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Strategic Performance Measurement System, Organisational Capabilities and Competitive Advantage

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ABSTRACT

This study examines organisational capabilities as a potential mediator in the link between SPMS use and organisational competitive advantage. The data was collected using a mail survey to top management of listed companies in Malaysia. The results show that SPMS makes a significant contribution with organisational competitive advantage and capabilities. However, diagnostic use is not significantly associated with organisational capabilities. The findings contribute to the body of knowledge by showing the role of SPMS from the perspective of the resource-based view theory and levers of control framework. The findings acknowledge that SPMS can be an indirect source for competitive advantage through its ability to enhance organisational capabilities.

Keywords: SPMS, diagnostic use, interactive use, organisational capabilities, competitive advantage, private sector.

INTRODUCTION

The strategic performance measurement system (hereafter will be referred to as SPMS) literature makes strong claims about the ability of SPMS to translate strategy into action and lead an organisation to enhance its competitive

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advantage (Fitzgerald, Johnston, Brignall, Silvestro & Voss, 1991; Kaplan & Norton, 1992). This paper defines SPMS as an information system containing financial and non-financial measures that are derived from strategies and designed to align individual actions with the organisational strategy. SPMS as an information system will help managers in feedback (diagnostic use) and feedforward (interactive use) action. The purpose of SPMS is to influence managerial actions by focusing attention on factors critical to the success of the organisation. The use of performance measures is an effective way to increase organisational competitiveness and profitability through the support of organisational capabilities.

SPMS is designed based on the strategy being followed by an organisation. Among the examples of SPMS are balanced scorecard (Kaplan & Norton, 1992), results and determinant framework (Fitzgerald et al., 1991), and performance pyramid system (Lynch & Cross, 1991). The main purpose of SPMS is to help organisations to build organisational capabilities to sustain competitiveness. For example, learning and growth perspective in Balanced Scorecard (BSC), and innovation in results and determinant framework, emphasise the importance of internal capabilities to improve organisational competitiveness. In short, many organisations are adopting SPMS that provide information that allows the firm to identify the strategies offering the highest potential for achievement of the organisation's objectives and align management processes such as target setting, decision-making and performance evaluation with the achievement of the chosen strategic objectives (Ittner, Larcker & Randall, 2003).

Literature on SPMS in the early 1990s focused more on the issue of the design of SPMS, for example, see Fitzgerald et al. (1991); Eccles and Pyburn (1992); Nanni and Dixon (1992); Kaplan and Norton (1992). This line of research was interested at looking into the fit between the design of SPMS and the strategy of the organisation. However, in the late 1990s and early 2000s, academicians were more interested in the implementation processes of SPMS (Franco & Bourne, 2003). The study done by Otley (1999) and Simons (1999) provided a new perspective in the SPMS literature in terms of the implementation of SPMS and its use in supporting business strategy.

This study focuses on the use of SPMS i.e. diagnostic and interactive. The issues of the use of SPMS have not been covered extensively, and there is no single theory or clear agreement about the factors influencing the use of SPMS (Henri, 2006b). According to Langfield-Smith (1997), the important distinction between the existence and the use of controls was not acknowledged in many past research studies. In order for control systems, including SPMS, to support a certain strategy, it may not be sufficient for certain controls to merely exist, it can be argued that the appropriate orientation for examining controls is their use and importance to key decision makers (Langfield-Smith, 1997). She viewed that Simons's (1999) theory of diagnostic and interactive controls is useful in clarifying this distinction. Based on prior literature, the issue of how SPMS can

improve the organisational competitiveness remains unresolved. Only a few studies such as Henri (2006a), Tuomela (2005) investigate this issue using Simons's levers of control framework. According to Henri (2006a), the findings provided by the management control system, including SPMS and strategy stream of research, remain ambiguous and sometimes contradictory. These ambiguous findings can be explained by (1) the absence of a theoretical framework founded on the resource-based view, and (2) the limited attention devoted to the dynamic tension resulting from different uses or roles of management control system including SPMS. Hence, this study attempts to examine the relationship between SPMS use, capabilities and competitive advantage based on the levers of control framework (Simons, 1999) and resource-based view theory (see for example Grant, 1991 and Barney, 2001).

The resource-based view (RBV) theory argues that sustained competitive advantage derives from the resources and capabilities a firm controls that are valuable, rare, imperfectly imitable and not substitutable (Barney, Wright & Ketchen, 2001). These resources and capabilities can be viewed as bundles of tangible and intangible assets, including a firm's management skills, its organisational processes and routines, and the information and knowledge it controls. This study adopts Henri's four capabilities (2006), where she identified innovation, organisational learning, market orientation and entrepreneurship as primary capabilities to achieve competitive advantage, to match and create market change.

The purpose of this paper is to examine the role of SPMS use to enhance organisational competitive advantage through its ability to facilitate organisational capabilities i.e. innovation, organisational learning, market orientation and entrepreneurship. The role of SPMS use is considered based on Simons's (1999) levers of control framework. This study examines organisational capabilities as a potential mediator in the link between SPMS and organisational competitiveness. This paper reports the result of a study on SPMS, capabilities and competitive advantage. There are three research questions in this study: (1) does SPMS use influence organisational capabilities?; (2) do organisational capabilities influence organisational competitive advantage?; and (3) do organisational capabilities mediate the relationship between SPMS use and organisational competitive advantage through SPMS use influence on organisational capabilities?. There is lack of evidences on the relationship of the SPMS use and organisational competitive advantage. Thus, this study seeks to fill the gap in SPMS-strategy literature by examining this issue by looking at the use of SPMS to support business strategy to enhance organisational competitiveness from the perspective of the resource-based view (RBV) theory and levers of control framework. The rest of this paper is divided into five sections. Section two is the literature review, section three details the methodology, followed by the results and discussion in section four and finally the last section provides the conclusion.

LITERATURE REVIEW

Simons (1999) explained that diagnostic control systems are the essential management tools to transform intended strategies into realized strategies. These control systems focus attention on goal achievement and for each individual within the business. Diagnostic control systems also allow managers to measure outcomes and compare results with preset profit plans and performance goals. Kaplan and Norton (1992) proposed the balanced scorecard (BSC) and suggested that diagnostic control system measures are grouped into four categories: financial measures; customer measures; internal business measures; and innovation and learning measures. They argued that effective managers use diagnostic measures in each of these four categories simultaneously to guide their business towards desired goals.

Interactive control systems are the control systems that managers can use as tools to influence the experimentation and opportunity-seeking that may result in emergent strategies. Interactive control systems are formal information systems managers use to involve themselves regularly and personally in the decision activities of subordinates (Simons, 1999). While there is a continuing debate in SPMS literature on whether SPMS is a diagnostic or interactive control system, Tuomela (2005) suggested that financial measures and non financial measures can be used both diagnostically and interactively.

SPMS plays an important role to help organisation members identify the cause-and-effect relationships between process results, evaluated in terms of secondary objectives and primary objectives (Atkinson, Waterhouse & Wells, 1997). Supporting an understanding of how process performance affects organisational learning and performance is SPMS's diagnostic role (Atkinson et al., 1997). According to them, a particular element of the diagnostic role is to mesh non-financial measures, with organisational goals, which are usually financial. Hence, SPMS should supply the information that employees need to evaluate and quantify the causal links, which, in turn, provide the basis for the evaluating and reengineering process (Atkinson et al., 1997). The findings from Atkinson et al. (1997) reported that a bank gets a benefit from SPMS, where the measures can help managers to signal and diagnose what drives current profitability performance and how the bank functions, so they can identify gaps and change strategies and tactics to improve financial performance. Through this diagnostic role, the SPMS can give an early warning of potential lower profits, so the bank can correct problems early on. Moreover, it also supports the bank's learning by identifying and testing models of relationship between drivers and results.

Diagnostic controls promote organisational learning through feedback mechanisms. They provide input regarding which processes are working well and which are not (Widener, 2005). While Simons (1999) mentioned that diagnostic control systems (concerned with financial measures) do constrain innovation and opportunity-seeking to ensure the predictable goal achievement

needed for intended strategies. A diagnostic control system is like a cybernetic view, where the features (1) depend solely on financial measures; (2) focus on short-term; (3) are information aggregated; (4) static; and (5) not actionable and lack timely signals. This system will encourage conservatism and promotes comfort and clarity (Henri, 2004). The study conducted by Henri (2006a) found that a diagnostic use of SPMS has a negative influence on the capabilities of market orientation, entrepreneurship, innovation and organisational learning. This is because diagnostics are related to the monitoring and tracking results and by creating constraints to ensure compliance with orders it causes the negative effect of diagnostic use on organisational capabilities.

Interactive control systems are systems that top managers use to involve themselves regularly and personally in the decision activities of subordinates. The purpose of interactive control systems is to direct managers' attention towards current strategic uncertainties (Simons, 1999; Marginson, 2002). The choice by top managers to make certain control systems interactive provides signals to individuals in an organisation about what should be monitored and where new ideas should be proposed and tested. This signal activates organisational learning and through the debate and dialogue that surrounds the interactive management control process, new strategies and tactics emerge over time (Simons, 1991).

The purpose of interactive controls is to facilitate managers in anticipating and effectively managing future uncertainties. Interactive controls can be a facilitator of organisational learning. Interactive controls heavily involve top managers for the purpose of creating dialogue and sharing information and, thus, can stimulate learning. Top managers can use interactive controls to influence and guide the learning process; indirectly this can help top managers understand that individual ideas and initiatives will emerge over time in unsystematic ways. The interactive control systems provide a signal throughout the organisation regarding the important arena for proposing, considering, and implementing new ideas. This process facilitates double loop learning, in which the search, scanning, and communication processes allow new strategies to emerge (Simons, 1991; 2000; Widener, 2005).

Widener (2005) adopted four levers of control i.e., beliefs system, boundary system, diagnostic and interactive use to investigate the effect of performance measurement systems on organisational performance. The study indicated that reliance on performance measurement systems influence performance through their effect on learning. Sensitivity tests demonstrated that the relation between performance measurement systems and performance is weak; however, the effects become apparent when organisational learning is included in the model.

Henri (2006a) conducted a survey to examine the relationship between diagnostic and interactive use of SPMS and organisational performance. The study also examined the mediating effect of organisational capabilities, namely, market orientation, entrepreneurship, organisational learning, and innovations.

The study found that the relationship between diagnostic and interactive use of SPMS and performance is indirect. SPMS use influenced the four capabilities, which, in turn, influenced organisational performance.

An organisation's capabilities are complex bundles of skills and accumulated knowledge, exercised through organisational processes that enable organisations to coordinate activities and make use of their assets (Day, 1994). These capabilities are deeply embedded in organisational routines and can lead to positional advantage based upon innovative offerings or superior service. Firms that possess such an advantage should enjoy superior performance. Market orientation, entrepreneurship, innovation and organisational learning are the capabilities that collectively give rise to an organisation's positional advantage (Day & Wesley, 1988; Hult & Ketchen, 2001).

Narver and Slater (1990) explained that market orientation consists of three behavioural components, which are customer orientation, competitor orientation and interfunctional coordination. Customer orientation and competitor orientation are referred to as "all of the activities involved in acquiring information about the buyers and competitors in the target market and disseminating it throughout the businesses" (Narver & Slater, 1990, p. 21). Interfunctional coordination is "based on the customer and competitor information and comprises the business's coordinated efforts, typically involving more than the marketing department, to create superior value for the buyers" (Narver & Slater, 1990, p. 21).

Naman and Slevin (1993) defined entrepreneurship as:

> *"Entrepreneurship can be viewed as a characteristic of organisations and can be measured by looking at managerial behaviour as the firm engages in the entrepreneurial process. Entrepreneurial firms are those in which the top managers have entrepreneurial management styles, as evidenced by the firm's strategic decisions and operating management philosophies" (p. 138).*

Hurley and Hult (1998) define innovativeness as the notion of openness to new ideas as an aspect of a firm's culture. Innovativeness of the culture is a measure of the organisation's orientation towards innovation. Huber (1991) defines organisational learning as the development of new knowledge or insights that have the potential to influence behaviour (as cited in Henri, 2006a).

Hult and Ketchen (2001) suggest that market orientation, entrepreneurship, innovation, and organisational learning do not constitute unique resources independently, but rather they can collectively contribute to the creation of a unique resource. According to them, these four elements are each necessary but are not individually sufficient for creating 'positional advantage'. Only collectively can they help an organisation be unique and gain an edge over their competitors (Hult & Ketchen, 2001; Henri, 2006a)

Many studies had been done to examine the performance effect of performance measurement system for example Davis and Albright (2004); Said,

HassabElnaby, and Wier (2003); and Ittner and Larcker (2001). However, not much attention has been given to the performance effect from the perspective of RBV. The RBV theory is based on the principle that competitiveness is a function of distinctive and valuable resources and capabilities controlled by a firm. The capabilities support strategic choices by providing competitive advantage necessary to achieve strategic objectives. SPMS must be aligned with capabilities to be effective and be consistent with strategic choices (Henri, 2006a). According to Henri (2006a), the SPMS literature has devoted scant attention to the RBV theory. Therefore this study represents an effort to fill this gap by examine the effect of SPMS use on competitive advantage from the perspective of RBV theory. Based on the past literature, this study proposes that SPMS use is positively related to organisational competitive advantage indirectly through its contribution to capabilities of organisation learning, innovation, market orientation and entrepreneurship. The relationship is linked together in a model as in Figure 1.

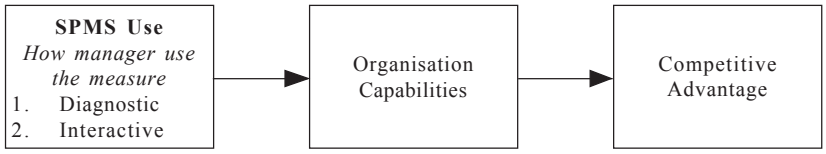

Figure 1 SPMS, Capabilities and Competitive Advantage

RESEARCH METHOD

Sample

The sampling frame for this study is Malaysian companies listed on Bursa Malaysia. The list of companies was obtained from Bursa Malaysia and the New Straits Times as at 9 June 2007. All listed companies are derived from Bursa Malaysia's directory, however, as Bursa Malaysia does not include the companies according to the industries, the study used the industry classification provided by the New Straits Times. The directory consists of 640 companies listed on the main board and 247 listed on the second board, giving a total of 887 listed companies excluding Mesdaq companies. However, the final number of samples was reduced to 778 companies for various reasons such as lack of contact name for the top management teams, unable to detect company address, number of employees too small, companies experiencing financial problems, merging of companies or consolidation process and companies already included in the prior pilot test. The address of the companies and the name of the CEO or top management are based on the information in the company's annual report and website. Table 1 illustrates the sample selection for this study.

Data Collection

Data was collected through a structured questionnaire sent to one member of the top management team. The study used the top management team as respondents because according to Simons (1999) top management are the persons who are knowledgeable about the business strategy and the ones who will use SPMS either diagnostically or interactively. A total of 162 questionnaires were returned, 3 of these were excluded from the study for incomplete responses. However, 14 companies were excluded because of the outlier concern, therefore, 145 responses were used in the data analysis yielding an 18.6% response rate (see Table 1).

Table 1 Sample Selection

Industry	Main Board	Second Board	Total
Consumer	86	48	134
Industrial	157	127	284
Construction	44	15	59
Trading	138	45	183
Finance	45		45
Infrastructure	9		9
Hotels	5		5
Properties	95	3	98
Plantations	43	3	46
Mining	1		1
Technology	17	6	23
Total	640	247	887
(-) Pilot sample			60
Sub total			827
(-) Companies with incomplete information i.e. address, key management name, etc. and number of employees less than 150			49
Total companies used as a sample in this study			**778**
Mailed questionnaire		778	100%
Usable returned questionnaire		145	18.64%

Table 2 presents companies profiles in terms of number of employees, average sales revenue for three years, and major activity. In terms of number of employees, 28.3 percent of the samples have employees between 200 and 500. Another 37.2 percent have employees between 600 and 1,900, 14.5 percent employed 2,000 to 7,000 employees, and 12.4 percent have less than 160 employees. The remainder of the sample have employees between 8,000 and 20,000 (4.8 percent) and above 20,000 (2.8 percent).

For sales revenue, 26.2 percent earned between RM51 million and RM150 million, 22.5 percent earned a revenue of above RM850 million, 13.1 percent have sales revenue between RM151 million and RM250 million and only 7.6 percent earned revenue of less than RM50 million. Majority of the respondents are manufacturing (35.9 percent) and service companies (40.9 percent).

Table 2 Profile of Companies

Item	Frequency	Percentage
Number of employees		
Less than 160	18	12.4
Between 200 to 500	41	28.3
Between 600 to 800	25	17.2
Between 900 to 1900	29	20.0
Between 2000 to 7000	21	14.5
Between 8000 to 20000	7	4.8
Above 20000	4	2.8
Total	145	100.0
Sales revenue		
Less than RM50 million	11	7.6
Between RM51 million to RM150 million	38	26.2
Between RM151 million to RM250 million	19	13.1
Between RM251 million to RM350 million	12	8.3
Between RM351 million to RM450 million	8	5.5
Between RM451 million to RM550 million	13	9.0
Between RM551 million to RM650 million	4	2.8
Between RM651 million to RM750 million	4	2.8
between RM751 million to RM850 million	2	1.4
Above RM850 million	33	22.5
Total	144	99.3
Missing	1	0.7
Major Activity		
Manufacturing	52	35.9
Services	59	40.7
Others	34	23.4
Total	145	100.0

Table 3 displays the details of the respondents' profiles according to the position and working experience. The majority of the respondents are chief financial officers (22.8 percent) and chief executive officer/managing director (16.6 percent). Accountant/finance manager represent 12.4 percent, while senior

manager and general manager represent 11.7 percent. Director represents 11.0 percent, followed by, chief operating officer (7.6 percent), head of department (4.1 percent) and others (2.1 percent). The majority of the respondents (51.7 percent) have been in the current position between 1 year and 5 years. Another 39.3 percent of the respondents have been in the current position for 6 years to 15 years, and 4.1 percent of the respondents have been in the current position for over 20 years. For the experience in the current organisation (not in the same position), 40.7 percent of respondents have 1 year to 5 years of experience, 37.9 percent have 6 years to 15 years experience. The remaining respondents have 15 years to 20 years (9.7 percent) experience and above 20 years (9.7 percent).

Non-response bias was investigated by comparing early to late respondents on strategic performance measurement dimensions and organisational capabilities. There were no statistically significant differences noted between early and late respondents.

Table 3 Profile of Respondents

Item	Frequency	Percentage
Position		
CEO/MD	24	16.6
CFO	33	22.8
Director/Finance Director	16	11.0
COO/VP/EVP/SVP	11	7.6
General Manager/DGM	17	11.7
Head of Department	6	4.1
Accountant/Controller/Finance Manager	18	12.4
Senior Manager/Manager	17	11.7
Others	3	2.1
Total	145	100.0
Working years - in the current position		
1 to 5 years	75	51.7
6 to 15 years	57	39.3
15 to 20 years	4	2.8
Above 20 years	6	4.1
Total	142	97.9
Missing	3	2.1
Working years - in the organisation		
1 to 5 years	59	40.7
6 to 15 years	55	37.9
15 to 20 years	14	9.7
Above 20 years	14	9.7
Total	142	97.9
Missing	3	2.1

Variable Measurement

Independent Variable

SPMS use is measured using the instrument developed by Vandenbosch (1999), Henri (2003; 2006a) and Widener (2005). Altogether, there are 12 items for SPMS use (see Table 4), and the respondents are asked to rate the purpose of the top management uses of SPMS on a five point Likert-scale ranging from 1 = not at all to 5 = to a great extent.

Mediating Variable

For market orientation, the instrument developed by Narver and Slater (1990) was adopted. The instrument consisted of three subscales used to measure customer orientation, competitor orientation and interfunctional coordination. Altogether, 14 items are used to measure market orientation. For entrepreneurship, the study used the instrument suggested by Hult and Ketchen (2001) and Henri (2003). This instrument was originally developed by Naman and Slevin (1993). Entrepreneurship covers three dimensions, which are the willingness to take business related risks, the willingness to be proactive when competing with other organisations, and the willingness to innovate, i.e., to favour change and innovation in order to gain competitive advantage (Naman & Slevin, 1993). Altogether, there are 9 items (3 items excluded after factor analysis) to measure entrepreneurship. For innovation and organisational learning, the instrument is based on the suggestion by Hult and Ketchen (2001) and Henri (2006a). The respondents were asked to rate organisational capabilities using five-point likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Appendix 1 presents the items for market orientation, entrepreneurship, innovation and organisational learning.

Table 4 SPMS Use Dimensions

Diagnostic Dimension	Review key measure Compare Monitor results Track progress
Interactive Dimension	Focus on common issues Tie organisation together Develop common vocabulary Make sense of goals & strategy Enable challenge and debate Enable discussion Provide a common view Focus on CSF

Dependent Variable

The measure of competitive advantage is adapted from the dimensions used by Fitzgerald et al. (1991) and Day and Wesley (1988). According to Day and Wesley (1988), there is no common meaning for "competitive advantage" in common practice or in the marketing literature. However, they viewed competitive advantage as a positional superiority, based on the provision of superior customer value or the achievement of lower relative costs, and the resulting market share and profitability performance (Day & Wesley, 1988). Moreover, Day and Wesley (1988) suggested that researchers can use the measures such as customer satisfaction, customer loyalty, market share and profitability to determine an organisational competitive advantage. In the "Results and Determinants Model", Fitzgerald et al. (1991) categorised organisational performance into two dimensions – competitive performance and financial performance. Competitive performance is based on market share, sales growth and customer base, while for financial performance is based on profitability, liquidity, capital structure and market ratios.

This study views competitive advantage as a positional advantage that an organisation has over a competitor due its ability to create and sustain superior customer value. There are five items to measure competitive advantage such as customer satisfaction, customer loyalty, market share, sales growth, and profitability, but after factor analysis customer satisfaction is dropped due to factor loading (see Appendix 2). The respondents were asked to rate organisational competitive advantage using five-point likert scale ranging from 1 = very poor to 5 = excellent. According to Dess and Robinson (1984) to conceptualise organisational performance including competitive advantage is a complex and multidimensional phenomenon. Researchers frequently encounter difficulty in obtaining accurate measures because the information is viewed as confidential (Dess & Robinson, 1984). When facing this situation, Dess and Robinson (1984) suggested that researchers might use a subjective measures based on managers' perception. Their research on organisational performance using top management team perception found that the performance measured was consistent with how organisation actually performed based on return on assets and growth in sales. The findings suggests that a researcher might consider using a subjective measure if accurate objective measures are unavailable and the alternative is to remove the consideration of performance from research design. Besides that, subjective measures may be useful in attempting to operationalise broader, non-economic dimensions such as customer loyalty, customer satisfaction (Dess & Robinson, 1984).

RESULTS AND DISCUSSION

Validity and Reliability Tests

Table 5 presents the results of validity and reliability. One of the measures to quantify the degree of intercorrelation among the variables and the appropriateness of factor analysis is the Kaiser-Meyer-Olkin measure of sampling adequacy (MSA). Overall, the MSA is above 0.60 indicated that it was acceptable. Based on Hair, Black, Babin, Anderson, & Tatham's (2006) guideline, these statistical analyses showed that 1) the value of factor analysis for all items that represent each research variable is 0.4 and more, indicating the items meet the acceptable standard of validity analysis, 2) all research variables have eigenvalues larger than 1, and 3) the items for each research variable exceeded factor loadings of 0.40. Besides that, all the constructs showed that the Cronbach alpha of above 0.70, exceeded the acceptable standard of reliability analysis of 0.70 (Pallant, 2001), meaning that the constructs have a good internal consistency.

Table 5 The Goodness of Data

Dimensions	Items (after deleted)	Items deleted (by number)	Factor Loadings	MSA	Eigenvalue	Variance Explained	Cronbach Alpha
SPMS Use:							
Diagnostic	4	none	.85 to .87	.825	2.955	73.866	.881
Interactive	8	none	.72 to .85	.888	4.688	58.606	.897
Organisation Capabilities:							
Market Orientation:							
Customer orientation	6	none	.63 to .79	.832	3.128	52.128	.806
Competitor orientation	4	none	.70 to .85	.720	2.384	59.588	.771
Interfunctional coordination	4	none	.71 to .85	.672	2.292	57.293	.747
Entrepreneurship	6	3	.58 to .85	.744	3.004	50.068	.798
Innovativeness	3	2	.80 to .88	.690	2.168	72.266	.808
Organisation learning	3	1	.75 to .88	.624	1.968	65.589	.732
Competitive Advantage	4	1	.69 to .77	.710	2.184	54.608	.721

Table 6 displays the Pearson correlation analysis and descriptive statistics. Means for SPMS use, diagnostic and interactive are ranging from 3.98 to 4.18. It means that overall top management use SPMS to a considerable extent with the emphasise more on diagnostic use. For capability and competitive advantage the mean are 3.83 and 3.84 respectively. The correlation coefficients for the relationship between independent variables (i.e., SPMS use, diagnostic, interactive) and the mediating variable (i.e., capabilities) and the relationship

Table 6 The Correlation Analysis and Descriptive Statistics of Main Variables

			Pearson Correlation Analysis				
	Mean	**Standard Deviation**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
(1) SPMS Use	4.18	.529	1				
(2) Diagnostic	4.38	.594	.916**	1			
(3) Interactive	3.98	.566	.908**	.664**	1		
(4) Capability	3.83	.433	.547**	.406**	.597**	1	
(5) Competitive advantage	3.84	.551	.335**	.245**	.368**	.451**	1

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed).

between independent variables (i.e., SPMS use, diagnostic, interactive) and dependent variable (i.e. competitive advantage) are less than 0.90 indicating the data are not affected by any serious collinearity problem (Hair et al., 2006) .

Regression Analysis

The hypothesis was tested using hierarchical multiple regression. Before conducting the analysis, the data was examined to ensure the assumptions of regression analysis such as normality, multicollinearity, and outliers are not violated. From the examination, there is no problem for normality, multicollinearity, outliers and linearity. Normality was assessed based on Kolmogorov-Smirnov statistic, where all variables showed no problem of normality (significant value of more than 0.05). For outlier, based on Pallant's (2001) guideline, the cases have an outlier if the standardised residual is more than 3.3 or less than -3.3. With large samples, it is not uncommon to find a number of outlying residuals. If there are only a few outliers, it may not be necessary to take any action (Pallant, 2001). From the scatter plot, 14 cases are found as outliers and are deleted from data analysis.

According to Baron and Kenny (1986), a variable is called as a mediator if it accounts for the relation between the predictor (independent variable) and the criterion (dependent variable). To establish mediation, the following conditions must hold: (1) the independent variable (i.e. SPMS Use) must affect the mediator (i.e. organisation capabilities) in the first equation; (2) the independent variable must be shown to affect the dependent variable (i.e. competitive advantage) in the second equation; and (3) the mediator must affect the dependent variable in the third equation. If these conditions all hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second. Perfect mediation holds if the independent variable has no effect when the mediator is controlled (Baron & Kenny, 1986, p. 1177).

To test the hypothesis, two analysis were done; (1) regression of overall SPMS use on dependent variable (Table 7); and (2) regression of each dimensions of SPMS use on dependent variable (Table 8 and 9). The analysis is conducted based on the suggestion by Baron and Kenny (1986). Model 1 refers to requirement 1, model 2 and model 3 refers to requirement 2 and 3 respectively (see Table 7, 8 and 9). These two analyses are explained below.

First Requirement

For the first requirement, the independent variable (i.e. SPMS Use) must affect the mediator (i.e. organisation capabilities). Therefore, the first step is to regress overall SPMS use and capabilities (refer Model 1 in Table 7) and regress each dimensions of SPMS use (i.e. diagnostic and interactive) and capabilities (refer Model 1 in Table 8). From Table 7, it was found that SPMS use ($b = 0.547$, $p = 0.000 < 0.001$) has a significant effect on organisation capabilities. If we look at each dimensions, both diagnostic use ($b = 0.016$; $p > 0.10$) and interactive use ($b = 0.586$; $p < 0.001$) give a positive contribution to the organisation capabilities, however only interactive use has a significant effect on organisation capabilities (refer Table 8). Therefore, two variables which are overall SPMS use and interactive use are fulfilling the first requirement to conduct the mediation analysis.

Second Requirement

The second requirement is to test relationship between independent variable and dependent variable. According to Baron & Kenny (1986), the independent

Table 7 Hierarchical Multiple Regression – SPMS use, Capabilities and Competitive Advantage

Model	**1**			**2**			**3**		
DV	**Capabilities**			**Advantage**			**Advantage**		
IV	**Coeff. (B)**	**Std. Error**	**Beta**	**Coeff. (B)**	**Std. Error**	**Beta**	**Coeff. (B)**	**Std. Error**	**Beta**
Intercept	1.957	.241		2.382	.346		1.431	.394	
SPMS Use	.448	.057	.547***	.348	.082	.335***	.131	.093	.126
Capabilities							.486	.113	.382***
R^2	.299			.112			.214		
Adj. R^2	.295			.106			.203		
Change in R^2	.299			.112			.102		
F	61.132***			18.053***			19.367***		
F Change	61.132***			18.053***			18.475***		
df	(1,143)			(1,143)			(1,143)		

***significant at the 0.001 level; **significant at the 0.01 level; *significant at the 0.05 level

variable must be shown to affect dependent variable. In the second step, overall SPMS use is regress on competitive advantage (refer Model 2 in Table 7). For each dimensions of SPMS, diagnostic use and interactive use is regress on competitive advantage (refer Model 2 in Table 8). As shown in Table 7, it is indicated that overall SPMS use ($b = 0.335$, $p = 0.000 < 0.001$) has a significant relationship to competitive advantage. The results suggested that SPMS use has made a unique, and statistically significant, contribution to the prediction of competitive advantage. If we look at each dimensions, interactive use ($b = 0.368$, $p = 0.000 < 0.001$), showed a significant effect on competitive advantage (refer Table 8). As a conclusion SPMS use and interactive use are meet the requirement for mediating variable.

Table 8 Hierarchical Multiple Regression – Each Dimensions of SPMS

Model	**1**			**2**		
DV	**Capabilities**			**Advantage**		
IV	**Coeff. (B)**	**Std. Error**	**Beta**	**Coeff. (B)**	**Std. Error**	**Beta**
Intercept	1.990	.232		2.409	.343	
Diagnostic	.012	.066	.016	.001	.097	.001
Interactive	.448	.069	.586***	.358	.101	.368***

***significant at the 0.001 level; **significant at the 0.01 level; *significant at the 0.05 level

Third Requirement

The third requirement is about relationship between mediating variable and dependent variable, where the mediator must affect the dependent variable, when dependent variable is regress on both independent and mediating variables. Therefore, in the third step, competitive advantage is regress on both independent variable (i.e. overall SPMS use and interactive use) and mediating variable (i.e.capabilities). The results on this relationship are presented in Table 7 and 9.

As shown in Table 7, organisation capabilities have a significant effect on competitive advantage ($b = 0.382$; $p < 0.001$). For the relationship of each dimension (interactive), organisation capabilities ($b = 0.359$; $p < 0.001$) also have a significant relationship with dependent variable i.e. competitive advantage (see Table 9). Therefore it can be concluded that organisation capabilities is a mediator between SPMS use and competitive advantage. Organisation capabilities are also a mediator in the relationship of interactive use and competitive advantage.

Table 9 Hierarchical Multiple Regression – Interactive Use, Capabilities and Competitive Advantage

Model	1			2			3		
DV	Capabilities			Advantage			Advantage		
IV	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta
Intercept	2.009	.206		2.411	.304		1.494	.375	
Interactive	.457	.051	.597***	.359	.076	.368***	.150	.090	.154+
Capabilities							.457	.118	.359***
R^2	.357			.136			.219		
Adj. R^2	.352			.130			.208		
Change in R^2	.357			.136			.083		
F	79.321***			22.462***			19.854***		
F Change	79.321***			22.462***			15.040***		
df	(1,143)			(1,143)			(2,142)		

***significant at the 0.001 level; **significant at the 0.01 level; *significant at the 0.05 level; +significant at the 0.10 level

Perfect mediation holds if the independent variable has no effect when the mediator is controlled (Baron & Kenny, 1986, p. 1177). From Table 7, when organisation capabilities were controlled, the effect of SPMS use on competitive advantage is not significant ($p > 0.10$) but beta coefficient ($b = 0.126$) is lower than earlier direct relationship of independent and dependent variable (where $b = 0.335$). However, for interactive use, when organisation capabilities were controlled, interactive use has a significant effect ($p < 0.10$) on competitive advantage but beta coefficient is reduced from 0.368 to 0.154 (refer Table 9). Thus, the results provided evidence that there is a complete or full mediation effect of organisation capabilities on SPMS use and competitive advantage. On the other hand, there is a partial mediation effect of capabilities on the link between interactive use and competitive advantage. The results showed that SPMS use i.e. diagnostic and interactively use can help to enhance the capabilities i.e. market orientation, entrepreneurship, innovation and organisation learning and this will lead to increase the level of competitive advantage of the organisation.

Discussion of the Results

The results provide ample evidence on the role of SPMS as a strategic control tools to ensure that organisational strategies are implemented and the ability of SPMS to enhance organisation competitiveness. From the results, it is clear that SPMS use play an important role in enhancing organisational capabilities such as market orientation, entrepreneurship, innovation and organisation

learning. The results show that SPMS use makes a unique and significant contribution with competitive advantage and capabilities. The results suggest that interactive use of SPMS have a positive and significant association with organisational capabilities. One interesting finding is that the diagnostic use of SPMS is not significantly associated with organisational capabilities. The results also indicate that organisational capabilities play a role as a mediator in the relationship between SPMS use and competitive advantage.

The results shed more lights on the role of SPMS and found that SPMS can be used either diagnostically or interactively. This is in line with Widener's (2005) study, which stated that SPMS can be used in dual roles simultaneously by indicating that a part of SPMS are used interactively while the other components may be used in a more diagnostic manner. However, unlike Widener's (2005) study, the results in this study found that diagnostic use of SPMS was insignificant with organisational capabilities such as market orientation, entrepreneurship, innovativeness and organisational learning. For interactive use, the findings indicated that it has significant association with capabilities. The possible explanation for this is because interactive use of information from SPMS is a basis to stimulate dialogue in the organisations. This is reflected through the discussions and meetings between top management and managers from different departments and different levels. This situation is similar to the findings in Tuomela's (2005) study who reported that SPMS was used both in a diagnostic and interactive way, and that the main role of SPMS is to facilitate organisational dialogue among top managers through which strategic learning can emerge. Regarding this, the organisations use SPMS as an interactive control system, which plays a pivotal role in supporting the implementation of strategy in the firm.

The results suggest that diagnostic use does not significantly contribute to enhancing the capabilities. However, diagnostic use has a significant contribution when it is combined or acts together with interactive use. The results provide support for Henri (2006a) who asserted that diagnostic use has a negative effect on the organisational capabilities because it creates constraints to ensure compliance with orders through monitoring and reviewing the performance. The findings are in line with Simons's (1999) view that diagnostic use and interactive use must work together to ensure the effectiveness of strategy implementation. Diagnostic use can help senior managers to monitor organisational outcomes, correct deviations from preset standards of performance, restrict risk taking and provide boundaries for innovation. Diagnostic use of SPMS constrains search behaviour and limits opportunity-seeking for senior managers to be innovative and experimenting new ideas. In contrast, interactive use of SPMS is able to assists senior managers to promote and provoke discussion. Interactive use also involves both control and learning, therefore it can act as a catalyst and assist senior managers to monitor changes in market environments and motivate debate about data, assumptions and action

plans. Over time, the information and learning generated by interactive control systems can be embedded in the strategies and goals that are monitored by diagnostic control systems.

The results of the study support the assertion by Fitzgerald et al. (1991), Kaplan and Norton (1992) and Simons (1999) who claimed that organisations can use SPMS to help them build their internal capabilities of market orientation, entrepreneurship, innovation and organisational learning. SPMS contains financial and non-financial information and by using the information, either diagnostically or interactively can motivate and stimulate organisational learning and the emergence of new ideas. The findings are consistent with Kalagnanam's (1997) study who explained that the internal process, and innovation and learning measures under the SPMS address the measurement of a firm's capabilities by measuring business process, learning and innovation aspects, and training. This information then allows senior management to take actions that will enhance the firm's capabilities, which, in turn, will facilitate the effective implementation of its strategy. Consequently, the firm will score well on measures pertaining to the customers perspective i.e., quality, delivery, cost. Good performance on the customer based measures will likely lead to a high score on measures pertaining to the financial perspective (e.g., stock return).

The results provide support for Simons (1999) who claimed that there is a link between SPMS use and competitive advantage. The evidences in this study show that the impact of SPMS on competitive advantage is not direct, but are indirect through the contribution of SPMS on organisational capabilities. This is consistent with the argument by Henri (2006a) who argued that SPMS must be aligned with capabilities to be effective and consistent with strategic choices. SPMS provides information on a wide variety of measures such as financial, quality, resource utilization, customer satisfaction and innovation and learning. These measures can be used to link the strategy and the capabilities needed to achieve the strategy's objectives. From the RBV perspective, information and control systems are generally not a source of competitive advantage because they lead organisations to fully realise the benefits of the resources they control but do not generate sustainable rents (Henri, 2003). In other word, SPMS use may not contribute directly to competitive advantage, but instead contribute indirectly by stimulating the deployment of capabilities.

CONCLUSION

This study provides empirical evidence on the relationship between SPMS use, organisation capabilities and competitive advantage. Overall the results of the study support the argument that SPMS use is positively related to organisational competitive advantage indirectly through its contribution to capabilities of market orientation, entrepreneurship, innovation and organisation learning.

SPMS use can significantly contribute to enhance organisational capabilities. The interactive use of SPMS has greater influence than diagnostic use. The association between interactive use and overall organisational capabilities i.e. market orientation, entrepreneurship, innovation and organisational learning is positively significant. The levers of control framework suggest that interactive use of SPMS can stimulate organisational learning and the emergence of new ideas and strategies. Furthermore, this study find that SPMS can be used either diagnostically or interactively.

This study contributes to the limited body of knowledge concerning the role of organisation capabilities and how it mediates the relationship between SPMS use and competitive advantage. The absence of a theoretical framework founded on the RBV theory is identified as a major reason for the ambiguous and contradictory findings in SPMS and strategy research (Henri, 2006a). By examining the mediating effect of capabilities, it provides new evidence to better understand the performance effect of SPMS on competitive advantage from the RBV perspective. To date, the importance of organisational capabilities as a source of competitive advantage has increased, thus, studying this issue is both relevant and topical for study. The link between SPMS, capabilities and competitive advantage should result in insights and implications that are important for researchers and practitioners faced with the design of a relevant SPMS and how to use SPMS effectively.

In the strategic management and strategic management accounting literature always mention the importance for organizations of building and sustaining their competitive advantage. However, not many studies have been conducted that investigate the consequences of SPMS on competitive advantage. Prior studies such as by Henri (2006a), Said et al. (2003) examined the effect of SPMS on performance, particularly financial performance. This study operationalise competitive advantage based on the suggestion by Day and Wesley (1988) and Fitzgerald et al. (1991). Therefore, this study contributes to the strategic management and strategic management accounting literature by identifying the variables to measure competitive advantage. From the factor analysis, it shows that customer loyalty, market share, sales growth and profitability have a satisfactory factor loading and only customer satisfaction does not meet the standard of factor loading. Therefore, future research can test these five items to confirm whether the items can be used for operational competitive advantage.

From a managerial perspective, the findings of this study validate arguments in SPMS literature that SPMS design and use play an important role in helping organisations gain and sustain competitive advantage. The results reflect the importance of SPMS use i.e. diagnostic use and interactive use to help organizations to create and build internal capabilities. The results suggest that managers can use SPMS measures in either a diagnostic or interactive ways, however, diagnostic use shows insignificant contribution to organisational

capabilities. The findings provide evidence that proactive use of SPMS can facilitate an enhancement of organisational capabilities. The results suggest that top management should always have discussions with subordinates to create dialogue and share information on critical success factors.

The results of this study are strongly support the idea that capabilities are an important source of competitive advantage as suggested by RBV theory. There is positive relationship between organisation capabilities and competitive advantage. It means that the organisations that have strong market orientation, entrepreneurship, innovation and organisation learning will improve their competitiveness in terms of customer satisfaction, customer loyalty, market share, sales growth and profitability. The use of SPMS information i.e. diagnostically and interactively can play an important role to increase organisational competitiveness through the support of organisation capabilities. The results showed that SPMS use can facilitate the four capabilities which in turn, enhance organisational competitive advantage. However, this study is constrained to only Malaysian listed companies, therefore generalising the results to non-listed Malaysian companies or companies in different countries should be made with caution. Future studies could be conducted within non-listed companies such as companies listed under Federation of Malaysian Manufactures (FMM) or public sector organisations. This study can also be replicated in other countries. Therefore it can enhance our understanding on the use of SPMS in different settings and in different cultures.

Simons (1999) mentioned about dynamic tension between diagnostic use and interactive use. Due to time constraint, this study does not include dynamic tension, however, future research can extend this model by looking at environment uncertainty and how it affects the balance between diagnostic use and interactive use in different situations. It is interesting to see whether high or low environment uncertainty has any influence on the dynamic tension between diagnostic use and interactive use.

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Appendix 1 Organizational Capabilities Items

Market Orientation Dimension:
Customer orientation
Customer commitment and orientation to serving customers' needs.
Customer satisfaction objectives.
Understand of customer needs.
After-sales service.
Measure customer satisfaction systematically and frequently.
Create customer value.

Competitor orientation
Respond rapidly to competitive actions.
Top management team regularly discusses competitors' strengths and strategies.
Salespeople share information concerning competitors' strategies.
Target opportunities for competitive advantage.

Interfunctional coordination
Information shared among all business functions.
Top managers from every function visit current and prospective customers.
Functional integration in strategy.
All of business functions contribute to customer values.

Entrepreneurship Dimension
Marketed many new lines of products or services.
Changes in products or service lines have been usually quite dramatic.
Often the first business to introduce new products, administrative techniques, operating technologies, etc.
Strong tendency for high risk projects (with chances of very high return).
Initiate actions to which other organisations respond.
Adopt a very competitive, "undo-the competitors" posture.

Innovation Dimension
Technical/service innovation, based on research and development results, is readily accepted.
Innovation is readily accepted in program/project management.
Management actively seeks innovation and ideas.

Organisational Learning Dimension
Learning as a key to improvement.
Ability to learn is the key to continuous improvement.
Employee learning is an investment, not an expense.

Appendix 2 Competitive Advantage Items

Profitability
Market share & positions of main product/service
Sales growth
Customer/brand loyalty