UNIVERSITY OF CAPE COAST

PROJECT FAILURE IN THE ROAD CONSTRUCTION INDUSTRY OF GHANA

BERNICE DARFFOUR ABANKWAH

2020

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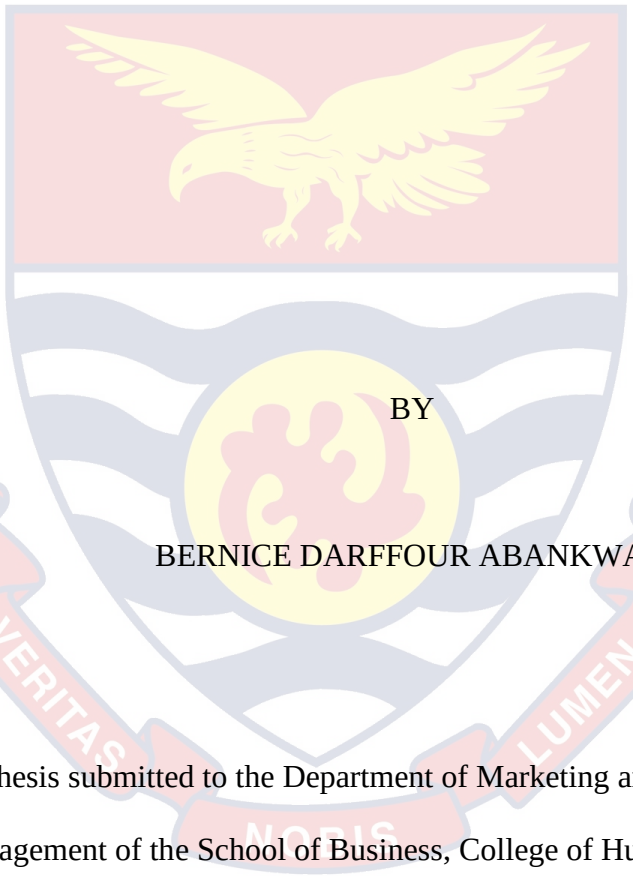

BY

BERNICE DARFFOUR ABANKWAH

Thesis submitted to the Department of Marketing and Supply Chain Management of the School of Business, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Commerce degree in Project Management

OCTOBER 2020

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: ……..…… Date: .....

Name: Bernice Darffour Abankwah

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature: …….. Date: ….....

Name: Prof. Francis O. Boachie-Mensah

ABSTRACT

Project failure is of a major concern such that it has been discussed in thirty-two global journals and counting (Habibi & Kermanshachi, 2018). Despite the construction industry being considered as a mature project-based industry, it has been faced with difficulties. The road construction industry provides numerous benefits such as the easy conveyance of goods and people to their destinations, hence, a failure in road construction will go a long way to affect the entire economy. This study measured road project failure in terms of cost, time and scope. Using the social constructivism paradigm through interviews, the study investigated project failure in the road construction industry of Ghana.

Various road projects under the jurisdiction of the Ghana Highway Authority were used as the basis of the study. This study revealed that even though there are numerous determinants that account for the occurrence of the failure factors (cost failure, time failure and scope failure) in extant literature, cost failure was caused by lack of resources, inadequate skills and price fluctuations of construction materials, while time failure was caused by financial constraints, unfavourable environmental conditions and bureaucracy with scope failure being caused by unrealistic scope, political interference and poor planning.

The research recommended that all road project stakeholders should come on board to ensure that issues are dealt with wholly and completely so that road projects can be constructed within budget, on time and within the stakeholder's expectations and requirements.

KEY WORDS

Cost failure

Iron Triangle

Project failure

Project management

Scope failure

Time failure

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my supervisor, Prof. Francis Boachie-Mensah of the Department of Marketing and Supply Chain Management, for his professional guidance, advice, encouragement and the goodwill with which he guided this work. I am very grateful.

I am also grateful to my family and friends for their support, especially my father, Benjamin Osei Abankwah, my mother, Doris Asabea Abankwah, my sister, Abigail Abankwah and my brother, Daniel Abankwah.

DEDICATION

To my family and friends.

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LIST OF ACRONYMS

CPDs	Construction Projects Delays
GDP	Gross Domestic Product
GETFund	Ghana Education Trust Fund
GHA	Ghana Highway Authority
IT	Information Technology
KPMG	Klynveld Peat Marwick Goerdeler
PERT	Program Evaluation and Review Technique
PMBOK	Project Management Body of Knowledge
PPM	Project and Program Management
ROI	Return on Investment

CHAPTER ONE

INTRODUCTION

The road industry in Ghana helps in the development of its economy since it ensures the timely and safe movement of people, products and other things to their destination. Roads account for ninety-five percent (95%) of the transportation system in Ghana (Ministry of Roads, 2017) which indicates that it is the most widely used transportation system. The road industry serves socio-economic purposes to the entire populace of Ghana since it serves as a medium between the origin and destination of people, goods and other products (Akinradewo, Aigbavboa, Oke & Coffie, 2019).

Amoatey and Ankrah (2017) also supported the importance of road infrastructure by stating that it helps in socio-economic development and poverty alleviation by providing people in either urban or rural areas access to healthcare, employment, education and various social activities. Therefore, a failure in the road industry in terms of time overrun and cost overrun means that the road users will have to wait for longer periods before they can go about their activities safely and faster and also cause an increase in the "capital-output-ratio" (El-Maaty, El-Kholy & Akal, 2016).

O'Brien and Haskins (2014) in their report describe a competent project manager as one who ensures that every unique endeavour undertaken is completed on time, within budget and according to the planned scope. Therefore, a failure in any given project will affect the institution adversely not only financial wise but in terms of opportunity cost, employee morale, future zeal for projects and business credibility or reputation. Nzekwe, Oladejo and Emoh (2015) concluded in their study that, project failure leads to

a drain in government funds, misuse of taxpayers' money and a decrease in goodwill. In contemporary times, project failure has emerged as a key issue of discussion in project management because of its impacts on numerous areas which include the development of countries and the performance of the firm carrying out the projects and its intensity is discussed in existing literatures.

This study is related to that of Adebisi, Ojo and Alao (2018), Damoah and Kumi (2017), Famiyeh, Amoatey, Adaku and Agbenohevi (2016), Damoah and Akwei (2017), Amoatey and Ankrah (2017) since they were looking at the causes of failure in multi-storey buildings in Nigeria, causes of failure of Ghanaian construction projects, causes of construction cost and time overrun in Ghanaian educational projects, Ghana's government project failure and the critical project delay causes in Ghana respectively.

Background to the Study

Almost every project needs the concept and techniques of project management in complex decision-making process regarding the planning, operations and conceptualisation of projects (Alias, Zawawi, Yusof & Aris, 2014). The demand for project management in institutions has increased because of technological advancements and the competitive nature of the global market (Luu, Luyen & Nguyen, 2015). Other firms and institutions also focus on project management because it is embedded with appropriate tools and techniques and it makes use of the best managerial solutions to help project managers become top notch in achieving the objectives of the firm (Attarzadeh & Ow, 2008) such as completing the project on time and within budget (Choudhry, Nasir & Gabriel, 2012). Project management is also viewed to be the solution to all project failures and abandonment since it

ensures that resources are managed effectively towards the success of the project (Nzekwe *et al*., 2015).

Project failure is seen to encompass every area in project management, from agricultural (Razanakoto *et al*, 2018) to construction (Damoah & Kumi, 2017) to electrical (Department of Energy, 2015; Ntshangase & Tuan, 2019) to knowledge management (Akhavan & Pezeshkan, 2014) and IT (Stanley & Uden, 2013). Project failure is defined in terms of the project evaluator (Carvalho, 2014); the time of the project's evaluation (Heeks, 2006); the project's performance criteria for assessment (Mir & Pinnington, 2014); the content of the project failure (Agarwal & Rathod, 2006; Ika, 2009) and the stakeholders' expectations (Alias *et al*., 2014; Lindhard & Larsen, 2016). The varying perceptions of different stakeholders is a key factor used to define what project failure/success constitutes of and what it does not (Akbiyikli, Dikmen, Eaton & Akniyikli, 2019; Aziz, 2013; Davis, 2014). There is difficulty in defining project failure by well-defined criteria because of these reasons.

The main promoter of economic advancement in every country is the construction industry (Pero, Stößlein, & Cigolini, 2015). Therefore, the role project management plays in the construction industry cannot be understated, since it is obvious that project management is the core of every construction activity regardless of the geographical location (Ofori, 2012). Developing countries in their quest to advance, embark on construction projects (Amoatey, Ameyaw, Adaku & Famiyeh, 2015). Thus, project failure will lead to losses not only to the citizens, but also to the direction of development. Developing countries view infrastructure projects such as road projects very important

than developed countries (Perera, Rameezdeen, Chileshe, & Hosseini, 2014) because they are regarded as the backbone of development in developing countries (Damoah & Akwei, 2017). The World Bank (2015) allocated $4.8bn to assist in the development of transport projects. Regardless, Habibi and Kermanshachi (2018) estimated that, more than half of total construction projects are bound to fail.

Over the years, the Government of Ghana has solicited for sponsorship from the World Bank, International Monetary Fund and other monetary bodies to construct roads, buildings and railways (Bawumia, 2015) since the construction sector contributes immensely to the socio-economic development of the general population (Amoatey *et al.*, 2015). The Government of Ghana uses 75% of its Ghana Education Trust Fund (GETFund) allocation to develop infrastructure and 20% of the Common Funds for the various district assemblies are used to invest in educational projects (Asiedu, Frempong & Alfen, 2017). The multi-faceted nature of the construction industry manifests itself in the extent through which its benefits run through all sectors of the economy (Ofori, 2012).

In 2018, it contributed GH₵ 19.7 million to the gross domestic product (GDP), representing 7.1 per cent of Ghana's GDP (Ghana Statistical Service, 2019). Government's construction projects lay the basis and foundation for the other sectors of the economy to thrive since they depend on the products of the construction industry. The construction industry also creates employment opportunities for both unskilled and unemployed individuals and can be seen in the Job Creation Report that, the industry provided more than 600,000 jobs which represents about 7% of the nation's working population (Ghana

Statistical Service, 2015 as cited in Boadu, Wang & Sunindijo, 2020). Public sector projects are more prone to experience project time overrun which escalates into cost overrun (Muhwezi, Acai & Otim, 2014).

The road industry in Ghana helps in the development of its economy since it ensures the timely and safe movement of people, products and other things to their destination. Roads account for percent (95%) of the transportation system in Ghana (Ministry of Roads, 2017) which indicates that its is the most widely used transportation system. The road industry serves socio-economic purposes to the entire populace of Ghana since it serves as a medium between the origin and destination of people, goods and other products (Akinradewo, Aigbavboa, Oke & Coffie, 2019).

Consequently, many works are subjected to classify and assess valid factors that account for project failure. The failure of a construction project is usually measured against its original scope, time of delivery, financial plan, and the quality or performance of deliverables. Shehu, Endut, Akintoye and Holt (2014) found out that there are cost overruns of 55 percent in the Malaysian construction industry after studying their cost performance. Poor project management results in an improper use of the construction capital meant for construction purposes. Recently, most studies have informed us on the role poor management plays in construction projects in developing countries, such as Vietnam where it faces complications, such as uncertainties, involving additional cost targets, quality and deadlines (Nguyen & Chileshe, 2014).

Statement of the Problem

A project is said to be successful after it has satisfied the time, cost and scope constraints of that particular endeavour. Project failure has been in existence for a long time. Kusek, Prestidge and Hamilton (2013) stated in their book that, in the 1950s, project management saw a rise in failure due to scheduling issues. Scholars therefore created the Gantt Chart, the Program Evaluation and Review Technique (PERT), the Critical Path Method and other analytical tools to curb and tackle issues concerning time, quality, scope and cost. Despite these advances, the failure rate for projects was 60% (Kusel, Prestidge & Hamilton, 2013). Controlling and managing these constraints (that is, time or schedule, cost and scope) was viewed as "hard" concepts in project management (Alias *et al*., 2014). To ensure project success, a proper management practice is essential, since it conveys soft and hard benefits to several stakeholders which, in turn, increase shareholder value.

Construction projects contribute immensely to the development of many countries. Despite its contribution, the construction industry faces many setbacks and constrictions which negatively impact the effectiveness of many construction projects, since most studies and existing literature show that most projects fail to attain their predicted objectives or are totally rejected (KPMG, 2013), and thus costing the government and firms large amounts of money (Espiner, 2007) and could cause some detriments to the economy (Sambasivan, Deepak, Salim & Ponniah, 2017).

Globally, various aspects of literature have placed emphasis on the percentage of failed projects. Charavat (2003) (as cited in Attarzadeh & Ow, 2008) stated that, 52.7% of projects worldwide incurred both cost and time

overrun with 31% of projects completed not according to scope. In New Zealand, a nationwide survey was conducted in 2010 and it was found that two-thirds of construction firms had experienced at least one project failure in the past year, and that only one-third of the projects had been delivered on budget, causing an overrun of approximately NZ$15 million (KPMG, 2013). The "Refinery and Petrochemical Integrated Development" (RAPID) project in Malaysia started operations in 2017 instead of 2016 (Ansah & Sorooshian, 2017).

There is a significant difference between the failure of projects in terms of developing and developed countries (Habibi, Kermanshachi & Safapour, 2018; Olawale & Sun, 2010; Prasad, Vasugi, Venkatesan & Nikhil, 2019; Shehu *et al*., 2014). Singh (2010) also found out that, the larger the project, the higher the cost overrun. Amoatey and Ankrah (2017) then concluded that, when comparing projects, large projects such as road projects and railway projects have a high probability of experiencing time overrun with Jorgensen, Halkjelsvik and Kitchenham (2012) also supported this idea by stating that, the larger the project, the higher its cost overruns.

There are many project failures in developing countries (Aziz, 2013) and, in Ghanaian Government projects, failure has become the norm rather than the exception ("Ghana at 50 toilets abandoned", 2011; "The abandoned restaurant," 2011). Despite the construction industry being considered as a mature project-based industry, it has been faced with similar problems. O'Brien and Haskins (2014) highlighted examples of other global failed projects. In 2004, Sainsbury lost €260 million to a failed IT Supply Chain project, the National Health Service (NHS) in Europe also wasted €12 billion

on a failed IT implementation project, Global Bank "B" in 2012 lost €292 million due to the failure to apply Anti Money Laundering procedures, Global Bank "A" incurred a cost of $1 billion because of a glitch in an IT project and the French National Railway Company lost €15 billion for purchasing wrong trains.

In Nigeria, the Ajaokuta Steel Complex was commissioned in 1979 to be completed in six and half years was rather completed in December 1987 (Jagboro, 2016). Kontagora (1993) (as cited in Adebisi *et al*., 2018) noted the existence of about 4,000 uncompleted or abandoned Federal Government of Nigeria projects. Damoah and Akwei (2017) in their study outlined some failed government projects in Ghana. They are the Affordable Housing Units projects, the Educational reforms project and the Savannah Accelerated Development Authority afforestation project. A dual carriageway that was estimated to cost GH₵ 73 million changed to GH₵100 million at completion due to challenges which led to delay and cost overrun (Amoatey & Ankrah, 2017). A review of sixty-five projects in ten educational institutions revealed that, only five were completed within their stipulated time with the rest exceeding their scheduled date (Government of Ghana, 2013). Famiyeh *et al*. (2016) found that, educational projects which had a stipulated duration of six months are still uncompleted.

The reality seems to be that these numerous reports (Standish Group, 2001, 2004; Royal Academy of Engineering, 2004) attest to the fact that projects have the propensity not to meet certain constant measure or performance objectives. Hartman and Rafi (2014) asserted that projects are not bound to necessarily experience terrible or severe failure but they are likely to

experience cost overrun, time overrun or they may fail to meet expectations such as quality, scope, safety and stakeholders' anticipations for the project. This is despite efforts to address the factors which drives the inability of the projects to meet these criteria.

There is a high probability that construction projects in developing countries will fail. Nwachuku and Nzotta (2010) agreed to this by stating that, construction projects fail at a retrogressive rate in most developing countries. Due to this, Asiedu *et al*. (2017) mentioned that, researches recently focus on finding the causes, the level of impact of these causes and appropriate remedies. Accordingly, even though extant literature has been devoted to identifying the factors that lead to failure; they have mainly been discussed from a generic point of view or individual case studies. Researches that focus exclusively on government construction projects in developing countries are rare despite the dynamics in which these projects are implemented (Damoah & Kumi, 2017).

Amartey and Ankrah (2017) through their study found that, about 70 per cent of road projects experience delays and 52% experience cost overruns. The average time overrun and cost overruns of road projects in Ghana was 17 months and US$1.15m (or 22.5%), respectively. The five most critical causes of road construction delays were delay in finance and payment of completed work by owner (client-related); inadequate contractor experience (contractor-related); changes in scope by the owner during construction (client-related); delay to furnish and deliver the site to the contractor (client-related); and inflexible funding allocation for project items (donor-related). Attarzadeh and Ow (2008) after analyzing a case study that involved the projects of 50

students concluded that poor planning and poor scheduling of projects were the main reasons why their projects failed.

The noticeable signs of a failing project are constant scope creep, schedule overrun and cost overrun (O'Brien & Haskins, 2014). The Price Waterhouse Coopers survey on Project and Program Management (PPM) (2014) showed that since 2004, the top three causes of project failure have been; change of scope during project execution (41%), poor estimation during project planning (39%) and insufficient resources (30%). Sauer, Germino and Reich (2013) (as cited in Holgeid & Thompson, 2013) classified project failure influencers into two main headings namely; change in project manager or sponsor and, change in scope, schedule and budget.

Literature concerning road project failure in relation to the various elements in the iron triangle (that is cost, time and scope) in Ghana was not found. Previous and existing literatures focused on project delay causes in road construction (Amoatey & Ankrah, 2017); causes of government construction projects failure (Damoah & Kumi, 2017); causes of construction time and cost overruns in selected educational projects (Famiyeh *et al*., 2016); causes and effects of state housing projects time overrun (Amoatey *et al*., 2015); causes of time overrun in building projects (Fugar & Agyakwa-Baah, 2010); and delay and cost overrun in groundwater construction projects (Frimpongs, Oluwoye & Crawford, 2003). The findings of these studies cannot be generalised to other projects because of the uniqueness of each sector.

Road projects were considered in this study rather than building projects and other projects because road construction projects are more

mechanized than building projects, the activities involved in road construction is exposed to the weather than that of the building project activities, road projects are fully public projects whiles building projects could be public or private and there are differences in the types of materials used in road construction and building projects (Seboru, 2015). This study aims to address the phenomenon of "project failure" by investigating the failure of government road construction projects in Ghana.

Purpose of the Study

The main purpose of this study is to investigate project failure in the road construction industry in Ghana.

Research Objectives

In the quest to achieve the main aim of this research, the following objectives were set to:

1. assess the perception of key players in the road industry on the determinants of the cost failure (cost overrun).
2. examine the perception of key players in the road industry on the determinants of time failure (delay).
3. determine the perception of key players in the road industry on the determinants of scope failure (creep).

Research Questions

The following questions were formulated in accordance with the research objectives to achieve the aim of this study.

1. What is the perception of key players in the road industry on the determinants of the cost failure (cost overrun)?

2. What is the perception of key players in the road industry on the determinants of time failure (delay)?
3. What is the perception of key players in the road industry on the determinants of scope failure (creep)?

Significance of the Study

The findings of this study will contribute to existing knowledge in the subject under study. It will also serve as a reference point to researchers, students and other stakeholders who are interested in investigating road project failure in Ghana. The implications of this study will be relevant for the various players in project management, especially in the construction industry. The results will also provide extensive insight and in-depth understanding into how these critical failure factors affect the project's objectives. The findings will inform the Ghana Highway Authority and other interested stakeholders about the causes of project failure and how it can affect the project if not dealt with.

The results will also help road project managers and the Ghana Highway Authority put in place effective plans to eliminate the occurrence of project failure to increase profitability and reputation of the firm as a whole since the study will correctly identify the specific determinants of project failure.

Delimitations

The study's focus was on road construction projects under the Ghana Highway Authority's supervision and on the part of the project failure measurements, the study limited itself to the elements in the Iron Triangle (that is, cost, scope and time).

Limitations

There was the difficulty in generalizing the findings of the study to other projects since only road projects were used and also some of the respondents refused to partake in the interview due to excuses, such as being busy. Some of the respondents too did not agree to the idea of recording them during the interview for reasons they did not disclose so the researcher had to resort to taking notes from what they said. Due to the sensitive nature of some information, some respondents were unwilling to disclose such information. Most of these contractors, project managers and Ghana Highway Authority Officials were unavailable because they were on-site managing or supervising other road projects.

Definition of Terms

Project failure: It is defined as the inability of a project to achieve its purpose due to cost failure(overrun), time failure (delay) and scope failure.

Iron Triangle: It is a model of the constraints of project management. It is the combination of the three most significant restrictions on any project. They are cost, scope and time.

Project time failure (delay): is defined as the extension of a project time beyond the planned completion date.

Project cost failure (overrun): may be generally expressed as the difference between the final cost of the project and the original contract sum.

Project scope failure: it includes a change in the boundaries of the project thereby affecting the responsibility of the team members.

Organisation of the Study

The study is organized into five chapters. Chapter one focuses on the introduction which includes the background to the study, statement of the problem, objectives of the study, purpose of the study, research questions, research hypothesis, significance of the study, delimitations, limitations, definition of terms and organisation of the study. Chapter two reviews the related literature on project failure and firm performance in the construction industry. Chapter three presents the research methodology that will be used to undertake the study. Chapter four contains the results and discussion and Chapter five, which is the last chapter, presents the summaries, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This study is focused on investigating the failure of road construction projects in Ghana by examining the causes of road construction failure in Ghana and assessing the severity of cost, time and scope failure causes on road construction in Ghana. This particular chapter according to Quansah (2015) is about reviewing and discussing relevant materials related to this study to find out the strength and weakness. This study is bounded to failure in road construction projects and the three elements in the iron triangle (time, cost and scope) without paying attention to the other project areas and the other elements in measuring project failure in project management. This chapter begins with the theoretical review of the systems theory, followed by the empirical review of literature on the concept project failure and causes of project failure. The chapter ends with the conceptual framework for the study.

Theoretical Review

This study was underpinned by the Systems theory and the Chaos Theory. These theories were explained in relation to project failure in the road construction industry of Ghana with respect to how any modification or impact in any of the individual components (namely; cost, time and scope) will cause a variation in the whole project.

System Theory

A system is said to be a collection of parts that come together to form a whole such that, due to their interaction, a change in one of the parts will affect the whole component (system). An effective insight into how these

systems operate makes it possible and easy to predict what might happen when a system experiences a known change. The Systems theory describes the interrelatedness of all parts of an organization and how one change in one area can affect multiple other parts. (Bertalanffy, 1968). Small changes in one part may cause big changes in another part, while large changes in one area may only result in small changes in another. In projects, cost, time and scope will be classified as parts that make up a project. Therefore, a change in cost (cost overrun), time (delay) or scope (scope creep) will lead to a change in the project leading to project failure.

Chaos Theory

This theory holds the view that in every given project system with predictable outcomes, a little variation in a parameter can change the project's anticipated future event (De-Meyer, Loch & Pich, 2002). This is such that if a project was anticipated to be completed within budget, schedule and according to scope, then a little modification in the "cost", "time" and "scope" parameters could change the anticipated outcome for that project. The Chaos theory is characterized by:

A sensitive dependence on planned events. Also known as the "butterfly effect", it is of the assumption that, the small impacts that bring about either a positive or negative significant outcome cannot be predicted (Schuldberg, 2011). For instance, a small variation in the project's scope would cause the project to experience cost and time overrun and the cause of this small variation was unnoticeable until its manifestation. Even though the variation was a slight one, it caused changes in the other parameters because of its interconnection.

Bifurcation and Catastrophic changes. Catastrophic changes refer to the to the phenomenon where a slight modification in any of the system's parameters leads to an escalated effect which causes a complete transformation and restructuring of the whole system (Robertson & Combs, 1995). Bifurcation on the other hand is when a slight change in any of the system's parameters (time, cost and scope) lead to a change in the nature of the others and this change could be influenced by either internal or external factors.

Strange attractor. While this system's parameters operate in a dynamic pattern, they continue to exhibit chaotic features (Robertson and Combs, 1995). The strange attractor's capability is short lived but its effect is felt for a longer period (Olaniran, Love, Edwards, Olatunji & Matthews, 2017). An example is seeking the services of a professional to deal with scope related problems that might cause project failure. Even if the professional is able to deal with the problem, the solution will cause inconsistencies with the already planned scope and will thereby need additional cost and time to ensure equilibrium among the parameters (Dekker, 2013).

Ministry of Roads and Highways

The ministry of roads and highways of the republic of Ghana is responsible for road construction and road maintenance in Ghana. The ministry undertakes the road construction program with the objective of opening up new areas for accessibility and socio-economic growth, reduction of vehicle operating cost and travel time and facilitation of efficient movement of people, goods and services by developing, maintaining, rehabilitating and upgrading roads. Amoatey and Ankrah (2017) revealed that, the Ministry of Roads and Highways assists the government to achieve its objectives by

providing roads to the public that causes little or no disruption to all road users.

The condition of roads in Ghana during 2015 was 35% good, 33% fair and 32% poor; in 2016, it improved to 39% good, 32% fair and 29% poor and the ministry projected an increase in 2017, that is, 45% good, 30% fair and 25% poor. (Ministry of roads and highways, 2017). In the 2019 report, it was recorded that, the projected increase in 2017 was not fully met. 2017 had 41% of roads to be good, 33% to be fair and 26% to be poor. These same figures were recorded in 2018 but with a projected increase of 50% good, 40% fair and 10% poor roads in 2021. (Ministry of road and highways, 2019).

Ghana Highway Authority

The Ghana Highway Authority is in charge of administering, developing and maintaining roads and its related structures by:

1. Conducting research with the aim of ensuring that the administration, planning, developing and maintenance activities are properly done.
2. Manage and control traffic on roads by constructing safe roads for transportation
3. Meeting with other sectors to negotiate on agreements and
4. Collecting revenues such as tolls on behalf of the government of Ghana.

Figure 1 shows the organisational structure of the Ghana Highway Authority by displaying its line of authority and command.

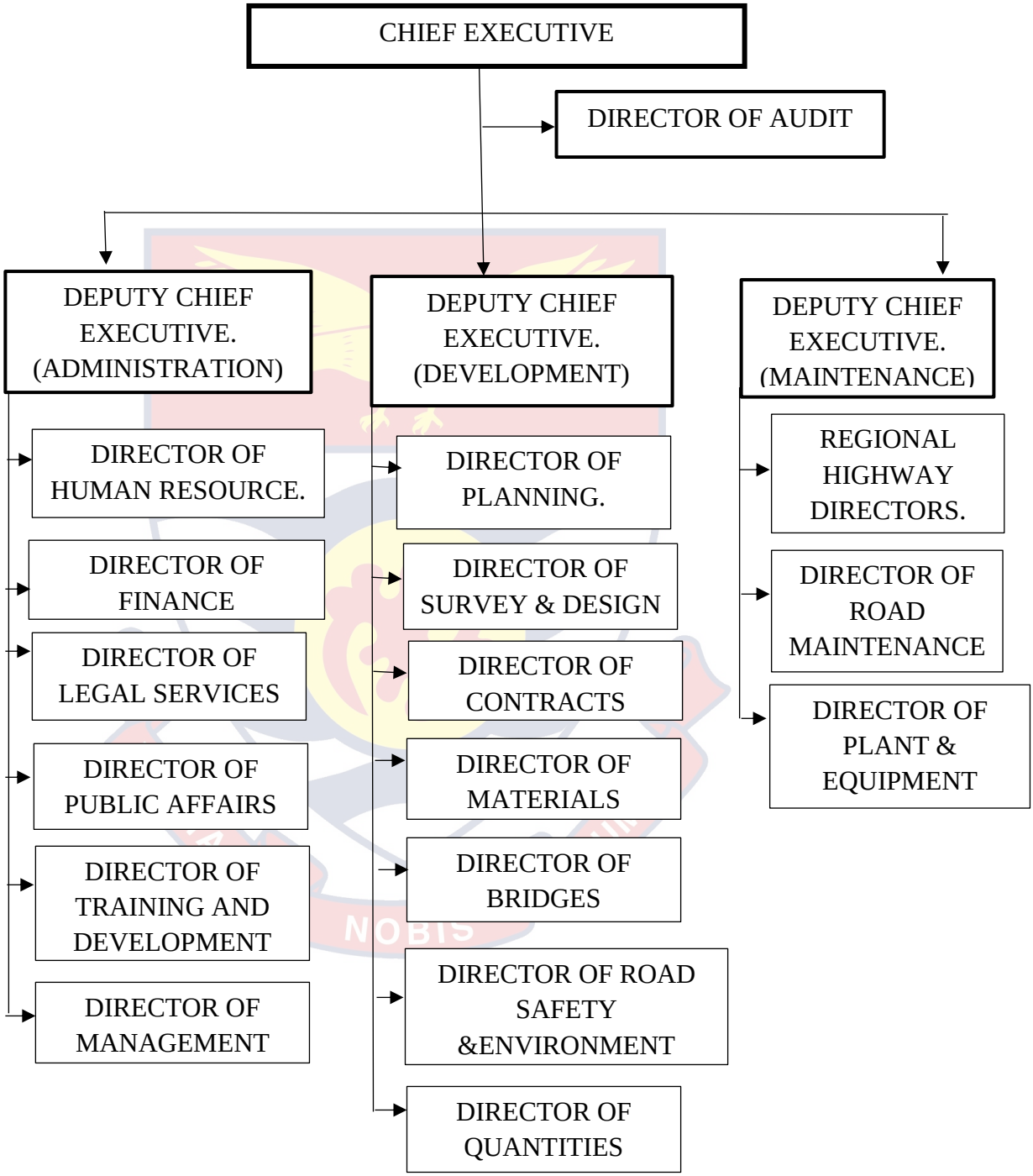

Figure 1: Organisational structure of the Ghana Highway Authority

Source: Ghana Highway Authority (2014)

The Ghana Highway Authority is governed by a board of directors appointed by the President in accordance with Ghana Highway Authority Act, 540, 1997 to ensure the effective functioning of the Authority. With three departments namely; maintenance, administration and development, the Authority has a management structure that comprises of the Chief Executive, Deputy Chief Executives, Directors heading the ten regions, Managers and the workforce.

Some stakeholders of the Authority include the National Road Safety Commission, the Driver and Vehicle Licensing Authority, the Ministry of Roads and Highways, the Securities Exchange Commission, the Ministry of Finance, the Ghana Ports and Harbour Authority, the Ministry of Transport, Ghana Highway Authority Staff, Contractors and Consultants and the Civil Service.

Ghana Highway Authority seeks to realize its mission of "providing a safe and reliable trunk road network at optimal cost to support the socio-economic development of Ghana" by achieving the following objectives;

i. generating internal funds.
ii. controlling road fatalities by ensuring road safety.
iii. reducing travel delays.
iv. collaborating with other sectors and key players in the road construction industry.

Empirical Review

This section discusses the already existing research of other authors in relation to this study**.** The discussion was categorised under the following headings; project failure and causes of project failure.

Project Failure

Project failure is very intense such that it has been discussed in 32 global journal and counting (Habibi & Kermanshachi, 2018). There are many controversies associated with the definition of project failure. This according to Zuofa and Ochieng (2014), can be traced to the need for consistency on the concept of project failure by the various stakeholders involved. Consistency amongst these stakeholders is impossible because the construction industry is made up of many stakeholders and each of them have different views and perceptions concerning project failure (Enshassi, Choudry & El-Ghandour as cited in Oyekoge & Al Kiyumi, 2017).

Despite this, numerous authors such as Koushki, Al-Rashid and Kartam (2005), Ogunsemi and Jagboro (2006), Chileshe and Berko (2010), Jansu and Belarmin (2015), Sepasgozar, Razkenari and Barati (2015), Mulla and Waghmare (2015) and Nghiem, Van, Viet and Nghia (2015) have universally linked the measurement of project failure to cost, time and quality. Researchers, such as Kappelman, McKeeman and Zhang (2006) and El Emam and Koru (2008), also supported this by stating that a project is said to be a failure if its judged on the basis of cost, time and requirement. Moreover, a project is deemed as a failure if it has either overrun its estimated cost, exceeded its projected date of completion or produces a unique outcome that did not conform to its anticipated performance criteria (Belassi & Tukel,

1996). In Information Technology (IT), project failure is when the IT project fails to contribute to achieving organizational goals (Thong, Yap & Raman, 1996).

KPMG (2013) defined project failure as a project with a budget overrun of 30% or more; and/or a schedule overrun of 30% or more; and/or a cancelled or deferred project due to its inability to demonstrate or deliver the planned benefits. Other researchers, such as Toor and Ogunlana (2010), argued that project failure should not be measured on the basis of the iron triangle but the assessment of projects should be beyond the traditional key performance indicators.

Shenhar and Wideman (2002) argued that it is impossible to establish a well-defined failure criterion for projects since every project is unique in its own way in terms of stakeholders involved, size, industry, complexity and environment. Mangione (2003) asserts that a project is said to be failed if it generates a negative Return on Investment (ROI). Alias *et al*. (2014) described project success in terms of meeting the various expectations of given participants on a project, therefore, it can be deduced that failure on a project corresponds to failure to meet the expectations of the various participants which could be contractors, client or project managers. Nwachuku and Nzotta (2010) described a failed project as one that does not satisfy the needs of its users. Baker, Fisher and Murphy (2010) stated that, even if a project satisfies its cost and time constraints after completion but fails to serve its intended purpose, then it has failed.

The Project Management Institute's Project Management Body of Knowledge (PMBOK) Guide (2008) did not ostensibly define what a failed or

successful project is but it went further to suggest that, every project charter should include the project's definition for success or failure of that particular project. The Standish Group in the CHAOS report (1994) (as cited in Holgeid & Thompson, 2013), categorised project failure into challenged projects and impaired projects. They explained "challenged projects" as those that upon completion have incurred both time and cost overrun and was not according to the planned specifications while "impaired projects" were described as those projects that are terminated at any point in its development cycle.

While debate exists regarding a precise definition of project failure, the stance adopted in this study is that of Belassi and Tukel (1996) that "a project is deemed as a failure if it has either overrun its estimated cost, exceeded its projected date of completion or produces a unique outcome that did not conform to its anticipated performance criteria".

Ansah and Sorooshian (2017) introduced an assessment method known as the '4Ps' to help mitigating project failure in order to ensure performance enhancement and maximization of profit. The '4Ps' concept is a framework that is aimed at analysing delay in projects comprehensively. They further suggested that, the assessment should be done in a manner that will include the various activities of the project team members from their operations to the skills, techniques and tools employed to get the work done. The 'Ps' in the concept represent Project, Practices, Participants and Procurement. Project failure was assessed using critical success factors (Salleh, 2009) and schedule impact/risk analysis (Arcuri, Hildreth & Tech, 2007; Chakrabortty, Abbasi & Ryan, 2019; Li *et al.*, 2018; Owolabi *et al.*, 2020) employed the to assess project failure.

Adam, Josephson and Lindahl (2016) suggested that a robust assessment of the effect of each of the factors should be considered and the assessment should be based on facts (that is data observed from the field) and not any other data. The most effective method of analysing failure according to them is to identify the various determinants of the factors and their corresponding rankings which will indicate its prevalence. They went on to add that, a liquidated damage clause should be included in contracts so that contractors will compensate their clients in the case of delay.

Causes of Project Failure

Amade Ubani, Amaeshi, and Okorocha (2015) asserted that a lot of factors are responsible for project failure. Existing literature has laid out the causes of project failure in the general construction industry context without paying attention to the specifics but Alao and Jagboro (2017) emphasized that knowledge about the specific cause of failure in every project will lead to the suggestion of an appropriate solution for that failure. Mahamid, Bruland and Dmaidi (2012) measure project failure in terms of how the project was not delivered within the stipulated date, incurred a cost higher than the approved budget, did not suit the client's preference and it cannot be used for its intended purpose.

A comparison of public projects in Hong Kong, Beijing, Sydney and Singapore by Ling (2018) revealed that all these four cities recorded significant cost and time overruns but Hong Kong recorded the highest time and cost overruns with Singapore having the least cost overrun and Beijing recorded the least time overrun. Damoah and Kumi (2017) found ten factors that causes project failure in Ghana and they are; change in government,

starting more projects than the government can fund, poor planning, lack of commitment by project leaders, poor supervision, corruption, bureaucracy, partisan politics, delays in payment and political interferences in ascending order.

Nguyen and Chileshe (2014) ranked the critical factors for project failure to be high inflation, volatility of the economy, payment delays, corruption and bribery, lack of a systematic approach to project management, contractor's poor performance, owner's inability to finance the project, inability and lack of knowledge in managing projects, poor design capacity, frequent design changes, lack of experience poor project planning. An assessment into the failure factors of multi-storey building by Adebisi *et al*. (2018) revealed the most significant factors of project failure to be contractor bankruptcy, improper scheduling of project activities, failure to engage technical experts with experience, inadequate funding, poor planning, structural failure.

Antony and Gupta (2017) opined that the ten reasons for project failure are scope creep, poor communication, incompetent team, inadequate training and learning, improper selection of process improvement methodology, tools and techniques, resistant to change, irregular monitoring and control, lack of commitment and support from top level management, inappropriate rewards and recognition system and sub-optimal team size. Most projects fail because of incorrect plans and estimates, failure to execute tasks as planned and other human factors such as lack of skills on the part of the project manager (Attarzadeh & Ow, 2008). The main contributor to project failure in most

emerging economies was seen to be bureaucracy (Killick, 2010; Amoako & Lyon, 2014; Damoah & Kumi,2017).

Other causes of project failure in the construction includes culture (Damoah & Akwei, 2017; Damoah, Akwei & Mouzughi, 2015); corruption (Transparency International, 2015); bottlenecks in the public administration system (Amaoko & Lyon, 2014; Damoah & Akwei, 2017); lack of resources (Damoah & Kumi, 2017); poor project management knowledge and application (Amponsah, 2010) and partisan politics (Asunka, 2016; Kayser & Wlezien, 2011). Damoah and Kumi (2017) explained in their study that the severity of the causes of project failure is different in all projects in terms of its size (large, medium or small), procurement method (traditional or design and build), sector (private or public) and nature of project (new or refurbishment).

Habibi and Kermanshachi (2018) categorised both the causes of time and cost overrun into engineering related, procurement related and construction related. Marzouk, El-Dokhmasey and El-Said (2008) identified the specific causes of engineer related project failure causes to include unpredictable shop drawings, and problems or mistakes in the design drawings. Criteria such as the size, priority, type and specific stage involvement of the project can cause failure related to the engineering phase (Liao, O'Brien, Thomas, Dai & Mulva, 2011). Faridi and El-Sayegh (2006) (as cited in Ansah & Sorooshian, 2017) supported the claim by identifying improper planning, incomplete project designs and slow decision-making process as engineer related causes of project failure. The causes of procurement related project failure were listed to be scarcity of skilled labour,

equipment and materials (Kermanshachi, Dao Shane & Anderson, 2017; Mamman & Omozokpia, 2014; Panova & Hilletofth, 2018). Inflation which causes price fluctuations of materials and increased price of imported goods can be traced to cause procurement related failure (Ameh, Soyingbe & Odusani, 2010).

Al-Hazim, Salem and Ahmad (2017) after analysing government projects which were implemented from the year 2000 to 2008 revealed that project failure was due to uncontrollable natural factors, that is the weather and terrain. Failure can lead to "blame-shifting" games amongst stakeholders. Oyekoge and Al Kiyumi (2017) stated that the stakeholders tend to blame the contractor for failure of the project because of the contractor's inexperience, financial constraints, use of less labour, poor planning, inadequate technical capacity and improper supply chain practices. Ansah and Sorooshian suggested in their study that, the various parties involved in the project failure should own up and take responsibility to ensure easy identification of the main source of the problem to tackle it.

Nzekwe *et al*. (2015) went further to explain that the non-involvement of professionals by clients to manage their projects causes project failure. To ensure fairness, Keane and Caletka (2015) suggested that after the delay factors have been identified and analysed, the failure impact should be calculated and the penalties should be shared amongst the parties involved. Tabassum, Abid and Honarmand (2018) also emphasised that a better and more realistic method should be put in place to examine claims made by the parties and assist in the calculation and appropriation of delay penalties.

Even though some of these causes are similar, common or interconnected, there are some irregularities, inconsistencies and contrasts views because of the differences in culture (Wang, Ford, Chong & Zhang, 2018).

Cost Overrun

Every project aims at completing successfully without any cost overrun. Cost overrun is measured by subtracting the final project cost from the planned cost. If the difference is a positive value, then there has been an incident of cost overrun (Bordat, McCullouch, Labi, & Sinha, 2004). Flyvberg, Holm and Buhl (2003) defined cost overrun as the difference between the project's completion cost and the project's planned cost. Park and Papadopoulou (2012) explained cost overrun as the difference between the cost at completion and the agreed upon contract sum. Others refer to cost overrun as cost escalation or budget overrun (Kaliba, Muya & Mumba, 2009) and cost variation (Sun & Meng, 2009). Cost failure is expressed either in terms of the overestimation or underestimation of the project's real, actual or initial cost (Mahamid & Bruland, 2011).

Cost overrun is a critical factor in causing project failure in developing countries (Aziz, 2013; Damoah & Akwei, 2017; Kaliba *et al*., 2009; Pinto, 2014). Olaniran *et al*. (2017) estimated that about 64% of projects under execution have already overrun its cost and this is due to the complex nature of the project (Fang, Marle, Xio & Zio, 2013) and the changing nature of the project's activities (Pehlivan & Oztemir, 2018).

There are many approaches in existence that are used to evaluate cost overruns in projects. Some of these approaches or methods are: Process Model

and Analysis Technique (Cho & Eppinger, 2005); Artificial Neural Network (Kim, Han, Kim & Park, 2009); Event Tree Analysis (Ferdous, Khan, Sadiq, Amyotte & Veitch, 2011); Simulation-Based Risk Assessment Approach (Fang & Marle, 2012); Fault Tree Analysis (Khakzad, Khan & Amyotte, 2013); Integrated Decision Support System (Fang *et al*., 2013); Bayesian Belief networks (Cardenas, Al-Jibouri, Halman & van Tol, 2014); Artificial Intelligence Application (Zhang, Huang, Wu & Skibniewski, 2017); Monte Carlo Simulation and Multi-Criteria Decision Model (Qazi, Quigley, Dickson & Kirytopoulos, 2016; Floyd, Barker, Ricco & Whitman, 2017); Structural Equation Modelling (Demirkesen & Ozorhon, 2017); Failure Mode and Effect Analysis (Lee & Kim, 2017) and International Construction Risk Assessment (Liu, Zhao & Yan, 2016).

Doloi (2013) measured cost failure in terms of improper control of project resources, ineffective monitoring and feedback processes, complexity of construction design, poor construction techniques or methods and deficiencies in planning and scheduling. In a study by Cantarelli, Flyvbjerg, Molin and van Wee (2010), cost overrun was explained in terms of political, technical, psychological and economic categories by attributing it to inaccurate cost estimation and inaccurate project viability rankings. Park and Papadopoulou (2012) mentioned that site conditions (such as inadequate site planning, unfavorable weather conditions, poor drainage system and the geological structure), inaccuracy in estimating project cost, scope changes and incompetent subcontractors (mainly suppliers) can influence project cost overruns.

The causes of cost overrun according to Famiyeh *et al*. (2016) were delays or irregularities in payment, price fluctuations of materials, poor management of project finances and poor project feasibility analysis. Chileshe and Berko (2010) investigated into the causes of cost overruns in construction projects and found out that, out of the large number of important factors of cost overrun, design errors and omissions, lack of project knowledge, underestimation of costs, schedule slippage, inflation, variations and delays in monthly payment to contractors were most dominant in their study. Out of the fifty-five cost factors that affect performance, the project manager's incompetence, poor project manager's leadership skills and lack of top management support were seen to be most dominant (Iyer & Jha, 2005).

Asiedu and Adaku (2019) after analysing the various factors of cost overrun found out that, the most significant ones were change orders from clients in the form of omissions, variations or adjustments and additions in the project, unfavourable weather, poor working environment and ineffective project coordination among contracting parties. Amadi and Higham (2017) described cost overruns as a result of the technical mistakes made by any of the project team members and explained further that it is caused by poor geological and technical assessment, non-adherence to standards and regulations and inadequate geotechnical assessment tools. El- Maaty *et al*. (2016) listed poor planning, inaccurate cost estimates, lack of frequent review of cost project during execution, ineffective communication, inadequate research before bidding on the part of the contractor as the causes of cost overrun.

Time Overrun

Time is regarded as the period elapsed from the beginning of a project to its completion and handing over to the client (Choudury & Phatak, 2004). Marzouk and El-Rasas (2014) defined time overrun as the extended time beyond the agreed upon date of delivering the project to the client. An overrun will, therefore, be an extension of the completion period of a project (Annan, 2003). Trauner, Manginelli, Lowe, Nagata and Furniss (2009) described delay as acting untimely and delivering or performing later than as expected. Planned schedule estimates are usually influenced by the inaccuracy and little or no information on future situations (Tienda, Pellicer, Benlloch-Marco & Andres-Romano, 2015).

Time overrun (delay) can cause the death of projects and it is evident in projects that do not have their processes broken down, no clear existence of the processes involved or do not have allocated time to the steps involved (Kusek *et al*., 2013). Hampton, Baldwin and Holt (2012) revealed in their study that, delay affects both clients and contractors differently but they all experience financial related impacts in the long run. The client for instance will have to foot additional bills such as paying for the services of consultants he or she engaged and also pay for other unplanned resources used to tackle the project delay. The contractor on the other hand will have to pay for the extra interest charges accumulated on the loan he or she received to finance the project.

In managing projects, Alkass and Harris (1991) indicated that time overrun is the commonest challenge faced, and an analysis of this overrun is a critical issue. Zidane and Anderson (2018) mentioned that, a proper definition

of the various delay causes will help in delay avoidance, reduction and mitigation. Rezaee, Yousefi and Chakrabotty (2019) also revealed that an early and effective identification of delay causes helps minimize the impact of the cause in the future. Delay is as a result of sequential events that are triggered by root causes (Hsu, Aurisicchio, Angeloudis & Whyte, 2020).

Additionally, Sweis, Moarefi, Amiri, Moarefi and Saleh (2018) stated that, the removal of the root causes prevents a future reoccurrence of these root causes and an effective monitoring after getting rid of the root causes will prevent project delay from occurring. They continued by stating that, if the symptoms or direct causes of project delay are dealt with without paying attention to the root cause will increase the possibility of a reoccurrence of this root cause or a manifestation of this root cause in a different nature.

Famiyeh *et al*. (2016) listed unrealistic projects deadlines, little or no supervision of projects, inappropriate execution methods, delay in permits issuance and financial constraints as causes of time overrun. Frimpongs *et al*. (2003), Mohamad, Nekooie, Al-Harthy and Amur (2012) and Oyekoge and Al Kiyumi (2017) grouped the factors that causes time overrun into client-related, contractor-related and consultant-related factors. In developing countries, government projects according to (Sambasivan & Soon, 2006; Sweis, Hammad & Shboul, 2008; Kaliba *et al*., 2009; Ahsan & Gunawan, 2010; Fallahnejad, 2013; Marzouk & El-Rasas, 2014; Damoah & Akwei, 2017) face time overrun as a critical cause of failure.

Seboru (2015) concluded in his study that the top five causes of time overrun were inadequate scheduling and planning, unconducive weather (rain), irregularities in payment by client, bureaucracy and slow decision-

making process. Mahamid *et al*. (2012) identified fifty-two causes of delay in road construction projects out of which, five were concluded to be severe. The five consisted of delay of progress payment by owner, shortage of equipment, political situation, awarding project contract to lowest bid price and segmentation of the West Bank and limited movement between areas.

Also, Amoatey and Ankrah (2017) explored the critical road project delay factors in Ghana. They classified the causes into client-related, contractor-related and donor-related. The major causes under each classification were; client-related causes (delay in finance and payment of work by owner, changes in scope and delay to furnish and deliver the site to the contractor), contractor-related cause (inadequate contractor experience) and donor-related cause (inflexible funding allocation for project items) were seen to be the critical road projects delay. The other causes grouped in the various classifications were; client related (slow decision making) and contractor-related (difficulties in financing, delay in preparation of shop drawings, delay in site mobilization and rework due to errors).

Furthermore, Mpofu, Ochieng, Moobela and Pretorius (2017) also categorized the delay factors into labour related, design consultants related, contractor related and client related factors. Other researchers such as Arcuri *et al*. (2007), Umair *et al*. (2014), Adam *et al*. (2016) and Ansah and Sorooshian (2017) classified time overrun (delay) causes into compensable delays, non-compensable delays, non-excusable delays and concurrent delays.

Ansah and Sorooshian (2017) went further to explain the various classification types identified above. Compensable delays were described as specifically engineering related and caused by the owner and his or her

representatives. This usually occurs when there is a delay in decision-making by the client. Non-compensable delays are also known as naturally uncontrollable delays. Normally referred to as “acts of God”, none of the stakeholders involved is to be held responsible for its occurrence. These unpredictable occurrences include volcano eruptions, harsh weather conditions and earthquakes. The project’s stipulated time is extended but the initial budget remains constant. Non excusable delays are caused by the contractor and his or her suppliers. In the case of its occurrence, the subcontractor in the person of the supplier compensates the contractor but the owner does not make any changes to the already existing scope. Concurrent delays are the result of the overlapping occurrence of two or more of the already discussed classification of delay (which are compensable, non-compensable and non-excusable).

Habibi and Kermanshachi (2018) from their study listed causes of delay in projects to be shortage of materials, labour and equipment, harsh weather, lack of finances, poor timing of decisions and poor communication. Sensitivity analysis was employed by Hammad, Abbasi, Chakrabortty and Ryan (2020) to predict the critical path changes to prevent project delays. Few technical staff, financial difficulties on the part of the contractor, inefficient equipment and shortage of materials were seen as the causes of delay by El-Maaty *et al*. (2016). Rezaee *et al*. (2019) from their study figured out that, wrong estimation of project activities and duration, weak technical backgrounds and absence of punitive clauses in project contracts is likely to cause delay in projects.

Pham and Hadikusumo (2014) identified the various delays associated with phases in engineering, procurement and construction projects. For the construction phase, ineffective communication, contractor's poor coordination of project activities, lack of control over procedures, poor project preparation and harsh weather conditions. For the engineering phase, non-availability of data on project's requirements, delay in project design approval, scope and specification changes and ambiguous design details.

The most predominant causes of delay in construction projects in various countries after been identifying the causes and ranking them are as follows: United States of America, excessive change orders (Tafazzoli & Shresta, 2017); Cambodia, shortage of construction materials (Durdyev, Omarov & Ismail, 2017); South Africa, strike actions by workers (Oshungade & Kruger, 2017); Burkina Faso, financial incapability on the side of the client (Bagaya & Song, 2016); Botswana, improper planning by contractors (Adeyemi & Masalila, 2016); Rwanda, delayed payments (Amandin & Kule, 2016); Norway, changes in scope (Aarseth Rolstadas, & Klev, 2016); Ethiopia, problems with cashflows (Zewdu, 2016); Portugal, slow decision-making process (Arantes, Silva & Ferreira, 2015); Vietnam, delay in dissemination of information (Luu *et al*., 2015); Kenya, non-payment by client (Seboru, 2015); India, inaccurate time and cost estimates (Mulla & Waghmare, 2015); Saudi Arabia, acquisition of lands (Elawi, Algahtany, Kashiwagi & Sullivan, 2015); Uganda, changes in scope (Muhwezi *et al*., 2014); Pakistan, domestic issues (Gardezi, Manani & Gardezi, 2014); Egypt, financial difficulties (Marzouk & El- Rasas, 2014) and Benin, financial incapability (Akogbe, Feng & Zhou, 2013).

Ghiasi, Kaivan, Arzani and Arzani (2016) identified fifteen delay causes after prioritising the various delay factors. The delay causes they identified were; contractors stating wrong (low) bidding prices during tender, complex contracts, lack of preparation by the client before issuing a contract, little or no use of Project Portfolio Management, lack of supervision and regular reports, lack of punitive clauses in the contract, inaccurate estimation of project cost by client, inexperienced contractors, insufficient knowledge on the technicalities involved on the project, weak project management implementation, poor research during the project's initiation stage, selecting contractors of the basis of "favouritism" instead of "capabilities", consulting unqualified personnel in various technical areas leading to the implementation of a weak project design, lack of labour and resources and lack of regular monitoring and evaluation.

Zidane and Anderson (2018) identified ten most important common causes of delay in the construction industry and ranked them universally. They were changes in project design during execution, payment delays, poor planning, lack of frequent supervision, poor project design, lack of contractor experience, difficulty in financing a project by the contractor, client's financial constraints, shortage of labour, equipment and materials and lack of requisite skills leading to low productivity. Arantes and Ferreira (2020) after using the relative importance index to rank delay factors revealed that the most important causes namely wrong timing of decision-making, changes in client's orders, ambiguous schedules and project requirements, contractor's difficulty in financing the project and wrong estimates for bidding and awarding

contracts corresponded to the universally ranked delay causes in Zidane and Anderson (2018)'s study.

Karami and Olatunyi (2020) classified delay causes in marine projects into sixteen themes which are; financial related, client-contractor related, organisational structure, delay in projects approval, construction strategies, unpredictable environmental factors, safety, management procedures, communication and regulations, client's inflexible structure, marine equipment, complex resources, design and construction, poor planning and politics and culture. Prasad *et al*. (2019) found that, even though there are no significant difference between the delay causes of design-build (DB) and design-bid-build (DBB) projects, the following were highly ranked as critical causes of delay in their study. They are; financial difficulties, delays in claims settlement, contractor's difficulty in financing the project, irregularities in payment for modifications made by the client, delay in subcontractors' payments, scope variations during project execution and changes in project design.

El-Rasas and Marzouk (2020) stated that the contractor and the client or owner have different views and opinions concerning the causes of delay in a project. The owners or clients responded that, critical factors that affect delay are little or no experience on the part of the contractor, ineffective project site management and supervision, poor project planning and scheduling and the use of wrong construction techniques by the contractor. The contractors also revealed that, modification of client's orders with respect to the project scope, irregularities in payment and delay in documents approval and review by the client are more critical to cause delay in projects.

After systematically reviewing various literature on Construction Projects Delays (CPDs), Durdyev and Hosseini (2018) stated unfavourable weather conditions, poor communication, lack of coordination and conflict among stakeholders, improper planning, shortage and increase in price of construction materials, insufficient finances, shortage of machinery and lack of skilled personnel to operate on these machinery, inexperienced labour and poor site management as the causes of CPDs.

Scope Failure (Creep)

Generally, most projects begin without the stakeholders agreeing on the scope to be used (Saeed, 2009). Scope changes are constant in projects, but are acceptable because both parties are aware of the changes been made and approval is given by the client to initiate the necessary changes (Newton, 2015). Scope creep occurs when one party is not aware of the changes, when there is no agreement by any of the parties or when there is no acceptance or review of potential impacts (Amoatey & Anson, 2017). Scope creep was defined as the extension of a project which in turn changes its planned expectations (Freshman-Caffrey, 2014) or a term used to explain the gradual process where stakeholders realise what they want (Helms, 2012) or the uncontrolled changes in the project's deliverables that extends its scope without adjusting its cost or schedule (Amoatey & Anson, 2017).

Gurlen (2013) also argued that project team members in order to ensure improvement or perfection of a situation end up changing the scope of a project. Changing of the project requirements by the client in terms of modifying, adding or omitting parts of the initial scope can cause project failure (Kermansachi, 2016). Scope changes can be in the form of scope

reduction. Scope reduction is where some activities or deliverables are omitted or minimized in a manner that is acceptable to the client (Saeed, 2009).

Liu, Chen, Chen and Sheu (2011) and Damoah and Akwei (2017) in their studies found that government projects in developing countries mostly fail because of scope creep. Scope creep is a universal phenomenon associated with projects in the construction industry (Prasad *et al*., 2019). They went on to explain that, anytime there are variations in the scope of a projects, contractors are expected to work effectively and efficiently to meet their deadlines and clients are also required to provide the necessary resources to augment these changes. Effective and proper communication should be used to ensure that every information is disseminated to the right people at the right time. Braganca, Vieira and Andrade (2014) suggested that, the earlier a change is implemented on a project, the lower its impact on the project in the long run.

Amoatey and Anson (2017) indicated that the most critical causes of scope creep are client changes, unclear scope and unforeseen risks. In their study, scope creep was measured in terms of economic situation, changes initiated by the clients, new law, new ideas during project execution, unforeseen risk, new technology and unclear scope. Turk (2010) described in his study that inaccurate and ambiguous product delivery requirements was the cause of scope creep in projects and Clark (2014) supported this in his findings that misunderstanding projects requirements leads to scope creep. Hussain (2012) stated the common causes of scope creep in projects were defining the scope of a project without stakeholder consultations and ignoring the various “red flags” on the project that could lead to scope creep. Scope

creep can be said to affect the liability, reputation and profitability of firms (Lamont, 2013).

Chapter Summary

This chapter reviewed numerous existing literatures that relate to project failure in the road construction industry. Theoretical review of the systems theory was done to link it to road construction project failure. An empirical review on the concept project failure and causes of project failure was performed. The chapter concludes with the conceptual framework that underlines the research. It looks at the elements in the iron triangle (that is cost, time and scope) and how they come together as a whole to consist of project failure.

CHAPTER THREE

RESEARCH METHODS

Introduction

This study aims to understand the various causes of road project failure in Ghana with respect to the elements in the iron triangle in project management (thus, cost, time and scope) by collecting responses from the various players in the road construction industry. This chapter brings to light the research design used, the study area, the population, sampling procedure, the data collection instrument, the data collection procedures that was employed, the data processing and analysis used and a summary of the whole chapter.

Research Design

The research approach employed is the qualitative research approach together with the exploratory research design to gain a deeper understanding of the perceptions of people regarding project failures in the road construction industry. Creswell (2009) viewed qualitative research as one that gives room for innovations and allows flexibility since the researcher to operate within his or her self-developed frameworks. To acquire a new understanding and verification of a phenomenon or to explore the research subject, it is more appropriate to adopt the qualitative research approach (Agyekum-Mensah & Knight, 2017). Dainty (2008) also encourages the application of exploratory research design to gain in-depth understanding of social phenomena.

The study is the phenomenology type of qualitative research where the researcher makes inquiries about the description of a phenomenon according to the participant's various multiple experiences (Creswell, 2009; Eatough,

2013; Jackson, Vaughan & Brown, 2018). Phenomenology is the study of phenomena in the exact nature in which it reveals itself in our daily life ("Phenomenology and narrative analysis," 2017). Vagle (2014) suggested that phenomena occur just because of our existence in the world. The purpose of phenomenological study is for the researcher to understand the meaning of the experiences of participants concerning the phenomenon under study (Christensen, Johnson & Turner, 2010). Through phenomenology, the researcher gains more experience while understanding the phenomenon under study (Spinelli, 2005) because emphasis is placed on the thoughts, feelings and lived experiences of these respondents.

In phenomenology studies, a relatively smaller number of subjects are taken through a rigorous process to help develop meaningful patterns and relationships in relation to the phenomenology in question (Moustakas, 1994). The social constructivism paradigm was used since it is associated with the qualitative research design (Neuman, 2000; Guba & Lincoln, 2005; Schwandt, 2007). The social constructivism paradigm is of the view that human beings tend to make understanding out of the world in which they operate by developing varied and multiple subjective meanings of their experiences (Creswell, 2009). The researcher is interested in the dynamics, variation and complexity of the views of the participants. Broad open-ended questions were asked and the researcher listened attentively to the how the respondents make their constructions of responses.

Social constructivists believe that the interpretation given by these participants is shaped and influenced by the context or settings in which they find themselves. For instance, the responses the contractors gave was different

from what the official gave. Even in terms of how they explained the causes of project failure and its impact on their businesses, contractors who hire labour on a daily basis responded differently from those who had permanent labour.

Some researchers in their studies on project failure considered the use of qualitative research. Chidambaram and Potty (2014) made use of qualitative analysis to draw conclusions in their study "Qualitative Analysis of Time Delay and Cost Overrun in Multiple Design and Build Projects". Agyekum-Mensah and Knight (2017) with the use of qualitative research explored the perception of professionals on the issue of delay in the construction industry because that area was a little considered. Robson (2011) advised that phenomenon, like "delay", is a real-world problem and it is best to question those involved in the project. Hence, this arose to the need as to why this work employed the use of qualitative data to ask about the live experiences of the people involved in road projects in Ghana.

Study Area

The location of the study is Ghana. Ghana is located in West Africa and is noted to be one of the fast-growing developing country in the continent because of the policies put in place by the government to improve the economy. It is made up of various industries such as the construction industry, the mining industry and others which work interdependently to ensure that their various objectives are met. The construction industry concentrates on the provision of buildings, road, groundwater, and many others. The Ghanaian construction industry faces a lot of challenges such as delay and cost overrun which impacts the economy and society negatively (Amoatey & Ankrah, 2017). The road construction industry through various agencies such as the

Ministry of Roads and Highways, Ghana Highway Authority, Department of Urban Roads and the Department of Feeder Roads is responsible for the planning, developing, and maintaining (trunk, community and city) roads in Ghana to improve the socio-economic status of its citizens. The condition of roads in the country determines the length of travel time and the degree of regional integration in the country. According to Ghana Highway Authority (2014) the condition of roads in the country was stated to be 52% good, 39% fair and 9% poor. The Authority aims at accomplishing its milestone of reaching 70% good, 20% fair and 10% bad roads by involving the 10 regional offices in the tasks to aid in easy implementation and supervision of road construction.

Population

In this study, the population consist of key players in the road construction industry that is project managers, contractors and officials of the Ghana Highway Authority. According to the Development Projects report of the Ghana Highway Authority, the regional demarcation of road projects status (list of projects awarded from 2008 to 2019 and have passed their completion date) as at 31st December 2019 was demarcated into regions. Table 1 shows the regional demarcation of the status of road projects.

Table 1: Regional Demarcation of Project Status

Region	Number of projects	Number of Contractors
Greater Accra	13	9
Volta	12	11
Northern	11	5
Upper West	8	2
Ashanti	8	5
Western	7	6
Eastern	4	3
Central	3	3
Brong-Ahafo	3	2
Upper East	2	2
Total	71	48

Source: Ghana Highway Authority (2019)

The respondents are the project managers, contractors and officials from the Ghana Highway Authority who worked on these 71 failed projects. The population is mainly a male dominated field with few women. About 90% of the population have their first degree and about 10% have their master's degree. Their ages ranged from 30 to 62. Forty-eight construction firms were awarded contract to work on the listed projects (71 failed projects) and each firm had a project manager or other workers playing the role as a project manager on the project and at least 2 officials from the Ghana Highway Authority Regional Offices who supervised the projects at the regional level. Therefore, the estimated population size for this study were 48 contractors, 48 project managers and 20 officials from the Ghana Highway Authority.

The accessible population reflects the characteristics of the target population in terms of age (the age range for the accessible population ranged from 30 to 51), sex (majority of them were males), education (most of them

had their first degree with a few with a master's degree) and they were drawn from the three categories, namely contractors, project managers and Ghana Highway Authority Officials. The limitations were that those who were unwilling to participate in the study were removed and those who were unavailable during the time of data collection were eliminated.

Sampling Procedure

Patton (2002) observed that, in qualitative research, emphasis is based on specific subjects because they have very rich information to offer. Purposeful sampling was used to select the specific road projects based on the criteria of been "failed" in order to inform the researcher a clear understanding of the research problem to be addressed (Creswell, 2007) after which the Convenience sampling was used to select participants for this study and it entails selecting respondents who are near and continuing with this selection process until the desired sample size is obtained (Cohen, Manion & Morrison, 2007).

Dukes (1984) and Polkinghorne (1995) (as cited in Creswell, 2007) suggested 3 to 10 and 5 to 25 participants for any phenomenology studies respectively. According to "Phenomenology and narrative analysis" (2017), the required sample size for phenomenology studies ranges from 2 to 25. These recommendations were in line with helping the researcher estimate the desired sample size, but the required participants depended on when the data got saturated.

In this study, Polkinghorne's suggestion on sample size was considered. Therefore, 25 participants were chosen from the population (various regions) through convenience sampling, which comprised 10 project

managers, 10 contractors and 5 Officials from the Ghana Highway Authority. The data collection was paused when the researcher realised that the data had been saturated. Data saturation is where, after comparing, the data collected revealed that no new pattern has emerged (Flick, 2003; Charmaz, 2006). Arthur and Adom (2019) stated that it is acceptable to halt the data collection process if the researcher notices that there is no identification of new themes.

A breakdown of the composition of the sample can be seen in Table 2.

Table 2: Composition of Selected Sample

Category	Population	Sample selected
Ghana Highway Officials	20	5
Project Managers	48	10
Contractors	48	10

Source: Field survey (2020)

Data Collection Instrument

The study exclusively made use of primary data. The data was collected using an interview guide constructed by the researcher in line with the research objectives. The Sections of Items in the Document were namely Section A: Project Failure and Section B: Demographics. Section A was applicable all the respondents and required them to provide responses on road project failure questions while Section B focused on the demographics of the respondents.

Validity and Reliability

Sim and Wright (2000) highlighted that differences exist in the implication and emphasis of validity and reliability issues in qualitative and

quantitative data. In qualitative research, reliability focuses on the level of dependability and consistency while validity refers to the extent to which the study's findings have been judged to be correctly interpreted (Golafshani, 2003). Seale (1999) (as cited in Golafshani 2003) argued that, trustworthiness should be examined to ensure reliability in research. Creswell (2014) described validity in qualitative research as employing certain activities to check how accurate the findings are and reliability in qualitative research as how consistent the approach used is in line with that of various studies and researchers. Kuiken and Miall (2001) listed congruence, distinctiveness and richness as a means of ensuring reliability and validity in qualitative studies. He went further to explain distinctiveness as the degree to which the phenomena are distinguished or differentiated from others, coherence as the degree to which various judgements about the interpretation of the data is consistent and richness as the degree to which the research extensively addresses the phenomena under study. Creswell and Miller (2000) also addressed validity in qualitative research using terminologies such as trustworthiness, authenticity and credibility. This study adopted Creswell (2014) most frequently used strategies that are done to ensure validity in qualitative research. It includes:

Triangulation. This is the use of different data sources in order to establish a concrete justification for the themes. This process can be claimed as the basis for ensuring validity if only the themes were developed from several sources. This study sought for responses from varying sources, that is project managers, contractors and officials from the Ghana Highway Authority and the themes used in this study evolved from their various responses.

Member checking. This is when a follow-up interview is done by going back to the respondents with the semi-finished product or the major findings of the themes to the participants. This is a form of cross-checking by the respondents to verify if these descriptions of the phenomenon are accurate as they said. The researcher reached out to some of the officials of the Ghana Highway Authority to authenticate some of the themes developed from their responses.

Prolonging time on the field. If time is spent on the field to collect information is extended, the researcher properly gains a deep understanding of the phenomenon under study, that is "project failure". Also, adequate details about the work settings can be gained to help in narration. The more experiences the researcher gains, the more valid the study becomes.

Consulting the services of an external reviewer. The reviewer should be an independent person who is not familiar with the study or the researcher. The auditor or reviewer asks questions and makes suggestions after checking the link between the research questions and the data collected, the analysis process from raw data to its interpretation and the level of accuracy of the transcribed data.

To ensure reliability in this qualitative research, one of Gibbs (2007) suggested techniques to ensure reliability was used. It suggests that a thorough check of the transcribed data should be done to make sure they are free from errors. Bracketing was also used as a means of ensuring validity and reliability in my study. Bracketing has been described as keeping an open mind about the context by setting aside any preconceived idea, opinions, perceptions and thoughts about the phenomenon (Gearing, 2004; Todres & Holloway, 2010;

Van Manen, 2014). This was done by focusing solely on the respondent's view of the phenomenon "project failure", recording and transcribing the interviews wholly and seeking validation of the various themes by the respondents.

Pre-test

The main aim of the pretest was to authenticate the validity and reliability of the research instrument. The instrument was pre-tested on two officials from the Ghana Highway Authority, two project managers and one contractor. The officials of the Ghana Highway Authority were both from the Accra Regional Office while the project managers and contractor had worked on road projects in the Central, Greater Accra and Eastern Regions. After the pre-testing, the researcher realized that some questions in the interview guide had to be changed before data collection.

Some questions were deleted, modified and added to arrive at the final interview guide for data collection. Those who were involved in the pre-test were excluded from the data collection for the main study.

Ethical Consideration

Approval was given by the Institutional Review Board of the University after ethically clearing the research. Also, anonymity was ensured by assigning codes (alphanumeric characteristics) to the respondents. Confidentiality was assured since the information received from the respondents was protected and the identity of the participants were not revealed in any reports. The information recorded was considered confidential, and no one had access to the information documented during the interview.

Data Collection Procedures

An in-depth interview was conducted to elicit responses from participants. Interviews are used as a primary tool in qualitative data collection since the researcher is able to focus on how the respondents express themselves when telling their stories (Skhedi, 2019). Interview is the fundamental means to collect information on the lived experiences of respondents in phenomenological studies (Giorgi, 2009; Jackson *et al*., 2018). Also, interview was more appropriate to use because it assists in the case where there is the need to probe further to get a clearer response (Cohen *et al*., 2003). According to Agyekum-Mensah and Knight (2017), interviews are conducted with the intention of exploring both the comparative and contrasting views of the respondents concerning a phenomenon and to obtain a general overview of a phenomena.

The interview lasted between 30 to 90 minutes and it took place at the various workplaces of the respondents and the whole data was collected for 3 weeks by the researcher from 29th July 2020 to 14th August 2020. The participants were interviewed during the day (mornings and afternoons, depending on the time favourable to the participants) within their working hours. A tape recorder was used to record the respondents after permission was sought from the respondents. Some problems the researcher encountered were the unwillingness of some of the members of the sample to participate in the study, and some members of the sample too were not at post during the data collection period, because they had other projects to manage or supervise. Others claimed they were busy and did not have time to spare. Those who

were willing to be interviewed also disagreed to be recorded. The researcher then had to resort to writing their responses in the form of field notes.

Data Processing and Analysis

This phenomenological study employed the analysis of statements to generate meaningful units toward the development of an essence description (Creswell,2009). It is during data analysis that the collected data was sorted by virtue of category or chronology by repeatedly reviewing the data to be coded. Thematic Analysis was used as a tool to analyse the data collected in this study. It is the process of identifying themes or patterns found in a qualitative data (Maguire & Delahunt, 2017). Thematic Analysis was used as a data interpretation tool because it has the ability to diagnose and identify the various variables that affects the phenomenon under study "project failure" as described by the respondents (Alhojailan, 2012).

This analytical tool assists in coding and categorisation (the data is categorised into themes). Braun and Clarke (2006) emphasised that "thematic analysis" should include coding, categorisation and have themes arranged in a meaningful order. Alhojailan (2012) stated that it is acceptable to manually analyse data rather than depending on software-based tools such as NVivo but went on to argue that the manual method should not be used always.

Thematic Analysis has the advantages of being an easy to grasp and quick to learn tool because there are few guidelines to adhere to and it is more flexible to use even though the researcher is compelled to use well-structured techniques to analyse the data to produce a well organised report (Nowell, Norris, White & Moules, 2017). There are two levels of themes in Thematic Analysis namely; semantic and latent themes. Braun and Clarke (2006)

brought out differences between these two levels of themes. According to them, semantic themes are those themes that are produced after making meanings from exactly what the respondents said and latent themes are those that are produced focusing on theories and pre-existing literature. There are many laid down steps and phases in relation to how to analyse qualitative data using Thematic Analysis. Miles and Hubberman (1994) presented a model to be used for thematic analysis of qualitative data.

The first step in this model was data reduction. After the data is collected, it is summarised, paraphrased and organised so that drawing and verifying of conclusions will be made easy. This is the stage where coding is done to serve as a link to the various parts of the data. The data is organised and further analysed thoroughly word by word to describe themes.

The next step was to display the data. The data is displayed to ensure uniformity in the arrangement and organisation of the themes. It comes right after data reduction because it complements it. Halldorson (2009) stated 3 benefits of displaying of data that it projects the data more clearly, prevents overloading during the analysis process and makes meaningful sense by showcasing patterned concepts from various response. Yang and Wei (2010) stated that data can be displayed in the form of tables, charts, graphs, figures, narrations, and maps.

The last stage is the drawing and validating of conclusions. Drawing of conclusions is based on the data displayed from the previous phase. To draw conclusions, it requires the generation of ideas which includes: categorisation of interrelated information, identifications of the connection among the factors and variables, notation of similar or contrasting pattern or themes and

developing coherence and consistency among the concepts to ensure a proper validation of the findings to fit the theoretical framework perfectly.

For this study, the data analysis was conducted in accordance with the steps Creswell (2014) outlined in his book "Research Designs; Qualitative, Quantitative and Mixed Method Approaches". The Steps are outlined as follows:

Step 1: The organisation and preparation of the data collected to be analysed. It includes the transcription of all the interviews and typing the field notes taken. With this study, from the interviews conducted, some participants allowed themselves to be recorded and those were transcribed but the researcher took interview notes of those who did not allow themselves to be recorded after which these notes were typed. After which they were arranged and sorted into their various sources.

Step 2: Reading through the data to acquire a general sense of what the information about. Reading thoroughly will help in understanding the tone used and the various perception of the participants. The researcher reflected on the general overview of the data by considering the participant's thoughts to know how credible it is to be used for analysis.

Step3: Coding. Bogdan and Biklen (2003) (as cited in Creswell, 2014) described coding as the method or process of organising the collected data to ensure that all the materials related to a given data can be easily distinguished from other data. The codes are terms given to categories of sentences which have been organised into segments (Creswell & Creswell, 2018). With this step, the researcher placed the data collected into consideration and arranged the various sentences into categories with a designated specific term. When

coding, the researcher developed codes that emerged after going through the data and also combined it with the codes that pre-existed in literature.

Step 4: After the coding process was done, the various specific terms was used to generate a description of the phenomenon under study and also create categories for analysis. The themes analysed by the researcher were used interconnectedly to form a general description of the phenomenon under study "project failure". The themes created were shaped by the researcher into a general description of the phenomenon. The codes in Step 3 were used to construct a description of the participants, their contexts and the themes to be analysed. Based on the evidence provided by the respondents, their diverse perceptions were connected to develop a description.

Step 5: A narrative passage which involves a detailed discussion of the several themes created in Step 4 was used in combination with tables, graphs, charts and others as support to convey the findings of the analysis. The narration consisted of a pattern of events and a vivid explanation of the themes.

Step 6: Interpretation. The meaning of the data was projected by either comparing the findings with already existing literature or any form of personal interpretation that arises from culture, history or experiences. The findings of the study were summarised, opinions concerning the study were discussed and the limitations related to the study were considered when interpreting the data. A comparison of the outcome or findings from the study to the systems theory and the chaos theory was done. The lessons learnt were compiled and used to interpret the lived experiences of the respondents.

Chapter Summary

For this Chapter, the research design which was used was explained in relation to the paradigms and approach underlying this study. Information concerning the population and a profile of the study are was provided together with the procedure used in sampling and data collection. This chapter also clarified the measures that were put in place during data processing and analysis. The limitations associated with this study were the difficulty in generalizing the findings of the study to other projects since only road projects were used and also some of the respondents refused to partake in the interview due to excuses, such as being busy.

Some of the respondents too did not agree to the idea of recording them during the interview for reasons they did not disclose so the researcher had to resort to taking notes from what they said. Due to the sensitive nature of some information, some respondents were unwilling to disclose such information. Most of these contractors, project managers and Ghana Highway Authority Officials were unavailable because they were on-site managing or supervising other road projects.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This qualitative study, which is purely a phenomenological study, aimed at exploring project failure in the road construction industry in Ghana by specifically focusing on the "time", "cost" and "scope" constraints of the projects. The research approach employed was the qualitative research approach together with the exploratory research design to gain a deeper understanding of the perceptions of people regarding project failures in the road construction industry. The social constructivism paradigm was employed in this study because the researcher believed that the interpretation given by these participants is shaped and influenced by the context or settings in which they find themselves.

Thematic Analysis was used as the analytical tool to analyse the data collected in this study and it was done with reference to the steps outlined by Creswell (2014). A total of ten out of the twenty-five sampled participants were used for this study and they consisted of three contractors, four project managers and three officials from the Ghana Highway Authority. This was because, some of them were unavailable because they were on-site managing or supervising other road projects and others were not willing to grant the interview. The convenience sampling technique was used in selecting these participants. Some interviews were recorded and interview notes were taken for the others. The recorded interviews were transcribed and the interview notes were typed.

This chapter presents the analysis and discussion of the results obtained from the interviews conducted with the contractors, project managers and Ghana Highway Officials. The first section presents a description of the participants used and their characteristics while the second section presents a presentation of the results from the transcribed data and typed interview notes, followed by discussion of the results based on the research objectives. The findings which emerged from the analysis were as a result of the identification of themes and codes from what the respondents said vividly and also what was pre-existing in literatures.

Description of Respondents

The ten respondents who participated in this study were drawn from various regions in Ghana. The Ghana Highway Officials were from the Central and Eastern regional offices, the contractors and project managers were from construction firms which worked on the "failed projects" in the Greater Accra, Volta, Western and Eastern regions. The construction industry in Ghana is a male-dominated field such that, a majority of the respondents were males. They were nine males and one female. Table 3 gives a clear explanation of the background information of the participants in this study.

Table 3: Background Information of Respondents

Classification of Respondent.	Participant's Assigned Code.	Gender	Age	Region	Highest Level of Education	Overall Work Experience	Years of Experience in Current Position
GHANA	GHA 1	Male	35	Eastern	Degree	10 years	3 years
HIGHWAY	GHA 2	Male	48	Central	Masters	20 years	5 years
OFFICIALS	GHA 3	Male	32	Central	Degree	7 years	7 months
	PM 1	Female	30	Greater-Accra	Degree	6 years	1 year, 2 months
PROJECT	PM 2	Male	33	Western	Degree	8 years	3 years
MANAGERS	PM 3	Male	32	Eastern	Masters	5 years	1 year
	PM 4	Male	39	Volta	Degree	14 years	6 years
CONTRACTORS	C1	Male	51	Greater-Accra	Degree	23 years	23 years
	C2	Male	45	Eastern	Degree	15 years	15 years
	C3	Male	36	Western	Degree	6 years	6 years

Source: Field survey (2020)

Presentation of Results

The analysis of the main results is presented according to the research questions stated in Chapter one of this study. The various responses were compiled and categorised under main themes from the research questions.

Perception on the Determinants of Cost Failure (Cost Overrun)

The first research question required the participants to describe their views on the various determinants of cost overruns in the project that they supervised or managed. They listed some determinants as the causes of cost failure of which excerpts from what they stated were used as themes to better explain their perception on the determinants of cost failure (overrun) properly and clearly.

To begin with, lack of resources was mentioned by most of the respondents as the predominant cause of cost overrun. In explaining the theme, some respondents (GHA 3 and C 2) highlighted limitations with human resource as a factor that contributed to cost overruns. This was evident in the use of phrases such as "*unavailability of skilled persons*" and "*difficulty in getting labour to hire*". In addition, another respondent emphasized that, unavailability of operational resources such as "*logistics*" also led to cost overrun and some respondents (GHA 1, C2, GHA 2, C1) also made reference to the issue of financial resource. They explained cost overruns in terms of "*delay in release of funds", "unavailability of funds to finance a project on the part of contractors"* and *"irregularities in payment"*.

GHA 2 went ahead to argue that due to the competitive nature of the tendering process, most "*Contractors state that they have enough funds or reliable bankers to loan them the contract sum to be used to finance the*

project when it is not so". According to the respondents, lack of resources as mentioned above are associated with some implications which threatens the ability of the project to be completed within the planned or anticipated budget. Some of these implications of the theme include; "*lack of frequent visual inspection or supervision at the project sites*" (GHA 3), "*accruing of interest on contract sum"* (GHA 1) and *abandonment of project by contractors to focus on others*" (C 1, GHA 2). Therefore, C2 suggested that *"contractors should employ labourers on a permanent basis and they will always have workers available for their projects"*.

The next theme that was mentioned was inadequate skills. Three respondents (that is, GHA 1, GHA2 and PM4) described their perception on this determinant of cost failure. While one respondent, GHA 2, argued that cost overrun is caused by the inadequate skills on the part of *"technicians such as quantity surveyors and safety officers",* PM 4 related inadequate skills to the presence of unqualified *"project managers"* as project team members. Another respondent (GHA 1), explained that *"both project managers and contractors"* should possess the requisite skills to ensure project success. This is because, one respondent perceived that technicians who have inadequate skills to execute a project will lead to their *"inability to supervise the project to find out the necessary faults and propose appropriate remedies for the ongoing project"* (GHA2). To another, when the project manager possesses inadequate skills, *"he or she is bound to overspend and will cause an increase in the cost of the project"* (PM 4).

It could be incurred from the respondents that change is inevitable in a project and thus, it is highly required of these project managers and

contractors in charge to possess the necessary skills. Thus, GHA 1 highlighted that, the project manager or contractor would not be able to make the necessary "*modifications and will not be able to identify and initiate those changes at an early stage in the project plan"* because of the inadequate skills they possess.

The third theme was price fluctuations of road construction materials. Two respondents, that is PM3 and C1 described their thoughts on price fluctuations of road construction materials. Construction materials are prone to price fluctuations because of the persistent rise in the price of goods and services in the country. Specific construction materials that experience price fluctuations are "*bitumen, chippings and labour"* as emphasised by PM3 and *"machinery and equipment"* (C1). These materials are directly linked to products such that, an increase in these products will lead to an increase in the construction materials.

For example, "*an increase in electricity tariffs will lead to an increase in the price of chippings, an increase in the price of petroleum products will lead to an increase in the price of bitumen and an increase in the minimum wage rate will also cause an increase in the cost of labour*" (PM 3). Also, *"any fluctuations in exchange rates as a result of inflation affects the price of imported machinery and equipment"* (C 1).

Perception on the Determinants of Time Failure (Delay)

The second research question was aimed at seeking the participants' views, perception and thoughts on the various determinants of delay (time overrun) in the project that they supervised or managed. They listed many determinants as the causes of time failure of which excerpts from what they

stated were used as themes to better explain the determinants of delay (time overrun) properly and clearly.

First theme that was described by some of the participants (namely, GHA 2, C 1, C 3 and C 2) were financial constraints. Financial constraints that could lead to time failure manifested in the form of *"lack of payments by government"* (GHA 2), *"lack of funds on the part of the contractor"* (C 1), *"paused payments by project sponsor"* (C 3) and *"non-payments"* (C 2). To describe the implications that financial constraints has on time failure, the following phrases were used by the respondents. One of the respondents mentioned that, financial constraints *"hinders the smooth running of the project"*, to another, financial constraints *"makes it difficult for the contractor to plough back his or her profit hence making him or her unable to pay the labour cost hence abandonment of project"*. With the issue of project abandonment, one respondent gave some clarifications that, *"the number of days of non-payment equals the number of days of project delay"* (C 3).

The next determinant as explained by some participants was unfavourable environmental conditions. Road projects are subjected to all the uncertainties that the environment offers due to the nature of the road projects. These environmental uncertainties could be in the form of "*rains"* (PM 1, C 3, C 3) or *"unforeseen situations such as the nature of the land (sinking sand)"* (GHA 3). The respondents described how the duration of the road project is affected because of these unfavourable uncertainties. One of the respondents mentioned that "*all project activities cease; some completed areas are depleted by the rains and some construction equipment are destroyed by the rains"*. In addition, another explained that the *"project performance is*

affected; hence number of non-working days equals the number of days the project will be behind schedule or payment of labour cost even when there's non-performance" (C 3). These environmental conditions are natural, unplanned and unexpected hence it implies that *"there will be a difficulty proceeding with work"* as mentioned by another respondent.

Some comparisons were made by the participants to explain their dissatisfaction and preference because of the effect of these unfavourable uncertainties on the project schedule. One respondent mentioned that, *"the dry season (harmattan and sunny weather) was more preferable because it rather helps speed up the drying rate"*. Also, he will choose "*contract (by day) to permanent labour"* because in the instance where it rains, no payment will be made when dealing with the contract labour since they are only paid when they are done working for the day but permanent labourers will receive their pay at the end of the month whether they worked or not.

To deal with these unexpected environmental conditions, the respondents gave details as to how they respond to these unplanned conditions. The respondent who mentioned "sinking sands and other natural land uncertainties" argued that he chooses to *"halt work and find possible alternatives to construct the road"* which means that he goes back to re-plan what was anticipated before the execution of the project and comes back to work according to the new plan. Another respondent also stated that, to reduce labour cost during these unfavourable environmental circumstances, he *"reaches an agreement with the labourers to reduce their salaries when the condition stays longer"* (C 3).

The least mentioned determinant as described by the participants was bureaucracy. 2 of the participants (PM 2 and C 3) mentioned it as the cause of time failure in the road projects they supervised. These respondents in their explanation of bureaucracy agreed that, it as when the *"processes and procedures involved in acquiring approvals or permits takes a long time to be responded to*". One respondent went further to state in his submission that, *"whether you need an immediate response or not, the approval will take months and it is only evident in public projects*". To deal with the issue of bureaucracy in projects, one of the respondents went further to explain that, most of these project managers factor the delay in terms of bureaucracy in the project duration but still, *"the approval will take longer than as factored"*.

Perception on the Determinants of Scope Failure

Scope failure has been cited as one of the determinants of project failure. The third research question aimed at providing a description of the participants' views on the various determinants of scope failure in the project that they supervised or managed. They listed many determinants in their interview as causes of scope failure of which excerpts were extracted from what they stated and were used as themes to better explain the determinants of scope failure properly and clearly. Few of the participants made reference to scope failure and this revealed that most of them did not find scope as an issue.

The first determinant that was mentioned was unrealistic scope. Only two participants mentioned this determinant with relation to scope failure with one participant (GHA 1) giving clarification to some statements made by the two participants. In explaining the theme "unrealistic scope", one of the

respondents stated that, it is when *"the approved project activities do not match with the approved cost and duration"*. Furthermore, the other respondent described unrealistic scope as when *"there is an inconsistency in the planned scope and the reality on the ground such that the deliverables are non-existent"*. For the project to achieve its goals, it is suggested that, to deal with non-existent deliverables, project scopes are modified to suit the circumstances involved. The modifications could be in the form of change in location, change in project size or a change in the project's job description. A respondent mentioned that, modifications in non-existent deliverables could be in the form of, *"changing a road project with the scope of resurfacing of roads could be to pothole fixing if the said road requires pothole fixing instead of resurfacing"*.

Moreover, to seek clarification on the submissions made by the contractors, the researcher asked the officials from the Ghana Highway Authority the reason some project scope includes deliverables that are non-existent. GHA 1 explained that, "*Every road has an estimated life span according to the road's design. In the life span of a project, it is required that maintenance should be done regularly. The maintenance could be in the form of pothole fixing or resurfacing. Timelines for maintenance are scheduled per the nature of the road and if the timeline is due, we award the contract to a contractor with the assumption that the road might have developed those faults."*

The other determinant to be named was political interference. Road projects like other social interventions are implemented according to the recommendations of consultants or specialists to serve as a solution to the

problem of these community members. Only one respondent (GHA 1) made reference to this theme as a determinant of scope failure. He mentioned that, *"politicians would prefer that roads are constructed using different routes for his or her gains hence the roads are changed to be constructed according to the politician's preference".* Therefore, GHA 1 went ahead to propose a suggestion that: *"necessary efforts should be put in place to ensure a proper balance of the politician's preference, the end-user's need and the objectives of the Ghana Highway Authority".*

Poor planning was also mentioned as a determinant of scope failure by only one respondent (PM 3). PM 3 related poor planning to be the cause of scope failure because only poor preparations will cause changes in already planned project scopes. According to this respondent, if a project is planned poorly, it implies that, *"until an effective and thorough planning is done, the scope will be change and modified and this will affect both duration and costs of the project"*

Discussion of Results

This section gives an account of what happened in the work by restating the findings and evaluating them by comparing them to the findings present in already existing literature.

Findings Associated with the Perception on the Determinants of Cost Failure (Overrun)

The findings associated with the determinants of cost failure (overrun) were classified into themes for a better understanding of the results. For research question one, three themes emerged. They were lack of resources, inadequate skills and price fluctuations of construction materials.

Lack of resources was the first determinant to be mentioned. Even though resources are limited, a good manager would be able to make use of the existing few ones to deliver the project smoothly. It can be implied that most of these resources were not available because they were scarce in the market and these resources range from skilled labour to equipment and materials (Kermanshachi, Dao Shane & Anderson, 2017; Mamman & Omozokpia, 2014 and Panova & Hilletofth, 2018). The lack of financial resource factor run through almost all the responses of the contractors and project managers which implies that most of these construction firms experience delay in payments and withholding of funds which results in problems with harsh cash-flow problems.

Lack of financial resources could be as a result of delays in monthly payment to contractors and delays or irregularities in payments to contractors (Chileshe & Berko, 2010; Famiyeh *et al*., 2016). The divergent view that GHA 2 had concerning lack of financial resource may imply that, even though the contractor knew that he had difficulty in financing the project, the contractor's failure to remain truthful when bidding because of his or her quest to win the contract will see them end up abandoning the projects that they claimed they had enough funds to complete it which obviously resulted in consequences of cost overrun (Prasad, Vasugi, Venkatesan & Nikhil, 2019; Zidane & Anderson, 2018).

Inadequate skills were mentioned as the next determinant of cost failure. This implies that the determinant could be as a result of a technical mistake made by any of the project members that resulted in incurring additional cost on the project (Amadi & Higham, 2017) or probably, the

project manager exhibited poor project management skills which could have been avoided if an experienced and competent project manager was selected for the project (Amponsah, 2010). Another implication might be that incompetent team members were used for these projects to help cut cost since professionals are expensive to be employed but they help in the smooth delivery of these projects. These incompetent ones will end up exhibiting little or no skills beneficial to the delivery of the project and this is going to cost the project more harm than the good intended. This implication is in relation to the works of Anthony and Gupta (2017), Attarzadeh and Ow (2008) and Iyer and Jha (2005) who listed incompetent project team, human factors such as lack of project manager's skills and project manager's incompetence as causes of project failure respectively.

Price fluctuations of construction materials. This could imply that due to the development of taste for foreign goods and the over-dependence on imported construction materials, contractors mostly import construction materials and these are subjected to inflation which is definitely going to increase the contract sum (Chileshe & Berko, 2010). Also, price fluctuations of construction materials could result in cost overrun since the price budgeted for the materials were increased at the time of purchase (Famiyeh *et al*., 2016; Ameh, Soyingbe & Odusani, 2010).

Cost failure was found to be the most severe such that it can cripple the whole project and could bring it to a standstill. Numerous studies, such as that of Aziz (2013), Damoah and Akwei (2017), Kaliba *et al*. (2009) and Pinto (2014), viewed cost failure (overrun) as a critical factor in causing project failure in developing countries. Olaniran *et al*. (2017) estimated that about

64% of projects under execution have already overrun its cost and this was due to the complex nature of the project (Fang *et al*., 2013) and the changing nature of the project's activities (Pehlivan & Oztemir, 2018). This relates to the participants thoughts and perceptions about the determinants of cost failure. They mostly made reference to the upper hand that cost has in depicting the failure of a project.

Even though other authors worked on the determinants of cost overrun, they arrived at different findings were different and contrasts that of this study. The determinants for cost overrun in this study were lack of resources, inadequate skills and price fluctuations of construction materials. Cantarelli, Flyvbjerg, Molin and van Wee (2010), in their study found that cost overrun was best explained in terms of political, technical, psychological and economic categories by attributing it to inaccurate cost estimation and inaccurate project viability rankings. Park and Papadopoulou (2012) also mentioned that site conditions (such as inadequate site planning, unfavorable weather conditions, poor drainage system and the geological structure), inaccuracy in estimating project cost, scope changes and incompetent subcontractors (mainly suppliers) can influence project cost overruns.

Other contrasting findings include those found in the studies of Asiedu and Adaku (2019), who found that change orders from clients in the form of omissions, variations or adjustments and additions in the project, unfavourable weather, poor working environment and ineffective project coordination among contracting parties caused cost overruns. El- Maaty, El-Kholy and Akal (2016) went ahead to list poor planning, inaccurate cost estimates, lack of frequent review of cost project during execution, ineffective communication,

inadequate research before bidding on the part of the contractor as the causes of cost overrun.

Findings Associated with the Perception on the Determinants of Time Overrun (Delay)

Three themes were associated with research question two, which states "What is the perception of key players in the road industry on the determinants of time failure?" The classified themes were financial constraints, unfavourable environmental conditions and bureaucracy which were found to be the determinants of time overrun (delay) in this study.

Financial Constraints. The participants gave varying responses about this particular theme according to how they felt "financial constraints" delay projects. This finding was seen to be as a result of financial incapability on the side of the client, problems with cashflows, non-payment by client, financial difficulties, contractor's difficulty in financing the project and financial incapability of the project sponsor (Prasad, Vasugi, Venkatesan & Nikhil, 2019; El-Maaty *et al*., 2016; Bagaya & Song, 2016; Zewdu, 2016; Marzouk & El- Rasas, 2014; Akogbe *et al*., 2013). This implies that, to prevent any delay on the road projects, the contract should include penalties to be borne by the party who caused the time overrun (delay) in order to ensure that projects are delivered on-time (Rezaee *et al*., 2019).

Unfavourable environmental conditions was the second theme that was described as a determinant of time failure in this study. Unpredictable environmental conditions, unconducive and harsh weather conditions were revealed to cause time failure (overrun) in road projects (Karami & Olatunyi,2020; Durdyev & Hosseini, 2018) which implies that its occurrence

will lead to a pause in the execution of the road project and hence, the reason for delay. This determinant, "unfavourable environmental conditions," which is a natural occurrence, should be considered, since it was not the fault of any of the project parties involved and; the clients should also extend the completion date in the case of any naturally occurring project delay.

Bureaucracy was also explained according to the description given by the participants. The bureaucratic nature of most organizations in the road construction industry especially the agencies in charge of supervising the road projects and the project sponsor (financier) were found to contribute to project time failure (overrun). This is because of the delay in documents approval and review by the client (El-Rasas & Marzouk, 2020) or a delay in the project design (Pham & Hadikusumo, 2014). Bureaucracy as a determinant of road projects construction failure might be as a result of the slow decision-making process (Arantes *et al*., 2015) or a delayal in the issuance of permits to begin the project (Famiyeh *et al*., 2016).

Some studies that were reviewed revealed findings that conflicted with that of this study such as the work of El-Rasas and Marzouk (2020). They stated that the contractor and the client or owner have different views and opinions concerning the causes of delay in a project. The owners or client's views conflicted with that of the findings in this study. The critical factors their study revealed were; little or no experience on the part of the contractor, ineffective project site management and supervision, poor project planning and scheduling and the use of wrong construction techniques by the contractor.

Zidane and Anderson (2018) also identified some important common causes of delay in the construction industry and ranked them universally. Even though they termed their findings as common, they were in contrast to the findings in this study. Their analysed findings were: changes in project design during execution, poor planning, lack of frequent supervision, poor project design, lack of contractor experience, shortage of labour, equipment and materials and lack of requisite skills leading to low productivity.

Arantes and Ferreira (2020) used the relative importance index to rank delay factors and it revealed that the most important causes were wrong timing of decision-making, changes in client's orders, ambiguous schedules and project requirements. These delay factors were not in correspondence with the identified determinants in this study. Another contrasting view is that of the study Ghiasi, Kaivan, Arzani and Arzani (2016). The delay causes they identified were: contractors stating wrong (low) bidding prices during tender, complex contracts, lack of preparation by the client before issuing a contract, little or no use of Project Portfolio Management, lack of supervision and regular reports, lack of punitive clauses in the contract, inaccurate estimation of project cost by client, inexperienced contractors, insufficient knowledge on the technicalities involved on the project, weak project management implementation, poor research during the project's initiation stage, selecting contractors of the basis of "favouritism" instead of "capabilities", consulting unqualified personnel in various technical areas leading to the implementation of a weak project design, lack of labour and resources and lack of regular monitoring and evaluation.

Even the comparisons of nations in terms of their predominant delay causes showed that, most countries had different delay causes than that of the identified findings in this study for Ghana. The countries with their corresponding diverging delay causes were: United States of America, excessive change orders (Tafazzoli & Shresta, 2017); Cambodia, shortage of construction materials (Durdyev, Omarov & Ismail, 2017); South Africa, strike actions by workers (Oshungade & Kruger, 2017); Botswana, improper planning by contractors (Adeyemi & Masalila, 2016); Rwanda, delayed payments (Amandin & Kule); Norway, changes in scope (Aarseth *et al*., 2016); Vietnam, delay in dissemination of information (Luu *et al*. 2015); India, inaccurate time and cost estimates (Mulla & Waghmare, 2015); Saudi Arabia, acquisition of lands (Elawi, Algahtany, Kashiwagi & Sullivan, 2015); Uganda, changes in scope (Muhwezi *et al*., 2014) and Pakistan, domestic issues (Gardezi, Manani & Gardezi, 2014).

Also, Mahamid *et al*. (2012) identified five severe delay causes. These five consisted of delay of progress payment by owner, shortage of equipment, political situation, awarding project contract to lowest bid price and segmentation of the West Bank and limited movement between areas all of which are in contrast with the delay factors findings in this study.

These studies from their findings classified the delay factors into labour related, design consultants related, contractor related and client related factors (Mpofu, Ochieng, Moobela & Pretorius, 2017); client-related, contractor-related and donor-related (Amoatey, 2017) and client-related, contractor-related and consultant-related factors (Frimpongs, Oluwoye &

Crawford, 2003; Mohamad *et al*., 2012 and Oyekoge & Al Kiyumi, 2017). These views contrasted to what was found in the delay factors of this study.

Findings Associated with the Perception on the Determinants of Scope Failure

After analysis of the data received, the themes developed with respect to the determinants of scope failure in this study were found to be unrealistic scope, political interference and poor planning.

The first theme to be most mentioned as the determinant of scope failure was Unrealistic scope. The common and most predominant cause of scope failure was noticed to be unrealistic scope. It can be implied that unrealistic scope was a result of not considering some unforeseen circumstances when developing the road project's scope, some of which include the current economic situation, new law, unforeseen risk and new technology (Amoatey & Anson, 2017). Another implication could be that an inaccurate and ambiguous product delivery requirement caused scope creep (failure) in road projects or the misunderstanding of the project's deliverables (Clark, 2014; Turk, 2010).

The next talked about theme was Political Interference. This determinant revealed how the activities of some politicians could lead to a modification in the already planned scope of the road project. This modification could be in the form of some additions and omissions to satisfy the politician's interest. Partisan politics and political interference dominated in government construction projects in Ghana (Damoah & Kumi, 2017). This implies that the influence from a politician is significant that it can cause changes in the whole project's scope with or without stakeholder consultations

or engagements. Politicians interfere with the contracting process even to the extent of directing the officials to select a particular contractor over the other because of the affiliations the contractor has with the politician (Lehne, Shapiro & Eynde, 2016).

Eja and Ramegowda (2019) concluded on political interference in the form of lack of continuity on the part of the sitting government in power. They went further to justify the actions of these political parties, that they abandon existing projects because of conflicts and sabotage. Hayat and Amaratunga (2014) mentioned that, political conditions have a positive impact on road construction and development but it appeared otherwise in this study. It would therefore be more appropriate if politicians should consider when and how they would interfere or meddle in the affairs of road project constructions.

The last theme to be stated as a determinant of scope failure was Poor Planning. The participants brought to light how an improper planning of the project scope can cause the project to experience scope failure. A project, when properly planned, takes into consideration every important detail and makes it difficult for any modifications to be made. Damoah and Kumi (2017) mentioned poor planning as a cause of government construction project failure in Ghana. Proper planning is essential to project success hence lack of skilful planning in terms of scheduling and estimation would cause project failure. This implies that the developer of the scope, that is, the client should plan properly and consult professionals to develop a clear and concise scope to avoid ambiguity and inconsistencies.

Other findings that were contrasting to that of this study were that of Hussain (2012), who identified the common causes of scope creep (failure) in

projects to be project scope definition without stakeholder consultations and ignoring the various "red flags" on the project that could lead to scope creep (failure). Gurlen (2013) also argued that project scope failure could be as a result of project team members in their quest to ensure improvement or perfection of a situation. Liu *et al*. (2011) and Damoah and Akwei (2017) in their studies found that government projects in developing countries mostly fail because of scope creep. Prasad *et al*. (2019) also suggested that scope failure was most severe by stating that "Scope failure is a universal phenomenon associated with projects in the construction industry". This was found otherwise in this study. The scope aspect of projects was least mentioned because the participants mentioned Scope has not really been the issue.

Chapter Summary

This chapter revealed the purpose of the study, a summary of the research method used, the sample used together with its characteristics, presentation of the results according to the study's research questions and a discussion of the key findings. The key findings in this study were in four parts. For part one, the findings on the determinants of cost failure (overrun) were unskilled project team members, unavailability of funds, irregular payment of funds and increased price of construction materials. Part two revealed financial constraints, unfavourable environmental conditions and bureaucracy as the determinants of time overrun (delay). Unrealistic scope, political interference and poor planning were the key findings in part three, while part four had cost failure (overrun) identified as the most severe amongst the three (cost failure, time failure and scope failure).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter contains a summary of the study, conclusions that were arrived based on the findings, recommendations on how to deal with the problem "project failure" and identification of suggestions of alternatives to be used in further research.

Summary

The main purpose of this study was to investigate project failure in the road construction industry in Ghana by placing emphasis on the cost, time and scope factors. It was guided by three research questions, which are the following:

4. What is the perception of key players in the road industry on the determinants of the cost failure (cost overrun)?
5. What is the perception of key players in the road industry on the determinants of time failure (delay)?
6. What is the perception of key players in the road industry on the determinants of scope failure (creep)?

The research methods employed were the qualitative research approach together with the exploratory research design to gain a deeper understanding of the perceptions of people regarding project failures in the road construction industry. The study was also the phenomenology type of qualitative research where the researcher made inquiries about the description of a phenomenon, "project failure" according to the various multiple experiences of the

participants (contractors, project managers and officials from the Ghana Highway Authority).

According to the research questions, the following results were revealed. Research question one sought to ask the participants of their views on the various determinants of cost overruns in the project that they supervised or managed. They listed some determinants as the causes of cost failure and they are: lack of resources, inadequate skills and price fluctuations of construction materials.

Research question two aimed at asking the participants of their views on the various determinants of delay (time overrun) in the project that they supervised or managed. They listed determinants such as financial constraints, unfavourable environmental conditions and bureaucracy the causes of time failure in road projects.

Research question three sought to ask the participants of the underlying causes of scope failure. The determinants they identified fell under the following: unrealistic scope, political interference and poor planning.

Conclusions

Road project failure occurs when a road project is unable to achieve its purpose due to cost failure (overrun), time failure (delay) and scope failure. The various agencies and parties involved in road construction carry out their tasks to ensure that roads constructed in the country are within budget, on schedule and according to the required specifications, but, due to failure factors that are classified under cost failure, time failure and scope failure, their expectations do not become a reality. This study revealed that even though there are numerous determinants that account for the occurrence of the

failure factors (cost failure, time failure and scope failure) in extant literature, cost failure was caused by lack of resources, inadequate skills and price fluctuations of construction materials, while time failure was caused by financial constraints, unfavourable environmental conditions and bureaucracy with scope failure being caused by unrealistic scope, political interference and poor planning.

Some observations made after analysing the data were that two of the scope failure determinants, namely: political interference and poor planning, were identified by the participants. These determinants did not match with the scope failure determinants in already existing literature. They rather matched the causes of time failure(delay) in other projects or it was mentioned as the cause of the generic phenomenon "project failure" and not specifically "scope failure".

Also, from the responses of the participants, it was noticed that there is a link between these three-failure factor which is supported in literature that these factors are intertwined but these three mostly depended on the cost aspect. It can therefore be concluded that cost failure can lead to both time failure and scope failure. The most mentioned factor was the cost element with the scope element been the least commented factor which could be concluded that most of these road projects failure do not have an issue with the scope aspect.

Recommendations

From findings one, the identified determinants of cost failure were lack of resources, inadequate skills and price fluctuations of construction materials.

It is recommended that project leaders should engage the services of experienced and competent professionals to execute the project. The agency-in-charge, that is, the Ghana Highway Authority, should also award contracts to recognized and registered contractors who would work hard to prevent any damage on their hard-earned reputation. Also, contractors who bid for contracts should ensure that they have strong financial backing or support before they contest or compete for any road contracts.

It would also be recommended that project authorities in charge of funds disbursement (that is, the Ministry of Finance) should properly plan the cash flows of the project over its life cycle by setting funds aside for investment, if possible, since most developing countries have an issue of cash flows during the construction due to economic problems to deal with the irregularities in payments. Lastly, the project leader should, if possible, deal directly with subcontractors, such as suppliers, to ensure that they buy things cheaper and bulk purchases should also be encouraged.

Findings two indicated that financial constraints, unfavourable environmental conditions and bureaucracy were the determinants of time failure/overrun or delay. Some suggested recommendations were that, to prevent any delay on the road projects, the contract should include penalties to be borne by any of the project parties who caused the time overrun (delay) and this will go a long way to ensure that projects are delivered on-time for fear of being penalised. The recommendation for the determinant “unfavourable environmental conditions” which is a natural occurrence is that, clients should consider and extend the completion date and make provisions for these

additional days in the contract since it was not the fault of any of the project parties involved.

The bureaucracy determinant can be minimised by submitting documents to be approved early because these systems that cause bureaucracy are instruments that are used to facilitate procedures pending approvals even though bureaucracy has led to intentional delay in service delivery under the pretence of exhibiting compliance with rules.

For findings three, unrealistic scope, political interference and poor planning emerged as the determinants of scope failure. Suggested recommendations to these findings were that project clients should ensure clear and unambiguous scopes are developed to be handed over to the project manager and contractor. The scope should be concise, and it should be able to communicate effectively to the project manager and contractor the client's requirements. Political interference can be minimized when politicians consider when and how they would interfere or meddle in the affairs of road project constructions. Also, much effort should be put in place to ensure a proper balance of the politician's preference, the end-user's need and the objectives of the Ghana Highway Authority. Lastly, a proper and effective planning process should be undertaken.

Suggestions for Further Research

For further studies, researchers might consider looking at the interrelatedness amongst these three failure components (namely, cost failure, time failure and scope failure) and their implications on the road construction industry. Other researchers too can focus on measuring these project failure causes by collecting responses from other project stakeholders or team

members other than project managers, contractors and officials of the Ghana Highway Authority.

Future research can also consider including other agencies in the road construction industry in Ghana such as the Department of Feeder Roads and the Department of Urban Roads to gain a comprehensive view of what happens in the road construction industry of Ghana. Attention can also be paid to other project sectors in Ghana by investigating how these three failure components exhibit or manifest themselves in those areas.

Future research can also be based on other components apart from cost, time and scope to analyse how project failure can be as a result of those components. For an in-depth understanding of this study, the mixed research approach can be employed in further research.

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APPENDIX A

INTERVIEW GUIDE

The researcher is a student of the University of Cape Coast Graduate School and in the School of Business (Department of Marketing and Supply Chain Management). The researcher would like to solicit responses from you in carrying out a research on "Project Failure in the Road Construction Industry". You are assured that the research is solely for academic purposes and no other thing. All responses received are going to be treated with a high level of confidentiality.

A. PROJECT FAILURE.

1. How many road projects have you managed?
2. With regards to (the specific project) ……...
    I. How would you assess it in terms of its schedule (time), was the duration according to the duration specified in the contract?
    II. What caused the change in time (delay, if any)?
    III. Was the estimated cost equal to the cost at completion?
    IV. What caused the change in cost (cost overrun, if any)?
    V. Were there any changes in the planned scope (scope creep)?
    VI. What caused the change in scope (if any)?
3. Is there anything you will like to add? What else should we talk about regarding project failure in the road construction industry?

B. DEMOGRAPHICS

1. Gender: Male [ ] Female [ ].

2. Age: …….

3. Region: ……..

4. Highest level of education: …….

5. Status of Interviewee: Contractor [ ]

Ghana Highway Authority [ ]

Project Manager [ ]

6. Date:

7. Overall work experience:

8. Years of experience in current position: