Strategic Management Accounting Information and Performance: Mediating Effect of Knowledge Management

Ruhanita Maelah
Universiti Kebangsaan Malaysia, ruhanita@ukm.edu.my

Baha'a Aldeen Hussein Mohamed
Universiti Kebangsaan Malaysia

Amizawati Mohd Amir
Universiti Kebangsaan Malaysia

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Cover Page Footnote

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Ruhanita Maelah*, Bahaa Aldeen Hussein Mohammed, and Amizawati Mohd Amir
Faculty of Economics and Management, Universiti Kebangsaan Malaysia
Bangi, Selangor, Malaysia

Abstract

Research Aims: The objective of this study is to examine the relationship between Strategic Management Accounting (SMA) information, Knowledge Management (KM), and the performance of Malaysian hospitals.

Design/methodology/approach: A survey is employed, and data is collected using self-administered questionnaires. Responses from 95 Malaysian private hospitals were analysed using Partial Least Squares (PLS) 3.0.

Research Findings: The findings indicate that SMA information positively affects performance, and KM mediates the relationship between SMA information and interpretation.

Theoretical Contribution/Originality: This study utilised the Resource-Based View (RBV) theory to explain SMA information as a resource and KM as a capability that impacts the competitive advantage of organisations. This study contributes to the line of literature on SMA information and KM in the healthcare sector.

Managerial Implication in the South East Asian Context: Findings of this study can be used by managers to improve SMA information and KM in their organisations.

Research limitation & Implications: Firstly, the data were collected from a single sector, the healthcare sector, in a developing economy and focused on hospitals. It may be inappropriate for the results of this study to be used for other sectors, such as industrial sectors or in other countries. Secondly, the results from path analysis do not explain for sure how these independent variables influence the dependent variables. Although the path analysis can reveal the significant relationships between the independent and dependent variables, it is insufficient to provide subjective information that may need to be addressed using a qualitative method.

Keywords: strategic management accounting, information, knowledge management, healthcare, hospital

INTRODUCTION

The healthcare industry has been recognised as a dynamic and growing sector in the world economy (ETP, 2017), and the private healthcare sector is growing in importance throughout the Asian region. A professional survey conducted among insurers operating in Asia and focusing on medical costs and other healthcare issues in China, Hong Kong, Indonesia, Malaysia, Pakistan, the Philippines, Taiwan, Thailand, Singapore, South Korea, and Vietnam reported an estimate of medical inflation in 2018 that would exceed that observed in 2017. It projected the inflation index over the next three years (Table 1). According to the Aon Medical Inflation Index (AMII), the median of the 11 economies surveyed is 82.7 points. Vietnam experienced the most significant increase (164.5 points) in medical inflation in 2018–2021, followed by Malaysia (132.4 points). The index for South Korea is the lowest at 64.3 points.

Table 1. Healthcare inflation index

Country	Medical Inflation Index 2017/2018
South Korea	64.3
Taiwan	71.4
China	73.0
The Philippines	74.2
Hong Kong	78.8
Thailand	82.7
Indonesia	90.8
Singapore	95.1
Pakistan	115.3
Malaysia	132.4
Vietnam	164.5
Regional Median	82.7

Source: AON AMII (2018)

Malaysian healthcare exhibited tremendous economic potential and recorded healthcare spending at 4,8% of the GDP, above its regional peers. National Transformation, 2050 (TN50) is a transformation plan initiative developed by the government, covering 30 years beginning in 2020. While focusing on developing human capital as a pillar of national success (Hassan et al., 2017), Malaysia pays significant attention to the healthcare industry as one of the economic pillars. The Malaysian healthcare industry has grown continuously for over three decades since the 1990s.

The Malaysian healthcare system comprises public and private sectors, which are still undergoing expansion. The public sector dominates up to 70% of services significantly subsidised by the government, as most Malaysians rely on public healthcare services. Meanwhile, the private healthcare sector accounts for the remaining 30% and mainly consists of curative and rehabilitative services. This sector is financed on a strictly fee-for-service basis (Brandt & Lim, 2012). Under the Economic Transformation Program (ETP), Malaysia's healthcare industry is being transformed into a private sector-driven agent of economic growth. The ETP has listed key strategies for the generation of an incremental gross national income from the healthcare industry of RM35,3 billion between 2010 and 2020 (Brandt & Lim, 2012).

Information plays a key role in competitive business environments. Strategic management accounting (SMA) applications have been used to improve organisations' performance and perspicuity in such environments. The rise in information significance external to firms contributes to the upward trend in SMA research (Cinquini & Tenucci, 2010). However, much SMA literature refers to non-service corporations; thus, the applications of SMA in healthcare are limited with respect to empirical evidence (Lachmann et al., 2013). Existing literature on contemporary management accounting has focused either on small and medium enterprises (SMEs) or on manufacturing companies (Ahmad, 2017; Antunes et al., 2017; Askarany, 2016; Ong et al., 2019). In healthcare contexts, previous studies have mainly analysed traditional management accounting practices and control systems in terms of environmental change (Naranjo-Gil & Hartmann, 2006). However, the implementation of SMA information remains unexplored. Therefore, it is crucial to emphasise the organisation's competitive positioning as providing the path towards future profit and value. SMA provides valuable information that enables companies to stay ahead of their competitors by upholding their competitive edge. Rashid, Ali, and Hossain (2020b) investigated SMA practices in developed and developing economies and found that competitor-based accounting was widely implemented.

The importance of knowledge was not given due attention under the management accounting umbrella (Dearman & Shields, 2001). Knowledge management (KM) is an organisational capability to utilise information to enhance corporate performance (Tanriverdi, 2005). KM contributes to an organisation's performance in the form of competitiveness (Alaarj et al., 2016; Chang & Chuang, 2011; Villar et al., 2014) and is an important tool for innovation in processes, products, and services (Batista & Matos, 2014). KM can help hospital management take the necessary actions to improve their performance. Some researchers argue that knowledge can influence performance (Alaarj et al., 2016; Chang & Chuang, 2011; dos Santos et al., 2014; Villar et al., 2014). However, the discussion of this topic remains limited. In fact, researchers have

afforded little attention to knowledge in the management accounting framework (dos Santos et al., 2014) or to KM's adoption and implementation in healthcare.

Under resource-based view theory (RBV), the application of a firm's resources is expected to impact its competitive advantage (Mahoney & Pandian, 1992). In line with the RBV, this study examines SMA information as the resource, performance as the competitive advantage, and KM as the capability. Specifically, this study's aims are threefold: to examine (1) the relationship between SMA information and KM, (2) KM and performance, and (3) KM as a mediator between SMA information and performance. The remaining sections present the literature review, research methods, results, and concluding remarks.

LITERATURE REVIEW

SMA Information

Earlier studies indicated that Malaysian companies use SMA to improve the decision-making processes and achieve desirable performance (Nik Abdullah, 2020; Ahmad, 2017; Nuhu, et al., 2016). Langfield-Smith (2008) argued that SMA practices were not widely adopted or understood. Nevertheless, studies have indicated that aspects of SMA have an influence on businesses. Langfield-Smith (2008) recommended a shift in focus from SMA practices and implementation to management accounting information (MAI). MAI has been recognised as useful for SMEs in relation to decision-making (Al Lami et al., 2019). Dearman et al. (2018) found that demand for MAI is based on the need for optimal decisions.

The information elements of SMA (customer information analysis, competitor information analysis, and product information analysis) and their potential to enhance performance were studied by Noordin et al. (2009), Mohammed et al. (2019), and Noordin et al. (2015). Companies require SMA information to support management's development and oversee organisational strategy (Simmonds, 1981). Therefore, the focus is on an organisation's competitive positioning, which is the core factor of its future financial performance. SMA information can help determine a firm's position in relation to its competitors. Anecdotal evidence indicates that SMA practices are used to some extent to cope with the competition. For example, Rickwood, Coates, and Stacey (1990) found that a company provided external information on the marketing performance of its competitors and intended to handle its declining market share. Another study reiterated that knowledge of the costs, market share, and cost formation of competitors could enable firms to determine when their competitors attempted to change their relative competitive positions as well as the firms' possible reactions (Lord,

1996). Mohammed et al. (2019) observed that private hospitals in Malaysia use and implement SMA information.

Parallel to its development, SMA also comprises information for strategy development and planning, monitoring the market condition, monitoring competitors' cost structures, and monitoring competitors' pricing policies (Collier & Gregory, 1995). Lord (1996) argued that functions associated with SMA include gathering competitor data and utilising accounting information strategically, thereby gaining a competitive position. Based on the previous discussion, SMA is conceptualised as the customer, competitor, and product information valuable towards enhancing performance. Ghani et al. (2012) affirmed acknowledging the value of SMA information allows the organisation to better understand their competitors' products and services as well as customer needs and how these are provided to their clients. At present, the use of SMA information is seen in a broad range of practices, while studies related to accounting information remain scarce (Zakaria, 2015).

Knowledge Management

KM utilises certain management techniques to improve or build knowledge value. KM is a systematic process to acquire and disseminate knowledge so that the employees can use it in an effective manner to perform and complete their duties (Alavi & Leidner, 2001; Sucahyo, et al., 2016). The operational definition used in this study for KM is "a systematic process is used in an organisation for integrating different sources and types of knowledge; converting competitive intelligence into plans of action; acquiring knowledge about business partners; and exchanging knowledge with business partners." The possession of knowledge related to certain variables that are present in an organisation allows managers to use it to maximise performance in their activities. KM has a role in competitiveness, innovation as well as new product development (Chang & Chuang, 2011; Villar et al., 2014). The following subsections define KM and its relationships with performance and hospitals.

Knowledge Management Classification

Early research in KM in terms of capabilities is rooted in 2001 with the publications by Gold et al. (2001), who categorised; (1) processes, which includes knowledge acquisition, conversion, application and protection and (2) infrastructure, which includes technology infrastructure, structure, and culture (Alavi & Leidner, 2001; Gold et al., 2001; Liu & Deng, 2015; Tseng & Lee, 2014). Jointly, processes and infrastructure determine the KM and are linked to organisational performance (Gold et al., 2001). Several works of literature have

confirmed the association between KM outcome, processes (Liu & Deng, 2015; Wu & Chen, 2014), and infrastructure (Sandhawalia & Dalcher, 2011).

Definitions of KM processes vary in previous literature. For instance, processes include acquisition, sharing, application (Gharakhani & Mousakhani, 2012); transfer, conversion, protection (Tseng & Lee, 2014); acquisition, conversion, application, and protection (Gold et al., 2001; Liu & Deng, 2015); obtaining, storing, refining and sharing; conversion, acquisition, and application; transfer, integration, creation, application (Wu & Chen, 2014); dissemination, acquisition and utilisation (Chen & Fong, 2012). In this study, KM is considered to be a single variable that allows organisations to integrate, convert, acquire and exchange knowledge among business partners (Noruzy et al., 2013). Many researchers have considered KM to be a single variable in the theoretical framework of their studies (Byukusenge et al., 2016; Mia & Hasan, 2015; Noruzy et al., 2013; Sucahyo et al., 2016)

Knowledge Management and Performance

In recent years, KM has been studied from the perspective of private organisations which achieve competitive advantage through efficient service and innovative products (Lee et al., 2016). In the private sector and the healthcare sector, one considerable concern is the demographic shift in the workplace, whereby many trained and skilled employees retire or leave the profession over a period of time (Oliver & Kandadi, 2006). Thus, private sector organisations need to institutionalise and pass on the tacit knowledge of the experience from retiring senior employees' existing staff.

KM is a resource that contributes to organisation competitiveness (Chang & Chuang, 2011; Chen & Fong, 2012; Villar et al., 2014). In addition, most managers depend on knowledge to perform their duties, so KM is important for companies to review their choices and decide on the course of action (Civi, 2000). KM facilitates organisation through the utilisation of new knowledge to reduce costs, increase speed and meet customer needs (Civi, 2000). Chong et al. (2000) estimated the investment cost of the KM project is between USD1.5 and USD15 million. The amount seemed prohibitive, but the absence of KM may lead to making poor decisions, which may result in even higher costs. KM also allows companies to achieve high performance through improved profits, new market identification, better efficiency, improved market share, and more effective operations (Civi, 2000).

KM requires investment and time, thus demanding implementers to utilise and maintain the system (Williams, 2002). Researchers stressed the need for adopting KM practices in accounting departments to improve the competency of employees (Trivellas et al., 2017). In this context, Santos, Lavarda & Marcello (2014) argued that KM is one of the sources of management accounting and must be well-managed to maximise the performance of an organisation. KM should receive special attention as it relates directly to the competitiveness of the organisation (Lee et al., 2016).

Knowledge Management and Healthcare

Within the healthcare sector, there are many systems and techniques of management accounting that require the necessary knowledge and skills for their application (Nilakanta et al., 2009). When knowledge is increased, it can help healthcare managers in several tasks, such as managing the patient's disease, facilitating communication between clinicians and patients, keeping the patient more informed, as well as forecasting the impact of intervention procedures. KM within an organisation is the most significant factor of success (Stone et al., 2000).

The healthcare industry encompasses hospitals, patients, laboratories, clinics, physicians, and customers (Mahmood et al., 2012). Hospitals should foster KM by encouraging knowledge sharing and innovation (Lee & Hong, 2014). Subsequently, the departments within a hospital require the ability to acquire new knowledge and techniques to encourage their employees (Lee & Hong, 2014). KM can help hospitals to capitalise on their existing resources and capabilities to develop new products and services. Therefore, hospitals should adopt KM to enhance its creation, sharing, and application (Lee & Hong, 2014). In this way, effective KM will turn hospitals into fast-learning, sustainable and competitive organisations (Noruzy et al., 2013).

Performance

The term performance became prevalent in management, strategic management, and accounting research, but its structure and definition were rarely justified (Kirby, 2005). The activities of an organisation may allow an accurate assessment of the extent to which an organisation achieves its strategic, tactical, and operational objectives, which may serve as the basis of the performance management systems (Kuwaiti, 2004). The performance comprises financial and non-financial measures which indicate the extent to outcomes and objectives achieved (Cadez & Guilding, 2012; Hoque & James, 2000). It includes the study of processes/strategies within organisations to see whether the result is in line with what was intended or should have been achieved. The operational definition for performance is in line with Lachmann et al. (2013), who consider two indicators to reflect the hospitals' performance

which is investment returns and efficiency of costs as a financial indicator, medical programs' reputation, and quality of care as a non-financial indicator.

Performance of Healthcare Organisation

In a recent development, the performance of healthcare organisations has become a research interest in the operations management field (Boyer et al., 2012; Stock & McFadden, 2017). Performance of hospital operations includes patient safety, process quality, and patient satisfaction (Stock & McFadden, 2017). Lachmann et al. (2013) considered the indicators for financial and non-financial performance. Hospitals face pressure to make continuous improvements from stakeholders such as insurance companies and clients while facing the rise in medical costs (Stock & McFadden, 2017). In lieu of expanded customer requirements, intensified competition, and rapid advances in technology (Hong et al., 2014), multiple performance indicators should be considered.

Concerns regarding healthcare quality and healthcare value have been posed since the 1980s (Boyer et al., 2012). Dobrzykowski et al. (2016) stressed the need to emphasise the performance of hospitals and improve the delivery of hospital services in the public and private sectors. Stakeholders, including medical professionals, researchers, government agencies, and advocacy organisations, have continuously developed numerous initiatives to measure, track and improve healthcare quality and safety (Leape et al., 2009; Pronovost et al., 2006; Wachter, 2010).

Base et al. (2012) highlighted that evidence based on the performance of the public and private health sectors is important for policymakers. The Ministry of Health Malaysia envisioned forming collaborations for healthcare to achieve the following: (1) achieving full health potential; (2) recognising the value of health; (3) improving further and sustaining health status for a better quality of life. This study resorts to both financial and non-financial performance measurements for the evaluation of the performance of private hospitals.

THEORETICAL FRAMEWORK

In this study, RBV is applied to examine the relationships between the variables. Noordin et al. (2015) highlighted the importance of SMA information quality in raising the level of performance of organisations. In this study, SMA is considered as information (Noordin et al., 2015; Zakaria, 2015); in terms of RBV, the information can be considered as a resource (Mao et al., 2016). This information (resources) will be valuable if they are treated properly and well managed (Ling, 2013).

In line with RBV theory, KM is the mediator variable that represents a capability that maximises the effect of SMA information on performance. According to Lane et al. (2001), knowledge acquisition at the organisation level acts as a mediator between the firm's absorptive capacity and its performance. Prior studies have confirmed that KM provides a framework to manage resources and convert them to value (Chen & Fong, 2012; Tanriverdi, 2005; Villar et al., 2014). The theoretical framework (Figure 1) indicates SMA information is independent, performance and KM is the dependent and mediating variable, respectively.
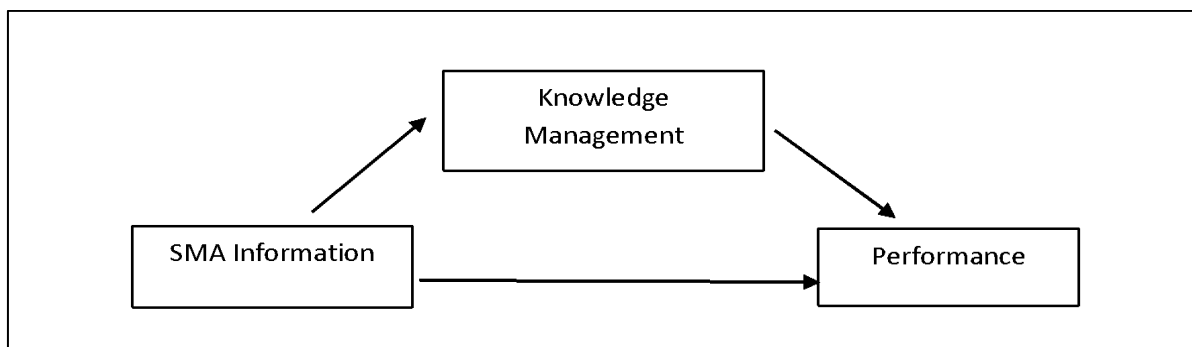

Figure 1: Theoretical Framework

Hypothesis Development

SMA Information and Performance

Research on SMA has focused on the effects of such SMA adoption on performance (Rashid et al., 2020a). Across the literature, there are several studies that mention the relationship between accounting information and performance. Noordin et al. (2015) discussed the positive influence of the SMA information on the performance of Malaysian manufacturing organisations focusing on electronic and electrical companies. Zakaria (2015) discussed SMA information usage among Malaysian SMEs, while Hammad and Jusoh (2010) studied hospitals that found a positive impact on performance. Therefore, the first hypothesis is developed:

H1: There is a positive relationship between SMA information and performance.

SMA Information and KM

A crucial element of management accounting is the creation of knowledge in organisations by providing internal users with information forms to reach a certain goal (Choe, 2004). The information is a necessary source to generate knowledge (Nonaka & Lewin, 1994; Said et al., 2010). Furthermore, Choe (2004) proposed that accounting information plays an important part in creating new knowledge. Many researchers argue that SMA is an information source collected from outside and inside the organisation (Hussein et al., 2016; Noordin et al., 2015; Said et al., 2012). This source of information can be used to create and develop KM. On this basis, the second hypothesis was developed:

H2: There is a positive relationship between SMA information and KM.

KM and Performance

In the past literature, many authors studied the relationship between KM and performance (Giampaoli et al., 2017; Sucahyo et al., 2016; Tanriverdi, 2005; Yang et al., 2014). Sharp (2003) considered knowledge as the determinant incorporating competition and future value. Companies are willing to invest in KM, realising the great benefits associated with it (Chang & Chuang, 2011). KM has been acknowledged as a stream of research that discusses the sources of organisational competitive advantage (Hsu & Sabherwal, 2012). The third hypothesis is developed as follows: the sources of organisational competitive advantage (Hsu & Sabherwal, 2012). The third hypothesis is developed as follows:

H3: There is a positive relationship between KM and Performance.

SMA Information, KM, and Performance

Stone et al. (2000) stated that knowledge could be divided into two dimensions – content and structure – both of which are crucial to success. In the field of accounting, the effect of knowledge on performance is indirect. The possession of knowledge related to certain variables that are present in an organisation allows managers to use it for maximising performance in their activities (Hunton et al., 2000). In addition to the role of KM in enhancing competitiveness, it serves as a medium between organisational factors and effectiveness (Zheng et al., 2010). Dos Santos et al. (2014) explained the importance of knowledge, which is one of the capabilities that contribute to managing the company's tangible and intangible resources. KM can mediate the relationship between dependent and independent variables (Zheng et al., 2010). As such, hypothesis H4 is developed as follows:

H4: KM is a mediator between SMA information and performance.

RESEARCH METHOD

This study applies the quantitative method, cross-sectional research design, as it aims to obtain empirical evidence to reach the objectives of the study. Data are collected through survey methods using questionnaires. The initial population of this study is the private healthcare sector which consists of private hospitals, clinics, nursing homes, maternity homes, private medical practitioners, private dental practitioners, and private pharmacists. In line with previous literature that found structural factors, such as the size of the organisation, influence the use of SMA, this study considers the definition of Malaysian SMEs to exclude micro-sized private healthcare from the population. The websites of the Association of Private Hospitals of Malaysia (APHM) and the Takaful Malaysia Insurance Company were used as the sampling frame, resulting in sample distribution of private hospitals as shown in Table 2.

Table 2. Private hospitals in Malaysia

Location	Frequency	Percentage	Cumulative Percentage
Central Malaysia	86	46.7	46.70
North Malaysia	36	19.6	66.30
South Malaysia	27	14.7	81.00
East Coast Malaysia	15	8.1	89.10
East Malaysia	20	10.9	100.00
	184	100	100.00

Pre-test and pilot tests were conducted to ensure the reliability and validity of the questionnaire items. Questionnaires were self-administered and distributed by hand and through emails. A total of 95 responses were received from 179 distributed questionnaires, representing a 53% response rate. Self-administrative questionnaire distribution may contribute to the satisfactory response rate recorded by this study. Selected previous studies in the healthcare sector in Malaysia have attained a high response rate (Mimi et al., 2011; Roshan et al., 2009). The demographic information of the respondents is presented in Table 3. Most of the respondents have more than five years of job experience. Also, 89.5% of the respondents are working in middle management and 7.4% in top management. A total of 73.7% and 16.8% of the respondents are from the accounting/finance and management department, respectively. There are four academic level qualifications – Master or PhD, Bachelor, Certificate or Diploma, and professional qualification. Most of the respondents hold a bachelor's degree (77.9%).

Table 3. Demographic characteristics of the Respondents (n=95)

No.	Demographic Variable	frequency	%
1	**Job experience:**		
	Less than 5 years	29	30.5
	5-10 years	50	52.6
	More than 10 years	16	16.8
2	**Current position in your organisation:**		
	Top management	7	7.4
	Middle management	85	89.5
	Low management	3	3.2
3	**Current department:**		
	Accounting /Finance	70	73.7
	Management	16	16.8
	Medical	8	8.4
	Others	1	1.1
4	**Highest academic level qualification:**		
	Master/PhD	7	7.4
	Bachelor	74	77.9
	Certificate/Diploma	8	8.4
	Professional qualification	6	6.3
	Others	0	0

Variable Measurements

Guilding et al. (2000) used SMA practices as the indicators of SMA information. In line with Noordin et al. (2009), this study adapted conceptualised SMA information through modification of questionnaire items to better reflect the hospital environment. SMA information was measured using 26 items representing customer, competitor, and product-related information. Respondents were asked to identify with statements on the usage of SMA information for their organisation's strategic purposes using a five-point Likert scale ('1 = Not used at all' to '5 = Greatly used').

KM capabilities are considered to be systematic processes that begin with knowledge acquisition from internal and external sources (Alaarj et al., 2016). In the management accounting field, researchers have not given much attention to knowledge (dos Santos et al., 2014). Four items developed by Noruzy et al. (2013) utilising a five-point Likert-type scale with choices ('1 = Strongly disagree' to '5 = Strongly agree') are used to measure KM.

This study measured performance utilising a self-rating approach to assess the performance of an organisation against its competitors (Chenhall & Langfield-smith, 1998; Lachmann et al., 2013). According to Jusoh and Parnell (2008), the combination of non-financial measures with the financial measure provides better indicators for performance. A study by Hassan et al. (2012) indicated that traditional performance measures are widely practised in Malaysia. The performance of hospitals is adapted from Lachmann et al. (2013) from previous studies (Cadez & Guilding, 2012; Hoque & James, 2000). Table 4 provides a summary of variable measurements for this study.

The questionnaire was divided into four sections (A, B, C and D). Section A covers SMA information, which consists of 26 items as indicators to measure customer information analysis, competitor information analysis and product-related information analysis. Section B and Section C address the items related to KM (4 items) and performance (4 items), respectively. Section D consists of the demographics of the respondents.

Table 4. Summary of variable measurements

Variables			Items	Scales	Sources
SMA information	Customer information	6	Customer warranty claims Customer profitability analysis Forecast on revenue streams Forecast on the cost of servicing Forecast on customer future profits Forecast on the profit earned from customer	"1 = Not used at all to 5 = Greatly used"	(Guilding et al., 2000; Noordin et al., 2009)
	Competitor information	10	Estimation of competitor's pricing Estimation of competitor's market share Appraisal of competitor's quality program Appraisal of competitor's growth rates Estimation of competitor's sales trend Estimation of competitor's cost structure Estimation of competitor's profitability Appraisal of competitor's R&D investment Appraisal of competitor's techniques investment Appraisal of competitor's cost reduction		
	Product related information	10	Cost management during R&D Internal failure-related costs External failure-related costs Quality assurance related costs Appraisal of product attributes Prevention costs Appraisal of cost across the product life cycle Value creating activity Product positioning-related costs Market penetration related costs		

Table 4. Summary of variable measurements (Continued)

Variables			Items	Scales	Sources
KM	None	4	Our organisation has processes for integrating different sources and types of knowledge. Our organisation has processes for converting competitive intelligence into plans of action. Our organisation has processes for acquiring knowledge about our business partners. Our organisation has processes for exchanging knowledge with our business partners.	"1 strongly disagree to 5 strongly agree"	(Noruzy et al., 2013)
Performance	None	4	Return on investment Cost efficiency The reputation of medical programs The quality of care	"1 = Strongly below average to 5 = Strongly above average".	(Lachmann et al., 2013)

Data Analysis

Smart-PLS is used to analyse the impact of SMA information on performance mediated by KM. The two-stage approach of Hair et al. (2014) is conducted for the assessment of the measurement and structural models. The model is evaluated for predictive relevance and analysed for mediating relationships. The results from the bootstrapping procedure related to the path of this hypothesis are presented in Table 5.

Table 5. Test of the total effects using bootstrapping

Path	coefficient (β)	T-value	P-value
SMA ---------> Performance	0.587	9.909	0.000
SMA ---------> KM	0.513	6.814	0.000
KM -----------> Performance	0.341	3.543	0.000

For Hypothesis 1, path coefficient = 0.587, t-value >1.96 and P-value < 0.5. In this research model, the independent variables had a significant positive coefficient, which means SMA information has a significant positive relationship with performance. Hypothesis 2 is supported with a path coefficient value (0.513) being more than zero, the t-value (6.814) being more than 1.96, and the P-value being zero. For hypothesis 3, path coefficient = 0.341, t-value >1.96 and P-value < 0.5 indicating KM has positive relationship with performance.

In this study, path "a" represents the relationship between SMA information and KM, "b" represents the relationship between KM and performance, "c" is the direct effect between SMA information and performance, and "ab" is the indirect effect between SMA information and performance through KM. Table 6 presents the results for each path with meditation.

Table 6. Mediation test results

Path		Beta	M	SE	t-value	P value
a	SMA -> KM	0.513	0.517	0.075	6.814	0
b	KM -> Performance	0.341	0.342	0.096	3.543	0
c' (direct effect)	SMA -> Performance	0.408	0.412	0.085	4.805	0

A common approach for testing the mediating effects is the Sobel (1982) test (z), which examines the relationship between the independent and the dependent variables as compared to the relationship with the mediating variable (Helm et al., 2010). The Sobel test is performed using the formula below:

$$z = \frac{ab}{\sqrt{(b^2 SE\frac{2}{a}) + (a^2 SE\frac{2}{b})}}$$

In this formula, regression weight for the relationship between the independent and mediating variable; and between the mediating and the dependent variable; SE_a and SE_b are the standard error regression weight (a) and (b), respectively. Table 6 presents the results of the mediation test after applying the Sobel formula. The results indicate that H4 is supported because all the values are considered to be in the recommended range.

Table 7. Mediation test results

Path	ab	SE	Z	P value	Result
SMA---KM---> Performance	0.174	0.055	3.152	<0.001	supported

The variance accounted for (VAF) is used to determine the level of mediation, (Hair et al., 2014), as follows: $VAF = \frac{(a*b)}{(a*b+c')}$

The value of VAF in this study is 0.30009, which is between 20% and 80%, meaning that KM partially mediates the relationship between SMA information and performance. Interpretation of mediating effect is based on Hair et al. (2014); VAF less than, 20% - no mediation occurs; VAF between, 20% to 80% -partial mediation; VAF above 80%, - full mediation.

RESULTS AND DISCUSSION

Strategic Management Accounting Information and Performance (H1)

Findings from this study support the previous literature concerning the relationship between SMA information and performance. A significant relationship (p 0.00) is established between SMA information and performance, thereby confirming the findings of previous studies (Cadez

& Guilding, 2012; Lachmann et al., 2013; Noordin et al., 2015; Zakaria, 2015). This implies that higher use of SMA information leads to higher performance, justified by the SMA information function, which has long been established in its role to facilitate, support, monitor and implement control on strategies (Noordin et al., 2015; Zakaria, 2015).

SMA Information and Knowledge Management (H2)

Knowledge is generated and compiled from a stream of information (Nonaka & Lewin, 1994). Results indicate KM is affected by the high level of strategic information. The t-value, which interprets the link between the two variables, is high (6.814); this corresponds to Ali et al. (2017). SMA information as a resource provides valuable information regarding the elements of KM. Therefore, organisations acquire, integrate, convert and exchange this information as knowledge between their employees and business partners.

For instance, employees should acquire, integrate, convert and exchange information during interactions with customers in order to create knowledge for the organisation (Tseng, 2009). Employees can seek information regarding specific needs for services or products, which can be used as feedback and inputs for future improvements (Tseng, 2009). It is important to build up a database rich with knowledge, desirable to institute the necessary mechanisms to acquire, integrate and exchange the information (Teece, 2000).

Knowledge-based competitor information is acquired, interpreted, and integrated information on a competitor (Tseng, 2009). Numerous competitors create a highly competitive environment; thus, knowledge related to competitor information has become one of the priorities for organisations (Tseng, 2009). Utilising knowledge in relation to competitors relies upon the related KM capabilities present in the organisations.

Knowledge Management and Performance (H3)

Initially, KM was defined in this study as a systematically interrelated process for the acquisition, transfer, integration, and conversion of knowledge among employees. Based on this, employees can utilise KM to perform their duties and achieve organisational performance (Noruzy et al., 2013). The result indicated a significant relationship at P (0.00). Thus, this study supports the previous literature (Giampaoli et al., 2017; Sucahyo et al., 2016; Tanriverdi, 2005; Yang et al., 2014) by providing empirical evidence concerning KM as a process and how it is implemented in the Malaysian healthcare sector in hospitals specifically.

By using the KM process, managers can do their work regularly and quickly because it significantly reduces the time and resources to locate relevant information. Thus, KM has

become a critical factor for improving performance. Furthermore, managers can leverage the expertise and best approaches that lead to maximising their performance in this specific domain. This has facilitated new, original and realistic solutions to problems as well as the flexibility to deal with their business management in a proper way.

Hospitals that have the KM process have better potential in creating, sharing, storing, applying, and totally managing knowledge. It has been confirmed in previous studies in many fields that KM is one of the capabilities that organisations rely on in competing with their peers in the market (Figueiredo et al., 2016; Giampaoli et al., 2017; Khasawneh et al., 2016; Noruzy et al., 2013; Obeidat et al., 2016; Sucahyo et al., 2016; Yang et al., 2014). Employees who share knowledge, work-related skills, and information develop abilities to undertake duties, thereby promoting organisational performance and subsequently competitive advantage (Obeidat et al., 2017).

Knowledge Management as Mediator (H4)

The role of KM as a mediating variable between SMA information and performance of hospitals was examined using the previously mentioned Sobel method. From initial inspection, a direct relationship between SMA information and hospital performance was established. Applying KM as a mediation variable came in line with the nature of RBV theory which suggested adding a mediation variable will affect the relationship between dependent and independent variables.

The findings indicate that KM has been fully utilised as a capability to maximise the effect of SMA information as a resource for the performance of hospitals. KM is a mediating variable p between SMA information and hospital performance. This implies that hospitals in Malaysia depend upon SMA information and KM to enhance their performance (Zheng et al., 2010). Organisations neglecting the KM process have the potential to lose the benefits of SMA information. The value of SMA information may be realised through the act of sharing knowledge with various organisational members and functions. Managers should eliminate the challenges to knowledge sharing and promote understanding and communication to enhance organisation performance (Ahmed & Shoaib, 2014).

The findings support the argument of RBV theory which refers to resources and capabilities as enablers to achieving competitive advantage (Lioukas et al., 2016). SMA information as a resource has a positive relationship with performance. KM as a capability can maximise this relationship. Practically, when the hospitals use KM for monitoring or controlling SMA

information, they will get better performance. The following table summarises the results of the hypotheses.

Table 8. Summary of the results of the hypotheses

	Hypotheses	Result
H1	There is a positive relationship between SMA information and Performance.	Supported
H1a	There is a positive relationship between CUIA and Performance.	Supported
H1b	There is a positive relationship between COIA and Performance.	Supported
H1c	There is a positive relationship between PRIA and Performance.	Supported
H2	There is a positive relationship between SMA information and KM.	Supported
H3	There is a positive relationship between KM and Performance.	Supported
H4	KM mediates the relationship between SMA information and Performance.	Supported

Theoretically, this study contributes to the line of literature in the SMA area by investigating SMA information, KM, and performance with reference to hospitals in Malaysia. The majority of previous studies in this area focused more on SMA techniques and the practical aspects of the manufacturing industry (Cadez & Guilding, 2012; Langfield-Smith, 2008; Noordin et al., 2015; Rahman & Ramli, 2016), there are few studies in the service sector (Abdul Rahman et al., 2012; Auzair et al., 2013). Thus, this study adds value to the previous literature by examining the relationship between SMA information and performance in the service sector within the Southeast Asia region. Secondly, knowledge has not been given much attention in management accounting literature in the healthcare sector. In this study, the resource-based view (RBV) theory is used to explain the relationship between SMA information, KM and performance. SMA information is conceptualised as a resource and KM as a capability utilised by hospitals to achieve better performance. This framework can be tested on hospitals in the Southeast Asian region.

The results of this study also have a practical contribution that provides empirical evidence highlighting the importance of information. Findings exhibit hospitals in Malaysia use SMA information, including competitor, customer, and product-related information analysis, to manage their competitive market. The findings from this study can be used by managers to improve SMA information and KM in their organisations.

CONCLUSION

Findings from this study indicate that SMA information (competitor information analysis, customer information analysis, and product-related information analysis) has a significant positive effect on performance and on KM. In addition, there is a positive relationship between SMA information and KM. The study also found that KM partially mediates the relationship between

SMA information and performance. This study adds value to the pool of works of literature by introducing KM as the mediator in examining the variables in private hospitals. Results indicated SMA information is a significant factor influencing the performance of organisations. This raises the challenge for researchers to further improve the existing status of studies on SMA information. This study can be expanded to other sectors to explain the effect of SMA information on performance. The relationship between SMA information elements with KM and performance can also be analysed. The study also found KM is a mediator variable. Conducting further studies on the application of SMA and KM and comparing the results with other countries would prove beneficial. Finally, a qualitative approach and secondary data may be adopted to enhance the results of this study.

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