

STRATEGIC PERFORMANCE MEASUREMENT SYSTEM DESIGN AND ORGANISATIONAL CAPABILITIES

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ABSTRACT

This paper reports the results of strategic performance measurement system (SPMS) design and organisational capabilities i.e. market orientation, entrepreneurship, innovation and organisational learning. The main research question of this study is ‘does the adoption of SPMS that consists of financial and non-financial measures enhance organisational capabilities’. The data was collected using a mail survey to top management of listed companies in Malaysia. The results found that overall SPMS design had a statistically significant influence on organisational capabilities. The regression result for each dimension of SPMS design i.e. financial and non-financial showed that non-financial had a positive and significant impact on each dimension of capabilities, while financial measures only had a significant relationship with organisational learning. The results strongly suggest that the adoption of multidimensional financial and non-financial measures is positively associated to enhancing organisational capabilities.

Introduction

Over the last two decades, the performance measurement systems experienced a lot of changes. In the past, organisations placed greater reliance on traditional financial measures such as return on investment, return on assets, residual income and profit. However, changes occurring in the business environment such as changes in technology, customer focus, marketplace and so on exert pressure for performance measurement system practice, as traditional financial measures have been criticized for being inadequate for today’s competitive environment (Eccles

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and Pyburn, 1992; Kaplan, 1983; Nanni and Dixon, 1992). In the 1990s, a new development arose in performance measurement system literature as academicians were starting to discuss the need for a strategic performance measurement system (hereafter will be referred to as SPMS).

SPMS is designed based on the strategy being followed by an organisation. Among the examples of SPMS are balanced scorecard (Kaplan and Norton, 1992), results and determinant framework (Fitzgerald, Johnston, Brignall, Silvestro and Voss, 1991), and performance pyramid system (Lynch and Cross, 1991). The main purpose of SPMS is to help organisations 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 and Randall, 2003).

This study defines SPMS as an information system containing financial and non-financial measures that are derived from strategies and it is 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.

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 and 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 reason why Henri (2006) used four capabilities is because past research suggests that each of these four capabilities is adequate to offer strengths, but is not sufficient to develop sustained advantage. For example, 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 to be unique and gain an edge over their competitors (Henri, 2006; Hult and Ketchen, 2001). According to Hult and Ketchen (2001), these four capabilities are strongly related to differentiation strategy.

The purpose of this paper is to examine the relationship between SPMS design and organisational capabilities from RBV theory. The main research question in this paper is whether the SPMS design i.e. adoption of financial and non-financial measures can influence organisational capabilities i.e. market orientation, entrepreneurship, innovation and organisational learning. Despite the wide interest in SPMS, surprisingly there have been few empirical studies conducted to examine the impact of SPMS (Malina and Selto, 2001), and the effect of SPMS remains uncertain (Ittner and Larcker, 2001). According to Henri (2006), the findings provided by SPMS literature remain ambiguous and sometimes contradictory because of the absence of a theoretical framework based on RBV theory. Therefore, this study represents an effort to fill this gap by examining the influence of SPMS on organisational capabilities from an RBV perspective. 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

The literature review section is divided into two: first, traditional performance measures versus the multidimensional performance measures usage; second, the relationship between SPMS design and organisational capabilities i.e. market orientation, entrepreneurship, innovation, and organisational learning.

Traditional Performance Measures Versus the Multidimensional Performance Measures Usage

Traditional performance measures that depend on financial measures are not adequate to assist organisations in today's dynamic business environment. Johnson and Kaplan (1987) criticized traditional performance measures such as ROI for being too late, too aggregated and too distorted to be relevant for assisting managers in planning and control decisions. According to them, the financial measures provide a misleading target for managerial attention and fail to provide a relevant set of measures that appropriately reflect the technology, the products, the processes and the competitive environment in which the organisation operates. Eccles and Pyburn (1992) asserted that one of the most important limitations of financial measures is that these measures are lagging indicators, meaning that they do not

provide guidance to predict future performance. Atkinson, Waterhouse and Wells (1997) warned that a performance measurement system based primarily on financial measures lack the focus and robustness needed for internal management and control. Financial measures are derived from an accounting system that is designed more to fulfil the external requirements rather than communicating information for internal users. Further, they mentioned that financial measures normally ignored the important issues such as customer satisfaction. Thus to become relevant, financial measures need to be supported by non-financial measures such as quality, delivery, cycle time, customer satisfaction, innovation, and so forth which typically address the imperatives of global competition (see for example Johnson and Kaplan, 1987; Eccles and Pyburn, 1992; Lynch and Cross, 1991; Kaplan and Norton, 1992). Kaplan and Norton (1996), for example, suggest that multidimensional performance measures reflect the organisation's changing business environment as well as the achievement of its goals.

A study conducted in Canada showed that financial measures are most frequently used in manufacturing firms (Gosselin, 2005). Similar results were also found in the study of Northern Cyprus's hotel industry (Haktanir and Harris, 2005). A study by Abdel-Maksoud, Dugdale and Luther (2005) provided confirmation that UK manufacturing organisations used a comprehensive range of non-financial performance measures. In Australia, Chenhall and Kim-Langfield (1998) found that the majority of large Australian firms have adopted a range of management accounting techniques that emphasize non-financial information. The white paper on performance measurement practices among the Fortune 1000 and public sectors in USA and Europe showed that their performance measurement systems are more concerned with lagging rather than leading indicators and there was also a tendency to rely on financial measures (KPMG, 2001). Despite the importance of non-financial information asserted in prior literature, however, the results on the adoption of non-financial measures showed a contrasting trend (Chenhall and Langfield-Smith, 1998; Yau and Robani, 1999; KPMG, 2001; Abdel-Maksoud, Dugdale and Luther, 2005; Gosselin, 2005; Haktanir and Harris, 2005).

In Malaysia, Yau and Robani (1999) found no evidence to prove that financial measures are more important than non-financial measures amongst manufacturing firms. In their literature review of performance measurement system practice, Maliah, Nik Nazli and Norhayati (2004) concluded that the use of contemporary management accounting tools including non-financial measures is lacking among Malaysian organisations. While the study done by Mohd Yusoff (2001) reported that Malaysian manufacturing firms focusing on quality in departmental objectives is a factor to management to emphasise more on non-financial measures in time of intense competition. The survey among 120 Malaysian manufacturing firms conducted by Ruzita, Daing Nasir and Yuserrie (2006) found that the majority of these firms used a greater extent of financial measures, followed by customer

measures, internal business process measures, and learning and growth measures. Based on past literature, this study expects that organisations will adopt multi-dimensional measures consisting of financial and non-financial measures. The financial performance represents only one dimension of value and, as such, is inadequate in evaluating the strategic performance of an organisation. The financial measures need to be supported by non-financial measures. It is because non-financial measures are more closely linked to strategic initiatives and reflect the range of factors that contribute to success, for example competitive performance, quality of service, customer satisfaction and innovation. Non-financial measures are leading performance measures that drive lagging financial performance measures. Hence, the adoption of multi-dimensional performance measures can improve organizational performance and competitiveness (Fitzgerald, Johnston, Brignall, Silvestro and Voss, 1991; Kaplan and Norton, 1996; Simons, 1999). Thus, it leads to the first hypothesis:

Hypothesis 1: Organisations tend to use multi-dimensional performance measures comprising financial and non-financial measures.

The Relationship between SPMS Design and Organisational Capabilities i.e. Market Orientation, Entrepreneurship, Innovation, and Organisational Learning

The adoption of diversity of performance measures is claimed by numerous authors such as Fitzgerald, Johnston, Brignall, Silvestro and Voss (1991), and Kaplan and Norton (1996) as an important source to help an organisation develop and maintain its internal capabilities. BSC which consist of four perspectives financial, customer, internal business process, and learning and growth, for example, provided three elements that are essential to strategic learning. First, it articulates the company's shared vision, defining in clear and operational terms the results that the company, as a team, is trying to achieve. Second, the scorecard supplies the essential strategic feedback system, where a business strategy can be viewed as a set of hypotheses about cause-and-effect relationships. Third, the scorecard facilitates that strategy review is essential to strategic learning. This can be done through the discussions between corporate and business unit executives to evaluate the validity of the unit's strategy and the quality of its execution (Kaplan & Norton, 1996).

Fitzgerald, Johnston, Brignall, Silvestro and Voss (1991) had proposed a results and determinant framework for service industries. The framework consists of two types: results and determinants. The measures related to results are competitiveness and financial performance, while the measures related to determinants of those results are quality, flexibility, resource utilisation and innovation. The measures of financial performance and competitiveness are the results of actions previously taken and reflect the success of the chosen strategy.

The framework reflects the concept of causality, indicating that results obtained are a function of past business performance in relation to specific determinants. This demonstrates the need to identify drivers of performance in order to achieve the desired performance outcomes.

Management control systems (MCS) including SPMS play an important role in facilitating organisational learning, and generative organisational learning is dependent upon both the characteristics and use of the organisation's MCS (Kloot, 1997). Further, Kloot (1997) added that SPMS remains the cornerstone upon which effective management control rests, and the SPMS must include financial and non-financial information. SPMS assists managers in monitoring the implementation of business strategy by comparing actual results against strategic goals and objectives (Simons, 2000). A SPMS typically comprises systematic methods setting business goals together with periodic feedback reports that indicate progress against those goals. The goals can be short term or long term. Normally the short term goals focus on time frames of one year or less, while the long term goals include the ability to innovate and adapt to changing competitive dynamics over periods of several years. Through adopting both short term and long term goals, a successful organisation is able to identify and create opportunities and turn them to gain advantage over its competitors. Hence, SPMS can play a critical role in helping managers adapt and learn (Simons, 2000).

Ong (2003) asserted that the type of performance measurement system affects learning from experience because of the feedback that it provides managers. Feedback is important for learning because it provides information about errors and guidance to managers to correct their responses and adjust their mental model of the task. People's mental model of the task guides their judgments and decisions. SPMS provides information for managers to test and modify their mental models about how their actions affect the performance of the firm (Ong, 2003). The study done by Ong (2003) found that the information from financial measures alone is not adequate to help managers to make a decision and this will impede their performance. This is because financial measures are a lag indicator reporting on outcomes from past managerial actions and also does not provide specific guidance to managers on what to do to maximize firm performance. But, when firms add non-financial value drivers to a summary of financial measures in the SPMS, managerial performance may improve because managers learn better and managers are following better incentives (i.e., they are better motivated). Learning from having non-financial value drivers in the SPMS may come from three different sources. Learning may arise from non-financial value drivers information, from non-financial value drivers weights, or from paying greater attention to non-financial value drivers information and non-financial value drivers weights, once non-financial value drivers are rewarded (Ong, 2003).

Kalagnanam (1997) conducted a survey to examine the relationship between strategy and the reporting of non-financial measures to plant senior management and documents the perceptions of managers with respect to the influence of non-financial performance measures on their actions/decisions. The study found that non-financial measures allow the plant managers to identify problems more easily than if they only focused on financial measures, and to initiate general or more specific actions depending on the problem itself. Therefore, reporting non-financial measures to plant senior managers will likely broaden their perspective with respect to the different competitive factors, in addition to price.

Fernandez (2002) developed a model of the relationships between key non-financial measures i.e., employee training, service quality, customer satisfaction, customer loyalty and financial performance measures using data from 109 retail branches of one of the Spain's largest banks, that specialized in providing services to small and medium companies. The results indicate strong relationships between service quality, customer satisfaction and customer loyalty. The results also provide partial support for the positive relationship between training and service quality, and the positive effect of high levels of loyalty on financial performance measured in terms of both levels and changes in performance. This study showed that the inclusion of non-financial indicators is able to assist organisations to collect information regarding customer needs and thus can help organisations to be market orientated.

Market orientation firms seek to understand the need for an organisation's culture to be oriented around customers and competitors. Market orientation is important since it can contribute to organisational continuous learning and knowledge accumulation through continuously collecting information about customers and competitors and using the information to create superior customer value and competitive advantage (Hult and Ketchen, 2001; Sin, Tse, Heung and Yim, 2005). Entrepreneurship is defined as the identification and exploitation of previously unexploited opportunities (Ireland, Hitt and Sirmon, 2003). Entrepreneurship involves bundling resources and deploying them to create new organisational and industry configurations. According to Ireland, Hitt and Sirmon (2003) by exploiting entrepreneurship opportunities it can contribute to the organisation's effort to build sustainable competitive advantage. Innovation can be defined as the generation, acceptance and implementation of new ideas, processes, products and services (Calantone, Cavusgil and Zhao, 2002). Prior empirical studies had found that innovation capability is the main determinant of organisational performance (Calantone, Cavusgil and Zhao, 2002). Organisational learning refers to the generation of new insights that have potential to reshape behaviour (Hult and Ketchen, 2001). According to Hult and Ketchen (2001) market orientation, entrepreneurship, innovation and organisational learning are each necessary but

are not individually sufficient for creating positional advantage. Past research suggested that each element is adequate to offer strengths, but together they can help a firm be uniquely competitive (Hult and Ketchen, 2001).

In the prior SPMS literature, most studies focused on only one variable of capabilities i.e. organisational learning. The only exception is Henri (2006) who included market orientation, entrepreneurship, innovation and organisational learning. However, although Henri's (2006) study does not include SPMS design she did examine the influence of diagnostic use and interactive use on organisational capabilities. This study, therefore, attempts to fill the gap by extending the work of Henri (2006) and examine the influence of SPMS design on organisational capabilities.

This study expects that the adoption of a SPMS comprising of multi-dimensional measures has a positive relationship with organisational capabilities. Thus, the following hypothesis is proposed:

Hypothesis 2: SPMS design, which consists of financial and non-financial measures, is positively related to organisational capabilities i.e. market orientation, entrepreneurship, innovation, and organisational learning.

The relationship is linked together in a model as in Figure 1.

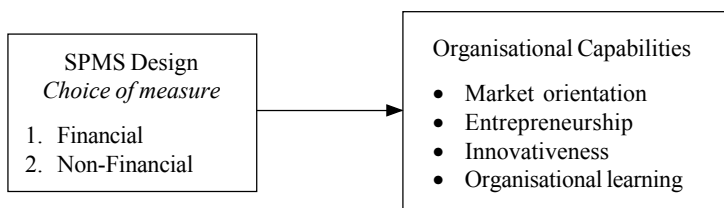


Figure 1: Strategic Performance Measurement Design and Organisational Capabilities

METHODOLOGY

The Sample

The sampling frame is a list or set of directions that identify all the sample units in the population (Alreck and Settle, 1995). 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 respondents 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 were based on the information in the company's annual report and website. Table 1 presents the characteristics of the sample in terms of number of employees, average sales revenue for three years, average annual profit for three years, and major activity.

There are several reasons for choosing both manufacturing and service organisations. First, the competitive environment for both manufacturing and service organisations has now become far more challenging and demanding (Atkinson, Banker, Kaplan and Young, 2001). The competitive environment for both organisations is different, and therefore these organisations will demand different and better management accounting information including a performance measurement system. Second, in total, the manufacturing and service sector contributed about 89 percent of Malaysia gross domestic products (GDP) in the first quarter of 2005, with the manufacturing sector contributing about 31 percent of the GDP, and the service sector accounting for 58 percent of the GDP ("Economic Review Malaysia: Economic Performance in the first quarter of 2005", 2005). Thus, it is important to cover both types of organisations to provide a better understanding of performance measurement practices in these organisations. In addition, not much research has been conducted regarding the practices of performance measurement system in the service industry (Hussain and Hoque, 2002).

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. Table 2 displays the details of the respondents' profiles according to the position and working experience.

Table 1: Characteristics of the Sample – Size, Sales Revenue & Profit

Item	Frequency	Percentage
<i>Number of employees</i>		
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
<i>Sales revenue</i>		
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
<i>Annual profits</i>		
Less than RM5 million	29	20.0
Between RM5 million to RM25 million	38	26.2
Between RM26 million to RM45 million	25	17.2
Between RM46 million to RM65 million	8	5.5
Between RM66 million to RM85 million	8	5.5
Between RM86 million to RM105 million	8	5.5
Between RM106 million to RM125 million	2	1.4
Between RM126 million to RM145 million	2	1.4
Between RM146 million to RM165 million	1	0.7
Above RM165 million	22	15.2
Total	143	98.6
Missing	2	1.4
<i>Major Activity</i>		
Manufacturing	52	35.9
Services	59	40.7
Others	34	23.4
Total	145	100.0

Table 2: Respondents Profile

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

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.

Variable Measurement

SPMS design refers to the choice of performance measure i.e. financial or non-financial, which is based on the strategy being followed by the organisations. SPMS design is measured using the instrument developed by Fitzgerald, Johnston, Brignall, Silvestro and Voss (1991), Kaplan and Norton (1992), and Hoque, Mia and Alam (2001). There are six dimensions, covering 30 items in this section, but in the factor analysis, 4 items are excluded giving a total of 26 items to be analysed. The six dimensions are financial, quality, flexibility, resource utilisation, customer satisfaction, and innovation and learning. The use of each item was measured on

a five-point Likert scale ranging from 1 = not at all to 5 = to a great extent. Descriptive statistics (mean, standard deviation, minimum and maximum) for each performance measure are presented in Table 3.

Table 3: Descriptive Statistics – SPMS Design

Items	Mean	Std dev	Min	Max
Operating income	4.63	0.60	2	5
Sales growth	4.46	0.68	2	5
Total net cash flows	4.25	0.85	2	5
Return-on-investment (ROI)	4.19	0.83	2	5
Customer satisfaction with range of products and services	4.17	0.87	1	5
On-time delivery percentage	3.98	0.96	1	5
Number of customer complaints	3.93	0.96	1	5
Average time taken to respond to a customer request	3.80	1.01	1	5
Survey of customer satisfaction	3.80	1.01	1	5
Account receivable turnover	3.76	0.94	1	5
Market share of main products/services	3.74	1.07	1	5
Cost reduction - quality product improvement	3.72	0.92	1	5
Number of new customers in targeted segment	3.66	0.96	1	5
Cost of quality	3.66	0.94	1	5
Number of customers lost due to failure to meet demand	3.63	1.12	1	5
Employee satisfaction ratings	3.48	0.94	1	5
Number of different products/services delivered	3.33	1.05	1	5
Hours of preventive maintenance	3.32	1.05	1	5
Number of new services/products launched	3.32	1.10	1	5
Supplier certification	3.30	0.98	1	5
Percent of sales from new products	3.30	1.10	1	5
Time-to-market for new services/products	3.28	1.13	1	5
Revenue per employee	3.24	1.21	1	5
Hours of employee training on quality	3.23	0.94	1	5
Total costs per customer	3.14	1.14	1	5
Value-added per person	3.03	1.20	1	5

Factor analysis for each individual dimension indicates that the items for each dimension are unidimensional as they loaded satisfactorily on a single factor (above 0.50) except for innovation and learning, innovativeness and entrepreneurship, where two factors emerged. However, according to Ang, Davies and Finlay (2000) the unrotated factor solution is considered adequate if the factor loadings are statistically significant. The factor loadings of 0.30 to 0.40 are minimally acceptable, but, values greater than 0.50 are generally considered necessary for practical significance (Hair, Black, Babin, Anderson and Tatham, 2006). The eigenvalues of all the dimensions are greater than 1.0 and it is considered as

statistically significant based on the guidelines by Hair, Black, Babin, Anderson and Tatham (2006). Table 4 represents the result of factor analysis for each dimension of SPMS design.

Table 4: Results of Factor Analysis for SPMS Design Dimensions

Factor	Description of items	Factor loadings	Eigenvalue	Percentage of variance explained
1	Financial Dimension		2.357	47.147
	Return-on-investment (ROI)	.744		
	Account receivable turnover	.734		
	Total net cash flows	.729		
	Operating income	.628		
	Sales growth	.584		
2	Quality Dimension		3.232	64.650
	Hours of employee training on quality	.839		
	Cost reduction – quality product improvement	.826		
	Supplier certification	.810		
	Hours of preventive maintenance	.801		
	Cost of quality	.741		
3	Flexibility Dimension		2.880	72.011
	Average time taken to respond to a customer request	.883		
	Customer satisfaction with range of products and services	.860		
	Number of customer losts due to failure to meet demand	.850		
	Number of different products/services delivered	.798		
4	Resource Utilisation Dimension		2.331	77.712
	Value-added per person	.894		
	Total costs per customer	.883		
	Revenue per employee	.867		
5	Customer Satisfaction Dimension		2.660	53.204
	Survey of customer satisfaction	.805		
	Number of customer complaints	.801		
	Number of new customers in targeted segment	.698		
	Market share of main products/services	.678		
	On-time delivery percentage	.650		
6	Innovation & Learning Dimension		2.855	71.366
	Time-to-market for new services/products	.916		
	Percent of sales from new products	.899		
	Number of new services/products launched	.890		
	Employee satisfaction ratings	.644		

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 and Slevin, 1993). Altogether, there are 9 items (3 items excluded after factor analysis) to measure entrepreneurship. For innovation and organisational learning, the instrument adopted by Hul and Ketchen (2001) and Henri (2006) was used for this study. Table 5 exhibits the summary results of factor analysis on organisational capabilities.

Table 5: Summary of Eigenvalues for All Dimensions of Capabilities

Dimension	Eigenvalue	Percentage of variance explained
Market orientation:		
Customer orientation	3.128	52.128
Competitor orientation	2.384	59.588
Interfunctional coordination	2.292	57.293
Entrepreneurship	3.004	50.068
Innovativeness	2.168	72.266
Organisation Learning	1.968	65.589

Results and Discussion

The Reliability Analysis

Reliability is an assessment of the degree of consistency between multiple measurements of a variable (Hair, Black, Babin, Anderson and Tatham, 2006). One form of reliability is internal consistency, which applies to the consistency among the variables in a summated scale. According to Hair, Black, Babin, Anderson and Tatham (2006), the purpose of internal consistency is to ensure that the individual items of the scale should all be measuring the same construct and thus be highly intercorrelated. Table 6 presents the reliability statistics before and after factor analysis for all variables involved in the study. Ideally, the Cronbach's alpha coefficient of a scale should be above 0.70 (Pallant, 2001; Hair, Black, Babin, Anderson and Tatham, 2006). In this study, overall the constructs showed a Cronbach's alpha of above 0.70, meaning that the constructs have good internal consistency.

Table 6: Reliability Before and After Factor Analysis

Dimensions	Cronbach's Alpha (Before factor analysis)	Cronbach's Alpha (After factor analysis)
SPMS Design:		
Financial	.717	.717
Quality	.862	.862
Flexibility	.859	.866
Resource utilisation	.835	.856
Customer satisfaction	.776	.776
Innovation & learning	.853	.865
Organisation Capabilities:		
Market Orientation:		
Customer orientation	.806	.806
Competitor orientation	.771	.771
Interfunctional coordination	.747	.747
Entrepreneurship	.765	.798
Innovativeness	.704	.808
Organisational learning	.728	.732

Hypothesis 1: Organisations Tend to Use Multi-dimensional Performance Measures Comprising Financial and Non-financial Measures

In order to answer Hypothesis 1, the descriptive statistics are conducted. Table 7 and Table 8 display the results of the descriptive statistics for SPMS design. Table 7 shows that the first ten measures have a high mean score consisting of five items of financial and five items of non-financial measures. These measures are operating income, sales growth, total net cash flows, return on investment, customer satisfaction with range of products and services, on-time delivery percentage, number of customer complaints, average time taken to respond to a customers' request, survey of customer satisfaction, and account receivable turnover.

Overall the results show that manufacturing and service organizations in the study used both financial and non-financial measures. The financial dimension is viewed as important, followed by customer satisfaction, flexibility, quality, innovation and learning and resource utilisation (see Table 8).

Table 7: Descriptive Statistics – SPMS Design

Items	Mean	Std dev	Min	Max
Operating income	4.63	0.60	2	5
Sales growth	4.46	0.68	2	5
Total net cash flows	4.25	0.85	2	5
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On-time delivery percentage	3.98	0.96	1	5
Number of customer complaints	3.93	0.96	1	5
Average time taken to respond to a customer’s request	3.80	1.01	1	5
Survey of customer satisfaction	3.80	1.01	1	5
Account receivable turnover	3.76	0.94	1	5
Market share of main products/services	3.74	1.07	1	5
Cost reduction – quality product improvement	3.72	0.92	1	5
Number of new customers in targeted segment	3.66	0.96	1	5
Cost of quality	3.66	0.94	1	5
Number of customers lost due to failure to meet demand	3.63	1.12	1	5
Employee satisfaction ratings	3.48	0.94	1	5
Number of different products/services delivered	3.33	1.05	1	5
Hours of preventive maintenance	3.32	1.05	1	5
Number of new services/products launched	3.32	1.10	1	5
Supplier certification	3.30	0.98	1	5
Percent of sales from new products	3.30	1.10	1	5
Time-to-market for new services/products	3.28	1.13	1	5
Revenue per employee	3.24	1.21	1	5
Hours of employee training on quality	3.23	0.94	1	5
Total costs per customer	3.14	1.14	1	5
Value-added per person	3.03	1.20	1	5

Table 8: Descriptive Statistics – All Constructs of SPMS Design

Variable	No. of items	Mean	Std. Deviation	Min	Max
SPMS Design:					
Financial	5	4.26	0.54	3	5
Customer satisfaction	5	3.82	0.72	2	5
Flexibility	4	3.73	0.86	1	5
Quality	5	3.45	0.78	2	5
Innovation & learning	4	3.34	0.90	1	5
Resource utilisation	3	3.14	1.04	1	5

Hypothesis 2: SPMS Design, which Consists of Financial and Non-financial Measures, is Positively Related to Organisational Capabilities i.e. Market Orientation, Entrepreneurship, Innovation, and Organisational Learning

To test the relationship between SPMS design and organisational capabilities, a correlation analysis and multiple linear regressions were conducted. Table 9 displays the result of correlation analysis for all variables involved in the study. Overall, the results show that all variables of SPMS design i.e. financial, quality, flexibility, resource utilisation, customer satisfaction, innovation and learning have a positive and significant correlation at .01 level with organisational capabilities i.e. market orientation, entrepreneurship, innovation and organisational learning. The correlation analysis can also help to detect the possibility of multi-collinearity among the independent variables and dependent variables that will give a problem for regression analysis. The inter-correlation of more than 0.90 means the existence of such a problem (Pallant, 2001). Correlation analysis indicates that no multicollinearity problem exists as the inter-correlation among the variables is less than 0.90. Further, the multicollinearity is checked using the collinearity diagnostic test in the regression analysis. A common cut off threshold is a tolerance value of 0.10, which corresponds to a VIF value of 10 (Hair, Black, Babin, Anderson and Tatham, 2006). The results show that all the variables in the model have a tolerance value of more than 0.10 and a variance inflation factor (VIF) of less than 10. Therefore, the figures suggest that multicollinearity should not be a severe problem for this model.

The possibility of using structural equation models (SEM) in which the measurement of latent variables analysis and structural analysis are conducted simultaneously was rule out for two reasons: (1) SEM represents causal processes that generate observations on multiple variables (Hair, Black, Babin, Anderson and Tatham, 2006); however, this study does not look into causal relationships, but focuses on the direct relationship of independent variables and the dependent variable, and (2) SEM requires a large sample i.e. a generally accepted ratio to minimise problems with deviations from normality is 15 respondents for each parameter estimated in the model. As the sample for this study is 145 it is considered insufficient to conduct SEM (Hair, Black, Babin, Anderson and Tatham, 2006). For multiple regressions, two analyses were done; (1) regression of independent variable (overall SPMS design) and dependent variable (overall organisational capabilities); and (2) regression of each dimension of SPMS design and each dimension of organisational capabilities.

Table 9: The Correlation Analysis – All Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Financial	1									
(2) Quality	.605**	1								
(3) Flexibility	.456**	.629**	1							
(4) Resource utilisation	.427**	.514**	.616**	1						
(5) Customer satisfaction	.496**	.616**	.789**	.618**	1					
(6) Innovation & learning	.442**	.541**	.696**	.655**	.787**	1				
(7) Market orientation	.345**	.467**	.505**	.436**	.616**	.486**	1			
(8) Entrepreneurship	.170*	.272**	.414**	.449**	.478**	.607**	.487**	1		
(9) Innovation	.300**	.295**	.375**	.261**	.411**	.389**	.530**	.452**	1	
(10) Organisational learning	.383**	.408**	.351**	.212*	.467**	.334**	.574**	.230**	.545**	1

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

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

The multiple regression results, as displayed in Table 10, show that SPMS design is positively and significantly related to organisational capabilities. The results indicate 33.6 percent ($R^2 = .336$) of the organisational capabilities are explained by the independent variable. The R^2 was statistically significant with $F = 72.363$ and $p < .001$.

Table 10: The Regression Models of SPMS Design with Organisational Capabilities

Variable	Coeff.(B)	Std. Error	Beta
Intercept	2.098	.206	
SPMS Design	.446	.052	.580***
R^2	.336		
Adj. R^2	.331		
F	72.363***		
df	(1,143)		

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

The regression result for each dimension of SPMS design i.e. financial and non-financial against each dimension of organisational capabilities is displayed in Table 11. The results indicate that non-financial has a positive and significant impact on each dimension of capabilities, with the highest beta on entrepreneur ($b = .639$; $p < .001$), followed by market orientation ($b = .577$; $p < .001$), innovative ($b = .345$; $p < .001$), and organisational learning ($b = .279$; $p < .01$). Financial only has a significant relationship with organisational learning ($b = .224$; $p < .05$).

Table 12 shows the results of regression for each dimension of SPMS design with overall organisational capabilities. The results indicate that both financial and non financial explained 38.5 percent ($R^2 = .385$) variability of organisational capabilities. Non financial has the strongest unique contribution ($b = .602$) on organisational capabilities and is statistically significant, $F(2, 142) = 44.446$, $p < .001$. Again, the relationship of financial and organisational capabilities was positive but it was not significant ($b = .031$, $p > .10$). The results confirmed Hypothesis 2 which stated SPMS design consisting of financial and non-financial measures is positively related to organisational capabilities.

Discussion of Findings

This paper has examined SPMS design i.e. the adoption of financial and non-financial measures and its effect on organisational capabilities among Malaysian

Table 11: The Regression Models for Each Dimension of SPMS Design with Each Dimension of Organisational Capabilities

Model	1			2			3			4		
DV	Market			Entrepreneur			Innovative			Learning		
Variable	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta
Intercept	2.707	.242		2.164	.377		2.346	.374		2.656	.300	
Financial	.014	.068	.017	-.242	.106	-.193	.119	.106	.104	.208	.085	.224*
Nonfinancial	.354	.051	.577***	.595	.079	.639***	.292	.078	.345***	.193	.063	.279***
R ²	.344			.306			.171		.199			
Adj. R ²	.335			.296			.159		.188			
F	37.307***			31.329***			14.640***					
df	(2,142)			(2,142)			(2,142)			(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

Table 12: The Regression Models for Each Dimension of SPMS Design with Organisational Capabilities

Variable	Coeff.(B)	Std. Error	Beta
Intercept	2.468	.227	
Financial	.025	.064	.031
Non-financial	.359	.048	.602***
R ²	.385		
Adj. R ²	.376		
F	44.446***		
df	(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

listed companies. The results found that Malaysian companies used both financial and non-financial measures, with the financial dimension being used extensively compared to the non-financial dimensions. The results were similar with the findings from prior studies such as by Gosselin (2005), Ruzita, Daing Nasir and Yuserrie (2006), Abdel-Maksoud, Dugbale and Luther (2005) that reported the use of multi-dimensional consisting of financial and non-financial measures. The study by Gosselin (2005) and Ruzita, Daing Nasir and Yuserrie (2006) also found that financial measures are viewed as the most important measures compared to non-financial. However, unlike Gosselin (2005) and Ruzita, Daing Nasir and Yuserrie (2006), this study focused on both manufacturing and service industries and, therefore, the results should be interpreted more carefully as suggested by one of the respondents, as the SPMS of each company or industry is not the same, it depends on the nature of operation, demand/supply and other behavioural issues. An interpretation of this result is that organisations place a strong emphasis on the use of multidimensional measures of performance. This could be because multidimensional SPMS can help organisations to organise an establishment as highlighted by one of the respondents in the comment section of the questionnaire. Thus, this will put less strain on managing business, and gives more opportunity to concentrate on business activity and growth. The other possible reasons for the adoption of multiple performance measures could be the competitive environment and the use of technology such as computer-aided manufacturing. Hoque, Mia and Alam's (2001) study found that organisations operating in a more intensely competitive environment tend to rely more on the use of comprehensive measures of performance. The study also reported that the use of multiple measures of performance positively and significantly related to an organisation's application of computer-aided manufacturing processes.

Regarding the effect of SPMS on capabilities, the results indicate that the non-financial dimension has a positive and significant relationship with organisational capabilities compared to the financial dimension. The findings are consistent with the view on SPMS which includes non-financial indicators such as quality, customer satisfaction and innovation and learning that can provide the strategic feedback system (see Fitzgerald, Johnston, Brignall, Silvestro and Voss, 1991; Kaplan and Norton, 1996). Non-financial can affect learning from experience because of the feedback that it provides to the managers, as this can provide information about errors and guidance to managers for continuous improvement (Ong, 2003). The non-financial measures reflect the measurement of an organisation's capabilities by measuring resource utilisation, flexibility, quality, customer, and innovation and learning. This information then allows senior management to take action that will enhance organisational capabilities. The written comments in the questionnaire said that "we have implemented the performance measures using Balanced Scorecard approach to enhance the internal capabilities and align our workforce to achieve the company's objectives, which showed that organisations are aware of the importance of SPMS to build their capabilities.

The findings support the argument by Kloot (1997) who claimed that SPMS plays an important role in facilitating organisational learning. Kloot (1997) pointed out that SPMS must include both types of measures financial and non-financial in order to be effective. The findings are also in line with the suggestion of Jaworski and Kohli (1993) and Fernandez (2002) who mentioned that the inclusion of non-financial measures is able to develop employees' behaviour to focus on market orientation behaviour and also assist organisations to collect information regarding customer needs and, thus, help organisations to be market oriented. The adoption of multi-dimensional measures provides an opportunity for organisations to use this information for control, signalling, and education and learning as mentioned by Simons (2000). Managers most commonly use feedback information for control purposes to motivate and evaluate employees. Information is used for signalling when managers send messages throughout the organisation about their preferences, values and the type of opportunities that they want employees to seek and exploit. Information is also used for education and learning, and this can train individual managers and employees and enable entire organisations to understand changes in the internal and external environment that might affect it. Therefore, the adoption of multi-dimensional SPMS is able to enhance organisational capabilities i.e. market orientation, entrepreneurship, innovation and organisational learning and thus can help organisation to become competitive.

Correlation analysis (refer Table 9) shows that all dimensions of SPMS design have a positive association with organisational capabilities. However, in the regression analysis, it was found that financial has a negative influence on

entrepreneur (refer Table 11). Tabachnick and Fidell (2007) explain that there is a possibility of getting a different sign under correlation and regression and this is called a suppressor variable. The suppressor variable enhances the effect of the other variables by suppressing irrelevant variance to the prediction of an independent variable. In this case, non-financial acts as a negative suppressor for financial, which causes a negative relationship with capabilities. Henri's (2006) study also reported a similar situation, where she found a positive relationship in the correlation (in her case between diagnostic use and capabilities) but the contrast association in further analysis i.e. structural equation modelling.

The results reveal that financial measures do not have a significant impact on organisational capabilities. This provides support for an assertion in prior literature that said financial measures are lagging indicators, too late, too aggregated and lack focus for management and internal control (see Johnson and Kaplan, 1987; Eccles and Pyburn, 1992; Ghalayini and Noble, 1996; and Atkinson, Waterhouse and Wells, 1997). However, the descriptive statistics (refer Table 9), show that the financial measures remain important to the organisations. The possible explanation for this situation is because organisations continue to use financial measures as it is the traditional measure to determine the ability of the organisation to survive in the future. Furthermore, the shareholders always give priority for financial performance. One of the respondents included a comment that the financial indicators are the most used by the top management to assess the performance of the company as it not only reflects the past and current health of the company but is also perceived as an indication of its capability to continue in the future. The financial indicators will also eventually reflect the efficiency of the operations i.e. service delivery supremacy and employee productivity of delivery service or product. This might underline the reasons why financial measures remain important despite their limitations. Overall the results support that SPMS design consisting of financial and non-financial measures is positively related to organisational capabilities. The results provide evidence that financial measures alone are inadequate to assist organisations stay competitive in today's business environment. Thus, to become relevant, financial measures need to be supported by non-financial measures such as flexibility, quality, customer satisfaction, resource utilisation, and innovation and learning. The results suggest that SPMS plays an important role in facilitating organisational capabilities.

Conclusion

This paper sought to examine the relationship between SPMS design and organisational capabilities. This study has two purposes. First, to identify the level of adoption of multi-dimensional measures, and second, to examine the relationship of SPMS design i.e. multi-dimensional measures on organisational capabilities

i.e. market orientation, entrepreneurship, innovation, and organisational learning. To test this relationship, the study conducted a mailed survey of listed Malaysian companies on Bursa Malaysia. Prior literature suggests that the adoptions of multi-dimensional performance measures is able to assist organisations develop and enhance their internal capabilities. Overall the results of this study are in line with the prior literature, which shows that SPMS design has a positive and significant influence on organisational capabilities.

The results of this study provide an insight into SPMS as practised by Malaysian companies. Four conclusions can be drawn from this study. First, the findings show that these companies adopt financial and non-financial measures. Second, the financial dimension is viewed as the most extensively used followed by customer satisfaction, flexibility, quality, innovation and learning and resource utilisation. Third, the study reveals that the adoption of a multi-dimensional SPMS i.e. a combination of financial and non-financial is positively and significantly associated with organisational capabilities. Finally, for the relationship of each dimension and sub-dimension of SPMS design and capabilities, non-financial has a positive and significant contribution on organisational capabilities, while financial is reported as not significant. As with any empirical study, this paper has its limitations. Some limitations are inherent to the survey method, such as the use of perceptual measures and the sample, where only single top management from an organisation completed the questionnaire. Further, this study does not involve longitudinal time, therefore, it is unable to see the evolution of SPMS over time. A longitudinal study in different settings such as using case study methods may shed further light on the issue.

This paper extends the SPMS literature by examining the impact of SPMS on internal capabilities from a RBV perspective. This study represents one of the few that examine the impact of SPMS on market orientation, entrepreneurship, innovation and organisational learning. Except for organisational learning, these capabilities receive little attention regarding the role of SPMS in developing and enhancing the capabilities. Thus, the findings of this study contribute to the SPMS and strategic management literature by demonstrating the importance of SPMS design in enhancing organisational internal capabilities. The evidence of this study shows that SPMS design is an important source to help organisations to build and enhance their internal capabilities. From a 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 words, SPMS design may not contribute directly to competitive advantage, but instead contribute indirectly by stimulating the deployment of capabilities. Moreover, this paper also extends the SPMS literature by identifying the dimensions that are viewed as

important to the organisations. In prior literature, most of the studies focused on the dimensions suggested in the BSC. However, this study attempts to extend the performance measure dimensions by combining the dimensions in the Results and Determinant Framework (Fitzgerald, Johnston, Brignall, Silvestro and Voss, 1991) and BSC (Kaplan and Norton, 1992). Therefore, the results of this study demonstrate what is important and that the measures should correspond to the organisation's strategy.

The results have several implications for SPMS literature and managerial practices. The findings provide evidence that there is inconsistency between theory and practice. While the literature makes strong recommendations on the importance of non-financial, the results found that Malaysian companies still view financial measures as more important than non-financial. The results support that the adoption of multi-dimensional performance measures is necessary to keep paces with changes in the business environment and can help to build organisational capabilities that will in turn enhance organisational competitiveness. To the managerial practices, the results provide evidence of the role of SPMS design in helping organisations improve competitive advantage. The adoption of multi-dimensional performance measures can help managers with feedback and feedforward action, thus, it can help managers focus attention on critical success factors that are important to enhance organisational competitiveness. As a result, there is a need for the top management to pay more attention to the adoption of non-financial performance measures, which will help organisations translate the strategy into actions.

Besides looking at the design, future research might consider the issue of use of SPMS. According to Ferreira and Otley (2006) many previous studies on the management control systems including SPMS, have focused on the issue of design with less attention to the inter-relationship between design and the use of SPMS. It might be interesting to look at how organisations use SPMS either diagnostically or interactively as suggested by Simons (1999). According to Simons (1999) there is a link between the way that organisations achieve competitive advantage and the use of their SPMS. Interactive use of SPMS can foster organisational capabilities by focusing organisational attention on strategic priorities and stimulating dialogue, and, thus, help enhance organisational competitive advantage.

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