

An overview of knowledge management (KM) issues for implementation in consultant firms in Malaysian construction industry

Azlan Othman ¹, Syuhaida Ismail ² and Khairulzan Yahya ³

^{1,3} Faculty of Civil Engineering, Universiti Teknologi Malaysia, Johor Bharu, Malaysia

² UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia

¹irazlan@gmail.com, ²syuhaida.kl@utm.my, ³ khairulzan@utm.my

Abstract. In the past few years, there has been a growing interest in treating knowledge as a significant organisational resource. Thus, effective development and implementation of KM requires a foundation in several rich literatures. As a preparation for the competitive industrial nation, KM is an important countenance that should be the point of convergence for the industry players. This paper wishes to draw the attention on the current situation of KM practice, focusing on consultant firms in Malaysian construction industry. Questionnaires were distributed to about 200 respondents working in the industry, with the objective of appraising the KM implementation amongst consultant firms working in construction industry in Malaysia. This paper also gives the overview on KM definition, process, understanding and challenges in construction industry, besides the critical success factor of KM implementation. The literature is restricted on the recent KM study of 17 years research from 2000 to 2017. Finally, this paper proposes the conceptual ideas of relationship between KM process, KM understanding and KM challenges with critical success factor of KM implementation.

Keywords: Knowledge management (KM); consultant firm; Malaysian construction industry; KM implementation.

1. Introduction

Construction Industry is considered to be one of the important sources of economic development, growth and activities. Malaysian economy has to perform efficiently and to play effective role in making true the dream of developed nation status. According to Prime Minister of Malaysia, Dato' Sri Najib bin Tun Abdul Razak the importance of the construction industry to Malaysia's economy cannot be overstated, where construction in Malaysia has traditionally been a substantial driver of growth, and looking to the future, thus it is expected that this trend to will continue to expand [1].

A successful construction can only be achieved with good civil engineering design and consultations, which require decent engineering knowledge and experience. However, there is a gap in managing the civil engineering knowledge and expertise amongst the consultant firms in the construction industry. In general, a consulting firm is a business of one or more experts (consultants) that provides professional advice to an individual or an organization for a fee. The primary purpose of a consulting firm is to provide access to industry-specific specialists/consultants and subject-matter experts. There are different types of consultant firms serving different sectors. This paper mainly focuses on construction industry, which falls under civil engineering fields.



In the recent time, many challenges faced by the engineering consultant firm because construction project have turn into more complicated scenario. Hence, knowledge is seen as one of the most important resources contributing towards decision making in any organization and to maximize competitive advantage of organizations to survive in construction industry. In general, knowledge management (KM) is the process of creating, modifying, sharing and applying knowledge to create value from organization's knowledge assets [2]. KM systems and related initiatives have become a popular focus in many firms, yet many KM systems initiatives fail to achieve their goals. Therefore, there is a need of continuous efforts to improve the use of KM integration in construction industry and overcome projects diversity, complexity and non-standard production methods.

2. Process of knowledge management (KM)

In order to better understand how to share and manage knowledge, an operational framework should be initially developed since knowledge management (KM) is about people and the process that used to share information and build knowledge [3]. The effective implementation of KM requires sequent processes that ensure and encourage the knowledge flow [4]. Table 1 shows the literature summary of KM process based on questionnaire create in this paper.

Table 1. Processes of knowledge management (KM) practice.

No	Knowledge Management Process Elements	[5]	[6]	[7]	[8]	[9]
1	Identification					
B.1	Knowledge assets (information, skills) is identifiable		X			
B.2	Identification of the different types of knowledge (tacit, explicit) available in the organization	X				
B.3	Core values and competencies identified in the organization				X	
B.4	Opportunities for innovation identified to create competitive advantage.				X	X
2	Capture					
B.5	Knowledge and information is captured in minutes of meetings			X		
B.6	Knowledge and information is captured in seminars			X		
B.7	Knowledge and information is captured in presentation sessions			X		
3	Dissemination					
B.8	Knowledge dissemination is encouraged through workshop					
B.9	Knowledge dissemination is encouraged through meetings					
B.10	Documents are disseminated to authorized personnel through appropriate channel	X				
4	Utilization					
B.11	Best practices from previous project have been utilized in the new projects	X				
B.12	Lesson learnt from previous project will be utilized in the future projects	X				
B.13	New knowledge utilized by team members in the company/organization	X				
5	Sharing					
B.14	Knowledge sharing (best practices/lesson learnt) is encouraged through meetings			X		

Table 1. Processes of knowledge management (KM) practice (cont.)

B.15	Knowledge sharing (best practices/lesson learnt) is encouraged through presentations	X	
B.16	Knowledge sharing (best practices/lesson learnt) is encouraged through publications		X
B.17	Knowledge is shared among peers	X	
6	Storage		
B.18	Documents and reports properly stored in a softcopy database system	X	
B.19	Documents and reports stored in hardcopy in the library	X	X
B.20	Physical storage uses established records management or archival practices, with adequate shelving durable boxes, folders, labeling etc.		X
B.21	The repository for electronic resources has adequate capacity for long-term storage		
B.22	The repository for electronic resources is backed up routinely, based on established and enforced procedures and protocols.		
B.23	The location of stored resources, physical and electronic is reasonably convenient and accessible		X
B.24	Documents securely stored and protected	X	
7	Strategizing		
B.25	KM process has been well strategized by the company/organization		
B.26	Strategic knowledge well protected		
B.27	Training of workers required to meet the strategic objectives in the organization	X	
B.28	Employees well understood and aware of KM strategies in the organization		X
B.29	Relevant knowledge assets created in the organization		

3. Understanding of knowledge management (KM) implementation

The understanding of knowledge management (KM) will produce learning and facilitate knowledge sharing culture and environment, provide vision and effective leadership to overcome learning barriers. In fact it will help an organization to be transformed into a learning organization, where it is open to learn new techniques and continuously changes itself based on learned knowledge. Table 2 shows the literature summary of KM understanding based on questionnaire create in this paper.

Table 2. Understanding of knowledge management (KM) implementation.

No	Measure of Understanding the Importance of Knowledge Management (KM)	[10]	[11]	[12]
1	Attitude			
C.1	Information and knowledge are confidential and therefore need to be kept safely in personal storage drive			X
C.2	KM processes are very time consuming	X	X	
2	Ignorance			
C.3	KM has no benefits to the company/organization			
C.4	I do not know what KM is			

Table 2. Understanding of knowledge management (KM) implementation (cont.)

C.5	I am not aware if KM exists in my company/organization			
C.6	Company/organization does not need KM-based KPI			
C.7	Staff/Individuals do not need KM-based KPI			
3	Motivation			
C.8	KM improves employee's performance	X	X	
C.9	KM encourages innovations			X
C.10	KM enhances better decision making		X	
4	Benefit			
C.11	KM creates competitive advantage			X
C.12	KM generates revenue growth			X
5	Need			
C.13	Training on KM is necessary			X
C.14	Coaching on KM is necessary			X

4. Challenges of knowledge management (KM) implementation

In implementing knowledge management (KM), barriers and challenges are inevitable. According to [13], barriers to knowledge building mostly stem out from the existence of poor organisational culture. Furthermore, barriers to knowledge building are classified into three categories, namely individual (people), organisational, and technological barriers. In order for KM to be fruitful for the organization, these three barriers should be integrated in a way they complement each other. Table 3 shows the literature summary of KM challenges based on questionnaire create in this paper.

Table 3. Challenges in knowledge management (KM) implementation.

No	Challenges of Knowledge Management (KM)	[14]	[15]	[16]	[17]	[18]	[19]	[13]	[20]	[21]	[22]
1	Organizational Barriers										
D.2	No sharing culture										X
D.3	Difficult to implement									X	
D.8	Lack of social network				X	X					
D.9	Differences in culture				X	X				X	
D.14	Lack of interaction				X	X		X		X	
D.15	Fear of not receiving recognition				X	X	X	X			
2	Individual Barriers										
D.5	Difficult to capture knowledge during informal discussion		X								X
D.6	KM is not well understood				X	X		X			
D.7	Lack of communication skills				X	X		X		X	X
D.10	Lack of time				X	X				X	
D.11	Lack of trust				X	X		X			
D.12	Lack of motivation				X	X	X	X	X		

Table 3. Challenges in knowledge management (KM) implementation (cont.)

D.13	Lack of awareness of the benefit of knowledge sharing			X	X			X	X
D.17	Fear of causing internal conflicts					X			
3 Technological Barriers									
D.1	Technology limitation	X		X		X	X		X
D.4	Document contents are difficult to understand		X			X		X	X
D.16	Fear of knowledge insecurity					X		X	
D.18	Keeping data accurate and relevant					X			
D.19	Difficult to determine where KM belongs to (HR/IT/etc)					X	X		

5. Critical success factors (CSFs) of knowledge management (KM) implementation

The main use of critical success factors (CSFs) concept is as the focus for implementing organisational transformation by supporting beneficial change. The benefits of identification of CSFs allow a simple understanding of the amount of information, help the management to focus on major concern, easy to monitor and can be used in connection with strategic planning purposes. CSFs not only represent critical strategic thinking, but it should be used in conjunction with a planning process as CSFs are very important in keeping people focus. Table 4 shows the literature summary of CSFs in knowledge management (KM) based on questionnaire create in this paper.

Table 4. Summarised critical success factors (CSFs) associated with knowledge management (KM)

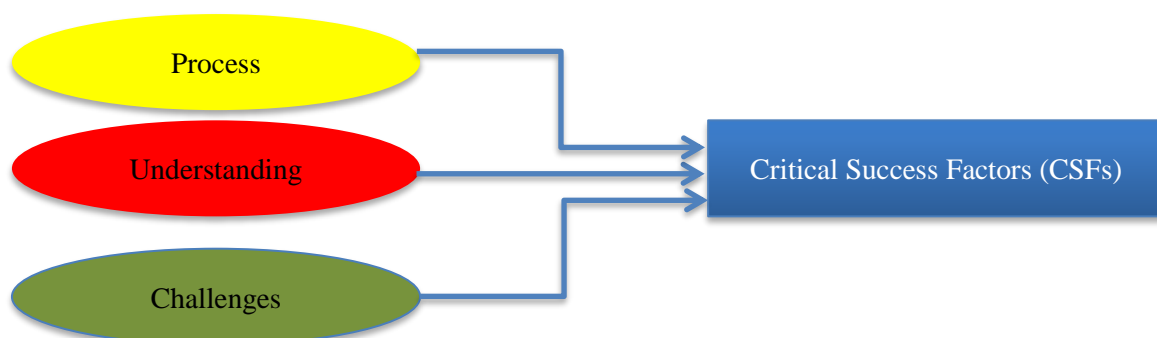
No	Critical Success Factor in Knowledge Management Implementation	[23]	[24]	[25]	[26]	[27]	[8]	[28]	[29]
E.1	Continuous organisation support		X		X	X	X	X	
E.2	Execution of plan					X			
E.3	Knowledge and sharing culture		X		X	X	X		
E.4	HR development							X	
E.5	Financial resources	X							
E.6	Technology		X	X	X	X	X	X	X
E.7	Infrastructure		X	X	X				
E.8	Clear strategy on knowledge management process	X	X	X		X	X		
E.9	Leadership demonstration by senior staff/management	X	X	X				X	
E.10	Knowledge management processes should be precise								X

Table 4. Summarised critical success factors (CSFs) associated with knowledge management (KM) (cont.)

E.11	Strong link to a business imperative				
E.12	Continuous learning				X
E.13	HR management		X		
E.14	Quality control and assurance		X		
E.15	Marketing		X		X
E.16	Environmental influences namely competition, markets, time pressure, governmental and economic climates	X			X
E.17	Training of staff should be made compulsory		X		
E.18	Measurement of knowledge management in term of KPI	X	X		
E.19	Benchmarking of a successful knowledge management system nationwide		X		X
E.20	Elimination of constraints that defer knowledge management implementation		X		X
E.21	Knowledge management processes should be easy to follow				

6. Framework development

For a successful project, the implementation of framework with certain guidelines is necessary to achieve the objective of the project [30]. The development of the framework of knowledge management (KM) will need to emphasis on all the critical activities involved in the KM process. A framework with the list of all critical processes involved and also takes into account other factors, such as level of understanding KM, challenges of the implementation and CSFs in implementing KM in construction industry, will be developed. Once the conceptual framework is developed, it will be verified by the expert focus group. Figure 1 shows the initial description on relationship between all objectives of this paper. The CSFs are set to be dependent variables while a set of independent variables were constructed to be the process, understanding and challenges. The further analysis on the relationship between all variables is discussed in further study.

**Figure 1.** Relationship between critical success factors (CSFs) and process, understanding and challenge of knowledge management (KM).

7. Conclusion

This paper provides an overview of knowledge management (KM) issues from years 2000 to 2017. The findings show that KM implementation in the Malaysian consultant firms are still lacking and less giving consideration. This paper has successfully achieved its aim in appraising KM implementation amongst consultant firms working in construction industry in Malaysia. This paper also gives some ideas of developing a conceptual framework of KM for consultant firm in the Malaysian construction industry by taking into account the quantitative elements of KM processes, KM understanding, KM challenges and KM critical success factors (CSFs). It is hoped that the discussion would lead to the successful implementation of KM practice in the construction industry.

8. Acknowledgements

The authors would like to express their sincere gratitude to the Ministry of Education, Universiti Teknologi Malaysia (UTM) and the Research Management Centre (RMC) of UTM for providing the financial support for this paper to be published. This paper is financed by UTM Razak School Grant for research funding under Cost Centre No. R.K130000.7740.4J290.

9. References

- [1] CIDB 2015 Construction industry transformation programme pp 2016- 20
- [2] Davenport T H and Prusak L 1998 Working knowledge: how organizations manage what they know (Boston, MA: Harvard Business School Press)
- [3] Hanley S S 1999 A culture built on sharing. Informationweek
- [4] Liebowitz J N, Ayyavoo H, Nguyen D Carran and Simien J 2007 Cross-generational knowledge flows in edge organizations *Industrial Management and Data System* **107(8)** pp 1123-53
- [5] Yang Xu, Jing Xi and Alain Bernard 2013 Knowledge management in e-commerce mass customisation. *IFIP Int. Conf. on Product Lifecycle Management (PLM2013)* pp 259-67
- [6] Tseng S M 2014 The impact of knowledge management capabilities and supplier relationship management on corporate performance *Int. J. of Production Economics* **154** pp 39-47
- [7] Fischer M and Marsh T 2014 Recognizing intellectual capital as an asset *J. of Business and Economics Research (Online)* **12(2)** pp 177
- [8] Obeidat B Y, Obeidat B Y, Al-Suradi M M, Al-Suradi M M, Masa'deh R E, Masa'deh R E and Tarhini A 2016 The impact of knowledge management on innovation: an empirical study on Jordanian consultancy firms *Management Research Review* **39(10)** 1214-38
- [9] Masa'deh R E, Masa'deh R E, Shannak R, Shannak R, Maqableh M, Maqableh M and Tarhini A 2017 The impact of knowledge management on job performance in higher education: the case of the University of Jordan *J. of Enterprise Information Management* **30(2)** pp 244-62
- [10] Lin J M C and Wang P Y 2008 A knowledge management system for Chinese language arts teachers *British J. of Educational Technology* **39(5)** pp 935-43
- [11] Todorović M L, Petrović D Č, Mihić M M, Obradović V L and Bushuyev S D 2015 Project success analysis framework: a knowledge-based approach in project management *Int. J. of Project Management* **33(4)** pp 772-83
- [12] Abd Rahman A, Imm Ng S, Sambasivan M and Wong F 2013 Training and organizational effectiveness: moderating role of knowledge management process. *Eur J of Training and Development* **37(5)** pp 472-88
- [13] Chong C W and Besharati J 2014 Challenges of knowledge sharing in the petrochemical industry *Knowledge Management and E-Learning: An Int. J. (KM&EL)* **6(2)** pp 171-87
- [14] McAdam R and Reid R 2001 SME and large organisation perceptions of knowledge management: comparisons and contrasts *J. of Knowledge Management* **5(3)** pp 231-41
- [15] Collison C and Parcell G 2001 Learning to fly: Practical lessons from one of the world's leading knowledge companies (Oxford: Capston Publishing limited)
- [16] Riege A 2005 Three-dozen knowledge sharing barriers managers must consider *Journal of Knowledge Management* **9(3)** pp 18-35

- [17] Jain K K, Sandhu M M and Sidhu G 2007 Knowledge sharing among academic staff: a case study among business schools in Klang Valley Malaysia *J. for the Advancement of Arts and Science* **23**
- [18] Ling C W, Sandhu M S and Jain K K 2009 Knowledge sharing in an American multinational company based in Malaysia *J. of Workplace Learning* **21(2)** pp 42-125
- [19] Dzone 2013 What is a knowledge management system? (NC, USA: Dzone Software)
- [20] Niazi M, Mahmood S, Alshayeb M and Hroub A 2015 Empirical investigation of the challenges of the existing tools used in global software development projects **9(5)** pp 135-43
- [21] Morteza-Shokri G, and Chileshe N 2014 Knowledge management: barriers to capturing lessons learned from Australian construction contractors perspective *Construction Innovation* **14(1)** pp 108-34
- [22] Lotti Oliva F 2014 Knowledge management barriers, practices and maturity model *J. of Knowledge Management* **18(6)** pp 1053-74
- [23] Holsapple C W and Joshi K D 2000 An investigation of factors that influence the management of knowledge in organizations *J. of Strategic Information Systems* **9(2)** pp 235-61
- [24] Hasanali F 2002 Critical success factors of knowledge management (USA: KM Advantage)
- [25] Chourides P, Longbottom D and Murphy W 2003 Excellence in knowledge management: an empirical study to identify critical factors and performance measures. *Measuring Business Excellence* **7(2)** pp 29-45
- [26] Hammer A C 2015 A study of business projects in innovation brokering in vri. Master in Management and Technology (Trondheim: Trondheim Business School, Sor-Trondelag University College)
- [27] Luo S H and Lee G G 2015 Applying failure mode and effects analysis for successful knowledge management *Total Quality Management and Business Excellence* **26(1-2)** pp 62-75
- [28] Inkinen H and Inkinen H 2016 Review of empirical research on knowledge management practices and firm performance *J. of knowledge management* **20(2)** pp 230-257
- [29] Kim T H, Lee J N, Chun J U and Benbasat I 2014 Understanding the effect of knowledge management strategies on knowledge management performance: a contingency perspective. *J. of Information and Management* **51(4)** pp 398-416
- [30] Baccarini D 1999 The logical framework method for defining project success *Proj. Manage. J.* **30(4)** pp 26-32.