THE INFLUENCE OF KNOWLEDGE MANAGEMENT ON NEW PRODUCT DEVELOPMENT PERFORMANCE IN MALAYSIAN MULTIMEDIA SUPER CORRIDOR COMPANIES

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Statement of Originality

The work described in this Master Thesis, entitled “The Influence of Knowledge Management on New Product Development Performance in Malaysian Multimedia Super Corridor Companies” is to the best of the author’s knowledge that of the author except where due reference is made.

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ABSTRACT

Malaysia’s plan to achieve “developed country” status depends on it sustaining high economic growth across a wide range of industry sectors. But this growth cannot be maintained in such a competitive global environment without developing Malaysia’s manufacturing-based economy to be knowledge-based. Success in a knowledge-based global economy depends on a country’s ability to develop and manage its knowledge, and in particular how organisations’ acquire, disseminate and respond to knowledge. To contribute to an increasingly important body of knowledge in the Malaysian context, this study investigates the influence of knowledge management on new product development performance in Multimedia Super Corridor companies located in Malaysia. Specifically, the purpose of this study is to (a) find out the influence of knowledge acquisition and its dimensions, employee attitudes and opinions, financial reporting systems, and sensitive to market place information, on new product development performance; (b) examine the influence of knowledge dissemination and its dimensions, knowledge disseminated on the job, disseminate knowledge technique, and disseminate knowledge technology, on new product development performance; and (c) investigate the influence of responsiveness to knowledge and its dimensions, respond to customer, respond to technology, and flexibility and opportunistic, on new product development performance in Malaysian Multimedia Super Corridor companies.

Questionnaires were distributed to senior level management in the sample Multimedia Super Corridor companies, with 213 useable sets of data returned. Data analysis was performed using SPSS Version 17.0 and SmartPLS 2.0 for tests such as confirmatory factor analysis, convergent validity, discriminant validity and reliability on the measurement
model, and t-value test on the structural model. The results showed that responsiveness to knowledge was found to have significant positive impact on new product development performance, as its all dimensions were found to have significant positive impact on new product development performance. Surprisingly, the statistical analysis indicated that knowledge acquisition had no significant impact, as its three sub-dimensions, employee attitudes and opinions, financial reporting systems, and sensitive to market place information, had no significant impact on new product development performance. Another unexpected finding of this study was partial support of knowledge dissemination, in which only the sub-dimension disseminate knowledge technology was found to have significant positive impact on new product development performance. This study enhances both scholars’ and practitioners’ understanding about the influence of knowledge management on new product development performance. The study results may be useful for manager to more clearly understand how knowledge management can impact new product development performance. The chapters of this study are organized in the following sequence. Chapter 1 presents the introduction, Malaysian scenario, problem statement and purpose of the study. Chapter 2 reviews the past literature on knowledge management and its definition. Chapter 3 demonstrates the research methodology, sampling, the measurement instrument to be used, the statistical analysis, and the hypothesis of the study. Chapter 4 summarizes and presents the output from the statistical analysis. Chapter 5 discusses the findings. And Chapter 6 presents limitations and implications of this study as well as suggestions for future research.
ABSTRAK

Rancangan Malaysia untuk mencapai status "negara maju" bergantung kepada keupayaannya mengekalkan pertumbuhan ekonomi yang tinggi dalam pelbagai sektor industri. Walau bagaimanapun, pertumbuhan ini tidak dapat dikekalkan dalam persekitaran global yang kompetitif sekiranya Malaysia tidak membangunkan ekonominya yang berasaskan pembuatan kepada ekonomi yang berasaskan pengetahuan. Kejayaan dalam ekonomi global yang berasaskan pengetahuan bergantung kepada keupayaan negara untuk membangun dan menguruskan pengetahuan, khasnya cara organisasi memperoleh, menyebar dan bertindak balas kepada pengetahuan. Untuk menyumbang kepada pengetahuan dalam konteks Malaysia, objektif kajian ini adalah mengenai pasti pengaruh pengurusan pengetahuan terhadap prestasi pembangunan produk baru dalam syarikat-syarikat Koridor Raya Multimedia di Malaysia. Khususnya, tujuan kajian ini adalah untuk (a) mengetahui pengaruh memperoleh ilmu dan dimensinya: sikap dan pendapat pekerja, sistem laporan kewangan dan sensitif kepada maklumat pasaran, terhadap prestasi pembangunan produk baru, (b) memeriksa pengaruh penyebaran pengetahuan dan dimensinya, pengetahuan disebarkan di tempat kerja, teknik menyebar pengetahuan dan teknologi untuk menyebar pengetahuan, terhadap prestasi pembangunan produk baru, dan (c) menyiasat pengaruh responsif kepada pengetahuan dan dimensinya, bertindak balas kepada pelanggan, bertindak balas kepada teknologi dan fleksibiliti dan oportunis, terhadap prestasi pembangunan produk baru dalam syarikat-syarikat Koridor Raya Multimedia Malaysia.

Soal selidik telah diedarkan kepada pengurus peringkat tinggi dalam syarikat-syarikat Koridor Raya Multimedia dan 213 set data yang boleh diguna pakai telah dikembalikan. Analisis
data dilakukan dengan menggunakan SPSS versi 17.0 dan SmartPLS 2.0, di mana ujian seperti faktor konfirmatori, kesahihan konvergen, kesahihan diskriminan dan kebolehpercayaan dilakukan untuk menilai model pengukuran, dan ujian t-Value digunakan untuk menilai model struktur. Hasil kajian menunjukkan bahawa tindak balas kepada pengetahuan mempunyai kesan positif yang ketara terhadap prestasi pembangunan produk baru kerana semua dimensinya didapati mempunyai kesan yang ketara terhadap prestasi pembangunan produk baru. Yang menghairankan, analisis statistik menunjukkan bahawa pengaruh memperoleh ilmu tidak memberi kesan yang ketara kerana tiga sub-dimensinya: sikap dan pendapat pekerja, sistem laporan kewangan, dan sensitif kepada maklumat pasaran, tidak mempunyai kesan yang ketara terhadap prestasi pembangunan produk baru. Satu lagi penemuan yang tidak dijangka dalam kajian ini adalah penyebaran pengetahuan disokong sebahagian, di mana cuma sub-dimensi teknologi untuk menyebarkan pengetahuan didapati mempunyai kesan positif yang ketara terhadap prestasi pembangunan produk baru. Kajian ini meningkatkan pemahaman penyelidik dan eksekutif syarikat mengenai pengaruh pengurusan pengetahuan terhadap prestasi pembangunan produk baru. Hasil kajian ini berguna kepada pengurusan syarikat untuk memahami dengan lebih jelas bagaimana pengurusan pengetahuan boleh mempengaruhi prestasi pembangunan produk baru. Kandungan kajian ini disusun dalam urutan yang berikut. Bab 1 membentangkan pengenalan, senario Malaysia, pernyataan masalah dan tujuan kajian. Bab 2 mengulas kesusasteraan yang lalu mengenai pengurusan pengetahuan dan definisinya. Bab 3 menunjukkan metodologi penyelidikan, persampelan, instrumen pengukuran yang akan digunakan, analisis statistik, dan hipotesis kajian. Bab 4 meringkaskan dan membentangkan output daripada analisis statistik. Bab 5 membincangkan tentang hasil kajian. Dan Bab 6 membentangkan batasan dan implikasi kajian ini serta cadangan untuk kajian depan.
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CHAPTER ONE
INTRODUCTION

1.0 Background

Rapid changes in the technology market place have increased the level of uncertainty in market place (Young, 2010). These changes include customers’ higher expectations towards products, shorter product life cycles, advanced technology systems, new types of strategic alliance and globalization trends (Awwad, 2011). Due to these changes, it is believed that most technology organisations face aggressive competition in their business environment. Moreover, advances in technology enable customers to have more sources of product information before they purchase. Customers can easily search for information and do business across states or countries by using advances in communication, information, and transport technologies (Čepinskas & Masteika, 2010). Known as globalization, these advances mean customers even can reach and purchase products produced in a country far from their home.

To survive in an increasingly global and competitive market, companies need to shorten new products development times (Millson & Wilemon, 2010), and shorten new product market introduction times (Danese & Filippini, 2010). As customers demand more sophisticated products (Millson & Wilemon, 2010), investments in intellectual capital also need to be made as financial capital and physical asset investments are not enough (Lee, 2006). Hence, organisations should be able to manage all types of resources effectively in order to adapt to these changes (Lee, 2006), and achieve better new product development performance.
The possession of knowledge enables organisations to gain competitive advantage (Nonaka, 2007). In the other words, organisations’ competitiveness depends on their ability to generate knowledge (Markova & Ford, 2011). Knowledge is inimitable, non-substitutable and valuable, hence, it is needed for innovation to sustain an organisation’s growth, success and survival in a changing business environment (Varis & Littunen, 2010). In addition, knowledge, an intangible asset, is important in increasing organisations’ value add (Macerinskien & Survilaitè, 2011). Knowledge is an important resource for organisations, especially in a dynamic knowledge-based economy (K-economy).

Because information and knowledge are the main requirements for organisational growth (Macerinskien & Survilaitè, 2011) in a knowledge-based economy, intellectual capital becomes more important than financial capital (Chen, Lin, & Chang, 2006). Large amounts of knowledge are needed to produce new products in a K-economy environment (Čihovská & Hvizdová, 2011), and this accumulated knowledge has to be effectively managed. With increasing amounts of information available, filtering and deciphering the information in decision-making becomes complicated and the attainment of knowledge is hampered (Varis & Littunen, 2010). In other words, survival in a K-economy requires effective management of knowledge (Macerinskien & Survilaitè, 2011).

Knowledge management (KM) includes “knowledge identification, creation, acquisition, transfer, sharing and exploitation” (Hussain, Ahmed, & Si, 2010), and it has become increasingly important for organisations to support their operations, innovate, and respond to the fast changing business environment (Sandhawalia & Dalcher, 2011). One way for organisations to better manage knowledge is through a more systematic and effective way—the application of a KM concept. “Acquisition, transmission, and use of knowledge have always been an important part of human affairs” (Fei, Meng, & Clarke, 2008). By
managing knowledge systematically and effectively, organisations “become more adaptive, innovative, intelligent and sustainable” (Kuan & Aspinwall, 2004). In previous research by Nonaka (2007), Japanese companies such as Honda, Canon, Matsushita, NEC, Sharp, and Kao were found to rapidly respond towards market changes because they are able to produce new knowledge in distinctive ways. They applied KM concepts and were able to innovate faster than their competition.

In conclusion, since knowledge is important for an organisation to gain competitive advantage, and to produce new products demands large amounts of knowledge, it is imperative to investigate if KM influences new product development (NPD) performance. This scenario is especially true for companies located in Malaysia’s Multimedia Super Corridor (MSC), which is an integral part of Malaysia’s Vision 2020 to be a developed K-economy (Mustapha & Abdullah, 2004). Hence, this study aims to examine the influence of KM on NPD performance in Malaysian MSC companies.

1.1 The Malaysian Scenario

Malaysia, a Southeast Asian developing country, faces market changes and fierce global competition. The provision of cheap labour contributes less to its economy nowadays because other countries, such as Vietnam and China, can provide cheaper labour sources than Malaysia (Pek & Kwee, 2004). Strategies, successful in the past, need to be upgraded if Malaysia is to move from a middle-income country to a high-income country. Application of a KM strategy, which can effectively manage and add value organisational resources, is able to strengthen Malaysia to compete in the competitive world market (Razali & Juanil, 2011). For example, providing cheap knowledge-labour can help Malaysian organisations gain
competitive advantage, and this ability is especially important for Malaysia to shift to a knowledge-based economy.

A knowledge-driven economy is one in which generation and utilization of knowledge is essential in economy growth (Mustapha & Abdullah, 2004). Transformation towards a K-economy in Malaysia is seen as parallel with Vision 2020, and will help Malaysia to become a fully developed and knowledge-rich country by the year 2020 (Awang, Ismail, Flett, & Curry, 2011). With this transformation target, some government agencies have been established to give impetus to K-economy in Malaysia. For example, National Information Technology Council (NITC) acts as premier advisor in the information and communication technology matters, the Economic Planning Unit (EPU) functions as planner in formulating policies and strategies for K-economy development, and Ministry of Higher Education (MOHE) plays an important role in producing high quality and knowledgeable individuals.

Moreover, the Malaysian Government officially launched Multimedia Super Corridor (MSC) in 1996 as one of the initiatives towards K-economy, and aims to create an ideal multimedia environment for local and international companies to produce multimedia products (Siong, 2006). MSC is considered one of the key drivers of Vision 2020 (Jarman & Chopra, 2008). The Ninth Malaysia Plan (2006-2010) created five corridors named Iskandar Malaysia, The Northern Corridor Economic Region (NCER), East Coast Economic Region (ECER), Sarawak Corridor of Renewable Energy (SCORE), and Sabah Development Corridor (SDC) (Economic Planning Unit, 2010). In addition, a Malaysian Knowledge-based Economy Master Plan was introduced in 2002 to sketch out the strategies to move towards a K-economy (Wei & Hooi, 2009).

The Malaysian Government has also put much effort in human resource development and upgrading the quality of education. For example, the government launched the Malaysian
Smart School project in the year 1997 that provides more advanced technology facilities with the aim to produce graduates with high levels of IT knowledge (Awang et al., 2011). Furthermore, the government established more public and private higher education institutions to increase the opportunities for Malaysians to have higher education qualification (Ramachandran, Siong, & Ismail, 2009). Development of education is important in moving towards a K-economy because it is in institutions where Malaysians are taught how to manage knowledge and become a knowledgeable worker. Under the Tenth Malaysia Plan (2011-2015), the government’s focus is on developing and retaining a first-world skill and talent base by applying an integrated human capital and talent development strategy to cultivate Malaysians from their early childhood to their final working life (Economic Planning Unit, 2010).

Developing creative and analytical human capital is essential for Malaysia to manage knowledge and overcome critical incidents. For example, technological disasters have happened seven times in Malaysia between 1968 and 2002. The reasons given were lack of human expertise (Shaluf & Ahamadun, 2006). Lack of human expertise in managing knowledge to overcome unexpected critical incidents is still at a worrying level. According to the Tenth Malaysia Plan (2011-2015), there have been a reduction in knowledge generation, where the number of researchers decreased from 21.3 per 10,000 labour force in 2004 to 20.3 per 10,000 labour force in 2008 (Economic Planning Unit, 2010). As such, Malaysian organisations are considered as lacking the capability to utilize existing human resources effectively especially in managing their knowledge.

Implementation of knowledge management strategy in Malaysia is still in its infancy, even though continuous efforts have been undertaken by the Malaysian government in fostering knowledge development as the initiative to move towards a K-economy. In previous
KM research by Razali and Juanil (2011), the implementation of KM strategy in property management companies in Malaysia was shown to be in an immature stage. Moreover, in KM research done by Chong, Chong, and Wong (2009) on the Malaysian telecommunications industry, most of the respondents noted the importance of KM strategies, but did not really apply these in their organisations’ operations. Hence, the previous research highlights factors that are barriers to implementing KM strategy in Malaysia, such as differences in organisational culture, lack of communication skills, lack of understanding about KM, employees’ unwilling to share behaviour, lack of cross-department interaction, and leadership style (Sohail & Daud, 2009).

In conclusion, Malaysia continues to move towards becoming a K-economy, but the implementation of knowledge management strategy in the country is still at an early stage. As such, both organisations and employees need to work together to overcome the existing barriers that impede the successful implementation of KM strategy as a path way of transformation towards a K-economy and realization of the Vision 2020.

1.2 Problem Statement

Developing new products is important in contributing to an organisation’s growth, profitability and competitiveness (Wang, Lee, Wang, & Chu, 2009). However, in the process of developing a new product, most organisations face uncertain obstacles or problems from both internal and external environments. For example, technology advances, short product life cycles (Dahan, Soukhoroukova, & Spann, 2010), resource limitations (Hardie & Newell, 2011), threats from competitors, and customers’ rapid change in their expectations (Lyus, Rogers, & Simms, 2011) are some of the main problems that organisations face when developing new product. Thus, it is believed that organisations with weak KM may try to
keep pace, but there is no guarantee that they will survive in this strong competitive market place (Wang, 2008).

The effects of globalization have forced organisations to recognise that customers’ needs and expectations are changing faster than ever before. Customers’ needs and expectations change in line with changes in customer context (Chang & Hong, 2011), such as demographic, psychographic, or behavioural characteristics (Jirawuttinaunt & Ussahawanitchakit, 2011). Moreover, customers’ expectations toward product features and benefits always exceed the actual performance of the product (Hsieh & Yuan, 2010). In addition, technology advances allow customers to make comparisons in terms of a product’s price and quality from different providers. Customers nowadays are less loyal to one particular product provider as they can have access to multiple product providers within a short time, make comparisons among them, and then select the one that they think is the best (Larivière, Aksoy, Cooil, & Keiningham, 2011). As such, many organisations are facing challenges in producing new products and adapting to the customers’ rapidly changing expectations.

In addition, organisations face problems in producing high quality new products with minimum costs and a low failure rate. This problem results from a lack of innovation knowledge at the beginning of new product development process and increases prices of raw materials (Rejeb, Boly, & Morel-Guimaraes, 2011). For example, a lack of understanding on the robust design approach, which is a powerful approach to develop high quality new product with minimum cost, means the organisation is unable to identify and cut down unnecessary costs in producing a new product (Antony, 2002). Furthermore, developing a new product is not an easy task because new product development is a complex process, where a large amounts of time, cost, energy, and effort are needed, yet its success rate is low.
As innovation is also a complex process, one in which decisions and new ideas and methods are critical to the success of the process (Rejeb et al., 2011), and organisations face challenges in producing innovative new products.

Organisations also face challenges in introducing new products into the market, which can lead to lost revenue, reduction in product value, loss of market position to competitors, and can affect the organisation’s reputation in managing it business (Hendricks & Singhal, 1997). In today’s intensively competitive markets, product life cycles place have been compressed, which then reduce the value of the product (Goktan & Miles, 2011). When products are slow to be introduced into a market, customers are often unwilling to wait as they can find others suppliers offering advanced technologies. This scenario frequently happens in a fast growing industry, where new entry customers have not established loyalty to existing products (Hendricks & Singhal, 1997). Moreover, a longer time-to-market may cause products to become outdated as competitors may already have released higher quality, technically advanced product. Panizzolo, Biazzo, and Garengo (2010) also noted that introducing a new product into the market within shortest period at highest level of launch quality is challenging organisations nowadays. Hence, longer product introduction times for new products into a market cause a reduction in a products’ value and an organisations’ profit.

Although considerable research exists on the factors that affect new product development failure, few studies have examined the influence of knowledge management. Existing research covers factors such as unawareness and unwilling to innovate, wrong perception on technology usage, no unique organisation structure (Woodside & Biemans, 2005), uncertainty of pre-development activities, improper resource allocation (Gordon, Ayers, Hanna & Ridnour, 1995), and inability to define product and market. However, this body of knowledge has failed to stem the high new product failure rate as this is still at a
worrying level. While organisations should continue to manage these factors within their operations, new areas of research are required to identify other causes of new product failure.

In a nutshell, as a consequence to environmental change, large amounts of wider knowledge are needed for organisations to respond to the market condition that is increasingly being characterized by higher levels of complexity, globalization, and dynamism (Mishra & Bhaskar, 2011); and developing new products efficiently and effectively is known as a critical strategic tool to grasp new market opportunities and stay competitive in existing markets (Reddi & Young, 2012). Besides, in multifunctional process of NPD, different abilities, knowledge elements, resources, competences and cultures are needed (Fain, Kline, & Duhovnik, 2011). Hence, this research aims to investigate the influence of KM on NPD performance, and has developed an appropriate problem statement: What is the influence of KM on NPD performance? The result will provide valuable insights for organisations in Malaysia and have better strategies to improve on their NPD performance.

1.3 Research Objectives

In this research study, both general and specific objectives have been set. The general objective is broad in focus, whereas specific objectives are narrow in focus.

1.3.1 General Objective

This study attempts to examine the influence of KM on NPD performance. It is believed that KM is increasing in its importance in managing productivity, such as NPD performance. Systematically and effectively managing the knowledge needed in the process to develop new products is important for an organisation to gain competitive advantage.