comprehensive way and it should be accessible to everyone within the project team.

In addition, Scope management tasks need to be defined within the project management plan. It is also required to distinguish processes and the exact content of activities within the scope and explain this to the project team members. If possible, the contractor should be asked for input to ensure a design can be created that fits within the defined requirements and which is possible to execute (Meredith and Mantel, 2009).

Moreover, project team members should be aware of the long lead time of the formal scope change procedure. Verbal agreements can speed up the process, but they should only be used in crisis situations. To ensure the agreement is enforceable, a documented

version of the agreement is required, but can be made afterwards. For verbal agreements a high level of trust between the client and the contractor is needed (Meredith and Mantel, 2009).

Furthermore, Nahod (2012) listed the following as ways of ensuring effective scope management of construction projects: (i) Work breakdown Structure (WBS) should be connected to roles and assign responsibility, to increase mutual understanding of project team members; (ii) The contractor must define how each activity will be verified during execution in a document prior to execution; (iii) Regular verification meetings between the client and the contractor will ensure that both actors are up to date about the state of the verification; (iv) Regular meetings between the client and the contractor must be organized in order to be fully aware whether the executed activities of the contractor are in accordance with the requirements; (v) By combining information concerning the verified activities with thorough stakeholder involvement, the client is able to decide whether the project's result meets the intended goal; (vi) To monitor scope properly, the scope state should be tracked preferably in a tool. In case changes do arise, these should be documented in this tool as well.

Defining a project scope is the first step in successfully managing a project. It is important to ensure that all the work required to achieve project objective are considered and well-articulated before project commencement. Scope definition is perhaps the most important part of the upfront process of defining a project as it helps to clearly describe the logical boundaries of the project. Where the deliverables and the boundaries of a project are not clearly defined, the chance of a project success is zero (PMI, 2010).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter was very vital to the conduct of this research as it was the pivot around which all activities of the research revolve. It comprised the key strategy adopted for the research and its finding followed by the rationale for the adoption of such a strategy. The primary objectives of choosing a research methodology and design was to give instructions to plan and conduct the study in a manner which promotes the attainment of set goals (Burns and Grove, 1998). According to Burns and Grove (1998), research methodology is the guide for undertaken the study. Also it can be referred to as strategies and procedures engaged to collect and conduct a data analysis when conducting a research (Polit and Hungler, 1999). According to Christou *et al*. (2008), research methodology is an approach to gaining knowledge of the world, is about discovering ways of engaging in a task to access what is believed to be the truth. Research methodology involves designing data gathering tool, sampling, collection of data and conducting analysis on data retrieved.

3.2 RESEARCH STRATEGY

Research strategy refers to the step by step procedures and action plans adopted for a research from the stage of general assumption up to data interpretation (Creswell, 2013). According to Naoum (2002), in conducting research study it is relevant to clarify the researcher's orientation. The research strategy dwells on the manner in which the objectives of the study are questioned. Qualitative, triangulation and quantitative are the three main strategies. Naoum (2002) stated that, the choice of engaging a particular research approach is dependent on the study's aim and also type of information available for the conduct of the study.

This research followed a quantitative strategy by the utilization of survey questionnaires to elicit data from respondents. The quantitative strategy was suitable for this research because of the desire of the researcher to measure opinions of respondents using scientific basis (positivist) approach. By adopting the quantitative strategy, the researcher was entirely detached from the research phenomenon unlike the other strategies like qualitative strategy.

3.3 RESEARCH DESIGN

The design of a research deals with framework that will be used to collect data and make analysis to these retrieved data (Bryman, 2005). It serve as guide to execute the technique to collect and analyze data. It further provides connections between data which are empirical and provides a logical sequence to make conclusions to the study's research questions (Bryman, 2005). Case study, experimental design, action research and survey are the forms of research design (Yin 2003; Bryman, 2005). Survey as a form of research design was employed in the conduct of the study. Due to the need to generalized research finding, a survey questionnaire was adopted. Oppenheim (2003) stated that the utilization of a survey questionnaire improves replication and give reliability of observation due to its in-built uniform measurement and sampling techniques.

3.4 POPULATION OF THE STUDY

In every research, defining the population of the study is very essential. The population of the study defines the actual group the study is interested in. The population of target is the whole combination of respondents that meet the established research criteria (Burns and Groove, 1998). Population of a study may comprise of members in an organizations, villages, places or events selected due to their significance to the

achievement of research set objectives (Burns and Groove, 1998). The study limited its target population to five DIKI construction firms in the Greater Accra region of Ghana. The target respondents were Engineers, Quantity Surveyors and Project Managers of these firms. Further, the total number of Engineers, Quantity Surveyors and Project Managers of the firms were acquired from their various human resource department which gave a total population or sampling frame of 59.

3.5 SAMPLING TECHNIQUE AND SAMPLE SIZE

The term "sample" means a part of a whole (population) drawn to reflect the remaining (Naoum, 2002). Thus, sampling refers to the process of selecting a quota of the population to characterize the entire population. A sample, then, consists of a subject of the units that constitute the population and normally used in large-scale survey research for the sake of economy and accuracy (Polit & Hungler, 1999). However, research studies use simply a small fraction of the population, referred to as a sample. This is because using a sample is more practical and less costly than collecting data from the entire population. Polit & Hungler (1999) asserted that, the major risk of using a selected sample is that it might not adequately reflect the behaviours, traits, or beliefs of the population.

Having determine the sampling frame or population for the study, researcher adopts the Miller and Brewer (2003) formula which gives the formula for the sample size given a confidence interval of 90 percent as follow:

$$n = \frac{N}{1 + N(a)^2}$$

Where:

n= the sample size,

N= the sample frame (59)

α= the margin of error (10%).

The sample size was determined as follows: $n = \frac{59}{1 + 59\,(0.1)^2}$

$n = 37.11$

Therefore, the Sample Size (n) = 37.

Hence the suitable sample size for the study was 37 respondents which means questionnaires must be disseminated to at least 37 respondents to achieve a 90% confidence interval.

The snowball sampling technique was used to select five DIKI construction firms currently operating in the Accra metropolis. The snowball sampling was used for identifying respondents with rich information that are relevant to the study. In using this approach, the researcher contacted the most visible and easy to reach respondent operating in the firm for questionnaire administration and when the process was concluded with this respondent he or she directed researcher to other firms within the catchment area of the study. This process continued till a representative sample size of Forty-eight (48) respondents was obtained. Key respondent namely Engineers, Quantity Surveyors and Project Managers were identified using the snowball sampling technique. These category of respondents were engaged as a result of their various engagement in construction project management and their experiences in project scope management enhanced the reliability and validity of their responses given.

3.6 DATA COLLECTION

In research study, field and desk survey were the approaches to data collection. According to Fadhley (1991), desk survey involve the review of literatures and forms a relevant part of the conduct of the research as it provide the opportunity to gather data to develop questionnaires for dissemination to retrieve data from the field. Field survey is mainly collecting data from respondents using questionnaires developed from the desk survey. Desk survey culminated into the identification of key variables in project scope management which were used in the development of questionnaires which were administered to respondents to collect data for analysis.

3.6.1 Questionnaire Development

According to Oppenheim (2003), for questions relevant to the study to be set, it is vital to initially establish the required information which needs to be gathered. In the development of the questionnaire, lots of considerations were made to ensure that respondents are able to easily read the questions and make meaning out of it to provide the required answers intended by the researcher. This in the long run helped the researcher from wasting much time in data collection from the respondents. All the questions in the questionnaires were closed ended placed on a Likert scale of 1 to 5. The scale measures the intensity or strength of the opinion of respondents. The diction of the questionnaire was simple as jargons and other technical terms were very minimal in the crafting of the questions.

Similarly, the numbers of questions were kept minimal to encourage respondents to answer the questions. The questionnaire consisted of four parts: the first part entails the respondent profile which were to determine profession, educational background and years of experience of respondents.

The second part sought to ascertain the significant effects project scope definition has on construction project performance. The third part sought to ascertain the challenges experienced in project scope management. The fourth part sought to ascertain ways of improving scope management for successful project delivery.

3.6.2 Questionnaire Distribution

The 55 questionnaires were evenly distributed among respondents. Out of this 48 questionnaires representing 87 percent of the respondent gave response to the questionnaire administered. These retrieved questionnaires formed the basis for the conduct of the analysis. According to Coffey *et al*. (1996), the rate to the response of the questionnaire by respondents indicates the fraction of questionnaires completed by respondents. Moreover, he further stated that in literature a high rate of response from respondents indicates the study's validity of its findings. However, the entire field survey was completed in one week and the higher rate of response from respondents can be accredited to the researcher constant follow ups on questionnaires for collection and also the ease of reading and understanding of the questions by the respondents.

3.7 DATA ANALYTICAL TOOL

After the questionnaire retrieved they were prepared by coding and fed into the Statistical Packages for Social Sciences (SPSS) for data aggregation and subsequent analysis. The type of variables obtained influence the test that will be adopted in the analysis of retrieved data. The variables can either be categorical variables, ordinal variable or interval and also if these variables are distributed normally. In this research both descriptive and inferential statistics was utilize to analyze retrieved data from respondents. This study therefore employed percentages for the analysis of background

information while Relative Important Index (RII), mean scores as a measure of central tendency and the standard deviation as a measure of the dispersion were used in the measurement of the variables.

3.8 RESEARCH ETHICS

The research ethics were appropriately observed. Respondents were briefed on the purpose of the study and what will be done with their responses given. They were assured of given much confidentiality to responses provided by them and that their responses will only the engaged for the purpose of this research conduct. Also they were given assurance of not being obliged to undertake the research process and that they are free to dismiss themselves from the data collection process. These information and assurances relayed to respondents encouraged them to be involve in the conduct of the study.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter documents the analysis and discussion of the primary data retrieved from the forty-eight (48) respondents in the five DIKI construction firms in the Greater Accra region of Ghana which is linked to literature reviewed to answer the objectives of the study. The first part of the analysis deals with the profile of respondents and the influence such attributes have on the study. The second part captures the detailed analysis of the specific objectives of the study in view of the significant effects project scope definition has on construction project performance; the challenges experienced in project scope management; and the ways of improving scope management for successful project delivery. However, out of the 55 questionnaires distributed, 48 questionnaires representing 87 percent were completed and retrieved. There were no missing values in the completed questionnaires by the respondents. The persistent follow-ups to retrieve questionnaires resulted in the high response rate.

4.2 PRESENTATION AND DESCRIPTIVE ANALYSIS OF DEMOGRAPHIC DATA

The aim of the analysis of respondent profile was to help in providing understanding of respondent characteristics. Knowledge of the background of respondents ensures confidence in the reliability of data collected. Figure 4.1; 4.2; and 4.3 presents results of the data analysis of respondents' background.

4.2.1 Respondents Profession

Respondents were asked to indicate their profession to be affirmed that questionnaires distributed were completed by actual targeted respondents. The respondents who were targeted were of only three profession namely, the Engineer, Quantity surveyor and Project manager. The results of the analysis indicated that, Engineers were 18 out of the total respondents surveyed which makes up a percentage of 37%, Quantity surveyors were 22 out of the total respondents surveyed which makes up a percentage of 46% and project managers were 8 which forms the remaining respondents surveyed which makes up a percentage of 17%. Figure 4.1 gives a summary of respondent profession involved in the survey conduct.

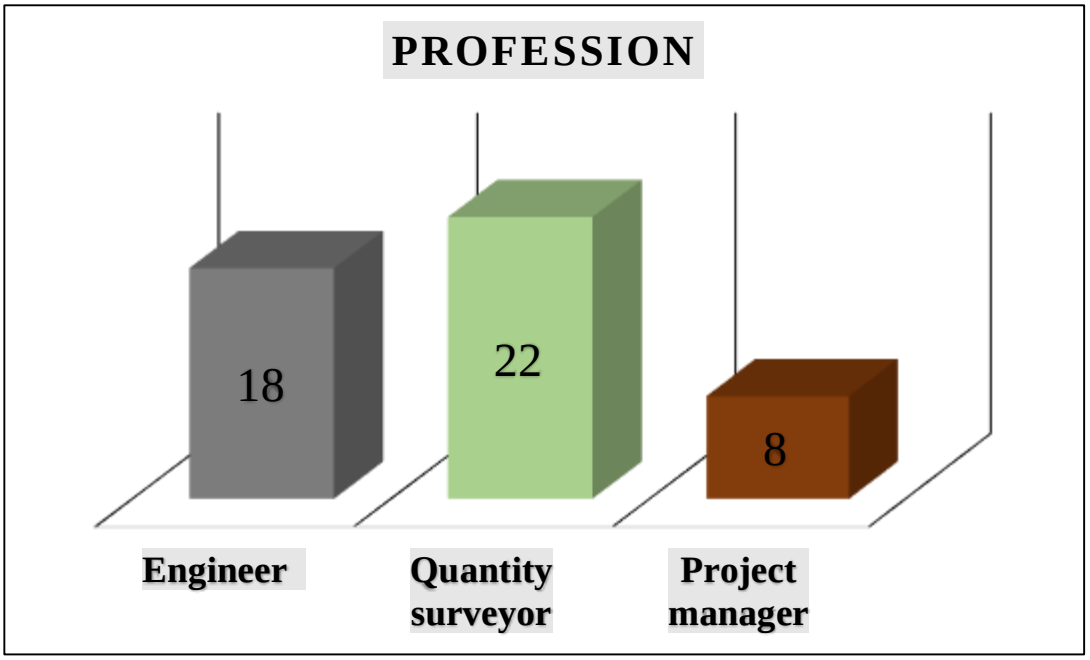

Figure 4.1: Profession of Respondents

4.2.2 Respondents Educational Background

Respondents were asked to indicate their educational background to affirm that questionnaires distributed were completed by targeted respondents who are knowledgeable in project scope management. The results of the analysis of respondents educational background indicated that, respondents with master's educational background were 19 out of the total respondents surveyed which makes up a percentage of 40%, respondents with bachelor's educational background were 23 out of the total respondents surveyed which makes up a percentage of 48% and respondents with HND educational background were 6 which forms the remaining respondents surveyed which makes up a percentage of 12%. Figure 4.2 gives a summary of respondent educational background involved in the survey conduct.

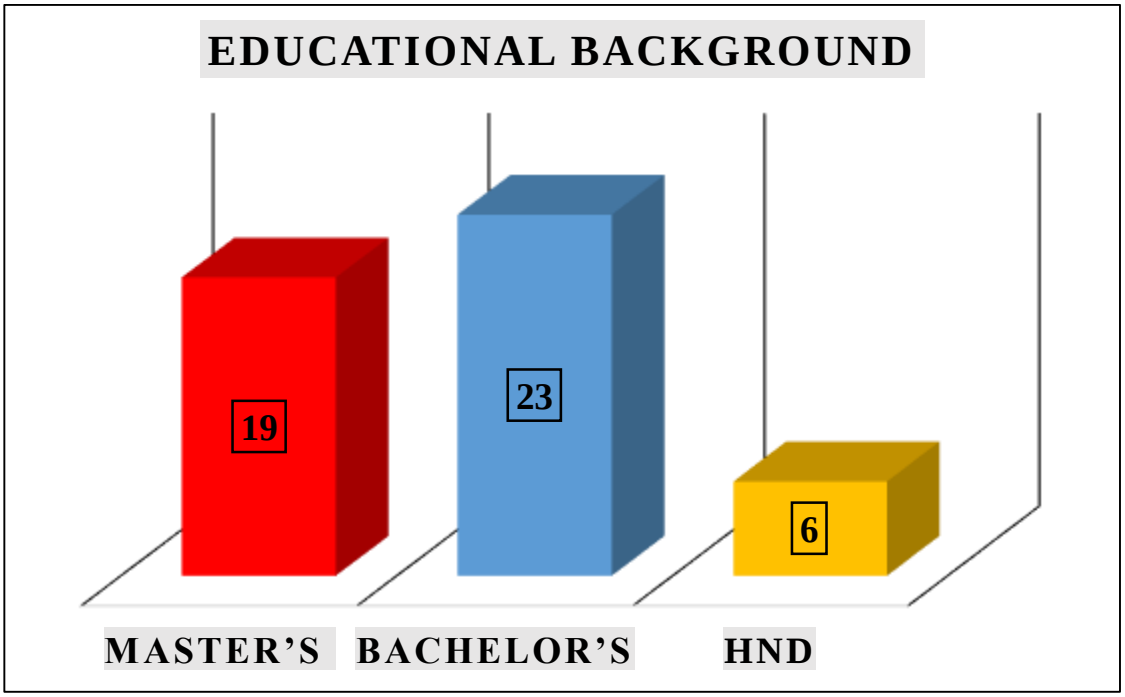

Figure 4.2: Educational Background of Respondents

4.2.3 Respondents Years of Experience

Respondents were asked to indicate their years of experience to affirm that questionnaires distributed were completed by targeted respondents who have gain enough experience in project scope management. The results of the analysis of respondents years of experience indicated that, respondents with years of experience between 1-5years were 12 out of the total respondents surveyed which makes up a percentage of 25%, respondents with years of experience between 6-10years were 27 out of the total respondents surveyed which makes up a percentage of 56% and respondents with years of experience over 10years were 9 which forms the remaining respondents surveyed which makes up a percentage of 19%. Figure 4.3 gives a summary of respondent years of experience involved in the survey conduct.

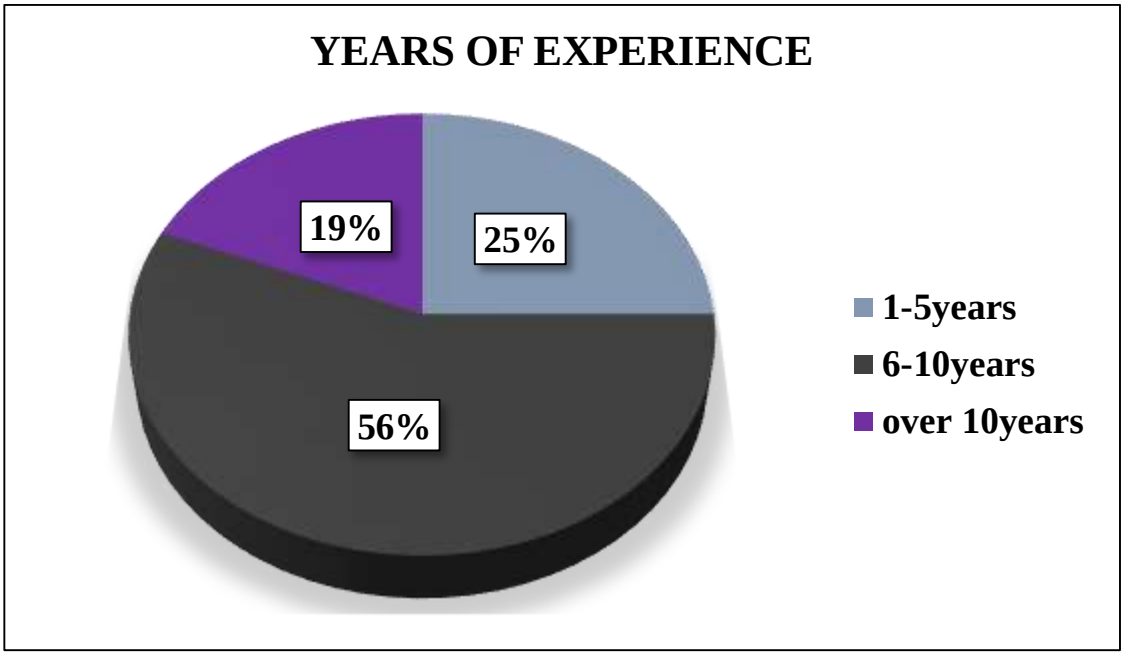

Figure 4.3: Years of Experience of Respondents

4.3 SIGNIFICANT EFFECTS PROJECT SCOPE DEFINITION HAS ON CONSTRUCTION PROJECT PERFORMANCE

This section presents the analysis of the first objective of the research study. To establish the significant effects project scope definition has on construction project performance, questionnaires were administered to respondents to collect data in other to ascertain that variables identified in the literature review are considered by respondents as significant effects project scope definition has on construction project performance. To gain knowledge in this area, respondents were asked to rate the variables identified in the literature review in terms of their agreement to these variables from a Likert scale of 1 to 5 where one (1) is Strongly Disagree; Two (2) is Disagree; Three (3) is Neutral; Four (4) is Agree; and Five (5) is Strongly Agree. The summary of the analysis conducted is shown in Table 4.3.1 below which evaluate the responses from the respondents on the identified variables based on their mean scores, standard deviation and Relative Importance Index (RII).

Setting the scope early in the project is important, by focusing on the most important parts of the scope the project can gain solidness early while effectively using its resources. Project scope management is a process required to ensure that the project includes all the work required, and only the work required, to complete project successfully. It is primarily concerned with defining and controlling what is and what is not included in the project. Further, is a statement that defines the boundaries of the project. Table 4.3.1 examines the significant effects project scope definition has on construction project performance and it is clear from the table that in these category of variables, “Helps avoids budget overrun” had the highest RII=0.9750 and therefore was ranked first (1^{st}) which can be confirmed in a study done by Fageha and Aibinu (2013)

which indicates that adequate front-end project planning with clear project scope definition can alleviate the potential for cost overrun and inadequate project planning.

Further, the following variables "Increased confidence that 100% of the work is identified and included"; "Helps avoid delay in project schedule" and "Better communication to project sponsors, stakeholders and team members" were ranked second (2^{nd}), third (3^{rd}) and Fourth (4^{th}) respectively by respondents with a RII of 0.9708; 0.9542; and 0.9500 respectively. However, the variable "Helps avoid constantly change in requirements" was ranked tenth (10^{th}) with a RII of 0.8916. According to Karl (2014) a well-defined scope help avoid common problems like: Requirements that constantly change; Requirements that need a rethink mid-project; The final outcome not being what client expected; Budget overrun; and Delay in project schedule. According to him effective scope management can help to avoid some of these issues by clearly defining and communicating the scope to all parties involved in the project.

Moreover, considering the mean scores of the variables all scored above the average mean score of 2.5 which reflects that variables identified were rated by respondents above the level of "Four (4) = Agree" from the Likert scale which confirms that respondents at least agree to the fact that identified variables in literature are significant effects project scope definition has on construction project performance.

Table 4.1: Significant effects project scope definition has on construction project performance

Significant effects project scope definition has on construction project performance	N	SUM	Mean Score	Std. Deviation	RII	Ranking
Helps avoids budget overrun	48	234	4.875	0.3342	0.9750	1st
Increased confidence that 100% of the work is identified and included	48	233	4.854	0.3567	0.9708	2nd
Helps avoid delay in project schedule	48	229	4.771	0.4247	0.9542	3rd
Better communication to project sponsors, stakeholders and team members	48	228	4.750	0.4376	0.9500	4th
Serves as a foundation for the control process within the project	48	227	4.729	0.4491	0.9458	5th
More accurate estimation of tasks, risks, timelines and costs	48	226	4.708	0.4593	0.9416	6th
Avoids the final outcome not being what the client expected	48	225	4.688	0.4684	0.9376	7th
Appropriate resource allocation	48	219	4.563	0.6493	0.9126	8th
Enhance the quality of project	48	216	4.500	0.6842	0.9000	9th
Helps avoid constantly change in requirements	48	214	4.458	0.7426	0.8916	10th

4.4 CHALLENGES EXPERIENCED IN PROJECT SCOPE MANAGEMENT

This section presents the analysis of the second objective of the research study. To establish the challenges experienced in project scope management, questionnaires were administered to respondents to collect data in other to ascertain that variables identified in the literature review are considered by respondents as challenges experienced in project scope management. To gain knowledge in this area, respondents were asked to rate the variables identified in the literature review in terms of the level of how critical these variables are from a Likert scale of 1 to 5 where one (1) is Not Critical; Two (2) is Moderately Critical; Three (3) is Critical; Four is Very Critical; and Five (5) is

Extremely Critical. The summary of the analysis conducted is shown in Table 4.4.1 below which evaluate the responses from the respondents on the identified variables based on their mean scores, standard deviation and Relative Importance Index (RII).

Project failure can be attributed to inadequate pre-project planning and poor project definition of project elements. 70% of poor time performance of construction projects is due to changes in project scope. Table 4.4.1 examines the challenges experienced in project scope management and it is clear from the table that in these category of variables, "No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract" had the highest RII=0.9708 and therefore was ranked first (1st) which can be confirmed in a study done by Rwelamila and Puurushottam, (2012) which claimed that during project lifetime the challenges experienced in scope management involves: Lack of information due to bad communication; No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract; and Contractor not involved at the early stage of scope management.

However, the following variables "The scope state is not always tracked in a tool which makes monitoring difficult", "The work-breakdown structure is not connected to roles" and "Scope management tasks associated with scope are not documented" were ranked eleventh (11^{th}), twelve (12^{th}) and thirteenth (13^{th}) respectively by respondents with a RII of 0.7584; 0.7542; and 0.7458 respectively. Moreover, considering the mean scores of the variables all scored above the average mean score of 2.5 which reflects that variables identified in literature were rated by respondents above the level of "Three (3) = Critical" from the Likert scale which confirms that respondents at least finds the variables identified as critical challenges experienced in project scope management.

Table 4.2: Challenges experienced in project scope management

Challenges experienced in project scope management	N	SUM	Mean Score	Std. Deviation	RII	Ranking
No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract	48	233	4.854	0.3567	0.9708	1st
Knowledge shared among project team members of different project teams is not correctly documented	48	231	4.813	0.3944	0.9626	2nd
Verification does not take place on a regular basis	48	229	4.771	0.4247	0.9542	3rd
The contractor is not involved at the early stage of scope management	48	226	4.708	0.4593	0.9416	4th
Lack of information due to bad communication	48	223	4.646	0.6010	0.9292	5th
Decision-making within the steps takes too much time	48	216	4.500	0.6842	0.9000	6th
The stakeholders are not involved thoroughly in the process	48	209	4.354	0.7852	0.8708	7th
The stakeholders are not involved in validating the projects deliverables	48	196	4.083	0.8321	0.8166	8th
Responsible actor for scope management not assigned or documented in the project documents	48	188	3.917	0.8464	0.7834	9th
Lack of overview of possible risks that can result in scope change	48	185	3.854	0.8481	0.7708	10th
The scope state is not always tracked in a tool which makes monitoring difficult	48	182	3.792	0.8495	0.7584	11th
The work-breakdown structure is not connected to roles	48	181	3.771	0.8565	0.7542	12th
Scope management tasks associated with scope are not documented	48	179	3.729	0.8688	0.7458	13th

4.5 WAYS OF IMPROVING SCOPE MANAGEMENT FOR SUCCESSFUL PROJECT DELIVERY

This section presents the analysis of the third objective of the research study. To establish the ways of improving scope management for successful project delivery, questionnaires were administered to respondents to collect data in other to ascertain that variables identified in the literature review are considered by respondents as ways of improving scope management for successful project delivery. To gain knowledge in this area, respondents were asked to rate the variables identified in the literature review

in terms of their importance from a Likert scale of 1 to 5 where one (1) is Not Important: Two (2) Moderately Important: Three (3) is Important: Four (4) is Very Important: and Five (5) is Extremely Important. The summary of the analysis conducted is shown in Table 4.5.1 below which evaluate the responses from the respondents on the identified variables based on their mean scores, standard deviation and Relative Importance Index (RII).

Project scope has impact on project success. It is therefore important that project scope determined by the decision-maker is attainable. There are evident that unreasonable project scope is one of the causes of project failure. Unreasonable scope happened when scope is set beyond the available resources; this includes luxurious specification and large size or volume. First identification of scope management steps creates a solid basis for the next step in project management and scope should be documented in a comprehensive way which must be accessible to everyone within the project team. Table 4.5.1 examines ways of improving scope management for successful project delivery and it is clear from the table that in these category of variables, "Regular verification meetings between the client and the contractor" had the highest RII=0.9292 and therefore was ranked first (1^{st}) which can be confirmed in literature by Nahod (2012) who asserted that an effective way of ensuring successful scope management of construction projects is by regular verification meetings between the client and the contractor which ensure that both actors are up to date about the state of the verification.

However, the following variables "Organizing workshops and interview with stakeholders", "Work breakdown Structure (WBS) should be connected to roles and assign responsibility", "Scope management tasks should be defined within the project management plan" and "The contractor must define how each activity will be verified during execution in a document prior to execution" were ranked seventh (7^{th}), eighth

(8^{th}), ninth (9^{th}) and tenth (10^{th}) respectively by respondents with a RII of 0.8834; 0.8626; 0.8292; and 0.8208 respectively.

According to Turner (2009) in construction project scope management, organizing workshops and interview with stakeholders ensures thorough stakeholder involvement, and improve the collection of project requirements. In addition, Scope management according to Meredith and Mantel (2009), tasks need to be defined within the project management plan. They further states that it is also required to distinguish processes and the exact content of activities within the scope and explain this to the project team members. If possible, the contractor should be asked for input to ensure a design can be created that fits within the defined requirements and which is possible to execute.

Moreover, considering the mean scores of the variables all scored above the average mean score of 2.5 which reflects that variables identified in literature were rated by respondents above the level of "Three (3) = Important" from the Likert scale which confirms that respondents at least finds the variables identified as important ways of improving scope management for successful project delivery.

Table 4.3: Ways of improving scope management for successful project delivery

Ways of improving scope management for successful project delivery	N	SUM	Mean Score	Std. Deviation	RII	Ranking
Regular verification meetings between the client and the contractor	48	223	4.646	0.4833	0.9292	1st
Regular meetings between project team members	48	220	4.583	0.4982	0.9166	2nd
Scope state and scope change should be tracked in a tool	48	218	4.542	0.5035	0.9084	3rd
Contractor should be asked for input to ensure a design can be created that fits within the defined requirements and which is possible to execute	48	216	4.500	0.5053	0.9000	4th
By combining information concerning the verified activities with thorough stakeholder involvement	48	215	4.479	0.5049	0.8958	5th
Distinguish the processes and the exact content of activities within project scope and explaining this to the project team members	48	214	4.458	0.5035	0.8916	6th
Organizing workshops and interview with stakeholders	48	212	4.417	0.4982	0.8834	7th
Work breakdown Structure (WBS) should be connected to roles and assign responsibility	48	207	4.313	0.5518	0.8626	8th
Scope management tasks should be defined within the project management plan	48	199	4.146	0.652	0.8292	9th
The contractor must define how each activity will be verified during execution in a document prior to execution	48	197	4.104	0.6601	0.8208	10th

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This research study inaugurated with the aim of investigating the effects scope management have on project success in the Ghanaian construction industry. It has become relevant to conduct this study due to the little knowledge area on the impact project scope definition has on construction project performance unlike a lot of research attention given to project failures as a result of improper scope management. The four chapters previously undertaken presents the introduction of the study, it further presents review of pertinent literature based on the aim and objectives of the study. Also, the methodology engaged for the research conduct was delve into in the third chapter. The fourth chapter presents the analysis of data retrieved from respondents in the field survey.

This chapter concludes the research endeavor by addressing only the main points throughout the study. It begins by reviewing objectives of the study, findings, recommendations and limitations of the research. The culmination to this research study will be drawn on future research agenda arising from this research study.

5.2 REVIEW OF RESEARCH OBJECTIVES

The principal aim of this research study was to investigate the effects scope management have on project success in the Ghanaian construction industry. To attain this research aim, three research objectives were set to actively drive the research agenda as follows:

Objective 1: To determine the significant effects project scope definition has on construction project performance

In project management a well-defined scope of a project enhances the changes of completing the project successfully within the time scheduled, budget allocated and the desired quality. During the pre-planning phase of a project, scope definition is undertaken and is a period in which a considerable amount of resources and time is needed in activities leading to the final investment decision. Defining the scope of a project is proven to be an effective way to decrease significantly risks that could arise and enhance the chances of success of the project during its implementation.

Critical issues concerning the significant effects project scope definition has on construction project performance were reviewed which led into the identification of variables from the review as significant effects project scope definition has on construction project performance. To affirm these identified variables from literature, questionnaires were designed and administered to respondents who are engaged in project scope management in construction industry namely, Project Manager, Quantity Surveyor and Engineer to seek their views. Their responses were analyzed using the Relative Important index as the analytical tool.

This research study explored the significant effects project scope definition has on construction project performance and found, Helps avoids budget overrun; Increased confidence that 100% of the work is identified and included; Helps avoid delay in project schedule; Better communication to project sponsors, stakeholders and team members; Serves as a foundation for the control process within the project; More accurate estimation of tasks, risks, timelines and costs; Avoids the final outcome not being what the client expected; Appropriate resource allocation; Enhance the quality of

project; and Helps avoid constantly change in requirements as significant effects project scope definition has on construction project performance.

Objective 2: To identify the challenges experienced in project scope management

Issues concerning the challenges experienced in project scope management were reviewed which emanated into the identification of variables from the review as challenges experienced in project scope management. To affirm these identified variables from literature, questionnaires were designed and administered to respondents who are engaged in project scope management in construction industry namely, Project Manager, Quantity Surveyor and Engineer to seek their views. Their responses were analyzed using the Relative Important index as the analytical tool.

This research study explored the challenges experienced in project scope management and found, No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract; Knowledge shared among project team members of different project teams is not correctly documented; Verification does not take place on a regular basis; The contractor is not involved at the early stage of scope management; Lack of information due to bad communication; Decision-making within the steps takes too much time; The stakeholders are not involved thoroughly in the process; The stakeholders are not involved in validating the projects deliverables; Responsible actor for scope management not assigned or documented in the project documents; Lack of overview of possible risks that can result in scope change; The scope state is not always tracked in a tool which makes monitoring difficult; The work-breakdown structure is not connected to roles; and Scope management tasks associated with scope are not documented as challenges experienced in project scope management.

Objective 3: To determine ways of improving scope management for successful project delivery

Issues concerning the ways of improving scope management for successful project delivery were reviewed which emanated into the identification of variables from the review as ways of improving scope management for successful project delivery. To affirm these identified variables from literature, questionnaires were designed and administered to respondents who are engaged in project scope management in construction industry namely, Project Manager, Quantity Surveyor and Engineer to seek their views. Their responses were analyzed using the Relative Important index as the analytical tool.

This research study explored the ways of improving scope management for successful project delivery and found, Regular verification meetings between the client and the contractor; Scope state should be tracked preferably in a tool and in case changes do arise, these should be documented in this tool as well; Contractor should be asked for input to ensure a design can be created that fits within the defined requirements and which is possible to execute; By combining information concerning the verified activities with thorough stakeholder involvement; Distinguish the processes and the exact content of activities within project scope and explaining this to the project team members; Organizing workshops and interview with stakeholders; Work breakdown Structure (WBS) should be connected to roles and assign responsibility; Scope management tasks should be defined within the project management plan; Contractor must define how each activity will be verified during execution in a document prior to execution as ways of improving scope management for successful project delivery.

5.3 RECOMMENDATIONS

In view of the research findings, it deem appropriate to make recommendation on relevant issues for consideration by project team members and other stakeholders as far as scope management is concern. The following are the recommendations to this study:

- It is important that construction project scope management stakeholders organize workshops and interview with stakeholders to ensures thorough stakeholder involvement which will improve the collection of project requirements.
- Also, scope should be documented in a comprehensive way and it should be accessible to everyone within the project team.
- Further, the contractor for the project should be probed for input to ensure a design can be created that fits within the defined requirements and which is possible to execute.
- In addition, regular meetings between the contractor and the client must be organized in order to be fully aware the executed activities of the contractor are in accordance with stated requirements.
- Moreover, it is imperative to ensure that all works essential to attain project objective are considered and well-articulated before the commencement of project.

5.4 LIMITATIONS OF THE STUDY

This research study experienced some limitations similarly to other research. Limitations in this study is expected to give the basis for other future research work that will be explored. The study limits its scope to Five D1K1 construction firms in the Accra metropolis, in the Greater Accra Region of Ghana.

Moreover, literatures that were published were engaged in the analysis of the study and conclusions that were made on this research study was based on data and results retrieved from respondents using questionnaires.

5.5 FUTURE RESEARCH AGENDA

This research study has its own shortcomings as it cannot cover all aspects of the effects scope management have on project success. It is therefore appropriate to turn these shortcomings into future research to be conducted; these future researches as far as this study is concerned evolved from the analysis and discussion of the research results which includes:

- A future research agenda to explore factors influencing project scope performance;
- The effect project scope change have on infrastructural project performance;
- Identifying possibilities to improve project scope change management in the construction industry; and
- Exploring project scope management practices of the building construction industry.

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APPENDIX

QUESTIONNAIRE DESIGN

TOPIC:

THE EFFECTS OF SCOPE MANAGEMENT ON PROJECT SUCCESS IN CONSTRUCTION PROJECT MANAGEMENT

This study aims to investigate the effects scope management have on project success in the Ghanaian construction industry. Please kindly respond to the questions by ticking the appropriate box for each item. Please note that all information provided will be strictly confidential.

Thank you for your assistance.

BY

BENONY KODZO ABORHOR

SECTION A: RESPONDENT PROFILE

1. Please indicate your profession:
    a. Project Manager
    b. Quantity Surveyor
    c. Engineer

2. Please indicate your educational background:
    a. MSc
    b. BSc
    c. HND

3. Please indicate your years of experience:
    a. 1 – 5 years
    b. 6 – 10 years
    c. Over 10 years

SECTION B: To determine the significant effects project scope definition has on construction project performance.

Kindly rank the following factors with respect to the above heading in section B. Use a Likert scale of 1 - 5 where one (1) is Strongly Disagree: Two (2) is Disagree: Three (3) is Neutral: Four (4) is Agree: and Five (5) is Strongly Agree.

No	**Significant effects of project scope definition**	1	2	3	4	5
1	Better communication to project sponsors, stakeholders and team members					
2	More accurate estimation of tasks, risks, timelines and costs					
3	Appropriate resource allocation					
4	Enhance the quality of project					
5	Avoids the final outcome not being what the client expected					
6	Increased confidence that 100% of the work is identified and included					
7	Serves as a foundation for the control process within the project					
8	Helps avoids budget overrun					
9	Helps avoid delay in project schedule					
10	Helps avoid constantly change in requirements					

SECTION C: To identify the challenges experienced in project scope management.

Kindly rank the following factors with respect to the above heading in section C. Use a Likert scale of 1 -5 where one (1) is Not Critical: Two (2) is Moderately Critical: Three (3) is Critical: Four is Very Critical: and Five (5) is Extremely Critical.

No	**Challenges experienced in project scope management**	1	2	3	4	5
1	Decision-making within the steps takes too much time					
2	Lack of information due to bad communication					
3	Knowledge shared among project team members of different project teams is not correctly documented					
4	The stakeholders are not involved thoroughly in the process					
5	Lack of overview of possible risks that can result in scope change					
6	Responsible actor for scope management not assigned or documented in the project documents					
7	Scope management tasks associated with scope are not documented					
8	The contractor is not involved at the early stage of scope management					
9	The work-breakdown structure is not connected to roles					
10	No clear agreements between the client and the contractor concerning how to verify that the activities comply with what is stated in the contract					
11	Verification does not take place on a regular basis					
12	The stakeholders are not involved in validating the projects deliverables					
13	The scope state is not always tracked in a tool which makes monitoring difficult					

SECTION D: To determine ways of improving scope management for successful project delivery.

Kindly rank the following factors with respect to the above heading in section D. Use a Likert scale of 1 -5 where one (1) is Not Important: Two (2) Moderately Important: Three (3) is Important: Four (4) is Very Important: and Five (5) is Extremely Important.

No	**Ways of improving scope management**	1	2	3	4	5
1	Organizing workshops and interview with stakeholders					
2	Scope management tasks should be defined within the project management plan					
3	Distinguish the processes and the exact content of activities within project scope and explaining this to the project team members					
4	Contractor should be asked for input to ensure a design can be created that fits within the defined requirements and which is possible to execute					
5	Work breakdown Structure (WBS) should be connected to roles and assign responsibility					
6	The contractor must define how each activity will be verified during execution in a document prior to execution					
7	Regular verification meetings between the client and the contractor					
8	Regular meetings between project team members					
9	By combining information concerning the verified activities with thorough stakeholder involvement					
10	Scope state and scope change should be tracked in a tool					