

The Challenges In Implementing Knowledge Management Practices In Construction Industry



Mohamad Nizam Yusof, Nurhidayah Marzuki Yahaya, Norafzan Awang, Nik Nurkhairunissa Binti Nik Hassan, Khor Soo Cheen

Abstract: Knowledge is an essential resource to the companies in construction sector due to the nature of these organizations deal with projects. The performance of a project required new aptitudes, outlooks, models and responsibility all through the organizations. Currently, the execution of knowledge management especially in the construction sector is at earliest stages arrange. Nevertheless, the awareness of knowledge management practices among construction companies is high, where most of them are alert of the advantages that knowledge management can bring to their organizations. In any case, the execution of any new procedure or activities has dependably been a difficult assignment; a portion of these difficulties may happen during the usage or at practice stage. Likewise, the implementation of knowledge management is no exception. To achieve successfully implement and practice knowledge management, the knowledge of the challenges, especially in relation to effective implementation should not be ignored by the organizations. The study was conducted in Malaysian construction industry that involves selected construction companies under grade G7 classified by CIDB, Malaysia. An aggregate of 110 surveys were gotten and analyzed. The gathered data was analyzed to identify the challenges in implementing knowledge management in construction industry. The results play a role as a guideline to effectively implement and practice knowledge management.

Index Terms: Challenges, Knowledge Management, Knowledge, Construction Companies, Construction Industry.

I. INTRODUCTION

The execution of knowledge management (KM) in construction sector in Malaysia context is relatively new. Abdul-Rahman and Wang [1] concluded which KM application in the Malaysian construction industry is at a medium stage and most businesses are in the initial stage with structured knowledge management procedures. On the other side, there is a growing demand for Malaysian

construction firms to acknowledge the management of organizational expertise. Abdul-Rahman and Wang [1] expressed that KM practices is at the very pith of an organization.

Because of the nature of these organizations working with projects, organizational knowledge is essential for businesses in the construction sector. The achievement of projects required new skills, mindsets, models and commitment throughout the organization. In this knowledge era, the experience, skills and knowledge of the workforce becomes the organization's greatest resources [2]. As construction companies' activities mostly concentrated on completing projects, according to stakeholders or clients' requirement, the previous experience and expertise of the organization give more advantages to run the project efficiently. Although, majorities of the practitioners in construction industry are not entirely implementing KM in their organizations, however, most of the construction companies know about the advantages of KM to the organizations [2].

Nowadays, managing knowledge is becoming an important strategy for organization to remain active in the industry; however organizations have to be prepared and adapt to the changes in the construction business. Mohd Zin and Egbu [3] stated that to exploit the advantage of KM, construction firms essential to stay aware of the consistently changing needs in the market. Overseeing changes is another significant system to be rehearsed by the association to guarantee the congruity of their development business. Additionally, these organizations need to direct research on present and future example of customer requirements, its impacting causes, and the rate of progress in the market and thus, set up the required assets to adjust, receive or to achieve vital changes to stay ahead in the challenge.

In the connection to overseeing changes, development organizations ought to likewise have the option to detect availability in adopting knowledge management practices [3]. Readiness assessment includes an unpredictable arrangement of intuitive errands that, break new ground and much of the time for the organizations. In this unique circumstance, these associations need to attempt an expansive scope of activities (strategies, spending activities, hierarchical structures which, taken in aggregate, speak to a decided motivation) to survey and effectively deal with their availability for information the board execution.

Manuscript published on 30 May 2019.

* Correspondence Author (s)

Mohamad Nizam Yusof, Faculty of Informatics Science, University College Bestari. Bandar Permaisuri, Malaysia.

Nurhidayah Marzuki Yahaya, Faculty of Islamic Studies, University College Bestari. Bandar Permaisuri, Malaysia.

Norafzan Awang, Faculty of Economics and Management, University College Bestari. Bandar Permaisuri, Malaysia.

Nik Nurkhairunissa Binti Nik Hassan, Faculty of Social Science, University College Bestari. Bandar Permaisuri, Malaysia.

Khor Soo Cheen, Faculty of Green Technology, University Tunku Abdul Rahman. Perak, Malaysia.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

There are a variety of factors to be considered by construction companies that plan to practice this strategy in the organization. Mohd Zin and Egbu [3] stated that very important factors that have influenced to the progress of KM implementation are the role of human resources, culture, the role of technology, leadership, top management support and organizational structure. The biggest obstacle continues individual-related as the most troublesome components to alter are attitudes and practices [4]. Construction firms could react to all of these problems by encouraging data on board operations to ensure they are side by side with those of the challenge [3]. Davenport and Prusak [5] noted that KM was just viable on the off chance that it is viewed as a human-communication practice as innovation assumes just a restricted job to the achievement of KM implementation. The success of KM implementation is additionally identified with the difficulties that the association will confront. Hence, it is imperative to recognize the difficulties that are looked by construction companies so as to actualize KM activities in their organizations.

II. KNOWLEDGE MANAGEMENT

Currently, in this knowledge era, knowledge has turned into a focal power behind the accomplishment of firms. Knowledge management was presented over two decades ago to help companies create, share, and use knowledge more efficiently. However, the ineffectiveness in dealing with the knowledge makes it invaluable to firms. Knowledge management could be characterized as the process of identifying, optimizing and actively managing intellectual property for make esteem, increment efficiency, and achieve and maintain competitive benefit [6]. It can likewise be characterized as the way toward recognizing/making, acclimatizing, and applying hierarchical learning to abuse new chances and improve organizational performance. Gold, Malhotra [7]

Describes the process of knowledge management as a formalized coordination to efficiently manage knowledge. There seems to be no usually recognized technique in the knowledge management method. In their research, earlier scientists differentiated a few main components of the method of knowledge management. Throughout the context of construction organization, The knowledge management method begins with the observation and section of the knowledge to be captured, then examining the tools for the acquisition of data and finally filtering, refining, analysis, stocking and communicating the understanding collected. [8].

Information the executives was presented over two decades back to help organizations make, offer, and use learning all the more efficiently. Be that as it may, the insufficiency in managing the learning makes it important to firms. Information the board can be portrayed as the procedure of ID, improvement and dynamic administration of scholarly resources for make regard, increase proficiency, and gain and support upper hand (Nonaka and Takeuchi, 1995). It can moreover be described as the route toward perceiving/making, acclimatizing, and applying various leveled figuring out how to manhandle new shots and improve hierarchical execution. Gold, Malhotra, and Segars (2001) characterizes information the executives procedure

as an organized coordination for overseeing learning adequately. There is no commonly recognized technique during the time spent learning the board. Prior scientists have recognized a couple of key pieces of the learning the executives procedure in their examination. Inside the setting of development associations, the information the executives procedure starts with seeing and recognizing the learning to be caught, trailed by looking at the apparatuses (systems and advancements) for securing the learning, lastly the caught information is in this way separated, refined, examined, put away and shared (Hari, Egbu, and Kumar, 2005).

III. THE CHALLENGES IN IMPLEMENTING KNOWLEDGE MANAGEMENT IN CONSTRUCTION COMPANIES

The introduction of KM in the business world has given vast benefits to organizations that implement this mechanism in their strategic planning. There are many benefits to be obtained by organizations from KM implementation. For instance, Santosus and Surmacz [9] listed have several advantages that organizations can assume from knowledge management practices:

- Foster innovation by empowering the free progression of thoughts
- Improve client service by streamlining reaction time
- Boost incomes by getting items and administrations to advertise quicker
- Enhance worker degrees of consistency by perceiving the estimation of representatives
- Streamline administrators and decrease costs by disposing of redundancies (cost of defects)

As indicated by an overview done by McAdam and McCreedy [10] KM's benefits are the four top-level items improved in quality, efficiency, teaching and cost decrease. They are believed to be identified in associations with improving inner effectiveness. Those who considered it likable to productivity improved consistency and aggressiveness through lower expenditures.

Besides the benefits of KM implementation, there are also challenges in implementing KM in the organizations. Robinson, Carrillo [11] had identified seven barriers in implementing KM including Worker reluctance to exchange of information, bad ICT capacity, absence of devoted resources, absence of leadership assistance, bad organizational culture, badly articulated approach, and difficulty in assessing advantages. Carrillo, Robinson [12] positioned four principles of difficulties in implementing knowledge management as follows:

- a) Insufficient time;
- b) Organizational culture;
- c) Lack of standard work processes; and
- d) Insufficient funding.

A) Insufficient time

Within construction companies time is sometimes connected by the need to perform scheduled projects. Most building businesses recognize that their organizational system is too sheltered to even consider exploiting expertise. Workers might be eager to share knowledge, however the strain to convey under tight task plans and the need to assume on extra liability for knowledge management activities nearby regular obligations infrequently encourage the fruitful improvement of a knowledge-sharing culture [5].

B) Organizational culture

Previously, the most debatable issue in the challenges of KM execution is the culture of knowledge sharing between workers. Many researchers found that employees of the organizations are still reluctant to share their knowledge with others, and changing their behavior is not easy [13]. Numerous workers consider their to be as an individual property and a wellspring of solidarity and a large portion of commonplace existing development organizations think that its hard to support the way of life of knowledge sharing [12]. Some of the reasons, to this problem for example, the absence of trust among workers, deficient time, the absence of KM mindfulness, the absence of acknowledgment of new thoughts, the prejudice of the board for inventive missteps and the refusal of arrangements from individuals in lower positions, can adversely influence knowledge sharing procedure [5].

C) Lack of standard work processes

A work process is basically how an organization does its work. The absence of standard work procedures has additionally been distinguished as a key hindrance in KM execution [12]. These days, numerous construction companies suffer from experience of having an excessive number of various procedures for performing comparative exercises. Researcher expressed building companies could have strong project management skills yet are frequently much slower in organizing their inner company operations [14]. Moreover, Carrillo, Robinson [12] noted that, the absence of standard work procedures is an issue with enormous associations where, now and again, they have developed quickly and there are never again have standard methodology which prompts various methodologies being embraced.

D) Insufficient funding

Money is a standout amongst the most significant assets for the achievement of knowledge management implementation. The usage of KM requires all the more financing, in any case, the low net revenue of development organizations and their traditionalist nature has been an obstacle to them to put resources into KM activities and bolster required infrastructure [12].

Moreover, Abdul-Rahman and Wang [1] found that the perception of the highly competitive marketplace, the time constraints, the high complexity of construction works, the focus on creating client's value are the principal challenges in the execution of KM.

IV. KNOWLEDGE MANAGEMENT IN CONSTRUCTION INDUSTRY

Knowledge management is the best practices that are applied in the organizations to manage organizational knowledge effectively towards the organizational performance. Inside the construction business sector, it is progressively being recognized that KM can realize the genuinely necessary advancement and improve business execution the business requires [15]. Kamara, Anumba [16] Indicated that efficient knowledge management activities are seen as a vehicle for companies to meet their growth needs and enhance organizational effectiveness. Besides, a few examinations demonstrate that the organization's business execution relies upon the productivity of KM activities [5]. Today the construction sector is confronting huge issues and difficulties [17]. To tackle these issues, companies have to develop the correct methods to remain important and skilled in the company. According to Faraj, Alshawi [18] the accomplishment of a construction firm in today's competitive marketplace relies onto the nature of a training it has with regard to its markets, goods, facilities and techniques. Kamara, Anumba [16] observed the importance of task management and knowledge management for construction firms to stay aggressive and respond appropriately to the demands of the customer in multiple activities to resolve the problems facing construction firms.. Researcher disclosed that the focus on knowledge management reflects the growing recognition that is a key issue for the company, where the knowledge that an organization has ended up being more important than the standard source of financial energy [12].

V. ANALYSIS OF DATA

A) Respondent's Background

The replies showed that a significant number of the respondents (29%) were project managers. Other positions involved were managing directors represented 26% of the respondents, which is the second most noteworthy extent. This was followed by executive managers (14%) and general managers (2%). For 11–15 years, a dominant portion of the participants (47%) had been working in the construction industry. For over 15 years, 33% had worked, 15% for less than 5 years, and 6% for 6–10 years. A substantial proportion of participants held a Bachelor qualification (45%), although 11% held a Masters qualification. The vast majority of respondents in this study were therefore experienced, educated and held high-level management positions actively involved in the strategic leadership of their company.

B) One Sample T-Test analysis of the level of KM implementation in the Malaysian construction industry

One sample t-test was applied to determine the level of application of KM in Malaysian construction industry. Table 1 demonstrates the outcome of the descriptive analysis of the knowledge management process's descriptive analysis

. Table 2 describes the outcomes of one sample t-test on the level of application of KM in the Malaysian construction industry with the test value=3. With a predetermined confidence rate at 95%, all variables are identified to have a significance level under 0.05 ($p < 0.05$) (See Table 2). This outcome interpreted that a greater mean value than 3.00 was achieved by all the suggested variance. The total score of the mean is 3.823. The outcome demonstrates that the level of knowledge management application is above moderate level in the Malaysian construction industry. From the analysis, it can be seen that that knowledge application has the largest mean score at 3,915, suggesting that the construction firms applied expertise and exercised the most. The second variance is the knowledge acquisition technique with a mean of 3.859. This is followed by knowledge conversion and knowledge protection with the mean at 3.783 and 3.734 respectively.

Table 1. Descriptive Analysis of Knowledge Management Process in Malaysian Construction Industry

| | N | Mean | Std. Deviation | Std. Error Mean |
|------|-----|-------|----------------|-----------------|
| KMA | 110 | 3.859 | .457 | .043 |
| KMC | 110 | 3.783 | .503 | .047 |
| KMAP | 110 | 3.915 | .485 | .046 |
| KMP | 110 | 3.734 | .622 | .059 |

*Total mean = 3.823

**Note: KMA=Knowledge Acquisition, KMC=Knowledge Conversion, KMAP=Knowledge Application, KMP=Knowledge Protection

Table 2. One-Sample Test for the levels of Knowledge Management Implementation in Construction Industry

| | T | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
|------|--------|-----|-----------------|-----------------|---|--------|
| | | | | | Lower | Upper |
| KMA | 19.680 | 109 | 0.00 | .86900 | .7725 | .9455 |
| KMC | 16.336 | 109 | 0.00 | .78364 | .6886 | .8787 |
| KMAP | 19.753 | 109 | 0.00 | .91509 | .8233 | 1.0069 |
| KMP | 12.383 | 109 | 0.00 | .73455 | .6170 | .8521 |

C) The Challenges in Implementing Knowledge Management in Construction Companies

The selection of proposes challenges is derived from various literatures [12, 16]. Table 3 summarizes the results of one sample t-test of the challenges entailed in the practice of knowledge management in the construction companies with the test value=3. With the confidence level predetermined at 95%, 8 of 9 variables are identified to have a significance level under 0.05 ($p < 0.05$). This result indicates that the majority of the proposed variance except lack of motivation and reward acquired a higher mean than value of 3.00. From Table 3, it can be seen that the focus on creating client's value is the highest challenge with t-value=11.375, $p < 0.01$. This is followed by high competitive marketplace at t-value=10.920, $p < 0.01$, time constraints at 8.725, $p < 0.01$, high complexity of construction works at t-value=8.698, $p < 0.01$ and financial constraints at t-

value=8.02, $p < 0.01$. The other ranking of challenges can be referred to Table 3.

Table 3. One-Sample Test for Challenges in implementing Knowledge Management in Construction Companies

| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | | Ranking |
|---------------------------------------|-------|-----|-----------------|-----------------|---|-------|---------|
| | | | | | Lower | Upper | |
| Focus on creating client's value | 11.37 | 109 | 0.000 | 0.85 | 0.71 | 1 | 1 |
| High competitive market place | 10.92 | 109 | 0.000 | 0.90 | 0.74 | 1.07 | 2 |
| Time constrains | 8.72 | 109 | 0.000 | 0.76 | 0.59 | 0.94 | 3 |
| High complexity of construction works | 8.69 | 109 | 0.000 | 0.72 | 0.56 | 0.89 | 4 |
| Financial constraints | 8.02 | 109 | 0.000 | 0.77 | 0.58 | 0.96 | 5 |
| Trend of early retirement | 4.51 | 109 | 0.000 | 0.37 | 0.21 | 0.54 | 6 |
| Lack of top management commitment | 3.83 | 109 | 0.000 | 0.40 | 0.19 | 0.61 | 7 |
| Lack of organizational culture | 3.26 | 109 | 0.001 | 0.31 | 0.13 | 0.51 | 8 |
| Lack of technological infrastructure | 3.09 | 109 | 0.002 | 0.30 | 0.11 | 0.51 | 9 |
| Lack of organizational structure | 3.03 | 109 | 0.003 | 0.22 | 0.08 | 0.38 | 10 |
| Lack of motivation and reward | 0.18 | 109 | 0.856 | 0.02 | -0.18 | 0.22 | 11 |

VI. FINDINGS AND CONCLUSION

The findings reveal that majorities of the respondents in this study believed that the level of KM implementation in their organization is at a moderate level. To confirm the perspective of respondents, the one sample t-test analysis was carried out through Statistical Package for Social Sciences (SPSS) software. With the confidence level predetermined at 95%, all KM processes, comprising knowledge acquisition, knowledge conversion, knowledge application and knowledge protection are distinguished to have a significance level under 0.05 ($p < 0.05$) (See Table 1). This result interprets that all the KM processes obtained a higher mean value than 3.00 with the total score of mean at 3.823, meaning that the implementation of KM is above moderate level. In terms of the challenges in implementing knowledge management in construction industry, it was found that “the focus on creating client’s value” is the utmost challenge facing by Construction Company to implements KM strategy in their organization. The top five of the challenges including “high competitive market place”, “time constrains”, “high complexity of construction works” and “financial constraints” respectively. Time and financial are two factors that frequently considered as vital resources towards success in the organization development and project performance. Thus, companies should consider the top five challenges more to ensure the practices of KM to be implemented efficiently and effectively.

Although, the practices of KM is relatively new in Malaysian construction industry, most of the respondents, in the current study moderately understand what knowledge management is about. This study found that the level of knowledge management is above moderate level. This study has also successfully identified the challenges in



implementing knowledge management in construction industry. The findings can be utilized as guidance for top management, to enable a company to strive competently. Right decisions are vital to empower construction companies to stay focused, and success in the difficult condition.

REFERENCES

1. Abdul-Rahman, H. and C. Wang, Preliminary approach to improve knowledge management in engineering management. *Scientific Research and Essays*, 2010. 5(15): p. 1950-1964.
2. Asmi, A., A. Rasli, and M.A. Madjid, Factors that influence implementation of knowledge management and information technology infrastructure to support project performance in the construction industry. 2004.
3. Mohd Zin, I.N. and C. Egbu. Readiness of organisations to implement a knowledge management strategy: A construction industry overview. in *Procs 26th Annual ARCOM Conference*. 2010. Association of Researchers in Construction Management.
4. Raiden, A.B., A.R. Dainty, and R.H. Neale, Current barriers and possible solutions to effective project team formation and deployment within a large construction organisation. *International Journal of Project Management*, 2004. 22(4): p. 309-316.
5. Davenport, T.H. and L. Prusak, *Working knowledge: How organizations manage what they know*. 1998: Harvard Business Press.
6. Nonaka, I. and H. Takeuchi, *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. 1995: Oxford university press.
7. Gold, A.H., A. Malhotra, and A.H. Segars, Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, 2001. 18(1): p. 185-214.
8. Hari, S., C. Egbu, and B. Kumar, A knowledge capture awareness tool: An empirical study on small and medium enterprises in the construction industry. *Engineering, Construction and Architectural Management*, 2005. 12(6): p. 533-567.
9. Santosus, M. and J. Surmacz, *The ABCs of knowledge management*. *Cio magazine*, 2001. 23.
10. McAdam, R. and S. McCreedy, A critical review of knowledge management models. *The learning organization*, 1999. 6(3): p. 91-101.
11. Robinson, H.S., et al., Knowledge management practices in large construction organisations. *Engineering, Construction and Architectural Management*, 2005. 12(5): p. 431-445.
12. Carrillo, P., et al., Knowledge management in UK construction: strategies, resources and barriers. *Project Management Journal*, 2004. 35(1): p. 46-56.
13. Holste, J.S. and D. Fields, Trust and tacit knowledge sharing and use. *Journal of knowledge management*, 2010. 14(1): p. 128-140.
14. Gann, D., Putting academic ideas into practice: technological progress and the absorptive capacity of construction organizations. *Construction Management & Economics*, 2001. 19(3): p. 321-330.
15. Egbu, C., J. Sturgesand, and B. Bates. Learning from knowledge management and trans-organisational innovations in diverse project management environments. in *Proceedings of the 15th Annual conference of the association of researchers in construction management*, Liverpool, Liverpool John Moores University. 1999.
16. Kamara, J.M., C.J. Anumba, and P.M. Carrillo, A CLEVER approach to selecting a knowledge management strategy. *International journal of project management*, 2002. 20(3): p. 205-211.

17. Chan, A.P. and A.P. Chan, Key performance indicators for measuring construction success. *Benchmarking: an international journal*, 2004. 11(2): p. 203-221.
18. Faraj, I., et al., Distributed object environment: using international standards for data exchange in the construction industry. *Computer Aided Civil and Infrastructure Engineering*, 1999. 14(6): p. 395-405.

AUTHORS PROFILE



Mohamad Nizam Yusof received the BSc. Degree in information studies in 2002 in Universiti Teknologi MARA. He received MSc degree and PhD in project management from Universiti Sains Malaysia. Currently, he is a Dean at Faculty of Informatics Science, University College Bestari. His research interest includes strategic management, knowledge management and project management.



Nurhidayah Marzuki@Yahaya received the B.SOC.SCI. (Honours) Political Science in Universiti Sains Malaysia. She received MSc degree and PhD in Islamic development management from Universiti Sains Malaysia. Currently, she is a Lecturer at Faculty of Islamic Studies, University College Bestari. Her research interest is in Islamic development management.



Norafzan Awang received the BEc. Degree in 2003 in Universiti Utara Malaysia. She received MSc degree in Economics from Universiti Malaysia Terengganu in 2008. Currently, she is a lecturer at Faculty of Economics and Management. Her research interest includes quality of life, knowledge economics, economic development and statistic.



Nik Nurkhairuniss Nik Hassan received the Bachelor in Psychology in 2009 Universiti Malaysia Sabah. She received Master in Counseling from Universiti Utara Malaysia 2012 and PhD in Counseling in 2018. Currently, she is a lecturer at Faculty of Social Sciences. Her research interest includes psychology and counseling.



Khor Soo Chen received the BSc. Degree in Bachelor of Science (Housing, Building and Planning) (Hons) (Construction Management) in Universiti Sains Malaysia. She received Master of Science (Project Management) and Doctor of Philosophy (Sustainable Construction Management) in Universiti Sains Malaysia. Currently, she is an assistant professor at Faculty of Green Environment, UTAR. Her research interest is in sustainable construction management.