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Analyzing the Effect of Contract Administration on Project Completion and Attainment of Project Objectives in Basic School Construction in Greater Accra Region by Free Senior High School Secretariat of the Ministry of Education in Ghana Through Adoption of Total Quality Management

William Akoto Oppong

Abstract

One project that is at the heart of the current Ghanaian government is the Free Senior High School (FSHS), since it was part of their major campaign promises. This will therefore need a lot of new classroom blocks, hostels, boarding houses, assembly halls and other building constructions to accommodate the students since the already enrolled students are over clouded in the available accommodations. Nevertheless, for this project or vision to successfully complete, its contract administration has to be properly managed. Evaluation of the contract administrative process will require a holistic assessment from the beginning to the end of the project hence Total Quality Management (TQM). The main purpose of this study is to find the relationship between effective contract administration and successful project completion. The study achieved this through positivism approach. The target population is stakeholders of Free Senior High School contracts in the Greater Accra Region. The 400 sample was distributed among the 16 districts in the Greater Accra Region. The study revealed a positive significant correlation between TQM and Procurement. Also, there was a direct correlation between TQM and Successful completion of the FSHS undertaken projects. This however implies that when procurement practices are done through effective application of TQM methods, contract administration will be effective thereby leading to successful completion of the FSHS projects. That is, when Corporate Culture Quality, Strategic Quality Management, Quality Improvement Measurement Systems, People and Customer Management, Operational Quality Planning, External Interface Management, Supplier Partnerships, Teamwork Structures, Customer Satisfaction Orientation, Communication of Improvement Information are met in terms of contract administration, right materials are procured at the right place, right time, at the right price with the right quality and quantity thereby leading to successful completion of the project.

Keywords: *Contract Administration, Project Completion, Project Objectives*

1.0 DESCRIPTION OF THE RESEARCH UNDERTAKEN

Contract administration refers to the functions performed after a contract has been signed by the contract parties (Sebastian, 2009). In other terms, contract administration refers to all activities that are performed after a contract has been awarded and encompasses a plethora of activities ranging from typical to atypical. These activities do affect the project completion and objectives. Routine activities of contract administration are goal oriented and see to it that contract terms and conditions are met. Also, the enforcement of the contract language is contract administration. This calls for the contract manager to remain focus on the aims and objectives of the project. In every contractual agreement, the main objective is the project's successful completion (Davison & Sebastian, 2011).

1.1 Background of Study

According to the National Institute of Government Purchasing (NIGP) (2000), a project is considered to be successfully completed if the right items and quantities are successfully procured with the right qualities, at the right time and at the right price (Sebastian, 2009). In other words, a successful completion of a project depends on the following procurement variables; right items, right quantities, right qualities, right time and right price. However, for the purpose of this study, successful completion of a project is defined as the successful procurement of the right

items, at the right place, with the right quantities, right qualities, at the right time with the right price. This makes it to be six (6) Rs as compared to the five (5) Rs of NIGP's definition. These six Rs are affected by the manner in which the contract is administered. The ability to manage and resolve disputes and unforeseen circumstances are some of the determining factors of contract administration. These relate to the human and financial factors. In every contract, the act of controlling the achievement of project objectives is project management or administration. However, making proper use of the available resources and the administrative structures with a collection of proper tools and technology without dissuading or disrupting the typical activities of the project leads to the successful completion of the project that meets its objectives. These includes establishing the extent of work, defining the work requirement, allocating the required resources, planning the work execution, monitoring and evaluating the work progress, and adjusting deviations from the plan (Kerzner, 2013).

1.2 Problem Statement

One project that is at the heart of the current Ghanaian government is the Free Senior High School (FSHS). This was part of their major campaign promises. The implementation of this project met the admiration of majority of Ghanaians. FSHS means free tuition (which was already free), no admission, library, science centre, computer lab, examination, utility, text book, boarding fees and free meals for both boarders and day students (GNA, 2017). This includes vocational, agricultural and technical second cycle schools. This will therefore need a lot of new classroom blocks, hostels, boarding houses, assembly halls and other building constructions to accommodate the students since the already enrolled students are over clouded in the available accommodations. The program which started in September 2017 covered the first years, but will be rolled over to cover the second and third year students in the subsequent years. Nevertheless, for this project or vision to successfully complete, its contract administration has to be properly managed. Evaluation of the contract administrative process will require a holistic assessment from the beginning to the end of the project hence Total Quality Management (TQM), which is defined as a constant endeavour to fulfil, and preferably exceed, customer needs and expectations at the lowest cost by continuous improvement work, to which all involved are committed, focusing on the process in the organizations (Bergman & Klefsjo, 2003). According to Deming Edwards as was cited in Kanji (2012), statistics are used in TQM process to assess the quality at each stage of the project. This needs a constant customer research since quality is defined as whatever the customer needs and wants.

In a study conducted by Black and Porter in 1996 as was cited in Sadikoglu and Olcay (2014), 10 critical factors of TQM were found to be Corporate Culture Quality, Strategic Quality Management, Quality Improvement Measurement Systems, People and Customer Management, Operational Quality Planning, External Interface Management, Supplier Partnerships, Teamwork Structures, Customer Satisfaction Orientation and Communication of Improvement Information. Total quality management systems have been widely adopted to assess megaprojects but not projects like the basic school construction in Greater Accra region by the free Senior High School secretariat of the Ministry of Education in Ghana (Leong, Zakuan, Saman, Ariff & Tan, 2014). This study therefore bridges the gap by examining the effect of contract administration on project completion and attainment of project objectives in basic school construction in the Greater Accra Region by the Free Senior High School secretariat of the Ministry of Education in Ghana through the adoption of total quality management and extension of the key variables used to assess the successful completion of a project by NIGP to six.

1.3 Primary Objective

The primary main objective of this study is to analyze the effect of contract administration on project completion and attainment of project objectives in basic school construction in the Greater Accra Region by the Free Senior High School secretariat of the Ministry of Education in Ghana through the adoption of total quality management.

1.4 Secondary Objectives

The specific secondary objectives of the study are to:

i. Identify assessment variables for contract administration and project completion
ii. Assess the contract administration of the construction projects under the FSHS secretariat in the Greater Accra Region.
iii. Evaluate the projects' completion with the total quality management methods and verify whether the projects meet their objectives.
iv. Examine the relationship between contract administration and project completion.

1.5 Limitation

This study will serve as a guiding tool for the Free Senior High School secretariat of the Ministry of Education in Ghana. They will be aware of the complications that the project will face if the contract administration is not manned effectively and efficiently. This study will also be an advisory book for other organizations and companies of how to effectively administrate their contracts. Findings of this study will add up to exiting literature for further researches in this area. The philosophical foundation of the study is epistemology. The type of epistemology to be used is positivism. Descriptive research design involving quantitative methods will be used for the study. The study will use both primary and secondary data. The primary data will be retrieved from stakeholders with the aid of a structured questionnaire with a Likert Scale while the secondary data will be retrieved through the records of the FSHS secretariat.

Direct observation will also be used to gather data on the completed and on-going projects. Non-parametric data analysis will be used for the study. SPSS and Excel will be used to analyze the data. Weighted Rank Mean will be used to identify the contract management factors that affect a project completion. Spearman's Rank Correlation will be used to find the correlation that exists between effective contract administration and successful completion of a project. The significance level for the study will be 5% since this work falls under social science category.

1.6 Design and Overview of Study

1.6.1 Scope of the Study

The study covers the periods September 2017 to September 2018. The dependent variable is the successful completion of the FSHS project. This covers project completion and attainment of the FSHS project objectives in basic school construction. The independent variable is effective and efficient contract administration. In this, project completion serves as the mediating variable for the attainment of the FSHS project objectives in basic school construction.

1.6.2 Research Questions

v. What are the assessment variables of contract administration and project completion?
vi. What is the assessment level of contract administration of the construction projects under the FSHS secretariat in the Greater Accra Region?
vii. What is the evaluation level of projects completed using the total quality management methods?
viii. What is the relationship between contract administration and project completion?

1.6.3 Hypothesis

- Null Hypothesis (H_0): There is no relationship between effective contract administration and successful project completion at 95% confidence level.
- Alternative Hypothesis (H_1): There is a relationship between effective contract administration and successful project completion at 95% confidence level.

1.6.4 Organisation

The research covers five chapters. The first chapter introduces the study with the introduction and problem statement, objectives, research questions, hypothesis, scope, significance and organization. The second chapter reviews the literature pertaining to the subject matter. It also covers the theories, empirical reviews and the conceptual framework. The third chapter discusses the methodology of the study. These includes the philosophical foundation of the study, the research design, the data sources, the population, sample and sampling technique, the data collection method, the validity and reliability of the research instrument, the data analysis and ethical considerations. The fourth chapter discusses the findings of the study based on the analysis of the data collected. The fifth chapter concludes the study with summary, conclusion and recommendations.

1.7 Summary

This study will serve as a guiding tool for the Free Senior High School secretariat of the Ministry of Education in Ghana. They will be aware of the complications that the project will face if the contract administration is not manned effectively and efficiently. This study will also be an advisory book for other organizations and companies of how to effectively administrate their contracts. Findings of this study will add up to exiting literature for further researches in this area.

2.0 LITERATURE REVIEW

This section discusses literature on the effect of contract administration on project completion and attainment of project objectives through adoption of total quality management. It covers theories on contract administration through total quality management, empirical reviews on the effects of contract administrations on project completion and attainment of project objectives as well as the conceptual framework for the study.

2.0.1 Construction Contract Administration

According to Mwanaumo, Muya, Matakala, Mwiya, Kaliba and Sanga (2011), a construction contract is a legally binding agreement between two parties on the details and cost of a construction project. This type of contract covers very expensive, complex projects and simple renovations. There are two types of clients that use construction contracts: residential and commercial. Each client has different requirements that determine what is included in the contract (Mwanaumo, Muya, Matakala, Mwiya, Kaliba and Sanga, 2011). Administration is the management of the affairs of a contractor's business. Site administration is the management of the contractor's affairs on a particular construction site (Mwanaumo, et al., 2011). Site administration and site management is often under - resourced and neglected in favour of production pressures. Site administration and site management is the 'nerve centre' of operations and if these functions are not functioning effectively, they will hamper production output and quality will suffer. Good contract administration is required to manage design specification, contractual agreement, competitive tendering, evaluation, cost control, variations, final accounts, claims and even disputes; this will eventually help to reduce construction costs (Mwanaumo, et. al., 2011).

A building project, has to undergo three specific stages namely, design, tender and construction. In all three stages, good contract administration is required to manage design specification, contractual agreement, competitive tendering, evaluation, cost control, variations, final accounts, claims and even disputes. Poor management in any of these aspects would lead to unnecessary claims and disputes and eventually higher construction costs. Consultants can be reluctant to produce information release schedules because of concerns about being held to the dates on the schedule (even where the progress of construction does not require information when the information release schedule proposes it). Failure to keep to the dates set out in the information release schedule may then be a matter for which the contractor can claim an extension of time and loss and /or expense. A schedule of tender adjustments or clarifications negotiated and agreed after the receipt of tenders and prior to the signing of the contract should be included into the pack of documents. The requirement for the contractor to provide a performance bond and to obtain collateral warranties from any specialist sub-contractors or suppliers should form part of the conditions of contracts. Both client and contractor should engross the contract by witnessed signatures prior to commencement of work. In practice the administrative effort of collating all necessary paperwork can be overtaken by the desire to begin construction. In such circumstances it becomes harder to sort out any disputes as to the content. There have been cases where the courts have had to interpret an implied contract when the contract has remained unsigned at the time of the dispute (Mwanaumo, et. al., 2011).

2.0.1.1 Construction Contract Management

Contract Management could be defined as a multi-stage process that goes on through the entire duration of the contract and ensures that the parties meet their contractual obligations in order to deliver the specific objectives provided in the contract (Mwanaumo, et. al., 2011). The main purpose of contract management is to make sure that the objectives of the contract (supply of goods, delivery of services or execution of works) are met in a timely fashion and value for money is achieved. In practice this means optimizing the efficiency of the processes, balancing costs and risks against returns and ideally aiming for a continuous improvement in performance over the life of the contract. Therefore, the ultimate objectives of contract management are:

→ Effectiveness

The first and foremost condition of successful contract management is getting the job done. This translates in the fact that the ultimate scope/objective of the contract is accomplished, i.e.:

(i) Goods are delivered/installed;
(ii) Services are performed;
(iii)Civil works are completed.

→ Efficiency

Just getting the job done is not enough for a successful contract management. We should also be concerned about how the job is getting done. The aim should always be to get the job done in the best possible way. This means that the scope/objective of the contract is accomplished within the agreed:

(i) Costs (budget);
(ii) Time (duration);
(iii) Quality (functional parameters).

(Note: Achieving efficiency should not be mistaken for an unrealistic chase for cost savings, or unreasonable pressure to squeeze more output from the contractors for less money or less time. These practices frequently backfire and may result in more time and resources being misdirected towards a false objective) (Mwanaumo, et. al., 2011).

2.0.1.2 Construction Civil Works Contracts Management

The civil works contracts are among the most complex contracts generally throughout the business world. They are therefore the most challenging in terms of contract management. To begin with, there is a very large variety of types of civil works with various degrees of complexity and risks and even more various types of expertise required for their management (Mwanaumo, et. al., 2011).

Type of civil works – large infrastructure projects (highways, bridges, roads, irrigation systems, dams etc.), smaller scale municipal infrastructure projects (rehabilitation of buildings, roads, sewage, water or power utilities), environmental rehabilitation projects (earthworks, planting, seeding, water management etc.).

In the form of an equation with a multitude of variables this would translate as:

2.0.1.3 Types of Construction Contracts

Some of the most common types of construction contracts used in the construction industry are the following:

1. Lump Sum/Fixed Price Contracts;
2. Cost plus Contracts;
3. Unit Price Contracts; and
4. Time and Material Contracts.

The choice of which construction contract to use oftentimes comes down to the owner's risk tolerance (Mwanaumo, et. al., 2011).

2.0.1.3.1 Lump Sum or Fixed Price Contract

Under a Lump Sum or Fixed Price Contract, the contractor agrees to perform the work specified and described in the contract for a fixed price. The price of a fixed contract can only be changed upon the execution of a change order, under which the owner and the contractor either (1) agree for the contractor to perform additional work that falls outside the scope of the original work for an agreed upon extra compensation or (2) agree to remove certain work from the original scope of work and reduce the price of the contract in proportion to the work that the contractor no longer has to perform. These types of contracts are appropriate when a clear scope and a defined schedule have been reviewed and agreed upon (Mwanaumo, et. al., 2011). The benefit of using Lump Sum or Fixed Price Contracts is that the owner's construction costs are more predictable. The owner's cost will be capped by the contract price, so long as no change orders are issued and no disputes arise on the project.

There are not many drawbacks with the use of the Lump Sum or Fixed Price Contract. To ensure that the Lump Sum or Fixed Price Contract fulfills this function, i.e., provides a predictable and accurate cost of construction for the owner, it is very important for the scope of work under the contract to be clearly defined. This will eliminate the owner's risk of the contractor attempting to increase the contract price through the issuance of change orders for the performance of additional work that is arguably not part of the original scope of work but should be. Additionally, the schedule should clearly define the work and the deadlines that must be met. This could perhaps be a drawback to the use of the Lump Sum or Fixed Price Contract because it would require additional time and money to clearly define the scope of work and create a detailed schedule (though this is something that should be done on every construction project to protect the owner). In addition, other types of contracts, such as Cost Plus Fee or Time and Materials Contracts, could arguably be cheaper if the actual cost of construction were less than the contractor's estimated cost of construction on which the fixed price is based. But these types of construction contracts could also be more expensive if the actual cost of construction were to exceed the contractor's estimated costs.

Therefore, the Lump Sum or Fixed Price Contract is a relatively safe and predictable contract type that could be used on a construction project (Mwanaumo, et. al., 2011).

2.0.1.3.2 Cost plus Contracts

The Cost *plus* Contract is a type of a construction contract under which the owner agrees to pay the complete cost of the materials and labor needed to needed to build the project along with a fee for the contractor's overhead and profit. This contract type is favored where the scope of work is highly uncertain or indeterminate and the type of labor,

material, and equipment needed to build the project is also uncertain in nature. This type of contract involves payment of the actual costs, purchases or other expenses generated directly from the construction activity. Under this arrangement, complete records of all time and materials spent by the contractor on the work must be maintained. Cost Plus Contracts must contain specific information about certain pre-negotiated amount (some percentage of the material and labor cost) covering contractor's overhead and profit. Costs must be detailed and should be classified as direct or indirect costs.

There are multiple variations for Cost plus contracts, and the most common are:
1. Cost plus Fixed Percentage Contract – Compensation is based on a percentage of the cost;
2. Cost plus Fixed Fee Contract – Compensation is based on a fixed sum independent the final project cost. The owner agrees to reimburse the contractor's actual costs, regardless of amount, and in addition pay a negotiated fee independent of the amount of the actual costs;
3. Cost plus Fixed Fee with Guaranteed Maximum Price Contract – Compensation is based on a fixed sum of money. The total project cost will not exceed an agreed upper limit;
4. Cost plus Fixed Fee with Bonus Contract – Compensation is based on a fixed sum of money. A bonus is given if the project is finished below budget, ahead of schedule, etc.;
5. Cost plus Fixed Fee with Guaranteed Maximum Price with Bonus Contract –Compensation is based on a fixed sum of money. The total project cost will not exceed an agreed upper limit and a bonus is given if the project is finished below budget, ahead of schedule, etc.; and
6. Cost plus Fixed Fee with Arrangement for Sharing Any Cost Savings Contract – Compensation is based on a fixed sum of money. Any cost savings are shared with the buyer and the contractor.

The Cost plus Fixed Fee construction contract is more predictable than Cost Plus Fixed Fee Percentage Construction Contract because the contractor's fee for overhead and profit is, as its name suggests, predetermined. Regardless of what the cost of construction ultimately amounts to, the contractor's fee remains the same. Conversely, the Cost Plus Fixed Percentage Construction Contract provides more variability with respect to the amount of the contractor's fee because it is directly linked to the cost of construction, which in these types of arrangements is inherently unpredictable. In fact, the Cost plus Fixed Percentage Construction Contract arguably incentivizes the contractor to not keep the costs low because its fee increases with the cost of construction.

The Cost Plus with Guaranteed Maximum Price Contract seeks to eliminate some of the risks associated with Cost plus Contracts in that it caps the owner's overall financial exposure. Thus, while the contract price is to be determined based on the cost of construction and the contractor's fee, owner's costs are capped at a certain amount. These types of Cost plus Construction Contracts are oftentimes grouped with bonus contracts, built-in contingencies, or cost savings contracts which incentivize the contractor to complete the project with agreed targets regarding schedule, quality, and budget in exchange for additional compensation on the project (Mwanaumo, et. al., 2011).

2.0.1.3.3 Unit Price Contracts

Unit Price Contracts are based on anticipated quantities of items which are counted in the project in addition to their unit prices. The final price of the project depends upon the quantities required to carry out the work. Generally, these types of contracts are suitable only for construction and supplier projects which involve accurate identification of different types of items, but not their numbers, in the contract documents. These types of contracts are oftentimes used on excavation projects.

2.0.1.3.4 Time and Material Contracts

Time and Material Contracts are usually preferred if the project scope is not clear, or has not been defined. The owner and the contractor must establish an agreed hourly or daily rate, including additional expenses that could arise in the construction process. The costs must be classified as direct, indirect, mark-up, and overhead. Sometimes the owner might want to establish a cap or specific project duration to the contractor that must be met, in order to have the owner's risk minimized (Mwanaumo, et. al., 2011).

2.0.1.4 Condition of Contracts for Construction

The conditions of contract are the terms that collectively describe the rights and obligations of contracting parties (i.e. the employer and the contractor) and the agreed procedures for the administration of their contract. Contract conditions determine the allocation of risk and consequently, price. Typically these conditions address the following:

a) The parties' main responsibilities e.g., the employer provides the site and the right of access thereto while the contractor provides the works in accordance with the requirements established in the contract.
b) The timing of the works, e.g. start date, time for completion, period for defects liability, etc.
c) Testing and remedying of defects.
d) Payment, e.g. manner in which the works are to be assessed and certified, time for payment and interest on overdue amounts.
e) Variations and claims, e.g. the manner in which variations to the contract are to be evaluated and paid for and how the costs which result from employer liabilities are assessed and paid for.
f) Title (ownership) to objects, materials within the site, etc.
g) Risks and insurances, e.g. what are the employer's and contractor's risk and what insurances each party will take out.
h) Termination, e.g. the reasons for termination, the procedures for termination and the payment to be made upon termination.
i) The resolution of disputes, e.g. by adjudication, mediation, arbitration, litigation (court of law) or a combination thereof.
Conditions of contract can be standardized so that the same conditions of contract can be used on different projects, in which case they are referred to as standard forms of contract.
The public sector generally uses one of the following standard forms of contract when engaging main contractors for construction works contracts:
a) FIDIC (French initials for International Federation of Consulting Engineers) (1999) (Short contract and Red, Yellow and Silver Books).
b) General Conditions of Contract for Construction Works (GCC).
c) JBCC Series 2000 (Principal Building Agreement and Minor Works Agreement).
d) New Engineering Contract (NEC3) (Engineering and Construction Contract and Engineering and Construction Short Contract).

2.0.1.4.1 Communications

The construction sector has a wide range of standard forms of contract which are intended to balance the risk of the parties but more importantly, through extensive and repeated use, give rise to a certainty of meaning. The single most important task in administering a contract is to ensure effective communications with the employer and his representatives e.g. principal agent (JBCC Series 2000), engineer (FIDIC and GCC 2004) or project manager (NEC3). Each form of contract stipulates requirements for communications between the parties of the contract. These usually need to be communicated in a form which can be read, copied and recorded. The contract data associated with a contract also state to whom communications are to be addressed and where certain communications are to be sent.
The various contracts require:
a) The contractor to provide a programme within a specified time period.
b) The employer to pay the contractor within a specified time period.
c) The employer's representative to provide a decision within a specified period.
d) The contractor to give notice of his intention to declare a matter as being a dispute within a specified time period.
e) The contractor to submit timely request for inspections, etc.

Each of these events requires different types of communications between the parties. Effective communications can mean the difference between a problematic contract and a smoothly run one. It is also important for a contractor to communicate effectively with its suppliers, service providers and subcontractors.

2.0.1.5 Time Management
2.0.1.5.1 Programme

Construction works are unique in that each activity needs to be sequenced in order for the project to be completed. For example, it is not possible to erect the roof until the foundations and walls have been constructed. This type of logic is used to determine how long a project will take to complete. Efficient programming can mean significant time and cost savings to both the contractor and the employer. At the start of each contract, the contractor is required to prepare a programme and have it agreed to by the employer or his representative. This programme indicates the duration and logic of the sequencing of activities for the project. The employer or his representative will evaluate whether the logic is sound and whether the estimated time frames for completion of the works are reasonable.

The programme is an important tool for managing time to ensure that the works are completed in accordance with contractual requirements. It also allows the employer's representative to establish the reasonableness of any claims for an extension of time (Mwanaumo, et. al., 2011).

2.0.1.5.2 Extensions of time

Where the contractor is instructed by the employer or his representative to add, change or remove activities from the project or to change the scope of work, there may be grounds for a change to the time for completion. If the change to the project causes the project to be completed later than planned, then there is reason to change the completion date. If it does not, there is no reason to do so.

Some forms of contract require that the contractor submit a claim for an extension of time to the employer within a specified time period of becoming aware of an event that may give rise to such an extension, e.g. abnormal rainfall, failure by the employer to provide access to the site, etc. Failure to do so might result in the forfeiting of the right to an extension of time (Mwanaumo, et. al., 2011).

2.0.1.5.3 Completion

The contractor is responsible for the works from the date that possession of the site is given by the employer or his representative until such time that the works are completed or are capable of being used by the client. The different forms of contract have different processes for declaring a contract complete. Some require the employer's representative to issue a single completion certificate while others require a practical completion certificate and a completion certificate to be issued. At this point (depending on the form of contract) retention moneys are reduced, performance bonds are released and the defects liability period commences. This is a great financial relief for a contractor. Where the contract allows for it, the contractor is entitled to or required to hand over sections of the project before the whole project is completed. Handing over these sections means that the employer is able to utilize that portion of the works before the whole project is completed and the contractor is thereafter not liable for that portion of the works. The risk of damage to the works also passes to the employer upon completion. It is therefore important to manage and complete the work in such a manner that completion is achieved as soon as possible.

2.0.1.5.4 Early completion

If the contractor is very efficient, and there are no problems experienced on site, then the contractor will be free to start a new project much earlier. The contractor needs to ascertain that by completing a contract earlier does not cost him more. In some contracts, the employer may encourage early completion by offering a bonus for early completion.

2.0.1.5.5 Penalties for late completion

Provisions for penalties or delay damages (a monetary value representing the damage caused by the delay) are contained in most construction contracts. These are imposed where the employer has specific deadlines or other requirements and will experience a loss of revenue, loss of use of the premises if the project is delivered late or have to pay additional supervision and administration costs relating to the late completion. The contract document will specify the value of the penalties per day, per week or per month, or the extent of the penalties should specific requirements not be achieved. Penalties are deducted from interim payment certificates as soon as they occur and can be objectively quantified. They are based on the difference between the time that the works were actually completed and the time according to the contract when they were supposed to be completed.

2.0.1.5.6 Changes to the prices for the works

Instructions given by the employer or his representative that change the scope of the work or the timing of the works (i.e. the construction programme), can impact on the cost of the works. Each of the different forms of contract assesses the impact on the contract price differently. The contractor is required to carry out any instruction received in writing to change the scope of work or the timing of the works unless it is impossible or illegal to do so.

Changes in the scope of work most often arise through changes in the details on the construction drawings or specifications, the employer increasing or decreasing the size of the work, and new information regarding the site becoming available which necessitates that the design be amended. The contractor should always check the changes that are made to the drawings and identify how the changes affect the programme, materials ordering and utilization of resources. Changes in the completion date for the works frequently arise from access being denied to the site or a portion thereof for whatever reasons, the employer requiring the contractor to stop the works or an earlier completion being required. The contract also identifies which risks are carried by the contractor and which are carried by the employer. Accordingly should an event occur on the site and the contract states that it is the employer's risk, then the

contractor is entitled to have the contract price adjusted to compensate for the additional costs incurred. An extension to the time for completion may also be due to the contractor.

2.0.1.6 Construction Process

At the start of any contract, the contractor needs to deliver certain items that are required in terms of the contract. These items can include:

a) Proof of the insurances that the contractor is required to have.
b) Provision of a performance bond.
c) Provision of the preliminary contractual programme.

These contractual requirements are needed by the employer to justify providing the contractor with access to the site. The contractor must comply with these requirements timeously; otherwise he will be in breach of contract and may have the contract terminated due to lack of performance.

2.0.1.6.1 Allowable rates

Before the work on site can start, the contractor should make certain preparations. These preparations include careful planning of resources and methods of work in order to ensure that the manner in which the work is performed on site is in line with the thinking at tender stage.

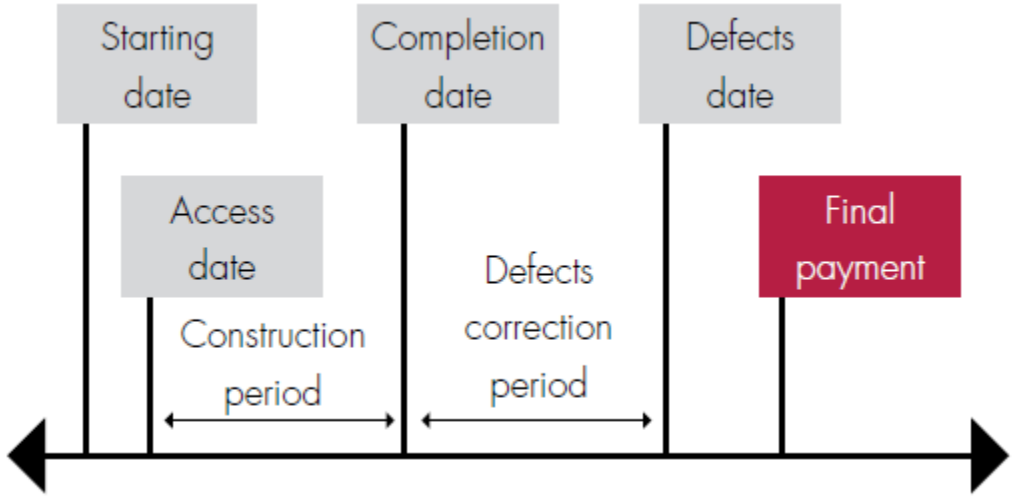

Figure 2.2: Pre-contract planning stage of the contract

This process is known as the pre-contract planning stage of the contract, and will result in a set of allowable rates or lump sum amounts for activities that have been calculated, in order to guide the productivity requirements on site. The contractor uses productivity rates from past projects of a similar nature to determine productivity hours. "Allowable rates or lump sums" are the costs or time period that a contractor can allow for the task at hand, covering labour, equipment, transport, supervision and planned profit. These allowable can help the contractor to plan the work more efficiently and make the most of cutting costs of production and thereby maximizing profits. This process is known as the pre-contract planning stage of the contract, and will result in a set of allowable rates or lump sum amounts for activities that have been calculated, in order to guide the productivity requirements on site. The contractor uses productivity rates from past projects of a similar nature to determine productivity hours. "Allowable rates or lump sums" are the costs or time period that a contractor can allow for the task at hand, covering labour, equipment, transport, supervision and planned profit. These allowable can help the contractor to plan the work more efficiently and make the most of cutting costs of production and thereby maximizing profits. Different options can be explored and the one that will yield the greatest profit or the least risk can be chosen. At tender stage the methodology for the works is prepared in a hurried and broad - brush manner. When the contract is awarded, the contractor owes it to himself to ensure that the most profitable and least risky options are chosen to maximise the profits for the shareholders.

2.0.1.7 Construction Procurement

A construction procurement system is "the organisational structure adopted by the client for the implementation, and at times eventual operation, of a project" (Masterman, 2008). Construction Industry Board (1997)

describes procurement system as a method of obtaining and organizing the external resources needed to complete a project whilst Chartered Institute of Builders (CIOB) (2008) considers procurement to be the process of identification, selection and commissioning of the contributions required for the construction phase of a project. Several definitions have been given by several authors all of which points to a common idea; *a contractual and coordinated arrangement that brings together the various parties in a construction contract with specific roles and responsibilities for the delivery of a construction project.* There are different procurement systems and several ways of classifying them. On the basis of how the interaction between design and construction, how funding and operations are managed, mode of reimbursement of the contractor, level of information available or required before a construction contract is let, and the magnitude of risk taken by participating parties, (Masterman, 2008; Adamu, Sidik & Osei-Tutu, 2017) identified four main categories of procurement systems. These includes separated procurement systems with main type being design-bid-build (traditional system); integrated procurement systems such as design-build (D&B) and private finance initiative (PFI); management oriented procurement systems such as construction management and management contracting; and discretionary systems which include partnering, alliancing, joint ventures.

Typically, design consultants, engineers, quantity surveyors had to finish with their designs before a contractor is sought to construct. The client deals with all these members as separate entities/organisations. Under the integrated procurement (main system being Design and Build whilst others are variants), one organisation usually a construction firm is responsible for both the design and construction of the project. This implies that the client at least deals with one organisation. Coles (2009) observed that the choice of a procurement method (path) is influenced by a number of factors that vary both in degree and significance. Key among these factors are the type of client (public or private, lay or experienced), type of business (design input, time available for the development of the design), level of fixed design achievable at the time of entering into the contract, management team, availability of resources like consultants, general workforce, contractor's plants and equipment, level of risk as well as legal requirements. Adamu, Sidik and Osei-Tutu (2017) further recognized that the choice of a procurement method especially in Ghana is affected by factors including expected benefit from the chosen procurement path, previous experience and desire for change, level of quality required, source of funds, nature of project, value of proposed work and financial commitment.

Characteristics in Ghana Known as the traditional system of procurement, DBB (Design-Bid-Build), method have been the main form of procurement in the Ghanaian construction industry since independence (Adamu, Sidik & Osei-Tutu, 2017). Despite limited literature on the knowledge and the level of use of the other forms of procurement in Ghana, recent studies (Kyei, 2009) have revealed that consultants, clients and contractors favoured the traditional system of procurement to other arrangements. Ameyaw (2009) observed that about ninety per cent of all building contracts are procured using the DBB method in Ghana. The common practice for instance is to have consulting firms that comprises typically of an architect, a quantity surveyor, civil and electrical engineers working together in one firm commonly referred to as a *consortium*. This arrangement which is very popular in Ghana tends to reduce the number of separate professional firms that the client had to contract with (Obeng-Ayirebi, 2002). A typical contractual and coordination relationship in DBB structure in Ghana is simplified and shown in figure 2.3(a) below. There is however a few architectural, quantity surveying and engineering firms which have been registered and are practicing as specialist independent consulting firms.

By virtue of its presence and use over a long period of time, familiarity with its procedures and wider applicability, it continues to thrive particularly among public clients who are the major employers in the construction industry (Ameyaw, 2009). Other major reasons for its use includes size of firms and contracts involved, the only procurement system with legal backing through the form of contract (Kyei, 2009); offers competitive fairness and satisfactory public accountability in the procurement of contracts, goods and services (Ghana Government's Public Procurement Act, Act 663, 2003). Again, there is relative ease in quality checks, changes can also be arranged and valued under the system especially with the use of the traditional bill of quantities. DBB also provides for fully developed and detailed designs as well as access to small firms (Adamu, Sidik & Osei-Tutu, 2017). Notwithstanding its advantages, DBB system of procurement is widely criticized as projects often lead to "finger pointing" between the consultants/architects and contractors. When a problem arises, the consultant accuses the contractor of faulty construction, and the contractor blames the consultant for faulty design and so on. This makes it so adversarial and does not encourage coordination among the parties. One other major flaws of this system is the separation of design and construction. As indicated above, the designer, who is entirely different from the builder, will have to complete with the design before a builder is sought. This phenomenon creates a problem of lack of "buildability" which is one of the major criticisms of DBB (Coles, 2009).

2.1 DEVELOPMENT OF THE STUDY

2.1.1 Project Completion- Project Management Processes

A project is an endeavor that is undertaken to produce the results that are expected from the requesting party (Oberlender, 2000). A project is made up of a group of interrelated work activities constrained by a specific scope, budget, and schedule to deliver capital assets needed to achieve the strategic goals of an Agency (Shadan, 2012). A project's execution is planned and controlled by the project manager. The project manager is assigned by the Agency, i.e., the Agency's executive management. The project manager must have adequate authority to exercise the responsibility of forming and managing a team for support of the project. The project manager must have prior experience managing similar projects in the past. If an Agency cannot commit such an individual with adequate time and resources, the Agency is well advised to outsource project management services for management of the project. The project manager may be tasked with management of multiple projects that may require assignment of additional project managers for support. In such cases the project manager is taking on the role of a program manager. Figure 2.4 shows typical project activities with a project manager. Figure 2.5 also depicts another typical project organization with a project manager. It shows how a project management organization is structured with the assignment of a project manager to manage project work activities (Elbeltagi, 2009).

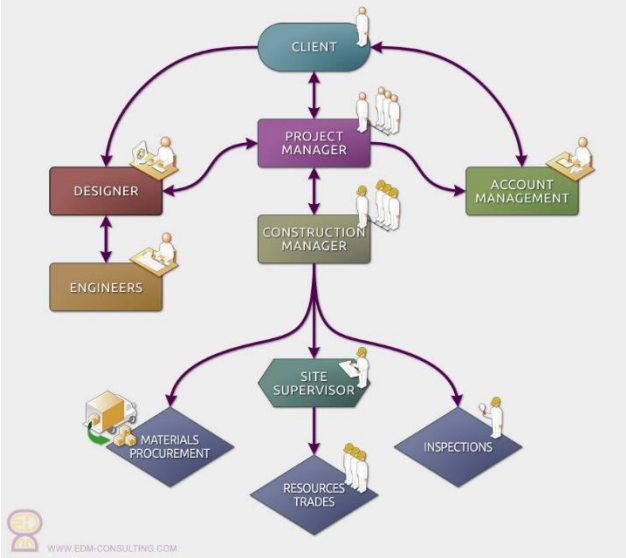

Figure 2.4: A typical project with a manager

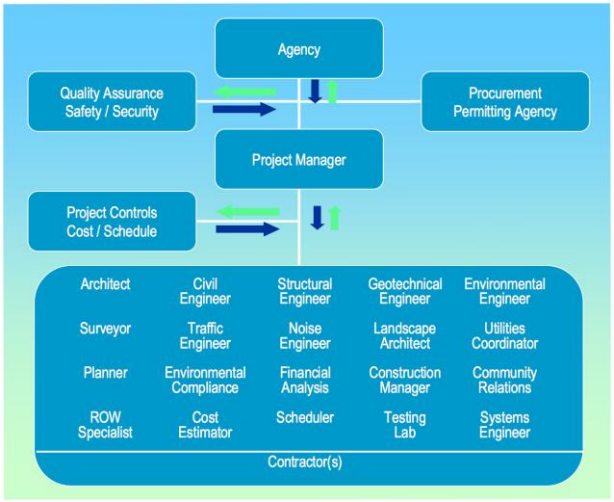

Figure2.5: A Project with a Project Manager

Note: Depending on the project, there may be a need for a professional not listed in the chart, such as an archeologist, etc.

Projects are defined by their scope, budget, and schedule. For example, an Agency is to undertake a project to design and build a new maintenance facility for its fleet of buses (scope), at an estimate of $30 million (preliminary budget) over a three-year period (schedule). The schedule specifies a defined beginning and end. Projects go through a life cycle of phases between their beginnings and end that for construction projects are typically: initiation, planning, design, construction, commissioning, and closeout.

Scope: Each project is unique and must have a written requirements document that takes into consideration operational needs, level of service, regulatory requirements such as Americans with Disabilities Act, and quality of deliverables. The scope evolves as new information becomes available through the project life cycle. For example, in the early planning phases of the maintenance facility project, the scope is to have five service bays. Later, as the design progresses, the exact location and the type of service in each bay can be determined. Scope refinement should not be confused with scope creep. Scope creep occurs when the Agency determines part way through the project that operational projections now call for six rather than five service bays. Changing to six bays after the project is underway is a serious change in scope that could impact the budget (larger facility, more land, redesign) and delay the schedule (replan, redesign, longer construction). Scope refinement is a necessary process in the project life cycle while scope creep results from lack of clarity on the Agency's requirements in the original scope for the needs, level of service, and level of quality for the deliverables (Elbeltagi, 2009).

Schedule: All projects must have a definite beginning and end. The Agency's Capital Improvement Plan (CIP) usually provides approximate dates for the beginning of a project and the end date when it is due to go into operation. Once there is a well-defined scope, the Agency needs to determine the time it will take to complete the project by developing the project schedule. Developing the schedule involves breaking down the work into manageable activities needed to accomplish the scope of each deliverable, estimating the duration of each activity, and placing them in a logical sequence. Section 9 describes useful techniques for developing a schedule. The result is a project schedule that tells you the expected duration of the project and the logical relationships between the activities, including activities on the "critical path," that control the end date (Elbeltagi, 2009).

Budget: All projects are constrained by limited monetary funding resources. Consequently, every project needs a budget to initially define its funding requirement. The budget usually provides the preliminary project funding that is established through a CIP covered. The project manager develops the budget based on the cost estimates at the beginning of each project phase and refines it once there is better information defining the scope. Refining the budget occurs through studies and analysis in the design development process through the preliminary engineering phase. When Agencies try to fix the budget too early in the project life cycle, they are surprised by the significant increases in the budget over what was set forth in the CIP. As explained later, the budget should not be fixed as baseline until after completion of the preliminary engineering phase. Estimating techniques for the costs of the activities needed to accomplish the scope of each deliverable are covered (Elbeltagi, 2009).

2.1.2 Project Life Cycle

The acquisition of a constructed facility usually represents a major capital investment, whether its owner happens to be an individual, a private corporation or a public agency (Elbeltagi, 2009). Since the commitment of resources for such an investment is motivated by market demands or perceived needs, the facility is expected to satisfy certain objectives within the constraints specified by the owner and relevant regulations. From the perspective of an owner, the project life cycle for a constructed facility may be illustrated schematically in Figure 2.6. A project is expected to meet market demands or needs in a timely fashion. Various possibilities may be considered in the conceptual planning stage, and the technological and economic feasibility of each alternative will be assessed and compared in order to select the best possible project. The financing schemes for the proposed alternatives must also be examined, and the project will be programmed with respect to the timing for its completion and for available cash flows. After the scope of the project is clearly defined, detailed engineering design will provide the blueprint for construction, and the definitive cost estimate will serve as the baseline for cost control. In the procurement and construction stage, the delivery of materials and the erection of the project on site must be carefully planned and controlled. After the construction is completed, there is usually a brief period of start-up of the constructed facility when it is first occupied. Finally, the management of the facility is turned over to the owner for full occupancy until the facility lives out its useful life and is designated for demolition or conversion (Elbeltagi, 2009).

Of course, the stages of development in Figure 2.6 may not be strictly sequential. Some of the stages require iteration, and others may be carried out in parallel or with overlapping time frames, depending on the nature, size and urgency of the project. Furthermore, an owner may have in-house capacities to handle the work in every stage of the

entire process. By examining the project life cycle from an owner's perspective we can focus on the proper roles of various activities and participants in all stages regardless of the contractual arrangements for different types of work. The project life cycle may be viewed as a process through which a project is implemented from beginning to end. This process is often very complex; however, it can be decomposed into several stages as indicated by the general outline in Figure 2.6. The solutions at various stages are then integrated to obtain the final outcome. Although each stage requires different expertise, it usually includes both technical and managerial activities in the knowledge domain of the specialist. The owner may choose to decompose the entire process into more or less stages based on the size and nature of the project. Very often, the owner retains direct control of work in the planning stages, but increasingly outside planners and financial experts are used as consultants because of the complexities of projects. Since operation and maintenance of a facility will go on long after the completion and acceptance of a project, it is usually treated as a separate problem except in the consideration of the life cycle cost of a facility. All stages from conceptual planning and feasibility studies to the acceptance of a facility for occupancy may be broadly lumped together and referred to as the Design/Construct process, while the procurement and construction alone are traditionally regarded as the province of the construction industry (Elbeltagi, 2009).

There is no single best approach in organizing project management throughout a project's life cycle. All organizational approaches have advantages and disadvantages, depending on the knowledge of the owner in construction management as well as the type, size and location of the project. It is important for the owner to be aware of the approach which is most appropriate and beneficial for a particular project. In making choices, owners should be concerned with the life cycle costs of constructed facilities rather than simply the initial construction costs. Saving small amounts of money during construction may not be worthwhile if the result is much larger operating costs or not meeting the functional requirements for the new facility satisfactorily. Thus, owners must be very concerned with the quality of the finished product as well as the cost of construction itself. Since facility operation and maintenance is a part of the project life cycle, the owners' expectation to satisfy investment objectives during the project life cycle will require consideration of the cost of operation and maintenance. Therefore, the facility's operating management should also be considered as early as possible, just as the construction process should be kept in mind at the early stages of planning and programming. The project phases have been summarized in the following subheadings.

2.1.2.1 Preconstruction Phase

The preconstruction phase of a project can be broken into conceptual planning, schematic design, design development, and contract documents.

Conceptual design:
- Very important for the owner.
- During this stage the owner hires key consultants including the designer and project manager, selects the project site, and establish a conceptual estimate, schedule, and program.
- The owner must gather as much information as possible about the project.
- The most important decision is to proceed with the project or not.

Schematic design:
- During this phase, the project team investigates alternate design solutions, materials and systems.
- Completion of this stage represents about 30% of the design completion for the project.

Design development:
- Designing the main systems and components of the project.
- Good communication between owner, designer, and construction manager is critical during this stage because selections during this design stage affect project appearance, construction and cost.
- This stage takes the project from 30% design to 60% design.

Contract documents:
- Final preparation of the documents necessary for the bid package such as the drawings, specifications, general conditions, and bill of quantities.
- All documents need to be closely reviewed by the construction manager and appropriate owner personnel to decrease conflicts, and changes.
- With the contract documents are almost complete; a detailed and complete cost estimate for the project can be done.

2.1.2.2 Procurement Phase (Bidding and award phase)
- The project formally transits from design into construction.
- This stage begins with a public advertisement for all interested bidders or an invitation for specific bidders.
- In fast-track projects, this phase overlaps with the design phase.
- If the project is phased, each work package will be advertised and bid out individually.
- It is very important stage to select highly qualified contractors. It is not wise to select the under-bid contractors.

2.1.2.3 Construction Phase
- The actual physical construction of the project stage.
- This stage takes the project from procurement through the final completion.
- It is the time where the bulk of the owner's funds will be spent.
- It is the outcome of all previous stages (i.e., good preparation means smooth construction).
- The consultant will be deployed for contract administration and construction supervision.
- Changes during construction may hinder the progress of the project.

2.1.2.4 Closeout Phase
- Transition from design and construction to the actual use of the constructed facility.
- In this stage, the management team must provide documentation, shop drawings, as-built drawings, and operation manuals to the owner organization.
- The as-built drawings are the original contract drawings adjusted to reflect all the changes that occurred.
- Assessment of the project team's performance is crucial in this stage for avoiding mistakes in the future.
- Actual activity costs and durations should be recorded and compared with that was planned. This updated costs and durations will serve as the basis for the estimating and scheduling of future projects.

Figure 2.7 shows the increasing cumulative cost as the projects progresses while the influence in the project cost and scope decreases.

2.1.2.5 Main Categories of Construction Projects

In planning for various types of construction, the methods of procuring professional services, awarding construction contracts, and financing the constructed facility can be quite different. The broad spectrum of constructed facilities may be classified into four major categories, each with its own characteristics.

2.1.2.5.1 Residential Housing Construction

Residential housing construction includes houses and high-rise apartments. During the development and construction of such projects, the developers usually serve as surrogate owners and take charge, making necessary contractual agreements for design and construction, and arranging the financing and sale of the completed structures. Residential housing designs are usually performed by architects and engineers, and the construction executed by builders who hire subcontractors for the structural, mechanical, electrical and other specialty work. The residential housing market is heavily affected by general economic conditions. Often, a slight increase in total demand will cause a substantial investment in construction, since many housing projects can be started at different locations by different individuals and developers at the same time. Because of the relative ease of entry, many new builders are attracted to the residential housing construction. Hence, this market is highly competitive, with potentially high risks as well as high rewards.

2.1.2.5.2 Institutional and Commercial Building Construction

Institutional and commercial building encompasses a great variety of project types and sizes, such as schools and universities, medical centers and hospitals, sports facilities, shopping centers, warehouses and light manufacturing plants, and skyscrapers for offices and hotels. The owners of such buildings may or may not be familiar with construction industry practices, but they usually are able to select competent professional consultants and arrange the financing of the constructed facilities themselves. Specialty architects and engineers are often engaged for designing a specific type of building, while the builders or general contractors undertaking such projects may also be specialized in only that type of building. Because of the higher costs and greater sophistication of institutional and commercial buildings in comparison with residential housing, this market segment is shared by fewer competitors. Since the construction of some of these buildings is a long process which once started will take some time to proceed until completion, the demand is less sensitive to general economic conditions than that for housing construction.

2.1.2.5.3 Specialized Industrial Construction

Specialized industrial construction usually involves very large scale projects with a high degree of technological complexity, such as oil refineries, steel mills, chemical processing plants and coal-fired or nuclear power plants. The owners usually are deeply involved in the development of a project, and prefer to work with designers-builders such that the total time for the completion of the project can be shortened. They also want to pick a team of designers and builders with whom the owner has developed good working relations over the years. Although the initiation of such projects is also affected by the state of the economy, long range demand forecasting is the most important factor since such projects are capital intensive and require considerable amount of planning and construction time. Governmental regulation such as environmental protection can also influence decisions on these projects.

2.1.2.5.4 Infrastructure and Heavy Construction

Infrastructure and heavy construction includes projects such as highways, tunnels, bridges, pipelines, drainage systems and sewage treatment plants. Most of these projects are publicly owned and therefore financed either through bonds or taxes. This category of construction is characterized by a high degree of mechanization, which has gradually replaced some labor intensive operations. The engineers and builders engaged in infrastructure construction are usually highly specialized since each segment of the market requires different types of skills. However, demands for different segments of infrastructure and heavy construction may shift with saturation in some segments. For example, as the available highway construction projects are declining, some heavy construction contractors quickly move their work force and equipment into the field of mining where jobs are available (Elbeltagi, 2009).

2.2 DIFFERENT THEORIES

2.2.1 Project Charter

Project Management Institute (2004) defined project charter as a document issued by the project initiator or sponsor that formally authorizes the existence of a project, and provides the project manager with the authority to apply organizational resources to project activities. In addition to its contract purpose, the project charter includes most elements of a preliminary project scope statement, which describes what is and what is not included in the project. It also helps to control changes to the scope of the project throughout its duration or life cycle. The intent is to cover, in a single document, all activities of the initiating process group as defined by Project Management Institute (2004).

As a comprehensive overview of the project, the project charter allows all parties involved (stakeholders) to reach agreement and document major aspects of the project such as the objectives, the scope, the deliverables, and the resources required. The charter supports the decision-making process and is also often used as a communication tool. The project charter should normally be developed by the project sponsor or a manager external to the project team. In practice, however, the project manager often plays a major role in the development of the project charter. The project manager works closely with the project sponsor, who provides background information for the project (e.g. purpose of the project and linkages to business needs, strategic priorities, objectives, and outcomes). The project manager also interviews stakeholders to gain more information in order to develop the charter. Regardless of the size and type of project, the elements of a project charter are the same, just as the fundamental project management processes and principles remain the same. Although the depth and scope of applying these processes and principles may change from project to project, the project framework remains constant (Treasury Board of Canada Secretariat, 2008). The elements of a project charter are as follows: Introduction, Overview of the Project, Purpose of the Project Charter, Project Objective and Scope, Major Milestones, Major Deliverables, Assumptions, Constraints, Business Need or Opportunity, Preliminary Cost for the Project and Project Charter Acceptance (Treasury Board of Canada Secretariat, 2008).

2.2.2 Project Management Office

Although the concept of a project management office (PMO) or project office (PO) has been around for many years, the functions, purposes, and definitions of these offices have changed over time. The PMO evolved from a project office (PO) that was responsible for one project or programme, usually a major government-funded project (1950-1990), to the more multi-project management scenarios currently found (Kerzner, 2003; van der Linde1 & Steyn, 2016). The PMO keeps evolving and changing as the needs of industry change and as new principles and methodologies are developed. It is therefore necessary for a PMO to change and adapt continually to an organization's needs in order to remain valuable. Currently, the project management discipline is involved in a wide variety of industries. The functions and purposes of PMOs are also varied to the extent that there is no single scheme that can describe the ideal set of functions and purposes of the PMO (Hobbs & Aubry, 2007). The variations are obvious from the various definitions of a PMO. For example, the definitions given for a PMO in A Guide to the Project Management Body of Knowledge (PMBOK Guide) varies between the 4th (2008) and 5th (2013) editions (Project Management

Institute, 2008; 2013). The former mentions that the role of a PMO can range from providing support functions to being responsible for the direct management of projects, while the latter emphasizes standardization and facilitating the sharing of resources, methodologies, tools, and techniques. Ward, as cited by Dai and Wells (2004), gives a third definition of the PMO, which includes 'strategic matters'. This is interpreted as a mandate that includes the function of project portfolio management.

Hobbs and Aubry (2007) support the point that there is a large variability in the roles, function, structures, and legitimacy of PMOs between organizations. From their survey of 500 organizations, they realized that PMOs found in industry vary significantly from what is found in the literature. The main differences lie in the structures and roles/functions of the PMO, as well as the perceived value of the PMO. The reason why there is such variation in the structures and roles of PMOs is that there is no 'one-size-fits-all' solution. PMOs are structured and mandated according to the needs of the organizations within which they function; thus no two PMOs are the same. This makes the task of measuring the impact of or value added by the PMO difficult; each PMO adds value in different ways. Unless an appropriate method of determining the value of a PMO is used, invalid conclusions can be reached about the value that a specific PMO contributes. Therefore, the objective of this paper is to shed some light on ways to determine the value of a PMO (van der Linde1 & Steyn, 2016).

Unger, Gemunden and Aubry (2012) stated that the roles of PMOs and the impact of these roles in terms of value creation are unclear. They even claim that there is no empirically validated evidence that the involvement of PMOs in project management has increased project performance or organizational performance. The lack of empirical evidence for PMOs in general is understandable, given that the functions and purposes of the PMO are so varied. The value added by a PMO is as varied as the functions of the PMOs. They claimed that a PMO adds value to an organization and to a portfolio of projects; in their work, they propose alternative methods to determine the value added by a PMO. They link the specific roles of a PMO to the value created by each role. Aubry, Hobbs and Thuillier (2007) summarized various methods that have been used in the literature to attempt to measure the value or performance of a PMO. These methods include the return on investment (ROI) of a PMO, a pragmatic method, the balanced score card method, and success factors. The financial measures are problematic. For example, the ROI of a PMO is very difficult to determine, as a PMO generally does not contribute directly to the bottom line of an organization. With the pragmatic measures defined by Aubry, Hobbs and Thuillier (2007), the value of the PMO is also very difficult to determine. The balanced score card method is based on ROI and thus has the same problems as other financial measures. The success factors contribute to the understanding of the conditions that might lead to success, but they do not give an indication of the performance of a PMO.

The roles, value, and legitimacy of PMOs in industry are varied to the extent that there is no empirical validation for the performance increase due to a PMO, or of the value created by a PMO (Hobbs & Aubry, 2007; Unger, Gemunden & Aubry, 2012). The literature also provides ambiguous views about the value of a PMO (Hurt & Thomas, 2009). Many PMOs are found not to add value, or to add very little value, especially if the direct return on investment is used as a measure. The literature that indicates that PMOs do add value claims that PMOs add value in ways other than a direct financial benefit. For example, Unger, Gemunden and Aubry (2012) indicated that the PMOs they studied showed improvements in resource allocation and commitment, cooperation improvement between projects, improved quality of information sent to management for decision-making, and improved single-project performance. Hobbs and Aubry (2007) also mention that one value-adding benefit of a PMO is that it improves the project management maturity of an organization. Hurt and Thomas (2009) indicated that the establishment of project management principles and practices under the management of a PMO can have benefits that include cost savings, increased revenue, reduced rework, improved competitiveness, attainment of strategic objectives, strategic alignment, more effective use of human resources, improved general use of resources, and better project decision-making.

2.2.3 Project Objectives

Construction works are procured for strategic reasons by clients that can be broadly defined in terms the client's ultimate use of the facility on completion (Bowen, 2015). The strategic nature of construction raises two pertinent issues, namely, the manner in which construction works are procured and the measures applied to determine project success. In essence, all activities related to the process of procurement should be informed, structured and carried out in a manner designed to meet or enhance those objectives strategic to the needs of the construction client. Typically, this would include all the procurement activities, from the evaluation of environmental conditions affecting delivery through to operational use. Consequently, any measures of project performance ought to be tied to the strategic outcome required by the construction client: in terms of the investment/business case, the product, and desired organizational and stakeholder outcomes.

Since few construction clients possess either the expertise or capacity to undertake building projects on their own, they typically engage external service providers (i.e. architects, engineers, management consultants, constructors

and building suppliers) to deliver the building assets that they need. For most clients the activity of building is a complementary or residual activity and hence it is no economic case for them to retain these skills in order to carry on their primary business activities. To engage the service providers, construction clients require contracts - not only to ensure full and adequate performance by the service providers on whom they depend, but also to provide a degree of certainty that the strategic objectives of the transaction are met in a controlled way. The contract thus assumes a pivotal role as a means towards these ends. It is imperative, therefore, that the contract's philosophy, structure and parameters are consistent with the procurement approach adopted to deliver the necessary control over supply chain resources, the manner in which the project will be managed and controlled, and with the choice of criteria selected to measure project success at completion.

Construction contracts have evolved into standard contract forms, not only because of their advantages of familiarity and the prohibitive cost of customization but also to provide certainty on the nature of the transaction between parties on a project specific basis (Bowen, 2015); in effect, to minimize transaction costs. The practice is outmoded and its practice has contributed significantly to many of the construction industry's recent and current difficulties (Bowen, 2015). The development of these contract forms reflects the building industry's perspective. Terms and conditions are the product of an exclusive dialogue between building trade organizations and the built environment professions. The result is a compromise of beliefs between these parties to form a fair and equitable balance of risk and power in the contract terms. The business needs of the construction client, therefore, are very much a secondary consideration (Bowen, 2015). Whilst the client may accept this arrangement in order to gain the benefits of the reduced transaction costs within the construction project, the downside of this is that any resulting agreement between the contracting parties is the product of a 'free' commercial negotiation only in a very narrow sense (Root, 2001) and the client is limited in his ability to exercise any direct or meaningful control over the way the process is organized. However, these established contracting practices have come under sustained pressure as clients have started to exert pressure on the industry to better serve their needs (Bowen, 2015) and have begun to look to their own sectors for innovative procurement practices (Bowen, 2015).

2.2.4 Strategic objectives of construction clients

The traditional criteria for determining a project success are evident in the golden triangle of time, cost and quality (PMI, 2000). The argument here is that the criteria apply primarily to the work of the project and are defined solely from the point of view of the contractor. They neither address the wider issues of the investment and business case, nor the vested interest of stakeholders which is related to the performance of the building. Based on the research undertaken between the 1960's and the 1980's in the United Kingdom, Turner (1993) as cited in Bowen (2015), distilled a more complete set of criteria for performance measurement in construction. He proposes, therefore, a set of project success criteria as follows:

- It achieves the stated business purpose;
- It provides satisfactory benefit to the owner;
- It satisfies the needs of the owner, users and stakeholders;
- It meets its pre-stated objectives to produce the facility;
- The facility is produced to specification, within budget and on time; and,
- The project satisfies the needs of the project team and supporters.

Having proposed a more complete set of pro-forma criteria, Turner made a number of important observations concerning their nature and utility:

- Most of the criteria are subjective, with only time and cost being objective;
- The judgment is affected by the assessor's covert objectives;
- The measures are not necessarily compatible, so judgment depends on a complex balance. Relatedly, they are not mutually exclusive, so it is possible to satisfy them together;
- The measures are not judged simultaneously. They cannot, therefore, be forced to be compatible at the end of the project. For example, the first two measures are unlikely to be fully assessed until sometime after commissioning and the product is in use.

Similarly, Bowen (2015) contends that the degree of client satisfaction revolves around two types of criteria: subjective criteria (e.g., aspirations, aesthetics, quality, value for money); and objective criteria (e.g., time scales, construction techniques, price). This measurement of project success should define the strategy for project performance measurement, should also characterize the structure and process of planning, organizing and control for each project

phase, and should be the measure applied on completion to determine the extent to which the strategic objectives of the investment/business case have been met.

2.2.5 Construction Industry in Ghana

Ghana's economy has grown rapidly in the past 20 years, and the construction sector has both contributed to and benefited from this (Darko & Löwe, 2016). The sector itself has registered impressive growth, increasing its contribution to gross domestic product (GDP) and employing 320,000 people (Darko & Löwe, 2016). It employs 2% of young people in Ghana and provides more training and apprenticeship opportunities to young people than any other sector (Owusuaa, 2012; GSS, 2013). Despite this, the construction sector has a large skills gap, due in part to training quality, and there is significant unmet demand for skilled artisans. The number of skilled artisans in Ghana almost halved between 1960 and 1984, from 70,571 to 37,258 (Offei-Nyako et al., 2014). More recently, the World Bank estimated there was a shortfall of 60,000 artisans and trades people in construction, and that a further 250,000 skilled artisans would be required by 2020 (Darvas & Palmer, 2014).

The Ghanaian construction industry is complex in nature, representing a range of stakeholders (Dadzie et al. 2012, 256). The Ministry of Water Resources, Works and Housing, responsible for the housing infrastructure and construction throughout the country, classifies building contractors into four groupings: projects worth up to $75,000 (D4K4); projects ranging from $75,000-250,000 (D3K4); projects worth $250,000-500,000 (D2K2); and projects over $500,000 (D1K1) (Frimpong & Kwasi, 2013, 121). The majority of the companies in Ghana fall under D4K4 and D3K4 classification (Oxford Business Group, 2014). The Chartered Institute of Building in Ghana estimates that there are over 1,600 building contractors working in Ghana since October 2012 (Oxford Business Group, 2014). Although the building construction industry supports the country's economy and thus provides a means for social development, the industry is characterized by unprofessional practices (Asamoah & Decardi-Nelson, 2014, 63).

The industry suffers from a lack of planning, including inappropriate water and energy use, building material consumption, failure to meet consumer/tenant needs, and disjointed stakeholders cooperation in the industry (Twumasi-Ampofo et al. 2013, 6). These deficits form part of an industry mired in corruption without transparent processes for procuring the services of consultants and contractors (Asamoah and Decardi-Nelson, 2014, 63). The unsustainable building construction processes coupled with the constant degradation of the environment continue to take their toll on Ghana's development (Djokoto et al. 2014, 135). The problem-ridden industry must also deal with a national housing problem in need of 70,000 units annually and an accumulated delivery deficit of 250,000 units to meet the housing demands (Twumasi-Ampofo et al. 2013, 6). These numbers are backed up by the U.N. Human Settlement Program who estimates that Ghana will need two million new housing units by 2020 to meet the demand for housing (Imaralu, 2013). The sustainability challenge confronting the construction industry is to meet the demand for housing and other buildings in a strategic and sustainable manner. Normally stakeholders within the industry have the power and capacity to influence the positive changes necessary to improve the state of the industry (Ofori, 2012, 6). Currently, the approach the Ghanaian building construction industry is employing to tackle existing challenges is not cohesive and is adopted differently by the government and private organizations, rendering most efforts ineffective. This current approach is unstructured and contributes to a further challenge of meeting the demand for housing units.

These "affordable" or low cost houses are traditionally built with local materials such as brick and tile, land concrete, adobe bricks, compressed earth bricks, pozzolana cement, bamboo, and secondary timber species to reduce costs (Twumasi-Ampofo et al. 2013, 8). This approach, however, has yet to align the notion of "affordable" with the real cost of the market (Twumasi-Ampofo et al. 2013, 8) and lacks common consensus among the stakeholders in the industry (Asamoah and Decardi-Nelson 2014, 63). This has often resulted in many building construction failures and is indicative of a lack of concise understanding and dialogue among stakeholders in the industry (Ampadu-Asiamah & Ampadu-Asiamah, 2013, 149). Ofori (2012, 4) also explains that most construction projects in Ghana have a long gestation period due to their large and complex nature and thus are slow to respond to planned and unplanned changes. Therefore, there is a need to mitigate the sustainability challenges in the building construction industry by immediately integrating sustainability into its practices (Ahmed, Hatira & Valva, 2014).

2.2.5.1 Sustainable Development & Construction in Ghana

A recent study about sustainability in the Ghanaian construction industry characterized the business as a robust sector, reliant, and dependent, on traditional methods of construction. As the industry has traditionally favored the use of blocks and concrete, it has made the entry of other alternative building material and services difficult. As such, clients and stakeholders do not demand innovative resources and solutions, relying instead on out-dated supplies (Djokoto et al. 2014, 136). Yet, despite the Ghanaian construction industry's reluctance to go beyond meeting the

client's needs, the industry has managed to become more sophisticated and dynamic (Asamoah & Decardi-Nelson, 2014, 63).

Despite a purported desire to adopt sustainable construction practices, the industry is further hampered by a lack of capacity to actually implement sustainable practices (Djokoto et al. 2013, 136). Professionals within the built environment are not yet fully trained in sustainable construction principles and thus lack the know-how to properly carry out such practices. In addition to forming an appropriate knowledge basis, these professionals would benefit from trainings in how to engage with owners/end users, investors, developers, designers, and contractors (Djokoto et al. 2013, 136). The lack of a solid knowledge basis as well as ineffective communications has resulted in delayed projects throughout Ghana (Ampadu- Asiamah & Ampadu-Asiamah, 2013, 150). As the timing of construction projects from inception to completion is critical to both clients and consumers due to increasing interest rates, inflation and development plan targets, the need for this training is particularly acute (Ampadu-Asiamah & Ampadu-Asiamah, 2013, 150). Many of the construction projects in Ghana are becoming larger and more technical, and will require a higher quality of professional services and better control systems to meet the needs of the growing population (Asamoah & Decardi-Nelson, 2014, 63). The need to invest in training skills is of paramount importance to the survival of the industry.

Djokoto et al. (2013) present ten main barriers that must be addressed before sustainable construction can be successful. These barriers are: lack of demand (by property owners), lack of strategy to move towards sustainable development, higher development costs, lack of public awareness, lack of government support, lack of cooperation, risk of investment, lack of building codes and regulations, higher investment costs and lack of a measurement tool.

2.2.3 Total Quality Management

The chronic problems of the construction industry are well known: low productivity, poor health and safety, inferior working conditions, and inadequate quality (Polat, Damci & Tatar, 2011). Great amount of time, money and resources, both human and material, are wasted each year in the construction industry because of inefficient or non-existent quality management procedures (Polat, Damci & Tatar, 2011). Similar problems had also been encountered in the manufacturing industry, yet great performance improvements have been attained in manufacturing in the last decades because of successful quality management programs such as Total Quality Management (TQM) (Hoonakker, Carayon & Loushine, 2010).

According to Kaynak (2003), Total Quality Management (TQM) is a holistic management philosophy that strives for continuous improvement in all functions of an organization, and it can be achieved only if the total quality concept is utilized from the acquisition of resources to customer service after the sale. Bou-Llusar, Escrig-Tena, Roca-Puig, and Beltran-Martin (2008) also defined TQM as an approach to management embracing both social and technical dimensions aimed at achieving excellent results, which needs to be put into practice through a specific framework. As well, Sadikoglu and Olcay (2014) defined TQM as a firm-wide management philosophy of continuously improving the quality of the products or services or processes by focusing on the customers' needs and expectations to enhance customer satisfaction and firm performance. Elghamrawy and Shibayama (2008) contributed by defining TQM as a customer-oriented and quality focused management philosophy for achieving continuous improvement.

The roots of TQM can be traced back to the early 1920s, when Walter Shewhart of Bell Laboratories first applied statistical process control to measure variance in production systems (Elghamrawy & Shibayama, 2008). This concept was further developed in the Japanese manufacturing industry in the 1940s led by American quality gurus such as Deming, Juran, and Feigenbaum. In the 1950s, the Japanese adopted, developed and adapted the methodologies introduced by the Americans, begun to develop distinctive approaches suited to their own culture led by Japanese quality gurus such as Ishikawa, Taguchi and Shingo, and achieved considerable performance improvements.

However, in the 1970's and 1980's American business and the media began to recognize the tremendous business success of the Japanese. Since then, schools of management theory have espoused various concepts of "Japanese management," from corporate culture to quality circles. This style of management is credited with many positive changes in corporate America. It stresses the importance of worker involvement in improving product quality, improved quality results in decreased cost, increased productivity, lower prices and greater customer satisfaction. With increased customer satisfaction, the company captures a greater share of the market, leading to increased employment. Increased worker involvement also contributes to improved worker satisfaction and quality of work life (Kaynak, 2003). This management concept is known by various names in the American companies which have adopted it, for example, Total Quality Improvement, Team Management, Continuous Quality Improvement and Total Quality Management, to name a few.

An awareness of quality in western countries increased in the 1980s with a new wave of western quality gurus such as Crosby, Peters and Møller (Polat, Damci & Tatar, 2011). TQM refers to a new concept in which the

focus is shifted from quality of products to quality of all issues within an organization. In other words, it compasses all aspects of business, makes quality a strategic objective, and requires an integrated effort among employees at all levels to increase customer satisfaction by continuously improving performance (Polat, Damci & Tatar, 2011). TQM aims to establish quality enhancement as an organizational dominant priority and improve organizational effectiveness through eight principles, which include: 1) top management leadership, 2) customer management, 3) people management, 4) supplier management, 5) quality information management, 6) process management, 7) learning, and 8) continual improvement (Koh & Low, 2010). The process of producing quality work and improvement must start with the leadership, commitment and involvement of the top management as it is responsible for creating an organization culture for quality, defining organizational quality values and goals, and providing necessary resources and infrastructure for operating a quality management system.

Customer satisfaction is the key principle of TQM. All goods and services should fulfill the customer's needs. For this purpose, communication and feedback processes on the customer's concerns and satisfaction should be developed. TQM adopts the system approach to management, which involves collaboration between all parties including employees at operational and managerial levels, customers, suppliers, etc., as the performance can be improved through partnership among the parties and creating teamwork environment. Resources play critical role in producing quality products. Therefore, developing interdependent and mutually beneficial relationships with suppliers/subcontractors increases the ability to create value. Management of an organization involves making sound decisions to achieve improvement and solve problems based on the analysis of factual data and information. It can be achieved by developing quality information systems. Several interrelated and interdependent processes are carried out in a company. The quality of final product and/or service provided is highly dependent on the quality of these processes. A company should adopt a process management approach, which involves inclusion of quality measures in the processes and continuous monitoring and control of these processes, in order to eliminate or reduce the root causes of variances. Developing an organizational learning mechanism enables companies to learn from their past mistakes and ensures that those mistakes are not repeated. In this respect, learning is vital in improving the existing processes. The ultimate goal of TQM is achieving continuous improvement of technical and managerial processes within an organization in order to meet the mounting expectations of the customer and thereby create competitive advantage (Koh & Low, 2010).

The implementation of TQM in the manufacturing industry brought about increased productivity, decreased product cost and improved product reliability (Polat, Damci & Tatar, 2011). As a result of successful TQM implementations in the manufacturing industry, the construction industry has turned to the manufacturing industry as a source of innovation, and endeavored to adopt and implement this concept in the construction industry. It is commonly acknowledged that implementation of TQM in the construction industry promises several benefits such as more repeat customers, reduced rework, improved employee job satisfaction, higher productivity, improved budget performance, improved schedule performance, better chances in bidding process with pre-qualification, increased market share, etc. (Polat, Damci & Tatar, 2011). In spite of the benefits that it promises, TQM implementation in the construction industry is not easy due to the peculiarities of the industry such as one one-of-a-kind product, lack of top management's leadership and support, unqualified workforce, lack of effective teams, etc. (Koh & Low, 2010). Moreover, many construction companies still consider quality programs as extra cost because of the fact that they are not totally aware of that the cost of nonconformance to quality, i.e., the cost of rework, waste, errors, customer complaints, budget deficiencies, and schedule delays, is much higher than that of operating a quality program (Polat, Damci & Tatar, 2011). Although TQM has been widely implemented in the Japanese construction industry since the 1970s and in the U.S. construction industry since the 1990s, it has not been implemented widely and successfully in the Ghanaian construction industry (Polat, Damci & Tatar, 2011).

2.3 Historical Thinking

2.3.1 Criticisms of Total Quality Management as a viable concept

Although there are many success stories of TQM implementation and its benefits, the real impact of TQM cannot be disregarded (Evan & Lindsay, 2001; Al Nofal, Al Omaim & Zairi, 2003). A number of failures have also been reported (Al Nofal, Al Omaim & Zairi, 2003), for example, Eskildson (1995) argues that TQM does not provide either a cure-all nor is it a single key to organizational success. He provides several examples one of which was the bankruptcy of the Wallace Company (one of the winners of the MBNQA) after receiving an award. The bankruptcy of the MBNQA winner to the unsustainable loss resulted from the high spending on quality (Hill, 1993). Therefore, the collapse of the company may indicate an ineffectiveness of the management system. The main reasons for TQM's disadvantages, based on Eskildson's suggestion, include: the number of overlapping programmes, lack of clear accountability, lack of credible measurement, inadequate reporting, difficulty in keeping up with changing customer priorities, diversification of business, and lack of strategic focus. One of the key problems, according to Goodman et

al. (1994), concerns the different methods of data collection and classification – TQM requires surveys, customer complaints, field reports and process data – and these methods cannot be combined due to data conflict.

Another criticism is that TQM focuses mainly on internal matters (performance measures, training, employee participation and leadership) and the real growth element comes from external matters (marketing). Therefore, quality programmes should incorporate the marketing side of quality – make customers' needs and perceptions meaningful internally. In addition, the key is to find ways to link external measures of customers' requirements, fulfillment and purchase behaviour to internal quality measures (Kordupleski et al., 1993). Harari (1993) also strongly argue the disadvantages of TQM principles. He points to eleven reasons why TQM brings potential problems in real world applications:

1. Focuses on internal processes rather than on external result;
2. Focus on minimum standard;
3. Develops its own ponderous bureaucracy;
4. In addition, total quality philosophy involves a comprehensive transformation Delegates quality to quality Czars rather than to real people;
5. Does not require radical organizational reform;
6. Does not demand changes in management compensation;
7. Does not demand entirely now relationship with outside partners;
8. Applies to faddism, egotism, and quick-fixism;
9. Drains entrepreneurship and innovation from the organization cultures;
10. Has no place for emotion and soul, but mechanical approach;
11. Tries a one-size-fits all solution.

Katz (1993) describes TQM pitfalls and asserts that the main reasons of TQM failures are:
1. Failing to recognize the difference of organization characteristics and environment.
2. Applying tools of TQM before needs are determined and direction is established.
3. Conducting mass training of hourly employees without involvement of all levels of management.
4. Overemphasizing technical tools.

In addition, total quality philosophy involves a comprehensive transformation of organizational beliefs, values and behaviours (Olian & Rynes, 1991). Senior management's lack of understanding the quality principles could result in a misestimating of the degree of change involved in the adoption of a total quality strategy. TQM implementation requires radical change to traditional management practices. For instance, traditional management paradigm stresses authorizations. Therefore, even though managers may support the principle of employee participation and input, they are uneasy about giving up their authority (McConnell, 1995). The development of an effective work team may be problematic in organizational cultures where human resource systems emphasize individual performance reviews and compensation (Waldman, 1993).

Despite the criticism, neither academics nor practitioners dispute the fact that the quality movement has been the most influential of all management innovations in the last two decades (Krishman et al., 1993). Evans and Lindsay (2001) assert that many companies achieved astonishing success through total quality emphasis and because the world is becoming more quality conscious, companies that resist TQM may not be in business for long. As the editor of Quality Digest put it, "TQM isn't dead. TQM failure just proves that bad management is still alive and kicking" (cited in Evans and Lindsay, 2001). Moreover, TQM has been credited with some extraordinary success stories. These successes involve business turnarounds for industry giants such as Ford, Motorola and XEROX (Krishman et al., 1993). Shin et al. (1998) states that the proper implementation of TQM could be a powerful vehicle where companies are able to achieve excellence in business performance.

However, they also claim that companies that have not achieved TQM potential benefits have begun abandoning its practices. These companies should not blame the TQM framework, key principles for its failure is the lack of understanding of what TQM means for each unique organization and how to implement it effectively that has created skepticism on the effectiveness of TQM. In their study, Salegna and Fazel (2000) sought to determine the extent to which the aforementioned obstacles represent major barriers to TQM implementation. The study reveals the following obstacles in rank order: lack of time to devote to quality initiatives, poor inter-organizational communication, lack of real employee empowerment, lack of employee trust in senior management, politics and trust issues, lack of a formalized strategic plan for change, lack of strong motivation, view of the quality programme as a quick fix, drive for short-term financial results, lack of leadership, lack of customer focus, and lack of a companywide definition of quality. It should also be understood that TQM is not a short-term fix; it is a long-term, never ending commitment to the improvement of quality and performance.

2.3.2 The Significance of Critical Factors

A review of the literature suggests that a blend of 'soft' and 'hard' quality factor impact TQM implementation. Soft quality factors are intangible and difficult to measure, and are primarily related to leadership and employee involvement. Hard quality factors, on the other hand, refer to systems and tools and techniques, such as those that impact internal efficiency (e.g. quality management system, cost of quality and statistical process control) and external effectiveness (e.g. benchmarking and customer satisfaction surveys). However, Black and Porter (1993) contend that it is difficult to classify factors along soft-hard criteria. Wilkinson (1992), on the other hand, stresses the practicality of using this classification, referring to experiences at the Co-operative Bank Plc and Black and Decker UK. Lau and Idris, (2001) conducted a study on a number of Malaysian industries to identify soft elements (culture, teamwork, employment continuity, education and training, top management leadership for quality and continuous improvement, employee involvement and customer satisfaction/involvement) likely to have a significant effect on the TQM tangible effects.

The authors found a relationship between identified soft elements and TQM tangible effects. Additionally, they identified a combination of the soft elements that are critical to TQM tangible effects. 'Soft' quality factors are discussed under leadership, internal stakeholder management and policy in this chapter. They refer to issues that impact the maximization of organization-wide support and involvement in attaining the quality goals of an organization. Wilkinson (1992) argues that they may be best treated as 'internal marketing' issues. These factors include: senior executive's commitment and involvement, comprehensive policy development and effective deployment of goals, entire workforce commitment to quality goals of the organization, empowerment, effective communication, internal customer supplier concept, teamwork, system for recognition and appreciation of quality efforts, and training and education, among other things. 'Soft' quality factors are long-term issues that must be addressed as long-term issues. Their consideration in the implementation plan is critical to the success of the TQM, and there is a chance for failure in the event that they insufficiently paid attention to (Wilkinson, 1992). 'Hard quality factors' are usually the tools and systems that contribute to the success of the goals. These 'hard' quality factors include: benchmarking; performance measurement; management by fact, managing by processes, self-assessment, quality control tools, cost of quality process, documented quality management system, supplier management, and customer management. Together, 'soft' and 'hard' quality factors comprise the total quality management model proposed by Oakland (2000). 'Soft' quality factors are expected to rate highly in terms of criticality and emphasis in TQM implementation process. The 'hard' quality factors are usually considered as tactics rather than strategies (Pegels, 1993).

2.3.3 The Factors of TQM

2.3.3.1 Leadership

Breiter and Bloomquist (1998) argue that the most common barrier to TQM success is failure of management leadership. In another instance, Aune (1998) suggests that among the principles of TQM, leadership ranks the first in terms of importance, Leadership is about managing people (Hackett & Spurgeon, 1998). The questions of why and how leadership is significant in TQM need to be addressed and highlighted. Zairi (1999) does this in the case the of Motorola company; he lists 18 main functions played by senior leadership.

2.3.3.2 Employee involvement and empowerment

Since the late 1980s, employee involvement, participating management, democratic management, and quality of work life are terms that are very common to many managers who pursue excellence in quality achievement in order to be competitive (Rees, 1999). To investigate the practice of employee involvement in TQM, we need to look at the reasons for implementing TQM, the attitudes of the staff and their management style, teamwork, and barriers to employee involvement (Hales & Klidas, 1998). We also need to consider company employees at different levels, including senior management. Typical reasons for initiating a TQM programme include the desire for improvements in productivity, performance, morale, and employee motivation, as well as skills (Tuffrey, 1997). Employee involvement, participation, and empowerment form the cornerstones of TQM.

2.3.3.3 Middle management role

Middle management has a role to play, but it has been defined as the major source of resistance to the implementation of successful quality improvement processes (Steiner, 2001). Middle management sees a quality improvement process as a threat. They fear that it will eventually eliminate their jobs as the number of management levels is decreased to improve communication. They fear that their decision-making power and responsibilities will be lost to lower level employees, leaving them without anything to do. But the middle managers are keys to process implementation that have important contributions. First, they must convert company-wide strategies, structures and

intentions into detailed operational activities, fine tuning the overall direction to suit the real world where supplies arrive late, machines break down, and people come to work with a headache (Wimalasir & Kouzmin, 2000). Secondly, they are the role models for the front-line staff. Any organization committed to developing the middle managers needed for the future controls the factors requiring change. It does not need a new method or the adoption of new management theory (Hunt & At-Twaijri, 1996).

2.3.3.4 Training and education

The assumption that training and learning are linked to economic performance and competitiveness at the levels of both individual organizations and national economy has been central to the recent changes in education and training policies in most business corporations, and even at government level (Millar, 1999). From the perspective of human resources management, labour will no longer be considered as a commodity and a cost to be minimized, but will be a vital investment for organizational success (Wiley, 1997).

2.3.3.5 Rewards and recognition

Organisations and managers consistently acknowledge reward and recognition as an important element in motivating individual employees (Twomey & Twomey, 1998). Employee of the month schemes, profit sharing, and monetary payment for higher productivity, or commission on sales revenue, are widely used. It is important to recognize that pay incentives and rewards are also communication and motivation devices (Poole & Jenkins, 1997).

2.3.3.6 Teamwork

The concept of teams and teamwork is increasingly becoming an important key to productivity and employee satisfaction in the contemporary workforce (Adebanjo & Kehoe, 2001). The use of teams has increased significantly as organizations (both public and private) have turned more and more jobs over to team-based structures. Teams are now being used in innovative ways in strategic planning, flexible-jobbing initiatives, global networks, the horizontal organization, and the virtual organization. In addition, teams can be employed in traditional decision-making techniques such as brainstorming and nominal group (Stough et al., 2000).

2.3.3.7 Role of employee unions

The structure of collective bargaining occupies a central position in the debate on the effectiveness of any industrial relations system (Clarke, 1998). It is posited that the structure of collective bargaining exerts an important influence on the local autonomy of both management and employees, and the pattern of strikes and pay outcomes. For some managers, depending upon their ideology and style of management, multiemployer bargaining has a further advantage in that it can 'neutralize' or, at the very least, minimize workplace trade unionism.

2.3.3.8 Policy and strategy

An increasing number of organizations, as part of a strategic planning approach to continuous improvement, are starting to use policy deployment, suggested by Lee and Dale (1998). In western organizations, the interest in policy deployment has primarily been generated by the use of self-assessment against a recognized model for business excellence, such as the European Foundation for Quality Management Model and Malcolm Baldrige National Quality Award (Watson, 1998). In recent years, policy deployment has been a topic in which organizations have shown an increasing interest, but it is still not a well-known technique in many companies (Civi, 2000).

2.3.3.9 Resources Management

Cornford (2001) argues that resource management can be analyzed in two sections: communication management and supplier management. McAdam and Reid (2000) suggest that knowledge management is an emergent and eclectic body of knowledge, which covers the systematic management of knowledge of all kinds, within all levels and types of organizations.

2.3.3.10 Communicating Management

The need for continuous quality improvement must be conveyed effectively and regularly if TQM is to take root and be sustained. Concerning management communication strategies determining job satisfaction in telecommuting, Ilozor et al. (2001) argue that several management communication strategies directly influence job satisfaction of telecommuters. By using a sample of 43 telecommuters, they found that there are eleven aspects of the strategies which had to have significant influence on the job satisfaction of telecommuters: communicating job responsibilities, goals and objectives, deadlines and job expectations, communicating freely and regularly, providing appropriate equipment, training and career development, and reviewing work and salary regularly. They conclude that

cultural, economic and social contexts may have a distinct part to play in the impact of management communication strategies on the job satisfaction of telecommuters.

2.3.3.11 Managing suppliers

Supplier management is an increasingly important aspect of competitive manufacturing. The role of supplier management is highlighted by Szwejczewski et al. (2001). They suggest that suppliers can make a significant contribution to the achievement of manufacturers' performance objectives.

2.3.3.12 Accredited quality management system

A quality system is designed to provide both the support and mechanism for the effective conduct of quality-related activities in an organization, and is a systematic means to manage quality. Accredited quality management systems form a major pillar supporting the development and operation of TQM in an organization. The origins and basis of commercially-oriented quality system standards have evolved over the past thirty years or so. Much of the initial development was for military projects in the USA (Muthu et al., 2001). Larsen and Haversjo (1999) argue that although the latest Mobil Oil survey suggests that more than 200,000 accredited ISO 9000-family certificates had been issued world-wide up to September, 1997, few of these had been given to organisations in the social sectors.

2.3.3.13 Organizing for quality

The challenge of organizing for quality is to enable quality improvement to develop and flourish. The success of the quality improvement process depends on effective and systematic implementation. Given the corporate-wide nature of TQM, a suitable infrastructure to support quality initiatives is required. Oakland (2000) highlights that authority must be given to those charged with following TQM through with actions that they consider necessary to achieve the goals.

2.3.3.14 Managing by Process

Managing by process is the key to engaging an organization's employees to take responsibility for what they are doing in relation to satisfying the customers (Guimaraes & Armstrong, 1998). In many big companies, such as Shell Chemicals UK, there is a growing recognition of the need to move away from the traditional functionally-based approach to managing through a set of clearly defined, customer-driven processes. Appelbaum et al. (2000) say that the process-based approach or managing by process improves customer focus and avoids the limitations of managing by vertical functions.

2.3.3.15 Benchmarking

Benchmarking can be seen as an important management tool of TQM. Xerox Corporation first developed it in 1979, when severe quality and costs problems became visible in the face of the extremely low price of Canon copier machines (Davies & Kochhar, 1999). Today, this instrument is used by a large number of US companies, such as Motorola, Ford, GTE, IBM, and Kouzmin et al. (1999) define benchmarking as "the continuous process of measuring products, services and practices against the toughest competitors or those companies recognized as industry leaders, that is the search for industry best practices that will lead to superior performance" (Sarkis, 2001). Benchmarking is a more comprehensive exercise than 'reverse' product engineering which only focuses on the analysis of specific components and functions of the products of competitors (Fong et al., 1998).

2.3.3.16 Self-assessment

If a process of continuous improvement is to be sustained and its pace increased, it is essential that an organization monitors on a regular basis what activities are going well (Gore et al., 2000). Self-assessment provides such a framework. Self-assessment is more than just another fad, it is a management approach based on a vision of business excellence (van der Wiele et al., 2000). The use of self-assessment against an excellence model can provide the stimulus for further improvement, and can facilitate the necessary linkage between improvements and the business planning process, including policy deployment (Coleman et al., 2001; Lee & Quazi, 2001; Zink & Voss, 1998).

2.3.3.17 Cost of quality

Cost and quality have long been the centre of attention for both manufacturing and logistics managers as cost centres for most firms. Cost considerations drive a host of strategic decisions, including global manufacturing rationalization, outsourcing and downsizing, as firms seek ever-lower labour and materials costs (Andersen & Moen, 1999). Quality cost measurement has its origin in the early 1950s, and Feigenbaum's classification of quality costs in

the familiar categories of prevention, appraisal and failure has been almost universally accepted (Lee & Cunningham, 2001).

2.3.3.18 Quality Control Techniques

Quality control is an aspect that strongly influences the competitiveness of organizations and continually demands managerial attention. Since a quality control system is a aspect system of the organization, it contains all elements of the organization (Xie & Goh, 1999). The means of the organization (i.e. workers and machines), for instance, belong to both the production control system and the quality control system. However, in a production control system, workers and machines are the main sources of capacity. In a quality control system, emphasis is laid on the knowledge and skills of the workers and the transformation capabilities of the machines (van der Bij & van Ekert, 1999).

2.3.3.19 Measuring Customer Wants and Satisfaction

To survive in highly competitive markets, organizations need to provide goods and services that yield highly satisfied and loyal customers. When customers are satisfied, they are more likely to return to those who helped them, while dissatisfied customers are more likely to go elsewhere (Robledo, 2001). Without a unifying vision of customer needs, even the most talented and motivated teams earn only the small satisfaction of narrow competence, and the customer is lost. It is the clear customer oriented vision of where they are headed that is one of the main factors that distinguish great companies from the rest.

2.3.4 Empirical Review

Polat, Damci and Tatar (2011) conducted a research to identify the barriers and benefits of total quality management in the construction industry among Turkish contractors. They used a sample size of 120 large-scaled Turkish contractors, who are the members of Turkish Contractors Association (TCA). Their response rate was 67% (that is 80 large-scaled contractors). The survey results indicate that out of 16 potential benefits only "better chances in winning contracts in domestic markets" scores 2.86, which is lower than "very important", whereas the remainders score higher than "very important". "Better customer satisfaction /more repeat customers" scores 3.64, which is close to "critical". "Reduced rework" scores 3.50 and ranks closely behind "better customer satisfaction / more repeat customers". "Improved employee job satisfaction" and "better chances in winning contracts in international markets" score 3.08 and 3.18 respectively, which are slightly higher than "very important".

Out of 18 potential barriers only "incompatibility of standardized quality management systems with the construction industry" scores 1.91, which is slightly lower than "important", 14 barriers score higher than "important", and 3 of them, namely "lack of top management commitment", "lack of top management support" and "lack of top management", score higher than "very important". Based on the survey results, top level managers do not adequately believe in the importance of TQM implementations, therefore, they do not provide necessary resources to develop and utilize a QMS, lead the entire process, and motivate the employees in involving TQM implementations. The next three barriers, namely "difficulties in mapping processes and developing standardized procedures", "difficulties in taking corrective and preventive actions" and "difficulties in employing statistical quality control techniques in construction process", score slightly lower than "very important" and they are all obstacles stemming from one-of-a-kind product nature of construction projects.

Top level managers' apathy may result from their belief in that implementing TQM in the construction process is very difficult as construction operations are unique and non-repetitive and the construction process cannot be standardized. "Lack of workforce qualified in quality management implementations", "lack of effective teams / team building skills", and "need for employing skilled workforce" score 2.70, 2.67 and 2.58 respectively, which are higher than "important" and close to "very important". These barriers stem from the lack of expertise in TQM concept and unqualified workforce problem prevailing in the construction industry. This finding is reasonable given the fact that many construction workers are untrained, under-qualified, unskilled and inexperienced in many developing countries.

Sadikoglu and Olcay (2014) also conducted a study in Turkey to find the effects of Total Quality Management practices on performance. They used six variables as factors under Total Quality Management. These six factors were Leadership, Knowledge and process management, Training, Supplier quality management, Customer focus and Strategic quality planning. Variables they used to assess performance were Operational performance, Inventory management performance, Employee performance, Innovation performance, Social responsibility, Customer results, and Market and financial performance. They studied 500 firms. They found a positive correlation between all the six Total Quality Management indexes with all performance measures. Their findings suggest that firms use Total Quality Management for the purpose of improving operational performance, enhancing customer satisfaction and portfolio,

and increasing market and financial performance which are primary reasons of Total Quality Management practices (Sadikoglu & Olcay, 2014). Challenges faced with the implementation of the Total Quality Management were employee non-involvement, inadequacy of firm's structure and lack of firm's resources, illiteracy and unawareness among the employees, and constraints of the industry. They suggested for firms to primarily focus on change management, employee involvement and skill development (Sadikoglu & Olcay, 2014).

Kaynak (2003) researched on the relationship between total quality management practices and firm's performance. The sample size used in this study was 382 manufacturing companies. Kaynak used seven Total Quality Management techniques namely; management leadership, training, employee relations, quality data and reporting, supplier quality management, product or service design, and process management. Indexes he used to assess performance were quality performance, inventory management performance, and financial and market performance. The findings of the study suggest a positive correlation between implementation of total quality management and firm's performance. The findings also suggested that for an effective implementation of total quality management, there should be an assessment of management leadership. It was also found that management leadership is positively related to training, employee relations, supplier quality management, and product design.

However, management leadership is inversely or negatively related to quality data and reporting, and process management. Also, Kaynak (2003) found an inverse relationship between effective leadership by management and firm performance through the mediating effects of the other indexes of the total quality management. It was again revealed by Kaynak (2003) that training and employee relations are directly or positively related to quality data and reporting, but indirectly related to supplier quality management, process management and product or service design through quality data and reporting. Among all the indexes of total quality management, according to Kaynak (2003), supplier quality management emerged as the most important determining variable that positively affects process management, product or service design, and inventory management performance. However, according to Kaynak (2003), supplier quality management, process management and product or service design were the three total quality management practices that had positive effect on operating performance such as inventory management and quality performance.

3.0 RESEARCH METHODOLOGY

Chapter describes the processes used in conducting the study, the research approach, the sampling technique and the sample size, data collection and data analysis procedures that the researcher used to achieve the objectives of this study. The general aims of this study requires learning more about projects audited with regards to their effectiveness and efficiency and compliance with statutory and corporate guidelines and how it affects operational performance in the organizations. So quantitative and qualitative approach based on observations and records available of an existing literature is preferred in other to meet research objectives. Qualitative study is used to uncover the trends in thought and opinions and dive deeper into the problem (Corbin & Strauss, 2008), (Mugenda & Mugenda, 2013). On the other hand, Quantitative research also shows the objective measurements and statistical mathematical or a numerical analysis of data collected through polls, questionnaires (Peters, 2013). The study used these two methods to analyzed data.

This thesis includes any empirical research done by the author. It is a systematic literature review based on publicly available literature, researches, and facts related to the topic in discussion. This review involved looking information on auditing, project management, and project audit; this last one did not show the expected amount of results. Even though there is a strong correlation between programme management and project management, programme audit has been excluded from the coverage of this paper. As the new concept of project management started to be exploited in the 60's, academic papers before this date has not been considered relevant for this investigation. Three search engines were used, one from Google Scholar, one from The University of Manchester, and the last one from Universidad Espíritu Santo. These last two, allowed access to EBSCOhost which made available many academic articles from popular databases like Elsevier, Springer, Source Direct and Business Source Complete from which most of the sources for this paper come from; databases that contained a high level of academic papers related to auditing and specially on project management. To supplement the previously mentioned articles, web pages from PMI and APM were used, and also other web pages related to project management and auditing.

All the collected information was gathered thematically along this paper to better establish interconnections and dependencies between auditing and project management; and for a better understanding of the relation between these two. This paper first, attempts to define what Project Audit is and to describe its main features. Later, a comparison between project audits, financial audits and technical reviews is made. The relevance of project audit,

what a project auditor is and the project auditor's role is also covered later in the following section. A perspective to the current and future challenges of the topic in discussion is exposed and finally conclusions and recommendations are developed.

3.1 Research Design

The study described in the research was based fundamentally on both qualitative data obtained from primary and secondary sources to meet the objective of the study. During data gathering the choice and design of the method was based on ongoing analysis. It was constantly modified and these give room to the researcher to drop unproductive areas from the original plan. The primary source of data was derived from questionnaire to develop and distributed the sample of the population for analysis. The focus was on various workers who are directly involved in projects management, procurement management i.e. Architects, Engineers, Quantity surveyors, Project Finance Manager, Municipal Chief Executives, Procurement managers and Project Managers. The nature of this research is exploratory and open ended however, small number of people will be interviewed in depth and or relatively small number of focus groups will be contacted for the study. According to the available statistics, the total populations of those directly involved in these organizations are estimated to be approximately two hundred and forty (240).

3.2 Ethical Considerations

The respondents were informed of the aim of the research before information was collected from them therefore in compliance to the standards of voluntary and informed consent. The researcher required permission from heads the various units from the local government ministry. Integrity and confidentiality were very much upheld all through the study.

3.3 Research Methods

Semi- structured questionnaire was constructed with the guide of the literatures that was reviewed. The questionnaire was focused on asking the respondents about; the different rules and regulations they follow in developing a supplier relationship, the step in which they develop and implement the relationship, the barriers and difficulties they experience throughout implementation of the strategy and the impacts of the relationship with their suppliers. The data was recorded and updated simultaneously as responses are received; this was due to insufficient time allotted to the project. The results were organized in the Statistical Social Package for Scientist spreadsheet with the code sheet that has been developed to measure the attitudes from the data of the survey results. The data was organized into separate rows and columns with the assigned attitudinal score. The responses of each question were assigned with numerical values for the data analysis.

3.3.1 Sample Technique

Purposive sampling was used for the research to cover specific people within the population for the study. The advantage of this type of sampling is the fact that there are several different types of sampling (homogenous sampling, expert sampling, critical sampling) methods. Another benefit of this type of sampling method is its ability to gather large amount of information by using a range of different techniques and this variety give the researcher a better cross section of the information. Patton (1990) asserts that there are no specific rules when determining the sample size in qualitative research. Qualitative sample size therefore may best be determined by the time allotted, resources available and study objectives; In 1990, Morse suggested a sample size between thirty to fifty (30-50) could suffice the number to determine a good report, however, Creswell (2013) varied it to between twenty to thirty (20-30) to be sufficient to establish a true reflection of research. Vilfredo Pereto (as cited in Richard Koch 1998) asserts that 80/20 principle indicates that the minority of results outputs or rewards. This therefore means that the eighty percent of an achievement is as a result of twenty percent of inputs. In other words, four fifth of an input (greater proportion) in every endeavour is largely irrelevant. Therefore, regardless of the research of the positions of Creswell, Patton, and Morse, the researcher uses the twenty percent as the estimated proportion for the determination of the sample size.

3.3.2 Result

The sample of the research was calculated using the Cochran, 1963 formula with 95% confidence level, with Vilfredo Pereto (Pereto, 1920) analysis of 20% as estimated population proportion and five percent (5%) was used as a precision or error level. The calculation formula of William G. Cochran is presented as follows:

$$n = \frac{Z^2 ɣ * P (1-P) N}{Z^2 ɣ * P (1-P) + N (e^2)}$$

Where:

n = sample size

N= Total Population size

ɣ= confidence level of the test

P= estimated population of proportion

Z= abscissa of the curve (1.96)

e = allowable error/ precision.

Substitute number in formula.

Sample size= 1.96^2 x 0.2 x (1- 0.2) 240

$1.96^2 * 0.2 (1- 0.2) + 240(e^2)$

Sample size= 121.44

Approximately = 125.

After the calculation, the researcher arrived at 121.44 but decided to round it up to use 125 in order to attain a reliable data.

3.3.3 Questionnaires

Questionnaires analysis is the process of bringing order, structure and meaning to the mass of information collected (Mugenda & Mugenda, 2003). Given that the study was conducted using a mixed method approach (defined under "research design"), analysis was done using Statistical Package for Social Sciences (SPSS) and coding/theming. SPSS was used, allowing the researcher to present the information in form of tables and figures.

3.3.4 Interviews

The study used a regression model to predict the extent to which the identified independent variables affect the dependent variable of interviews conducted. In this case SPSS version 18 was used in regression analysis and computation of coefficients.

4.0 DATA ANALYSIS

This chapter of the study presents the analysis and interpretations as well as the discussions of the data collected based on the objectives of the study. The subsections of the chapter have been arranged based on the objectives of the study. The main objective of this study is to analyze the effect of contract administration on project completion and attainment of project objectives in basic school construction in the Greater Accra Region by the Free Senior High School secretariat of the Ministry of Education in Ghana through the adoption of total quality management. One project that is at the heart of the current Ghanaian government is the Free Senior High School (FSHS), since it was part of their major campaign promises. This will therefore need a lot of new classroom blocks, hostels, boarding houses, assembly halls and other building constructions to accommodate the students since the already enrolled students are over clouded in the available accommodations. Nevertheless, for this project or vision to successfully complete, its contract administration has to be properly managed. Evaluation of the contract administrative process will require a holistic assessment from the beginning to the end of the project hence Total Quality Management (TQM). Total quality management systems have been widely adopted to assess megaprojects but not projects like the basic school construction in Greater Accra region by the free Senior High School secretariat of the Ministry of Education in Ghana (Leong, Zakuan, Saman, Ariff & Tan, 2014). This study therefore bridges the gap by examining the effect of contract administration on project completion and attainment of project objectives in basic school construction in the Greater Accra Region by the Free Senior High School secretariat of the Ministry of Education in Ghana through the adoption of total quality management by Sadikoglu and Olcay (2014) and extension of the key variables used to assess the successful completion of a project by NIGP to six.

The specific objectives of the study were to identify assessment variables for contract administration and project completion, assess the contract administration of the construction projects under the FSHS secretariat in the Greater Accra Region, evaluate the projects' completion with the total quality management methods and verify whether the projects meet their objectives, and finally to examine the relationship between contract administration and project completion. The main alternative hypothesis of the study is: There is a relationship between effective contract administration and successful project completion at 95% confidence level. In order to achieve these, the study was based on the philosophy of Epistemology. The aspect of epistemology being used by this study is positivism, hence

quantitative methods under descriptive research design. The major source of data for this study is primary. The target population for the study as stated earlier is stakeholders of Free Senior High School contracts in the Greater Accra Region with a sample size of 400 through the application of Miller and Brewer (2003) sample size calculation. The 400 sample was distributed among the 16 districts in the Greater Accra Region (Refer to Table 3.1). The Cronbach alpha coefficient for the questionnaire used was 0.956 (Refer to Appendix B), which is greater than 0.7. This indicates that the questionnaire used is 95.6% accurate; therefore it is reliable and valid for the study.

4.1 Profile of the Respondents

Table 4.1: Demographic variables of the respondents studied

Variable	Frequency	Percentage (%)
Age		
28	50	12.5
30	125	31.3
43	225	56.3
Total	400	100.0
Gender		
Male	326	81.5
Female	74	18.5
Total	400	100.0
Education Level		
Tertiary	400	100.0
Position at work		
ICT	50	12.5
Junior Officer	225	56.3
Operations-FSHS Unit	125	31.3
Total	400	100.0

Source: Field Data, 2018

Table 4.1 represents the demographics of the respondents studied. The average age of the respondents was 37 years with the majority (56.3%) being 43 years. Also, majority (81.5%) of the respondents were males. All the respondents studied were tertiary graduates in terms of educational level. However, majority (56.3%) of the respondents were junior officers. The category of respondents studied as shown in Table 4.1 indicates that the responses were from highly educated and professional individuals, therefore response errors were minimised.

4.1 CONTEXT OF RESEARCH SITE

4.1.1 Evaluation of FSHS projects' completed with the total quality management methods and the assessment variables for contract administration and project completion

Table 4.1: Total Quality Management (TQM) assessment variables

TOTAL QUALITY MANAGEMENT (TQM)	WRM	Description
Corporate Culture Quality	4.20	Agree
Contract goals are set considering performance requirements	4.00	Agree
The construction firm's wide culture is committed to quality improvement	4.00	Agree
There is a strong communicative culture throughout all areas of the construction firm	4.00	Agree
The involvement of workers in the construction firm can only be achieved if managers are the first to show commitment, practicing what they preach	4.00	Agree
Managers of the construction firm behave in a way that allows the integration and mobilization of members of a team	5.00	Strongly Agree
Strategic Quality Management	3.49	Undecided
Process control and improvement of core processes in the construction firm are in accordance with the design	3.00	Undecided

Management in the construction firm shows active leadership in quality issues	4.00	Agree
Employees welfare in the construction firm are included in activities that are marked for improvement	3.00	Undecided
Senior management in the construction firm are committed to quality through involvement and communication	3.00	Undecided
Development/implementation of long-term plans/strategies in the construction firm are focused on quality	4.00	Agree
Analysis of performance and cost data in the construction firm are done to support improvement priorities	3.00	Undecided
Managers in the construction firm encourage employee empowerment and autonomy	4.00	Agree
Managers in the construction firm participate and give support to continuous improvement processes	3.19	Undecided
Managers in the construction firm collaborate in quality training by the capacity building of their subordinates	3.13	Undecided
Managers in the construction firm ensure that all staff of the company have a customer-driven mindedness	4.00	Agree
Managers in the construction firm ensure that employees are capable of taking initiatives and assimilating better ways of doing their jobs	4.13	Agree
Quality Improvement Measurement Systems	3.38	Undecided
The construction firm has a quality and improvement policy	2.44	Disagree
There are assessment and improvement processes in the firm	4.00	Agree
There is management of data/information to support quality improvement efforts in the construction firm	4.19	Agree
There are procedures to ensure the reliability and improvement of data gathering in the construction firm	3.88	Agree
Continuous improvement processes are based on a systematic assessment of the construction firm's effectiveness	2.88	Undecided
Benchmarking techniques are used to establish improvement standards and objectives in the construction firm	3.88	Agree
Systematic measurement of quality and non-quality costs is carried out in the construction firm	4.00	Agree
Information systems are in place to capture external information about clients and markets in the construction firm	2.56	Undecided
Self assessment processes take place on regular bases in the construction firm	2.56	Undecided

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

Tables 4.2, 4.3, 4.4 and 4.5 represent the evaluation of the Free Senior High School (FSHS) projects completed as well as its contract administration with the Total Quality Management (TQM) factors. In the Tables, a Weighted Rank Mean (WRM) within the range of 1-1.49 is Strongly Disagree, 1.5-2.49 is Disagree, 2.5-3.49 is Undecided or Not Sure, 3.5-4.49 is Agree and finally 4.5-5 is Strongly Agree. From Table 4.2, it is obvious that the quality of corporate culture has been met (WRM of 4.20). This indicates that the FSHS contract goals are set considering performance requirements. This also means that they were committed to quality improvement. There is also a strong communicative culture throughout all areas of the construction firms contracted. The managers were the first to show commitment and behaved in a way that allowed the integration and mobilization of members of the team. Meanwhile, they were undecided whether strategic quality management (WRM of 3.49) was observed. However, they showed active leadership in quality issues and implemented long-term plans or strategies by focusing on quality. They as well encouraged employees' empowerment and autonomy and ensured that all staff of the company have a customer-driven mindedness and are capable of taking initiatives and assimilating better ways of doing their jobs. But they were undecided as to whether the quality improvement measurement systems were in line with the set objectives. Meanwhile there is management of data or information to support quality improvement efforts in the construction firms contracted. There are also assessment and improvement processes and procedures to ensure the reliability and improvement of data gathering in the construction firms contracted. Benchmarking techniques are used in the

construction firms contracted to establish improvement standards and objectives. Systematic measurement of quality and non-quality costs is carried out in the construction firms contracted.

Table 4.2: TQM assessment variables Cont.

TOTAL QUALITY MANAGEMENT (TQM)	WRM	Description
People and Client Management	3.40	Undecided
The human resource management is in line with the construction firm's quality performance plans	3.25	Undecided
Employees are recognized/measured to support quality/performance objectives in the construction firm	2.88	Undecided
Client relations are managed well in the construction firm	2.56	Undecided
Continuous improvement and change are necessary even when good results are being obtained in the construction firm	4.00	Agree
Managers in the construction firm stimulate the continuous improvement of procedures and processes	4.13	Agree
Managers in the construction firm continuously acquire and update knowledge that is valuable for the organization	4.00	Agree
Managers in the construction firm create an environment that makes it easier for employees to accept proposed changes voluntarily	2.88	Undecided
The opinions of employees are duly recognized by management in the firm	2.88	Undecided
Emphasis is placed on recruiting required-skilled employees in the construction firm	4.13	Agree
Specific capacity building is offered to employees in the construction firm	4.00	Agree
Employees continuously update their skills in their specific area of knowledge by attending refresher courses	3.69	Agree
Employees in the construction firm are given the opportunity to suggest and implement solutions to work problems	2.88	Undecided
Employee autonomy and participation is encouraged in the construction firm	2.69	Undecided
Managers in the construction firm explicitly recognize employees' achievements at work	3.69	Agree
Operational Quality Planning	4.16	Agree
Development/implementation of short-term plans/strategies are focused on quality in the construction firm	3.69	Agree
Performance requirements are considered in developing short-term goals in the construction firm	4.56	Strongly Agree
Effective management in the construction firm is based on information about clients	4.25	Agree
Clients' needs are taken into consideration when establishing objectives in the construction firm	4.00	Agree
Systematic procedures are put in place to plan, coordinate, monitor and evaluate, and control to enable the construction firm achieve its goal or objectives	4.25	Agree
Quality processes cut across all the stages in the construction management	4.13	Agree
Managers in the construction firm embrace new technological ideas for the betterment of their objectives for future similar projects	4.25	Agree

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

Besides, it cannot be confirmed whether people and client management (WRM of 3.40) is being practiced as expected (Refer to Table 4.3). However, there is a continuous stimulation by managers of the firms contracted to improve procedures and processes. Also, the firms contracted continuously acquire and update knowledge that is valuable for the organization. In addition, emphasis is being placed on recruiting required-skilled employees and specific capacity building is offered to employees in the firms contracted. As well, employees continuously update their skills in their specific area of knowledge by attending refresher courses. Managers in the contracted firms explicitly recognize employees' achievements at work. Moreover, operational quality planning (WRM of 4.16) was

revealed by the study to be appropriate. This indicates that development or implementation of short-term plans or strategies are focused on quality in the contracted firms. Also, performance requirements are considered in developing short-term goals. Besides, effective management in the contracted firms is based on information about clients. Also, clients' needs are taken into consideration when establishing objectives in the contracted firms. Systematic procedures are put in place to plan, coordinate, monitor and evaluate, and control to enable the contracted firms achieve their goal or objectives. In addition, quality processes cut across all the stages in the construction management. Managers in the contracted firms embrace new technological ideas for the betterment of their objectives for future similar projects.

Table 4.3: TQM assessment variables Cont.

TOTAL QUALITY MANAGEMENT (TQM)	WRM	Description
External Environmental Management	3.04	Undecided
Responsibilities for public health and safety, and the environment are recognized in the construction firm	2.00	Disagree
There is a positive social and environmental impact on the construction firm	3.69	Agree
The nature of the resettlement plan for the encroachers on the construction site is within the timeframe	2.13	Disagree
Clients' future requirements are determined in the construction firm	2.63	Undecided
Design processes are integrated with client and operational requirements in the construction firm	3.56	Agree
The establishment of the construction firm's objectives recognizes the environmental and safeguards impact analysis	4.00	Agree
The construction firm has a high regard for environmental and social safeguard policies	3.31	Undecided
Supplier Partnerships	4.03	Agree
There is an existence of supplier development partnership policy	4.88	Strongly Agree
There are actions to assist and improve the quality and responsiveness of suppliers in the construction firm	3.75	Agree
Suppliers are strategically managed in the construction firm	3.19	Undecided
Quality agreements with suppliers are established in the construction firm	4.13	Agree
Cooperation with suppliers provides the construction firm with high quality raw materials and resources	3.69	Agree
Relationships with clients and suppliers allow the construction firm to have rapid access to information about new products and technology	4.56	Strongly Agree
Teamwork Structures	3.43	Undecided
Specific organizational structures are used to support quality improvement in the construction firm	3.69	Agree
Techniques are used to identify key processes, clients and suppliers in the construction firm	3.69	Agree
Teamwork is a common practice in the construction firm	3.13	Undecided
Employees maintain fluid communication with one another, going beyond formal structure of the construction firm	4.25	Agree
Employees have worked together for a long time, which facilitates good coordination among them in the construction firm	3.25	Undecided
Employees voluntarily pass on useful information between one another in the construction firm	2.56	Undecided

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

To add to the above, they were undecided as to whether the external environmental management (WRM of 3.04) is being done appropriately. Nevertheless, there is a positive social and environmental impact of what the contracted firms are doing. Also, the design processes by the contracted firms are being integrated with client and operational requirements. Besides, the establishment of the contracted firms' objectives recognize the environmental and safeguards impact analysis. Moreover, the study revealed that supplier partnership (WRM of 4.03) is appropriate and cordial between the contracted firms and their suppliers as well as the FSHS secretariat. This confirms that there is an existence of supplier development partnership policy and there are actions to assist and improve the quality and

responsiveness of suppliers. Also, quality agreements with suppliers are established in the contracted firms. Cooperation with suppliers provides the contracted firms with high quality raw materials and resources. Relationships with clients and suppliers allow the contracted firms to have rapid access to information about new products and technology. Meanwhile, it cannot be said whether teamwork structures are appropriate in the contracted firms. However, specific organizational structures are used to support quality improvement in the contracted firms. Also, techniques are used to identify key processes, clients and suppliers in the contracted firms. As well, employees maintain fluid communication with one another, going beyond formal structure of the construction firm (Refer to Table 4.4).

Table 4.4: TQM assessment variables Cont.

TQM=3.63(Agree)	**WRM**	**Description**
Client Satisfaction Orientation	3.44	Undecided
There is an existence of client satisfaction policy in the construction firm	2.00	Disagree
The construction firm is committed to clients through strengthening of warranties/policies	3.56	Agree
Clients satisfaction are compared with competitors and internal indicators	4.13	Agree
There is a determination of improvements in client satisfaction in the construction firm	2.88	Undecided
Managers in the construction firm take part in continuous improvement processes, even when these activities go beyond managerial responsibilities	4.31	Agree
Satisfaction of current and future clients ensures the competitive success of the construction firm	2.88	Undecided
The construction firm collaborates in the form of consortium with other firms to achieve its overall objectives in satisfying the client	4.31	Agree
Communication of Improvement Information	3.71	Agree
There is an existence of communication policy in the construction firm	3.44	Undecided
Promotion of quality improvement policies are discussed with the necessary stakeholders	3.31	Undecided
The construction firm's processes and their interrelationships are clear to all stakeholders	3.44	Undecided
Quality policies are translated into a set of specific and measurable objectives in the construction firm	4.00	Agree
Managers in the construction firm inform employees about the quality strategy	4.69	Strongly Agree
Every staff knows the vision, mission and objectives of the construction firm	4.00	Agree
Formal communication channels are in place to provide the construction firm's areas with information about clients' needs	4.00	Agree
Formal communication procedures are established with all stakeholders in the construction firm	4.00	Agree
Employees have access to information about quality results in the construction firm	2.88	Undecided
Internal communication is totally opened and transparent in the construction firm	3.31	Undecided

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

In addition to the above, it cannot be certified whether there is client satisfaction orientation (WRM of 3.44). This is because they stated vehemently that there is no client satisfaction policy in the contracted firms. Nevertheless, the contracted firms are committed to clients through strengthening of warranties or policies. Also, client's satisfaction is being compared with competitors and internal indicators. Managers in the contracted firms do take part in continuous improvement processes, even when these activities go beyond managerial responsibilities. The contracted firms do collaborate in the form of consortium with other firms to achieve its overall objectives in satisfying the client. However, the study revealed an improvement in communication and information processes (WRM of 3.71). This indicates that quality policies are translated into a set of specific and measurable objectives in the contracted firms. Also, managers in the contracted firms do inform employees about the quality strategy. As well, every staff knows the

vision, mission and objectives of the contracted firms. Besides, formal communication channels are in place to provide the contracted firms' areas with information about clients' needs. Also, formal communication procedures are established with all stakeholders in the contracted firms. However, in conclusion, it can be stated categorically that the overall Total Quality Management evaluation requirement has been met since the overall Weighted Rank Mean (WRM) was 3.63.

4.1.2 Assessment of the contract administration of the construction projects under the FSHS secretariat in the Greater Accra Region

Table 4.5: PROCUREMENT Assessment

PROCUREMENT = 4.16 (AGREE)	**WRM**	**Description**
The right construction materials were procured by the firm	4.00	Agree
Construction materials were procured at the right place by the firm	4.00	Agree
Construction materials procured by the firm were with the right quantities	4.31	Agree
Construction materials procured by the firm were of right quality	4.31	Agree
Construction materials were procured at the right time by the firm	4.00	Agree
Construction materials were procured at the right price by the firm	4.31	Agree

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

Table 4.6 represents the assessment of procurement practices within the Free Senior High School (FSHS) secretariat. It was however obvious from the study that procurement processes were carried out appropriately within the FSHS secretariat. This indicates that the right construction materials were procured by the firm at the right place with the right quantities and quality at the right time and at the right price.

Table 4.6: Performance evaluation of the Completed FSHS projects

SUCCESSFUL COMPLETION OF THE PROJECT	**WRM**	**Description**
Technical/Operational performance	4.03	Agree
Construction methods and processes are explicitly defined	3.88	Agree
There is comprehensive documentation about construction methods and its processes	4.31	Agree
Quality manuals and the firm's processes are periodically revised to ensure compliance	3.31	Undecided
Systems of indicators are in place in the firm to revise changes in processes	3.44	Undecided
Construction processes exist that promote efficient behaviourial patterns throughout the firm	3.88	Agree
Process efficiency has improved in the construction firm	4.00	Agree
Knowledge about efficient operation management has improved in the firm	4.88	Strongly Agree
Maintenance of project accurate recording time management has improved in the construction firm	3.88	Agree
There is an existence of an updated reviewed materials and construction management scheduling in the construction firm	4.75	Strongly Agree
Inventory management performance	4.17	Agree
Construction inventory levels are high to meet the construction needs	2.75	Undecided
Intensive efforts are made to guarantee high quality construction materials	4.31	Strongly Agree
Efforts are made to know what the construction firm's workforce needs in terms of materials needs in stock for the construction	4.88	Strongly Agree
Construction equipments and materials are managed well in the firm	4.31	Agree
Quality of construction materials has improved to ensure total quality management of the project	4.19	Agree
Relationships with suppliers have improved to ensure total balance of equilibrium	4.56	Strongly Agree
Employee performance	4.04	Agree
Employees identify and provide solutions to construction problems at site	4.00	Agree
Employees share the construction firm's values	4.56	Strongly Agree
Employees show high levels of initiatives in the firm	3.44	Undecided

Employees absenteeism have decreased in the firm	3.31	Undecided
Employees turnover have decreased in the firm	2.88	Undecided
Employees opinions contribute to improving construction performance at site	3.88	Agree
Employees have high levels of technical know-how in the firm	4.75	Strongly Agree
Communication with employees has increased in the firm	4.31	Agree
Employee satisfaction has improved in the firm	4.19	Agree
Employee involvement at construction sites has improved in the firm	4.00	Agree
Employees willingness to work extra time at construction sites has improved	4.13	Agree
High employee commitment at construction sites has improved	5.00	Strongly Agree

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

Tables 4.7 and 4.8 represent the performance evaluation of the completed FSHS projects. It was obvious from the study that in terms of technical or professional performances, the contracted firms are doing very well (WRM of 4.03). This is because the construction methods and processes being applied by the contracted firms are explicitly defined. There is also a comprehensive documentation about construction methods and its processes. Besides, construction processes exist in the contracted firms that promote efficient behaviourial patterns throughout. This has however improved the efficiency of the processes. As well, knowledge about the efficient operation management has improved. Maintenance of project accurate recording time management has also improved. There is an existence of an updated reviewed materials and construction management scheduling in the construction firm.

The study also revealed that inventory management performance has improved (WRM of 4.17). This indicates that intensive efforts are made to guarantee high quality construction materials in the contracted firms. Also, efforts are being made to know the material needs of the contracted firms. Besides, the construction equipments and materials are managed well in the contracted firms. As well, the quality of construction materials has improved to ensure total quality management of the project. Also, relationships with suppliers have improved to ensure total balance of equilibrium. To add to the above, employees' performance has improved (WRM of 4.04). This is because employees identify and provide solutions to construction problems at site, they share the construction firm's values, their opinions contribute to improving construction performance at site, they have high levels of technical know-how in the firm and their satisfaction levels have improved. Besides, communication with employees has improved in the contracted firms. Also, employee involvement at construction sites has improved. As well, employees' willingness to work extra time and commitment at construction sites has improved.

Table 4.7: Performance evaluation of the Completed FSHS projects Cont.

SUCCESSFUL COMPLETION OF THE PROJECT=3.87	**WRM**	**Description**
Innovation performance	3.94	Agree
Frequent technological innovations are implemented at construction sites	3.88	Agree
Buildings and construction services are designed and developed based on client needs and expectations	4.00	Agree
Designs and materials used are superior to those of competitors	3.88	Agree
Construction designs provide clients with high utility	4.00	Agree
The firm is able to develop new designs and apply new technologies ahead of competitors	3.88	Agree
The firm is oriented towards the fulfillment of clients' expectations and needs	4.00	Agree
Social responsibility	3.45	Undecided
Protection of environment has improved in the firm	3.44	Undecided
Noise levels have decreased in the firm	3.44	Undecided
Pollution levels have decreased in the firm	3.63	Agree
The construction firm has a positive impact on the society	3.31	Undecided
Client results	3.95	Agree
Client satisfaction has improved in the firm	4.44	Agree
Client consolidation has improved in the firm	2.75	Undecided
Communication with clients has improved in the firm	4.31	Agree
Client complaints have decreased in the firm	4.31	Agree
Construction services offered to clients are better than competitors'	4.44	Agree
Client relationships are managed and enhanced in the firm	3.19	Undecided

Standardized construction systems are in place to deal with client complaints	4.19	Agree
Client base (market share) and financial performance	3.48	Undecided
Contract funds and other finances are managed	2.19	Disagree
Marketing techniques and methods are developed to gain more clients	2.75	Undecided
The construction firm has more clients	3.31	Undecided
Output per employee at construction site has improved	2.88	Undecided
Revenue levels have improved in the firm	4.00	Agree
There has been a noticeable improvement in financial results in the firm	4.00	Agree
The contractor has financial capacity to complete the project on time	4.44	Agree
The contractor is credit wordy	4.19	Agree
The contractor has letters of credit with suppliers	4.56	Strongly Agree
There is a budgetary allocation by the client for the project	4.19	Agree
There is timely release of fiscal cash for the project	1.75	Disagree

Note: An approximate; 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree & 5=Strongly Agree
Source: Field Data, 2018

In addition to the above, the study revealed that performance in terms of innovation has improved (WRM of 3.94). This indicates that there are frequent technological innovations being implemented at construction sites. Besides, buildings and construction services are designed and developed based on client needs and expectations. Also, designs and materials used are superior to those of competitors. Moreover, construction designs provide clients with high utility. The contracted firms are able to develop new designs and apply new technologies ahead of competitors. The contracted firms are oriented towards the fulfilment of clients' expectations and needs. However, they were undecided about the social responsibility aspects of the contracted firms.

Nevertheless, client results have improved (WRM of 3.95). This gave an indication that client satisfaction and communication with clients have improved. Besides, clients' complaints have decreased in the contracted firms. Also, construction services offered to clients are better than competitors'. Standardized construction systems are in place to deal with client complaints. It is therefore obvious that the FSHS projects reviewed have been completed successfully since the overall WRM was 3.87. The following section gives the impact of contract administration on the successful completion of the projects undertaken.

4.1.3 The relationship between contract administration and project completion

Table 4.8: Spearman's Correlation Analysis

Variables	Spearman's rho	TOTAL QUALITY MANAGEMENT (TQM)	PROCUREMENT	SUCCESSFUL COMPLETION OF THE PROJECT (PERFORMANCE)
TOTAL QUALITY MANAGEMENT (TQM)	Correlation Coefficient	1.000	.575**	.167**
	Sig. (2-tailed)		.000	.001
PROCUREMENT	Correlation Coefficient	.575**	1.000	.891**
	Sig. (2-tailed)	.000		.000
SUCCESSFUL COMPLETION OF THE PROJECT (PERFORMANCE)	Correlation Coefficient	.167**	.891**	1.000
	Sig. (2-tailed)	.001	.000	
	N	400	400	400
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Field Data, 2018

Table 4.9 represents the correlation between contract administration and successful completion of the undertaken FSHS projects. The contract administration was assessed with both Total Quality Management (TQM)

and Procurement evaluation variables. From the analysis, there was a positive significant correlation between TQM and Procurement at 99% confidence level(r=0.575, p-value=0.000). Also, there was a direct correlation between TQM and Successful completion of the FSHS undertaken projects at 99% confidence level (r=0.167, p-value=0.001). Conceptually, there was a significant perfect positive relationship between effective procurement and successful completion of the undertaken FSHS projects (r=0.891, p-value=0.000). This gives an indication that when procurement processes are done through effective application of Total Quality Management methods, there will be an effective procurement practices hence successful completion of the projects. These findings conform to the findings of Sadikoglu and Olcay (2014). Sadikoglu and Olcay (2014) found a positive correlation between Total Quality Management and performance. Their findings suggest that firms use Total Quality Management for the purpose of improving operational performance, enhancing customer satisfaction and portfolio, and increasing market and financial performance which are primary reasons of Total Quality Management practices (Sadikoglu & Olcay, 2014).Table 4.10 gives the regression analysis between TQM and Procurement.

Table 4.9: Regression Analysis between Procurement and TQM

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	15.501	.783		19.806	.000
TOTAL QUALITY MANAGEMENT (TQM)	.032	.003	.518	12.092	.000
F-Statistic	146.210				0.000
Adjusted R-Square	0.267				0.000
a. Dependent Variable: PROCUREMENT					

Source: Field Data, 2018

The regression analysis in Table 4.10 indicates that about 26.7% of the total variation in the effectiveness of procurement practices could be explained by TQM implementation. This therefore affirms to the conceptual framework aspect linking TQM and Procurement. Table 4.11 also presents the regression analysis between procurement and successful completion of the project.

Table 4.10: Regression Analysis (Procurement as explanatory variable)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-83.618	1.989		-42.035	.000
PROCUREMENT	11.897	.080	.991	149.372	0.000
F-Statistic	22312.				0.000
Adjusted R-Square	0.982				0.000
a. Dependent Variable: SUCCESSFUL COMPLETION OF THE PROJECT (PERFORMANCE)					

Source: Field Data, 2018

The regression analysis in Table 4.11 indicates that about 98.2% of the total variation in the successful completion of the FSHS project could be explained by effective procurement practices. This aspect also confirms the part of the conceptual framework that links procurement and the successful completion of the FSHS projects

undertaken. This however implies that when procurement practices are done through effective application of TQM methods, contract administration will be effective thereby leading to successful completion of the FSHS projects. This however confirms the alternative hypothesis of this study that states that there is a positive correlation between effective contract administration and successful completion of the FSHS projects. This conforms to the findings of the research conducted by Kaynak (2003). Kaynak used a sample size of 382 manufacturing companies. The findings of the study suggest a positive correlation between implementation of total quality management and firm's performance. The findings also suggested that for an effective implementation of total quality management, there should be an assessment of management leadership. It was also found that management leadership is positively related to training, employee relations, supplier quality management, and product design.

Table 4.11: Regression Analysis (Procurement and TQM as explanatory variables)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-75.100	1.017		-73.829	.000
TOTAL QUALITY MANAGEMENT (TQM)	-.100	.003	-.134	-34.901	.000
PROCUREMENT	12.733	.046	1.061	275.415	0.000
F-Statistic	45879.734				0.000
Adjusted R-Square	0.996				0.000
a. Dependent Variable: SUCCESSFUL COMPLETION OF THE PROJECT (PERFORMANCE)					

Source: Field Data, 2018

Table 4.12 represents the regression analysis that simultaneously used procurement and TQM as the independent variables with successful completion of the project as the dependent variable. The analysis indicates that about 99.6% of the total variation in the successful completion of the FSHS projects could be explained by both TQM and Procurement simultaneously.

Table 4.12: Correlation between TQM factors and Project's Success

Variables	Spearman's rho	P	SQM	QIMS	PCM	OQP	EEM	SP	TS	CSO	CII
SUCCESSFUL COMPLETION OF THE PROJECT (PERFORMANCE)	Correlation Coefficient	1.000	.409**	.624**	.167**	.624**	.167**	.624**	.986**	.167**	.409**
	Sig. (2-tailed)		.000	.000	.001	.000	.001	.000	0.000	.001	.000
Strategic Quality Management	Correlation Coefficient	.409**	1.000	.967**	.967**	.967**	.967**	.967**	.414**	.967**	1.000**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	
Quality Improvement Measurement Systems	Correlation Coefficient	.624**	.967**	1.000	.870**	1.000**	.870**	1.000**	.633**	.870**	.967**
	Sig. (2-tailed)	.000	.000		.000		.000		.000	.000	.000
People and Client Management	Correlation Coefficient	.167**	.967**	.870**	1.000	.870**	1.000**	.870**	.169**	1.000**	.967**

	Sig. (2-tailed)	.001	.000	.000		.000		.000	.001		.000
Operational Quality Planning	Correlation Coefficient	.624**	.967**	1.000**	.870**	1.000	.870**	1.000**	.633**	.870**	.967**
	Sig. (2-tailed)	.000	.000		.000		.000		.000	.000	.000
External Environmental Management	Correlation Coefficient	.167**	.967**	.870**	1.000**	.870**	1.000	.870**	.169**	1.000**	.967**
	Sig. (2-tailed)	.001	.000	.000		.000		.000	.001		.000
Supplier Partnerships	Correlation Coefficient	.624**	.967**	1.000**	.870**	1.000**	.870**	1.000	.633**	.870**	.967**
	Sig. (2-tailed)	.000	.000		.000		.000		.000	.000	.000
Teamwork Structures	Correlation Coefficient	.986**	.414**	.633**	.169**	.633**	.169**	.633**	1.000	.169**	.414**
	Sig. (2-tailed)	0.000	.000	.000	.001	.000	.001	.000		.001	.000
Client Satisfaction Orientation	Correlation Coefficient	.167**	.967**	.870**	1.000**	.870**	1.000**	.870**	.169**	1.000	.967**
	Sig. (2-tailed)	.001	.000	.000		.000		.000	.001		.000
Communication of Improvement Information	Correlation Coefficient	.409**	1.000**	.967**	.967**	.967**	.967**	.967**	.414**	.967**	1.000
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	
	N	400	400	400	400	400	400	400	400	400	400
**. Correlation is significant at the 0.01 level (2-tailed).											

Source: Field Data, 2018

Table 4.13 represents the correlation between the individual factors of TQM and Projects' success. It was obvious that all the TQM determining factors were positively related to the successful completion of the FSHS projects. However, among them, Teamwork structures had the highest correlation (0.986) followed by Quality Improvement Measurement (0.624), Operational Quality Planning (0.624), Supplier Partnership (0.624), Strategic Quality Management (0.409), Communication of Improvement Information (0.409), People and Client Management (0.167), External Environmental Management (0.167) and Client Satisfaction Orientation (0.167).

Table 4.13: Correlation Analysis between Performance measurements and TQM

Variables	Spearman's rho	TQM	PROCUREMENT	T/O	Im	Ep	Ip	Sr	Cr	Cbfp
TOTAL QUALITY	Correlation	1.000	.575**	.169**	.169**	.169**	.645**	.870**	.870**	.858**

MANAGEMENT (TQM)	Coefficient									
	Sig. (2-tailed)		.000	.001	.001	.001	.000	.000	.000	.000
PROCUREMENT	Correlation Coefficient	.575**	1.000	.904**	.904**	.904**	.255**	.904**	.904**	.891**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000
Technical/Operational performance	Correlation Coefficient	.169**	.904**	1.000	1.000**	1.000**	.645**	.633**	.633**	.624**
	Sig. (2-tailed)	.001	.000				.000	.000	.000	.000
Inventory management performance	Correlation Coefficient	.169**	.904**	1.000**	1.000	1.000**	.645**	.633**	.633**	.624**
	Sig. (2-tailed)	.001	.000				.000	.000	.000	.000
Employee performance	Correlation Coefficient	.169**	.904**	1.000**	1.000**	1.000	.645**	.633**	.633**	.624**
	Sig. (2-tailed)	.001	.000				.000	.000	.000	.000
Innovation performance	Correlation Coefficient	-.645**	.255**	.645**	.645**	.645**	1.000	.184**	.184**	.182**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
Social responsibility	Correlation Coefficient	.870**	.904**	.633**	.633**	.633**	.184**	1.000	1.000**	.986**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000			0.000
Client results	Correlation Coefficient	.870**	.904**	.633**	.633**	.633**	.184**	1.000**	1.000	.986**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000			0.000
Client base (market share) and financial performance	Correlation Coefficient	.858**	.891**	.624**	.624**	.624**	.182**	.986**	.986**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	0.000	0.000	
	N	400	400	400	400	400	400	400	400	400
**. Correlation is significant at the 0.01 level (2-tailed).										

Source: Field Data, 2018

Table 4.14 represents the correlation between TQM, Procurement and the various Performance indicators. It was equally obvious that TQM and Procurement were positively related with all the performance indicators. This also conforms to the findings of Kaynak (2003) and Sadikoglu and Olcay (2014).

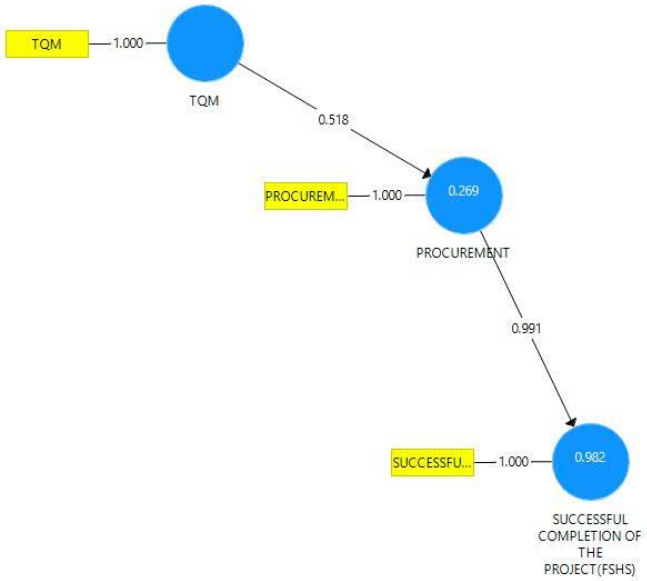

Figure 4.1: Structural Analysis confirming the conceptual framework
Source: Field Data, 2018

Figure 4.1 represents the structural analysis confirming the conceptual framework of the study. The structural analysis indicates that the magnitude of TQM improving contract administration or effective procurement is 0.518. Also, the magnitude of procurement affecting the successful completion of the project (FSHS) is 0.991. This implies that when TQM methods (Corporate Culture Quality, Strategic Quality Management, Quality Improvement Measurement Systems, People and Customer Management, Operational Quality Planning, External Interface Management, Supplier Partnerships, Teamwork Structures, Customer Satisfaction Orientation, Communication of Improvement Information) are used to facilitate contract administration, right materials are procured at the right place, right time, at the right price with the right quality and quantity thereby leading to successful completion of the project. This therefore affirms the conceptual framework of the study as is shown in Figure 4.2.

5.0 EVALUATION OF THE RESEARCH

This chapter presents the conclusion and recommendation of the study. The regression analysis in Table 4.11 indicates that about 98.2% of the total variation in the successful completion of the FSHS project could be explained by effective procurement practices. This aspect also confirms the part of the conceptual framework that links procurement and the successful completion of the FSHS projects undertaken. This however implies that when procurement practices are done through effective application of TQM methods, contract administration will be effective thereby leading to successful completion of the FSHS projects. This however confirms the alternative hypothesis of this study that states that there is a positive correlation between effective contract administration and successful completion of the FSHS projects. This conforms to the findings of the research conducted by Kaynak (2003). Kaynak used a sample size of 382 manufacturing companies. The findings of the study suggest a positive correlation between implementation of total quality management and firm's performance. The findings also suggested that for an effective implementation of total quality management, there should be an assessment of management leadership. It was also found that management leadership is positively related to training, employee relations, supplier quality management, and product design.

5.1 Findings and Discoveries

5.1.1 Evaluation of contract administration and FSHS projects' completed with the total quality management methods**.** The study revealed that the quality of corporate culture has been met. This indicates that the FSHS contract goals are set considering performance requirements. This also means that they were committed to quality improvement. There is also a strong communicative culture throughout all areas of the construction firms contracted. The managers were the first to show commitment and behaved in a way that allowed the integration and mobilization of members of the team. Also, they showed active leadership in quality issues and implemented long-term plans or strategies by focusing on quality. They as well encouraged employees' empowerment and autonomy and ensured that all staff of the company have a customer-driven mindedness and are capable of taking initiatives and assimilating better ways of doing their jobs.

There is also management of data or information to support quality improvement efforts in the construction firms contracted. There are also assessment and improvement processes and procedures to ensure the reliability and improvement of data gathering in the construction firms contracted. Benchmarking techniques are used in the construction firms contracted to establish improvement standards and objectives. Systematic measurement of quality and non-quality costs is carried out in the construction firms contracted. Besides, there is a continuous stimulation by managers of the firms contracted to improve procedures and processes. Also, the firms contracted continuously acquire and update knowledge that is valuable for the organization. In addition, emphasis is being placed on recruiting required-skilled employees and specific capacity building is offered to employees in the firms contracted. As well, employees continuously update their skills in their specific area of knowledge by attending refresher courses. Managers in the contracted firms explicitly recognize employees' achievements at work.

Operational quality planning was revealed by the study to be appropriate. This indicates that development or implementation of short-term plans or strategies are focused on quality in the contracted firms. Also, performance requirements are considered in developing short-term goals. Besides, effective management in the contracted firms is based on information about clients. Also, clients' needs are taken into consideration when establishing objectives in the contracted firms. Systematic procedures are put in place to plan, coordinate, monitor and evaluate, and control to enable the contracted firms achieve their goal or objectives. In addition, quality processes cut across all the stages in the construction management. Managers in the contracted firms embrace new technological ideas for the betterment of their objectives for future similar projects.

To add to the above, there is a positive social and environmental impact of what the contracted firms are doing. Also, the design processes by the contracted firms are being integrated with client and operational requirements. Besides, the establishment of the contracted firms' objectives recognize the environmental and safeguards impact analysis. Moreover, the study revealed that supplier partnership is appropriate and cordial between the contracted firms and their suppliers as well as the FSHS secretariat. This confirms that there is an existence of supplier development partnership policy and there are actions to assist and improve the quality and responsiveness of suppliers. Also, quality agreements with suppliers are established in the contracted firms. Cooperation with suppliers provides the contracted firms with high quality raw materials and resources. Relationships with clients and suppliers allow the contracted firms to have rapid access to information about new products and technology. Meanwhile, it cannot be said whether teamwork structures are appropriate in the contracted firms. However, specific organizational structures are used to support quality improvement in the contracted firms. Also, techniques are used to identify key processes, clients and suppliers in the contracted firms. As well, employees maintain fluid communication with one another, going beyond formal structure of the construction firm.

In addition to the above, the contracted firms are committed to clients through strengthening of warranties or policies. Also, client's satisfaction is being compared with competitors and internal indicators. Managers in the contracted firms do take part in continuous improvement processes, even when these activities go beyond managerial responsibilities. The contracted firms do collaborate in the form of consortium with other firms to achieve its overall objectives in satisfying the client. The study revealed an improvement in communication and information processes. This indicates that quality policies are translated into a set of specific and measurable objectives in the contracted firms. Also, managers in the contracted firms do inform employees about the quality strategy. As well, every staff knows the vision, mission and objectives of the contracted firms. Besides, formal communication channels are in place to provide the contracted firms' areas with information about clients' needs. Also, formal communication procedures are established with all stakeholders in the contracted firms. However, in conclusion, it can be stated categorically that the overall Total Quality Management evaluation requirement has been met.

5.1.2 Assessment of the contract administration of the construction projects under the FSHS secretariat in the Greater Accra Region. It was obvious from the study that procurement processes were carried out appropriately within the FSHS secretariat. This indicates that the right construction materials were procured by the firm at the right place

with the right quantities and quality at the right time and at the right price. It was obvious from the study that in terms of technical or professional performances, the contracted firms are doing very well. This is because the construction methods and processes being applied by the contracted firms are explicitly defined. There is also a comprehensive documentation about construction methods and its processes. Besides, construction processes exist in the contracted firms that promote efficient behaviourial patterns throughout.

This has however improved the efficiency of the processes. As well, knowledge about the efficient operation management has improved. Maintenance of project accurate recording time management has also improved. There is an existence of an updated reviewed materials and construction management scheduling in the construction firm. The study also revealed that inventory management performance has improved. This indicates that intensive efforts are made to guarantee high quality construction materials in the contracted firms. Also, efforts are being made to know the material needs of the contracted firms. Besides, the construction equipments and materials are managed well in the contracted firms. As well, the quality of construction materials has improved to ensure total quality management of the project. Also, relationships with suppliers have improved to ensure total balance of equilibrium. To add to the above, employees' performance has improved.

This is because employees identify and provide solutions to construction problems at site, they share the construction firm's values, their opinions contribute to improving construction performance at site, they have high levels of technical know-how in the firm and their satisfaction levels have improved. Besides, communication with employees has improved in the contracted firms. Also, employee involvement at construction sites has improved. As well, employees' willingness to work extra time and commitment at construction sites has improved. In addition to the above, the study revealed that performance in terms of innovation has improved. This indicates that there are frequent technological innovations being implemented at construction sites. Besides, buildings and construction services are designed and developed based on client needs and expectations. Also, designs and materials used are superior to those of competitors. Moreover, construction designs provide clients with high utility. The contracted firms are able to develop new designs and apply new technologies ahead of competitors. The contracted firms are oriented towards the fulfilment of clients' expectations and needs. However, they were undecided about the social responsibility aspects of the contracted firms. Nevertheless, client results have improved. This gave an indication that client satisfaction and communication with clients have improved. Besides, clients' complaints have decreased in the contracted firms. Also, construction services offered to clients are better than competitors'. Standardized construction systems are in place to deal with client complaints. It is therefore obvious that the FSHS projects reviewed have been completed successfully.

5.1.3 The relationship between contract administration and project completion. The contract administration was assessed with both Total Quality Management (TQM) and Procurement evaluation variables. From the analysis, there was a positive significant correlation between TQM and Procurement. Also, there was a direct correlation between TQM and Successful completion of the FSHS undertaken projects. Conceptually, there was a significant perfect positive relationship between effective procurement and successful completion of the undertaken FSHS projects. This gives an indication that when procurement processes are done through effective application of Total Quality Management methods, there will be an effective procurement practices hence successful completion of the projects. The study also revealed that about 26.7% of the total variation in the effectiveness of procurement practices could be explained by TQM implementation.

In addition, about 98.2% of the total variation in the successful completion of the FSHS project could be explained by effective procurement practices. This however implies that when procurement practices are done through effective application of TQM methods, contract administration will be effective thereby leading to successful completion of the FSHS projects. That is, when Corporate Culture Quality, Strategic Quality Management, Quality Improvement Measurement Systems, People and Customer Management, Operational Quality Planning, External Interface Management, Supplier Partnerships, Teamwork Structures, Customer Satisfaction Orientation, Communication of Improvement Information are met in terms of contract administration, right materials are procured at the right place, right time, at the right price with the right quality and quantity thereby leading to successful completion of the project.

5.2 Limitation

This study will serve as a guiding tool for the Free Senior High School secretariat of the Ministry of Education in Ghana. They will be aware of the complications that the project will face if the contract administration is not manned effectively and efficiently. This study will also be an advisory book for other organizations and companies of how to effectively administrate their contracts. Findings of this study will add up to exiting literature for further researches in this area. The philosophical foundation of the study is epistemology. The type of epistemology to be used is positivism.

Descriptive research design involving quantitative methods will be used for the study. The study will use both primary and secondary data. The primary data will be retrieved from stakeholders with the aid of a structured questionnaire with a Likert Scale while the secondary data will be retrieved through the records of the FSHS secretariat.

Direct observation will also be used to gather data on the completed and on-going projects. Non-parametric data analysis will be used for the study. SPSS and Excel will be used to analyze the data. Weighted Rank Mean will be used to identify the contract management factors that affect a project completion. Spearman's Rank Correlation will be used to find the correlation that exists between effective contract administration and successful completion of a project. The significance level for the study will be 5% since this work falls under social science category.

5.3 Recommendations

In order to successfully complete the Free Senior High School projects, there should be an improvement in Corporate Culture Quality, Strategic Quality Management, Quality Improvement Measurement Systems, People and Customer Management, Operational Quality Planning, External Interface Management, Supplier Partnerships, Teamwork Structures, Customer Satisfaction Orientation, Communication of Improvement Information. Also, for projects to complete successfully there should be an effective contract administration that will help to procure the right materials at the right place, right time, at the right price with the right quality and quantity.

5.4 Further Study and Research

Further study need should be conducted to cover the FSHS implementation in Ghana, since this study covers the periods September 2017 to September 2018. The dependent variable is the successful completion of the FSHS project. This covers project completion and attainment of the FSHS project objectives in basic school construction. The independent variable is effective and efficient contract administration. In this, project completion serves as the mediating variable for the attainment of the FSHS project objectives in basic school construction.

5.5 Conclusion

One project that is at the heart of the current Ghanaian government is the Free Senior High School (FSHS), since it was part of their major campaign promises. This will therefore need a lot of new classroom blocks, hostels, boarding houses, assembly halls and other building constructions to accommodate the students since the already enrolled students are over clouded in the available accommodations. Nevertheless, for this project or vision to successfully complete, its contract administration has to be properly managed. Evaluation of the contract administrative process will require a holistic assessment from the beginning to the end of the project hence Total Quality Management (TQM).

Total quality management systems have been widely adopted to assess megaprojects but not projects like the basic school construction in Greater Accra region by the free Senior High School secretariat of the Ministry of Education in Ghana. This study therefore bridges that gap through the adoption of total quality management and extension of the key variables used to assess the successful completion of a project. The main purpose of this study is to find the relationship between effective contract administration and successful project completion. The study achieved this through positivism approach. The target population is stakeholders of Free Senior High School contracts in the Greater Accra Region. The 400 sample was distributed among the 16 districts in the Greater Accra Region. The major findings have been arranged in terms of the objectives of the study.

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