



Multiple Perspectives of Performance Measures

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Management accounting has had a primary function in developing performance measures to assist managers in planning and controlling their organizations. Traditionally, these measures have been internal, aggregate metrics of financial performance. Managers from other functions such as operations, marketing and human resource management have sought to develop measures of greater relevance to their areas of management. What has occurred is a proliferation of approaches to the development of performance measures. The purpose of this paper is to provide a review of research that has addressed the choice and design of performance measures across a range of disciplines. The review aims to clarify some of the issues, from a broader management perspective, that relate to the effective development of performance measures. It is intended that the paper will help in coordinating, communicating and unifying different approaches to the development of performance measures and assist in developing a sounder foundation for research and practice concerning the design of performance measures.

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Introduction

Management accounting has had a primary function in developing performance measures to assist managers in planning and controlling their organizations. For many years the focus was on aggregate measures of financial performance related to both the organization as a whole and its segments. Measures such as Return on Investment (ROI) and more recent modifi-

cations, such as Economic Value Analysis (EVA), continue to be promoted widely by both academics and practicing management accountants and management consultants. Additionally, budgetary systems have provided a basis to examine how effective organizations are in meeting standard costs and overall financial targets. However, these measures have tended to be highly aggregated, focused on the internal operations of the business and backward looking. The demands from managers for performance management systems that can assist in assessing the effectiveness and efficiency in specific areas such as operations, marketing and human resource management has resulted in endeavors from those in these functions to develop performance measures of greater relevance to their areas of management. What has occurred is a proliferation of approaches to the design of performance measures. This has generated a situation where much could be gained from coordination, communication and unification of different approaches to the development of performance measures. The purpose of this paper is to provide a review of research that has addressed the choice and design of performance measures across a range of disciplines. The review aims to clarify some of the issues, from a broader management perspective, that relate to the effective development of performance measures thereby enhancing the foundations for research and practice concerning the development of performance measures.

Traditional Management Accounting Approaches to Performance Measurement

Much of the early research on performance measurement in management accounting concerned either the use of performance measures to evaluate divisional and managerial performance or the use of

standard costing and variance analysis to control production activities. The accounting perspective on performance measurement can be identified in the prescriptions of the textbooks and academic literature at that time. For example, the first edition of Horngren's (1962) *Cost Accounting* included detailed chapters on the calculation and use of standard costs for controlling major components of production cost as well as the use of ROI for evaluating managerial operating efficiency. Within a decentralized corporate environment, the criteria for selecting divisional performance measures were corporate optimality, divisional independence and controllability (Shillinglaw, 1961).

While profit-based measures continued to be prescribed and used for evaluating managerial and divisional performance, it has been argued that the dysfunctional impact of these measures on decision making could be reduced by combining profit-based measures with non-financial measures (Stern and Shiely, 2001; Ehrbar, 1998; Bromwich and Bhimani, 1989; Johnson and Kaplan, 1987).

Financial Versus Non-financial Measures

In their influential book, *Relevance Lost*, Johnson and Kaplan (1987) outlined the limitations of short-term financial measures and argued the case for relying more on non-financial measures. This book forms a bridge between the accounting and manufacturing literatures on performance measurement.

Johnson and Kaplan (1987) claimed that the role of short-term financial measures had been undermined by rapid changes in technology, shortened product life cycles and innovations in production operations (Johnson and Kaplan, 1987, 254–255). The decreased reliance on direct labor, increased capital intensity and increased contribution made by intellectual capital and other intangible resources made it invalid to rely on traditional methods of matching revenue to costs and consequent short-term measures of profit as a measure of performance. They proposed that a selection of non-financial indicators should be employed, based on the organization's strategy, and include measures of manufacturing, marketing and research and development. For example, they proposed that companies that focused on improving product design and process flexibility should measure the total number of parts per products and the percentage of common versus unique parts, while those that focus their strategy on quality should measure scrap, rework, defect rates, customer complaints and warranty calls (Johnson and Kaplan, 1987, 256–257). These indicators were said to provide better predictors of the organisation's long-term goals than short-term profits and financial measures.

Many other writers at this time were promoting a similar message. Howell and Soucy (1987) developed

a series of non-financial measures that emphasized quality, inventory, material scrap, equipment maintenance and delivery throughout. Bromwich and Bhimani (1989, 56–57) highlighted the importance of replacing measures of labor productivity, machine utilization and standard cost variances with measures of quality, delivery time, inventory reduction and machine performance in the new manufacturing environment. The new manufacturing environment was also said to encourage a need for a more encompassing means for evaluating strategic investment decisions (Berliner and Brimson, 1988). Much of the work appearing at this time that addressed the financial and non-financial trade-off was normative in nature or was grounded in descriptive case studies.

More recently, insights from non-accounting disciplines have helped clarify a broader role for performance measures in organizations. The following sections review the contributions to performance measurement issues from operations management, marketing, human resource management (HRM) and corporate strategy.

Operations Management and Performance Measurement

Operations management is a field of enquiry that is concerned with the processes of production and is often referred to as manufacturing or production management, and more recently advanced manufacturing or world-class manufacturing. While this discipline has its roots in the manufacturing sector, the principles have been applied to service organizations and both profit and not-for-profit entities.

In general, this discipline focuses on attaining operating improvements through the more efficient design of production processes and the effective control of operations. Writers consider that production processes are not passive systems that merely provide the output of the organisation. Rather, they provide the organisation with a strategic capability to be competitive (Hayes *et al.*, 1988). Throughout the 1980s operations management gained high levels of visibility in organizational studies with the popularization of a wide variety of practices designed to enhance the reliability and efficiency of production. These included total quality management (TQM), just-in-time (JIT) systems, flexible management systems (FMS), computer-aided design and computer aided manufacture (CAD/CAM), materials requirements planning (MRP), manufacturing resources planning (MRP II), lean manufacturing and value added manufacturing (VAM). These novel techniques or approaches to manufacturing brought new challenges for control and performance measurement. For example, the adoption of JIT led to a change in emphasis of performance measures to encompass

both financial and non-financial aspects, such as measures of on-time deliveries, reduction in inventory, cooperation with suppliers, process cost reduction, quality, cycle time and product complexity (Mosconi and McNair, 1987; Johnson, 1988; Green *et al.*, 1991).

At its simplest level, operations management has stressed the importance of developing performance measurement systems to measure directly the inputs, throughputs and outputs of various functions such as ordering, production and delivery. Popular approaches have been production control systems and statistical process control. These approaches employ direct measures of performance such as yield and throughput that are in real time and in fine detail.

As this discipline has matured, more complex approaches have recognized the interdependencies between the production, marketing, HRM and finance functions and have attempted to build performance measurement systems that capture these interdependencies (Harrison *et al.*, 1990; Hall, 1990; Vollman, 1990; Cooper and Turney, 1990).

From an operations management perspective, traditional management accounting performance measures were considered a serious impediment to the aims of innovation within the production processes (Schonberger and Knod, 1994; Vollman, 1990). By the late 1980s many management accounting commentators were drawing on ideas from operations management to show how traditional management accounting measures were unsatisfactory and how operations management could provide directions for improvements. The focus moved from recording and reporting costs and cost variances against budget, to understanding and controlling the causes of costs (Schonberger and Knod, 1994). This was accompanied by a move towards more customer-oriented and less complex performance measures. Whereas cost reports of the past tended to be distant, historic and complex, controlling the causes of costs could be undertaken by operations employees in real-time and this required the identification of the drivers of costs. The improvement process needed to be visual (performance charts displayed in the workplace) and to be owned by the operating staff. (Schonberger and Knod, 1994, 211–212).

The CAM-I (Computer-Aided Manufacturing International¹) initiatives clarified the problems and sought to develop a Conceptual Model for developing cost management in the modern manufacturing environment. In their CMS Conceptual Design, performance measurement was seen as a key factor to ensure the successful implementation of a strategic plan, through measuring business and plant performance in relation to the goals and objectives developed during the planning process. This approach included the provision of timely information for

identifying and eliminating activities that add no value, and identifying causal factors that may lead to manufacturing improvements (Berliner and Brimson, 1988, 159). Thus, performance measures could form a hierarchy from the business level through to the activity level, with a common focus on performance criteria that could be used to measure competitive position, such as quality, service and life-cycle cost. Explicit recognition was given to identifying and eliminating non-value-added activities, and then monitoring performance through reporting of simple activity-level performance measures.

In 1989, a symposium sponsored by the American Accounting Association provided the opportunity for authors concerned with world-class manufacturing to explain the inadequacies of traditional management accounting performance measures and suggest improvements (AAA, 1990). The theme of this symposium was *performance excellence in manufacturing and service organizations*. Experts from academic circles, industry and consulting in both operations and accounting presented papers that emphasized moving away from what were described as the failures of accounting performance measurement towards new performance measurement tools. A common theme was that measures and activities should be driven by the need to satisfy the customer, and that measures should be linked closely to the strategy of the organisation.

Several publications based on symposiums followed, notably *Measures of Manufacturing Excellence* (Kaplan 1990) and *Performance Measurement, Evaluation and Incentives* (Bruns, 1992). These works helped forge a connection between the management accountants and operational management approaches to performance measurement, and stimulated a stream of management accounting research exploring these connections.

Advanced Manufacturing and Flexible Performance Measurement

Over the past 20 years management control systems (MCS) research has considered how performance measures can be developed to suit advanced technologies such as JIT and TQM (Young and Selto, 1991). For example, Kalagnanam and Lindsay (1999) argue that JIT is best suited to open, informal, organic forms of controls. They claim that organic systems can best manage the close linkages or coupling within JIT that can cause variability (task uncertainty due to many exceptions) between elements of production processes (interdependence). Organic systems are also required to manage the need for flexible responses to customers, which involves coordinating interdependencies across the value chain. Finally, JIT implies continuous improvement that is best served by commitment to change from the shop floor, which is encouraged by organic systems.

Quality Programs and Performance Measurement

Quality programs such as TQM involve the effective management of interdependencies across and beyond production processes, including relationships with customers, suppliers and other external parties. Performance measurement systems are required to encourage managers and shop floor employees to focus on the critical elements of efficient operations within the TQM programs and to provide effective links across the value chain. These measures can be generated at both the process (cybernetic type controls such as statistical process controls) and strategic levels (i.e. linking processes to strategic outcomes). As with JIT, continuous improvement is also an important aspect of TQM and requires access to knowledge on world's best practice and systems to encourage innovation. To achieve this, performance measurement systems may include benchmarking, and systems that recognize links between strategy and operations, such as balanced scorecards and strategic integrative controls.

There is some evidence from management accounting researchers linking TQM to the choice of performance measures. [Ittner and Larcker \(1995\)](#) demonstrated that product focused TQM was linked to flexible revisions, to reward systems and timely problem solving information. They found that for advanced (holistic) TQM, external benchmarking and the integration of quality and strategic information are important. [Ittner and Larcker \(1997\)](#) examined the association between quality programs and a variety of strategic controls related to implementation, internal and external monitoring. Links between quality and strategic controls were found, with differences between countries. Also, performance effects were restricted to controls concerning managers' participation in approving quality programs and team formulation, with other associations contingent on industry effects. [Sim and Killough \(1998\)](#) found that customer and quality performance was higher in TQM and JIT situations where there were customer and quality-related performance goals and incentives, compared to where fixed pay was used. [Ittner et al. \(1999\)](#) reported that performance gains from supplier partnership practices were associated with extensive use of non-price selection criteria, supplier certification and activities that involved frequent meetings and interactions with suppliers. These controls were not effective for arms length supplier relations.

Flexible Manufacturing and Performance Measurement

[Foster and Horngren \(1988\)](#) found that flexible manufacturing systems (FMS) were associated with performance measures focused on time, quality, operating efficiency and flexibility. There was also a

change in the costing methods (allocations, treatment of costs as period rather than product cost and changes in the components of direct costs). However, flexible manufacturing (FM) has been linked to a de-emphasis of efficiency-based measures with control derived from integrative liaison devices ([Abernethy and Lillis, 1995](#)). It should be noted that there is a difference between FMS which are *technical systems* such as computer assisted design and computer assisted manufacturing (CAD/CAM) and FM which is a generic notion of technology emphasizing a *strategy* of flexible response and customization.

Advanced Manufacturing and Non-financial Performance Measures

Several management accounting studies have examined the role of non-financial performance measures in advanced technologies. [Banker et al. \(1993\)](#) found that JIT, quality and teamwork were associated with the provision of non-financial, quality and productivity measures to shop floor employees. [Fullerton and McWatters \(2002\)](#) identified that nontraditional performance measures (bottom up measures, product and vendor quality), compensation rewards based on non traditional measures and empowerment were related to more advanced JIT.

There is some evidence suggesting that relying on non-financial measures to evaluate managers in TQM situations provides interactive strategic control ([Chenhall, 1997](#)). [Mia \(2000\)](#) found that the provision of broadly-based MCS enhanced organizational performance in JIT settings. The broad performance measurement systems included performance targets related to non-financial manufacturing indicators, actual performance on those targets, organizational financial indicators and industry and organizational trends on overall performance. Customer focused manufacturing, together with advanced manufacturing technology (AMT), have been associated with non-financial measures ([Perera et al., 1997](#)). It is noteworthy that there is ambiguity in findings related to the extent to which associations between usefulness of non-financial performance measures and advanced technologies are related to enhanced performance. For example, [Chenhall \(1997\)](#) found positive performance effects between combinations of non-financial measures and TQM, while [Perera et al. \(1997\)](#) did not. One explanation for these differing findings is in the use of the performance measures. [Chenhall \(1997\)](#) related the measures to reward and compensation systems, whereas [Perera et al. \(1997\)](#) did not make this linkage. Perhaps the extent to which non-financial measures are used to evaluate and reward managers may be important in understanding links between performance measures, advanced technologies and performance ([Chenhall, 1997](#) c.f. [Perera et al., 1997](#)). This suggestion is consistent with [Sim and Killough's \(1998\)](#) findings that incentive pay enhanced the positive

effects of TQM and JIT on customer and quality performance.

Marketing and Performance Measurement

There have been several different areas of performance measurement research in the marketing discipline. This includes defining, modeling and measuring specific aspects of marketing such as customer satisfaction and brand equity; and, more broadly, measuring the effectiveness of marketing activity. Evaluating marketing activity effectiveness is important to the overall management of productive processes as it includes linking the customer to other aspects of the value chain. For example, to understand customer satisfaction it is necessary to understand customer expectations and perceptions, and customer value. Customer perceptions of service quality may be different to that of management and this can lead to the development of measures of internal business process within the organization, which are drivers of customer perceptions and satisfaction (Lovelock *et al.*, 2001, 111). A useful review of the linkages between marketing and management control systems is provided in Foster and Gupta (1994). In this section we consider various aspects of marketing-based performance measurement research and examine links with management accounting. This approach takes a broad perspective to marketing activity which involves considering the interdependencies between marketing and other aspects of the value chain. The specific aspects presented are: customer satisfaction measurement, customer lifetime value and measuring brand equity. A final section considers customer-oriented research undertaken in the accounting literature.

Customer Satisfaction Measurement and Organizational Performance

Defining and measuring customer satisfaction and understanding the link between customer satisfaction, service quality and organizational performance has been studied for some decades in the marketing literature. For many years it was generally believed that market share was the main driver of profitability and the influential PIMS (Profit Impact of Market Share) studies conducted in the 1970s reinforced this idea (Buzzell and Gale, 1987). However, a range of studies conducted by Sasser and Reichheld (see for example Reichheld and Sasser, 1990; Reichheld, 1996) found that customer loyalty was a more influential driver than market share. This work led to a large body of research that explored the determinants of customer loyalty, including customer satisfaction (Heskett *et al.*, 1994). The marketing literature has also investigated whether higher customer satisfaction improves financial performance, through increasing customer loyalty, reducing price

elasticities, positive word-of-mouth advertising, reducing transaction costs and enhancing the firms' reputation (see for example, Anderson *et al.* (1994), Fornell *et al.* (1996); Anderson *et al.* (1997)).

The *service profit chain* (SPC) is an outcome of research that maintains that there are strong direct links between profit, growth, customer loyalty, customer satisfaction, the value of goods and services delivered to customers and employee capability, satisfaction, loyalty and productivity (Heskett *et al.*, 1994). In particular, the strongest linkages were found between profit and customer loyalty, employee loyalty and customer loyalty, and employee satisfaction and customer satisfaction. The development of the service profit chain had implications for performance measurement. In fact, the service profit chain has been likened to a form of balanced scorecard with its focus on drivers and means-end relationships (Heskett *et al.*, 1994).

Research in marketing that has tested empirically the SPC framework has appeared only in recent years. For example, Kamakura *et al.* (2002) applied the SPC framework to a Brazilian bank. They linked individual customer marketing survey data from 500 branches to behavioral measures of retention and operational data relating to each branch. Gustafsson and Johnson (2002) developed a model to show the association between financial performance and the way quality production enhances customer loyalty and retention and applied this to data at the Volvo Car Corporation. The model could be used for various "what if" analyses, such as predicting the profit impact of quality improvement in the sales process, or the profit impact of a one point scale improvement in customer perception of the sales process. Note that in both of these studies the focus is on the SPC framework in a single organization, which highlights the contextual nature of customer preferences and the linkages to operations and profitability.

Much of the research in marketing has focused on refining and elaborating service quality and the drivers of service quality, rather than the outcomes. Parasuraman *et al.* (1988) completed what is now considered to be landmark research into perceptions of service quality. They developed a survey questionnaire called SERVQUAL, which contains 21 expectations and matching perception items that reflect five service quality dimensions: tangibles (appearance of physical elements), reliability (dependable, accurate performance), responsiveness (promptness and helpfulness), assurance (competence, courtesy, credibility and security) and empathy (easy access, good communications and customer understanding). SERVQUAL does not provide a model of customer satisfaction and customer loyalty (Carman, 1990). It provides a means for measuring directly customer perceptions of the importance of various attributes of service that customers value. However, some argue that attribute importance can be derived statis-

tically from satisfaction and loyalty evaluations (Dillon *et al.*, 1997; Gustafsson and Johnson, 2002).

Gaps between customer expectations and service quality may arise for several reasons: not knowing what customers expect, specifying service standards that do not accurately reflect what management believes are customers' expectations, service performance that does not match specifications, and not living up to the service performance that is promoted and promised by the company (Lovelock *et al.*, 2001, 102). Providing product attributes that customer value may flow through to customer satisfaction and customer retention. Achieving these outcomes involves ongoing measurement of both customer satisfaction and service levels.

There has been relatively limited empirical research in the marketing literature examining the linkages between service quality and profitability (see Zeithaml (2000) for a review) or linking marketing effort to profitability (see the Bowman and Narayandas (2004) review). However, recent research in the accounting literature has investigated the linkage between customer satisfaction and financial returns (Anderson *et al.*, 1997; Ittner and Larcker, 1998a; Banker *et al.*, 2000). There is also interest in the extent to which customer satisfaction measures form part of executive compensation contracts (Ittner and Larcker, 1997; Ittner and Larcker, 1998a).

Customer satisfaction can be measured in various ways and most of the empirical studies cited above relied on customer satisfaction measures that were developed and used within the specific companies being researched. Smith and Wright (2004) extended the work of Ittner and Larcker (1998a) and Banker *et al.* (2000) by applying the SPC framework to companies within the Personal Computer industry to explain the causal relations between product value attributes (brand image, firm viability, product quality and post-sale service quality), product market attributes (average price and customer loyalty) and financial performance (sales growth and return on assets). They found that product value attributes directly and differentially impact on the level of customer loyalty and selling prices. Customer loyalty measures also explained levels of revenue growth and profitability.

Customer Lifetime Value

Another tool of customer analysis that is advocated in the marketing literature is the measure of the lifetime value of a customer (CLV). CLV is the net profit or loss to a firm from a customer flowing from the life time of transactions of the customer with the firm (Jain and Singh, 2002). It is assumed that customers who remain with an organization for a long period of time generate more profits than those who stay for a short time, due to price premiums paid by loyal

customers, increased sales and new customers gained through referrals from those loyal customers, cost effectiveness of dealing with an established customers, and revenue growth through increased sales from those customers (Reichheld, 1996).

A customer life cycle can be viewed as a series of transactions between a customer and an organization over the period of time that a customer remains with the firm (Jain and Singh, 2002). This period will vary depending on the nature of the business of the firm, the customer profile and the relationship between the firm and customer. The increased interest in customer relationship management in the academic and practitioner marketing literatures highlights the importance given to increasing the length of the customer life cycle.

Marketing research into CLV has tended to focus on three areas (Jain and Singh, 2002). These are first, developing *models for calculating CLV* for each customer, second, *customer base analysis*, which focuses on various methods to analyze information about the existing customer base and predicting the future value of customer transactions, and third, *normative models of CLV* which focus on the analysis of CLV and its implications for management decisions, and in particular profitability.

In its simplest form CLV may be measured as the present value of the future net cash flows that are expected to be received over the lifetime of a customer, consisting of revenue obtained from the customer less the cost of attracting, selling and servicing the customer (Keane and Wang, 1995; Berger and Nasr, 1998). There are two value drivers that influence the CLV: customer volume effect and profit per customer effect (Reichheld, 1996, 37). However, while there are more sophisticated models of CLV there is no consensus as to how customer valuation should be measured (Turnbull and Wilson, 1989; Wayland and Cole, 1994; Berger and Nasr, 1998).

The customer migration model divides customers into two groups, those who have long-term commitments to a vendor and those who spread their business between vendors. The two models present different behaviors and retention patterns for those two groups (Dwyer, 1997). The optimal resource allocation model focuses on the optimal balance between spending to acquire customers and spending to retain customers, to maximize CLV (Blattberg and Deighton, 1996). Customer relationship models utilize mathematically-based Markov Chain Models to model both customer retention and customer migration scenarios, taking into account complex customer behaviors (Pfeifer and Carraway, 2000; Rust *et al.*, 2000).

Models of customer base analysis are sophisticated models that take into account the past behaviors of customers to model the probability of purchase of

individual customers in the next time period, to determine the customers who are active in future periods (Schmittlein *et al.*, 1987; Reinartz and Kumar, 2000). Outcomes of this modeling may be used to calculate CLV. Normative models question some of the beliefs underlying CLV, such as the belief that long life customers are more profitable. For example, the customer equity model of Blattberg and Deighton (1996) analyze the effects of the marketing mix on the long term value of the customer base. CLV is also referred to as customer equity or customer profitability (Jain and Singh, 2002). In the accounting literature there has been limited recognition of marketing approaches to CLV. Andon *et al.* (2001) is an exception presenting three case studies of customer valuation, two of which employ discounted cash flow forms of CLV, and the other customer profitability based on activity analysis.

Measuring Brand Equity

Both academic marketing research and practice have focused on the measurement of brand equity, as well as the effectiveness of brand-building activities of managers. Several models of brand equity have emerged and some are used in practice. These include the Brand Asset Valuator, which is used by the marketing agency Young and Rubicam. This is a 32-item questionnaire used to measure brand equity for 450 global brands and 8000 local brands in 24 countries, and the EquiTrend, used by the consulting firm Total Research, which measures brand equity annually for 133 US brands (Aaker, 1996). Other models exist such as Brand Equity Ten (Aaker, 1991, 1996) which has four dimensions of loyalty, perceived quality, associations and awareness. This line of research has been taken up by financial accounting researchers, who have focused on the valuation of brands for balance sheets purposes.

Customer-Oriented Accounting Research

There have been some studies in accounting journals that have specifically addressed customer performance measures or customer focus. These identify customer based accounting performance measures (Guilding and McManus, 2002) and the way that these measures broaden the role of management accounting (Vaivio, 1999).

Guilding and McManus (2002) published a survey of Australian companies and their customer accounting practices reporting reasonably high levels of adoption of some techniques. Among the practices surveyed were customer accounting, customer profitability analysis, customer segment profitability analysis, lifetime customer profitability analysis and valuation of customer or customer groups as assets. Vaivio (1999) presented a case study in which he explained how 'the customer' became quantified (or

measured) and the impact that this had on reshaping areas of responsibility and making new dimensions of performance more visible. Organizational restructuring, and new forms of dependency and power emerged between different managers and functional areas. The case study illustrated how the introduction of customer measures had the potential to change the nature of the management accounting system and to move the controller away from arms-length passive reporting of accounting numbers to a closer identification with the immediate day-to-day concerns of management. As accounting came to "own" the new measures it was able to expand its power and influence into specific operational areas.

Simons (2000, 189–190), drawing on Heskett *et al.*'s (1994) 'service profit chain' and (1997) Kaplan and Norton's (1996; 2000; 2001) balanced scorecard (BSC) shows how customer satisfaction leads to acquisition and retention, and that these attributes are antecedents to improved market share, customer profitability and achievement of financial objectives. To achieve this, organizations need to provide unique value to customers such as product functionality, quality, time and price; develop brand equity by generating a positive image; and ensure a positive relationship with customers by ensuring that they are seen as convenient, trustworthy and responsive. This line of research that attempts to develop cause-effect between marketing and accounting outcomes provides a rich source of ideas to be developed by accounting researchers with a focus on the benefits and pitfalls of employing multiple measures aimed to map business models.

Human Resource Management and Performance Measurement

Unlike the disciplines of operations management and marketing, HRM has not, in general, had a strong focus on the development of performance measures to assess organizational performance. However, HRM researchers have had an interest in the use of performance measures as part of reward systems at the shop floor level. Variable performance payments have been included in employee remuneration, through piece-rates, gainsharing and profit sharing, and appropriate measures of performance have been important in determining the extent of rewards. However, the concerns of HRM with many aspects of managing people have helped inform the debate in accounting on how performance measures should be developed to accommodate the 'human' element of the organization.

Traditionally, HRM emphasized personnel management, which focused on the way managers supervise employees and encourage their development. Over

the past few decades HRM has adopted a more holistic approach that aspires to develop the entire management team with the aim of managing all organizational resources, of which employees are one. So while HRM is concerned with traditional practices of recruitment, training, development, communications and rewards, its purpose is to employ, explicitly, these practices to develop organizational values consistent with achieving desired strategic priorities. The primary outcome is to enhance the organization's financial performance, which moves the purpose away from placing the highest priority on the welfare of employees, to one that considers the organization's overall needs for human resources. This involves relating HRM practices to other functions and to broader organizational goals.

Given this change in focus of HRM to managing employees as a resource, an important issue is how HRM practices are planned and assessed. There are several areas of performance measurement innovations initiated by HRM, or by management accountants as a response to HRM concerns. These include the development of 360 degree performance ratings, developing quantitative ways of assessing HRM outputs, the Human Capital Index, multi-attribute utility analysis, accounting for human or intellectual assets, balanced scorecards and intangible assets.

360 Degree Performance Ratings

An important concern for HRM is planning and evaluating how employees' overall abilities and skills can be assessed with a view to providing employee development, as well as facilitating promotion and succession planning. The innovation of 360 degree performance ratings provides a way of gaining insight into an individual's performance from a variety of sources such as supervisors, peers, subordinates, customers and suppliers (Hazucha *et al.*, 1993). The provision of information from a wide set of individuals who have close working relationships with the employee provides multiple perspectives of the individual's performance. Also, it is important to assess if additional measures provide incremental information beyond the ratings from a single source (Borman, 1997).

From a development viewpoint, such rating can be a rich source of information on areas that may need improvement. Also, benefits to socialization may accrue from the process of having a wide spectrum of parties participating in performance measurement. From a performance measurement perspective, 360 degree performance ratings raise several important measurement issues. To operationalize 360 degree performance ratings, measures are required for the different perspectives. On the one hand, measures from within a group, such as peer group concerns with cooperativeness, should have high inter-rater reliability. However, performance

measures drawn from different sources may reflect performance from a variety of perspectives. For example, customers may be concerned with measures of responsiveness while supervisors may emphasize measures of improvement suggestions. Another concern is the comparability of measures from different interest groups involved in the 360 degree assessments. When combining measures from different perspectives it is important to determine if different raters observing the same behaviors interpret or weight the measures differently. Borman (1997, 302) provides a summary of reasons why inter-rater agreement may be inhibited by the use of 360 degree assessments. In essence these involve different raters using different dimensions of performance, or defining measures of these dimensions differently. Also, raters may use similar measures but weight them differently in making judgments on performance. Or different raters may use the same measures, weight them similarly but have different opportunities to observe individuals being rated and thus see different behaviors. While these factors are common to many approaches to performance measurement, 360 degree assessments highlight the potential problems related to the reliability of performance measurement when using multiple sources.

Developing Quantitative Ways of Assessing HRM Outputs

Assessing individual performance using 360 degree performance ratings is focused on assessing individual performance and providing feedback for learning and improvement. Of interest, are performance measurement innovations that have sought to relate HRM practices to organizational outcomes. We consider two such innovations, the human capital index (HCI) and multi-attribute utility analysis.

The consulting firm, Watson-Wyatt, has developed a methodology for calculating the correlation between HRM practices and shareholder value (Watson Wyatt, 2005). The system provides a set of measures that quantify which HR practices and policies have the greatest association with shareholder value. Using these measures they assign a single Human Capital Index (HCI) score to a company (0–100), with high scores indicating superior HR practices and being associated with higher share value.

Performance was measured by objective financial measures including market value, three and five year total returns to shareholders and Tobin Q. Publicly available data and Standard and Poors Compustat databases were used to access financial information needed for their analysis. Thirty key HR practices were associated with a 30% increase in market value. Examples of these measures are clear rewards, recruiting excellence, communication integrity, collegial and flexible workforce. While the HCI is practitioner-based it does provide an example of an

attempt to link HR practices to overall financial performance.

Multiple-attribute utility analysis (MAU) is an approach that attempts to build performance measures into assessing how the multiple facets of job performance combine to influence desired outcomes (Boudreau, 1991; Roth and Bobko, 1997). MAU involves four steps. First, the process involves determining multiple attributes related to the consequences or outcomes of a decision. For example, the attributes of an incentive system might cover improved productivity, morale, turnover, absenteeism and cohesiveness. Next, performance measures are determined for each attribute. Given the diversity of attributes this presents many challenges for measurement. The involvement in determining measures of those affected by the decision is recommended to enhance acceptance of final decisions. Once measures are determined they are combined in a utility function to assist in making decisions. This involves a preliminary step of estimating weights and utility functions. A key concern is to develop a series of utility functions that relate the multiple measures to a common metric such as effectiveness. An ordering of the relative importance of different attributes is performed. The most appropriate way of combining different attributes and weighting their relative importance is complex, and of great relevance to management accountants who wish to employ performance measurement systems with multiple measures (Roth and Bobko, 1997, 354–359). Finally, a decision is made by determining the utility of possible decision options and then determining the robustness of the decision to changes in measures, weights and utility functions, employing simulation and sensitivity analysis.

Human Resource Accounting

Human resource management has stressed that, increasingly, a key business asset of strategic importance is the organization's workforce. In the 1970s, recognition among some accounting researchers of the importance of a strong human resource management function promoted the development of human resource accounting (HRA). HRA measures and assesses how well the workforce is trained and motivated (Flamholtz, 1974, 161). The American Accounting Association's Committee on 'Accounting for Human Resources' (1974) was instrumental in developing an awareness that behavioral research on HRA was needed for HRA to move forward. This body outlined two possible foci: the effect of HRA on employee attitudes and performance; and the impact of HRA on management decision making (Tomassini, 1976). However, early attempts in HRA had only limited success in terms of take-up, possibly due to difficulties in measuring the value of 'human assets'. Tomassini (1976) presented a framework to facilitate research into HRA that included an exami-

nation of the informational attributes of HRA, which included both quantitative and qualitative perspectives, including information that could not be measured. Tomassini argued that the impact of HRA may be contingent on informational, organizational and individual attributes of managers.

Balanced Scorecards and Intangible Assets

More recently, innovations in measuring the workforce, such as intangible assets and intellectual capital, have evolved as organizations recognize the key HRM principle that it is people who are the source of competitive advantage (Stewart, 2001). HRM researchers have developed performance measurement frameworks that link various aspects of intellectual capital and, in some instances, link these to other perspectives including financial performance (Brooking, 1996; Stewart, 1997; Sveiby, 1997; Edvinsson, 2002; Andriessen, 2004). These systems have contributed by helping to define the meaning and measurement of intangible assets and more generally have provided links between HRM practices and the economic value of the organization.

One of the earliest frameworks was the Skandia Navigator (Edvinsson, 1997). The Swedish finance company developed a five dimensional performance measurement system that related key dimensions of HRM practices to the history of the organization, a financial focus, today's operations measured in terms of customer and process dimensions, and future considerations identified as renewal and development.

Perhaps the most important contribution of this area of development has been to clarify the meaning and measurement of intangible assets. Marr and Adams (2004, 22) provide a summary of converging ideas on the meaning of intangible assets as a critical strategic resource. Intangible assets include human capital, relational capital and organizational or structural capital. Human capital relates to the skills, aptitudes and attitudes of employees; relational capital is concerned with the relationships between the organization and all its key stakeholders; and organizational capital covers explicit knowledge held by the organization or its intellectual property, routines and practices. It is noteworthy that intangible assets have grown in importance as the fundamental component of the learning and growth dimension of the BSC, as developed by Kaplan and Norton (1996, 2000, 2004). Initially, the learning and growth perspective included employee capacities, information systems capabilities and behavioral factors such as motivation and empowerment (Kaplan and Norton, 1996). In the latest approach to their BSC (Kaplan and Norton, 2004), learning and growth are described as human capital, information and organizational capital. While HRM specialists welcome the increased emphasis on intangible assets in the BSC, some are critical of its incomplete and partial appli-

cation (Marr and Adams, 2004). Specifically, they claim that information capital includes IT infrastructure which might better be classified as part of tangible or knowledge-based assets. More importantly, while relationships with customers are included in the customer perspective the concept of relational capital is missing from intangible assets. Without a comprehensive coverage of intangible assets the strategic causal logic of BSC can be questioned.

Strategy and Performance Measurement

Strategy has emerged as a key consideration in studying the management of organizations. Originally, strategy was concerned with practices that help in planning the long-term direction of organizations and implementing these plans. While these considerations are still important, it has been recognized that the processes by which strategy is formulated and implemented requires the contribution of the functional specializations of marketing, production, HRM and accounting. The need to understand how the different functions contribute to strategy necessitates understanding the way they operate collectively. For example, marketing may identify the potential for new products, but the viability of producing these new products will depend on particular technologies that may or may not be available. The identification of a technology may require HRM considerations of recruitment and training and possible restructuring to match employees with production flows. Finally, the costs of these are matched with customer revenues by the accounting function, to determine financial viability and plans are drawn and performance measures established to effect and control the strategy.

The starting point for this process may begin with ideas from any of the functional specializations making them all potentially strategic. For example, production may develop a novel process that significantly decreases the throughput time of production and reduces costs. This may provide an opportunity for marketing to capture new customers. HRM may be required to ensure that employees are provided with skills for the new technology.

Insights into the role of strategy in the development of performance measurement systems can be found in a stream of research that has emerged since the 1980s in the accounting and management literature (Langfield-Smith, 1997). The orientation of early approaches was the matching of some dimension of performance measurement systems to the specific strategic type. Several studies focused on the relationship between strategy and performance evaluation and reward systems. In particular, a common focus was the choice of subjective or objective approaches to rewarding performance.

In these studies, strategy was usually operationalized using several of the strategy frameworks that had emerged in the strategy literature. These included the defender-prospector typology of Miles and Snow (1978), the differentiator-cost leadership categories of Porter (1985) and the harvest-build mission (used by Gupta and Govindarajan, 1984).

Gupta (1987) and Govindarajan and Gupta (1985) were some of the early papers that provide consistent evidence that objective performance evaluation and reward systems support defender strategies, whereas for prospector strategies more subjective performance evaluation suit. One aspect that may be driving this consistency is the level of environmental uncertainty associated with prospector-type strategies and defender-type strategies. Prospector-type strategies are usually associated with high levels of environmental uncertainty, where it may be difficult to set targets accurately and to measure objectively managerial performance.

The relationship between performance measurement systems and the strategy-uncertainty connection are evident in several studies that have found a positive relationship between high environmental uncertainty and subjective performance evaluation (see Briers and Hirst, 1990, for a review). In these situations, critical success factors include strategies related to new product development, innovation and research and development. These strategies tend to be long term and difficult to quantify, and so may be better served by subjective measures. Defender-like strategies are associated with low environmental uncertainty and a focus on stability and internal efficiency implies there is a high knowledge of input-output relationships. Thus, it is easier to develop objective performance measures and targets.

Integrated Performance Measurement Frameworks: Integrating Multiple Approaches to Performance Measurement

In the 1990s, performance measurement evolved from loose ideas of including both financial and non-financial measures to more complex frameworks based on a balanced suite of measures that explicitly link those measures to strategy. These often took the form of causal maps that showed the operational implications for different strategies, and these derived largely from practitioner-oriented case studies and consulting experiences (Kaplan and Norton, 1996; 2001; McNair *et al.*, 1990). For example, Lynch and Cross (1995) promoted a performance measurement hierarchy that articulates an integrated performance measurement system, from senior management level to the operational level, which addresses both market and cost considerations to support aspects of strategic importance. Another

example is the performance prism (Neely and Adams, 2001; Neely *et al.*, 2002), consisting of five facets. The top and bottom facets are stakeholder satisfaction and stakeholder contribution, respectively, while the three side facets are strategies, processes, and capabilities.

Kaplan and Norton (1996, 2000, 2001, 2004) presented what has globally become recognised as a tool to explicitly link performance measurement systems to strategy. This BSC emphasises the need for balance between short-term and long-term measures across the various strategic dimensions of the business. It also, encompasses financial, marketing, operations and HRM perspectives

The BSC has been well documented and praised in a range of professional journals. By providing explicit links between strategy, goals, performance measures and outcomes the BSC is presented as the key to achieving high-level performance (Kaplan and Norton, 1996). The BSC is said to provide a powerful tool for communicating strategic intent and motivating performance towards strategic goals (Ittner and Larcker, 1998b). However, despite the high profile and apparent high levels of acceptance of BSC in practice, there has been only limited research attention given to testing the claims or outcomes of the BSC and the processes involved in using the BSC for its intended purposes.

Ittner *et al.* (2003) studied how different types of performance measures were used in a subjective BSC bonus plan, in a financial services firm and found that using a BSC to reward managers has the potential to counter many of the criticisms of short-term accounting-based reward systems. However, the varying subjective weighting given by managers to performance measures allowed supervisors to ignore many of the performance measures when undertaking evaluations and awarding bonuses, even when some of those measures were leading indicators of the bank's strategic objectives of financial performance and customer growth. Hoque and James (2000) found that overall usage of BSC was significantly correlated with organizational performance. In a study of banks, Davis and Albright (2004) found that a group of branches that used BSC outperformed a group that did not use BSC on common composite financial measures. Other studies have shown that the association between strategic performance measurement systems (SPMS) and performance depends on the type of organizational performance being considered, with some evidence suggesting that SPMS are associated with medium to long-term performance. Ittner *et al.* (2003) found that in financial service firms, those using a broad set of financial and particularly non-financial measures earned higher stock returns. Also, Ittner *et al.* (2003) found that techniques such as the BSC, economic value and business modeling were associated with increased measurement systems satisfaction but not with economic per-

formance. Further support for the importance of implementation of the BSC is provided by Banker *et al.* (2004) in their experimental study of the judgment effects of performance measures and strategy. They found that the evaluations of business unit managers were influenced more by measures linked to strategy than those not linked to strategy, but only when managers are informed of the details of the business unit strategies. Malina and Selto (2001) presented a case study that focused on the effectiveness of the BSC as a management control to communicate strategy. The BSC is designed to aid in communication by specifying the causal linkages between various performance measures and strategic outcomes, and hence provides an understanding of the decisions and activities that must be followed to achieve high financial performance (Kaplan and Norton, 1996).

Bryant *et al.* (2004) modeled the hierarchical causal linkages between financial and non-financial measures as found in a BSC, to understand how value is created within the firm. The BSC consists of measures within four perspectives: financial, customer, internal business process and learning and growth. An unresolved question was whether outcome measures in one perspective drive measures in the next perspective of the hierarchy (Kaplan and Norton, 1996, 31) or drive outcome measures in all higher-level perspectives (Kaplan and Norton, 2001, 61). Bryant *et al.* (2004) found that each outcome measure within a BSC was associated with outcomes measures in all higher-level BSC perspectives. For example, higher levels of employee skills (part of the learning and growth perspective) was associated with higher levels of product introductions (internal business process perspective) and customer satisfaction (customer perspective).

Some studies suggest more equivocal outcomes from BSC. Chenhall and Langfield-Smith (1998) reported that while BSC were part of the 'best practices' of high performance firms they were also evident in poorly performing firms that had less well developed management techniques. In an experimental study, Lipe and Salterio (2000) found that managers had cognitive difficulties working with measures to evaluate performance that were specific to a situation (unique measures) and preferred measures that were the same for different situations (common measures).

The Tableau De Bord

Integrated frameworks for performance measurement are not new. The tableau de bord has been used by French companies for many decades, and can be considered the precursor to the BSC. It is an integrated performance reporting system that focuses on key control parameters. It adopts a pyramidal analysis of different aspects of an organisation's performance to feed three levels of management—strat-

egy, management and operations (Lebas, 1994). Information may relate to aspects of the balance sheet, future employment creation, return to shareholders, environmental performance and customer satisfaction as well as measures of sales, production and marketing performance. It is a customized tool that will vary depending on the needs of management, and provides a means for monitoring the pulse of an organisation and identifying any form of activity that requires some form of action (Bromwich and Bhimani, 1994, 55). Reporting frequency may be daily, monthly or annually, and while the primary focus is financial, accounting data may be integrated with graphical data, statistical data and qualitative description.

Environmental and Social Performance Measures

More recent variations of integrated performance measurement systems include those that encompass environmental and social responsibility concerns. These forms of reporting derive from an increased global interest in corporate social responsibility, which involves organisations taking into account the social and environmental impact of corporate activity when making decisions (Adams and Zutshi, 2004). There is growing evidence that many senior managers regard corporate social responsibility as leading to increased profitability and long-term survival (Simms, 2002).

A company's environmental and social performance may be communicated within the annual report to shareholders, or through specific triple bottom line (TBL) reports, environmental reports, social impact reports and through social audits. TBL reporting focuses on financial, social and environmental performance and is aimed at a broad range of stakeholders. Social performance refers to the impact of an organisation's behavior on society including the broader community, employees, customers, and suppliers. Environmental performance is the impact of an organisation's performance on the environment, including natural systems such as land, air and water as well as on people and living organisms (Langfield-Smith, Thorne and Hilton, 2006).

Some organisations have added social and environmental dimensions to their BSC. Two examples are the BSC used at Novo Nordisk and Shell (Zingales and Hockert, 2003). The Danish pharmaceutical manufacturer, Novo Nordisk, has a major investment in people and in research and development. Management realized that conventional performance measures did not provide sufficient information to manage these two areas. In the late 1990s, the company adopted a BSC and integrated social and environmental measures. Novo Nordisk's scorecard has four dimensions: finance, business processes, customers and society, and people and organization. The customers and society, people and organization

and business process dimensions incorporate environmental and social indicators and targets. Performance across the BSC is reported as part of the company's TBL external reports, and managers' bonuses are based on achieving BSC targets.

The BSC at Shell contains a dimension called sustainable development, which replaces the typical learning and growth perspective. Managers' bonuses are linked to performance targets within this dimension and strategy maps are used to articulate the cause and effect linkages from this dimension to other dimensions in the BSC. This allows managers to understand how a focus on sustainable development can influence other important performance targets.

Conclusion

In recent years there has been a proliferation of approaches to performance measurement across a range of disciplines, including management accounting, operations management, marketing, human resource management (HRM) and corporate strategy. In some cases, researchers have drawn on work undertaken within these related disciplines. However, often researchers have been unaware of what are sometimes parallel developments in related fields with little cross fertilization of ideas (Merchant *et al.*, 2003; Luft and Shields, 2003; Mensah *et al.*, 2004).

While we have considered the contribution to performance management from a selection of disciplines, it is important to emphasize that the effectiveness of performance measurement systems will depend on how they affect individuals' behavior. Concurrent with the above developments in different disciplines there has been a separate stream of more academic-oriented research, derived mainly from organizational and behavioral theories. Within management accounting, research has focused on understanding the behavioral effects that arose from how managers used performance measures, such as budgetary information.

An important line of research is the identification of undesirable consequences of budgetary systems of control. Argyris (1952) reported that subordinates feelings of budgetary pressure arose from three main factors: the tendency of supervisors to emphasize the need to meet budgets, the raising of budgeting targets to more difficult levels once they had been achieved, and an inflexible and uncompromising nature of budget documents, which did not point to the real reasons for budget variances. This pressure led to several undesirable consequences: increased tension, frustration, resentment, suspicion, fear and mistrust, and a reduction in long-term performance. Argyris suggested that budgetary participation was a possible moderator of supervisory style, and that

managers needed training in human relations to enable 'real' participation to take place. Further studies that continued this research included Hofstede (1968), Schiff and Lewin (1970) and Lowe and Shaw (1968).

Hopwood (1972, 1974) also examined different approaches to budgeting, identifying their behavioral implications. He defined three styles of budgeting information that could be used: budget-constrained style, profit-conscious style and non-accounting style. Compared to the budget-constrained style, the use of a profit-conscious style was associated with lower job-related tension and lower manipulation of accounting reports, better relations with superiors and colleagues, and better job satisfaction and feelings of justness of evaluation. Additional work in this area provided conflicting findings (Otley, 1978) and motivated a range of subsequent studies that examined the behavioral effects of a reliance on accounting performance measures (RAPM). These studies included Hirst (1981, 1983), Brownell (1982), Brownell and Hirst (1986), Brownell and Merchant (1990) and Brownell and Dunk (1991) who attempted to reconcile these conflicts. One variable that emerged at about the same time was budgetary participation. Budgetary participation can be distinguished from RAPM in that it relates to subordinate managers' *involvement* in budget setting. Budgetary participation was argued to moderate the link between RAPM and outcomes such as performance (Brownell, 1982; Brownell and Hirst, 1986), and also became the focus for several studies that tried to identify the situations in which it was most effective. (See Briers and Hirst (1990) for a review of the use of budgetary information in performance evaluation, and Shields and Shields (1998) and Hartmann and Moers (1999) for critical reviews of the contributions of the budgetary participation literature). More recent studies have used behavioral theories to identify how managers respond to multiple measures as opposed to common measures (Lipe and Salterio, 2000), diverse measures that may generate tension between conflicting measures (Holstrom and Milgrom, 1991), and distrust of more subjective measures (Moers, 2005).

The purpose of this paper has been to explore developments in performance measurement across a range of disciplines and to identify if there are ways to coordinate and integrate approaches and how this might best be achieved. One approach that holds promise to provide for some unification is the emergence of financial and non-financial measures within an integrative, strategy framework that seems to have arisen concurrently in management accounting and various functional areas of management. These developments have aimed to accommodate the rise of new manufacturing technologies and a strategy perspective that has placed novel demands on performance measurement systems and control. Operations management was an early discipline to develop a focus on manufacturing measures and to try and

link these across the value chain and with strategy. Performance management has drawn insights by combining a financial perspective with a non-financial marketing orientation to develop further our understanding of the linkages between customer loyalty, customer satisfaction and financial performance. HRM has focused attention on developing measures that take into account the multiple facets of HRM on the performance of individuals and the organization. Important links have been made between innovations in integrated performance measurement systems and BSC and an HRM focus on the central role of intangibles and intellectual capital to ensure sustainable organizational growth and development. Developments towards integrated performance measurement systems, including the BSC, seems to have been taken up in several discipline areas, and "ownership" of the BSC and citation of the BSC occurs across marketing, operations, HRM and accounting. The strategy discipline has had a long history of considering the design of performance measures and all areas of management have drawn liberally from work in the area of strategy.

To conclude, in this paper we have demonstrated how many disciplines have contributed to the development of performance measures. While management accounting has played a key role in performance measurement there is a view that accounting researchers are somewhat reluctant to draw on other disciplines for ideas and inspiration. Merchant *et al.* (2003) noted the apparent limited awareness that accounting researchers have of developments and insights in other disciplines. This may contribute to hindering progress by fragmenting the literature, slowing down communication and inducing incomplete or incorrect conclusions. Limited cross-fertilization of ideas and findings was also highlighted by Mensah *et al.* (2004) who found that there was a decreasing incidence of citation of management accounting in other disciplines. Kinney (2001) highlighted the unique contribution that accounting has in the measurement area and considered knowledge of business measurement as one of the core competencies of accounting. Examining developments in the design of performance measures across operations, marketing, HRM, strategy, and management accounting may enhance management accountants' understanding of the role that other disciplines may play in the design and implementation of performance measurement systems, as well as highlighting the potential for management accounting to contribute to thinking in these other disciplines.

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Note

1. CAM-I is a research and development coalition of industrial organizations, professional accounting firms, government agencies and universities set up in 1986 to address the role of cost management in the new manufacturing environment.

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