

**THE DEVELOPMENT OF KNOWLEDGE SHARING CULTURE  
IN THE CONSTRUCTION INDUSTRY**

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IN THE CONSTRUCTION INDUSTRY

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***DEDICATION***

*I have an amazing family who has supported every single  
decision I have undertaken for the past 23 years.*

*Thanks to beloved Mummy, Daddy,  
Lilian, Leslie and Lester*

*And special thanks go to Yong Be Wee,  
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## ABSTRACT

This research aims to identify the determinants that promote the development of knowledge sharing culture in the construction industry. The construction industry is, unlike any other industries, which have hidden reservoirs of intelligence that remain largely untapped and unionized. Construction sector is fragmented and characterized by small and medium size organizations shall accommodate an interesting avenue for tapping into this hidden asset to capitalize on what collective organizations concern. Right organization characteristics along with right work practices are conducive to knowledge sharing which in turn influence the employees' behaviour. Consequently, there are four objectives of this study. First objective is to identify the practices for factors that promote the development of knowledge sharing culture. Second objective is to identify the preferred practices for each factor that promotes the development of knowledge sharing culture. Third objective is to investigate the relationship between the factors and the development of knowledge sharing culture. And finally, to investigate the relationship between the practices and the development of knowledge sharing culture. For the purpose of this study, six units of construction organizations in Sarawak are investigated through two major approaches which comprised of case study and questionnaire survey. Descriptive analysis, frequency analysis and one-sample *t* test analysis are applied to analyze the factors, practices and their significant relationship in promoting knowledge sharing culture. From the literature review, eight factors and 51 practices are identified as the determinants that promote the development of knowledge sharing culture. These factors and practices are verified through the case study interviews. Some 34 practices out of 51 practices being surveyed are identified as the preferred practices which act as promoters of knowledge sharing culture. The result of one-sample *t* test shows that the factor of strategy, structure, support mechanism, management development, communication, trust, motivation, learning and all the 51 identified practices are the contributing determinants that promote the development of knowledge sharing culture.

## ABSTRAK

Penyelidikan ini bertujuan untuk mengenalpasti faktor-faktor yang membantu pembangunan budaya perkongsian ilmu dalam industri pembinaan. Industri pembinaan tidak sama dengan industri lain yang mana terdapat ilmu pengetahuan tersembunyi yang masih belum disatukan untuk mencapai kegunaan berfaedah. Sektor pembinaan itu terpecah dan terdiri daripada organisasi bersaiz kecil dan sederhana memberi pendekatan menarik untuk menjadikan aset tersembunyi ini bermanfaat lalu mempergunakannya bersama organisasi. Keadaan organisasi yang sesuai bersama dengan amalan kerja yang baik membawa kepada perkongsian ilmu yang mana mempengaruhi sikap pekerja. Objektif pertama kajian ini, untuk mengenalpasti amalan kerja bagi faktor yang membantu pembangunan budaya perkongsian ilmu. Objektif kedua untuk mengenalpasti amalan kerja yang diutamakan bagi setiap faktor yang membantu pembangunan budaya perkongsian ilmu. Objektif ketiga pula, untuk menyelidik hubungan antara faktor dan pembangunan budaya perkongsian ilmu. Akhir sekali untuk menyelidik hubungan antara amalan kerja dan pembangunan budaya perkongsian ilmu. Untuk tujuan penyelidikan, enam firma pembinaan di Sarawak telah dikaji melalui dua pendekatan iaitu kes kajian bersama borang soal selidik. Analisis deskriptif, frekuensi dan *one-sample t test* telah diaplikasi untuk menganalisis faktor, amalan kerja dan kepentingan hubungan dalam pembangunan budaya perkongsian ilmu. Hasil daripada kajian literatur, lapan faktor dan 51 amalan kerja telah dikenalpasti sebagai faktor dan amalan kerja bagi faktor yang membantu pembangunan budaya perkongsian ilmu. Sebanyak 34 daripada 51 amalan kerja yang dikaji telah dikenalpasti sebagai amalan kerja yang diutamakan yang mana bertindak sebagai penentu budaya perkongsian ilmu. Hasil analisis menunjukkan bahawa faktor strategi, struktur, mekanisme sokongan, pembangunan pengurusan, komunikasi, kepercayaan, motivasi, pembelajaran dan kesemua 51 amalan kerja yang telah dikenalpasti adalah penentu yang menyumbang kepada pembangunan budaya perkongsian ilmu.

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## **CHAPTER 1**

### **BACKGROUND OF STUDY**

#### **1.1 Introduction**

This chapter summarizes the context of this study through a general introduction of knowledge management and knowledge sharing culture for the support of knowledge management life cycle. The discussion begins with the background of knowledge management including their function to support business operation in the organizations. The critical issues of knowledge sharing culture in the construction industry are emphasized in the problem statement. Then, the research objectives, research methodology, scope and limitations and research justification are addressed. Finally, this chapter provides a brief chapter outline of this dissertation.

#### **1.2 Introduction to the Research Field**

During the 1980s, downsizing was organizations most popular strategy to reduce overhead and increased profits (Forbes, 1997, P. 28). However, the danger for organizations with high turnover rates resulted in a risk of losing important and valuable knowledge, as employees left and took the knowledge that they had accumulated over the years with them (Piggott, 1997, P. 169). With time, organizations had come to recognize that they had lost years of valuable information and expertise and were now determined to protect themselves against a recurrence (DiMattia and Oder, 1997, P. 33).



As more and more of what is valuable reside in the heads of people, organizations are becoming aware that if people leave, the value leaves too. These extra values are generated through knowledge worker's ideas, analysis, judgment, synthesis and designs (Frances., 1999, P. 78). Since knowledge workers are able to play certain roles in the organization structure and address organization challenges with their knowledge and experience; therefore they are of great and growing demand in the market.

In the 1990s, the impacts of globalization on economy put pressure on organizations to increase adaptability, innovation, and process speed. This is because with globalization, knowledge is increasingly available to everyone (Harari, 1997, P. 35). Schultz and Kitchen (2000, P. 101) described that globalization derived because of data transfer that allows knowledge to be easily and quickly distributed around the world. In this context, knowledge has become the most crucial component in the struggle for competitiveness (Richter and Vettel, 1995, P. 39). According to Svenja et al. (2003, P. 78), the new economy can be defined as congealed knowledge which means that the faster ideas transfer into business value, the greater the competitive advantage that can be preserved.

As reiterated by Tun Dr Mahathir Mohamed (2000), "knowledge economy is all about learning. As long as we are prepared to keep learning from each other and from the world, the knowledge economy should be a piece of cake and an ever expanding one," (The Sun, 6<sup>th</sup> September, 2000, P. 3). So, learning itself had become not the input, but part of the output. To survive in the knowledge economy, organizations need to do better tomorrow than yesterday and constantly be on the lookout on how to correct and prevent problems in business processes; in order to make continuous improvement to achieve business sustainability.

As a result, management undertakes knowledge management strategy in an effort to store and retain employees' knowledge for the future benefit of the organization

(Forbes, 1997, P. 28). Knowledge management is a discipline used to systematically leverage expertise and information to improve organizational efficiency, responsiveness, competitiveness and innovation as described by Tkach (1999, P. 5). Knowledge management is the combination of management awareness, attitude, practices, systems, tools and techniques designed to release the power of knowledge in a particular organization (McDonald, 1999, P. 67).

Knowledge management appeals to all working adults who operate in the knowledge economy. No one is exempted because everyone must use information, whether to evaluate internal or external dynamic information flows. Knowledge management makes sense to first organize what people know as a division and then to share it, which leads to a whole host of cultural issues. This is because knowledge management highlights the importance of a sharing culture in order to support and foster knowledge management focus (Alavi, 1999; Davenport and Prusak, 1998, P. 48). Knowledge management focuses on ways of sharing and storing the knowledge of individual, as a mean of improving organization's competency, speed, efficiency and profitability of a larger whole.

Since wealth creation is in people's minds rather than in their hands; organization will depend not only on workflow management but on enticing each employee's best idea, judgment and effort. Besides that, as stated by McDermott and O'Dell (2001, P. 81), "however strong your commitment and approach to knowledge management, your culture is stronger." To stimulate and motivate people to be productive in the contribution to a knowledge oriented culture, managers must create, manage and improve organization knowledge environment. This is because it would be meaningless to have strategic knowledge management systems if not actualized in practice. Practices are the most visible symbol of culture, and they provide the most direct way for changing behaviours needed to support knowledge. New behaviours resulting from new practices will change norms over time, which will provide long term support for more effective knowledge use.

Organizations that are keen to share, exchange and generate knowledge must have a culture that is aligned with the values that make such open transfer possible. This is because knowledge mobilization depends upon an organization culture that promotes overlapping behaviours such as information sharing and joint experimentation (Swan et al., 2000, P. 99). For organizations to change to a knowledge sharing culture; often it is slow and at times difficult. It will cause disorientation and disruption because people are used to working in a certain way, within a certain organization and using certain tools.

Consequently, the case of culture, by contrast, is more problematic. As described by Svenja et al. (2003, P. 78) “the most difficult but also the most important facilitating condition seems to be the culture, which is not only necessary but is essential to providing the trust among the actual knowledge workers to collaborate effectively.” Organization culture can affect both the scope and the content of knowledge transfer. Cultural barriers to sharing knowledge exist in the absence of elements of organization culture that would legitimize or support such sharing.

To promote better knowledge sharing culture, organizations should foster awareness that the value of knowledge is a relative matter. This is because people do not automatically pass their knowledge on to others; there are individual barriers which make people less willing or less able to do so. Employees usually regard certain areas of their personal knowledge as part of their power base within the organization, or as their private business. According to Gilbert (2000, P. 173) barriers at individual level are of two kinds: those affecting the ability to share knowledge, and those affecting the will to do so. In both cases, willingness to share knowledge is limited.

The ability to share knowledge depends primarily on the individual’s talent to communicate and his or her social behaviour. Knowledge assets may not be passed on because individuals are not able to describe and communicate them (Nonaka, 1995, P. 65). On the other hand, willingness is influenced by many factors. Pride in the ownership of one’s own expert knowledge may play an important part. Lack of time

resulting from real or imagined informational overload can also reduce preparedness to take part in knowledge sharing activities. Finally, employees often fear that if they pass their knowledge to others, they will endanger their own position in the organization. This happens mainly in strongly politicized organizations where knowledge serves as a power base. Under these conditions, efficient sharing of knowledge is usually impossible.

Consequently, the right organizational climate has an important part to play in creating the right culture for efficient sharing of knowledge. As knowledge is created invisibly in the human brain; only the right organizational climate can persuade people to create, reveal, share, and use it. This is because the human element in knowledge, a flexible, evolving structure is desirable, and motivational factors for creating, sharing, and using knowledge are very important.

### **1.3 Problem Statement**

Studies by Royal Commission (1992, P. 3) and Latham (1994, P. 6) in different countries have shown that the construction industry generally performs poorly, when compared to other industries. In Malaysia, the construction industry's products generally are of low quality. This is manifested everyday from complaints made by consumers through newspapers, television, radio and complaints to the authorities. Example of complaints made through the newspaper are 'Wrong building material, bad design turning our homes into sweat boxes' (The Sun, 5<sup>th</sup> May, 2000, P. 16) and 'Dream homes are a nightmare for buyers' (The Star: Metro, 20<sup>th</sup> May, 2006, P. M4). These issues are far too many in Malaysian built environment after the completion of a construction project such as defects, failure, poor workmanship, catastrophic and design inadequacies.

As remarked by Elias Ismail (2000, P. 42), “the indication of low quality can be gauged by the products that is ‘not as expected’, ‘not up to standards’, ‘not comfortable’, ‘not friendly’, and in addition to products that failed defects and so on.” All these low quality construction products had led to a decreased quality of life, unfriendly and uncomfortable environment. Consequently, quality is a vital issue to be addressed by all construction professionals today. According to Mohd Peter Davis (2000, P. 24), “quality within the limited context of construction is defined as conformance to adequately developed requirements.” Therefore quality problem is a tough issue because it is simply so subjective and it is a mind set issue from the perspective of the consumer.

Upon realizing the importance of quality within the construction industry, Chief Executive Officer from Construction Industry Development Board Malaysia (1995) commented that, “...one way to develop and upgrade the industry is from the aspect of upgrading or improving its product. The product refers to the quality of services it provides. There is no doubt that quality in any construction relies on all parties involve like the clients, developers, designers, consultants and builder. In assuring quality, the prominent success factor is the performance of the builders himself through the ability of his site managers, site supervisors and workers in translating and executing project information and drawings” (Dato Prof Hj. Abdul Rahman bin Abdullah, 1995, P. 7).

To accomplish quality improvement in the construction project, the construction organizations need to make improvement for their knowledge assets. Construction knowledge should be discovered, organized and shared among construction players to avoid potential knowledge or information from being deprived. According to Sarajul Fikri bin Mohamed (2002, P. 47) construction knowledge is thus both explicit (engineering principles etc.) and implicit (in one’s knowledge of organization, or location). In the construction industry, extensive knowledge is gained in the course of the project management. This is because construction of a project involves thousands of details and complex interrelationship among owners, architects, engineers, general

contractors, specialist contractors, manufacturers, materials dealers, equipment distributors, government bodies and agencies, employees and others.

Therefore, construction organizations demonstrate extremely high levels of knowledge as a result of the complexity of construction tasks that requires many experts in different fields. However, when an expert leaves or retires; his or her accumulated knowledge through years of experience is also gone or stored as various documents that are unorganized and hard to find. This knowledge is extremely valuable, because it is not available to the rest of the marketplace for the time being and therefore represents a major factor for setting an organization apart from the competition. Knowledge management is therefore critical to the construction industry (KPMG, 2000, P. 36).

According to Faridah Yusuf and Mustafa Samad (2000, Paper 10) knowledge management is considered as the ability of the organization to establish an environment, which supports the evolution of data to knowledge through information while enabling success. Consequently, knowledge management has the potential to release a significant amount of productive potential, for example: the historical reports of construction projects include a rich data context of buried details which provide knowledge that brings competence and skills to individuals in the organization and thus to the construction industry as a whole. Therefore, construction knowledge management involves establishing an environment conducive to more effective and efficient knowledge creation, application and sharing between parties and individuals which in turn help solve construction problem and thus improve performance.

The industry is also large and complex, the many different players in the industry does not share a common education base, as a result, cognitive frameworks are not always easily shared. However, when information is shared in a group setting, new ideas are generated. Besides that, knowledge sharing makes employees better informed for future decisions and actions. Furthermore, the project nature of the industry with a frequently reconfigured set of supply chain partners, non-repetitive nature of work,

pressure to complete and lack of incentive to appraise performance, means that information flow is often restricted. Subsequently, the ability to harness and effectively deploy the knowledge held by one's employee is crucial objective for many businesses especially in the construction industry.

Kamara et al. (2000, P. 258) stated that knowledge needs to be managed at different, interrelated levels in the construction organization including (i) management of knowledge within projects – across different stages of a project and (ii) management of knowledge in individual firms (e.g. consultants, contractors etc.) in the construction industry to enhance their capability to adequately respond to client requirements. However, knowledge in the organization is by no means always easily captured or effectively shared amongst industry players. Kululanga and McCaffer (2001, P. 23) stated that knowledge management is even more problematic in the construction industry, where even the management of existing knowledge is under-chartered territory.

Despite the interest and effort that have been invested by many leading construction companies into knowledge management; these efforts however seldom bring the expected improvements in business processes. Many practitioners and researchers have acknowledged the limitations of current approaches to knowledge management relating to and arising from projects involving several companies in the construction domain (Rezgui, 1998, P. 34 and Vakola, 1999, P. 47). These limitations include:

- a) Much construction knowledge, of necessity, resides in the minds of the individuals working within the construction domain,
- b) The intent behind decisions is often not recorded or documented. It requires complex processes to track and record the thousands of *ad hoc* messages, phone calls, memos, and conversations that comprise much project-related information,

- c) People responsible for collecting and archiving project data may not necessarily understand the specific needs of actors who will use it, such as the actors involved in the maintenance of the building(s),
- d) The data are usually not managed while they are created but instead are captured and archived at the end of the construction stage. People who have knowledge about the project are likely to have left for another project by this time - their input is not captured,
- e) Lessons learned are not organized well and buried in details. It is difficult to compile and disseminate useful knowledge to other projects, and
- f) Many companies maintain historical reports of their projects. Since people always move from one company to another, it is difficult to reach the original report authors who understand the hidden meaning of historical project data. These historical data should include a rich representation of data context, so that they can be used with minimum (or no) consultation.

The above limitations all impede sharing of knowledge among individuals and organizations within the construction sector. Specific knowledge in the construction industry is difficult to collect and transfer. It is generally recognized that there is much 'knowledge wastage' and difficult in accessing important information. However, it is this knowledge that brings competence and skills to the individuals in the construction industry and thus to the organization as a whole.

Knowledge is by no mean always easily captured or effectively shared among industry players in the construction industries. It is therefore important for individuals with the relevant knowledge to share information among themselves. This is because every problem in the construction industry needs to be solved in a way that utilized other people's knowledge to develop different people's capacity to handle problems. The



construction industry does not base on an individual's ability to do better job; everyone in the organization is expected not only to develop appropriate technical expertise, but also analytical, business, human and conceptual skills.

As construction industries strive to improve the quality of products it provides, they need to meet the challenges of utilizing the knowledge and information of their human experience and expertise of production to sustain competitive advantage. As part of this process, organizations need to enable their staff to capitalize on their individual knowledge and information with others. To succeed in the development of knowledge sharing culture, organizations and individuals need to both accept and adapt to an environment where intangibles assets are the key driver in the organization. They need to develop new processes, cultures and behaviours that encourage the creation of new knowledge, the sharing of existing experience and know-how and the efficient utilization of those assets for the benefit of all (Oxbrow, 2000, P. 20).

To materialize the development of knowledge sharing culture within the construction industry, it will be helpful to clarify the linkage between the organization culture, practices and individuals' behaviours in the construction industry. The linkage is that organization culture bearing certain characteristics that influences work practices, and work practices in turn influence employees' behaviours (De Long and Davenport, 1997, P. [www.bus.utexas.edu/kman/pubs.htm](http://www.bus.utexas.edu/kman/pubs.htm)). This means that right organization characteristics along with right work practices conducive to knowledge sharing influence employees' behaviour.

Obviously, the issue of intention to knowledge management is as important as having positive attitudes and commitment towards effective knowledge sharing culture. Consequently, this research attempts to identify the determinants that promote the development of knowledge sharing culture among organizations in the construction sector. In order to respond to the research question, the identified determinants that promote the development of knowledge sharing culture are listed in each subsequent

section in chapter two; in the form of research propositions for data analysis in chapter four.

Therefore, the goal of the present study is to contribute to the understanding of the factors determining the development of organization's knowledge sharing culture by exploring the practices for factors that influence employees' active participation in these communities. Having observed the determinants, the retention of workers with valuable knowledge may be just a key element of an organization's knowledge management strategy as it attempts to induce its workers to share their knowledge.

#### **1.4 Research Objectives**

The objectives of this study are as below:

- i. To identify the practices for factors that promote the development of knowledge sharing culture.
- ii. To identify the preferred practices for each factor that promotes the development of knowledge sharing culture.
- iii. To investigate the relationship between the factors and the development of knowledge sharing culture.
- iv. To investigate the relationship between the practices and the development of knowledge sharing culture.

## **1.5 Research Methodology**

This section provides a brief outline of the research methodology that had been adopted to guide this study. Extensive literature review had been conducted to provide a comprehensive background study. The review mainly examined the overall definition of knowledge, types of knowledge, knowledge management, knowledge sharing culture, construction industry issues, and related issues on the lack of knowledge sharing culture in the construction industry. Furthermore, the review highlighted the factors and practices that promote the development of knowledge sharing culture.

The researcher employed a case study approach with six units of study and questionnaire survey in this investigation. Interviews were carried out with construction professionals from the case studies to verify the factors and practices for factors that promote the development of knowledge sharing culture. Questionnaire survey was conducted to validate the factors and the practices for factors that promote the development of knowledge sharing culture from the knowledge employees' point of view. Data collected from the interview and questionnaire survey were analysed using qualitative analysis, frequency analysis and one-sample *t* test. The output of the analysis reflected the factors and practices for each factor that promote the development of knowledge sharing culture.

## **1.6 Scope and Limitations**

The area of research focused on the construction firms in Sibu, Sarawak. The reasons for the particular mode of study in Sibu construction industry can be best explained as the result of its size, diversity of operations in wide geographical areas, organization of production process, price determination procedures, number of specialist firms required and various sources of equipment and material or components needed for

production. Besides that the increasing population and influx of workers to this highly commercialized town has increased housing development in the urban areas (Sarawak Property Bulletin, 2004, P.2). As a result, there are many leading construction firms which generate employment and valuable spin-off industries to the state's economic growth.

Under the 8<sup>th</sup> Malaysia Plan (2001-2005), RM570 million has been allocated to SibU for its development. The majority are spent on new infrastructure development including roads and bridges and the upgrading of existing facilities. This is to achieve SibU's vision of becoming a Garden City by the River (Sarawak Property Bulletin, 2004, P. 2) has exert the dire need for quality infrastructure to remote part of SibU. To ensure quality infrastructure development, the practice of knowledge sharing culture among the relevant parties in the construction industry is critical to foster continuous education from the knowledge and experience gain from past projects.

Current research is generally targeting those big organisations that are acting as main contractors. This study converged on the perception from two management levels of a particular construction organization which include tactical and operational level. However, it is limited to the investigation of organization behaviour and practice over employee behaviour in the development of organization knowledge sharing culture.

## **1.7 Research Justification**

Knowledge sharing is critical to the construction organizations due to its temporary nature of and short-term relationships between project teams; the transfer of knowledge from one project to the next and from one firm to the other has been extremely difficult. This knowledge is often tacit remained in individuals and organizations and finally disappears once the project is closed out. The fragmented nature of the construction environment is another cause that inhibits performance

improvement. As a result the need to share knowledge in the construction industry is often overlooked or not well managed. By enhancing the development of knowledge sharing culture would help to solve this problem through the distribution of such intelligence among the relevant parties within the construction industry.

The turnover of the construction industry represents about 10 per cent of the GDP of most countries (Olomolaiye et al., 1998, P. 26). The perception remains that construction knowledge sharing culture is a peripheral function which has a tenuous relationship with business success. This is because in a world of interactive technologies with new networked business models required a radical approach towards effective sharing of knowledge by changing people's attitudes toward work and authority. Consequently, efficient knowledge sharing practice in this sector shall benefit in several ways including minimizing wastes and rework, improved business performance and productivity.

Furthermore, effective management of knowledge can be achieved within the construction industry through attaining relevant expertise, skills and excellence from different fields. At the outset, it strives to facilitate formal and informal learning through organization environment among construction people. The effect shall produce more informed, knowledgeable workforce who achieved mastery in their business and thus the performance of the organization shall be improved. As a conclusion, a radical way in which construction knowledge is transferred between individuals in the industry is expected to occur.

## **1.8 Structure of Chapter Outline**

This dissertation is divided into 5 chapters as follows:

Chapter 1 presents the background of study which includes problem statements, research objectives, research methodology, scope and limitations and research justification.

Chapter 2 begins with the discussion on knowledge and knowledge management. Then, the definition of knowledge sharing culture, factors and practices that promote the development of knowledge sharing culture are addressed.

Chapter 3 explains the research design which included the research procedures; survey and data analysis methodologies.

Chapter 4 contains data analysis, results and discussion of this study. The intention is to provide a context in which the objectives of this study are accomplished.

Chapter 5 consists of the conclusions and recommendations for further research which includes generalizing the findings and research limitations.