# Exploiting intranet technology in facilitating knowledge management among Quantity Surveying's consulting firms

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*Abstract* - Successful knowledge transfer is an important process which requires continuous improvement in today's knowledge-intensive economy. However, improving knowledge transfer processes represents a challenge for most of the small and medium size consulting firms. In recent years, the terminology 'knowledge management' initiative has been introduced. The concept of knowledge management (KM) is seen as the solution through the inculcation of knowledge sharing via various tools and techniques in managing the knowledge within parties in construction. Through intranet as one of the KM tools, the organisations are able to create, acquire and transfer knowledge. The aim of this research paper was to investigate how quantity surveying (QS) consulting firms is exploiting intranet technology in facilitating knowledge management in order to deliver quantity surveying services efficiently. A qualitative approach through semi-structured interviews was adopted as the method used to establish current knowledge management practices and the tools used for sharing knowledge and learning. The study finds that the use of intranet has not been used to its fullest potential due to the barriers and challenges in using intranet as KM tools. Thus has created some problems with regard to deliver quantity surveying services efficiently. A discussion is also included on the future research direction for the development of a conceptual framework to support the integration of quantity's surveyor services with relevant knowledge management initiative.

*Keywords - Intranet; Knowledge Management; Consulting Firms; Quantity Surveying*

## I. INTRODUCTION

The growing body of literature on knowledge management reflects its strategic importance in the new knowledge-based economy. This is particularly relevant to the knowledge-intensive service organisations. Examples of knowledge-intensive service organisations include consulting, engineering and design firms. The challenge posed to knowledge intensive service organisation is to remain competitive in a highly volatile and competitive knowledge environment where market quickly shifts and technologies rapidly proliferate (Dunford, 2000).

Like the quantity surveying consulting firms who plays an important role in any construction projects, the firms received, gathered, organised, processed and generated loads of knowledge extract from data and information in the form of technical, financial and contractual reports and documents (Willis et al., 2002). The knowledge is then used to develop a winning strategy and position themselves ahead of their competitors by providing better services.

The changing trend of the country's construction and business climate and practices for the last ten years demand the quantity surveying communities and practices to revolutionise the method or approach of providing their services so as to meet the needs and requirements of more knowledgeable clients and increasingly complex and sophisticated design and constructions. This can be done through better utilisation of the vast amount of accumulated data and information which are in the keeping of most quantity surveying practices. These data and information need to be systematically organised and methodically analysed and synthesised, using the proper information and communication technology (ICT) tools, to generate more accurate, reliable and meaningful information or knowledge.

The question is how to exploit the current ICT tools, so that the service will be better, more efficient and scientifically or methodically in approach. Thus, it is concerned with knowledge management process that embraces the entire system within which technology operates. This is involving the integration of ICT into the processes of gathering, identifying and organising the accumulated data and information, analysing and/or synthesising them to generate accurate, reliable and meaningful information or knowledge that can be used to provide better quality products or services (Robinson, 2005).

This paper explores the role of intranet in knowledge management, the issues to be considered in utilising the intranet as a tool for knowledge sharing within the quantity surveying consulting firm and proposes a conceptual framework to integrate quantity's surveyor services with relevant knowledge management initiative. It starts with the literature review identifying the role of intranet as KM tools in the business context, quantity surveying services and an outline of the research methodology. This is followed by a discussion of the results. Finally, conclusions and future research direction are presented.

## II. THE ROLE OF INTRANET IN KNOWLEDGE MANAGEMENT

Knowledge management systems have become easier to use recently with high productivity and effectiveness due to the support of technology. Intranet is an information communication technology based upon internet technology. Deborah (2003) defined intranet as an internal closed network on internet technology designed to foster communication and collaboration within a single enterprise. Adrienne and Lara (2000) stated that intranets are private computing network, internal to an organisation, allowing access only to authorised user.

The intranet phenomena was introduced in the early 1990s following the idea that it can integrate all the computers, software, and database within a particular organisation into a single system that enable employees to find and share all the information they need for their work. In the past few years, intranets have emerged as an important KM tool (Ruggles, 1998). The majority of company intranets now host corporate information accessible to employees and has formal corporate roles and responsibilities to ensure that key information is captured timely and accurately and updated regularly. Inkpen and Dinur (1998) stated that Intranets facilitate communication and interaction and create what has been referred as a "knowledge connection".

An intranet support knowledge management in at least three ways: (1) providing compression of time and space among users; (2) offering the flexibility to exchange information; and (3) supporting information transfers and organisational networking independent of direct contacts between users (Robertson, 2004)

The main drivers for intranet use in the organisations are various. In the aspect of workforce productivity, intranet helps users to locate and view information faster and use application relevant to their roles and responsibilities. With the help of a web browser interface, user can access data held in any database the organisation wants to make available, anytime and anywhere, increasing employee's ability to perform their job faster, more accurately and with confidence that they have the right information (Yaghoubi et al., 2011)

Moreover, intranet can serve as powerful tools for communication within an organisation. From communication standpoint, intranets are useful to communicate strategic initiatives that have a global reach throughout the organisation. The types of information can easily be conveyed is the purpose of initiative. By providing knowledge and information on intranet, staff can keep up-to-date with strategic focus and goal of the organisation.

Beyond act as a communication platform, intranet itself can be powerful tool to drive cultural change within an organisation. A successful intranet should reflect the culture of the organisation it serves (Yaghoubi et al., 2011). It can also be said that the vision, mission and image presented by an intranet are influence of the organisation's culture.

Intranet can also save business money on printing, duplicating document, and the environment as well as document maintenance overhead. This is because user can view information and data via web-browser rather than maintaining physical documents such as procedure manuals, internal phone list and requisition form. Intranet can make possible to provide the user with live changes so that they are keep up-to-date in all information, data and knowledge share among the entire user in an organisation. Intranet allows organisation to distribute knowledge and information to employees as a needed basis for their work. Employees may link to relevant information at their convenience, rather than being distracted indiscriminately by electronic mail.

As conclusion, use of intranet helps users to save more time in knowledge and information sharing and transferring. Attention is now increasingly being focused on the potential value of intranet in small and medium size organisation in terms of rapid transmission of up-to-date information; improve communication flow, knowledge enhancement, sharing of best practice, and encouragement of innovation (Coakes et al., 2010).

The following section reviews the applicability and relevant uses of intranet for quantity surveying practice in consulting firm.

## III. QUANTITY SURVEYING SERVICES IN CONSULTING FIRM

Today, the work of quantity surveyors is no more limited to only preparing preliminary cost estimates, cost plans, bills of quantities and tender documents, tender reports, contract documents, the administration of interim payments and preparing the final account. They have now include giving advises on project costs and finance, choice of procurement methods and contractual matters, the administration of tendering/bidding processes, carrying out investment appraisal, managing project cost and finance, participating in the contractual and financial negotiations and undertaking financial auditing (RISM, 2012). Their services have now cover civil engineering, mechanical engineering, landscape and oil and gas projects.

As consultant quantity surveyors, the firm not only gave advises to clients and other professional teams but also gathered, selected, organised and generated hoards of information in the form of the followings:

- Project cost estimates.
- Feasibility study which are inclusive of market, site, financial analysis and projected cash flows.
- Cost plans and cost analyses.
- Tender documents with and without quantities.
- Tender evaluation reports.
- Preparation and execution of the formal contract.
- Contract documents (with priced Bills of Quantities or with priced schedule of rates or priced elemental breakdown).
- Contractors profiles with their technical and financial background.
- Accounts of the Interim payments.
- Accounts of the valuation of variations.
- Settlement of the final accounts of the project.

All these information are for the different types of project of different sizes, height, shapes, complexity and built at different locations at different time. The accumulated information is an invaluable asset that can be fully exploited to create market advantage. With the aid of the latest knowledge management tools such as intranet technology, the accumulated information can be transformed into a large data base or information bank, which can in turn be analysed and synthesised to generate more reliable and meaningful knowledge and information.

## IV. RESEARCH METHODOLOGY

A total of ten people were interviewed from four medium-sized quantity surveying consulting firms. The respondents are the person with overall responsibility for knowledge management in their firms. All ten interviewees had senior position such as the Principal and Associates, and all had more than 10 years of experience within the industry. All ten interviews were conducted on firm premises and lasted for about one hour. The interviews were transcribed and returned to the firm in order to ensure the accuracy of the transcript and also in some cases, to gain additional information.

Semi-structured interviews were designed to reveal the use of intranet in managing quantity surveying knowledge within the organisation. The interviews also encouraged consulting firms to discuss practical suggestions for improving existing practices regarding their quantity surveying knowledge. Each interviewee was supplied with outline questions that were used as a guideline for the interviews. The formulation of themes and questions for the interview was supported by literature review on knowledge management and quantity surveying services.

## V. RESULT AND DISCUSSION

### A. Intranet Based Management Tools

According to six respondents interviewed, their firms rely heavily on intranet for document management systems to capture and store the project file and its associated information and knowledge. They agree that intranet is user friendly and thus, it is easy to use and understand. Intranet helps a lot in sharing and transferring knowledge within the QS practices by acting as a medium for storing knowledge.

Apart from benefit of intranet, the respondents believe that the training should be given to all new staff in organisation to ensure that all organisation employees are able to obtain knowledge from intranet through knowledge sharing and transferring process.

Despite the documents being stored and the key learning points having been made available, often it is difficult for the quantity surveyors and their team to retrieve the knowledge. The respondents point out an example to emphasise the point where most of the problems often occur on site such as valuation of variations, thereby requiring immediate attention. Furthermore, the quantity surveyor usually discussed the solution based on their experience on site and often abandoned the practical solution that had been recorded in their database.

Hence, databases containing solutions or key learning points were not made readily available to them.

The study revealed that most of the firms had developed their knowledge management system and shared knowledge through the intranet system. A dedicated unit is formed, led by personnel with ICT backgrounds to establish the organisation knowledge asset base. Such applications as project central database and document server (i.e., Novell and ReadSoft) are used to communicate information sharing among parties within the organisation. These enable reports to be generated electronically and accessed by the firm's main office and its subsidiaries' office.

Clearly, all respondents recognised the benefits of intranet, which increased efficiency in utilising information and reflected knowledge management initiatives currently in practice. These respondents also realised the benefits of keeping the information in a database accessible to all organisation levels to expedite their service delivery.

### B. Use of Intranet in Managing Quantity Surveying Knowledge

This section focuses on the data collected from the respondents interviewed on how intranet had used in managing quantity surveying knowledge. This is shown in Figure 1, which tabulates the quantity surveyor's services knowledge that respondents obtain from previous project in their intranet database.
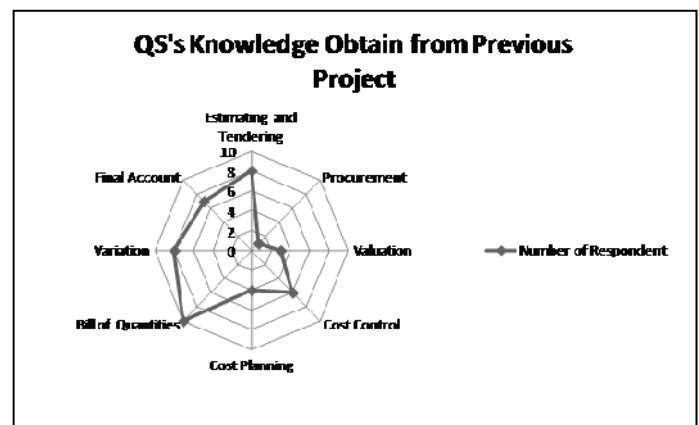


Figure 1. QS's knowledge used from intranet database

The findings revealed that intranet is important in helping QS to prepare bill of quantities (BQ). Based on Hackett & Robinson (2003) and Chan (2002), a bill of quantities is a document detailing the qualitative and quantitative aspects of every constituent parts of a proposed construction project. It is a document or a "book" containing a long list of all the items of works for construction. Each of these items is complete with the description of material, labour and workmanship for the work and its quantity (Davis and Baccarini, 2004). Basically, it is a document with detail information about the type, nature and quantities of the finished work in a construction (Willis et al., 2002).

All respondents mentioned that knowledge on BQ from previous similar project will be referred as a guide to prepare

BQ for a future or new project. This method can prevent on missing item in BQ. Besides that, BQ also used as document for tendering purpose, therefore mistake on detail for element description should be as detail as possible so that the price tender by contractor are based on client's requirements. These findings are consistent with Rashid et al. (2006) in the literature that BQ is considered as a multipurpose document for project costing or estimating, for assessing tenders, price negotiation, valuation of interim payment, variation orders and for the settlement of final account.

Knowledge from other quantity surveying services such as estimating and tendering, variation and final account also had been used moderately through intranet. All these services are related to costing where reasonable cost for every item can be referred from previous project. Therefore, information from previous project is important in helping QS to handle the costing element of the project. Cost control for a project is important because it help to balance the design expenditure between the various elements of the building; and provide client with a value-for-money of the construction project.

However, small numbers of respondents share and transfer knowledge in QS services such as valuation and procurement though intranet. This is due to accessibility issue of intranet outside the project workplace. Valuation is important in valuing the payment and time for the work that carried out on site by contractor and sub-contractor. Meanwhile, procurement is normally based on client's requirement on choosing the method of procurement, therefore only one respondent said he obtain this knowledge from previous project.

### C. The Challenges and Barriers in Managing Intranet

The interviews revealed some challenges in managing intranet as a knowledge management tool in QS consulting firm (as depicted in Figure 2). This barriers and challenges should need to be addressed to improve the usage of intranet as a medium for sharing and transferring knowledge.
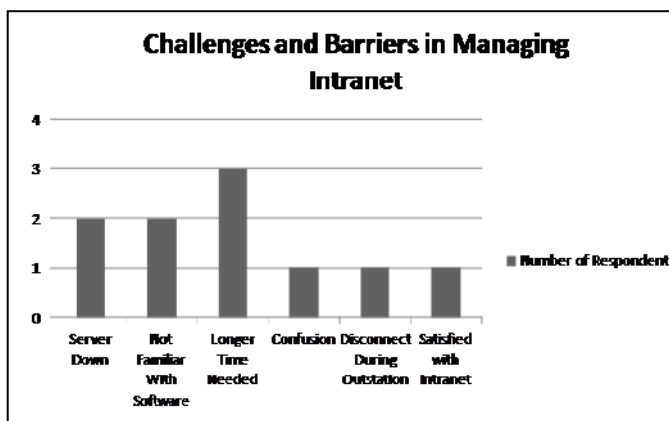


Figure 2. Challenges in Managing Intranet

From the Figure 2, 30% of respondents have problem in login or opening file through intranet. According to respondent, only one user is allow to open and edit a document at one time and this will cause inconvenient for others who want to open the same file. This situation will become more worse when there is more than two people urgently needed information in the same document. Thus, this situation created a problem on longer time in accessing file from intranet.

The problem on server down and not familiar with software had faced by two (20%) respondents respectively. They said intranet is ineffective when there are problem occur in server such as during service maintenance. Regarding the issue on software used, the respondents said the problem occurred because no training is provided by the organisation to the new staff and they have to learn how to use the software on their own effort.

Other problems such as causing confusion and disconnect while outstation had faced by 10% of the respondent respectively. Respondent said he is not able to get information from company's intranet when he is outstation or away from office. This situation brings lots of inconvenience to him. Ironically, despite of all problems mentioned by others, one (10%) respondent satisfied with the current function of intranet in his firm. He stated that intranet helps him in QS's work during handling a construction project.

From the findings, it is obvious that most of the QS faced problems and challenges in using intranet as part of knowledge management tool. To sum up, the most common problem faced by QS is taking long time in opening and loading the document needed when there are more than one user want to use that particular document.

### D. Recommendations on Improving Intranet as KM Tools

There are some methods suggested by respondents in order to improve the usage of intranet as a tool for knowledge management. This is as shown in Figure 3 below.
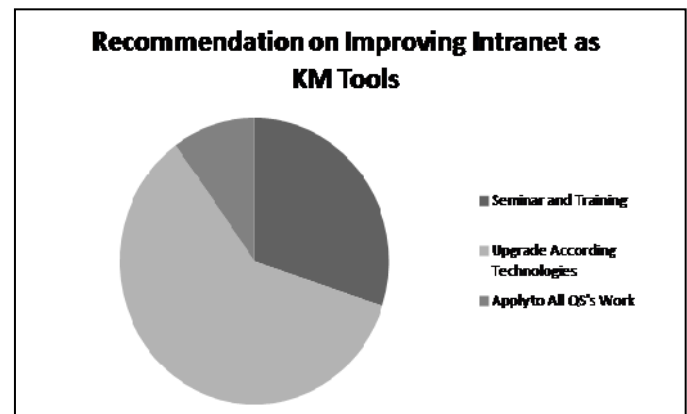


Figure 3. Recommendation on Improving Intranet as KM Tools

Majority of respondent mentioned that some software used is not fulfill their satisfaction. Thus, this software should need to be upgraded for more user-friendly and make QS's work more efficient. Meanwhile, 30% of them said training and seminar should be given to all QS for introduction to intranet as a knowledge management tools to use in helping QS's daily work. There are 10% of respondent suggest that intranet should be used in all QS's work as it helps in sharing and transferring knowledge more efficiently.

## VI. TOWARDS THE CONCEPTUAL FRAMEWORK

From the studies undertaken, it was deduced that intranet technology is about supporting the business of an organisation and using its essential requirements as a driver for quantity surveying services improvement.

In the next stage of research, it plans to investigate knowledge management adoption and innovative work practice in situations where quantity surveying consulting firms deal with highly demanding performance of various contract arrangements. Thus, the research seeks to understand actual practices and characteristic of knowledge embedded in personnel and organisation at different contract arrangement such as design and build, and PFI contract. This can be done through assessing and establishing effective communication requirements, knowledge management tools and as well as examining the structure of the firm.

This research would involve surveying project groups and finding out their knowledge management practices, the nature of knowledge used or required, the tools and models used for sharing knowledge and the gaps existing in current practices with a view to introducing better alternatives and practices. As such, the method is 'problem driven' in response to practitioners' perception of where knowledge flows exist and shares throughout the quantity surveying services. From this approach, it then provides a gap and opportunity to draw a conceptual framework that can enhance the knowledge management.

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