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**KNOWLEDGE MANAGEMENT PRACTICES IN THE QUANTITY
SURVEYING FIRMS IN GHANA**

BY

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DECLARATION

STUDENT

I declare that I have personally, under supervision, undertaken this study.

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SIGNATURE

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SUPERVISOR

I declare that I have supervised the student in undertaking the study and confirm that the student has my permission to submit it.

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ABSTRACT

The output of Quantity Surveying firms is firmly based on the knowledge and experience of Quantity Surveyors that work in this sector. Knowledge management has been proposed as an approach that would help in achieving this purpose by formalizing the way in which firms manage their information and experiences.

The study was carried out with the goal of investigating the Knowledge Management practices and to serve as a guideline to enhance development and effective Knowledge Management in Quantity Surveying firms in Ghana and to make recommendations.

The study finds out that, in undertaking their roles, Quantity Surveyors face many barriers and challenges that inhibit the implementation of knowledge management within QS firms. Many of the barriers and challenges that organizations face in managing their knowledge assets are influenced by the lack of time and lack of support from management,

Also, the best instances and tools to capture knowledge were also looked at during the survey.

The best instances were categorized into the methods used to capture knowledge; methods used to communicate knowledge; procedures of transferring knowledge; and the learning styles developed to improve knowledge.

Finally, the level of knowledge management in terms of their significance and benefits they have to the development of quantity surveying (QS) firms were assessed. Generally, knowledge management was assessed to have great importance in enhancing professionalism.

From the study, it was discovered that, knowledge is normally captured and stored. However, there is no proper processing of this knowledge to allow its disclosure to the entire company, and to capture the knowledge, quantity surveying firms proposed to conduct meetings or revision

during the execution of projects where they could share and discuss lessons learned and best practices.

Knowledge sharing is seen as a contributory factor in business improvement and the system could therefore be part of the daily work of the people. In addition to, there must be an internal motivation and commitment of those involved to share their knowledge and work experience (whether good or bad) without fear of punishment for having made a mistake or of losing power by the fact of sharing their knowledge with the rest of team members or firms.

Keywords: knowledge management, system, construction sector, study, practices

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DEDICATION

This thesis is dedicated to all my family members, especially the memory of my late Brother, Mr. Justice Appiah and Late Sister Mad Vida Appiah.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The economy of the future will be a knowledge economy. Competitiveness is highly related to the level of knowledge and technology (Drucker, 1998). Knowledge is the key resource today, and the firms that can learn to manage it more effectively will win (Cartlidge, 2000). To survive and grow in the future, the Quantity Surveying profession must respond quickly and creatively to the challenges of accelerating social, technological, economic and environmental change. An essential element in the future success and expansion of the profession is the skill and knowledge base at the core of professional practice (RICS, 1991).

Quantity Surveying Firms, as project-based professional services organizations that offer client service as their main output, depend on knowledge. They provide construction cost consultancy services from the inception of planning to the completion of a construction project. They depend on well-educated and skilled personnel. They concentrate on temporary assignments or projects and are characterized by knowledge assets. Their critical elements are in the heads of their employees, in networks, customer relations, manuals and service delivery systems. They strongly depend on employee loyalty and therefore vulnerable to exits.

Clients have also an increased expectation of the service offered by Quantity Surveyors and this coupled with greater competition both internally (from the profession) and externally has resulted in a challenge to their professional status.

To meet these challenges, Quantity Surveyors need to enhance their professionalism and status. Knowledge is a key feature of the Surveyor's portfolio and therefore effective knowledge

management skills can help to improve their expertise. Practitioners learn from experience and this is a continuing process. In any organization junior members draw on the experience of seniors as part of their learning experience and to some degree that learning flow can be reversed. What is required is some means by which that learning experience, together with intuitive 'knowledge', can be 'captured' and disseminated to colleagues within the same organization. Knowledge management (KM) is a systematic management approach to identify and capture the 'knowledge assets' of a firm so that they can be fully exploited and protected as a source of competitive advantage (Scarborough & Swan 1999).“Knowledge Management highlights the importance of a sharing culture in order to support and foster Knowledge Management focus (Alavi, M., and Leidner, D. 1999)”. Knowledge Management focuses on ways of sharing and storing the knowledge of individual, as a mean of improving the competency, speed, efficiency and profitability of larger whole.

As the Quantity Surveying Profession is subject to challenges and competition the proposed paper will explore the feasibility of introducing KM as a means to enhance professionalism and investigate its applicability to Quantity Surveying practices .The knowledge has been run for years in construction companies, in one way or another. In fact many organizations have certain elements that belong to knowledge management (Anumba et al., 2005), such as undertaking reviews of projects, studying the practices employed by other companies or developing processes manuals, among others. Therefore, Knowledge Management is not a new idea or trend within enterprises.

However, the need to implement a clear and structured knowledge management strategy itself represents a new concern among companies with a global and long term vision.

Thus, Knowledge Management has emerged in the recent years as a tool that seeks to formalize the way in which companies manage their information and experiences, thus promoting the capture, processing and dissemination of the different experiences of their key professionals and the lessons learned from different projects.

Human capital brings the experience, skills, knowledge or know-how and creativity of employees. In other words, human capital has the implicit knowledge (knowledge not encoded that resides in each person) that the firms seek to use. The second element of the intellectual capital, intellectual assets, are created when human capital shares its tacit knowledge. Once the tacit knowledge of individuals is encoded and written, the firms are now able to move the intellectual assets, rather than the individuals, where its needs it.

Furthermore, to survive in the knowledge economy, organizations need to do better tomorrow than yesterday and constantly be on the lookout for how to correct and prevent problems and make continuous improvement to achieve business sustainability. Knowledge management makes sense to first organize what people know as a division and then to share it, which led to a whole host of cultural issues.

1.2 PROBLEM STATEMENT

As competitiveness increases, tangible resources are not a sufficient basis to distinguish one firm from another due to the fact that physical resources can be easily acquired. That is why one of the major challenges currently facing Quantity Surveying Firms is the proper handling of knowledge, allowing them to minimize the risk on projects and anticipate inconsistencies through appropriate decision-making.

Knowledge is not stored in the right way for reuse and therefore firms are unable to capitalize on its potential to solve problems and/or create more knowledge. In projects for example, knowledge such as the identification of errors and the transfer of knowledge are buried in reports and spreadsheets that are not revised, or is lost due to the separation of the different actors involved (Anumba et al., 2005). In addition, frequently repeated errors and achievements from previous projects do not carry over to future projects, so reinventing the wheel is a frequent phenomenon. This leads to the re-implementation of activities that could be avoided and as a result of the foregoing, to deterioration in the performance of projects (Fong et al., 2006).

Another problem in the quantity surveying sector is the fact that due to the high market demands as regards the compliance with budgets, quality, increased revenue and specifically the deadlines, professionals lack sufficient time to conduct reviews of the achievements or failures occurred during projects or after they are completed. In addition, in the construction industry there is not a culture of post-project review (Carrillo et al., 2004), which does not allow the analysis of what happened in projects for the subsequent dissemination of lessons learned.

In some companies where some transfer of know-how is carried out, it is observed that the key construction professionals share their knowledge and management practices with the team members during the project implementation; however, these skills are not stored or transferred to rest of the firms.

Because of the foregoing, it is possible to think that if there were an initiative of knowledge management in firms, the knowledge could be reused and shared among the various participants in a project or firms, thus contributing to improving construction processes and reducing the time and cost involved in solving problems (Lin et al., 2006).

1.3 SIGNIFICANCE OF THE STUDY

The significance of this study is based on the uncontested pressure the global economy has placed on the Quantity Surveying Consulting Firms to speed their technological innovation processes and to exploit the properties of their intangible knowledge assets (Marquardt and Reynolds, 1994; Mann, 1998; Neef, 1998).

There are also high expectations for an organization when it is pursuing knowledge management. Practical experiences with systematic and explicit KM reported by advanced and early adopter organizations indicate that significances can be substantial. Most direct significances tend to be operational while tactical and strategic benefits often are indirect and take longer to realize. According to Liebowitz (2000); Beckman (1997) and Wiig (1999), the significances of KM are:

- Service quality, decision making, practice, and process improvement.
- Rapid and effective enterprise-wide problem solving.

- Increased revenue, customer satisfaction innovation, flexibility, adaptability, employee morale, business growth, creativity and ingenuity.
- Higher levels of expertise and knowledge.
- Enhanced employee capability and organization learning.
- Employee stimulation and motivation.
- Raising the company's professional image.

1.4 RESEARCH SCOPE

The major focus of this research is to propose Knowledge Management (KM) framework for the registered Quantity Surveying Construction Consulting Firms in Ghana. In turn, findings from this study shall be interpreted as the organisational issues and they may not be applicable to the individual project level. Information was solicited through survey questionnaire using KM best practice implementation derived from the Ghana Institution of Surveyors (GhIS).

1.5 RESEARCH QUESTIONS

The study seeks to ask the following questions:

1. What are the main barriers and challenges confronting the implementation of the knowledge practices in the Quantity Surveying firms in Ghana?
2. What are best instances and tools to capture and share the experiences and lessons learned from the Quantity Surveying firms in Ghana?

3. What is the Level of development of Knowledge Management practices to the Quantity Surveying firms in Ghana?

4. What appropriate recommendations on the effective use of Knowledge Management in the Quantity surveying firms in Ghana would make?

1.6 AIM AND OBJECTIVES OF THE STUDY

1.6.1 AIM

The main aim of this study is to investigate the Knowledge Management practices and to develop a framework to enhance development and effective Knowledge Management in Quantity Surveying firms in Ghana and to make recommendations.

1.6.2 THE RESEARCH SEEKS TO UNDERTAKE THE FOLLOWING SPECIFIC OBJECTIVES:

- 1) To identify the main barriers and challenges confronting the implementation of the knowledge practices in the firms in Ghana
- 2) To identify the best instances and tools to capture and share the experiences and lessons learned.
- 3) To assess more about the Level of development of Knowledge Management practice in the firms in Ghana.
- 4) To make recommendations for the practical issues, best strategies, and critical success factors to enhance Knowledge Management practice in construction consulting industry.

1.7 METHODOLOGY

As in all researches, the study commenced with an extensive literature review to help provide a thorough understanding of the recent developments in the methodologies used for enhancing the development of Knowledge Management research genre including the construction management discipline. The literature review provided profound opportunity to identify an appropriate theoretical framework for the study.

The research method instrument used for this research was questionnaire survey. Questionnaires are more anonymous than interviews and can usually be filled in when it is convenient for the respondents. Another advantage in using a questionnaire survey is that it is easier to reach a large number of respondents and obtain a generalized view if the situation in the profession. There is also the advantage of no interviewer bias influence on the work. Interview research methods were not used explicitly because; Knowledge management (K M) is still an infant in the QS professions. Also, cases where QS forms are deployed are limited; and therefore it is too early and difficult to discuss KM in depth through Interviews.

The target population came from the purposive sampling of the list of registered firms in the GhIS office in Accra and some of the QS sections in the Government Agencies such as; AESL, Urban roads, Feeder roads and Ghana Highway Authority in all the ten regional capitals in Ghana. Questionnaires were sent to their firms by either mail or by hand delivery. This study explored how knowledge is managed within the QS profession which hitherto had not been investigated by researchers.

1.8 LIMITATIONS

In conducting this research, some of the challenges that the researcher encountered are as follows:

- I. There was difficulty with regards to generating the project topic.
- II. Difficulty in obtaining information that had a bearing on the topic under investigation.
- III. A constraint with regards to time within which the research was conducted was another hurdle.
- IV. A financial constraint was another challenge to this project work.

1.9 ORGANISATION OF REPORT

This report consists of Five chapters; Introduction, Literature Review, Research Design and Methodology, Analysis and Discussions, and Summary and Conclusion.

Chapter one provided a general introduction and brief background of the study, overview of the research objective, research questions, and the research methodology employed.

Chapter Two reviews the literature KM and framework development. The first part of this chapter presents a review of KM literature, including various definitions associated with the subject, concepts, and KM approaches in the management consulting industry.

Chapter Three presents the research design and ology to be employed in this study. It describes a research framework developed through the literature review. All variables used in the research are presented and defined. This chapter also includes discussions on research design, samples and the survey instruments for measuring variables. All variables defined are operationalized for measurement purpose.

Chapter Four presents the results of the analysis and discussion of the results. This chapter describes the survey procedure employed, including the data collection procedure, sampling, and unit of analysis of the study.

Chapter Five concludes the study. It presents the summary, limitations and contributions of the study, and the future research needs.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the literature review on Knowledge Management practices in the quantity surveying in Ghana. The framework evaluation of this chapter includes discussions on the findings of the literature review and their implications.

2.1 CONCEPT OF KNOWLEDGE

As we move from the industrial age to the intelligence age, knowledge has become a central force behind a successful firm. With the faster and greater capability to process information in the quantity surveying firms, the amount of knowledge has been exponentially utilised by organization. Organisations try to recognise assets they have that are not being fully utilized. Such assets are employees and their knowledge. The assets include human skills, experience, know-how, best practices, databases etc. these assets provide opportunities to cut costs, save design time, and reduce the time to market (Quintas et al., 1997). Knowledge has become a critical corporate asset (Drucker, 1995). Leonard and Sensiper (1998) define knowledge as “information that is relevant, actionable and based on least partially on experience”.

Knowledge is characterised as consisting of data or information that have been organised and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current problem or activity. Based on various views of knowledge, it is clear that information becomes knowledge when it is combined with context and experience.

Due to this context-dependent aspect of knowledge, it is hard to share and transfer knowledge, compared with data and information. For example, when knowledge is transferred, it is interpreted according to the receiver’s capacity.

2.2 DEFINITION OF KNOWLEDGE MANAGEMENT

Knowledge is a core competence of organisations and needs to be managed as such. KM is defined in broad terms and includes all these concepts: knowledge of customers, knowledge of products and services, knowledge of relationships, and knowledge assets (Skyrme, 1999). According to Metcalfe’s law, the usefulness of a network equals the square of the number of

users. A knowledge hidden in one single person's head will be useful. However, if it is networked to others and shared with them, the usefulness of the knowledge will be exponentially increased. The effective KM will identify knowledge in one place and allows it to be networked and shared with others, thereby increasing exponentially the usefulness of the knowledge.

Defining KM is difficult because it has multiple interpretations (Choi, 2000).

The following definitions are a few examples of the multiple views on KM: According to Knowledge Management in QS profession: Knowledge management is a systematic approach to help information and knowledge emerge and flow to the right people at the right time to create value (Marwick, 2001). Firms who want to leverage the asset must approach Knowledge Management to accomplish the mission and vision of the companies (Tiwana, 2000). Associated to the definition of Rodriguez (2006) the concepts of knowledge and intellectual capital are also available. Knowledge, according to Davenport et al. (1998), is a mixture of experience, values, information and know-how that serves as a framework for evaluating and incorporating new experiences and information. The intellectual capital is defined by Sullivan (quoted by Granados, 2006), as knowledge that can be converted into profits. It comprises two main elements: human capital and intellectual assets.

Human capital brings the experience, skills, knowledge or know-how and creativity of employees. In other words, human capital has the tacit knowledge (knowledge not encoded that resides in each person) that the company seeks to use. Knowledge is the main contributor to the surveyor's portfolio. As a result, effective knowledge management skills can help to improve their expertise (Davis et al., 2007). Efficient knowledge management of quantity surveying firms depends on the capability of the individual to plan, manage, operate, monitor and control for making the decision (Lobermans, 2002)

Though utilizing of knowledge management is good but it does not guarantee success. There are some potential difficulties in QS profession related to knowledge management include for instance unwillingness to change the current operating system, unwillingness of employees to share their knowledge and misunderstanding and difficulty to evaluate knowledge management (Davis et al., 2007)

- 1) “KM is the management of the organisation towards the continuous renewal of the organizational knowledge base - e.g., creation of supportive organisational structures, facilities of organisational members, putting IT instruments with emphasis on teamwork and diffusion of knowledge (e.g., groupware) into place” (Bertel, 1996).
- 2) “KM is the collection processes that govern the creation, dissemination, and utilisation of knowledge” (Newman, 1997).
- 3) “KM is the mechanism for building the institutional memory of the firm to better apply, share, and manage knowledge across various components in the organisation” (Choo, 1998).
- 4) “KM is a strategy that turns an organisation’s intellectual assets - both recorded information and the talents of its member- into greater productivity, new value and increased competitiveness; it teaches corporation from managers to employees, how to produce and optimise skills as a collective entity” (Murray, 1997).
- 5) “KM is the explicit and systematic management of vital knowledge and its associated process of creating, gathering, organising, diffusion, use and exploitation. It requires turning personal knowledge into corporate knowledge that can be widely shared throughout and organisational and appropriately applied” (Skyrme, 1999b).
- 6) Ruggles (1998) proposed seven major categories of KM activities:
 - Generating new knowledge
 - Accessing valuable knowledge from outside sources
 - Using accessible knowledge in decision-making
 - Embedding knowledge in processes, products, and/or services
 - Representing knowledge in documents, databases, and software
 - Facilitating knowledge into other parts of the organization
 - Measuring the values of knowledge assets and/or impact of KM.

Based on the various definitions, there are five key processes associated with KM:

- i. Creation
- ii. Location

- iii. Organization
- iv. Distribution
- v. Sharing of knowledge

KM includes a broad process of creating, organising, and locating, distributing and sharing knowledge to achieve the organisations' goals. This is used as the working definition of KM in this study

2.3 DIMENSIONS OF KNOWLEDGE

It should be pointed out that there are two dimensions of knowledge: tacit and explicit. The first researcher who made a distinction between the two was Polanyi (1966). However, it was Nonaka and Takeuchi (1995) who brought its importance to organizational attention. Knowledge, according to Davenport et al. (1998), is a mixture of experience, values, information and know-how that serves as a framework for evaluating and incorporating new experiences and information. The intellectual capital is defined by Sullivan (quoted by Granados, 2006), as knowledge that can be converted into profits. It comprises two main elements: human capital and intellectual assets. Human capital brings the experience, skills, knowledge or know-how and creativity of employees.

In other words, human capital has the tacit knowledge (knowledge not encoded that resides in each person) that the firm seeks to use. The second element of the intellectual capital, intellectual assets, are created when human capital shares its tacit knowledge. Once the tacit knowledge of individuals is encoded and written, the firm is now able to move the intellectual assets, rather than the individuals need (Leonard and Sensiper, 1998). The intellectual assets may be procedures, lessons learned, plans, drawings, memos, sketches, etc. When these elements are legally protected they become intellectual property, including patents, trademarks and intellectual rights among others. Tacit knowledge is more intangible. It is difficult to codify and transfer tacit knowledge because it is stored in an individual's head (i.e., expertise, experience, insights, or know-how). Tacit knowledge is shared through a socialization process and becomes explicit through externalization (Nonaka and Takeuchi, 1995.) Baker and Baker

(1997) described explicit knowledge as formal, systematic, and objective. Explicit knowledge is codified in organisational rules, routines, and procedures Boisot (1995) used the taxonomy of codified knowledge and uncodified knowledge. Codified knowledge can be captured, codified and shared in organisations, while uncodified knowledge cannot be captured, codified and shared. Explicit knowledge is generally stored in the form of texts (i.e., manual, policy book, database, or even in databases. Explicit knowledge is shared through a combination process becomes tacit through internalization.).

2.4 KNOWLEDGE MANAGEMENT APPROACHES

KM is concerned with the entire process of creating, organising, locating, distributing, and sharing knowledge. While managing organisational knowledge, a firm takes a specific approach. Researchers found that there are two major approaches to Knowledge Management: exploitive vs. explorative (March, 1991; Jordan and Jones, 1997; Hansen et al., 1999; Sarvary, 1999; Skyrme, 1999a; Zack, 1999). Exploitive approach focuses on reusing exiting knowledge. Explorative approach focuses on creating new knowledge. Of course, companies can take both approaches simultaneously. However, successful companies do not use them to an equal degree. They tend to employ one dominant Knowledge Management approach (Hansen et al., 1999). Jordan and Jones (1997) described two dominant knowledge modes within an organisation. Even though they did not term the modes, the two modes represent exploitive approach and explorative approach. The framework by Jordan and Jones consists of five broad subordinate categories knowledge modes: knowledge acquisition, problem solving, dissemination, ownership and memory.

Table 1.1: Knowledge management Modes

<u>Knowledge Acquisition</u>		
Focus Search	Internal Opportunistic	External Focused
<u>Problem Solving</u>		
Location Procedure Activity Scope	Individual Trial and error Experiential Incremental	Team Heuristic Abstract Radical
<u>Dissemination</u>		
Processes Breath	Informal Narrow	Formal Wide

<u>Ownership</u> Identity Resource	Personal Specialist	Collective Generalist
<u>Storage/Memory</u> Representation	Tacit	Explicit

2.5 KNOWLEDGE MANAGEMENT MODES

As Jordan and Jones did, Zack (1999) classified two KM applications: interactive applications and integrative applications. In the integrative applications, knowledge flows from people to computers (i.e., knowledge repository or data warehouse), and vice versa. The repository is the hub for people to place, retrieve and exchange their knowledge. Here the focus is on capturing and storing knowledge for reuse. Explicit knowledge flows into and out of a knowledge repository. “The primary focus tends to be on the repository and explicit knowledge it contains, rather than on the contributors, users, or the tacit knowledge they may hold” (Zack, 1999).

In the interactive applications, the primary focus is on supporting interaction among people. The knowledge repository can be utilised, but it is a “by-product of March (1991) called these exploration and exploitation. “Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, and innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, and execution” (March, 1991).

The exploitation approach is concerned about capturing existing knowledge, codifying it and utilising it. Knowledge is put into a form that makes it accessible to people so that it can be exploited by people. Knowledge is codified so that it can be accessible and applied. By nature, the exploitation approach tends to focus on explicit knowledge. The exploration approach is to explore and generate new knowledge for new challenges. New knowledge is needed to solve new problem and new challenges. Most of the time, there is no knowledge available for these kinds of problem. Collaboration among a group of people, or even with other organisations, is encouraged. The exploration approach tends to focus on implicit knowledge.

2.6 CLASSIFICATION OF KNOWLEDGE MANAGEMENT

Wetherill et al. (2002) argues that in the consulting firms knowledge can be classified into three categories:

1. Domain or subject knowledge: includes managerial information (building permits, existing regulation, etc.), standards, technical guides and databases of products, among others. Generally all companies have this information.
2. Organizational knowledge: this knowledge is of the firm itself and corresponds to the intellectual capital. It is formally found in business records and informally in processes and people. It includes knowledge about the abilities of people, projects experiences, and in conjunction with other companies (contractors, architects, engineering firms, clients, etc.).
3. Project knowledge: it is the knowledge with the greatest potential to be re-used and is the largest source of organizational knowledge. It is the specific knowledge created by the organization in each project (construction processes, problems, achievements, solutions, etc.), and in conjunction with other companies involved in the project.

2.7 FRAMEWORK OF KNOWLEDGE MANAGEMENT STAGES

The framework advanced by Van der Spek and Spijkervet (1997) identifies cycle of four knowledge management stages: conceptualise, reflect, act, and retrospect. As illustrated in Figure 1.1, these stages control the basic operations on knowledge. The conceptualise stage focuses on gaining insights into knowledge resources. This is achieved through researching, classifying, and modeling existing knowledge.

During the reflection stage, the conceptualized knowledge is evaluated using a variety of criteria, required improvements are established, and an improvement process is planned. During the act stage, actions to improve the knowledge are taken. This involves developing new Knowledge, plus distributing, combining, and holding this developed knowledge. The last

stage, and compares old and new situations. The configuration of KM stages is oriented toward a problem-solving cycle. Therefore, this configuration can be viewed as one way of coordinating knowledge manipulation activities within a problem-solving episode. The stages in the cycle are impacted by internal and external developments. Internal factors that impact the organisation of the management of knowledge are culture, motivation of employees, organisation, management, and information technology. External factors are recognized as influences, but examples of this factor are not identified in the framework.

2.8 KNOWLEDGE AND QUANTITY SURVEYING (QS) FIRMS

According to Carr-Saunders (1966) a profession may perhaps be defined as an occupation based upon specialized intellectual study and training, the purpose of which is to supply a skilled service or advice to others for a definite fee or salary. Similarly, QS firms are knowledge-intensive organizations that provide expert advice and professional knowledge to clients (Løwendahl, 2000). The organizational assets reside in the experience and knowledge of staff, rather than in plant and equipment.

2.8.1 THE FOUR ESSENTIAL CHARACTERISTICS OF QUANTITY SURVEYING FIRMS

According to Fong and Choi, (2009), the four essential characteristics of quantity surveying firms are as follows:

1. Knowledge-intensive nature.
2. Advisory nature.
3. Competence governed by institutions.
4. Code of conduct.

2.8.1.1 Knowledge-intensive nature

A higher educational qualification is an element required by professions (Lowendahl, 2000). This is reflected in the common belief in the industry that a body of knowledge originates from academic study and practical training in QS firms. Quantity Surveyors 'skills and expertise are thus the talent of quantity surveying firms and also contribute highly to firms' reputations. As a result, practitioners in these firms are associated with impressive academic backgrounds, supported by either accreditation of professional status from professional institutes or academic achievement in recognized academic institutions.

2.8.1.2 Advisory nature

It is claimed that altruistic and specialized services to clients are the core services of professionals (Becher, 1999). Quantity surveying firms in Malaysia are mostly private practices that seek to offer consultancy to clients in construction projects. The scopes of their services are stretching beyond the traditional framework to suit clients' ever-increasing demands. In contrast to these firms there are basic service and also additional service (Abdullah and Haron, 2006). Quantity surveying firms that have to shape their service to adapt to different clients and business scenarios. Hence, the quality of situation-specific decisions (Bots and Bruijin, 2002) is a useful indicator to reflect the competence of a professional organization. To discharge their professional duties, Quantity Surveyors have to apply their knowledge and expertise to provide impartial and objective advice and analyses to clients. The

quality of their decision depends to a large extent on the appropriate exercise of their expert discretion and professional judgment in relation to cost control and contract administration for construction projects. As a result, with clients' needs well communicated between clients' representatives and Quantity Surveyors in advance, clients generally receive an excellent professional service from Quantity Surveyors (Fong and Choi, 2009).

2.8.1.3 Competence governed by institutions

It is essential for a professional service that a governing professional body is established to maintain the competence and control the standards of conduct of the profession (Bennion, 1969). Therefore, the title of chartered member is taken as recognition of professional competence. The competence of professionally qualified Quantity Surveyors in Malaysia is well established and regulated by the professional institution, The Board of Quantity Surveyors Malaysia (BQSM). Although many practitioners claim to be Quantity Surveyors, the title of chartered quantity surveyor is only awarded to those who have passed the professional competence test set by the appropriate institutions. Clients, therefore, have some assurance of the standard of the intangible service they are purchasing under this system.

2.8.1.4 Code of professional conduct

Quantity Surveyors are often involved in managing confidential information, such as tender sums submitted by contractors in construction projects and payments to contractors for work done on site. They have to be fully aware of, and abide by, provisions in the standards of conduct and professional ethics. The Quantity Surveyors Act 1967 (Quantity Surveyors (amendment) Rule, 2004) highlighted that only registered Quantity Surveyors are permitted to practice as consulting Quantity Surveyors by the Board. Similarly, the qualification of practitioners in quantity surveying firms is well controlled and recorded under the registers of the institution.

Quantity surveying firms offer cost and contractual expertise to clients. The heavy reliance on the expertise and knowledge of staff sets a standard for outsiders to imitate. Freidson (1994) described these kinds of professional services as esoteric from the perspective of KM, the management quantity surveying firms, is a very exciting one. Quantity surveying consulting firms is an industry whose core product is knowledge itself.

Managing knowledge is the most critical process in the consulting industry (Sarvary, 1999). Consulting firms' core product is knowledge itself. They sell their expertise and experience to customers. The experience and expertise are nothing more than knowledge. Consulting firms get paid for the knowledge that they are providing to the clients. Producing and selling knowledge constitute their core activities.

2.9 ROLES OF A QUANTITY SURVEYOR

According to Willis and Ashworth (1987), the Quantity Surveyor is the person who has major skills in:

- (1) Economic knowledge – associated with the assessment of value for money and cost effectiveness in design; relying upon analysis and evaluative techniques necessary for costing, measuring and valuing in order that clients may be advised correctly.
- (2) Legal knowledge with a general knowledge of law and a specialist knowledge and interpretation of the law of contract (this is used in producing contract documentation and in the advice and settlement of contractual matters, disputes and claims).
- (3) Technological knowledge – a knowledge of the construction process and the methods used in the construction of buildings and other structures, together with an in-depth knowledge of the industry. (This provides a basis for developing other skills).
- (4) Managerial skills – the ability to organize the work associated with the construction project and to influence others in the procurement of buildings and structures, together with skills of an administrative function.

According to Abdullah and Haron (2007), there are many roles where a quantity surveyor will apply his/her knowledge in a QS firm, either in their basic roles or additional roles. Their services include:

- 1) Preparation of preliminary estimates and most plans.
- 2) Preparation of Bills of Quantities/tender documents.
- 3) Valuation of works for interim valuations' certificates.

- 4) Preparation of final accounts.
- 5) Cost analysis/planning.
- 6) Contractual advice.
- 7) Additional services provided such as project management, value management and facilities management.

2.10 KNOWLEDGE MANAGEMENT TECHNIQUES AND STRATEGY USED IN A QS FIRM

The primary goal or motivation for KM varies from seeking best practices in all business activities to providing a better service to clients. However, the overall objective is to improve project or business performance and indirectly to increase profitability. Ninety per cent (90%) of the knowledge captured in two main areas of expertise of the firm will be lost if the people involved leave the organization (Robinson et al., 2005). There is the reason to highlight the need for a KM strategy to address both tacit and explicit knowledge.

Knowledge management techniques can be divided into a codification and personalization approach (Davis et al., 2007). Codification approach describes how the system can help to capture the experience and knowledge of experts within the QS firms before the team members leave (Davis et al., 2007). A codification strategy revolves around explicit knowledge captured and leveraged using IT tools i.e. software such as expert systems, artificial intelligence and data mining tools. While, the personalization approaches express that the knowledge,

experience and skills can be captured via interviewing, protocol analysis, questionnaire surveys and observation and simulation. Personalization approach is applied in QS firms because it facilitates the communications of everyone in the organization, so they can easily transfer and share their knowledge and information in the arena of projects (Suman and Psunder, 2008). Personalization, at the other extreme, revolves around tacit knowledge using non-IT tools or human interactive systems such as peer tutoring, regular meetings and training, a supervision/mentoring system, a reward system and lessons that are learned (Davis et al., 2007). In a codification strategy, IT can be used to make intelligent decisions, whereas in a

personalization strategy, IT provides communication support. To encourage the use of KM, the QS firms should be given a clearer concept of KM and more guidelines for its implementation.

The exact KM approach relies heavily on the type and size of the organisation. BSI2 (2003) pinpoints the seven critical aspects of developing a KM system in an organisation:

- (a) Describe what is required from the KM programme
- (b) Draw up a strategy
- (c) Understand the organization's current knowledge
- (d) Enables a knowledge sharing culture
- (e) Manage the knowledge content
- (f) Use enabling technology
- (g) Measure and review the results. Below are some KM techniques which can help manage the knowledge content in QS firms.

2.11 CODIFICATION APPROACH OF CAPTURING KNOWLEDGE

An expert system can help capture the experience and knowledge of experts within the QS firms before they leave (Liebowitz, 2000). It is a computer program which could diagnose problems and produce reasons from its conclusions (Willis, 1994). Ashworth and Hogg (2002) and Delong (2004) concur that an expert system can capture the knowledge, e.g. where

disagreement amongst experts is settled by negotiation, and such results are refined so as to create artificial intelligence for solving the future problems.

2.11.1 STORING KNOWLEDGE

To store the explicit knowledge, as firms can develop a database system for storing data such as project details, costs, rates, etc., with an effective search engine for immediate access. This database system makes the wealth of experience immediately available to everyone in the company. The Building Cost Information Service (BCIS) is a good example of a database system. The difficulty inherent in having such a wide variety of data is its access. Rapid updating and retrieval are necessary if this is to be properly effective (Smith, 1989)

2.11.2 SHARING OR TRANSFERRING KNOWLEDGE

Information Technology such as email, Internet, Intranet, Lotus Notes, distribution of printed documents, CD ROMs, etc. are greatly enabled knowledge transfer. But all this technology should be designed to conform to proper human-computer interaction guidelines with respect to cognitive overloads, visualization and user interface consideration (Smith, 1989). A user friendly and easy assessed IT system would help to inspire knowledge transfer.

2.12 PERSONALISATION APPROACH OF CAPTURING KNOWLEDGE

According to Liebowitz (2000), the experience, skills and knowledge can be captured by means of interviewing, protocol analysis, questionnaires and surveys and observation and simulation.

2. 12.1 STORING KNOWLEDGE

To store the inexplicit knowledge, the firm can adopt the Knowledge Attic technique, which is similar to having a corporate memory or repository sitting there for possible use (Liebowitz, 2000). The captured knowledge is evaluated and possibly edited before being indexed and stored in the corporate memory. It is used as an archive which can be consulted when needed.

2.12.2 SHARING AND TRANSFERRING KNOWLEDGE

Hendriks revealed that knowledge sharing implies a relationship between at least two parties – one that possesses the knowledge and the other that acquires the knowledge while Cohen and Levinthal (1990) proposed that interactions between individuals who possess diverse and different knowledge enhance the organization's ability to innovate far beyond what any one individual can achieve Knowledge sharing also leads to the dissemination of innovative ideas and is considered critical to creativity and subsequent innovation in organizations (Armbrecht et al., 2001). Knowledge sharing between individuals is a process that contributes to both individual and organizational learning (Andrews and Delahaye, 2000). Organizational knowledge is recognized as a key component of organizational learning (Dodgson, 1993). Huber (1991) identified four knowledge concepts that contribute to organizational learning; these are knowledge acquisition, information distribution, information interpretation, and organizational memory. The voluntary act of sharing knowledge by an individual contributes to knowledge distribution, and the process of sharing may result in knowledge acquisition by other individuals within the organization. Knowledge sharing between individuals thus results in

individual learning which, in turn, may contribute to organizational learning. A possible concern in this approach to managing knowledge is that much organizational knowledge is controlled at the level of individuals (Staples and Jarvenpaa, 2001). Lam (2000) mentioned that individuals using the knowledge they have in their daily activities at work and organizations should facilitate the sharing of this knowledge with others. Weiss (1999) emphasized if individuals stay with the organization, the full extent of their knowledge may not be realized and utilized unless there are opportunities for the individual to share that knowledge with others in the organization Knowledge can be shared by:

- (a) Peer tutoring
- (b) Regular meetings and training
- (c) Supervision mentoring system
- (d) Reward system
- (e) Lesson learned

Knowledge management is an on-going process. Gumbley (1998) argues that sometimes organizations focus too much on building the KM system rather than actually using it. This will result in failure to achieve the expected return. Hence the measurement of the effectiveness of the KM system should be developed so as to check if KM works in the same way as expected. According to (Pathirage et al., 2006a), as a support to the set of processes that are part of knowledge management there is a series of tools that can be divided into two groups;

- Information technology tools: they are also known as technologies for knowledge management, stressing tools such as intranet, extranet and databases, among others.
- Tools that do not use information technology: these tools are also called knowledge management techniques and generally are used to manage the tacit knowledge.

Among these techniques is the mentoring, brainstorming, the quality circles, and project or post-project review meetings among others. These tools must be properly used to provide certain value-added or to solve a specific problem, otherwise, the results will be disappointing and will cause distrust of those involved in this effort.

It is important to avoid situations in which the tool to use is identified first and then finding a problem to solve (Carrillo et al. 2004).

Table 1.1: Knowledge Management Strategies of Consulting Firms

KM Strategy	Codification	Personalization
Competitive Strategy	Provide high quality, reliable and fast information – system implementation by reusing codified knowledge	Provide creative, analytically rigorous advice on high level strategic problem by channeling individual expertise
Economic Model	Reuse economics Invest once in a knowledge asset; reuse it many items	Expert economics Charge high fees for high customized solution to unique problems
Knowledge Management Strategy	People to documents Develop electronic document system that codifies stores, disseminates, and allows reuse of knowledge	Person to person Develop networks for linking people so that tacit knowledge can be shared.
Information Technology	Invest heavily in IT ; the goal is to connect people with reusable codified knowledge	Invest moderately in IT; the goals is to facilitate conversions and the exchange of tacit knowledge
Human Resources	Hire new college graduates who are well suited to the reuse of knowledge and the implementation of solutions. Train people in groups and through computer based distance learning. Reward people for using and contributing to document database	Hire MBAs who like problem solving and tolerate ambiguity. Train people through one to one mentoring. Reward people for directly sharing knowledge with others

SOURCE :(Adapted from Hansen et.al, 1999)

Summary of KM Approaches

Based on the literature review, it is clear that there are two basic approaches to KM.

The findings are summarized in Table 1.2

Table 1.2: summary of knowledge management approaches

	Approaches		Characteristics	
A	-	Centralized	-	Provides standardized
	-	KM systems	-	service
	-	Integrated	-	Procedure oriented
	-	Applications	-	Reuse of knowledge
B	-	Codification	-	Focus on capturing and
	-	strategy	-	utilizing knowledge
	-	Exploitation	-	Use explicit knowledge
	-		-	Heavy use of IT
			-	Pursue operational
			-	excellence.
B	-	Decentralized	-	Provides customized
	-	KM systems	-	service
	-	Interactive	-	Product/service oriented
	-	Applications	-	Create new knowledge
B	-	Personalization strategy	-	Focus on exploring new
	-	Exploration	-	knowledge by collaboration of people
	-		-	Use tacit knowledge
	-		-	Less use IT
			-	Pursue innovation
			-	product/service.

SOURCE: (Adapted from Hansen et.al, 1999)

Since one KM approach has different characteristics from the other, organizations need to identify their KM style first before they commit to implementation of the KM projects. Different KM approach will require different methods and different tools.

2.13 THE POTENTIAL DIFFICULTIES OF INTRODUCING KNOWLEDGE MANAGEMENT IN THE QUANTITY SURVEYING FIRMS

The concept of KM is ideal, but it does not guarantee success. Liebowitz (2000) suggests some potential difficulties for deploying KM as:

- (1) Lack of successful KM model in QS profession
- (2) Unwillingness to change the current operating system

(3) Unwillingness of employees to share their knowledge difficult to value the intellectual capital and show the tangible benefits and misunderstanding KM with information management and lack of time.

2.14 BARRIERS AND CHALLENGES TO THE IMPLEMENTATION OF KMIN THE QUANTITY SURVEYING PROFESSION

Quantity Surveyors provide the above services on a wide range of projects including building construction, civil and structural engineering, mechanical building and engineering services, petro-chemical, mineral extraction, planning and urban. Due to economic environment changes, the role of Quantity Surveyors is not as simple as stated by Seeley (1997). The following are amongst the challenges and barriers facing the QS profession and in the face of these forward-thinking policies will have to be adopted in order to maintain their competitive advantages and to survive and create a new. Culture has been a recurrent theme in the KM literature as it can enable or inhibit an organisation's KM strategy. 'Culture concerns the values, beliefs, history and traditions, which reflects the deeper foundations of an organisation (Coopers and Lybrand, 1999). It has also been identified as one of the most crucial factors contributing to the success of a KM project and perhaps the most difficult constraint that knowledge managers must deal with (Davenport, De Long and Beers, 1997).

The survey shows that culture has been identified as the most significant barrier in the implementation of KM strategies in construction organisations. This is also consistent with the findings from a survey of 431 US and European organisations which identified culture as the biggest impediment to knowledge transfer (Ruggles, 1998). Based on a rating scale from 1 (most significant) to 5 (least significant) barriers, the survey responses were averaged to give an overall rating score for each factor. The culture of formal and informal sharing of knowledge is important. 'Culture cannot be changed directly but only through indirect means such as incentives, role models and the like (Wiig, 1997). One senior manager felt that the culture of the organisation is such that KM is not always taken seriously and there is a need to 'repeat the message' continuously.

The lack of standard work processes has also been identified as a key barrier. The significant merger and acquisition activities over the past decade have transformed many construction organisations, and the implication is that organisations have inherited new processes.

Many construction organisations now suffer from having too many different processes for performing similar activities.

Gann (2001) argued that construction organisations may have strong capabilities in project management but are often much weaker in organising their internal business processes. However, preliminary evidence from on-going case studies with selected organisations reveals that there is a new recognition in some organisations for a rationalization or synchronization of some processes to improve the possibility of re-using knowledge of best practice and sharing experience. Time constraint is a key barrier in construction organisations given that projects are characterized by fixed time scales, associated with clients' need to deliver at particular times. Many construction organisations consider their organisational structure too lean to exploit knowledge management to full, as people wanted to share knowledge but the pressure to deliver under tight project schedule does not often permit the recording of experience and sharing of knowledge before, during and after projects.

According to Gann (2001), the poor organisation of internal business processes means that project-based construction organisations often struggle to learn from project to project. This means that the scope for reduction in project duration and the subsequent time available to document lessons learnt from previous projects are often very limited. Also, Sharing knowledge demands additional effort. This effort may be minimized by work practices and the introduction of better knowledge sharing tools. Construction projects are always working to tight deadlines. Anything that detracts from the main business is seen as of diminished importance. Another key barrier to the implementation of KM is employee resistance, which is closely associated with cultural factors. Cultural factors tend to be either negative or positive in orientation with respect to employees. Positive orientation refers to situations where individuals have a positive attitude to the creation and sharing of knowledge. Negative orientation reflects the reverse situation where there are knowledge inhibitors as people feel insecure about their job situation, do not trust their employers and are therefore less likely to share knowledge Gann (2001). Other barriers identified include KM systems available; employees may be tempted into thinking the data required is always easily accessible. In fact, it will take considerable time to get a spread of working KM systems. This may lead to employees losing faith in the system because it does not deliver immediate benefits in their own individual areas. Many of the existing systems rely on IT for delivery.

Construction offices may be port cabins in isolated environments with inadequate infrastructure. The IT support, a key element in KM systems, must be present to deliver the knowledge required and long term organisational commitment, lack of understanding of KM, and conflicting priorities on the demand for resources. KM is a long-term goal without any short cuts. If it is to bring long-term benefit to the organisation, it will take a considerable period to have systems up and running with sufficient time to be validated and for benefits to percolate to the organization's performance. The various stages involves in KM are complex.

It is easy to envisage the utopian world of delivering knowledge to different members of the project team as and when required for different stages of the construction process. However, in reality, for a company embarking on Knowledge Management, it is best to undertake very small projects that are self-contained with little input from external parties. One major obstacle is how organisations capture knowledge on projects that cuts across organisational boundaries. The industry is full of individuals, skilled trade workers and professionals who have years of experience of doing specific tasks. Converting their tacit knowledge to explicit knowledge for the benefit of others is a problem, which is difficult to conduct within a reasonable period and at an acceptable cost. The UK construction industry consists of a large proportion of small to medium-sized enterprise (SMEs). These organisations have more pressing concerns than KM and in many cases do not see the need nor do they have the commitment and resources to undertake KM. Some project team members may belong to different divisions or even different companies. Managing knowledge with such a team within a limited time period is difficult. Each team member will be working towards the agenda set by their employer. The benefits of KM may be seen as limited to the life of the individual project unless in long-term partnering type relationships. Despite efforts to encourage the UK construction industry to view itself as a manufacturing enterprise, it still regards each project as a one-off. This reinforces the view that KM on individual projects will be wasted as the next project may be quite different. Because of the view of the industry producing unique projects, there has also been a failure to learn from past mistakes. In many circles, the UK construction industry is regarded as a national (rather than international) industry and there is an unwillingness to learn from internal and external sources.

Knowledge Management, as a concept is relatively new to the construction industry, which has the fundamental need to manage its knowledge in a formal and structured way from project

to project, given that participants must work with various interested stakeholders (Carrillo et al., 2000).

2.15 BENEFITS OF KNOWLEDGE MANAGEMENT IN QS PROFESSIONALISM

There are high expectations for an organization when it is pursuing knowledge management. Practical experiences with systematic and explicit KM reported by advanced and early adopter organizations indicate that benefits can be substantial. Most direct benefits tend to be operational while tactical and strategic benefits often are indirect and take longer to realize. According to Liebowitz (2000); Beckman(1997) and Wiig (1999), the benefits of KM are: improved service quality, rapid and effective enterprise-wide problem solving, improved decision-making, increased revenue, business growth, increased innovation, practice and process improvement, higher levels of expertise and knowledge, increased customer satisfaction, enhanced employee capability and organization learning, increased employee morale, creativity and ingenuity, employee stimulation and motivation, increased flexibility and adaptability and raising the company's professional image. To survive and grow in the future, the QS profession "must respond quickly and creatively to the challenges of accelerating social, technological, economical and environmental change. An essential element in the future success is the skill and knowledge base at the core of professional practice (RICS, 1991). It is believed that KM is a relatively quicker and more effective way to enhance QS professionalism, compared with improving the education of the new generation of Quantity Surveyors or reformatting of the profession. (These are not mutually exclusive).The QS profession is characterized by a wealth of experiential knowledge, which is tacit and cannot be written down easily. It is crucial that QS firms realise their true potential assets, which can be determined by the KM system as it enables the company to 'know what it knows'. Quantity Surveyors are professionals who provide help to clients for the legal and financial problems with their expertise. The more projects Quantity Surveyors complete the more experience they gain. 'What is needed is a way of remembering the solutions for use in future projects' (BSI2, 2003).

However, most QS firms face a problem in that they are losing knowledge due to the retirement or resignation of key personnel. DeLong (2005) asserts that 'losing knowledge may

have impacts that are very tangible and financially quantifiable, or impacts can be intangible and hard to measure'. With the help of a KM system, knowledge is shared and stored and thus the risk of losing the knowledge can be minimised. BSI2 (2003) argues that KM does not only increase the profitability of the organisation but also reduces mistakes and waste of resources. Companies are realising that their competitive edge is mostly the brainpower or intellectual capital of their employees and management. Despite that KM is not yet tied to enterprise strategy and performance in practice (Davenport 1999). Establishing a KM system involves time, cost and changes in the original operating system which can be the reluctance of the investment. A survey of UK project-based organisations shows that about 50% of the respondents (majority were from the construction industry) noted that KM would result in new technologies and new processes that will benefit the organisation (Egbu, 2002).

Robinson et al. (2001), in a survey of UK engineering and construction firms, was able to identify the main drivers for knowledge management in construction as:

- The need to encourage continuous improvement (92.5%);
- To share valuable tacit knowledge (88.7%);
- To disseminate best practices (86.8%);
- To respond to customers quickly (84.9%);
- To reduce rework (77.4%); and
- To develop new products and services (58.5%).

Another survey of engineering design and construction organisations revealed that about 40% already have a KM strategy and another 41% plan to have a strategy within a year (Carrillo et al., 2004). Studies show that the most publicized knowledge management initiative is the post-project evaluation (Orange et al. 1999). Kamara et al. (2003) also describe the reliance of people to transfer project knowledge and the use contractual arrangement such as partnering to share knowledge. The increasing interest in knowledge management has led to an eagerness to find out what others are doing and thus benchmark company efforts. In the UK a number of research projects allow this to be undertaken informally. In the US the APQC has a benchmarking forum but to date not construction companies have not participated.

This could achieve a number of potential business benefits, such as:

- Helping in making decisions and estimates (KPMG, 2000; Carrillo, 2004)
- Reduction in the likelihood of repeating problems (Lin et al., 2006)
- Improved efficiency and productivity at work (Carrillo, 2004)
- Reduction in the cost of solving problems (Lin et al., 2006)
- Complementing the activities of quality management (Carrillo, 2004; Granados, 2006)
- Helping the transfer of information and knowledge (Granados, 2006)

2.16 QUANTITY SURVEYORS (QS) PROFESSIONAL'S EXPECTATIONS AND PERCEPTION OF KM

Owing to the increased complexity of construction projects and requirements from clients, Quantity Surveyors need to equip themselves with a broad range of knowledge. In order to sustain a competitive advantage the QS professional does not only need to learn faster than the speed of changes but also learn faster than their competitors. This can be achieved by establishing a KM system to capture, develop, maintain and renew the intangible assets in QS firms. An empirical survey was undertaken amongst fifty QS professional companies with the following observations necessary for enhancing professionalism in order to maintain competitiveness.

The majority of Quantity Surveyors agree that KM would bring numerous benefits to the company and themselves, so their perception of KM is very positive. However the results show that an increase in innovation would be less likely to occur. This can be explained by the lack of emphasis on creating knowledge. Furthermore Quantity Surveyors expected that KM would bring personal benefits more than benefits to the company. This is shown by the current knowledge sharing practices they frequently used. The findings illustrate that in the knowledge sharing process, knowledge and experience are mainly personal experiences and not company tactical experiences or company level problem solving techniques. Thus they think KM would contribute personally more than organizationally. The majority of the respondents believe that the most critical factors to KM success are top management support, employee active participation, application of IT system and creating knowledge sharing space. Indeed, those factors are very important. Without top management support, KM could not be implemented successfully; without employee active participation, even if there is an excellent KM system

provided, no result can be achieved and without knowledge sharing space, knowledge cannot be shared and accessed widely and smoothly.

However, regarding IT application as a critical factor to KM success contradicts with the previous literature which claimed that effective KM efforts can be based on limited technology. It is a common misunderstanding that KM is the same as information technology. Not surprisingly most respondents considered that the reward system is not important in KM. This is because they rarely use a reward system in their firm, which makes them unaware of the benefits of the reward system. According to the findings the main barriers for a QS firm to develop a KM system are lack of time and understanding of KM and the difficulty to locate, capture, generalize and store knowledge. The resistance to change the current practice and employ new management approach from the top management also contributes to the opposition to develop KM in as firms, is an unwillingness to share knowledge with others. However the survey finds the opposite. Most Quantity Surveyors are willing to share their knowledge with others. To conclude, the common current practices that Quantity Surveyors use to acquire or share knowledge are not enough to enhance employees' knowledge levels. Nearly half of the Quantity Surveyors cannot acquire all the knowledge they need from work, so there must be an improvement in KM methods to enhance their knowledge levels. Due to the deficiency in current practice and the positive expectation and perception of KM system, it is believed that KM is applicable to QS firms and is a possible means to enhance quantity surveying professionalism either individually and organizationally.

However, even if KM is implemented, there are some hidden limitations to the, positive effects on QS firms. Firstly, as Quantity Surveyors seek knowledge mainly within their firms and seldom from external sources, the range of knowledge have they acquired is limited to their profession only. New knowledge or other specialist knowledge is less likely to be acquired. Thus the effect of KM in enhancing their professionalism would be limited to their field only.

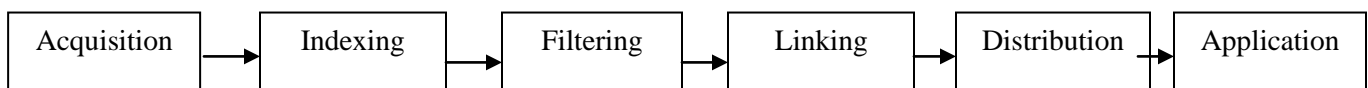
Secondly, knowledge creation is relatively less emphasized in the QS profession, so even KM is deployed, no new knowledge would be created and hence the profession would be less likely to expand. Thirdly, despite new knowledge or methods being developed through knowledge exchange by different personnel, its validity still needs experiential proof, thus there is a chance of theoretical inaccuracies.

2.17 MODEL OF KNOWLEDGE MANAGEMENT PROCESS

This model describes the KM process in a consulting firm, KPMG Peat Marwick (Alavi, 1997). It defines KM as the creation, leveraging, and sharing of know-how and intellectual assets by all individuals across the firm in order to better serve clients. The KM process model developed by KPMG consists of a sequence of six phases as shown in Figure 1.4: acquisition, indexing, filtering, linking, distribution, and application. Acquisition refers to knowledge creation and content development. This is accomplished by distilling experiences and lessons learned from client engagement projects, by collecting, synthesizing, and interpreting a variety of information.

The next three phases (indexing, filtering, and linking) are referred to as library management activities and include the screening, classification, cataloguing, integrating, and interconnection of content from both internal and external sources. The distribution phase includes packaging and delivery of knowledge in the form of Web pages(e.g., designing knowledge displays, templates, and graphics; creation of multimedia formats).Application refers to using the knowledge that has been collected, captured, and delivered to produce products and services.

Figure 1.0: KPMG Knowledge Management Process



(Adapted from Alavi, 1997)

2.1 PERFORMANCE MEASUREMENT OF KNOWLEDGE MANAGEMENT

Performance measurement has been defined as the 'characteristic of outputs that are identified for the purpose of evaluation' (Euske, 1984) while others have defined them as a 'tool' to compare actual results with a pre-set target and also to measure the extent of any deviation (Fortuin, 1988). It has been suggested that performance measurement is 'the reflect contribution of each team or process to the organization goal' (Turney, 1993).

The development of performance measurement can be split into three stages (Ghalayani and Noble, 1996):

a) The first phase which is deemed to have started in the 1980s, focused heavily on financial measures such as profits, return on investment, and productivity.

b) The second stage of measurement is characterized by non-financial measurement (i.e., foster improvement rather than just monitor performance, based on company strategy).

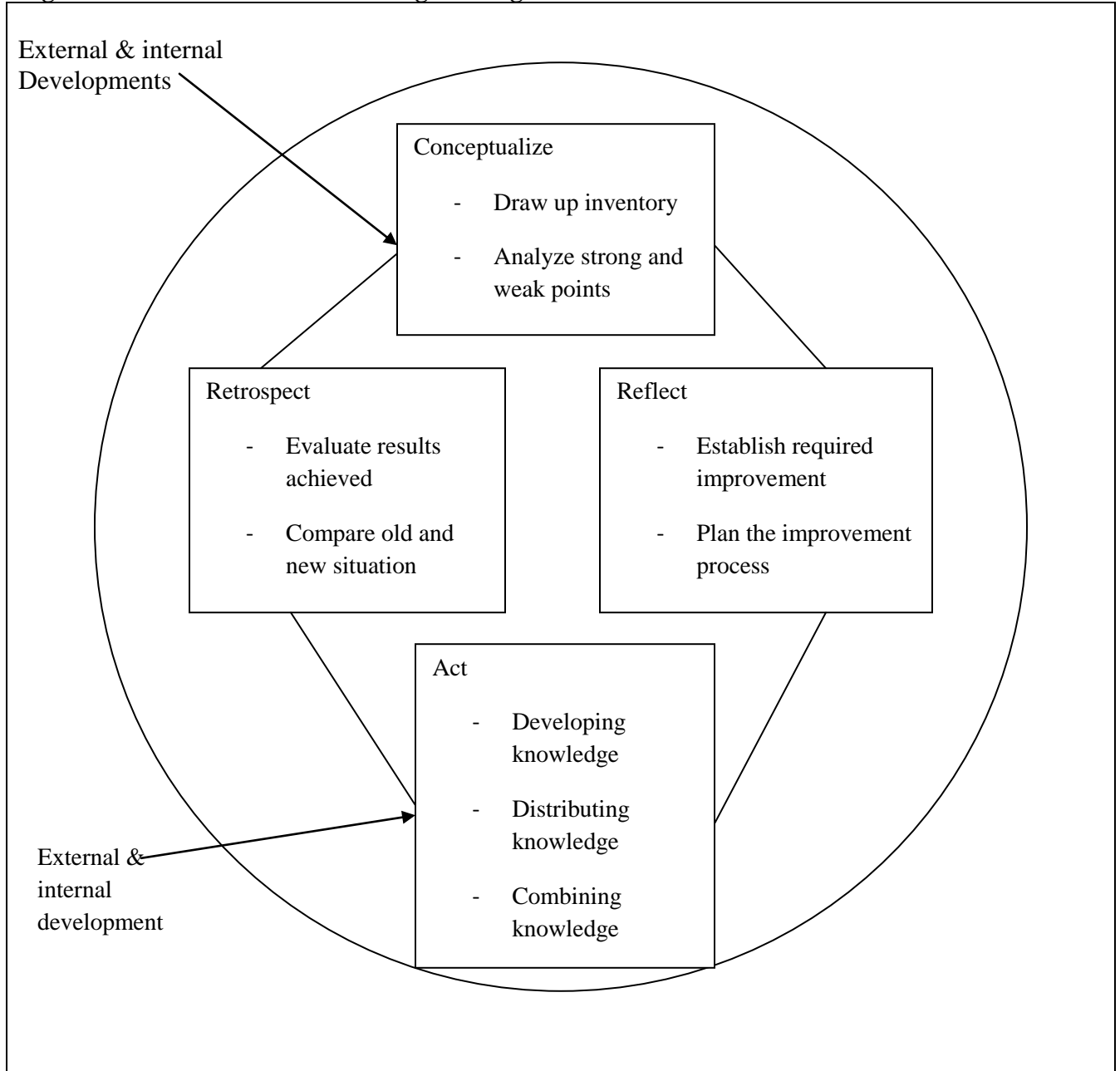
c) The third stage is characterized by the integrated use of financial and non-financial measurement (i.e., Balance Score Card, Measurement Model).

According to Robinson et al. (2005), their case study showed that the Balanced Scorecard and the Excellence Model can be used as frameworks for business improvement and providing a basis for developing KM. However, according to them the learning and knowledge dimension of both models are often overlooked in practical applications.

Publicizing the results of KM initiatives can help maintain KM as a high profile activity and increase the level of awareness, even after the initial interest has waned.

A full-scale measurement framework could be developed as an organization evolves to stage where KM implementation is mature, well co-ordinated and sustained. However, it is recognized that organizations at lower levels of KM maturity may need to start with basic qualitative performance measures to monitor and review the benefits (Dentand Montague, 2004).

Figure 1.1: Framework of knowledge management



SOURCE :(Adapted from Petrash, 1996)

CHAPTER THREE

METHODOLOGY

This chapter deals with the research methodology. The research methodology involves the systemic rules and procedures upon which this research agenda is based and against which the data collected are interpreted and the findings evaluated. The methodology describes the procedures in conducting research. The main approaches needed for the research are identified. It also identifies the population and sample techniques used to achieve the purpose of the study. In addition, the procedure used in administering the questionnaires in the collection data and data analysis techniques were explained. The chapter also provides the organization profile of the selected organization. The research adopted the questionnaire survey method as the objective was to concentrate on an individual organization's circumstances in order to gain in-depth understanding of the company involved. Data collections were in the form of both primary and secondary data. One-on-one interviews were conducted during the entire period across. The participants involved were the Project managers, Managing Directors, Project Coordinators, Principal, Senior Quantity Surveyors and Quantity Surveyors in quantity surveying firms.

3.1 Sources of data

Both primary and secondary data sources were used in the study.

3.1.1 Primary data

The primary source of data refer to as first-hand information obtained by the researchers through one-on-one interviews, distribution of questionnaires and physical observation and included how the practitioners approach Knowledge Management Practice in the Quantity Surveyors Firms in Ghana to increase performance and is considered as an essential source of information in research in Building and Civil Engineering Industries in Ghana.

An initial investigation was however conducted to become familiar with the context of the study and also to ascertain the willingness of the institution to release the relevant data. The main focuses of the interviews however were concentrated on the institution's valuation of its Knowledge Management Practice and its importance and significances. Some of the responses were recorded personally by means of notes taking and the other by questionnaire.

3.1.2 Secondary data

This was a data obtained from indirect source for the research. The secondary source of data includes the respective websites, internets, textbooks, journals, articles, magazines and other source.

3.2 Sampling and Sampling Techniques

1. To ensure representativeness of data collected from respondents, both census sampling and purposive sampling techniques were used. This was to help obtained acceptable level of confidence and accuracy.
2. Census technique was used to select the respondents for the questionnaire because all the quantity surveying firms were targeted whiles the purposive sampling technique was used to select the Quantity Surveying firms in Ghana.
3. In each of the firms, 10 No. of people were selected for the research
4. Cochran sample size determination formula was used to calculate the sample size which is outlined below.

Sample size= $n / [1 + (n/\text{population})]$

Where $n = Z^2 [P (1-P) / (D^2)]$

P= True proportion of factor in the population

D= Maximum difference between the sample mean and the population mean

Z= Area under the normal curve responding to the desired confidence level

Population value= 510 (51 firms with 10 workers each)

D= (Expected frequency-Worst acceptable) 12%-4%=8%

Z= 1.960 with confidence level of 95%

$n = Z^2 [P (1-P) / (D^2)]$

$n = 1.960^2 [0.10 (1-0.10) / (0.08^2)]$

n=54.02

Therefore, Sample size (S) = $n / [1 + (n/\text{population})]$

$S = 54.02 / [1 + (54.02/510)]$

S= 48.8

5% contingency (non-respondents) = 5% * 48.8 = 2.44

Sample (S) = 48.8 + 2.44 = 51.24

Sample size for the study was therefore fifty-one (51) respondents

3.3 Data Collection Tools

In an effort to collect credible information to provide answers to research questions raised, a research questionnaire, interview were used to solicit for the needed information from the respondents.

3.3.1 A structural Questionnaire

The term questionnaire used a technique of data collection in which each case is made to respond to the same set of questions in predetermined order.

3.3.2 Interview

In order to get the general view of Knowledge Management Practice in the Quantity Surveyors Firms in Ghana and to capture information that would likely be distorted or withheld with the use of only one method , the quantitative method was complemented by qualitative method such as in-depth interview to enhance the validity of the data. The format for the interview was the general interview guide approach which was intended to ensure that the same information is collected from each interviewee to focus on the study. The purpose of the interview was clearly spelt out at the beginning of the exercise. During the interview, the researcher asked one question at a time and tried to remain neutral as possible.

This includes negotiating their terms of engagement, the interview subject, how the information would be used and their confidentiality.

3.3.3 Survey Questionnaire

Respondents were asked to score items of the questionnaire related to Knowledge Management and the further prospects in their practice. The scores used a five-point ordinal scale to measure a range of opinions from” very significant to not significant”, “very important to not important” etc. as the case may be. A final section on demographic information completed the questionnaire of the part one.

Consultants from the Quantity Surveying Firms were sent a letter with the questionnaire inviting them to participate in the survey. In accordance with the norm, participation in the study was voluntary and the subjects were free to withdraw at any time without penalty. They were free to decline to answer any questions they did not wish to answer. The subjects were informed that their responses would be anonymous and confidential and that all questionnaires would remain with the research team.

In line with recommendations by Kirkpatrick (1971), the study's data collection instrument is a combination of closed-ended and open-ended questions with several closed-ended questions (refer to Appendix). Open-ended questions in the survey questionnaire free the subjects from the limitations of forced choice answers and potentially allow the expression of the subject's personal opinions. Open-ended questions have the potential of bringing out silent factors and can capture idiosyncratic differences (McMillan and Schumacher, 1997).

The questionnaire for the study consists of the following sections:

- (1) Knowledge management
- (2) Demographic information.

Towards the end, the respondents were requested to provide comments to ensure that their personal views could be expressed without being restricted by the five-point scale. Data for the study were collected by a survey questionnaire designed to obtain Quantity Surveying firms consultants' perceptions relating to the KM. Research by survey is a typical way to "determine the opinions, attitudes, preferences and perceptions of persons of interest to the researchers" (Borg and Gall, 1993).

Investigations are generally conducted for the interrelationships of certain responses, especially those involving demographic information (Krathwohl, 1993) and attitudinal variables in social science research (Vierra, Pollock and Golez (1998).Close-ended questions

comprised of scales to measure differences in perceptions along a five point continuum. Likert-like scales provide more information about the respondents' degree of contribution, agreement or necessity, and can provide subtler and deeper ramifications of the perception to be explored (Oppenheim, 1992). The appropriate number of points used in the scale is often debated.

Some researchers agree that the optimal length of the scales needs to be determined by the nature of what is to be examined and the extent to which respondents can discriminate among levels (Light, Singer and Willet, 1990). According to Oppenheim (1992), reliability of the five-point scale is good and permits a greater range of answers to respondents than smaller point scales. We followed Oppenheim's recommendation in using the five-point scale as it is good and permits a greater range of answers to respondents than smaller and larger point scales.

3.4 Data Analysis Techniques

A very critical aspect of thesis writing is how to effectively analyze data collected from the field. The quantitative data was analyzed using simple form of statistical tools such as percentages of tabulated results;

Bar Charts were also used to aid in the pictorial descriptions of the results. Also, severity index was employed with the use of percentages and ranks describing the most common statement/factors with several other statements/factors listed. Most of the data collected for the study were ordinal in nature. To be able to rank the factors perceived by the respondents to impact the various aspects of the study, it was necessary to highlight the relative importance of the factors (Kangwa & Olubodun, 2003). The severity index (SI) method was used for the ranking of the factors. It is an ordinal scale to measure a range of opinions from” very significant to not significant”, “very important to not important”

This method has been used in line with research by authors such as Elhag and Boussabaine (1999), Faniran (1999), Idrus and Newman (2002) and Kangwa & Olubodun (2003).SI is a non-

parametric technique based on the aggregate weighting of the initial frequency score of each factor (Kangwa & Olubodun, 2003). The formula for the severity index is giving as follows by Elhag and Boussabaine (1999):

S.I. = Where S.I. is the severity index, f_1 is the frequency of response, w_1 is the weight for each rating (i.e. rating in scale/number of point in a scale), and n is the total number of response. The value $(f_1 \times 100)/n$ is the valid percentage as computed by SPSS. Completed answered questionnaires were edited, coded and analyzed by computer using the statistical package for social scientist software or Microsoft excel. The qualitative data was subject to content analysis to bring opinions and differences with the quantitative data collected.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This Chapter focuses on the research findings, analysis of the results and discussions. Descriptive statistics involving frequencies and percentages of tabulated results were used. Bar Charts were also used to aid in the pictorial descriptions of the results. Also, severity index was employed with the use of percentages and ranks describing the most common statement/factors with several other statements/factors listed.

4.1 Demographic Findings

Table 4.1 below depicts the demographic findings of the 51 respondents sampled from all the Quantity Surveying Consulting Firms in Ghana who participated in the survey. From the table, it was realised from the practitioners current position of the firm that, 14(27.45%) of the respondents were project managers, while 18(35.29%) being Managing Directors and 8(15.68%) of the respondents constituted project Coordinators. Specifically, others respondents sampled were holding the positions of Quantity Surveyors formed 11(21.58%).The firms were probed to find out those they work for or in other words their clients include; Governmental bodies, private corporate and individuals who were majority the firms work for. From Table 4.1, it was observed that the firms mostly deal with government bodies representing (51%).This is can be accepted because the construction project needs a huge of budget and the budget is provided mostly from private and government body. Private Corporates are next to government bodies when it comes to the clients firms undertake project representing 37.3% of the sample. To better understand the type of products and services of the participants provided for their clients, the question “What the type of products and services of the participants provided for their clients?” was posed to the participants.

The following were enumerated; Project management services; Preparation for tender document and contract management; and estimating. However, project management services was the major and most service the firms render to their clients with 41.2% and preparation of tender document and the management of contract being their next highest services and products they mostly deliver to clients. It can be accepted that these products and services are common in the Quantity Surveying Consulting Firms as the basic products and services. Other products and services are not so popular among the participants.

Table 4.1 shows the ownership structure of the firms from the participants. It can be seen that most of them are 100% Ghanaian ownership firms constituted 84.3 % and the rest are joint ventures with the foreign companies and 100% foreign ownership formed 11.7% respectively. This attest to the fact that majority of the firms are owned by Ghanaians. This helps in the promotion of entrepreneurship and job creation for the unemployed people to reduce economic hardships in the country.

The working experience of the workers was sampled. It was found out that most of the respondents constituting 54.9% of the total respondents have worked for more than 10 years. Those with less than 5 years working experience formed 23.5%, and 5-10 years, 21.6%.

The level of education of respondents was sampled to find out the highest ladder each of the respondents has reached.

However, it was not surprising that, majority of the respondents were holders of Bachelor's Degree with 56.9% followed by 21.6% of them being identified in holding a Master's Degree.

As a result, practitioners in these firms are associated with impressive academic backgrounds, supported by either accreditation of professional status from professional institutes or academic achievement in recognized academic institutions.

Table 4.1: Demographic Background of the Practitioners

Variable Name	Category	Frequency	Percent
Current position in the firm	Managing Director	18	35.29
	Project Managers	14	27.45
	Project Coordinators	8	15.68
	Quantity Surveyors	11	21.58
	Total	51	100
Who are your clients	Private corporate	19	37.3
	Government body	26	51.0
	Individual	2	11.7
	Total	51	100
Type of provision of products and services	Project management services	21	41.2
	Preparation for tender document and contract management	16	31.4
	Estimating	10	19.6
	Others	4	7.8
	Total	51	100
Ownership structure of firm	100% Ghanaian ownership	43	84.3
	Joint venture with foreign company	2	3.9
	100% foreign ownership	6	11.7
	Total	51	100
Working experience	Less than 5 years	12	23.5
	5-10 years	11	21.6
	More than 10 years	28	54.9
	Total	51	100
Highest level of education	Diploma	5	9.8
	Bachelor degree	29	56.9
	Master	11	21.6
	Others	6	11.8
	Total	51	100

Source : Survey data, 2012

Main results of the survey

The analysis of the survey was divided into three sections, where section one examines the main barriers and challenges that confront the implementation of Knowledge Management practice in the firm. In section two the best instances and tools used to capture knowledge management and subsequently share the experiences and lessons learned are identified, and section three refers the level of development of knowledge management practice in the firms.

4.2 Identifying the main barriers and challenges that confront the implementation of Knowledge Management practice in firm in Ghana

This section outlines the various barriers and challenges that confront the implementation of knowledge management practice in the firms in Ghana.

The study outlined four main barriers and challenges that confront the implementation of knowledge management practice. From Table 4.2 below, it was realised that, among the first four main barriers outlined, lack of adequate time was the most common factor that confronts proper implementation of knowledge management practice constituted 58.8%. If employees understood how knowledge management initiatives directly impacted on the day to day tasks, they may be more willing to play an active role. Anything that detracts from the main business is seen as of diminished importance. Another key factor was the lack of support from management of the firms.

This result was consistent with the research based study of Choi, 2000. According to him, “a knowledge hidden in one single person’s head will be useful. However, if it is networked to others and shared with them, the usefulness of the knowledge will be exponentially increased. This confirms the importance of management support for the implementation of this initiative and this support should be both, in word and in action (Davenport et al., 1998;

McKenzie et al.2001; Carrillo et al., 2004.The effective KM will identify knowledge in one place and allows it to be networked and shared with others, thereby increasing exponentially the usefulness of the knowledge. However, this reason was not a major barrier since it recorded a preference rate of 2%.

Table 4.2: The main barriers and challenges to the implementation of Knowledge Management

Statements/Factors	Frequency	Percent
Lack of time	30	58.8
Inadequate support from management	13	25.5
Lack of participation of employees	7	13.7
Unwillingness of others to share their knowledge	1	2
Total	51	100
Lack of successful KM model in QS profession	16	31.3
Unwillingness to change the current operating system	21	41.
Unwillingness of employees to share their knowledge	7	13.7
Difficult to value the intellectual capital	7	13.7
Total	51	100

Source: Survey data, 2012

4.3 Identifying the best instances and tools used to capture and share the experiences and lessons learned.

The section describes the best instances and tools used to capture and share the experiences and lessons learned. In the context of the methods used to capture knowledge from these quantities surveying firms were analysed.

The adopted methods according to the research included questionnaires and surveys, interviewing, observation and simulation and other methods of knowledge capturing. Among the four, the most common practice/method for data capturing was observation and simulation with 52.9% and questionnaires and surveys being the next most common method of knowledge capturing, 30.6%. Knowledge capturing through interviews was also realised but was not highly adopted based on its percentages. According to Liebowitz (2000), the experience, skills and knowledge can be captured by means of interviewing, protocol analysis, questionnaires and surveys and observation and simulation.

Also, methods used to communicate knowledge within the organizations was analysed after knowing the various methods used to capture knowledge. The various methods employed by the quantity surveying firms according to the survey were through the firm intranet; by specific meetings to discuss lessons learned; discussion via e-mail and distribution of physical documents and several other means. Information Technology such as email, Internet, Intranet, Lotus Notes, distribution of printed documents, CD ROMs, etc. are greatly enabled knowledge transfer (Smith, 1989). It was discovered that, the firms communicate the knowledge acquired through organizing specific meetings to discuss the lessons learned. This method was observed to be the most used/practice form of communicating knowledge within the organisation with a percentage of 60.8% of the total sample. The method is applied because they've been

practicing this method for some time now and it seems more appropriate since discussion this knowledge learned helps other staff within the organisation to be well informed and understood what is happening within the organisation.

Other means such as discussion via e-mail and distribution of physical document were discovered to be another common method of communicating knowledge within the firms and this form 21.6%.

After the knowledge has been communicated to all other staff within the institutions, the learning styles of the firms to improve upon the knowledge acquired was analysed. The learning styles according to the survey from Table 4.3 were through discussions, meetings and seminars. Among the three, it was discovered that 52.9% of the firms normally learn through discussions while 23.5% respectively learn through meeting and seminars.

These results are consistent with a study by Egbu et al. (2002) to 55 firms in the UK, which reported that the most used technologies and techniques are the telephone, internet/intranet, e-mail, documents and reports, along with meetings. Finally, the research wanted to know after capturing the knowledge through the various methods outlined and communicating it to the relevant people within the organisation, how knowledge/learning experience is being transferred to others. Tutoring/mentoring was observed to be the major method of transferring knowledge to others (See Table 4.3). The above discussed processes and activities presented in Table 4.3 shows some linkage to the research based study of Ruggles (1998) who stated that “KM includes a broad process of creating, organising, and locating, distributing and sharing knowledge to achieve the organisations’ goals.”

Table 4.3: Identifying the Best Instances and Tools used to capture and Experiences and Lessons Learned

Variable Name	Category	Frequency	Percent
Methods use to capture knowledge	Interviewing	3	5.9
	Questionnaires and surveys	9	30.6
	Observation and simulation	27	52.9
	Others	12	10.3
	Total	51	100
Methods use to communicate knowledge within organization	The firms intranet	6	11.8
	By specific meetings to discuss lessons learned	31	60.8
	Distribution via e-mail and distribution of physical documents	11	21.6
	Others	3	5.9
	Total	51	100
How do you transfer your learning experience to others	An expert system	3	5.9
	Tutoring/Mentoring	24	47.1
	Database	4	7.8
	Meeting	20	39.2
	Total	51	100

Source: Survey data, 2012

4.4 Level of Development of Knowledge Management Practice in the Firms in Ghana

This section focuses on the level and the extent of Knowledge Management practices in the quantity surveying (QS) firms in Ghana. When asked to ascertain the extent to knowledge management is necessary in enhancing professionalism and competitiveness of quantity surveying firms.

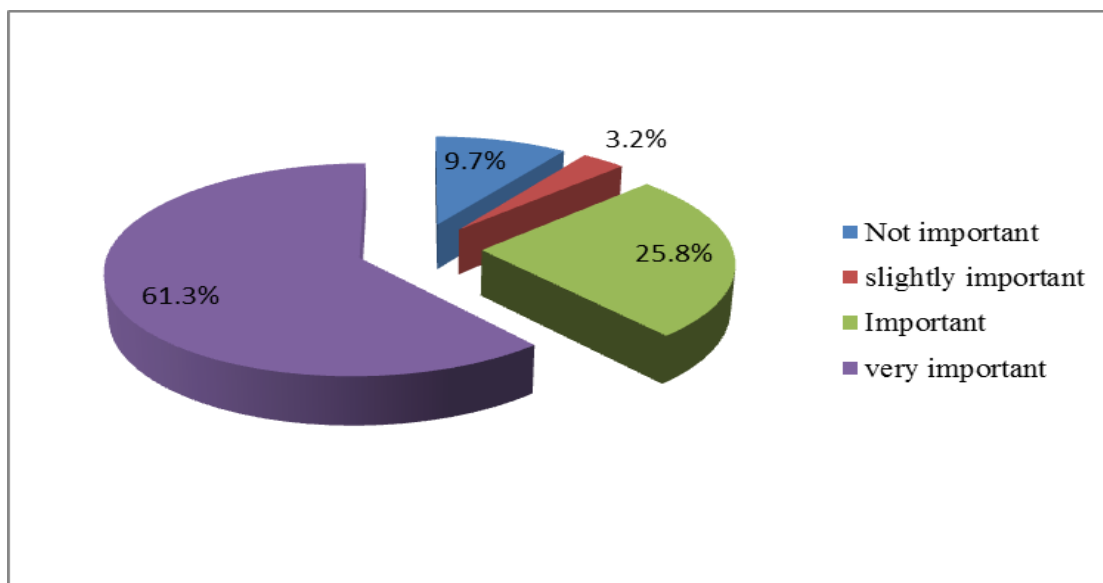


Figure 4.1: Extent of agreeing that Knowledge management is important in enhancing professionalism

Source: survey data, 2012

From figure 1 above, show that 61.3% of the respondents agreed to the fact that, Knowledge Management is very important in enhancing professionalism. 25.8 % of the respondents rated the statement as important and a few of them agreed that Knowledge Management is slightly important in enhancing professionalism. The wider agreement of the statement in general indicates that largely, the level of development of Knowledge Management practice in the firms in Ghana are very important in enhancing professionalism and competitiveness.

The activities and practices relating to Knowledge Management which are being developed in the quantity surveying firms are presented in Tables 4.3 and 4.4. From Table 4.3, it was realised that, improve service quality and customer satisfaction was highly rated as the most benefits derived from Knowledge Management with a severity index of 93.63%. According to Liebowitz (2000); Beckman (1997) and Wiig (1999), the benefits of KM are:

- i. Improved service quality
- ii. Rapid and effective enterprise-wide problem solving
- iii. Improved decision-making
- iv. Increased revenue and business growth
- v. Increased innovation, practice, and process improvement.

Other benefits which were discovered from the survey recorded very high percentage scores from slightly important to very important. The very high severity index in the analysis indicates that there is a general importance to the various benefits listed in Table 4.4. The remaining benefits that showed general importance are as follows: improve employee communication within teams; increase employee moral; provide more informed knowledge; improve efficiency and productivity at work.

Table 4.4: Benefits derived from knowledge management

Benefits	NI=1	SI=2	I=3	VI = 4	Total (%)	Severity index (%)	Rank
Improve service quality and customer satisfaction	0	0	25.5	75	100	93.63	1
Improve employee communication within teams	0	11.8	37.3	51	100	84.88	4
Increase employee moral	2	13.7	49	35	100	79.4	5
Provide more informed knowledge	0	3.9	37.3	59	100	88.73	3
Improve efficiency and productivity at work	0	5.9	17.6	77	100	92.65	2

Source: Survey data, 2012

Where NI= Not important, SI= slightly important, I=important and VI= very important

Significance of the drivers to Knowledge Management is being depicted in Table 4.4 below.

The drivers that are significant to Knowledge Management were needed to encourage continuous improvement; to disseminate best practices; to respond to clients quickly and to develop new products and services. The severity indexes of each and every significant statement depicted in Table 4.4 showed that all the four drivers significant to KM in QS firms are all highly significant since even the least index recorded was 84.3%.

Also in accessing the level of Development of knowledge management of QS firms, the significance of four drivers presented in Table 4.4 was accessed. From the Table, it was realised that, all the four drivers with the statement; ‘need to encourage continuous improvement’ being the most significant statement were all highly important since each and every statement recorded a high severity index in terms of percentage. Knowledge Management (KM) is recognised as an important business consideration to gain competitive advantage. If properly managed, KM can be converted into strategic intellectual assets of any knowledge-intensive organisation, especially consulting companies. It has been argued that 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 (Rasli et al., 2004).

Table 4.5: Significance of the following drivers to knowledge management in QS firms

Significance	NS=1	SS=2	S =3	VS = 4	Total (%)	Severity index (%)	Rank
Need to encourage continuous improvement	0	0	27.5	72.5	100	93.13	1
To disseminate best practices	0	0	43.1	56.9	100	89.24	2
To respond to clients quickly	2	9.8	45.1	45.1	100	84.3	4
To develop new products and services	0	3.9	37.3	59	100	88.93	3

Source: Survey data, 2012

NS= Not significance; SS = slightly significant, S = significant, VS = very significant

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter summarises all the findings of the study based on the set objectives, conclusions drawn from the results and making recommendations for informing decisions.

5.1. Summary of Findings

The study which was based on the topic 'Knowledge Management Practices in Quantity Surveying Firms in Ghana. The objectives set were;

- 1) To identify the main barriers and the challenges that confronts the implementation of knowledge management practice in the firm in Ghana.
- 2) To identify the best instances and tools to capture and share the experiences and lessons learned.
- 3) To assess more about the level of development of Knowledge Management practice in the firms in Ghana.

The researcher tackled the first objective by identifying the main barriers and challenges that confront the implementation of knowledge management.

Results obtained from Table 4.2 in Chapter four discovered that, four barriers and challenges were discovered and the following were barriers that hinder the implementation of knowledge management; lack of time, lack of support from management, lack of adequate participation of employees and unwillingness of others to share their knowledge.

However, the last barrier which is unwillingness of others to share their knowledge' was not observed to be a major barrier that confronts implementation of KM in QS firms with a sample percentage of 2.

Secondly, the best instances and tools to capture knowledge were also looked at during the survey. The best instances were categorised into the methods used to capture knowledge; methods used to communicate knowledge; procedures of transferring knowledge; and the learning styles develop to improve knowledge.

Finally, the level of development of Knowledge Management practice to the development of quantity surveying (QS) firms was assessed. From the charts presented in Chapter four, it was evident that 61.3% of the respondents were of the view that knowledge management is important in enhancing professionalism and development in QS firms. Generally, knowledge management was assessed to have great importance in enhancing professionalism.

5.2 Conclusion

Knowledge is a critical factor affecting an organization's ability to remain competitive in the new global marketplace. Knowledge Management is the corner-stone of many organizations' knowledge management strategy. Knowledge Management in an organization is the act of making knowledge available to others within the organization to ensure better sharing of best practice, lessons learned, information and project management for strategic decision-making.

From the study, it was discovered that, knowledge is normally captured and stored.

However, there is no proper processing of this knowledge to allow its disclosure to the entire company, and to capture the knowledge, quantity surveying firms proposed to conduct meetings or revision during the execution of projects where they could share and discuss lessons learned and best practices. To disseminate knowledge, most of the respondents in the QS firms preferred to use specific meetings to discuss the lessons learned and distribution via email.

In undertaking their roles, Quantity Surveyors face many barriers and challenges that inhibit the implementation of Knowledge Management within QS firms. Many of the barriers and challenges that organizations face in managing their knowledge assets are influenced by the lack of time, lack of support from management, lack of participation of employees in QS firms.

The above results outlined, were all included in the best instances and tools used to capture and share knowledge.

In assessing the level of development of Knowledge Management, a severity index was used to analyse eleven factors to find out their level of importance and benefits. However, all the results proved general importance and benefits of Knowledge Management. Some of the most important statement/factors outlined were; improve service quality and customer satisfaction; improve efficiency; need to encourage continuous improvement and to disseminate best practices.

These participants shared a common characteristic of being professional in Quantity Surveying industry but aside from this similarity there were differences in areas such as education background and type of business started. The participants have been involved in more than one business products and services and therefore are considered to be serial professionals with experience stretching over a period from 6 to 20 years or more in running a Quantity Surveying consulting business.

5.3 Recommendations

From the study conducted, the following recommendations are made;

- First, Knowledge Management should be part of curriculum at all levels of the educational system. This will make it possible for individuals in various Quantity Surveying Firms to be introduced to early stages of Knowledge Management.
- From the research, it can be seen that the knowledge is captured and stored; however, there is no proper processing of this knowledge to allow its disclosure to the entire firms, it therefore is recommended that the introduction of technologies and techniques such as intranet, databases, telephones and internet portals should be provided to disseminate information or groupware to share experiences.
- In addition, platform for exchange of knowledge, regular meetings, brainstorming, effective communication channels or documents, procedures manuals, forums and guides, among others should be adopted in the firms.
- More importantly, the study established that the professionals are losing knowledge due to the retirement, resignation, lack of time, commitment from management and unwillingness of employees to their share knowledge and stressed that to survive and grow in the future, the QS profession "must respond quickly and creatively to the challenges of accelerating social, technological, economical and environmental change.
- The employees should value the intellectual capital and show the tangible benefits of knowledge management practices and in the face of forward-thinking, policies have to be adopted in order to maintain their competitive advantages and to survive and create new things.
- Moreover, there should be intensification of public education on the need to publish news letters or magazines in paper or electronic file periodically where new practices and lessons are learned.
- I wish to recommend a further research in the area of Knowledge Management practices not only among Quantity Surveying Firms but among other firms. This will promote effective Knowledge Management practices among firms in Ghana.

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APPENDIX



**KWAME NKURUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY (KNUST)
COLLEGE OF ARCHITECTURE AND PLANNING
FACULTY OF ARCHITECTURE AND BUILDING
TECHNOLOGY
DEPARTMENT OF BUILDING TECHNOLOGY**

Dear Sir/Madam

INVITATION TO PARTICIPATE IN A SURVEY

**KNOWLEDGE MANAGEMENT PRACTICES OF QUANTITY SURVEYING FIRMS IN
GHANA**

I am currently involved in a master research programme seeking to obtain your perceptions of Knowledge Management Practices of Quantity Surveying Firms in Ghana.

Knowledge Management (KM) is the collection processes that govern the creation, dissemination and utilization of knowledge to ensure better sharing of best practice, lessons learned, information and project management for strategic decision-making.

The attached survey questionnaire and information obtained from this survey will be kept anonymous and completely confidential. All questionnaires will remain with the researcher.

Only findings in aggregate form will be submitted to the relevant authorities. The identification number on the questionnaire will be used for follow-up purposes only, so that reminder requests are sent only to those who have not returned their questionnaires and to cut fieldwork costs.

Your participation in this survey is completely voluntary, and you are free to withdraw at any time and for any reason. You are also free to decline to answer any questions you do not wish to answer.

I would like to convey our appreciation for your cooperation in completing this questionnaire. If you have any questions about this research project, please call me at 020-7187205 or 0244-681321 or e-mail rbuabeng88@yahoo.com

Thank you in advance for your participation and assistance with this project. Your input is much appreciated.

Sincerely yours

Bernard Appiah
MSCII STUDENT

QUESTIONNAIRE

Part A. DEMOGRAPHIC INFORMATION

Directions: Please tick () in the relevant boxes

1. What is your current position in this firm?
 - a. Project Manager ()
 - b. Project coordinator ()
 - c. Managing Director ()
 - d. Others, (Please specify)

2. Who are your clients?
 - a. Private body ()
 - b. Government body ()
 - c. Individual ()
 - d. Others, (Please specify)

3. What type of products and services do you provide?
 - a. Project Management Services ()
 - b. Preparation for Tender document and Contract management ()
 - c. Estimating ()
 - d. Others, (Please specify)

4. Describe the ownership structure of your firm.
 - a. 100 % Ghanaian ownership ()
 - b. Joint venture with foreign company ()
 - c. 100% Foreign ownership ()
 - d. Others, (Please specify)

5. How many years of working experience do you have.

- a. Less than 5 years ()
- b. 5 – 10 years ()
- c. More than 10 years ()

6. What is your highest level of education?

- a. Diploma ()
- b. Bachelor degree ()
- c. Master ()
- d. Others, (Please specify)

PART B: Questions Regarding Knowledge Management

Please respond to each item by circling/ticking the appropriate box ()

1. To what extent do you agree that knowledge management (KM) is necessary or important enhancing professionalism and competitiveness of quantity surveying professionals and firms?

Very Important	Important	Slightly Important	Not Important
4	3	2	1

2. The following are some of the benefits to be derived from KM. Please rate on a grade of 1 – 4 how important are these to you and your firm.

Item	Description	Very Important	Important	Slightly Important	Not Important
1	Improve service quality and customer satisfaction	4	3	2	1
2	Improved communication within teams	4	3	2	1
3	Increased employee moral	4	3	2	1
4	Provide more informed knowledge	4	3	2	1
5	Improved efficiency and productivity at work	4	3	2	1
6	Others				

3. How significant are the following drivers to KM in your firm /company

Item	Description	Very significant	Significant	Slightly significant	Not significant
1	Need to encourage continuous improvement	4	3	2	1
2	To disseminate best practices	4	3	2	1

3	To respond to clients quickly	4	3	2	1
4	To develop new products and services	4	3	2	1
5	Others	4	3	2	1

4. Does your firm classify, organize and document any knowledge or lessons learned from their previous projects?

- a. Yes ()
- b. No ()

5. If yes (4), how often?

- (a) Very often ()
- (b) Often ()
- (c) Once in a while ()

6. If Question (4) is true for you, what methods you use to capture knowledge and lessons learned from projects

- a. Interviewing ()
- b. Questionnaires and surveys) ()
- c. Observation and simulation ()
- d. Others, (Please specify)

7. What methods do you use to communicate knowledge within your organization?

- a. The firm's intranet ()
- b. By specific meetings to discuss lessons learned ()
- c. Distribution via e-mail and distribution of physical documents ()
- d. Others, (Please specify)

8. How do you transfer your learning experience to others?

- a. An expert system ()
- b. Tutoring/ Mentoring ()
- c. Database ()
- d. Meeting ()
- e. Others, (Please specify)

9. What is your learning style to improve your knowledge?

- a. Discussion ()
 - b. Meeting ()
 - c. Seminar ()
 - d. Others, (Please specify)
10. What are the main barriers to the implementation of a knowledge management system in your firm?
- a. Lack of time, ()
 - b. lack of support from management ()
 - c. The lack of participation employees ()
 - d. Unwillingness of others to share their knowledge
11. What are the potential difficulties of introducing knowledge management system?
- a. Lack of successful KM model in QS profession
 - b. Unwillingness to change the current operating system
 - c. Unwillingness of employees to share their knowledge
 - d. difficult to value the intellectual capital
 - e. Others, (Please specify)
12. What Knowledge factors are required to achieve success in KM in quantity surveying consulting firms?
- a. Good Leadership ()
 - b. Reward system ()
 - c. Human resource capability
 - d. Others, (Please specify)
13. What are the external or internal environmental factors that have impacted on transfer of knowledge in quantity Surveying Consulting Firms?
- a. Commitment from management ()
 - b. Communication ()
 - c. Willingness (more on trust) to share and listen ()
 - d. Others, (Please specify)
14. What do you (and your company) expect from KM initiatives?

- a. Maintain the knowledge and competitiveness ()
- b. Quality in service ()
- c. Documentation or filing data system more advance ()
- d. Others, (Please specify)

15. What appropriate recommendations would you suggest on the effective use of knowledge management in the quantity surveying firms in Ghana?

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THANK YOU FOR COMPLETING THIS SURVEY