

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
TECHNOLOGY, KUMASI, GHANA**

**Assessing the Impact of Knowledge Management on the performance of Ghanaian
Construction Firms**

By

Herty Amellor Brempong (BSc. Construction Technology)

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MASTER OF SCIENCE

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CERTIFICATION

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

HERTY AMELLOR BREMPONG (PG 9190317)

Student Name & ID

Signature:

Date:

Certified by:

PROF. BERNARD KOFI BAIDEN

(Supervisor)

Signature:

Date:

Certified by:

THE HEAD OF DEPARTMENT: PROF. BERNARD KOFI BAIDEN

Signature:

Date:

ABSTRACT

Most construction firms value the goals of improving on their projects in relation to the duration of work to be done and cost of the works. Failure to achieve this set goals can instigate negative effects in the likes of increasing the cost of project, projects running behind schedule and loss of productivity, therefore, contributing to the poor performance of the construction firms. The practice of knowledge management (knowledge acquired from previous experiences) is said to promote or improve organisational innovation, business performance, client satisfaction and the duration in project execution. Therefore, this study sought to assess the impact of firms applying knowledge management on the performance of construction firms in Ghana. This aim necessitated three objectives: to examine the effects of knowledge management on performance of Ghanaian construction firms, to identify experts expectations of knowledge management in the construction firms, and to examine the methods of knowledge, transfer in the construction firms. To this end, a great deal of extant literature was reviewed at depth. This research adopted a case study of three (3) selected construction firms within the Greater Accra region, the Accra metropolis to be precise. The quantitative approach was employed in this study, utilizing well-structured questionnaires which were administered to 60 respondents. The study uncovered increase in client satisfaction, increase in organisational revenue, reduction in time and cost of solving problems and also increase in quality service as the significant positive effects of knowledge management on firm's performance. Also, the critical negative effects of knowledge management on firms' performance were identified as time constraint, high cost of knowledge management implementation, difficulties in knowledge extraction, and lack of organisational culture. This study will provide a guiding framework for construction firms within the construction industry to effectively incorporate knowledge management practices into their business activities. The study therefore recommends that, management must be

efficient in their transfer of knowledge and to ensue technological input in the effective management of knowledge in order to boost their performance.

Keywords: Effects, Construction, Ghana, Knowledge Management, Performance.

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DEDICATION

This project is dedicated to my beloved parent Mr. Raphael Yaw Brempong and Mrs.HellenBrempong.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

In the developing countries, construction industries turn to face numerous problems that result in poor performances in the influences of time, cost, quality and productivity (Ofori-Kuragu et al., 2016; Badu et al., 2012; Dogbegah et al., 2011). Stakeholders and clients in Ghana have major concerns on how the industry performs (Ofori-Kuragu et al., 2016). Most construction firms within the industry in Ghana are a key sector which employs large number of people with various professions so as to attain a common goal. The construction firms bring various professionals together on projects, in respect to which knowledge is accumulated intellectually that can be used later by firms to add value, innovation, competitiveness among others to improve on future firm performances (Kasimu et al., 2012). These experts and professionals are not only brought together by firms to improve firm's performance but also to achieve the set goals of clients, and to find solutions to problems that arise on construction sites (Kasimu et al., 2012). Solutions to such problems found on construction projects are hardly documented on the bases that this lesson learned are confined in individual's brains, thus making it difficult for solutions to be made readily available when similar problems are encountered. However, the capturing, storing and sharing of knowledge is very important on the construction site to ensure that projects are delivered effectively (Kasimu et al., 2012). Industrial companies can improve the process of learning within the organization so as to enhance the performance and also to maintain its competitive advantage by successfully capturing, sharing and creation of knowledge (Li and Gao, 2003; KLICON, 1999; Ahmad and An, 2008). It is widely recognized that knowledge is an essential strategic resource for a firm to retain sustainable competitive advantage. As knowledge is created and disseminated throughout the firm, it has the potential to contribute to the firm's value by enhancing its capability to respond to similar, new and

unusual situations. According to Webb, 1998; Egbu et al. (1999), knowledge management is a mechanism of strategies and practices used within the organization that is very significant for the growth of construction firms. The construction industry requires innovations and to also improve its performance, therefore it has increasingly been acknowledged that the practice of knowledge management can promote the required improvements needed. Therefore, as construction firms requires specific goals and unique deliverables when delivering projects which are not similar, there can be difficulties in recording and capturing project knowledge efficiently (Kasimu et al., 2012). Once skills and knowledge are shared, then synonymous problems in construction projects will not be repeatedly solved therefore reducing the time, effort and resources of reinventing similar solutions (Lin, 2006). Renzel (2008) started that a firm's growth is commonly equated with success and knowledge is known as a push factor for firms to achieve success and grows of company. Among various resources available to the firm, knowledge is the most valuable firm's resources because it embodies best practices, routines, lessons learned, problem-solving methods and creative processes that are often difficult to replicate. Therefore, it is made known that the loss of organisational knowledge will impact greatly on the tangible assets or quantifiable financial losses. With the help of a knowledge system, knowledge is shared and stored and thus the risk of losing the knowledge can be minimised. BSI2 (2003) started that knowledge management does not only increase the profitability of the organisation but also reduces mistakes and waste of resources. In spite of the wide range of literature on knowledge management, there hasn't been a lot of studies conducted on the area in Ghana. There are few studies that has been conducted on knowledge management with respect to its adaptation, implementation as well as the challenges in the Ghanaian construction industry (Easterby-Smith et al., 2015 and Appiah, 2014). This is not the case of developed countries such as Hong Kong, UK and the USA, it has been known that construction researchers and practitioners have studied and applied the concept of knowledge

management. This is not the case for developing countries like Ghana (Easterby-Smith et al., 2015). Therefore, this study seeks to find out the impact knowledge management practice has on the performance of firms.

1.2 PROBLEM STATEMENT

According to Kasimu et al. (2012) knowledge is scattered in the construction firms through various documents and individuals' brains, thus making it difficult for solutions to be made readily available when problems are encountered hence causing projects to run behind schedule during various execution. A successful construction project is one that is described to be completed on scheduled time, within budget and at the required quality. Therefore, when projects run behind schedule, it can instigate negative effects such as increase in project cost, dissatisfaction to clients, other stakeholders leading to lawsuits and loss of productivity which in turn contributes to the poor performance of construction firms within the industry with respect to time. Furthermore, Ahadzie (2007) stated that many contractors in Ghana were blamed for poor performance and were heavily criticized for having limited knowledge in the application of requisite management techniques. The introduction of knowledge management (knowledge acquired from previous experience) into the construction firm enables the industry companies to be able to complete each project within the scheduled time or ahead of duration, also improving the quality of the projects. The practice of knowledge management enables employees to be able to reuse and share their previous experiences and knowledge so as to find solutions to problems without spending extra time, effort and resources on reinventing solutions that have already been invented elsewhere in the organization. (Ahmad et al., 2007; Bergeron, 2003). Therefore, this research seeks to assess the impact of firms applying knowledge acquired through previous experiences on the performance of construction firms in Ghana.

1.3 RESEARCH QUESTIONS

1. What positive and negative effects gained by applying knowledge acquired from previous experiences on firm performance?
2. What are the methods used in transferring knowledge acquired from previous experiences to others within the construction firms?

1.4 AIM

Assessing the impact of knowledge management on the performance in the Ghanaian construction firms.

1.5 SPECIFIC OBJECTIVES

1. To examine the effects of knowledge management on performance of Ghanaian construction firms.
2. To identify experts expectations of knowledge management in the construction firms.
3. To examine the methods of knowledge, transfer in the construction firms.

1.6 SIGNIFICANCE OF THE STUDY

This study is significant to the construction industry specifically the construction firms as it will serve as a base knowledge needed when considering the impact of knowledge acquired from previous experiences on performance of construction firms. The findings of this study will enable construction firms understand the significance of incorporating knowledge management practice into their business activities. The exposition that this study will bring to the fore will enable client groups and other stakeholders within and outside the industry to be aware of their needs in terms of their search for reputable construction firms for engagement. It is a belief of the author that thorough understanding and the benefits of knowledge

management will leave much to be desired in Ghana, especially by upcoming and smaller construction entities that are emerging nowadays. Finally, this research is of much significance in academia as it will serve as a major and critical contribution to knowledge which will consequently spur others on to engage in detailed and advanced level research on the impact of Knowledge acquired from previous experience on the performance of Ghanaian Construction firms.

1.7 OVERVIEW OF METHODOLOGY

The methodology adopted for this study consisted of the critical review of pertinent literature related to Knowledge Management practices adopted by construction firms and also firm's performance over the years. A quantitative method of research was employed where questionnaire was used to derive information from populations comprising registered construction firms at the registrar generals' department at the Accra metropolis. In analysing, the International Business Machines Statistical Packages for Social Sciences (IBM SPSS version 23.0) was used, where a descriptive statistical analysis of frequencies and percentages was used to obtain the results of the first part of the questionnaire. In ranking the last two part of the questionnaires with respect to its significance and level of agreement, the mean score and standard deviation was used in obtaining the required results.

1.8 SCOPE OF THE STUDY

The study focuses on assessing the impact of knowledge management practices on the performance of construction firms in Ghana specifically in the Accra metropolis in the Greater Accra Region. This consideration for the decision resulted in the city been the most populated with construction companies.

1.9 ORGANISATION OF REPORT

Chapter one introduces the research, which contains sections like the background, problem statement, research questions, aim, significance of the study, methodology, scope of the study, and objectives.

Chapter two delivers a review of literature that is related to the study. It explains the performance of construction firms. It gives the meaning and understanding of knowledge and knowledge management.

Chapter three presents research instruments for data collection and analysis of findings which will be obtained through questionnaires and also the methodology used for the study like, research style and design.

Chapter four discusses the various data collected from the survey as statistical methods, tables and information obtained from the analysis.

Chapter five is the final chapter which contains the summary of the findings, conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter the theory of the research will be reviewed. The theory of the research is based on previous literature regarding knowledge management and construction firms in particular its impact on performance in the construction companies. As though knowledge management is a relatively new research area, there has been quite a lot of research related to knowledge management and its implementation. These theories are anticipated to aid the identification of the benefits of knowledge management and its impact on firm performance.

2.2 KNOWLEDGE AND KNOWLEDGE MANAGEMENT

Many researchers have given different understating of knowledge. According to Awad and Ghaziri (2004) Knowledge can be expressed as the facts, skills and understanding that one has gained, especially through learning or experience, which enhance one's ability of assessingsituation, making decisions and taking actions. Knowledge been defined by Davenport and Prusak (1998) as a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. Schubert et al. (1998) also explained that knowledge as a state or fact of knowing with knowing something being a condition of understanding gained through experience or study; the sum or range of what has been perceived, discovered or learned. Knowledge is needed every time we look for a solution, that is to say when we have a problem to solve, hence the need for a systematic approach in handling knowledge within firms (Bergeron, 2003). Knowledge management was introduced into construction firms to help the firms create, share and use knowledge acquired on previous experiences within the firm more systematically.

Knowledge Management can be expressed as a sensible approach of receiving the exact knowledge to the precise individuals at the right time and aiding them share and put information into action in ways that attempts to enhance organizational performance (O'Dell et al., 1998). Duff (2000) explained that the notions of “right knowledge”, “right people” and “right time” underline the need of identifying useful knowledge among the huge amount of information that an organization produces every day. Knowledge management considered by Jashapara (2004), as an effective process of learning which is associated with exploitation and sharing of human knowledge that uses appropriate technology and cultural environments to enhance an organisation's intellectual capital performance. Hence knowledge acquired from previous experience by experts are made useful through this process. According to Gray (2001), knowledge creates a fiscal value when used in solving difficult issues, discovering new chances and taking strong decisions.

2.3 KNOWLEDGE MANAGEMENT DIMENSIONS

Practicing Knowledge management within organisation have been strongly advocated by most researchers in building the organization's competitive advantage and delivering improved performance (Davenport and Prusak, 1998; Ming-Yu, 2002; Syed-Ikhsan and Rowland, 2004; Zack et al, 2009). In turn classifying knowledge management enables organization to identify the different types of knowledge with different nature that requires different procedures, tools and activities to process and manage (Tserng and Lin, 2004; Lin et al., 2006). Knowledge strategies can be categorised in two dimensions: tacit and explicit, which are important to help an organisation to manage important and available knowledge resources.

2.3.1 Tacit Knowledge

According to Davenport et al. (1998), knowledge is a mixture of experience, values, information and know-how that serves as a framework for evaluating and incorporating new experiences and information. Nonaka (1994) stated that tacit is one dimension of knowledge which is rooted in action, experience and involvement in a specific context and is comprised of both cognitive and technical elements. Tacit knowledge stated by Awad and Ghaziri (2004); Baker et al. (1997); Davenport and Prusak (1998); Gupta et al. (2000); Tiwana, (1999); Tsernge and Lin, (2004) is also the most valuable type of asset which combines material with practices, services and understanding of people, which will aid individuals to sort the best results and reduce chances of making similar mistake. Moreover, this type of knowledge dimension is very private and difficult to be achieved, shared or official since it includes experiences, know-how and perceptions, which normally resides in individual's head and memories (Nonaka and Takeuchi, 2007; Lin et al., 2006). There has been an understanding that tacit knowledge cannot be easily articulated with formal language since it is a personal knowledge that is embedded in people experiences and involves intangible factors such as personal beliefs, perspectives and values (KLICON, 1999). Tacit knowledge can best be utilised with systems and devices that encourages and enables collaboration and knowledge distribution amongst the employees within the organization, such as e-messaging and e-meeting tools (Nonaka, 2007; Lin et al., 2006). However, the use of knowledge management tools like capturing, publishing, categorising and editing tools are useful whenever the need arises to apprehend, organise and turn tacit knowledge into explicit knowledge. this aid turning knowledge into more obtainable procedures which will assist the organisation to develop instead of needing it workers to reproduce or relearn from each stage all the time (Gore and Gore, 1999).

2.3.2 Explicit Knowledge

Explicit knowledge is also another type of knowledge dimensions which is articulated in official and systematic dialect, shared in the form of scientific formulae, specifications, manuals and such like (Easterby-Smith et al., 2015). Explicit knowledge is easily transmitted to others when captured, retrieved and stored, this type of knowledge dimension can be shared and used because it can be recorded as words, numbers and scientific formulae that is easily managed. In certain situations, explicit knowledge may include project-related fillings such as specifications, contracts, reports, drawings, changing orders and data (Lin et al., 2006). KLICON (1999) mention explicit knowledge as being readily obtainable, documented, collected and organized in order to be easily communicable and available to be recovered and used, that can be found in series of assorted sources, such as human resources data, meeting minutes and the internet. Moreover, the need for an organization to be able to store, share and transfer expert's knowledge from previous experiences are completed much easier for the improvement of the organization.

2.4 CONSTRUCTION INDUSTRY

Construction is a vast industry that is made up of many types of building and civil engineering jobs and experts. The construction industry includes work out fits such as carpentry works, road construction, bridge development and home design. The industry is one of the largest in the world due to its responsibility of creating the infrastructure of cities, towns and countries. Construction has been part of our growth for decades and has contributed immensely to the development of our various countries. Lopes (2012) indicated that, in every country the construction industry contributes to the economy for about 5 to 10 percent of the gross domestic product (GDP) being the greater part and employs population working up to 10 percent and correctly, virtually half of the gross fixed capital development. In Ghana, the construction

industry contributes 11.8 percent of GDP to the economy, which in turn contributes to the economic growth of the country (Ghana Statistical Service, 2014). This study is focus in Ghana, which is known as one of the SSA countries experiencing strong and consistent economic growth over the last decade with increased FDI inflow (GIPC, 2010; Sutton and Kpentey, 2012; UNCTAD, 2011). Osabutey and Debrah (2012) stated that Ghana is also among one of the seven African countries forecast to be among the 10 fastest-growing economies in the world over the years. Many construction organizations within the industry suffer from having too many different processes for performing similar activities and finding different kind of solutions for encountering similar problems. However, these processes when not handled well creates chronic problems such as poor performance of time and cost. Olawale and Sun (2010) indicated that the main aim of project control in the construction industry is to ensure projects are completed on time, within budget and achieve other project objectives.

2.4.1 Knowledge Management & Construction Firms

The construction industry is considerably more uneven than many other industries with amuch greater attentiveness of small professional organisations (Carty, 1995; Halpin and Woodhead, 1998). These organisations provide services that are considered to be highly tacit knowledge in its nature (Lowendahl, 2000), which involves wide varieties of experts working within interdisciplinary groups to perform each assigned task in carrying out the construction works. In addition, the idea of the knowledge worker (Green et al., 2004) has long been significant within the construction firm, which is measured to be one of the labour-intensive sectors of the economy compared to other industries. Knowledge management is introduced as a mechanism of strategies and practices that are used within the firm which is essentially important for the development of the construction firms. Moreover, the practice of knowledge management is slowly accepted within the construction industry and has been recognised to bring about the

much-needed innovation and improved business performance the industry requires (Webb,1998; Egbu et al., 1999). According to Kamara et al. (2002) organisations practicing knowledge management can base on its effectiveness in addressing the need for innovation as well as improving the business performance. The construction business's today is facing many problems and challenges and to face these problem firms need to plan a right strategy to remain relevant and capable in the industry (Chan et al., 2004). In this challenging era, where competition is key, a construction firm can be successful based on the quality of knowledge it possesses regarding its services, technologies, products and markets (Faraj, 1999). The global marketplace has increasingly stirred up competitiveness with the construction industry, hence it has become important for organizations to integrate and transfer the knowledge of their employees to make it available when and where it is needed. As a result, many organizations implement knowledge management initiatives within the construction firm in an attempt to capitalize on this valuable resource (Javernick-Will and Levitt, 2009). Carrillo et al. (2000) revealed that the knowledge an organisation possesses is more significant than its old ways of obtaining economic power based on the fact that knowledge management is becoming the core concern of business today.

2.5 FIRM PERFORMANCE

According to Euske (1984) measurement of performance has been explained as the representation of outputs that are identified for the purpose of evaluation while others have expressed it as a tool to relate main results with a pre-set target and also to measure the extent of any deviation (Fortuin, 1988). The satisfaction of owners and stakeholders within the construction industry in relation to firm's performance are key and important. Therefore, in the acknowledgement of firm performance, clients and stakeholder's satisfaction levels should be considered (Cho and Pucik, 2005; Glick et al., 2005). It is understood that the organisations

seek performance such as efficiency, growth, profit, size, liquidity, success/failure, market share and leverages which is also a different form of performances that is being sorted by stakeholders in the likes of clients, consultants and government (Choo and Pucik, 2005). MAIA Intelligence (2009) indicated that in organisations growth and improvement of performance are sometimes related to the satisfaction in the form of delivering projects on time, within its budget and of its quality. Within the construction industry clients want their projects delivered on time, on budget, free from defects, efficiently, right the first time, safely and by profitable companies. Regular clients expect continuous improvement from their construction team to achieve year on year reductions in project cost and reductions in project time (MAIA Intelligence, 2009). In turn most construction firms are bent on satisfying its stakeholders and clients by improving the firm's performance with respect to delivery of projects on time, hence maintaining its competitive advantage.

2.5.1 Knowledge Management and Firm Performance

The effective management of organisational knowledge enhances the firm's performance in various aspect which is also known to be one of the successful means an organisation can achieve success without depending solely on tangible assets and its resources (Lee and Sukoco, 2007). The success and growth of an organisation are based on the efficiency and effectiveness of knowledge management (Canals, 2001; Salojarvi et al., 2010; Omerzel, 2010). Improvement of organisational learning, enhances the capacity of the organisations to accumulate and use knowledge in order for experts or employees achieve each assigned activity to improve the organisations performance (KLICON, 1999). Ahmad (2010) stated that learning within the organisation can generate opportunities to gain competitive advantages, which involve the ability of an organisation to complete projects and activities during the scheduled time, at a lower cost combined with higher quality of projects than other competitors. Ahmed et al.,

(2007) explained that the practice of knowledge management creates a system which provides services for experts or knowledge managers to collect, share, reuse, update, and create new experiences, solutions to problems and also best practices to aid employees in processes such as problem solving, decision making and innovation, and so to enhance the performance of the organisation.

2.6 POSITIVE EFFECTS OF KNOWLEDGE MANAGEMENT ON FIRM PERFORMANCE

Organisations pursuing knowledge management practice derives various benefits that improves the firm's performance. Appiah (2014) mentioned that the practical experiences with systematic and explicit knowledge management being practiced by advanced and early adopter organisations indicate that its benefits are significant. In order for an organization to make positive gains and improvement on performance, the organization must respond quickly and innovatively to the challenges associated with the practice of knowledge management (Appiah, 2014). The retirement or resignation of key experts within an organisation creates a gap for losing knowledge, this being a problem is one among many that organisations face. Al- Khatib et al. (2005) stated that the loss of knowledge within an organisation can result in the loss of tangible assets and financial loss to the organisation or the effects may be intangible and not measurable. The practice of knowledge management and the use of its system grants an organisation the storage and sharing of knowledge therefore reducing the risk of loss of knowledge (Appiah, 2014). BSI2 (2003) argues that knowledge management does not only increase the profitability of the organisation but also reduces mistakes and waste of resources. The positive gain when knowledge management system is used in a firm will result in new technologies and new process that would benefit the firm and promote productivity. Companies are realizing that their competitive edge is mostly the brainpower or intellectual capital of their

employees and management therefore, utilizing the knowledge and experiences acquired will be beneficial to the organizations (Davenport, 1999). The implementation and practice of knowledge management would result as benefits to the organization and improve performance (Carrilo et al., 2000). It is known that major construction groups in the likes of construction groups in the likes of Construction Best Practice Programme, Movement for Innovation and CIRIA (Construction Industry Research and Information Association) based in the UK promotes knowledge management as a mechanism for improving projects, organisations and improving industry performance, furthermore this mechanisms also allows the organization that are geographically spread to benefit most from rapid access to valuable or useful knowledge held up in other parts of the organization, in other to provide quick and knowledgeable solutions for clients or any similar problems (Carrilo et al., 2000). Bergmann (2002) cited by Lin et al (2006) made mention that the use of previous information and knowledge decreases the need to refer explicitly to past projects, thereby minimizing the time and cost of resolving any form of issues encountered on and enhances the quality of results obtained during the construction phase of a construction project. The experiences of experts and their acquired knowledge can be shared on construction projects so as to aid in resolving any similar problems that are encountered on therefore avoiding the reinvention of solutions, moreover, the reduction of time spent in solving similar problems saves cost and improves the time schedule of projects. In other to attain experiences and acquired knowledge, it is required to have worked on several projects and performed various activities, this acquired experiences and knowledge can be captured, reused, stored and maintained so as to obtain organizational knowledge (Lin et al., 2006). Research by Alavi and Leidner (1999) indicated that knowledge management system was design to attain both process results and organizational outcomes. Therefore, this process aids in reducing the time for engaging clients during the proposal time, saving time, improving project management, increasing staff participation, enhancing

communication, making the opinions of plant staff more visible, reducing problem solving time, better serving the clients and providing better measurement and accountability. These process improvements are related to communication or efficiency gains within the organization. Which also reflects on the minds of professional within the organization, which led to cost reduction of specific activities, higher profit margins and solving related issues as at when encountered on projects (Alavi and Leidner, 1999). Thus, the perceived organizational benefits of knowledge management practices can be of primarily as being of a financial and effectively delivery of projects on scheduled time. In today's business there are several shaped forces that are pushing organizations to find various new alternatives in managing and improving business performance (Hamel, 2007; Schiuma, 2011). Organizations are challenged to be more innovative in the context in which change, imaginations and creativity are built as part of the mindsets of employees within organization. These days there is the need to optimize the use of resources and make sure that innovation as an engine for competitiveness and sustainability. In order for an organization to meet these challenges, there is the need to produce pro-active new solutions as at when needed during the execution of works so as to improve organisational performance. The understanding of how this capacity can be achieved by organization is related to the relevance that knowledge plays a resource and source of value creation. Knowledge is said to represent one of the fundamental constituent parts of any organization and it can be incorporated into people's abilities or ingrained into structural and technological capital. Therefore, the practices of knowledge management strengthen the growth of the organization (Schiuma, 2012). One of the benefits of knowledge management practice in the construction works has to do with project schedule, cost and quality of work done. Knowledge is the most useful form of means for problem-solving and decision making, therefore reusing, sharing previous experiences and knowledge, experts and professionals are able to find solutions to problems without spending extra time, effort and resources, hence

allowing projects to be completed on time, with reduced cost and required quality of works (Ahmed et al., 2007; Bergeron, 2003). Another benefit of knowledge management practice has to do with the improving organizational learning which enhances the ability of the organization to collect and use knowledge so that members can exploit it to improve the organisation's performance (KLICON, 1999). It can also create possibilities to gain competitive advantage, which involve the ability of firms to perform projects and activities at lower cost and time combined with high quality of projects than other competitors (Ahmad and An, 2008). Egan, (1998); Kamara et al., (2002); Love et al., (2003) suggested that the effective practice of knowledge management within organisations has proven as a needed condition for the improvement of quality works, advancing in technology, performance of businesses, competence in delivery of projects and also associating with partners, suppliers and clients in order to attain competitive advantage within the industry. Liebowitz (2000) also stated some benefits of practicing knowledge management as, it being flexible and can be adapted easily when implemented to achieve its purpose, also for practice and process improvement, increasing employee morale and creativity.

Table 2.1: Significant positive effect of knowledge management practices to be adopted for the study

No	Positive effects of knowledge management practice	Source
1	Improved service quality	Egan, (1998); Kamara et al., (2002); Love et al., (2003)
2	Rapid and effective enterprise-wide problem solving	Liebowitz, 2000
3	Improved decision-making	Ahmed et al., 2007
4	Increased revenue	Ahmed et al., 2007
5	Business growth	Schiuma, 2012
6	Increased innovation	Schiuma, 2012

7	Practice and Process Improvement	Liebowitz, 2000
8	Higher levels of expertise and knowledge	Liebowitz, 2000
9	Increased customer satisfaction	Carrilo et al., 2000
10	Enhanced employee capability and organizational learning	KLICON, 1999
11	Increased employee morale, creativity and ingenuity	Liebowitz, 2000
12	Employee stimulation and motivation	Liebowitz, 2000
13	Increased flexibility and adaptability	Liebowitz, 2000
14	Raising the company's professional image	Liebowitz, 2000
15	Complementing the activities of quality management	(Carrillo et al., 2000; Granados, 2006)
16	Helping the transfer of information and knowledge	(Granados et al., 2011)
17	Reduction in the cost of solving problems	(Lin et al., 2006)
18	Improved efficiency and productivity at work	Alavi and Leidner, 1999
19	Helping in making decisions and estimates	(KPMG, 2000; Carrillo et al., 2000)

2.7 NEGATIVE EFFECTS OF KNOWLEDGE MANAGEMENT ON FIRM PERFORMANCE

Knowledge management is developed to enhance the dignity of human life, as well as to improve human welfare and also improve the performance of the organization. The problems encountered during the practice of knowledge management relates to the fact that people often have the sense of greed, so it is uncommon to use science to fulfill their own interests even at the expense of others or the organizations (Al Ahmar, 2014). This greed in turn causes knowledge to be abused among individuals within an organization, as a result impacting

negatively on firm's performance. Egbu and Botterill (2000) explained that knowledge management when implemented would result in new technologies and new processes that would benefit the organization and promote productivity. Therefore, the loss of knowledge through the resignation or laying off experts can prove futile to the organization in a sense that acquired knowledge from experiences by experts will be lost without it been shared or stored. Gann (2001) explains that negative orientation reflects the inverse situation where individuals who have acquired knowledge and the needed experiences feel unsafe concerning their jobs due to the mistrust they have for their employers; therefore, they are unwilling or less likely to share their experiences or knowledge. The practice of knowledge management is very essential to an organization, therefore the failure of it not been fully utilised would impact negatively on organisations. The culture of the organisation has to do with the values, beliefs, history and the traditional ways of achieving assigned activities during the construction projects or within the firm (Coopers and Lybrand, 1998). The cultural aspect of the organisation has been identified as one of the factors which contributes to the success of the practice of knowledge management and also most difficult constraint that is faced by experts or knowledge managers deal with each time (Davenport et al., 1998). The organisational culture is seen in terms of vertical silos, whereas isolated businesses operate with little communication across the business unit. This is due to the organisational structures and unwillingness to admit problems do exists. The vertical silos within the organisations leads to lack of awareness of what others have done, a culture of internal competition which undermines effort to share knowledge, knowledge hoarding. Hackett (2000) also stated that organisational culture (in terms of a culture that encourages knowledge hoarding behaviour) was one of the largest obstacles to knowledge sharing and knowledge management practices in various business organisations. Carrillo et al. (2000) express that culture also being an issue within an organisation during the practice of knowledge management cannot be changed overnight in view of business initiative. According to

McDermott and O'Dell (2001), organisations that adopt knowledge management should adopt its approach that suits their culture and also in a way which balances with how employees perform their activities, rather than forcing the change on them. Grann (2001) stated that the construction firms are known to be very skilful with delivery of construction projects or products but are weaker when it's about dealing with the internal affairs or processes of the firm. Therefore, the acceptance of knowledge management within the construction firm will not only aid experts in sharing and storing their experiences or knowledge but also help with the internal process within the firm. Time constraint is one of the key negative effect in construction organisation given that projects are schedule within time range which is most suited to client. As many experts or professionals within the firm are willing to share their knowledge or experiences with other experts sometimes find it more difficult to do so due to the tight project schedule, therefore unable to record experiences during and after projects. (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995). Employees within firms presume that, they are to take on additional responsibility which has to do with knowledge management activities to their daily responsibility, this is then considered as time wasting by employees. On such situation's knowledge sharing may not appear as a top priority unless individual performance measurement combines them (Carrillo and Chinowsky, 2006). The encouragement of experts to willingly share the acquired knowledge as well as their experiences poses futile in the practice of knowledge management within the organisation (Dainty et al., 2004). Large organisations face issues of standard work processes, in other cases it has grown rapidly and there are no longer standard procedures leading to different approaches being adopted. Due to the low profit margins of construction organisations and their conservative nature have also led to a reluctance to invest in knowledge management initiatives and infrastructure support required (Carrillo and Chinowsky, 2006). The implementation of knowledge management effectively within an organisation raises much concerns because it

might be perceived as fad and its concept suffers from immaturity. Another issue in relation to the negative effect of knowledge management has to do with technological issues. These issues were related to technical infrastructure and the security of gathered knowledge as data on the internet. In specific the need for configuring and effective technical infrastructure and architectural requirements in the face of highly dynamic technology was reported (Alavi and Leidner, 1999). The negative effects during the practice of knowledge management with the organizations would include.

Table 2.2: Negative Effects of knowledge management on Firm Performance

No	Negative effects of Knowledge management	Source
1	Insecurity of knowledge sharing as its passed on and on by workers	Dainty et al., 2004
2	Lack of required skills for employees to articulate knowledge	
3	High cost of knowledge management implementation	Carrillo and Chinowsky, 2006
4	Advance technology of knowledge management	Alavi and Smith, 1999
5	Lack of company strategy to fully utilize the knowledge that it collects	Carrillo and Chinowsky, 2006
6	High cost of training workers on knowledge management system	Carrillo and Chinowsky, 2006
7	Failure of updating KM affects the system	Alavi and Smith, 1999
8	Lack of confidence in employees who are unsure of themselves and fearful of exposing their weaknesses.	Dainty et al., 2004
9	Organizational cultures and norms that don't support or encourage sharing and collaboration.	Coopers and Lybrand, 1998
10	Time constraint	Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995
11	Difficulties in knowledge extractions	Davenport and Prusak, 1998
12	Lack of company strategy to fully utilize the knowledge that it collects	Davenport and Prusak, 1998
13	Knowledge remains dormant and useless without any implementation goals	Carrillo and Chinowsky, 2006
14	Complexity and difficult understanding of knowledge management for average workers	Carrillo and Chinowsky, 2006
15	Difficulties in knowledge extractions	Carrillo and Chinowsky, 2006
16	Interpersonal reasons, such as distrust of management or co-workers	

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter defines the procedures in conducting research. It also describes the design used in the research, gives population and sampling technique in order to achieve the two-objective highlighted under study in the previous chapter (one).

3.2 RESEARCH STRATEGY

Naoum (1998) stated that research strategy can be defined as a way to which the research objectives can be questioned. Suanders et al. (2009) identifies case study as a research strategy. A case study strategy was used for this research. Three contractors in the D1&K1 class were selected and used for this study. The reason was that these three companies had documentary evidence that reflected the application of previous knowledge acquired on construction projects.

3.3 RESEARCH DESIGN

In order to find remedies for solutions, it is imperative to technically disentangled devoid extraneous influences (Nenty, 2009) our problem and thus to argue the preference of particular procedure over others. Research design is not just a work plan but it is a tool that enables the researcher to ensure that the evidence obtained answer the questions under investigation in research, as unambiguously as possible (De Vaus, 2001). Ogoe (1993) also stated that research design is a collection of guides or rules or data collection. Afedzie (2016) citing Saunders et al. (2012) also defines research design as a general plan, guides or rules about how research questions should be answered. Logically and as accurately as possible. This research is said to be explanatory on the bases that, the study is conducted in order to assess effects of specific

changes on existing practices such as knowledge management on firm performance. The research design of the study focuses on explaining the aspects of the study which hasn't been dealt with. Which also gives a fare and general ideas on the study which can be used as a tool that will lead to further studies in the future.

3.4 RESEARCH STRATEGY

The research strategy is known to have two approaches: quantitative approach which uses questionnaire and the qualitative approach which seeks a face to face contact or the mix method. However, this study in turn to adopt the quantitative approach involving a desk study and field study. The choice of strategy was based on the type, importance of the study and availability of information for this thesis, also the type chosen depends on one's objective under study. Quantitative research is associated with the use of structured questionnaire where response options have been predetermined and a large number of respondents are involved.

3.5 DATA REQUIRED

The sources of data required were secondary and primary data. The secondary source was obtained from reports, newspapers, books, journals and other materials related to knowledge management on construction firm performances. The primary source was obtained from registered Ghanaian contractors and consultants representing clients using a well-structured close ended questionnaire.

3.5 SAMPLING TECHNIQUES AND SAMPLE SIZE SELECTION

Sample defined by Webster (1985), as a finite part of a statistical population whose properties provide information about the whole population. Furthermore, Mugo (2002) defines population as a group of individuals, objects or items from which samples are chosen for measurement. Saunders et al (2012) stated that primary data collection consists of two (2) types of sampling methods as, probability and non-probability sampling. The researcher uses convenience and purposive sampling technique a non-probability sampling method, due to it accurate responses and it focuses on a specific group of people.

Three (3) construction firms with the classification category of D1&K1 were randomly selected on the basis that these contractors were the key experts who are highly ranked in the construction sector and are assumed to have the vital information about the thesis under study and have certain level of skill and understanding about knowledge management. These selected contractors are currently executing projects within the Accra metropolitan district and were conveniently sampled for the study. Afedzie (2016) citing Saunders et al. (2012) explained that convenience sampling which is also known as availability sampling method that depends on data collection from population members who are readily accessible to take part in a research where the first obtainable primary data source will be used for the study without extra demands. In addition, Jackson (2011) mentioned that purposive sampling which is also known as selective, judgement or subjective sampling techniques or method which researchers depend on their judgement when selecting members of population to take part in the research. Using the adopted sampling technique these key respondents were identified; the experts and managing professionals (supervisors, engineers, quantity surveyors, project managers and architects). Sixty (60) questionnaires were given out to 60 respondents, each construction firms selected were administered with 20 questionnaires each. The researcher needed certain group

of respondents who are known for their skills and are involved in large number of construction jobs so they will provide information and also contribute immensely to the study (Adjei, 2009).

3.6 ADMINISTRATION OF QUESTIONNAIRE

To attain the aim and objectives of the study, close-ended questionnaires well-structured was used to gather primary data from building contractors. Glasgow (2005) explained that closed-ended questionnaires are easy for respondent to respond and also to aid the researcher to analyze data easily. Data collection is a team used to describe the orderly approach to gathering and measuring information from a variety of bases to get a complete and exact picture of an area of interest. The primary goal of data collection effort is to capture quality data that easily interprets to rich data analysis that may lead to reliable and convincing answers to questions that have been posed. The developed questionnaires would be dispersed to and retrieved from the offices or on project site of the experts and management professionals in the selected construction firms. The distribution of the questionnaires and the process of retrieving them from the staffs of the construction firms in person were based on two reason, that is to make sure the questionnaires get to the intended recipients and also to aid improve the response rate (Ahadzie, 2007).

3.7 CONTENT OF QUESTIONNAIRE

The questionnaire was structured to address the objectives of the research. Simple and straightforward words and sentences were used in the questionnaires, thus, making it easy to understand and hence, providing a more accurate and reliable data from respondent. The questionnaire was based on three (3) parts: Part A reported the background of respondent (i.e. position, years in organization, working experience, qualification, background of the company, include years of existence and general ideas of knowledge management). Part B reported the

potential benefits that are associated to knowledge management practice on firm's performance. Respondents were to indicate in the boxes provided how the benefits gained during the practice of knowledge management has enhanced the firm performance. Part C also reported the disadvantages associated to knowledge management practices on firm performance. The questionnaire was designed to include only scaled-response questions. A five-point Likert scale of 1 – 5 was employed to measure the strength or intensity of respondent's opinion.

3.8 RESPONDENTS

The method adopted for the selection of respondents to respond to the questionnaire was based on purposive sampling. This non-probability sampling technique was used for this study because, it permits the researcher to deals with individuals who have knowledge on the topic under study (Eribil et al., 2010).The selected individuals are the industries expects and professionals who understand the topic under study and can respond thoroughly, such individuals are (Project manager, Architect, Engineer, Quantity surveyor and Supervisor).

3.9 DATA PRESENTATION AND STATISTICAL TOOLS FOR ANALYSIS

In addressing the goals of this research, collected questionnaires from respondents were aggregated to give a large unit for the analysis and one statistical software was used in the analysis, which is theInternational Business Machines Statistical Packages for Social Sciences (IBM SPSS version 23.0) to obtain the descriptive statistics such as mean score and standard deviation which will also help in ranking the various benefits and disadvantages of knowledge management practice on firm performance. The data were analysed and presented in a form of texts and tables. Descriptive statistics analysis involving frequencies and percentages were used to tabulate the results of the first part of the questions in the questionnaire. Whereas mean

score and standard deviation were also used to determine the last two parts of the questions in the questionnaire which also included its ranking in accordance to its importance and level of agreement. The criterion for ranking this part of the question was determined by indicating that when the standard deviation of each variable is less than 1.00 and its mean score is greater than 3.50 then it is considered as a very significant variable among them. It was also made aware that, in the case when two variables have the same mean score, the one to be ranked as the highest significant variable should be the one with the lowest standard deviation. Afedzie (2016) citing Stevens and Edwards (1996) affirms that the level of agreement among respondents to be more reliable when the standard deviation variables are less than 1.00 and when the mean score variable is greater than 3.50 is considered very vital. Reliability statistics were used to analyse the scale variables of both the significant positive effects and the critical negative effects of knowledge management on firm performance. From the analysis indicated in table 3.1 below, the scale was reliable with coefficients of 0.985 which is more than an alpha value of 0.70 cited by (Swanlund, 2013)

Table 3.1: Validity and Reliability

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.985	0.988	26

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter focuses on the research findings, analysis of data collected from the survey and discussions. The questionnaires consist of three (3) parts, firstly the respondent profile and general ideas of knowledge management, secondly the benefits of knowledge management on firm performance.

4.2 RESPONDENTS BACKGROUND

This section describes the background of respondents who took part in the field survey of the study. The Table 4.1 below shows the findings for the respondent's profile and general idea on knowledge management of the 60 respondents sampled from all the selected construction firms within the area of study. From the table below, results gained from the questionnaire shows the practioners current positions that, 51.7% of the respondents representing majority were Supervisors, 25% being Engineers, 13.3% of respondents representing Quantity Surveyors whiles 5% represented Architects and remaining 5% of respondents constituted Project Managers.

The working experience of the workers was also sampled. This question was intended to identify the level of experience of the respondents which is significant because it will affect the quality of responses that will be gained. It was found that majority of the respondents constituting 41.7% of the respondents who have worked for more than 5 years. The respondents who have being working for 3 – 5 years represented 33.3%, those with 1 – 2 years represented 16.7% respondents, whiles 5% being the representation of 2 – 3 years and workers with less than 1 year represented 3.3% of respondents.

However, the respondents holding Higher National Diploma (HND) represented 50% which stood for majority of respondents, followed by 33.3% of them being holders of Bachelor's Degree and 16.7% of respondents were identified to hold a Master's Degree. This question was intended to classify the educational level of respondents, therefore impacting positively on the responses that will be agreed on.

Respondents were asked to indicate how long their firms have existed in the construction industry. Indications showed that 50% of their firms have existed in the industry between 5 – 10 years as majority, 25% also existed for less than 5 years, 16.7% represented firms existed between 11 – 15 years and the rest of the respondents constituting 8.3% indicated their firms have existed in the industry above 15 years. The duration of firm's existence in the construction industry affects the quality of responses that is gained from the respondent.

Table 4.1: Respondents' Background

Employees Position	Total number of Respondent
Project Manager	3
Architect	3
Engineer	15
Supervisor	31
Quantity Supervisor	8
Years of Experience	Total working experience of respondent
Less than 1 year	10
1 – 2 years	3
2 – 3 years	20
3 – 5 years	25
More than 5 years	
Qualification	Number of respondents
MSc	10
BSc	20
HND	30
No. of years in operation	Number of respondents
Less than 5 years	15

5 – 10 years	30
11 – 15 years	10
Above 15 years	5

4.3 PRACTICING OF KNOWLEDGE MANAGEMENT IN FIRMS

This section of the collected data is significant to the study reasons being that, respondents within firms practicing knowledge management are well familiarize with it and can aid in gaining quality responses for the study. On the responses given to the question, 99.7% which constituted majority or the entire respondent indicated that their firms practice knowledge management.

4.4 METHODS OF LEARNING

This question will help the researcher classify how lessons are learnt from previous project within firms. This would give an idea as to how previous lessons are learnt from projects within respondents' firm. Table 4.2 identifies methods respondents use in learning from previous executed projects within their firms. 25% representing respondents indicated lessons learnt through questionnaire and surveys in their respective firms whilst 33.3% represented respondent whose firms uses interviews as method of learning. However, the remaining 41.7% being majority of respondent indicated that lessons are learnt through the use of observation and imitation.

Table 4.2: Methods of learning

Variable	Option	Frequency	Percentage (%)
Methods of Learning	Observation and recreation	25	41.7
	Interviewing	20	33.3

	Questionnaires and Survey	15	25
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4.5 KNOWLEDGE TRANSFER METHODS

The section describes the best cases used in transferring expert experiences and lessons learned among other staff within their firms. The research wanted to know after capturing the knowledge through the various methods outlined and communicating it to the people within the organisation, how to transfer knowledge/learned experiences. Majority of the respondent being 41.7% indicated that tutoring/mentoring is used a mode of transfer of knowledge to others within the firm. Other respondents representing 30% indicated meetings as their method of knowledge transfer, 16.7% representing respondents whose firms uses the expert system methods of transferring knowledge whiles other respondents constituting 11.7% were indicated to using database as their method.

Table 4.3: Knowledge transfer methods

Variables	Options	Frequency	Percentage (%)
Knowledge transfer methods	Meetings	18	30
	Expert System	10	16.7
	Tutoring/Mentoring	25	41.7
	Database	7	11.7
	Total	60	100

4.6 IDENTIFYING EXPERTS' EXPECTATIONS OF KNOWLEDGE MANAGEMENT PRACTICE

This question identifies the various expectations of respondents during the practices of knowledge management within their firms. These responses will aid the researcher in understanding the kind of outcomes expected to be obtained when knowledge management is being practiced in their various firms. From the table below, it shows that 50% of the respondents agreed to the fact that, knowledge management practice is expected to improve firms performance, 33.3% of respondents rated that the practice of knowledge management is expected to increase the quality of services the firms provide, moreover the filing of documents or data system within respondents various firms will be more advance with its rate at 8.3% being represented from the collected data, the remaining respondents constituting 8.3% also indicated that the practice of knowledge management will aid their firms to maintain knowledge and gain competitive advantages over their competitors.

Table 4.4: Expectation of knowledge management practice

Variables	Option	Frequency	Percentage (%)
Expectation of knowledge management practice	Improved firm performance	30	50
	Documentation or filling data system more advance	5	8.3
	Quality services	20	33.3
	Maintain knowledge and competitiveness	5	8.3
	Total	60	100

4.7 POSITIVE AND NEGATIVE EFFECTS OF KNOWLEDGE MANAGEMENT PRACTICE ON FIRM PERFORMANCE

In this section, the positive and negative effect of knowledge management practice on construction firm's performance, which relates to the first objective, is discussed. On a Likert score of 1 to 5, descriptive statistics was used to determine the mean score and standard deviation of variables, where scale 1 represent strongly disagree, 2 representing disagree, 3 representing neutral, 4 representing agree and 5 representing strongly agree. Table 4.5 and 4.6 below indicates the results gained from respondents identifying their level of agreements and disagreement to the benefits and disadvantages of knowledge management practice on the performance of construction firms. Reflecting on table 4.5 showed below, the results obtained from experts on their perspective on each positive effect.

Upon the agreements shown, the Reduction in the Time and Cost of Solving Problems was ranked first based on its mean score 4.53 which was the highest among the rest and its standard deviation of 0.536 being lowest. From the perspective of the experts within firms this means that, the practice of knowledge management within the firm is very beneficial to the improvement of the firm's performance. Lessons learnt from previous experiences on executed projects aids experts on the execution of new projects in a sense that, when experts encounter similar problems, the time, efforts and cost spent in solving such problems will be minimal since such issues has been solved. This then shows how well an organisation will perform within the industry. It is understood that a construction firm is seen to perform better within the industry when its able to deliver a project on scheduled time with a reduce cost and the responses gathered has shown likewise due to firms practicing knowledge management.

The second ranked on the table shown below is the Increased in Quality Services, with a mean score of 4.52 being the second highest and with the standard deviation of 0.537. This indicated

that the respondents agreed that practicing knowledge management within their firms has proven beyond reasonable doubt that it has helped improved the quality of services they render to their clients and other stakeholders within the industry hence improve on their firm's performance as well. These findings affirms Darroch (2005) statement citing Penrose (1959) which implies that knowledge of an employee is based upon his or her skills, experiences and ability to absorb new knowledge. This therefore becomes a resource in its own right way, which used will affect the quality of services that can be leveraged from each resource to be owned by the firm. Accordingly, knowledge management turns to be an important supporting role within the organisation.

Indication from the results attained respondent agreed to the fact that practicing knowledge management has enhanced their work force which in turn has gain satisfaction from clients which was ranked third from the results obtained in the table (4.5) below. Where its mean score reflected 4.52 and a standard deviation of 0.676 and more so has increased the organisational revenue, ranked as the fourth significant positive effect factor with its mean score as 4.48 and standard deviation as 0.537, which has impacted positively on the performance of their firms within the industry. The wider agreement from respondents clearly indicates that, practicing knowledge management within firms is very important in enhancing the abilities of all experts, also improving the organisational performances with regards to the quality of work done and the duration in completing works. Other significant positive effects which were discovered from the survey also recorded high mean scores which indicates the strongly agreements from the respondents on the asked questions. Appiah (2014) citing Rasli et al., 2004 made mention that management of knowledge within an organisation is recognised as an important business consideration in order to gain competitive advantage over its competitors. When it's managed very well it can be converted into a strategic intellectual asset of any knowledge-intensive organisation. It was also stated that the new skills, mind-sets, models and commitment as well

as new ways of interpreting the concept of effective management are needed to improve construction project performance.

Indications from table 4.6 below shows the level of disagreement respondents had over the critical negative effects of knowledge management on firm's performance. It was realised that, among the first four negative effects outlined, the respondents disagreed to Time constraint ranked as first with a mean score of 1.93 and standard deviation of 1.071 as one of the critical negative effects of knowledge management on their firm's performance.

Most respondent disagreed on the fact that organisational culture ranked as second with the indication of a mean score being 1.93 and standard deviation of 1.071 which has negative effect on knowledge management practice which in turn affects firm performance. Zack et al. (2009) cited Davenport et al. (1998) and Lee and Choi (2003) stating that organisational culture is perhaps the most persuasive aspect in helping or preventing the practice of knowledge management. Organisations that value what their workers know and reward them for sharing that knowledge creates a climate that is more conducive to knowledge management therefore enhancing their performance (Zack et al., 2009).

The high cost of knowledge management implementation was ranked as the third critical negative effect with a mean score of 1.92 and standard deviation of 0.962. Respondent disagreed that this will have any negative effects on the firm's performance since it is not a reoccurrence situation but rather something on a one time bases.

Respondent further went on to disagree to the fact that there are difficulties in extracting knowledge from workers during the practice of knowledge management. This does not affect their organisational performance in the sense that workers are motivated in various ways and rewarded for sharing their acquired experiences. This was ranked fourth with a mean score of 1.88 and standard deviation of 0.825.

Table 4.5: Positive Effect of knowledge management on firm performance

Descriptive Statistics					
Positive Effects	N	Sum	Mean	Std. Deviation	Ranking
Reduction in the time and cost of solving problems	60	272	4.53	.536	1st
Improved service quality	60	271	4.52	.537	2nd
Increased client satisfaction	60	271	4.52	.676	3 rd
Increased revenue	60	269	4.48	.537	4 th
Organisational growth	60	267	4.45	.594	5 th
Enhanced employee capability and organisational learning	60	267	4.45	.699	6 th
Improved decision making and estimates	60	267	4.45	.811	7 th
Increased flexibility and adaptability	60	265	4.42	.809	8 th
Employee stimulation and motivation	60	260	4.33	.837	9 th
Easy transfer of information and knowledge	60	260	4.33	.857	10 th
Increased innovation	60	259	4.32	.651	11 th
Complementing the activities of quality management	60	258	4.30	.561	12 th
Improved efficiency and productivity	60	257	4.28	.666	13 th
Increased employee morale, creativity and ingenuity	60	253	4.22	.761	14 th
Valid N (listwise)	60				

Table 4.6: Negative Effect of knowledge management on firm's performance

Descriptive Statistics					
Negative effects	N	Sum	Mean	Std. Deviation	Ranking
Time constraint	60	116	1.93	1.103	1 st
Lack of organisational culture	60	116	1.93	1.071	2 nd
High cost of knowledge management implementation	60	115	1.92	.962	3 rd
Difficulties in knowledge extraction	60	113	1.88	.825	4 th
Lack of required skills for employees to articulate knowledge	60	111	1.85	1.055	5 th
Employee resistance	60	103	1.72	.940	6 th
Lack of company strategy to fully utilize the knowledge collected	60	98	1.63	.802	7 th
Lack of training	60	98	1.63	.581	8 th
Distrust among co-workers and management	60	96	1.60	.588	9 th
Lack of structured procedures	60	96	1.60	.827	10 th
Advance technology of knowledge management	60	95	1.58	.809	11 th
Knowledge remains dormant ad useless without any implementation goals	60	93	1.55	.594	12 th
Valid N (listwise)	60				

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter five concludes the study. Firstly, the achievement of the objectives and contributions of this study are presented. Conclusions and recommendations from the study are put forth. Suggestions for further studies and limitation are outlined.

5.2 SUMMARY OF FINDINGS

This section presents the findings from the study based on the specific objectives set.

5.2.1 The positive and negative effect of applying knowledge acquired from previous experiences on firm performance

The research identified that four (4) positive effects were the most significant. They are: Reduction in time and cost of solving problems; improved service quality; improved client satisfaction; and increased revenue. These benefits were agreed to have positive effect on the organisation hence improve performance. From the findings four (4) negative effects were identified as critical. They are; Time constraint; Lack of organisational culture; High cost of knowledge management implementation; and the difficulties in knowledge extraction.

5.2.2 Identifying Experts Expectations of Knowledge Management Practice

The research identified that the practice of knowledge management within the construction firms is expected to improve the performance as well as increase the quality of services provided by the firms. Indications were also shown that the practice of knowledge management will aid firms to maintain knowledge and also gain competitive advantages.

5.4 CONCLUSION

Knowledge plays a vital role within an organisation and also contributes largely towards the organisations ability to remain competitive in the global marketplace. Knowledge management in an organisation is the act of making knowledge available to others within the organisation to ensure better sharing of best practice, lessons learned, information and project management for strategic decision-making. The practice of knowledge management helps in developing the organisation in various ways and also helps to increase useful knowledge within the organisation. However, the findings of this study show that the practice of knowledge management in organisations derives a lot of benefits that has positive effects on organisational performance. It was also discovered from the study that, knowledge captured and stored within the organisation were properly transferred throughout the entire organisations by conducting meetings and tutoring during the execution of projects where lessons learned could be shared and discussed among the experts in the firm. Most of the respondent indicated that through observation and recreation lessons are learnt from previous projects. Indication from respondent confirmed that, even though there are some negative effects associated to knowledge management practice, it was disagreed that it had any negative effects on their firm's performance. The suitable practicing of knowledge management within an organisation helps improves performance as well as ensuring its growth and also providing a competitive advantage over its competitors.

5.5 RECOMMENDATIONS

To encourage best practice among of knowledge management within the construction industry and among various firms, the following recommendations were made:

Management should ensure that the exchange and transfer of knowledge will be made easy and understandable to all experts within the organisation; adequate platforms need for such should be consistent.

As the global market advances towards technology, management should improve more on the technological ways of capturing, storing, sharing and transferring of knowledge within the firms.

There should be an awareness creation and advocacy on the benefits of practicing knowledge management on firm's performance.

5.6 LIMITATIONS

The study looked at how the positive and negative effects of knowledge acquired from previous experiences can impact on firm's performance. However, the responses of the study obtained from few selected construction firms within the industry alone affect the generalizations of the findings. The scope of the research was limited to one metropolis also affects the findings.

5.7 FURTHER RESEARCH

The research found that firms effectively managing knowledge were also more innovative and perform better than their counterparts. It was also found out that the benefits associated in practicing knowledge management positively affect firm's performance. The researcher recommends a further research on assessing the impact of knowledge management on firms' performance.

Further research should also be conducted to measure the practice of knowledge management against improvement of firms' performance.

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APPENDIX
QUESTIONNAIRE
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ART AND BUILT ENVIRONMENT
DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT,
KUMASI – GHANA
SURVEY QUESTIONNAIRE
IMPACT OF KNOWLEDGE MANAGEMENT ON THE PERFORMANCE OF
GHANAIAN CONSTRUCTION FIRM

Dear sir/Madam

This questionnaire forms part of an MSc. Construction management research project being part of an academic requirement which aims to assess the impact of firms applying knowledge acquired through previous experiences on the performance of construction firms in Ghana. I would be very grateful if you could spend 10 minutes of your time to answer the attached questions so that I can contribute towards the use of knowledge management system to improve construction activities therefore enhancing firm's performance and the industry at large.

I appreciate that you are already busy that participating in this survey will be another task to add to your busy schedule, but by contributing you will be providing important information and all data provided are purely for research purposes and will be kept anonymous and completely confidential.

Thank you for your valid input in advance.

Yours faithfully,

HertyAmellorBrempong

(MSc. Student)

Email: hertyamellor@gmail.com

Tel: (+233) 266393998/249841514

PART A. RESPONDENT PROFILE AND IDEA ON KNOWLEDGE MANAGEMENT

Directions: Please tick (√) in the relevant boxes

1. Please indicate your position in the firm

☐ Project manager

☐ Architect

☐ Engineer

☐ Supervisor

☐ Quantity Surveyor

2. Please state the number of years you have been in the firm/construction industry

☐ less than 1 year

☐ 1 – 2 years

☐ 2 – 3 years

☐ 3 – 5 years

☐ more than 5 years

3. Please indicate your qualification

☐ MSc

☐ BSc

☐ HND

☐ Other.....(please indicate)

4. How long (years) has the firm been in existence?
- ☐ Less than 5
 - ☐ 5 – 10
 - ☐ 11 – 15
 - ☐ Above 15
5. Does your firm classify, organise and document knowledge or lessons learned from their previous projects?
- ☐ Yes
 - ☐ No
6. If yes to (6) how long does it take?
- ☐ Weekly
 - ☐ Monthly
 - ☐ Yearly
 - ☐ Once a quarter
7. Please indicate how lessons are learnt from projects within your firm
- ☐ Observation and recreation
 - ☐ Interviewing
 - ☐ Questionnaire and surveys
 - ☐ Other..... (please indicate)
8. How do you transfer knowledge or learnt experiences to others within your firm?
- ☐ Meetings

☐ Expert system

☐ Tutoring/ Mentoring

☐ Database

☐ Other..... (please indicate)

9. Please indicate your expectation of knowledge management practise on firms

☐ Improved firm performance

☐ Documentation or filing data system more advance

☐ Quality in services

☐ Maintain the knowledge and competitiveness

☐ Others..... (please indicate)

PART B: SIGNIFICANT POSITIVE EFFECTS OF KNOWLEDGE MANAGEMENT ON FIRM PERFORMANCE

Below are potential positive effects associated to knowledge management practices on firm performance. From your experience, express your opinion on your level of agreement to the benefits of KM practice impacts positively on firm performance. Use the scale: 1 = strongly disagree 2 = disagree 3 = Neutral 4 = agree 5 = strongly agree

item	Benefits	1	2	3	4	5
1	Improved decision making and estimates					
2	Improved efficiency and productivity					
3	Reduction in the cost of solving problems					
4	Easy transfer of information and knowledge					
5	Complementing the activities of quality management					
6	Employee stimulation and motivation					
7	Increased employee morale, creativity and ingenuity					
8	Enhanced employee capability and organisationl learning					
9	Increased client satisfaction					
10	Increased innovation					
11	Organisational growth					
12	Increased revenue					
13	Improved service quality					
14	Increased flexibility and adaptability					

PART C: CRITICAL NEGATIVE EFFECTS OF KNOWLEDGE MANAGEMENT PRACTICE ON FIRM PERFORMANCE

Below are the critical negative effects of knowledge management practices on firm performance. From your experience, express your opinion on your level of agreement to the disadvantages of KM practice on firm performance. Use the scale: 1 = strongly disagree 2 = disagree 3 = Neutral 4 = agree 5 = strongly agree

item	Disadvantages	1	2	3	4	5
1	Time constraint					
2	Lack of organisational culture					
3	Employee resistance					
4	Lack of training					
5	Lack of structured procedures					
6	Difficulties in knowledge extraction					
7	Distrust among co-workers and management					
8	Lack of company strategy to fully utilize the knowledge collected					
9	Lack of required skills for employees to articulate knowledge					
10	High cost of knowledge management implementation					
11	Knowledge remains dormant ad useless without any implementation goals					
12	Advance technology of knowledge management					

Thank You.