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How intellectual capital mediates the relationship between knowledge management processes and organizational performance?

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The primary objective of the study is to examine the relationship between knowledge management processes and organizational performance, and to analyze the mediating effects of intellectual capital on the relationship between knowledge management processes and organizational performance. The self-administered questionnaire was distributed to the owner or senior manager of small and medium enterprises (SMEs) multimedia super corridor (MSC) status organizations. A total of 289 useable questionnaires were collected from them. The results reveal that knowledge management processes were confirmed as the antecedents of intellectual capital; and intellectual capital was established as a mediator between knowledge management processes and organizational performance. Findings show that the combination of knowledge management processes as organizational capability with intellectual capital as organizational strategic assets facilitates improvements in organizational performance.

Key words: Knowledge management, intellectual capital, organizational performance, SMEs.

INTRODUCTION

Organizations nowadays are challenged to leverage and make knowledge more productive as a competitive resource in a complex and unpredictable environment. Factors of production from the industrial economy like land, labor and capital, continue to remain significant, but they no longer present any obstructions to enter the market. Organizations competing in the knowledge-based economy sustain their competitive advantage by harnessing their own unique knowledge and building on their ability to learn faster than their competitors (Grant, 1996; Prusak, 2001). The creation and generation of organizational value involves the ability to identify, create and continuously manage knowledge as a strategic resource. Therefore, knowledge management (KM) should be at the forefront of any strategic management efforts made by an organization. KM, which involves the

process of capturing a company's collective expertise through the creation, storage, arrangement, retrieval and distribution of knowledge (Miller, 1999), is not sufficient in itself, since a more fundamental issue is the capturing and leveraging of tacit knowledge possessed by individual employees, referred to as intellectual capital (IC). IC is a combined knowledge embedded in employees (human capital), organizational structures (structural capital), and relationship (social capital), which make the core assets or resources in knowledge-based organizations.

Resource-based theorists (Barney, 1986; Haanes and Fjeldstad, 2000; Prahalad and Hamel, 1990) view organizations as heterogeneous entities characterized by their unique resource base, where IC is considered as an organization's strategic resource. KM processes are used to transform the resources into products or services that create value for customers. These resources contribute to a sustainable competitive advantage if they are valuable, rare, difficult to imitate or hard to substitute (Barney, 1991). That is, the creation of competitive

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advantage of an organization in the knowledge-based economy, is not based on market position but rather on the difficulty of replicating knowledge-based assets and the way they are developed (Teece, 1998).

Thus, organizations can actually create competitive advantage by managing IC systematically via KM processes. Through effective KM processes, which include knowledge acquisition, conversion and application, a knowledge asset can be identified and important knowledge can be exploited for value creation purposes. During the conversion process, IC is transformed into saleable products or services, which can eventually command premium prices from customers. Throughout KM processes and IC management, a successful organization develops internal policies, procedures, decision processes and incentive systems to evaluate and screen the commercialized innovation. In other words, KM processes must be embedded into all of the business processes in the organization in order to create organizational value. In fact, KM is a conscious strategy of getting the right knowledge to the right people at the right time by putting information into action that strives to improve performance (O'Dell and Grayson, 1998).

The main concepts used in this study are KM and IC, both comprising the building blocks required to manage an organization in the 21st century (Wiig, 1997). KM and IC need to be integrated in order to maximize organizational effectiveness. KM is discussed from the perspective of KM processes that use knowledge to create value in terms of IC. IC which consists of human capital, structural capital and social capital were renewed and refreshed every time organization acquire, convert and apply new knowledge in their business activities. That new value is later extracted from IC dimensions in the form of innovative and creative products or services. Organizations can create value only if they can make sense of the environment in which they operate and are able to exploit knowledge and organizational resources to meet their strategic needs.

This research is focused on the influence of KM processes and the resultant creation of IC in Malaysian small and medium enterprises (SMEs) multimedia super corridor (MSC) status organizations. These organizations are considered as knowledge intensive entities with a focus on producing information communication technology (ICT) products or services; consequently, they are required to use their unique knowledge as their strategic asset to compete in the business world. SMEs represent 99.2% of total business establishments in Malaysia, employing over 5.6 million workers and contribute 32% to country GDP (Bank Negara, 2007). Developing a competitive, productive and resilient SME sector is an important drive to support the Government's aim of achieving balanced economic development and higher standards of living at all levels of society. Clearly, SMEs also play a vital role in a country's economic growth. Thus, the concept of KM and IC used in the study

is appropriate in assisting SMEs to sustain their organizational performance (OP) via KM processes and the possession of IC.

Knowledge management in Malaysia

In 1960s, Malaysia was predominantly dependent on the agricultural economy. Subsequently, in 1970s the country's manufacturing industry emerged, and two decades later, in 1991, the former Prime Minister of Malaysia, Dr. Mahathir bin Mohamad, highlighted the need for the country to develop its knowledge-based economy. The launching of The National IT Agenda as well as the establishment of the multimedia super corridor in 1996, started to shift Malaysia from a production-based economy to knowledge-based one. This shift to a knowledge-based economy is part of Malaysia's wider plan to achieve fully developed country status by the year 2020.

The concept of KM began to establish in the late 1990s when influential multinational organizations like Microsoft and Hewlett-Packard brought their existing KM practices, processes and applications into Malaysia. During that period, the Malaysian government, through its 'knowledge economy master plan', had encouraged government agencies as well as the private sector, to adopt KM although some big organizations had already taken initial steps in this regard. One of the strategies proposed in the Knowledge-based Economy Strategic Plan 2001 is to ensure that the private sector is the vanguard of the knowledge economy's development. Multimedia Development Corporation, Siemens, Bank Negara Malaysia, Nokia Malaysia, and Telekom Malaysia were among the pioneers for the implementation of KM in the country.

It has been identified by some researchers that KM is among the key factors ensuring organizational success, and provides benefits such as improved efficiency, improved competency, better decision-making, etc to local organizations (Asleena, 2002; Badruddin, 2004; Bontis et al., 2000; Gan et al., 2006; Hishamuddin et al., 2004; Mazlan and Ahmad, 2006; Niza et al., 2004). Among the key reasons identified for the importance of KM to Malaysian organizations is the need for organizations to develop new areas of growth in the knowledge-intensive era (Bank Negara, 2005; Salleh et al., 2003).

Knowledge management in small and medium enterprises

Small and medium enterprises (SMEs) in Malaysia represent a vital part of the economy, being the source of various economic contributions through the generation of income via exporting, providing new job opportunities,

introducing innovations, stimulating competition, and assisting big organizations. The OECD (2000) stated that “productivity growth is fuelled by competitive processes in industry which, to a large extent build on the birth and death, entry and exit of smaller organizations”. SMEs are important in the economy and their competitiveness is crucial to the country’s growth and success. To maintain the competitiveness of local organizations in the market, the Malaysian government has implemented a series of strategies that suit the nature of the domestic economic framework as well as that of the global market. One of the strategies in the Ninth Malaysia Plan (2006 - 2010) is to promote SMEs with high innovation capabilities in order to become part of the global supply chain (Prime Minister’s Office, 2006).

The success of SMEs can be linked to how well they manage their knowledge (Brush and Vanderwerf, 1992; Dollinger, 1984, 1985), a process which has been shown to be a powerful weapon in the success of organizations (Davenport and Prusak, 1998; Desouza and Evaristo, 2003; Nonaka and Takeuchi, 1995). Various sources of literature show that SMEs that implement KM experience the same benefits as many larger organizations (Webb, 2002). Some of the most widely-cited potential benefits of KM are: improved competency (Davenport and Prusak, 1998; Skyrme and Amidon, 1997; uit-Beijerse, 1999); greater efficiency in processes and procedures (Skyrme and Amidon, 1997; uit-Beijerse, 1999); improved decision-making (Davenport and Prusak, 1998; uit Beijerse, 1999); improved learning (Civi, 2000; uit Beijerse, 1999); increased innovation, responsiveness to customers and knowledge sharing (Davenport and Prusak, 1998; Skyrme and Amidon, 1997); improved communication (Knight, 2002); strengthened organizational commitment (Davenport and Prusak, 1998) and building sustainable competitive advantage (Davenport and Prusak, 1998).

Salojarvi et al. (2005) argued that SMEs with a comprehensive and strategic approach to knowledge and intangible assets are growing faster than those with a less balanced approach. Hence, SMEs require some KM systems compatible with those of their partners so that useful knowledge can be easily accessed and shared. However, from the studies conducted by Wong and Aspinwall (2004) and Matlay (2000), only small groups of SMEs have actually adopted formal KM practices in their daily business activities. From a study conducted in 2003, three-quarters of Malaysian SMEs felt that KM was purely about the use of information and communications technology, and their managements were afraid of high investment in KM implementation, preferring to “wait and see” what others do and imitate them (Niza et al., 2003). As a result, the majority of SMEs’ employees spent the biggest percentage of their office hours preparing reports and presentations, and doing administrative work rather than trying to implement KM. Given this existing KM scenario in Malaysian SMEs, it can be seen as important

for employees to develop their understanding of KM as a key business driver and to introduce effective systems to manage their IC. It has been shown that SMEs can create competitive advantage by managing their IC, and many researchers consider IC as the most valuable organizational resource (Bontis, 1999). IC that comprises human capital, structural capital and social capital acts as a strong influence in determining an organization’s competitive power and performance; and it is recognized as the value driver of an enterprise (Bontis, 1999, 2001; Edvinsson and Malone, 1997; Stewart, 1997). Through an effective KM process, knowledge assets can be identified and important knowledge can be exploited. For example, a formalized knowledge transfer system could be established in various ways to acquire, convert, apply, store and transport knowledge throughout the organization (Almeida, 1996; Appleyard, 1996; Nonaka and Takeuchi, 1995). These KM processes enable organizations to capture, reconcile, store and transfer knowledge in an efficient manner and at the same time enhance their business performance and competitive advantage (Egbu et al., 2005; Salojarvi et al., 2005).

Knowledge management processes in small and medium enterprises

The competitiveness of SMEs depends on the quality of knowledge they apply to their business processes. Although KM processes are only part of the organization’s business processes (Zhou and Fink, 2003), according to Gold et al. (2001), they are a precondition for effective KM. This requires turning personal knowledge into organization-wide knowledge that can be shared throughout an organization and appropriately applied (Skyrme, 1997). For that reason, in order for SMEs to improve their competitive advantage, organizations should have KM processes that enable them to create and acquire new knowledge. Knowledge acquisition, conversion and application are KM processes applied to SMEs in this study.

Knowledge acquisition

This refers to the process of deriving new and useful insights and ideas. Knowledge may be created via research and development or through individual learning internally. However, the majority of SMEs do not have Research and Development departments or dedicated research personnel. This occurs because they cannot afford, or are unwilling, to commit resources to research efforts since their investments are largely focused on their core operational processes. In addition, they cannot afford the time for trial and error activities, even though experimenting with new ways of doing things are part of knowledge creation activities (Wong and Aspinwall,

2004). As reported by McAdam and Reid (2001), the creation of new knowledge is less advanced in SMEs than in large organizations. SMEs have the option to acquire knowledge from external sources such as through hiring or employing individuals with the required knowledge, or by purchasing knowledge assets such as patents, research documents or other intelligence (Wong and Aspinwall, 2004). They can also acquire external knowledge through other means such as searching (Huber, 1991; Lee and Yang, 2000), adopting it from other sources (Bhatt, 2000), or obtaining it from knowledge-driven organizations.

Knowledge conversion

Knowledge conversion refers to the processes of organizing and distributing of knowledge. According to Wong and Aspinwall (2004), SMEs have less knowledge assets which make the process of organizing and distributing easier. Further, due to SMEs having fewer employees, most of whom know each other very well, they have a better idea of the level of expertise and know-how possessed by their colleagues, and they know whom to consult if they need certain information. Wong and Aspinwall (2004) suggested that it is easier for SMEs to organize tacit knowledge than explicit knowledge, since they can do the former by profiling employees or setting up corporate listing of employees who are knowledgeable in a particular area. However, this suggestion is only suitable for the short term, and some SMEs actually need a repository system to codify, organize and store knowledge that is easily retrievable for use in the longer-term. In order for them to survive in a knowledge-based economy, SMEs need a system that is compatible with that used in large organizations due to their role as supplier or out-sourcing agent to big organizations.

Knowledge application

Knowledge application is associated to the process of storage, retrieval, application and sharing. Knowledge is kept solely in an individual's domain is of little value to an organization. As stated by Bhatt (2001), applying and sharing knowledge means making it "more active and relevant for the organization in creating values". Communication is likely to be faster in SMEs due to their flat structure and low level of bureaucracy which allows employees to be in frequent close contact and two-way communication to be the norm. This environment offers a strong foundation for the development of knowledge networks among employees. As a result, SMEs have a great advantage in this KM process since their environment is likely to be conducive for transferring, disseminating and sharing knowledge. In this situation,

knowledge tends to be passed on without any associated records or documentation due to the informal communication culture in existence. Documentation of key knowledge is actually rare, and it is normally not properly stored in a readily retrievable system for future use due to less formal working systems and procedures. The majority of SMEs believe it is unfeasible to establish a formal system for codifying, organizing and storing knowledge since they are always busy with their daily routines (Wong and Aspinwall, 2004). In addition, SMEs have less resources and capacity to maintain a knowledge repository than do large organizations. However, through a repository system, employees can frame new encounters by referring to experiences or projects that have been documented. This saves an organization the time that would otherwise be spent in searching for new information and knowledge.

Intellectual capital in small and medium enterprises

Knowledge intensive organizations use IC as a major source of competitive advantage. They use their specific product or market knowledge to differentiate themselves from their competitors. IC is viewed as an organization's competencies (Hamel and Prahalad, 1994; Mouritsen, 1998; Reich, 1990) and acts as the moving factor for business success (Pulic, 2002). IC is also known as the strategic assets of an organization and is used to differentiate one organization from the others through the products or services offered. As was discussed previously, IC comprises human capital, structural capital and social capital.

Human capital refers to the skills of an employee that help meet the task. It is the combined knowledge, skills, innovativeness and ability of the organization's individuals (Bontis, 2001). Human capital is important because it is a source of innovation and strategic renewal (Bontis, 1998; Stewart, 1997). It is the primary component of intellectual capital (Bontis, 1998; Choo and Bontis, 2002; Edvinsson and Malone, 1997; Stewart, 1997), since it is the critical source of intangible value in the information age (O'Donnell et al., 2003). According to O'Dell and Grayson (1998), organizations that focus on human capital will stay long in the competition compared to those who focus on information technology. This is due to the fact that information technology is readily available to everyone and information technology solutions can easily be copied by the competitors unlike human capital competencies that are developed through the sharing and acquisition of knowledge, and that are much more difficult to imitate.

Structural capital is the supportive infrastructure that enables human capital to function. This includes hardware, software, databases, organizational structure, process manuals, strategies, routines and anything that is valuable to the organization (Boisot, 2002; Bontis, 2001;

Walsh and Ungson, 1991). The structural capital in SMEs is primarily developed and maintained by its employees (Desouza and Awazu, 2006). SMEs are faced with a lack of knowledge repositories due to their limited budget. Knowledge is created, shared, transferred and applied through the organization's members without the intervention of automated mechanisms that are usually found in large organizations. Moreover, employees develop common knowledge in order to organize their work and commonly, they engage in two-way communication since their number is small. Nunes et al. (2006) also reported that informal systems are employed to aid KM activities in SMEs.

Social capital is defined as the combined value of the relationship with customers, suppliers, industry association and markets, and represents the potential an organization has due to ex-organization intangibles (Bontis, 1999). SMEs often tend to believe that their development is mainly driven by their employees' competencies and the quality of the relationships with their customers (Cohen and Kaimenakis, 2007). These organizations develop their social capital with greater ease than large organizations, by using the available knowledge from their association more readily in order to achieve high performance (Desouza and Awazu, 2006). In addition, Wong and Aspinwall (2004) added that SMEs' close proximity to their customers have enabled them to acquire knowledge via a more direct and faster flow than large organizations. According to Haksever (1996), SMEs appear to be in an advantageous position in terms of acquiring customers' knowledge, since managers and employees of SMEs tend to have close and direct contact with customers and some may know them socially and personally. A stronger knowledge channel could be developed to improve their ability to capture such customer knowledge.

Hypotheses development

Knowledge management processes and organizational performance

McKeen et al. (2006) report that KM practices are directly related to OP. This statement was supported by Becerra-Fernandez et al. (2004) who discuss the impact of KM processes on people, processes, products, and OP. They note that KM processes could affect organizations in these four areas in two main ways. Firstly, KM can help create knowledge, which can then contribute to improve OP, and KM can directly cause improvements in people, processes, products, and OP. A similar argument is made by Gold et al. (2001) and Mohrman et al. (2003), who suggest that OP is improve when the organization creates and exploits knowledge. Likewise, Marques and Simon (2006) and Salina and Wan Fadzilah (2008), who conduct a study on SMEs, find that KM processes affect

OP positively. Davenport and Prusak (1998) also claim OP is improve through locating and sharing useful knowledge. Thus, an organization that puts a deliberate effort into acquiring knowledge and converting it into a form that is accessible to all organizational members to use and apply for the improvement of their work, can expect to see improved performance. It is hypothesized that the relationship between KM processes and OP is positively related.

H₁: KM processes have a positive effect on organizational performance.

Knowledge management processes and intellectual capital

KM and IC are complementary concepts and cannot be separated. IC is recognized as a driver of innovation and competitive advantage, and KM is the activity of obtaining, growing, and sustaining IC in organizations. KM processes increase the value of IC when knowledge flows easily between these IC dimensions (Petrasch, 1996). During the knowledge acquisition process, all IC dimensions acquire, renew and update their current knowledge. This newly-acquired knowledge is then combined, converted and distributed among all employees in the organization during the knowledge conversion process. Subsequently, during the knowledge application process, the new combined and integrated knowledge is transformed into valuable products, processes or services. These products, processes and services are then converted into cash through direct sales, out-licensing, joint ventures, strategic alliances, integration with current business and creation of new business (Sullivan, 1998). The IC value increases through all these activities because human capital value is increased when new knowledge is created, shared and applied in the organization, and structural capital increases or improves during the creation, innovation and learning processes. Social capital also increases through the interaction between buyer and seller and the selling of new products or services that add value to the organization; and at the same time, OP is improved. All of these IC dimensions need to be integrated in order for an organization to leverage its complete knowledge base (Bontis, 1998). The second hypothesis is that KM processes have a significant positive effect on IC.

H₂: KM processes have a significant positive relationship with IC.

Intellectual capital and organizational performance

The third hypothesis focuses on how IC affects OP. Various literatures and perspectives suggest that IC can enhance OP by lowering costs, increasing customer

benefits and producing new products or services, and that it has direct and indirect impact on OP. Chen et al. (2005) find that IC has a positive impact on market value and financial performance.

According to Gloet and Terziovski (2004), it is essential to have the simultaneous approach of soft human resource management practices (human capital) and hard information technology practices (structural capital) in order to enhance innovation performance, which in turn has an impact on OP. Similarly, IC is an organizational resource that commonly exists as a resource bundle that affects OP (Bontis et al., 2000; Marr and Roos, 2005). Among all IC dimensions, Wang and Chang (2005) argue that process capital or structural capital has the strongest direct impact on OP for Taiwan's information technology organizations. The following hypothesis is formulated to test whether IC is positively related to OP.

H₃: IC relates positively to organizational performance.

Knowledge management processes, intellectual capital and organizational performance

The last set of the hypotheses is constructed to establish IC as a mediator between KM processes and OP. The hypotheses also consider individual IC dimensions as mediating variables. Common IC dimensions used as mediator variables are social capital and human capital. For example, social capital mediates the relationship between KM practices and financial performance (McKeen et al., 2006), social capital mediates the relationship between structural capital and KM (Chen and Huang, 2007), and the effects of human capital on career mobility are fully mediated by social capital (Lin and Huang, 2005).

Takeuchi et al. (2007) examine human capital and social capital as mediating variables on the relationship between high performance work systems and OP, while Wang and Chang (2005) find that innovation capital and process capital (structural capital) mediate the relationship between human capital and OP, and process capital mediates the relationship between innovation capital and OP.

Andreou et al. (2007) suggest that human capital, technology capital, and process capital all have an indirect effect on business performance for high-tech industries. In addition, Wang and Chang (2005) find that human capital has an indirect effect on OP as also do Andreou et al. (2007), Bontis (1998) and Chen et al. (2004). In addition, an organization's human capital and social capital have important implications for OP (Bontis et al., 2000; Pennings et al., 1998). Hence, the following hypotheses were established to investigate how IC mediates the relationship between KM processes and OP, and also to examine the mediating role of each IC dimension on the relationship between KM processes and OP.

H_{4a}: IC mediates the relationship between KM processes and organizational performance.

H_{4b}: Human capital mediates the relationship between KM processes and organizational performance.

H_{4c}: Structural capital mediates the relationship between KM processes and organizational performance.

H_{4d}: Social capital mediates the relationship between KM processes and organizational performance.

METHODOLOGY

Research design

The population for this study consists of multimedia super corridor (MSC) status organizations that focus on information, communication and technology industries. The MSC organizations are chosen because these organizations are recognized as knowledge intensive organization (Mohammad Nazir et al., 2005) and as such they are at the "cutting edge" of KM application in Malaysia. Sampling for this study consists of 833 SMEs MSC status organizations located at the five Cybercities in Klang Valley, Malaysia. These are the organizations that were established in the MSC first phase project and had used all the facilities provided by the government to MSC status organizations. The unsupervised self-administered questionnaire was used for data collection in this study, with questionnaires being hand delivered to the offices of the sample organizations, for the attention of the owner or senior manager. The non-response bias was reduced through the implementation of a pilot study (Alreck and Settle, 1985), which helped to provide indications of the direction of the bias. A survey instrument that had a 1-7 Likert scale was designed and it consisted of four main sections; Section A focused on KM processes, Section B on IC, Section C on OP, and Section D on the respondents' profile.

Measures

Organizational performance consists of financial and non-financial measures. Organizational financial measures consist of profit and growth (Deshpande et al., 1993; Drew, 1997) while organizational non-financial measures comprise innovativeness, customer satisfaction, quality, and flexibility in resources utilization (Hudson et al., 2001; Kaplan and Norton, 2007). Respondents were asked to rate their organization in comparison to their top competitors in the same industry over the last three years on each measure of performance. The OP measures such as growth rate, profitability, innovativeness, and overall business performance, were developed and validated by Deshpande et al. (1993) and Drew (1997) while customer satisfaction, quality in processes and products or services, and flexibility in resources utilization were developed by Hudson et al. (2001), Kaplan and Norton (1992, 2007), and Raymond and St-Pierre (2005). The KM processes variable consists of knowledge acquisition, knowledge conversion, and knowledge application (Gold et al., 2001; Holsapple and Singh, 2001; Salina and Wan Fadzilah, 2008). The three dimensions of KM processes used in the study were validated by Gold et al. (2001) and Holsapple and Singh (2001). The IC variable is categorized into human capital, structural capital, and social capital dimension (Bontis, 1998; Huang et al., 2007; Roos and Roos, 1997; Youndt et al., 1996). The IC dimensions that were adopted in this study were validated by Bontis (1998; 2001) and Huang et al. (2007); and in addition, human capital elements were also validated by Youndt et al. (1996). Bontis's IC questionnaire was originally administered in Canada (Bontis, 1998) and was re-administered in Malaysia (Bontis et al., 2000). It has been used widely to measure IC application in both big and small to medium-sized organizations. All these dimensions and elements are measured based on the respondent's perspective.

Table 1. Coefficient of Cronbach alpha.

Variables	Number of items	Cronbach alpha coefficient
Knowledge acquisition	10	0.85
Knowledge conversion	7	0.81
Knowledge application	10	0.86
Human capital	14	0.85
Structural capital	9	0.79
Social capital	11	0.83
Organizational performance	7	0.84

RESULTS

A total of 289 (35%) completed survey questionnaires, and 21 (3%) provided incomplete questionnaires. Eighty percent (80%) were local and only 17% multinational organizations, while the remaining 2% and 1% were joint venture and franchise organizations respectively. The alpha coefficients for this study are all above 0.7 and were concluded as being reliable (Hair et al., 2006; Nunnally, 1978). Table 1 presents the Cronbach alpha coefficient for each variable.

Hypotheses testing

A series of regression analyses was conducted to test the study's hypotheses. Baron's and Kenny's (1986) step in testing the mediating effect was used in the study. This section discusses the regression results for four models: Model 1: KM processes and OP; Model 2: KM processes and IC; Model 3: IC and OP; and Model 4: KM processes, IC and OP.

The analysis in Model 1 was to determine how KM processes influence OP. The results showed that KM processes explained 39% of the variation in OP. The model was significant with F-statistics = 60.58 and a significant p-value = 0.00. All standardized beta coefficients were significant showing a positive contribution to OP. The standardized beta coefficient also showed that knowledge acquisition ($\beta = 0.28$) contributes the most to OP, followed by knowledge conversion ($\beta = 0.22$), and knowledge application ($\beta = 0.19$). All of these variables are significant with p-value < 0.05. The findings support H1 in the study and the earlier research findings.

The analysis in Model 2 presents the regression results for the KM processes and IC. The analysis in Model 2 showed that the coefficient of determination (R^2) was equal to 0.61. This model is significant at p-value = 0.00 and F-statistics = 147.05. The standardized beta coefficients were significant with p-value = 0.00. Knowledge application contributes the most to IC with $\beta = 0.31$, followed by knowledge conversion with $\beta = 0.29$, and knowledge acquisition with $\beta = 0.27$. The findings support H2 in the study and contribute new finding to the field.

Model 3 focused on how IC affects OP. The regression results showed that all standardized beta coefficients were significant with p-value = 0.00. Social capital with $\beta = 0.36$ contributes the largest part to OP, and is followed by structural capital and human capital with $\beta = 0.26$ and $\beta = 0.20$ respectively. This model was significant with F-statistics = 81.45 and p-value = 0.00. Forty-six percent (46%) of the variation in OP was explained by IC dimensions. The findings support H3 in the study and the earlier research findings.

The final set of hypotheses was developed to answer the research question relating to how IC mediates the relationship between KM processes and OP. A series of regression equations was used to test mediations that model the relationship between the independent variable, mediator variables, and the dependent variable. The analyses were conducted in two stages, the first on the combination of all the IC dimensions, and the second on each IC dimension. The purpose was to explore the individual effects of the IC variable and the effects of the IC variables as a whole. According to Baron and Kenny (1986), a variable functions as a mediator when it meets the following conditions: 1) variations in levels of the independent variable significantly account for variations in the mediator, 2) variations in the mediator significantly account for variations in the dependent variables, and 3) when (1) and (2) are controlled, a previously significant relation between the independent and dependent variables is no longer significant or it is significantly decreased. Full mediation occurs if a significant relationship between the independent variable and the dependent variable becomes insignificant after controlling for the effect of the mediating variable. Meanwhile, a partial mediation occurs if the relationship between the independent variable and the dependent variable is still significant and the coefficient is reduced, after controlling for the effects of the mediating variable (Baron and Kenny, 1986; Hair et al., 2006).

The results in Model 4 present the direct relationship between the dependent and independent variable. The model was significant demonstrating that 39% of the variation in OP was explained by KM processes. The standardized $\beta = 0.62$ (p-value = 0.00) for KM processes and the model was positively significant at p-value = 0.00

Table 2. Hypotheses results.

Model	Hypotheses	Results
1	KM processes have a positive effect on OP	Supported
2	KM processes have a significant positive relationship with IC	Supported
3	IC relates positively to OP	Supported
4a	IC mediates the relationship between KM processes and organizational performance	Supported
4b	Human capital mediates the relationship between KM processes and organizational performance	Supported
4c	Structural capital mediates the relationship between KM processes and organizational performance	Supported
4d	Social capital mediates the relationship between KM processes and organizational performance	Supported

with F-statistics = 181.70. IC is the mediating variable in Model 4a which showed that this construct mediates the relationship between KM processes and OP by the increased value in R^2 of 0.09 between Model 4 and Model 4a and the decrease in the β coefficient of 0.37 for KM processes between Model 4 and Model 4a. This model also demonstrated F change = 49.71 and the model was significant with p-value = 0.00. A partial mediation effect was displayed in this model since it remained significant after controlling for the effect of IC. The mediation effect of human capital was displayed in Model 4b with the reduction in beta coefficient value of 0.14 for KM processes as compared to Model 4. In addition the R^2 value increased by 0.03, F change = 14.05 and the model was significant with p-value = 0.00 between Model 4 and Model 4b. This model also portrayed a partial mediation effect of human capital for the relationship between KM processes and OP. The regression results in Model 4c show the effects of structural capital as a mediator variable. These indicate that the beta coefficient for KM processes decreased by 0.17 and R^2 value increased by 0.03 (R^2 change = 0.03). The F change = 15.18, F-statistics = 102.93 and the model was significant at p-value = 0.00. Since the beta coefficient for KM processes decreased and the model was still significant, structural capital partially mediates the relationship between KM processes and OP.

The beta coefficient of KM processes decreases by 0.20 in Model 4d. The results also show that the R^2 change = 0.07, which displayed an increment in R^2 value in Model 4d in comparison to Model 4. In addition, the F change = 38.68, F-statistics = 122.12 and p-value = 0.00. The model demonstrated a partial mediation effect of social capital for the relationship between KM processes and OP. The findings show that IC and all its dimensions partially mediate the relationship between KM processes and OP. The results of these findings support hypotheses H4a, H4b, H4c and H4d in the study and contribute new finding to the field of study. The findings also show that IC and all its dimensions partially mediate the relationship

between KM processes and OP. Table 2 presents the results of hypotheses testing.

DISCUSSION

The results of this research demonstrate that the integrated concept of KM and IC, and its effect upon OP was successfully examined empirically among Malaysian SMEs MSC status organizations. The concept of IC applied in this study focuses on value creation, where the objective of IC management is to create and leverage IC assets and to improve organizational value-creating capabilities. IC as a critical organizational resource is captured as assets in this study. KM on the other hand, was discussed from a process perspective and considered as an organization's capability to transform its IC into a valuable form, while OP was assessed from financial and non-financial perspectives. KM processes that consist of knowledge acquisition, conversion, and application were used to create and increase the value of IC. The new IC value is extracted and used to compete in the market by introducing new products or services or new ideas. The results demonstrate new findings, these being that KM processes function as antecedents to IC value.

The finding also enhances the RBV by showing that KM processes can be used to mobilize, assemble, and manage all tangible and intangible resources in order to enhance OP (Becerra-Fernandez et al., 2004; McKeen et al., 2006; Salina and Wan Fadzilah, 2008), which answers some of the criticism levelled by scholars such as Haanes and Fjeldstad (2000) and Peppard and Rylander (2001). The analysis also showed that the integrated dimensions of IC enhanced OP that supports previous researches (Bontis et al., 2000; Chen et al., 2005; Gloet and Terziovski, 2004). Social capital being the major contributor to OP and this finding enhances social capital theory by demonstrating that social capital operates as the main contributor to OP in the case of

Malaysian SMEs MSC status organizations. This finding does not support previous findings from researchers who have found that either human capital or structural capital was the major contributor to OP. This outcome is a feature of the difference in the samples used.

Another new finding was that IC acts as a mediator between KM processes and OP. KM processes contribute positively to OP, but with the inclusion of IC and its dimensions as a mediator, it further helps to enrich this performance. Thus, in order to survive, SMEs need to focus on KM processes and acknowledge the importance of IC as a strategic organizational asset. The results showed that human capital, structural capital, and social capital all partially mediate the relationship between KM processes and OP. Again, these results contribute new knowledge to the fields of IC, KM, and OP. Previous studies consider human capital and social capital as a mediating variable, but these constructs were not tested in terms of their relationship with KM processes and OP.

Implications for managers

The findings indicate that the managers and owners of Malaysian SME MSC status organizations need to acquire more knowledge in order to generate greater OP, since it is confirmed that knowledge acquisition is actually the main contributor to such performance. As mentioned in the literature, the foundation of industrialized economics has shifted from natural resources to knowledge assets. The acquisition of information and knowledge can be done through social capital. The results indicate that SMEs have a strong social capital foundation due to their simple and flexible organizational structures which allow them to have close relationships with their customers, suppliers, associates, etc. The results also demonstrate a positive association between social interaction and knowledge acquisition. Besides the above findings, the managers and owners of SMEs MSC status organizations also need to acknowledge the importance of human capital, structural capital, and social capital, which are seen to act as mediators between KM processes and OP in this study. These IC dimensions help to strengthen OP as a result of KM processes. By using data from Malaysian SMEs MSC status organizations, the findings have important implications for other SMEs within the same context, where IC is being increasingly recognized as the major driver for organizational and national growth.

Conclusion

Overall, the results are able to provide strong support for the resource-based view which is the core theory used in this study, suggesting that OP could be enhanced through the combination of organizational capability, which comprises KM processes and IC, which is the organization's strategic asset. The results also suggest

that the integration of KM processes and IC enable organizations to maximize effectiveness and to enhance and sustain performance. The findings supported all four sets of hypotheses established in the study and provide strong support for the relationship between KM processes, IC and OP. The results also provide implications for the theory of the firm and management practices. At the same time, they exhibit a successful integration of KM, IC and OP that was examined empirically in Malaysian SMEs MSC status organizations. The results are encouraging, as they provide new findings such as the importance of social capital in contributing to performance in Malaysian SMEs MSC organizations. Furthermore, IC partially mediates the relationship between KM processes and OP.

Finally a few suggestions for future research emerge from this study's findings: Firstly, it was shown that IC and its dimensions mediate the relationship between KM processes and OP. However, this study examines IC and its dimensions individually and independently. Future research might consider carrying out a two-way or three-way interaction of the IC dimensions. Secondly, since OP consists of financial and non-financial measures, analysis of the data can also be done separately according to each dimension. By separating financial and non-financial performance, organizations can identify the largest contribution to their performance. Thirdly, future research might also consider using a longitudinal method in order to explore the trend of OP as a result of KM and IC integration. Additionally, future research might also consider applying the concept in the study to large Malaysian MSC organizations, so that comparisons can be made between these two types of entities.

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