



Factors Driving Knowledge Creation among Private Sector Organizations: Empirical Evidence from Malaysia

Lee Wai Yi¹ and Sharmila Jayasingam²

¹UNDP Malaysia, Kuala Lumpur, Malaysia

²Faculty of Business and Accountancy, University of Malaya, Malaysia

Abstract

The Tenth Malaysia Plan (2011 – 2015) [Tenth Plan] mentioned that in a quest to move from a middle income nation to high income nation, it is crucial for Malaysia to focus on innovation and knowledge-based growth. Despite the increasing attention focused upon knowledge management, particularly in the area of knowledge creation/innovation in Malaysia, organizations have yet to achieve the desired level of knowledge creation. Therefore, this study aims to determine what factors will influence knowledge creation among private sector organizations in Malaysia. This research examined how these four factors -- organization culture (sharing culture), organization structure (restrictive structure), Information Communication Technologies (ICT) and Human capital-- influences knowledge creation. The social system within the organization which includes knowledge sharing culture and human capital were found to positively influence the extent of knowledge creation. A restrictive organization structure had unexpected effect on knowledge creation whereas ICT was found to be only an enabler and not a driving factor.

Keywords: Knowledge creation, Malaysia, Knowledge sharing culture, Organization structure, Information Communication Technologies, Human capital.

Introduction

Since the early 1990s, Malaysia began paving the path and laying the foundation for its knowledge-based economy (k-economy) bearing the notion that continual effort is needed to improve the nation's and its industries' competitive position (EPU, 2004; EPU, 2009). However, the initiatives only began to gain notable momentum in the late 1990s and early 2000 with the establishment of the Multimedia Super Corridor and its flagships (1996), the Third Outline

Prospective Plan (2001), and the Knowledge Economy Master Plan.

Knowledge Management (KM) initiatives were also set up at various government organizations (e.g. INTAN, MAMPU, MINT, SIRIM, Telekom Malaysia, TNB), educational institutions (e.g. Multimedia University, Universiti Putra Malaysia (UPM), Open University Malaysia (OUM), Monash University (Malaysia), Universiti Teknologi Mara (UITM)), and even financial institutions (e.g. CIMB, OCBC, Bank Mualamat) (Chowdry,

2006). The measures undertaken by such institutions as mentioned above focuses on the development of knowledge enablers such as the development of human capital, research and development, information and communication technology, infrastructure and info-structure, and so on.

Evidently, concerted effort is in place to help the transformations of organizations to become knowledge-intensive firms. However, even with all these combined efforts by the Government, the impact and actual results of these initiatives are yet to be seen. In spite of the increasing attention showered upon KM, organizations have yet to achieve the desired level of KM especially in terms of knowledge creation.

Given the situation, one might think there must be some progress, especially in terms of knowledge creation. Conversely, a survey conducted by EPU (2004) on 1819 organizations from 18 industries found that despite the numerous initiatives in place, Malaysia was reported to be still lagging behind leading economies such as the United States and Singapore with regards to knowledge enablers specifically in terms of educated population, the number of computers, and the number of internet users. Malaysia was reported to be almost at par with developed nations only in terms of technological cooperation. Other attempts to evaluate KM, led researchers (e.g. Rahman, 2004; Toh, Jantan, and Ramayah, 2003; Chong, 2006) to report that the implementation of KM was still relatively slow in the Malaysian context. Although most organizations were aware of KM and its impending benefits, Chong (2006) found that the level of implementation was not at par with the level of awareness.

Furthermore, it has been reported that there is a wide discrepancy in the level of KM practices in Malaysia when compared to leading economies and foreign owned firms

(EPU, 2004). Although the second phase of the Knowledge Content Survey reported that the extent of knowledge enablers such as human capabilities, knowledge leadership, technology/info structures, and knowledge environment has improved across industries since the first survey, a decline was noted in the level of knowledge processes (knowledge generation, acquisition, sharing, and utilization) (EPU, 2009). In fact, most Malaysian firms leaned towards knowledge acquisition through hiring and shied away from actual knowledge acquisition (Jayasingam, et al., 2012).

Despite these drawbacks, the government of Malaysia is persistent in its quest to become a knowledge-intensive nation. The importance placed on k-economy by the nation is evident even in the recently introduced Tenth Malaysia Plan (2011 – 2015) (Tenth Plan). The fundamental themes of the Tenth Plan have been demarcated as the 10 Big Ideas. The essence of the 10 Big Ideas clearly delineates the need for the nation to unleash its innovative capabilities. Increased attention is being showered upon the development of soft infrastructure such as the development of human capital. A shift in focus from a capital intensive economy to a knowledge-intensive and innovation-led economy is aimed at facilitating the country's quest in achieving the status of a high income nation.

Therefore, we believe, firms need to make the transition from being good adopters and adaptors of technology to being good innovators—in other words, knowledge creators. Hence, this study aims to determine what factors will influence knowledge creation among private sector organizations in Malaysia. This research will focus on how factors such as organization culture (sharing culture), organization structure (restrictive structure), Information Communication Technologies (ICT) and Human capital will influence knowledge creation.

Theory and Hypotheses

Knowledge: The Essence of Competitive Advantage

The core ingredient for KM is knowledge. Knowledge exists at a higher order than information (Ahmed, Lim, and Zairi, 1999). Contrary to information which merely supplies facts in a structured outline, knowledge allows for making predictions, causal associations, or predictive decisions about what to do (Tiwana, 2003). Knowledge is a mix of experience, values, related information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information (Awad and Ghaziri, 2004; Davenport and Prusak, 1998). In short, knowledge is data and information that has been altered into a more significant form with the influence of personal belief, value and experience (Beijerse, 1999; Beveren, 2002; Zolingen, Streumer, and Stoker, 2001).

KM has evolved as a strategic process that has a clear link to organizational performance (Jayasingam et al., 2012). Most organizations are seeking benefits of KM in order to build on their competitive advantage such as gathering and sharing best practices, effectively managing customer relationships and delivering competitive intelligence (Ming Yu, 2002; Syed-Ikhsan and Rowland, 2004). Attempts to reap the promised benefits are made through active engagement in various KM practices such as knowledge acquisition, knowledge sharing, and knowledge creation. Knowledge acquisition relates to the discovery of knowledge, (Darroch, 2003). After acquiring knowledge, one might explore the idea of knowledge sharing. This practice refers to the exchange of knowledge between at least two parties in a mutual process allowing restructuring and sense-making of the knowledge in novel milieus (Willem, 2003). A chronological order stemming from knowledge sharing would be knowledge creation or innovation. Some might refer to it as knowledge generation.

For purposes of this study, the term will be referred to as knowledge creation.

Knowledge Creation: A Strategic Tool

Over the years, KM has been acknowledged as a strategic tool to establish competitive advantage. However, a large number of researches focused on KM practices such as knowledge sharing and transfer and paid less attention to knowledge creation (Mitchell and Boyle, 2010). Challenges associated with the measurement and conceptualization of the term knowledge creation was identified as the main reason for the dearth of research related to this practice. For the purpose of this study, we adopted the definition of knowledge creation provided by Michell and Boyle (2010), which delineates knowledge creation as “the generation, development, implementation, and exploitation of new ideas” (p. 70).

In Malaysia, the trend indicates that a growing number of firms are actively promoting knowledge creation (EPU, 2005). Despite this increase in awareness and encouragement, patent and copyright applications--the two very important variables to measure innovation and knowledge creation, continue to show slow growth. Only 1815 patents and Intellectual Property (IP) rights have since been registered in the past 12 years.

On a separate note, local firms did not even make it to the Global Most Admired Knowledge Enterprises (MAKE) Winners' listing. For example, in MAKE 2006's list, North America took top honours with 8 winners, followed by Asia with 6 winners and Europe with 2 winners. Although Asia came in second place, Malaysia was not amongst the countries that won. Instead these countries were Japan, South Korea and India. Again from 2007 to 2010, Asian MAKE winners were from Indonesia, India, Japan, South Korea and Singapore. Unfortunately, Malaysia still failed to make the list.

Although the MAKE list may not be an absolute measure of the extent on knowledge creation in Malaysia, it does compel us to reflect on where Malaysian firms went wrong. The criteria used for nominating the leading knowledge driven organizations focuses on knowledge creation capabilities such as innovation capability, value creation capability and so forth. This revealed that indeed the levels of innovation and knowledge creation in the country are still at low levels although systems and structures are in place to support it. Firms will need to move from being just good adopters and adapters of technology to being good innovators instead as recommended by the study undertaken by EPU (2009).

Drivers of Knowledge Creation

Most researchers have focused on factors that influence the extent of KM generally and knowledge sharing specifically. Not many studies have attempted to explore the influence of various factors on knowledge creation specifically. Hence, this study will focus on the four factors that have been highlighted as the strategic focus areas in the Malaysian Knowledge Based Economy Master Plan and test its influence on knowledge creation. These four factors are organization culture (sharing culture), organization structure (restrictive structure), Information Communication Technologies (ICTs) and Human capital.

Knowledge Sharing Culture

Steyn and Kahn (2008) posit that almost all approaches to KM will regard organizational culture as one of the key, if not the key component of any effective KM strategy. Organizational culture can either drive or inhibit an organization's KM strategy. Numerous researchers (e.g., Toh *et al.*, 2003, Chong, 2006) have highlighted the importance of organizational culture in impacting KM practices. KM practices such as knowledge sharing and knowledge creation are interdependent processes (Janz and Prasarnphanich, 2003). Hence, when

knowledge is not shared and knowledge hoarding prevails in an organization's culture, knowledge creation will be hampered. Thus, we hypothesize that:

H1: A knowledge sharing culture will positively influence the level of knowledge creation.

Restrictive Organization Structure

In the Malaysian context, many organizations are still very mechanistic in nature, perhaps due to culture pertinent to the Asian region where hierarchy of authority and high power distance relations seems to be still acceptable in practice (Hofstede, 1980). However, Chong and Choi (2005) suggest that such organizational constraints lead to inefficiency, ineffectiveness and powerlessness within an organization. They tend to create hierarchical bureaucracy with few incentives to innovate. Eventually, this will lead to slow responsiveness to decision making processes. Therefore, according to Steyn and Kahn (2008), organizations will need to make a number of elemental changes in terms of organizational structure to become more project based and team oriented. The shift in structure should include moving individual work to team work, transforming functional work to project-based work, replacing single-skilled personnel with multi-skilled employees and eliminating co-ordination from above to adopt co-ordination among peers. All these seemed to suggest an organic kind of structure to improve structural integration in the organization and develop better overall creativity and innovation. Hence, we posit that:

H2: Restrictive structure will negatively influence knowledge creation activities.

Information Communication Technology (ICT)

ICTs are enablers for the knowledge creation process through the conversion of knowledge from inputs to outputs (Skyrme,

1998; Terajetgul and Charoenngam, 2006). The use of suitable ICTs facilitates data sorting and presentation, storage, flow through the organization and finally, supporting the thoughts processes that inform effective decision-making. Daud (2007) stated that for effective KM to exist, it will typically need the appropriate combination of organizational, social and managerial initiatives along with, in many cases, the deployment of appropriate technology like ICT. However, many top managers are reluctant to develop or invest in a KM program despite its vital importance due to the misconception regarding the costly nature of developing a KM system utilizing ICTs (Chong and Choi, 2005). The third hypothesis for this study is:

H3: ICT as enabling tools will positively influence knowledge creation activities.

Human Capital

EPU (2005) highlighted the importance of human capabilities, where the ability of workers is essential and paramount for them to participate actively in knowledge-intensive activities. As quoted in Tasmin and Woods (2008), KM practitioners and researchers alike tend to support the notion that KM requires the integration between IT systems or ICT and people who run the firm as means to attain innovation. ICT systems exist and can readily be available but ultimately, it is the human capital that is crucial in applying the technology and utilizing it. It can be considered that it is widely known that the most important competitive advantage to any firm is its workforce. Hence, employees and managers who are well equipped with skills and information to fulfil their responsibilities are essential success ingredient for any KM implementation (Chong and Choi, 2005). Thus, we provide the following hypothesis:

H4: Human capital will positively influence knowledge creation activities.

Method

Research Site, Participants, and Procedure

The self-administered surveys were distributed via personal contacts and networks and their extended networks. We identified respondents from knowledge-intensive firms who has access to the research and development (R and D) activities within the organization to ensure they could provide reliable data especially related to the extent of knowledge creation in the organization. Organizations operating within knowledge intensive industries such as electronics/electrical, chemical/fertilizer and services sector (Toh, Jantan, & Ramayah, 2003) were selected as the sample of this study.

We are conscious of the likelihood of common method variance due to the use of common raters to provide the measures of both the predictor (knowledge sharing culture, restrictive organization structure, ICT, and human capital) and criterion (knowledge creation) variables. The study's internal validity could probably be affected by this (Podsakoff *et al.*, 2003). Hence, to reduce the effect of common method variance, we created a psychological separation between the predictor and criterion variable as suggested by Podsakoff *et al* (2003). This step was taken to avoid the assumption among respondents that the measurement of the criterion variables is related to the predictor variable. In addition, we assured the respondents that there was no right or wrong answers and what mattered most was the respondents' honest opinion. This was done to decrease the likelihood of them trying to link the answers for the predictor and criterion variable and provide answers as probably anticipated by the researcher (Podsakoff *et al.*, 2003).

The questionnaires were either hand delivered or emailed to the potential respondents. The snowballing technique was employed when distributing the surveys where we targeted one contact on our network and in return, that one contact was requested to contact 5 others in their extended network to participate in the survey. Utilizing this method somewhat improved the speed for data collection and improved response rate.

Out of 250 questionnaires sent out through various channels, 210 were received but only 205 were usable questionnaires, giving an effective response rate of 82%. This study had a fairly proportionate distribution of male (52.7%) and female (47.3%) respondents. As for age groups, 57.6% were 35 years or younger whilst the remaining 42.4% were aged 36 and above, indicating a majority of younger respondents. Most of the respondents possessed at least a bachelor's degree and beyond at postgraduate levels of education. This indicates that the respondents were highly educated and could be due to the fact the majority of the respondents were at officers/executives, supervisory, management and senior management levels, with a cumulative total of 94.1%.

Measures

The measures were adapted from two sources – the measures for the four factors were adopted from the work of Syed-Ikhsan and Rowland (2004). The measures for knowledge creation were adapted from the Malaysian Knowledge Content Survey (EPU, 2009). Since both sources already tested the questionnaires in Malaysia, it made the pilot test unnecessary. This section utilized the 7-point Likert Scale which required the respondents to indicate their levels of agreement and disagreement by placing a "X" at the following appropriate number (1=Strongly Disagree, 2=Disagree, 3=Slightly Disagree, 4=Neutral, 5=Slightly Agree, 6=Agree and 7=Strongly Agree.)

The survey contains three main sections; the first section asked questions related to the respondent's organization's KM strategy. The second section contains thirty questions related to the respondents and the organization where they work which will measure the dimensions of sharing culture, restrictive organization structure, ICTs, human capital and finally, knowledge creation. Sample items include: "...The management provides time and resources to take part in the learning and sharing exercises " (human capital)"...All staff are ready and willing to give advice and help upon request" (organization culture); "...Computer-based information systems provide me with more up-to-date information than that available in manual files" (ICT); "...The confidentiality status of documents in my organization often leads to problems in acquiring information and creating knowledge" (organization structure); and "my organization has constantly filed new applications for patents, designs, know-how, etc. in the past one year"(knowledge creation).

Results

Psychometric Properties of Measures

Exploratory factor analysis (EFA) was conducted on the four factors of sharing culture, restrictive structure, ICT and human capital. This was done to examine the correlations between the different variables in the study and to determine whether the data could be condensed or summarized into smaller set of factors.

For the independent variables, the factors were rotated using Oblimin with Kaiser Normalization method because the factors are assumed to be related. There were 5 factors created initially but it was left with 4 factors at the end after selectively dropping the items with high cross loadings. Some of these factors were not deemed fit nor made any sense to their related factors, and thus had to be dropped. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was

0.836 demonstrating adequate inter-correlations, and the Bartlett's Test of Sphericity was significant ($\chi^2 = 2069.797$, $p < 0.01$). The four factors were reliable with reliability coefficients above .70.

Factor analysis was also performed on knowledge creation items to ensure that all the 5 items fall into one factor only. The research results did show that all the 5 items fell into one factor and the name of the factor remained as knowledge creation. The KMO

measure of sampling adequacy was 0.820 whilst the Bartlett's Test of Sphericity was significant ($\chi^2 = 513.559$, $p < 0.01$ at 0.000). The scale demonstrated high reliability with a Cronbach alpha of .87.

Descriptive statistics, correlation between the factors, and reliability coefficients for the subscales are shown in Table 1. Yin, R. K. (1989). 'Case Study Research: Design and Methods,' *Sage Publications Inc.*, USA.

Table 1: Descriptive Statistics, Correlation Coefficient, and Reliability Coefficient for Independent and Dependent Variables

	Mean	Std Dev.	Human Capital	Restrictive Structure	ICT	Sharing Culture
Human Capital	4.36	1.16	.85			
Restrictive Structure	3.94	1.09	-.15*	.79		
ICT	5.18	1.05	.41**	.12	.84	
Sharing Culture	4.42	1.02	.53**	-.28**	.30**	.72

Note: * $p < 0.05$, ** $p < 0.01$; Diagonal entry shows reliability coefficients

Tests of Hypotheses

It was predicted that knowledge creation is still at low levels among most Malaysian organizations. The finding of this research confirms this fact. Respondents recorded that only 24.8% of their organizations had constantly filed new applications for patents, designs, and know-how in the past one year and only 21.5 percent recorded that the applications were successful. Although approximately 40% of the respondents found their organization to have increased the introduction of new products and improved processes in the past 1 year, this proportion was not sufficient to create new ideas that deserve recognition. Unfortunately, only

32.7% reported that their organizations had been actively involved in R and D activities in the past one year.

Multiple regression analysis was performed to determine the prediction power between the dependent variable (knowledge creation) and the multiple independent variables (sharing culture, restrictive structure, ICT and human capital). The results are as shown in Table 2. The model is found to be safe from multi-collinearity problems as the condition index values were all less than the cut-off point of 30 and the Variance Inflation Factor (VIF) which measures tolerance is less than 10 for all factors (Hair *et al.*, 2006).

We found only human capital ($B = 0.433$, $p < 0.01$) and sharing culture ($B = 0.285$, $p < 0.01$) to positively influence knowledge creation—hence, supporting *H1* and *H4*. Although *H2* states that restrictive structure

will negatively influence knowledge creation, the results show otherwise. Furthermore, the effects of ICT were not significant and therefore, *H3* was also not supported.

Table 2: Results of Regression Analysis

	Dependent variable Knowledge creation
<i>Independent variables</i>	
Knowledge sharing culture	.28**
Restrictive organization structure	.16*
ICT	-.05
Human capital	.43**
F value	24.25
R ²	.32
Adjusted R ²	.31

* $p < 0.05$, ** $p < 0.01$

Discussion

This study aimed at investigating the factors that influences the extent of knowledge creation in organizations. Given this objective, we tested four major hypothesized relationships: (a) the relationship between knowledge sharing culture and knowledge creation, (b) the relationship between restrictive organization structure and knowledge creation, (c) the relationship between ICT and knowledge creation, and finally (d) the relationship between human capital and knowledge creation. Our major findings are summarized below.

Major Findings

Several conclusions can be drawn from the results of this study. First, as hypothesized knowledge sharing culture creates an environment that facilitates knowledge creation. In line with the study by Chong (2006), culture is one of the most important factors for the success of a company especially in relation to knowledge creation and application. Basically, when sharing knowledge becomes a way of life in the organization and the culture strongly emphasizes that knowledge sharing is power, knowledge hoarding can be reduced (Chong

and Choi, 2005). Hence, when employees share knowledge voluntarily, the knowledge that is being circulated is able to stimulate new ideas and thoughts—leading towards knowledge creation.

Next, although we hypothesized a negative effect of restrictive structure on the extent of knowledge creation, the results proved otherwise. Surprisingly, restrictive structure appears to be still acceptable in Malaysia. Ansari *et al* (2004) highlight two key components of culture in Malaysia—one of it being preference for hierarchy. Given a high power distance, Malaysian society is described as a platform where bureaucratic structures are still widely acceptable (Hofstede, 1994). Since knowledge creation is still in its' infant stage among most business organizations, a structure that is defined by clear rules, procedures, and policies are probably still needed to monitor and coordinate knowledge creation activities. Third, ICT has long been associated with successful KM systems. In a competitive business environment, organizations are investing huge amounts in information technology to establish a state of the art KM system and enhance their competitive advantage (Kakabadse, et al., 2003). However, despite the implementation of

first-rate information technology, surveys point out that KM systems are failing at an equivalent pace as the rate of implementation (Ambrosio, 2000; Smith, et al., 2003). Organizations are fundamentally so obsessed with the notion that the success of the KM systems solely relies on technology—hence failing to acknowledge the fact that employees' acceptance and commitment towards the KM system is equally important (Coulson-Thomas, 1997; Davis, Subramaniam, and Westerberg, 2005). This could be indicative that ICT--which is available for use in organization--can only contribute towards knowledge creation when people utilize it as much as they should. The mere availability of technology is not sufficient to drive organizations to create knowledge.

Fundamentally, the importance of human capital is clearly supported in this study. Organizations must not overlook the fact that knowledge workers are the essence of the social system of KM projects (Alvesson, 2004; Ribiere and Sitar, 2003). Human capital competency plays an important role in helping them carry out their work in any situation (Teerajetgul and Charoenngam, 2006). Individual knowledge of knowledge workers lays the foundation for organizational knowledge. Hence, timely and appropriate employee training constitutes one of the key success factors for KM implementation (Chong and Choi, 2005).

Theoretical Contributions

Our study has some obvious theoretical implication. First, the social system within any organization seems to bear more significance in improving the extent of knowledge creation. An organization that possesses highly qualified employees and is characterized by a knowledge sharing culture has an added advantage when it comes to knowledge creation. ICT is important as the foundation of a KM system, but the integration of the social system with ICT is essential for the success of any knowledge creation initiative. Second, the influence of a

restrictive structure should be interpreted with caution. The unexpected positive influence this variable has on knowledge creation can be attributed to the Malaysian culture. However, it is also possible that the current extent of KM in Malaysia may require a more controlled organization structure to ensure knowledge creation activities are more synchronized with the organization's objectives

Practical Implications

This study has shed some light on the importance of the social system within an organization on knowledge creation. Hence, organizations should focus on establishing enabling environment for their people to share knowledge. The human capital should also be given more opportunities to develop their human capital to acquire more knowledge so as to be able to share it with their colleagues. When there is greater knowledge shared and attained, organizations can grow with a competitive edge against other rivals in the industry.

Limitations and Directions for Future Research

Our study has some potential limitations. First, we only considered four factors: knowledge sharing culture, restrictive structure, ICT, and human capital. Future research should attempt to identify other factors that can improve the extent of knowledge creation such as human resource practices, leadership style, and so on. Second, as our data were limited to the Malaysian context, it would be recommended that future researchers compare data from other different cultures. A comparative study would help shed some light on cultural differences, especially when interpreting the influence of a restrictive organization structure. Third, this was a cross sectional study which limited our ability to observe improvements in the extent of knowledge creation. We relied on the respondents' evaluation of the extent of knowledge creation in their organization in the past one

year. Future researchers could attempt to develop a more objective measure of knowledge creation to test this model.

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