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# IMPACT OF KNOWLEDGE AND INNOVATION MANAGEMENT TO FIRM FINANCIAL AND NON-FINANCIAL PERFORMANCE

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## Abstract

This research describes Knowledge and Innovation Management (KIM) dimensions and processes that are practiced in corporations in Malaysia. Specifically, KIM dimensions and KIM processes were measured and their relationship towards company financial and non-financial performances were determined. Data was collected from 300 large corporations operating in Malaysia. The analyses suggest that KIM dimensions and KIM processes are significantly practiced by corporations and these constructs (KIM dimensions and processes) have significant impact towards firms' financial and non-financial performances. This paper raises awareness and provides empirical evidence for the systematic implementation of KIM in organization, which are vital for firm performance. As empirical studies that tests and validates KIM principles in corporations are rare, this research provides valuable insights into the critical role of KIM in organizations as well as paves path for further exploration in the field of organizational performance.
KEY WORDS: Knowledge and innovation management, financial performance, non-financial performance, Malaysia.

## Introduction

Corporations are often in a dilemma when it comes to capturing its knowledge and innovation assets. Due to employee turnover which may deplete firm of its knowledge and innovation assets, various Knowledge and Innovation Management (KIM) initiatives are implemented in firms. Despite various definitions by authors, knowledge and innovation management is commonly attributed to the "how" knowledge and innovation is captured and used in firms instead of just "what" is captured. KIM is explained as "a field that arose with rapid practical intellectual strength for management" (Baskerville and Dulipovici, 2006, p. 83). Yu et al. (2019) also suggested in their recent study the importance of KIM dimensions – both internal and external knowledge sharing – in order to improve the overall performance of organizations. KIM facilitates organisations in developing synergies between disparate knowledge objects, resulting in tremendous increase in innovation (Desouza and Raider, 2006) which facilitates firm success. Organisations that truly implement KIM in the early stages have the propensity to increase their competitive advantage extensively compared to organisations that refrain from doing so (Chong and Chong, 2009). From resource based view, the focus has been shifting towards the intangible assets instead of tangible assets in case of corporate inputs. Moreover, in case of tangible assets, the criteria needed to achieve a competitive advantage in the market are now lacking since they can easily by reproduced. The organisations' competitiveness depends on flexible and innovative human resource management, thus the role of knowledge and intellectual capital is continuously increasing (Darroux et al., 2013; Gavurova et al., 2017; Ulewicz and Blaskova, 2018; Ayman et al., 2019).

In this context, organisations are increasingly aware of the importance of KIM to exploit the competitive advantage that knowledge can bring. Gupta and Govindarian (2000) concluded that large corporations exist due to their ability to transfer and exploit knowledge more efficiently. Employees are residing in disparate locations with different economical, socio-political, demographic, cultural settings, and even knowledge on product spread can be very different (Alavi and Leidner, 2001; Davenport and Prusak, 1998; O'Sullivan, 2008). However, achieving such a common set of KIM objective through coordinating the knowledge of a highly diverse workforce can be a major challenge, viewing from both the perspectives of individual employees and organisations. Lean approach, for example, can be a good solution to explore the current situation of any organisations in order to make improvements towards more efficient and effective operation. Olah et al. (2017) also presented in their study the practical use of the lean approach.

Due to the many differences that exist, the types of knowledge required by the parent and host companies are expected to vary and that they are spread on remote locations (Singh et al., 2006) even if similar knowledge processes are established and performed corporation-wide. For instance, different management styles, organisational structures, and culture affect the types of knowledge required and needed. Also the study of Abdullah and Liang (2013) represents that top management compensation system, cultural differences and top management's role have a significant influence in the level of knowledge sharing between subsidiaries and

headquarters or employees and managers. Similarly, Lu et al. (2019) stated in their research that "ethical leadership can significantly facilitate knowledge sharing through generating genuine concern for the organization." At the same time, differences in the demographic characteristics, attitudes, and the levels of skills and knowledge of information and communications technology (ICT) among the employees also bear significant effect. The study published by Ahmad & Barner-Rasmussen (2019) clearly described also the importance of language diversity – how language can influence knowledge sharing in multinational organisations. Yet, leveraging on the knowledge of employees and making them accessible can be very challenging. On top of all is the overall understanding of the broad spectrum of KIM. Without consistent awareness and understanding across all levels and subsidiaries, KIM implementation can be very cumbersome. All these issues call for research attention.

Notwithstanding the important contributions of KM to the MNCs and its implementation challenges, empirical studies on KM in MNCs to date are sparse. Many studies are conceptual in nature with limited focus (e.g., Fahey and Prusak, 1998; Lindgren and Henfridsson, 2002). Many of the studies are conducted in the Western countries with little focus on large corporations with subsidiaries in the developing countries. Forsgren, Holm and Johanson (2006) insist that KIM on the subsidiary level should be taken into consideration if one were to attempt to understand the KIM challenges faced by large corporations. This is in view of the fact that each subsidiary can be considered as an organisation within a large organisation.

As large corporations including MNNs operate in different regions, it is interesting to identify whether regional differences bear significant deviations to KIM practices. There is a scarce of studies done on KIM practices among large corporations in Malaysia which looked at their firm financial and non-financial performance. Prior studies have been conducted, among others, on local government (Kalsom and Syed Noh, 2005); among graduate students (Nathan, Ibrahim and Adebola (2017). KIM also relates to knowledge society and it is crucial to understand the meaning of absorption in KIM. Absorption means the ability of an individual or company to absorb and apply specific knowledge in unchanged form. Employee development has an essential role in this progress, as quality of human resources can be improved through education which can enable organisations to adapt. Furthermore, there is a critical relationship between absorptive capacity and collective effectiveness (Zhang et al., 2019).

A careful examination can thus determine KIM implementation success in Malaysian large corporations. This study is aimed at combining three important variables: (1) KIM dimensions; (2) KIM processes; and (3) KIM performance measurement. The rest of the paper is organised as follow. The next section reviews the relevant literature, followed by the methodology adopted. The descriptive results followed by empirical results are presented and interpreted before the implications are discussed. The paper ends with concluding remarks and suggestions for future research.

## Literature Review

### *KIM Dimensions*

KIM critical dimensions include managerial areas that must be assigned special and continual attention to achieve high performance (OuYang et al., 2010). According to Quinn, Anderson and Finkelstein (1996), KIM dimensions provide important meaning to KIM through the identification of core processes that are critical to successful KIM implementation. Many efforts have been taken to develop a comprehensive list of success factors since the early 1990s to date.

Table 1 shows the result of literature review and identification of KIM dimensions through seminal works.

**Table 1.** Knowledge and Innovation Management Dimensions

| *No.* | *KIM Dimensions* | *Source* |
|---|---|---|
| 1 | Training | Ahn & Chang (2005),Bennett & Gabriel (1999), Chase (1997), Chong (2006), Chong & Choi (2005), Dein & Seward (2005), Kalsom & Syed Noh (2005), Pastor (1996), Salleh & Goh (2002), Walczak (2006), Akhavan et al. (2014) |
| 2 | Employee Involvement | Choi (2000); Chong & Choi (2005), Chua & Lam (2005), Crauise O'Brien (1995), Davis, et al. (2005), Hall (2001), Lawler (1992), Lopez, et al. (2004), McMahon & Lawler III (1995), Ordonez de Pablos (2004), Robbins, (1998), Silos (1999); Wilson & Asay (1999). |
| 3 | Teamwork | Chase (1997), Choi (2000), Chong (2006), Conti & Kleiner (1997), Maier & Remus (2003), Nielsen, Nykodym, Simonetti, & Welling (1994), Nonaka (1994), Walczak (2006) |
| 4 | Empowerment | Anahotu (1998), Chong (2006), Chong & Choi (2005), De Long & Fahey (2000), Lopez, et al. (2004), S. Michailova & Nielson (2006), Ordonez de Pablos (2004); Robbins (1998), Senge, et al. (1999) |
| 5 | Leadership | Abell & Oxbrow (1999), Chase (1997), Choi (2000), Chong (2006), Chong & Choi (2005), Chua & Lam (2005), Davenport & Klahr (1998), Goh & Richards (1997), Hansen, Nohria, & Tierney (1999), Lin & Tseng, (2005), Lopez, et al. (2004), Moffett, McAdam, & Parkinson (2003), Nahm, Vonderembse, & Koufteros (2004), Politis, (2001), Salleh & Goh (2002), Swan, Newell, & Robertson (2000), Wiig (1997), Zammuto, Gifford, & Goodman, (2000), |

| | | |
|---|---|---|
| | | Zammuto & O'Connor (1992), Akhavan et al. (2014), Selvarajah et al. (2013). |
| 6 | Information system (IS) infrastructure | Beecheler & Yong (1994), Chase (1997), Chong (2006), Davis, et al. (2005), Maier & Remus (2003), Tsai (2001), Walczak (2006), Wiig (1997) |
| 7 | Performance measurement | Ahn & Chang (2005), Bassi & Van Buren (1999), Uit Beijerse (1999); W. Bukowitz & Petrash (1997); W. R. Bukowitz & Williams (2000); Carneiro (2001), Chong, 2006; Ghalayini & Noble (1996), Gooijer (2000), Martinez (1998), Moffett, et al. (2003), Pearson (1999), Tiwana (2002), Walczak (2006) |
| 8 | Knowledge-friendly culture | Ahn & Chang (2005),Uit Beijerse (1999), Bell & Housel (2001), Buckman (1998), Bukowitz & Williams (2000), Chase (1997), Chong (2006), Chong & Choi (2005), Chua & Lam (2005), Dunphy & Herbig (1998), De Jager (1999), Ordonez de Pablos (2004), Walczak (2006), Bučková (2015), Akhavan et al. (2014) |
| 9 | Benchmarking | Uit Beijerse (1999), Boxwell (1994), Camp (1989), Carpentar & Rudge (2003), Chong & Choi (2005), Cox & Thompson (1998), De Jager (1999); O'Dell (1996), Tiwana (2002) |
| 10 | Knowledge structure | Ahn & Chang (2005), Uit Beijerse (1999), Bukowitz & Williams (2000), Choi (2000), Chong (2006), Chong & Choi (2005), Davenport & Klahr (1998), Desouza & Raider (2006), Hsieh, Yang, & Lin (2002), S. Michailova & Nielson (2006), Ordonez de Pablos (2004), Ulrich, Von Glinow, & Jick, 1993, Wiig (1997) |
| 11 | Organisational constraints | Ahn & Chang (2005), Bassi & Van Buren (1999), Bonaventura (1997), Chase (1997), Choi (2000), Chong, (2006), Chong & Choi (2005), Chua & Lam (2005), Clarke & Rollo (2001), Davenport & Klahr (1998), Demarest (1997), Desouza & Raider (2006), Dyer & McDonough (2001), Liebowitz (1999), Longbottom & Chourides (2001), Maier & Remus (2003), McCune (1999), McDermott & O'Rell (2001), Ordonez de Pablos, (2004), Ruggles (1998) |
| 12 | Business strategy | Chong (2006), Lin & Tseng (2005), Nesbitt (2002), Wiig (1997) |

*KIM processes*

Systematic KIM processes provide a clear guideline for organisations in the KIM implementation process. Without clear process innovation, knowledge captured is of little use to the firm. KIM systems have to efficiently create, capture, organise, share, and apply organisational knowledge and expertise (Albers and Brewer, 2003; Gottschalk, 2002; Gupta, Lakshmi and Iyer, 2000; Liebowitz, 2000; Evans, Dalkir and Bidian, 2014; Rodriguez and Al-Ashaab, 2007). The KIM processes identified through the seminal works in the area are presented together with its definition in Table 2.

**Table 2**. KIM Process

| *No.* | *KIM processes* | *Description* | *Source* |
|---|---|---|---|
| 1 | knowledge and innovation creation | Knowledge and innovations in corporations especially new knowledge can be created by employees and customers through socialisation, externalisation, combination, and internalisation. | Uit Beijerse (1999), Bergeron (2002), Kermally, (2002), Nonaka & Takeuchi (1995), Stapleton, (2003), Wiig (1997) |
| 2 | knowledge and innovation gathering | Large corporations that operate in many countries can gather more information from their subsidiaries as more information sources the company have, the more opportunities for the company to be more competitive than other companies. | Ahn & Chang (2005), Bloodgood & Salisbury, (2001), Chong (2006), Michailova & Nielson (2006), Ordonez de Pablos (2004), Stapleton, (2003), Ikhsan & Rowland (2004) |
| 3 | Knowledge and innovation organising | Knowledge and innovation gathered from different groups of knowledge workers has to be arranged accordingly for easy access, consequently firm can discover knowledge they need but do not have, or have but have not utilised. | Uit Beijersev (1999), Call (2005), Chong (2006), Chua & Lam (2005), Davis, et al. (2005), Harvey, (2003) Wiig (1997) |

| | | | |
|---|---|---|---|
| 4 | Knowledge and innovation diffusing | Knowledge and innovation gathered in firms should be distributed and transmitted through teams either through formal or informal way by utilising and diffusing via innovation sharing network or communication technology. | Chase (1997), Chua & Lam (2005), Maier & Remus (2003), Michailova & Nielson (2006), Nonaka & Konno (1998), Publishing (2002), Soliman & Spooner (2000), Stapleton (2003), Wiig (1997), Lu et al. (2019), Ahmad & Barner-Rasmussen (2019) |
| 5 | Knowledge and innovation using | Employees will use knowledge and innovation created in-house in their daily operation, customized according to the division/function of the teams. These innovations should be easily accessible as well. | Ahn & Chang (2005), Chase (1997), Davis, et al. (2005), Lopez, et al. (2004), Maier & Remus (2003), Ordonez de Pablos (2004) |

*KIM performance measurement*

There is general agreement that KIM implementation results in knowledge and innovation related effectiveness and allowing practicing organisations to maximise their returns from knowledge-related assets (Uit Beijerse, 1999; Ordonez de Pablos, 2004; Wiig, 1997).

Performance measurement is crucial part in KIM; as without measurement (such as KPIs) organizations are unable to make correct and grounded decisions about further improvement (Andone, 2009; Wong et al., 2015; Shannak, 2009).

KIM implementation can be measured and evaluated in terms of financial and non-financial perspectives. Traditional measurements focused on financial terms as it is posited that corporations that have a full-fledged KIM implementation in place will experience an increase in profit and reduce in cost.

Furthermore, it will also increase their market shares and sizes, which eventually lead to a higher return on investment. There are also non-financial factors that can be used to evaluate KM performance, i.e. systematic knowledge activity, employee development, customer satisfaction, good external relationship, and organisational operation success (Chong, Wong and Lin, 2006). These factors are considered in the study.

Figure 1 shows the research framework of this study. The KIM Dimensions and KIM processes (independent variables) are posited to be important determinants of KIM performance outcomes (dependent variables) in terms of Financial and Non-Financial Outcomes.

Based on this research framework, the research methodology is designed to measure and test this framework as explained in the following section.

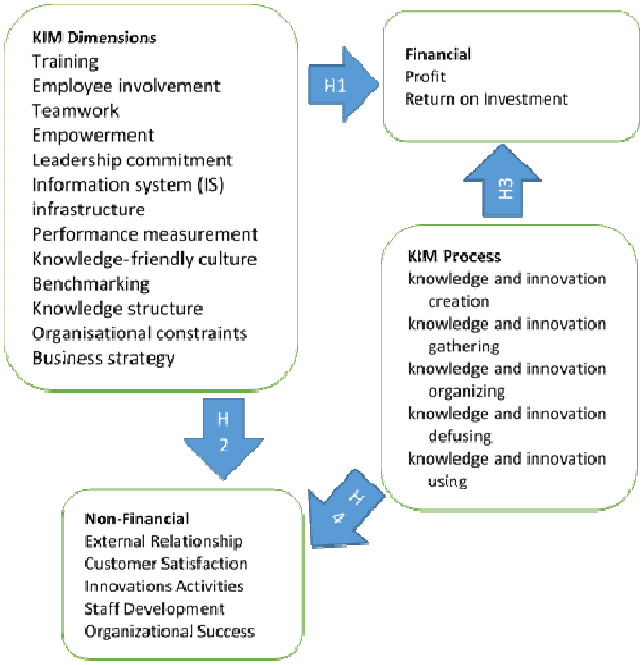


**Fig. 1.** Research framework

## Methodology

*Sampling*

A comprehensive list of all large corporation operating in Malaysia was obtained from the Malaysian Industrial Development Authority (MIDA). From the list, 300 large corporations which were predominantly Malaysian and Foreign Multi-National Corporations operating in Malaysia were selected through systematic sampling method. Self-reporting questionnaires were sent by mail with self-addressed stamped envelopes to the corporations, particularly from those who are holding the positions of managers and above. About 102 questionnaires were returned after a three-month period of data collection, yielding a response rate of 34 percent.

*Questionnaire Design*

The questionnaire is divided into four sections. Section A contains information on the individual and organisational demographic characteristics. Section B covers the degree of implementation of KIM Dimensions in which a 5-point Likert scale (1 = not implemented at all to 5 = extensively implemented with 3 as neutral point) was used. The questions were adopted primarily from the studies of Chong (2006). Section C measures the KIM processes in the firms. In both Sections B and C, the items have been tested for construct validity and are therefore fit to be replicated in this study. Section D measures the KIM performance outcomes. Respondents were asked to rank the impact of KIM implementation on their companies' performance using a 5-point Likert scale (1 = no value at all to 5 = high value) with a neutral response in between.

## Results and Discussion

The following sections present the descriptive results obtained from the empirical survey.

About 81.4 percent of the respondents are male executives. They come from various departments of the MNCs. The largest group of respondents come from the Finance department (19.61 percent), followed by Marketing/Sales (17.65 percent) and Human Resource department (16.67 percent). The smallest representation comes from the Research and Development department and the Production department, both sharing 1.96% each.

Most of the corporations surveyed (98.04 percent) indicated that they either have made investments in KIM (58.8 percent) or plan to invest in KIM in the next 4 years. This justifies the earlier argument that many firms sense a greater need for KIM towards their business success. About 7.8 percent of them intend to invest in KIM in the next 1 year, 9.8 percent in the next 1-2 years, and 21.6 percent between the next 2 to 4 years. In terms of departments, 28.4 percent of the 58.8 percent. Firms have implemented KIM in all departments. About 22.6 percent have implemented KIM in their Marketing/Sales department and 18.6 percent with the information technology (IT) department. The other departments with smaller percentage include finance, manufacturing, customer service, research and development, engineering, production, accounts, and administration department.

Table 3 shows the mean and standard deviation scores for the KIM dimensions, KIM processes and KIM performance outcomes.

Table 3 shows that 5 of the 12 Dimensions scored means of above 3.50, implying that teamwork, knowledge-friendly culture, knowledge structure, leadership commitment towards KIM, and information systems infrastructure have been implemented to some extent.

**Table 3.** Means and Standard Deviations of KIM Dimensions, KIM processes, Financial and Non-Financial Measurements

| **KIM Dimensions** | | | |
|---|---|---|---|
| **No.** | | **Mean** | **Std. Dev.** |
| 1. | Training | 3.04 | 1.089 |
| 2. | Involvement | 3.37 | 0.843 |
| 3. | Teamwork | 3.72 | 0.763 |
| 4. | Empowerment | 3.35 | 1.011 |
| 5. | Leadership commitment | 3.58 | 0.789 |
| 6. | IS infrastructure | 3.54 | 0.852 |
| 7. | Performance measurement | 3.46 | 0.897 |
| 8. | Knowledge-friendly Culture | 3.64 | 0.806 |
| 9. | Benchmarking | 2.80 | 0.758 |
| 10. | Knowledge structure | 3.62 | 0.797 |
| 11. | Organisational constraints | 3.21 | 0.813 |
| 12. | Business strategy | 3.13 | 0.897 |
| **KIM Processes** | | | |
| 1. | Knowledge and Innovation creation | 3.95 | 0.50 |
| 2. | Knowledge and Innovation gathering | 3.71 | 0.77 |
| 3. | Knowledge and Innovation organising | 4.14 | 0.77 |
| 4. | Knowledge and Innovation diffusing | 3.79 | 0.55 |
| 5. | Knowledge and Innovation using | 3.86 | 0.83 |
| **Non-Financial Measurement** | | | |
| 1. | External relationship | 4.11 | 0.88 |
| 2. | Customer satisfaction | 3.86 | 0.75 |
| 3. | Innovation activities | 3.87 | 0.73 |
| 4. | Staff development | 4.20 | 0.60 |
| 5. | Organisational success | 3.86 | 0.61 |
| **Financial Measurement** | | | |
| 1. | Profit | 4.08 | 0.68 |
| 2. | Return on investment | 3.86 | 0.76 |

The standard deviation scores for all the factors are well below 1 except for training and empowerment, implying consistency in the respondents' answers. Benchmarking has been found to be the least implemented KIM factor, followed by training, and business strategy.

In terms of KIM processes, many of the respondents' state that organising knowledge is the most implemented processes, followed by creation, use, diffusion, and gathering. All the processes scored mean values of above 3.50, indicating that they are implemented to some extent in the corporations.

Most participants agree that employee development is the most important KIM outcomes. This is followed by good external relationship and innovation activities in firms that promote open innovation. Customer satisfaction and organisational success share the same mean values of 3.86. In terms of financial performance, profit has been identified as the highest value of KIM outcomes, followed by return on investment.

*Inferential statistics: Relationships between KIM Dimensions, KIM processes and KIM performance outcomes*

Table 4 shows the results of the inferential statistics between KIM Dimensions, KIM processes and KIM performance outcomes.

**Table 4:** Summary of ANOVA test results for H1, H2, H3 and H4

| **Independent Variables** | **Dependent Variable (Organizational Performance)** | |
|---|---|---|
| | **Financial** | **Non-Financial** |
| KIM Dimensions | F = 2.203<br>p = 0.018<br>Significant<br>[H1] | F = 1.785<br>p = 0.063<br>Not Significant<br>[H2] |
| KIM Process | F = 4.746<br>p < 0.001<br>Significant<br>[H3] | F = 12.136<br>p < 0.001<br>Significant<br>[H4] |

The results reveal that KIM Dimensions have significant relationship with financial performance of the firms but insignificant with the non-financial performance indicators. Hence H1 is supported while H2 is not supported.

This signals the pivotal role that KIM dimensions play in the financial performance of large corporations. This finding agrees with previous research that have highlighted the importance of KIM dimensions for positive financial performance of organizations (OuYang et al., 2010).

KIM processes, on the other hand is found to be significantly related to both the financial and non-financial performance of the firms. Hence both H3 and H4 are supported. This again highlights the importance of systematically implementing KIM processes in firms significantly leads to better financial and non-financial performance of the companies. Although KIM dimensions do not statistically lead to non-financial outcome of corporations, it seems that KIM processes nevertheless has significant impact to non-financial outcome. This could include innovation activities that promotes open innovation culture at firms that creates positive and lively working environment.

## Conclusion and Suggestions for Future Research

This paper highlights the major dimensions of KIM implementation is large corporations operating in Malaysia. To this extend, this paper due to the page limitation only reports the descriptive findings of this large empirical ongoing study.

KIM dimensions are found to be significantly impacting corporations' financial performance. This is a major finding of this research which emphasizes that large corporations are able to be competitive financially due to their systematic efforts in promoting knowledge and innovation management in firms. KIM processes which includes creation, gathering, organizing, diffusing and using are significantly impacting large corporations' both financial and non-financial performance. For learning organizations, this is a critical finding to encourage firms to continue initiatives of knowledge and innovation capturing and diffusing.

This study is limited to Malaysian large corporation and similar studies comparing corporations in the region in warranted to better generalise the findings. Future research could also include other dimensions such as design thinking and business model canvassing practice in firms that could lead to more agile innovation artchitecture.

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