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Knowledge Management Practice in Malaysian Construction Companies

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Abstract: Construction industry is rich of knowledge that is considered to be the main source of the competitive advantage. This knowledge is threatened to be lost unless it is managed using a systematic knowledge management approach. This study investigated the level of knowledge management practice within the biggest Malaysian construction companies through the perceptions of the project managers. A questionnaire was distributed to the project managers of a number of 480 construction companies in Malaysia via an online survey. A total number of 227 completed respondents were collected from 181 companies. It is found that the practices of knowledge management processes, namely creating knowledge, capturing knowledge, organizing knowledge and storing knowledge were modest. However, the practices of disseminating knowledge and applying knowledge were low. Thus, Malaysian construction companies have to give more attention to their knowledge and ensure a structured application of knowledge management to sustain their knowledge and competitive advantage.

Key words: Knowledge Management · Knowledge Management Processes · Construction Industry · Creating Knowledge · Capturing Knowledge · Organizing Knowledge · Storing Knowledge · Disseminating Knowledge · Applying Knowledge

INTRODUCTION

The application of knowledge management in project-based organizations usually confront difficulties that are not common in non project-based organizations. These difficulties are happening because of the nature of projects that work on long life cycle and non-repetitive tasks [1]. In addition, projects depend on assembling of specific project teams who are disbanded once the projects are completed. These project teams often come from different companies for a short time and they have knowledge and experience from previous projects that are inherent in their mind (tacit knowledge) and will be lost when they leave. Therefore, project-based organizations need special knowledge sharing to facilitate capturing knowledge from individuals and transfer it to explicit knowledge [1]. This paper aims to investigate to what extent knowledge management is used in Malaysia construction companies. It tries to answer the questions: Do they benefit from the current project knowledge and individuals' past project knowledge and experiences? Do they store the current created project knowledge and individuals' past project knowledge and experiences to reuse it in future projects?

Knowledge Management: Knowledge management (KM) is the process of creating, modifying, sharing and applying knowledge to create value from an organization's knowledge assets [2, 3]. Kim [4] described knowledge management as the method that identifies, manages and shares all of the organization's knowledge assets including employees' experiences. Knowledge management involves individuals sharing of their experience, skills, ideas, context, interpretations, judgments, intuition and motivations [5]. Knowledge management aims to create a knowledge sharing environment within an organization [6] to improve performance through knowledge [7]. Furthermore, it aims to support organization's activities such as problem solving, decision making, strategic planning and dynamic learning by capturing, selecting, organizing, disseminating and transferring the important information and expertise [8].

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The Importance of Knowledge Management: Researchers identify the importance of knowledge management application within an organization. Hall and Sapsed [9] pointed out that the application of KM and knowledge sharing are recognized as an important source to sustain organizations' competitive advantage. There is a strong evidence that the effective management of the organization's knowledge is a critical factor that improves organizational competitiveness [10, 11]. Kim [4] believes that the purpose of KM is to deliver high values to the organizations. Auster and Choo [12] pointed out that the main goal of KM is to enable the organization to learn and to be adapted to its changing environment by harnessing its knowledge resources and knowledge capabilities. Also, KM provides a competitive advantage because it allows an organization to solve problems and take advantage of opportunities, increases responsiveness and innovation, save costs, supports decision making, facilitates collaboration, increases employees' productivity and reduces the negative impact associated with knowledge attrition [13].

Knowledge Management in Construction Industry: Construction industry can be described as a knowledge intensive sector [11, 14]. Furthermore, Fong and Chu [15] mentioned that the construction industry is rich with information and knowledge because of its fragments, the nature of the project, the wide variety of trades involved in the industry, information and knowledge are scattered over different processes, trades and people from different projects in the organization. However, knowledge management is a new and evolving practice for the construction industry [16]. Despite the significant role of knowledge management, construction companies often manage their knowledge informally and they need to do this managing more structured through knowledge management because of the challenges facing them today [17].

In the construction industry, project teams come together to execute the project and confront change situations and different problems that must be managed. These teams often execute their projects depending on their past experiences, rather than following continuous learning or analytical approach [18]. However, attracting and retaining qualified project managers and workers are expensive [19]. Tupenaite, Kanapeckiene and Naimaviciene [20] stated that high ratio of construction companies expected to lose a large portion of their qualified and skilled workforce with the lack of handling construction management problems that arise, unless they implement systematic and effective knowledge management practice to utilize and distribute knowledge.

Knowledge Management Processes: The effective implementation of knowledge management requires sequent processes that ensure and encourage the knowledge flow [21]. The aim of these processes is to leverage organizational knowledge capital to facilitate the achievement of organizational objectives [22]. The researcher explored and analyzed previous knowledge management processes and concluded that KM model provided by Lawson [23] is appropriate for this study as shown in Table 1. It is found that this model covers all the necessary activities of knowledge management. Lawson [23] used six different processes of knowledge management from the combination of the processes identified by Wiig [24]; Horwitch and Armacost [25]; and Parikh [26] and argued that they are sufficient to complete the assessment of knowledge management within an organization. Therefore, this study used these six processes to assess the current knowledge management implementation in Malaysian construction companies which are: creating knowledge, capturing knowledge, organizing knowledge, storing knowledge, disseminating knowledge and applying knowledge [27-35].

Table 1: Knowledge Management Processes

	Wiig [24]	Ruggles [27]	O?Dellý andý Grayson [28]	Zack [34]	Bhatt [29]	Egbu, Gaskell and Howes [30]	Gold, Malhotra and Segars [31]	Parikh [26]	Horwitch and Armacost [25]	Seufert, Back and Krogh [32]	Lawson [23]	Tserng anf Lin [3]	Current Study
Creation	X	X	X		X	X			X	X	X		X
Capture			X			X	X			X	X		X
Organization		X	X	X		X		X	X		X		X
Storage				X	X		X				X	X	X
Dissemination	X	X	X	X	X	X		X	X	X	X	X	X
Application	X		X	X		X	X		X	X	X		X
Acquisition				X	X		X	X				X	
Compilation/ transformation	X												
Knowledge update													X

Creating Knowledge: Knowledge creation is an ongoing process whereby individuals and groups share their explicit and tacit knowledge to create new knowledge [33]. Also, New knowledge can be created internally through innovating new methods that solve task-related problems, or acquired externally through sharing knowledge among the organizations [34]. Knowledge creation is a critical factor that sustains and increases the competitive advantage to an organization and adds value to organizational knowledge assets [35-37].

Capturing Knowledge: Capturing knowledge is the process where the organization makes efforts to capture tacit and explicit knowledge in order to add it to its knowledge assets and make it available for the future use [38]. Knowledge can be captured through various techniques such as interviews, concept mapping, observation and concept storing [38].

Organizing Knowledge: Organizing knowledge is the initial filtering process of knowledge to identify the useful knowledge [34], to avoid the valueless knowledge [29], to make the valuable and useful knowledge accessible for future use and to make knowledge in context to be actionable, updated and relevant [23]. Zack [34] emphasized organizing knowledge before storing and distributing it. Therefore, organizations need systematic activities to organize knowledge by labelling, cleansing, standardizing and abstracting the knowledge to facilitate the future use and search [34].

Storing Knowledge: Knowledge storing concerns the process of storing knowledge in reasonable and logical format to facilitate individuals' accessibility to it [23]. Knowledge can be stored in databases or warehouse functions and represent the conduit between knowledge creation and knowledge dissemination [39, 34]. Organization's capability in storing and preserving knowledge is a very important factor that sustains its competitive advantage and performance [40] and effectively safeguard the organization [41].

Disseminating Knowledge: Disseminating Knowledge is the process whereby the stored knowledge becomes accessible when needed [34] and involves the delivery of the organization's knowledge to individuals, team groups and organizations [42, 34]. Disseminating Knowledge provides accessibility of old and new knowledge within the organization to help in effective decision making and solving problems related to their tasks [42]. For effective knowledge dissemination that meet the specific needs of individuals, knowledge should be distributed in an easy and useful format and by using tools and systems that are easy to be understood [23].

Applying Knowledge: After the previous five processes, organizations need to apply its knowledge within the production processes to increase the efficiency and sustain the competitive advantage [34, 42]. Applying knowledge concerns the actual use of knowledge within the organization and how it is involved in performing tasks [42, 43]. Although knowledge is a very important factor the provides competitive advantage to the organizations, Pfeffer and Sutton [44] stated that this is occurring within the organizations that use knowledge the best, not to those that have the best knowledge.

MATERIALS AND METHODS

This study used the quantitative approach to assess the level of knowledge management practice within Malaysian construction companies. The research variables that represent knowledge management processes were obtained from the analysis of the previous knowledge management models. The knowledge management processes and the questionnaire were adopted from a study conducted by Lawson [23]. The questionnaire included 24 items (four items for each process) and used 5-point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree).

The target respondents were the project managers who currently execute projects in the biggest construction companies in Malaysia. The questionnaire was distributed using an online survey to the project managers in a number of 480 construction companies that were selected randomly among the biggest construction companies in Malaysia. A number of 227 completed responses were collected from 181 construction companies in a period of four months. The obtained data were analyzed using IBM SPSS v.20. The data analysis involved a reliability analysis to test the internal consistency of each construct variables as suggested by Hair et al. [45] and the descriptive analysis using the mean and the standard deviation to assess the level of each knowledge management processes practice.

Table 2: Reliability Analysis Results

Indicator	Cronbach Alpha	No. of Items	Rule (George and Mallery [46])
Creating Knowledge	.837	4	good
Capturing Knowledge	.811	4	good
Organizing Knowledge	.862	4	good
Storing Knowledge	.883	4	good
Disseminating Knowledge	.778	4	acceptable
Applying Knowledge	.831	4	good

Table 3: Descriptive Analysis of Knowledge Management Processes

Knowledge Management Processes	N	Min	Max	M	SD
Creating Knowledge	227	2.25	5.00	3.67	0.511
Capturing Knowledge	227	2.75	5.00	3.61	0.460
Organizing Knowledge	227	2.25	5.00	3.64	0.501
Storing Knowledge	227	3.00	5.00	3.80	0.520
Disseminating Knowledge	227	2.00	4.50	2.97	0.435
Applying Knowledge	227	2.00	4.25	2.66	0.444

RESULTS AND DISCUSSION

The reliability analysis was conducted using Cronbach's Alpha. George and Mallery [46] stated that the value of Cronbach alpha less than 0.5 is unacceptable, greater than or equal 0.5 is poor, greater than or equal 0.6 is questionable, greater than or equal 0.7 is acceptable, greater than or equal 0.8 is good and greater than or equal 0.9 is excellent. As shown in Table 2, the overall value of Cronbach's alpha for Knowledge Management processes were: Creating Knowledge=0.837, Capturing Knowledge =0.811, Organizing Knowledge=0.862, Storing Knowledge =0.883, Disseminating Knowledge=0.778 and Applying Knowledge=0.831.

Table 3 illustrates the results of the descriptive analysis of knowledge management processes. The results showed that the mean score of knowledge management was 3.39 with a standard deviation at 0.32. The overall mean score for knowledge management, including the six sub-constructs were calculated by computing new variables in SPSS for the mean scores of all items of the sub-constructs. Among the six sub-constructs of knowledge management, storing knowledge showed the highest mean score (M = 3.8, SD = 0.52), followed by creating knowledge (M = 3.67, SD = 0.511), organizing knowledge (M = 3.64, SD = 0.5) and capturing knowledge (M = 3.6, SD = 0.46). However, applying knowledge showed the lowest mean score (M = 2.66, SD = 0. 44), followed by disseminating knowledge (M = 2.97, SD = 0.435) [46, 47].

CONCLUSION

This study found that the practice of knowledge management is modest in Malaysian construction companies. The findings showed that the practice of storing knowledge was the highest, however, the practice of disseminating and applying knowledge that are the main objectives of knowledge management were relatively low. It can be concluded that Malaysian construction companies manage their knowledge informally. This finding is in line with a study conducted by Hari, Egbu and Kumar that concluded that construction companies often manage their knowledge informally. Therefore, these companies are threatened to lose their knowledge and competitive advantage unless they manage their knowledge more structurally. This argument is in line with many studies that indicate that knowledge gained through a project is lost if not shared and recorded properly Thus, Malaysian construction companies have to establish a structured knowledge management that provides a good practice of all knowledge management processes to sustain their knowledge and competitive advantage.

REFERENCE

1. Hills, M.J., P.W. Fox, C.K.H. Hon, P.S.W. Fong and M. Skitmore, 2008. The Role of Project Managers in Construction Industry Development, AACE International Transactions,Toronto, ON, Canada.
2. Davenport, T.H. and L. Prusak, 1998. Working Knowledge: How Organizations Manage What They Know. ACM: Ubiquity, pp: 1-15.
3. Tserng, H.P.J. and Y.V. Lin, 2005. A Knowledge System for Construction Projects Using Knowledge Map, Journal of Knowledge Management, 2: 299-300.
4. Kim, S., 2000. The Roles Of Knowledge Professionals For Knowledge Management. INSPEL, 34(1): 1-8.

5. Ahmed, P.K., K.K. Lim and A.Y.E Loh, 2002. Learning through knowledge management. Oxford: Butterworth/Heinemann.
6. Liebowitz, J. and T.J. Beckman, 1998. Knowledge Organizations: What Every Manager Should Know, Taylor and Francis, pp: 208.
7. Davies, N.J., 2000. Knowledge management. BT technology journal, 18(1): 62-63.
8. Gupta, B., L.S. Iyerand, J.E. Aronson, 2000. Industrial Management and Data Systems Emerald Article: Knowledge management: practices and challenges Knowledge management: practices and challenges. Industrial Management and Data Systems, 100(1): 17-21.
9. Hall, J. and J. Sapsed, 2005. Influences of knowledge sharing and hoarding in project-based firms, Management of Knowledge in Project Environments Elsevier Ltd., pp: 57-79.
10. Egbu, C. and K. Botterill, 2001. Knowledge management and intellectual capital: benefits for project based industries. Proceedings of the RICS Foundation-Construction and Building Research Conference (COBRA), Glasgow Caledonian University, pp: 414-22.
11. Windrum, P., K. Flanagan and M. Tomlinson, 1997. Recent Patterns of Services Innovation in the UK, Report for TSER Project SI4S.
12. Auster, E. and C.W. Choo, 1996. Managing Information for the Competitive Edge New York: Neal-Schuman, pp: 554.
13. Plessis, M., 2005. Drivers of knowledge management in the corporate environment. International Journal of Information Management, 25(3): 193-202.
14. Carillo, P.M. and C.J. Anumba, 2002. Knowledge management in the AEC sector: an exploration of the mergers and acquistion context. Knowledge and Process Management, 9(3): 149-61.
15. Fong, P.S. and L. Chu, 2006. Exploratory Study of Knowledge Sharing in Contracting Companies: A Sociotechnical Perspective, Journal of Construction Engineering and Management, 132(9): 928-939.
16. Robinson, H.S., P.M. Carrillo, C.J.Anumba and A.M. Al-ghassani, 2001. Linking Knowledge Management Strategy To Business Performance In Construction Organizations. Association of Researchers in Construction Management, 1: 5-7.
17. Hari, S., C. Egbu and B. Kumar, 2005. A knowledge capture awareness tool: An empirical study on small and medium enterprises in the construction industry. Engineering, Construction and Architectural Management, 12(6): 533-567.
18. Maqsood, T., A. Finegan and D. Walker, 2006. Applying project histories and project learning through knowledge management in an Australian construction company, The Learning Organization, 13(1): 80-95.
19. Bahra, N., 2001. Competitive Knowledge Management New York, NY: Palgrave, pp: 258.
20. Tupenaite, L., L. Kanapeckiene and J. Naimaviciene, 2008. Knowledge Management Model For Construction Projects, Computer Modelling and New Technologies, 12(3): 38-46.
21. Liebowitz, J., N. Ayyavoo, H. Nguyen, D. Carran and J. Simien, 2007. Cross-generational knowledge flows in edge organizations. Industrial Management and Data Systems, 107(8): 1123-1153.
22. Sveiby, K.E., 1997. The new organizational wealth: managing and measuring knowledge-based assets San Francisco: Berrett-Koehler Pub., pp: 220.
23. Lawson, S., 2003. Examining the relationship between organizational culture and knowledge management. Nova Southeastem University.
24. Wiig, K.M., 1993. Knowledge Management Foundations: Thinking about Thinking: how People and Organizations Create, Represent and Use Knowledge. Schema Press.
25. Horwitch, M. and R. Armacost, 2002. Helping Knowledge Management Be All It Can Be. Journal of Business Strategy, 23(3): 26-31.
26. Parikh, M., 2001. Knowledge management framework for high-tech research and development, Engineering Management Journal, 13(1): 27-33.
27. Ruggles, R., 1998. The state of the notion: Knowledge management in practice. California management review, 40(3): 80-89.
28. O'Dell, C. and C.J. Grayson, 1998. If we only knew what we know: identification and transfer of internal best practices. California Management Review, 40(3): 15-174.
29. Bhatt, G.D., 2000. Organizing knowledge in the knowledge development cycle. Journal of Knowledge Management, 4(1).
30. Egbu, C., C. Gaskell and J. Howes, 2001. The Role of Organizational Culture And Motivation In The Effective Utilization of Information Technology For Teamworking In Construction. The Seventeenth Annual Conference of the Association of Researchers in Construction Management (ARCOM), 1: 91-100.
31. Gold, A.H., A. Malhotra and A.H. Segars, 2001. Knowledge management: An organizational capabilities perspective, Journal of Management Information Systems, 18(1): 185-214.

32. Seufert, A., A. Backm and G. Krogh, 2003. Unleashing the power of networks for knowledge management. Knowledge Management and Networked Environments New York, NY: Accenture LLP, pp: 99-136.
33. Bohn, R.E., 1994. Measuring and Managing Technological Knowledge. Sloan Management Review, 36(1): 61-73.
34. Zack, M.H., 1999. Managing Codified Knowledge (b). Sloan Management Review, 40(4): 1-15.
35. Spender, J.C. and R.M.Grant, 1996. Knowledge and the firm: Overview. Strategic management journal, 17: 5-9.
36. Grant, R.M., 1997. The knowledge-based view of the rm: Implications for management practice. Long Range Planning, 30(3): 450-454.
37. Nonaka, I., R. Toyama and N. Konno, 2000. SECI ba and leadership-A united model of dynamic knowledge creation. pdf. Long Range Planning, 33: 5-34.
38. Nonaka, I. and H. Takeuchi, 1995. The knowledge-creating company: How Japanese companies create the dynamics of innovation. Long Range Planning). New York: Oxford University Press, pp: 29:592
39. Duffy, J., 2000. The Impact of Knowledge Management on Decision Support Systems. IFIP TC8/WG8.3 International Conference on Decision Support through Knowledge Management. Stockholm, Sweden.
40. Olivera, F., 2000. Memory systems in organizations: an empirical investigation of mechanisms for knowledge collection, storage and access, Journal of Management Studies, 37(6): 811-832.
41. Argote, L., S.L. Beckman and D. Epple, 1990. The Persistence and Transfer of Learning in Industrial Settings. Management Science, 36(2): 140-154.
42. Niu, K., 2008. Understanding Knowledge Management and Organizational Adaptation and the Influencing Effects of Trust and Industrial Cluster. University of North Texas.
43. Wong, W.L.P. and D.F. Radcliffe, 2000. Technology Analysis and Strategic Management The Tacit Nature of Design Knowledge, Technology Analysis and Strategic Management, 12(4): 493-512.
44. Pfeffer, J. and R.I. Sutton, 2000. The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action. Administrative Science Quarterly Boston: Harvard Business School Press, 46: 558
45. Hair, J.F., R.L. Tatham, R.E. Anderson and W. Black, 1998. Multivariate data Analysis. Upper Saddle River, NJ: Prentice Hall.
46. George, G. and P. Mallery, 2003. SPSS for Windows Step by Step: A Simple Guide and Reference, 11.0 Update. Boston, MA: Allyn and Bacon.
47. Ismail, W., K.M. Nor and T. Marjani, 2009. The Role of Knowledge Sharing Practice in Enhancing Project Success. Interdisciplinary Journal Of Contemporary Research In Business, 1(7): 34-53.