

DISSEMINATION OF KNOWLEDGE: OVERVIEW IN MALAYSIAN CONSTRUCTION ORGANISATION

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Abstract: Construction projects require proper knowledge sharing implementation in order to satisfy the demand of today's knowledgeable and aggressive clients. The effective knowledge sharing process in construction projects is certainly one of the key components to success. It is crucial for the construction industry to develop a new strategy in order to align with the other industries especially in the knowledge sharing aspect. The primary aim for this paper is to determine factors that contribute to barriers for knowledge sharing implementation in Malaysian construction organisation. This study also identify solutions that construction organisation should adapt strategies towards achieving proper knowledge sharing implementation. The factors identification process was collected through intensive literature study and supported by 2 numbers of interview sessions conducted in contractor organisation. 90 sets of questionnaire were distributed in determining the barriers and solutions. As the results, the factor of intangible benefit contributed to the barriers. Furthermore, role model in organisation is among solutions for Malaysian contractor organisation in order to promote knowledge sharing initiative in the industry. The output of this study is recommended for a milestone of knowledge sharing studies in Malaysia particularly to construction industry to transform in knowledge era in the new globalised world.

Keywords: *Knowledge, Knowledge sharing, Construction, Organisation*

1.0 Introduction

As Malaysia moves towards a knowledge-based economy and knowledge society, the need to prepare for the change is crucial. Nowadays, people live in a knowledge society where one of the key resources is knowledge and where information technology is the enabling mechanism. On the demand of this era, knowledge sharing initiative has become imperative to study. Knowledge sharing has become an important initiative discussed and undertaken, not only by business organizations but also by other types of corporations dealing with consultation, research, and education as well as construction

sector. Research on knowledge management has shown that knowledge sharing is a key as well as a challenge to the success of knowledge management both in theories and in practice (Grant, 1996a). Spencer (1999) explained in simpler terms that knowledge sharing seeks to make the best use of the knowledge that is available to an organization, creating and sharing new knowledge in the process. Internal knowledge, such as operational procedures, special skills, and technical know-how, makes the most valuable asset for organizations.

To enable a faster and better quality project delivery system, it is necessary for Malaysian construction organisation to migrate from the traditional/old-trend construction practices to the advance construction practices especially in how to manage project information thus to sharing the knowledge. Von Krogh in 2002 believed that project performance can be improved when employees communicate by sharing and utilising best practices, lessons learned, experiences, insights, as well as creating new knowledge. In order to do this, knowledge must be shared with employees, departments and even other companies to derive best practices. Successful organizations are those which have learned to maximize the return on all their assets - physical, financial, human and intellectual. But the management of intellectual assets is a new and challenging process as pointed out by Newcombe (1999) and Argote et al. (2000). Transferring knowledge within the construction sector has proven a rather difficult challenge in practice.

Many executives and managers and academics are struggling to understand and implement knowledge sharing strategies. Effective knowledge sharing process in construction projects is certainly one of the key to success as it provides an alternative approach that enables the organization to integrate and use all its intellectual resources via advanced information and communication technology. The expected result of this initiative is an improvement in the organisation's overall performance, innovativeness and competitiveness. Therefore, this paper is organized to provide a brief review of the literature on barriers and solutions for knowledge sharing in construction organization as well as general survey.

2.0 Literature Review

2.1 Knowledge and Organizational Knowledge

Nonaka (1994) recognizes knowledge as a multidimensional concept; likewise Davenport and Prusak (1998) distinguish knowledge as something deeper and richer than data or information. On the other hand, Bartol and Srivastava (2002) consider knowledge a broad concept which includes information, ideas and expertise relevant for tasks performed by individuals, teams, work units and the organisation as a whole. Drucker (1999) states that most part of today's work is knowledge work. Knowledge sharing practices coordinate organisational knowledge bases with knowledge workers

and vice versa (Nonaka and Konno, 1998). Knowledge consists of truths and beliefs, perspectives, concepts, judgements, expectations, methodologies and know-how and exists in different forms (Egbu, 2000). Knowledge in the construction domain can be classified into the three following categories (Lima, et al., 2002). It is categorized into domain knowledge, organizational knowledge and project knowledge.

Despite different understanding of knowledge interpretation, people agree that knowledge is one of the most important organizational resources. Thus, it must be shared and widely disseminated. World, today has shown the importance of knowledge and intellectual capital to organizations. For several years now, the issue and importance of organizational knowledge sharing is increasingly recognized (Argote, 1999; Tsai, 2002; Bechky, 2003). Two factors considered essential for long-term success of the firm involves the related concepts of innovation (Capon et al., 1992) and knowledge. Study by Nahapiet and Ghoshal, 1998; Conner and Prahalad, 1996; Grant, 1996b again stressed that knowledge is one of the most important resources of organizations. However, Lahti and Beyerlein in 2000 point out that without the employees, firms are unable to develop knowledge. In addition, Blair (2002) believes that when organisation's employees "have knowledge" that is beneficial to their organisation, they own something more than the data and information stored in the organisation's information systems. Knowledge is increasingly being recognised as a vital organisational resource that provides competitive advantage (Egbu, 2002).

However, sharing knowledge requires a communication between people to manage the tacit and explicit knowledge efficiently (Pervaiz, et al., 2002, Amani *et al.*, 2012). Nonaka (1991) defines explicit knowledge as the knowledge, which has been codified and expressed in formal language. On the other hand, tacit knowledge is harder to express, represent and communicate, it is intuitive, unarticulated and cannot be verbalized (Li and Gao, 2003).

2.2 Knowledge Sharing

Through the centuries, knowledge sharing has been of benefit to both individuals and groups (Reid, 2003). To learn and acquire new knowledge, individuals should interact and share implicit and explicit knowledge with each other. Hence, knowledge sharing is a crucial issue in organizations (Sa'enz et al., 2009).

Knowledge sharing is defined in accordance with Van Den Hooff and De Ridder's (2004) conceptualization. It is a process where individuals mutually exchange their implicit (tacit) and explicit knowledge to create new knowledge. According to this definition, knowledge sharing has two facets; collecting or receiving, and disseminating or donating, knowledge. On the other hand, Helmstadter (2003) defines knowledge sharing in terms of voluntary interactions between human actors through a framework of shared institutions, including law, ethical norms, behavioral regularities, customs and so

on. The subject matter of the interactions between the participating actors is knowledge. In addition to this definition, Truch, et al. (2002) move from the structure to the medium involved by stating that knowledge sharing has been arrived as transfer of information via channels such as email or databases, and direct interaction between people in order to share and align respective meanings/contexts, thereby increasing effectiveness of knowledge sharing.

As Naikal in 2005 point out, despite different definition of knowledge sharing, the ultimate goal of knowledge sharing is to distribute the right content to right people at the right time. Thus, it enables people to find relevant information and expertise that can aid into decision-making and problem solving effectively.

2.3 Knowledge Sharing in Construction Organization

Increased complexity of the construction business and consequence use of new management concepts and technologies led construction organizations to focus more on the transfer of knowledge. Arayici et al., (2005) claimed that collaborative working using information and communication technologies (ICT) systems in construction has become reality as many activities are performed globally with actors located in various geographical locations. He also add computer integrated construction (CIC) is the type of ICT system that binds a fragmented and geographically distributed set of construction stakeholders collaborating together. Both explicit and tacit are significant in construction industry where project team will use explicit to manage the contract or relationship between parties involved. However, tacit also important when a particular decision need to clarify urgently in emergency circumstances. It has been suggested that in the management of knowledge, organizations must be able to provide an environment in which individual and organizational knowledge, whether tacit or explicit, general or specific, declarative, procedural or causal is refined and repositied (Juhary, et al., 2004). On the other hand, construction industry also known as a high risk industry regarding to the project complexity. Thus, the interaction between explicit and tacit knowledge must be managed efficiently to minimize the risk.

2.4 Barriers and Solutions of Knowledge Sharing Implementation

Both Barney (1991) and Grant (1996) argued that knowledge is the most valuable resource of modern organizations and therefore the sharing of organizational knowledge within organizations is seen as being critical for the ability to leverage and use knowledge resources appropriately (Leonard-Barton, 1995; Boisot, 1998; Brown and Duguid, 2000; Carlile, 2004). Successful organizations practice to maximize the return on all their assets by utilizing physical, financial, human and intellectual. The new challenges evolve in organisation to manage intellectual asset in their management process. Many executives, managers and academics are struggling to understand and implement knowledge sharing strategies. Parallel with this, knowledge must be shared

with employees, departments and even other companies to derive best practices for the successful organisation.

2.4.1 *Organisational climate*

Factor that seems to have a considerable impact on knowledge sharing is organisational climate. Without a proper atmosphere in organisations, Sun and Scott (2005) claimed that other attempts to share knowledge might be worthless. In addition, the lack of an aspiring culture to communicate and explore new ideas may become a major barrier to knowledge sharing.

Skyrme (2002) point out another version of this culture which shows managing knowledge assets can be a challenge, especially in the construction industry, where short-term working contracts and temporary coalitions of individuals can inhibit knowledge sharing. Below are some of barriers arising in sharing the knowledge:

a) Knowledge is power

In today's enterprise, where so much depending on teamwork and collective knowledge, it is only a handful of people who have knowledge for which they can hold their peers (and bosses) to ransom. It might be the owner-manager of a small company not wanting to lose trade secrets; it may be a particular specialist who has been in the organization many years and built up his or her own unique way of achieving success without perhaps even understanding the deep tacit knowledge of how they do it. However, knowledge is power, but typically not the primary reason for lack of knowledge sharing.

b) 'Not invented here' syndrome

This is more common. People have pride in not having to seek advice from others and in wanting to discover new ways for themselves.

c) Not realizing how useful particular knowledge is to others

An individual may have knowledge used in one situation but be unaware that other people at other times and places might face similar situations. Additionally, knowledge derived for one need may be helpful in totally different contexts; or it may be a trigger for innovation – many innovative developments come from making knowledge connections across different disciplines and organizational boundaries.

d) Lack of trust

People will use others knowledge out of context, “mis-apply” it or pass it off as their own without giving any acknowledgement or recognition to the author. Another term for this barrier is plagiarism which is illegal and can have severe effect on the law side.

e) Lack of time

This is major reason given in many organizations. There is pressure on productivity, on deadlines and it's a general rule that the more knowledgeable you are, the more there are people waiting to collar you for the next task. People can possibly find time to add their lessons learnt to the knowledge database or have a knowledge sharing session with their colleagues.

According to Skyrme (2002), other barriers cited by experts include functional silos, individualism, poor means of knowledge capture, inadequate technology, internal competition and top-down decision making. Generally, a mix of structural and infrastructure barriers is exacerbated by the predominance of human ones - social, behavioural and psychological. It shows that there are several factors affecting adoption and implementation of knowledge sharing in construction organizations. Thus, suggestion to improve knowledge sharing implementation in organisation is suggested by Peansupap, et al. (2005). The suggestions were categorised into four factors i.e., culture, technology, management and workplace environment.

According to Skyrme (2002), culture change is never easy and takes time, however, cultures can be changed. Culture is defined in many ways, such as commonly held beliefs, attitudes and values (Hofstede, G. 1997), and in many other ways that also embrace rituals, artifacts and other trappings of the work environment. The simple but effective definition is the way we do things around here. There are some activities that might be used to plan and induce change in example a culture audit, use of role models and team-building / organization development sessions (Skyrme, 2002).

In addition, Skyrme also stated, culture goes hand in hand with structure (roles and responsibilities). At every level within the organization, there must be congruence between objectives, structures, processes, people and supporting infrastructure, and individual's motivations is the first step towards implementing changes in the work setting. People can change organizational culture and individual behaviours such that knowledge sharing, rather than knowledge hoarding, is the norm. There are seven incentives for sharing with examples (Stevens, 2000). Table 1 gives the example of activities or project engaged with the incentives of culture in knowledge sharing.

Table 1: Seven incentives of culture in knowledge sharing in some activities or project based (Stevens, 2000)

No.	Incentives	Examples : Activities / Projects
1.	Hire people who will share	At collective technologies of Texas, the process starts with recruiting people through an intensive few days of interactive interviews.
2.	Develop trust	Buckman Laboratories nurtures trust through its ten point code of ethics in which employees are steeped.
3.	Vary motivations	CAP-Gemini Ernst & Young applies incentives at three levels: a solid business case for senior executives, relevant benefits for departments, and incentivising positive behaviours with employees.
4.	Show public recognition	Harris has its 'wall of fame' a gallery of pictures of employees who have excelled at knowledge sharing.
5.	Reorganize for sharing	Northrop Grumman uses integrated product teams, backed up by appropriate mentoring programmes.
6.	Create communities	The World Bank uses electronic bulletin boards focused around relevant topics, but which cut across organizational boundaries.
7.	Develop leaders	Capital one formed a group from natural knowledge champions to promote knowledge sharing and develop training.

2.4.2 Technology

If organisations aim to enjoy knowledge sharing advantages, they will have to consider a number of key factors. Information technology (IT) is considered as one of the decisive factors in knowledge sharing. As one of the potential influences on knowledge sharing, IT has been examined in many researches (Jarvenpaa and Staples, 2000). And according to Jarvenpaa and Staples, (2000), individuals strongly believed that the use of computer-based information systems and electronic media contributed to providing valuable information.

Everyone benefits by sharing information. It is clear that technology like the World Wide Web can greatly enhance the sharing of knowledge both within and outside organisations. But knowledge sharing means more than databases and networks. Companies that have undertaken such initiatives have found that only 20 percent of their efforts involve technical issues; the remaining 80% of their time is taken up with institutional matters to create an environment for sharing and open exchange (Burk, 1999). Egbu in 2002 define the role deeply by explaining about the role of information technology (IT) in knowledge management as an essential consideration for any company wishing to exploit emerging technologies to manage their knowledge assets. Therefore, it can be said that information technology is one of factors that improve the quality knowledge sharing process for a particular organization to gain better return on

all assets i.e. physical, financial, human and intellectual. Following Table 2 describes future usefulness of Technologies and techniques for Knowledge Management in one United Kingdom case study.

In addition, knowledge sharing process needs every organization to use many distributing channels (Knowledge sharing platform) such as team meetings, video screening sessions, training and workshops/seminars/conferences to achieve the goal of sharing purpose. Additionally, according to Egbu (2002) IT is evolving. Based on his research, several lists of tools and technologies were provided and respondents were asked to assess how useful each would be for managing knowledge in the next 5 years. The internet, intranet and e-mail as the most useful tool for the future, demonstrating that there is an awareness of the increasing significance of newer communication tools over older ones, such as the telephone, and face-to-face meeting.

Table 2: Future usefulness of Technologies and techniques for Knowledge Management– United Kingdom studies (Egbu, 2002)

Technologies and Techniques	Mean Values
Internet/Intranet/e-mail	4.6
IT-based database	4.4
Telephone	4.2
Face-to-face meetings	4.2
Coaching and mentoring	4.1
Interaction with supply chain	4.1
Formal on-the-job training	3.8
Formal education and training	3.8
Cross-functional teamwork	3.8
Informal networks	3.7
Brainstorming sessions	3.6
Documents and reports	3.6
Project Summaries	3.5
Knowledge-based Expert systems	3.3
Work manuals	3.2
Video-conferencing	3.2
Job rotation	3.1
Decision support systems	3.1
Bulletin boards	2.8
Help desks	2.8
Quality circles	2.7
Knowledge Maps	2.6
Communities of Practice	2.5
Groupware	2.5
Storytelling	2.0

3.0 Methodology and Research Lead

Data needed for this study was collected via a questionnaire based on thorough review of the related literature and secondly via interview. The research employed a combination of qualitative and quantitative research method. Interviews have been conducted to collect richer data about the important variable for knowledge sharing, in two construction organizations. Two interviews were conducted among two project based organisations in Malaysia in order to find contextually rich descriptions about the nature and variables of knowledge sharing in these organisations. These organisations include Class A contractor firm from private sector organisations.

150 questionnaires were distributed to contractor organisation. This approach was supplemented by 90 numbers of questionnaires distributions were returned. 3 sets of a questionnaire are meant for each contractor firm consisting of top, middle and lower management level. The questionnaires were analysed statistically using SPSS software.

4.0 Result And Discussion

A total of 90 respondents have responded to the study. Overall respondents were 56 males outnumbered 34 females and giving a ratio 2:1. The respondents were at intermediate age 55% were between 18-30 years, while about 25% more than 41 years. The education qualification shown the respondents were knowledgeable, where majority 63.3% are a bachelor degree holder. In term of experiences of service in construction projects, only 13.3% have experiences more than 15 years while 56.7% have less than 5 years.

Based on the study conducted, the results show that there are 2 main barriers influencing knowledge sharing implementation; 1) Knowledge is power and 2) Knowledge sharing benefits are intangible and cannot be measured. While, there are 2 solutions to encounter the barriers; 1) Team building or organisation development sessions provided and 2) Develop leaders.

Before the detail discussion is revealed, the survey on purpose of knowledge sharing has taken place at the beginning of the question. The purpose is to get the general view on knowledge sharing in contractor organisations as a whole. Table 3 shows that increase knowledge, productivity and quality the main purpose of knowledge sharing in contractor organisation.

Table 3: Purpose of knowledge sharing

Purpose of knowledge sharing	Mean Values
Increase knowledge, productivity and quality	4.44
Can be used in decision making	4.33
Can fulfil staffs and client satisfaction	4.09
Can increase return on investment (ROI) for organisation	4.27
Can reduce expenditure cost for organisation	4.19

Table 4: Why don't people share

Why don't people share <i>Skyrme (2002)</i>	Mean Values
Knowledge is power	4.03
'not invented here' syndrome	3.54
Not realizing how useful particular knowledge is to others	3.89
Lack of trust	3.67
Lack of time	3.51

Table 4 exhibits people are unwilling to share as of 'knowledge is power'. According to Skyrme (2002), knowledge is power, but is not the primary reason for lack of knowledge sharing. However, for Malaysian contractor organization, knowledge is power has proven to be one primary reason in the barriers of knowledge sharing implementation.

Lack of time is major reason given in many organizations (Skyrme, 2002). However, in this study, lack of time has become least barrier in knowledge sharing implementation for contractor organisation. The reason is related to rich data and document specifically related to internal and external parties belong to construction organisation.

Table 5: Factors discouraging knowledge sharing

Factors discouraging knowledge sharing	Mean Values
Knowledge sharing benefits are intangible and cannot be measured	3.90
High cost required for knowledge sharing programs	3.51
Attitude of not sharing knowledge among employee – e.g.: Individualism	3.68
Inadequate technology	3.53

Table 5 shows the other factors of discouraging Knowledge Sharing implementation in contractor organisation. People insight that knowledge sharing benefits are intangible and cannot be measured. This main factor contributes to the paucity of knowledge sharing process in an organisation. Further findings; cost subject is not the main issue for knowledge sharing process in Malaysia contractor organisation.

Table 6: Factors encouraging knowledge sharing

Factors encouraging knowledge sharing	Mean Values
Existence of role models in the organization	4.02
Team building / organization development sessions provided	4.16
I will share if there is align rewards and recognition to support sharing behaviour	3.59
Proper technology / network provided makes knowledge sharing easier to execute	4.14
I will share if all employees feel that sharing knowledge is everyone responsibility	4.06
Smaller department makes ease on sharing knowledge execution	4.00
I will share if my individual achievement is evaluated based on employees proficiency of sharing knowledge	3.72

Factors encouraging to knowledge sharing implementation are imperative to study as it gives the solution to barriers faced by an organisation. From Table 6, it can be seen that employees need team building or organization development sessions in encouraging process of knowledge sharing among them. Definitely, the study has proven that rewards and recognitions are not the important factor in encouraging knowledge sharing behaviour.

Table 7: Suggestion to encourage knowledge sharing

Suggestion to encourage knowledge sharing	Mean Values
Hire people who will share	3.84
Develop trust	4.26
Vary motivations	4.23
Show public recognition	3.91
Reorganize for sharing, e.g.: mentoring programs	4.02
Create communities	3.93
Develop leaders	4.28
Knowledge sharing benefits campaign in organization	3.97

Table 7 provides a list of suggestion to encourage knowledge sharing process in workplace. Develop leaders are chosen by respondent in encouraging knowledge sharing behaviour among employees. This factor is supported by Table 8, the importance of Chief Knowledge Officer (CKO). As people know, leaders play a big role in coordinating all activities in an organisation. Besides, the least factor of encouraging knowledge sharing is “hire people who will share”. Hire people who will share is definitely impractical method to implement since it is difficult to evaluate people who are willing to share from the beginning stage of recruitment.

Table 8: Importance of chief knowledge officer

Management level	The need of Chief Knowledge Officer			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Lower	28	31.1	2	2.2
Middle	29	32.2	1	1.1
Top	30	33.3	0	0
Total	87	96.6	3	3.3

Table 9 : Knowledge Sharing technologies for Malaysia construction organisation (based on Egbu studies, 2002)

Technologies for knowledge sharing Egbu, (2002) studies	Mean	Ranking [Malaysian contractor organisation practices (2006)]
Internet/Intranet/e-mail	4.38	2
IT-based database	3.98	6
Telephone	4.49	1
Face-to-face meetings	4.27	3
Coaching and mentoring	4.07	5
Interaction with supply chain	3.72	11
Formal on-the-job training	3.69	12
Formal education and training	3.79	8
Cross-functional teamwork	3.62	13
Informal networks	3.61	14
Brainstorming sessions	3.46	15
Documents and reports	4.10	4
Project Summaries	3.91	7
Knowledge-based Expert systems	3.79	8
Work manuals	3.73	10
Video-conferencing	2.76	25
Job rotation	3.21	21
Decision support systems	3.27	19
Bulletin boards	3.16	22
Help desks	2.77	24
Quality circles	3.38	17
Knowledge Maps	3.26	20
Communities of Practice	3.41	16
Groupware	3.30	18
Storytelling	3.14	23

Table 9 shows the technology used by Malaysian contractor organisation in sharing knowledge. This table shows that internet become the most useful technology in UK while Malaysia is using telephone as a main tools for sharing.

5.0 Conclusion

The overall findings of the study conclude that the knowledge sharing implementation in contractor organisation is generally positive. However, there are certain areas that need special attention especially the technologies of communication where it is the aid of knowledge sharing implementation. A good sign for the construction industry is that there was only little proportion of the response were negative.

Mainly the reason why they do not share is because they wisdom that knowledge is power. This factor indirectly contributes to the 'individualism' factor among employees. Other factor is knowledge sharing benefits are intangible and cannot be measured. Therefore, to solve the problem, the organisation must provide team building or organisation development session in their organisation as well as develop leader in encouraging knowledge sharing initiative in the workplace.

There are several conclusions that can be drawn from the study in general which can contribute towards the success of knowledge sharing implementation:

- The overall result seems to be good and satisfactory in some aspect as far as the implementation of knowledge sharing is concerned. However, confidential level shall be considered in every group of management level (top, middle and lower). There are some private and confidential data or document to certain party.
- In general, the study provides the industry with the real situation faced with regards to the implementation of knowledge sharing. Although knowledge sharing is a common terminology, however, it is consider new in 'practicing' it.
- Knowledge sharing in projects can be carried out through utilizing information technology, and this can be established through an integrated environment, where all parties are well connected to each other. However, the failure of recognizing the benefits of knowledge sharing in construction organisation prevents this kind of new approach to be implemented in the industry effectively.
- To enable a faster and better quality project delivery system, it is necessary for Malaysia to migrate from the traditional/old-trend construction practices to the advance construction practices through knowledge sharing implementation process.

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