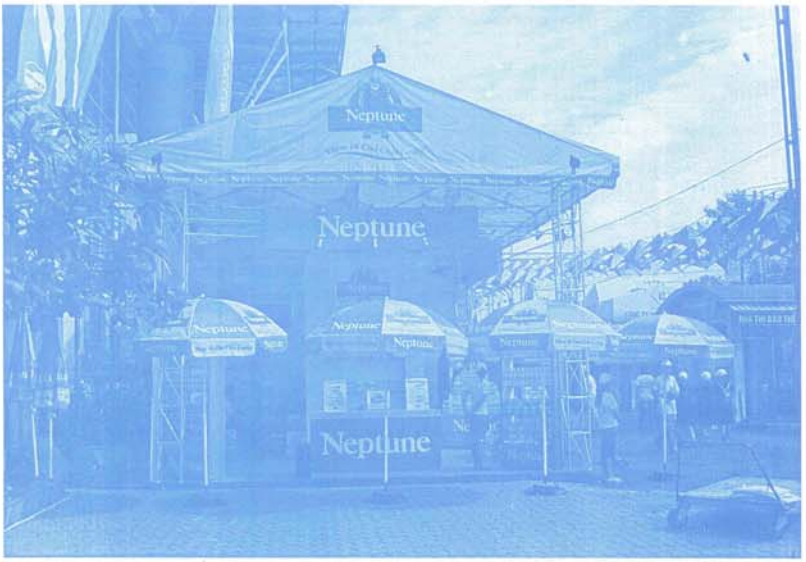


PERFORMANCE MEASUREMENT
A Literature Survey

LƯU TRỌNG TUẤN

Within the next five years, every company will have to redesign how it measures its business performance.

Eccles (1991, p. 617)

1. Introduction

The 1990s marked the growing research on performance measurement as an essential tool of management control system. While traditional performance measurement systems (PMSs) were focused purely on financial measures using accounting principles and data, evolving approaches highlight non-financial measures as well. Among the most popular performance measurement systems that involve both financial and non-financial measures is the balanced scorecard.

Another stream of research is concentrating on the adaptation of financial measures in such a fashion that they possess more explanatory power, the most popular of which is the economic value added (EVA). Each proposed method developed its own literature stream, articles mainly centering on the implementation of the new system, its pros and cons, and the link between adoption of the new system and corporate performance. This paper reviews main streams drifting in the literature regarding the new performance measurement approaches.

2. What Is Performance Measurement?

The scope in which the multi-disciplinary nature of performance management has been most extensively explored is that of performance measurement. Neely et al. (1995) defined performance measurement in its strictest sense as the process of quantifying the efficiency and effectiveness of action, and thus

- A performance measure can be defined as a metric used to quantify the efficiency and/or effectiveness of an action.
- A performance measurement system can be defined as the set of metrics used to quantify both the efficiency and effectiveness of actions.

They carried on with structuring the framework shown in Figure 1, which highlights the fact that a perfor-

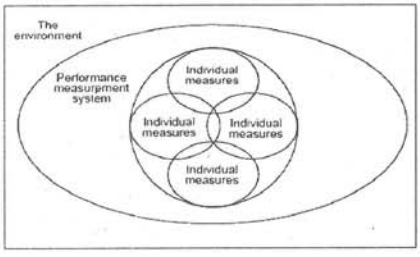
mance measurement system can be examined at three different levels:

- the individual performance measures;
- the set of performance measures – the performance measurement system as an entity; and
- the relationship between the performance measurement system and the environment within which it operates.

Whereas this definition accentuates effectiveness as well as efficiency, it is unlikely to make managers stop and challenge their performance measurement systems and gives little indication as to what they should quantify or why. Hence, Moullin (2003) defined performance measurement as "evaluating how well organizations are managed and the value they deliver for customers and other stakeholders". This definition gives much more guidance to people involved in performance measurement. In particular, it encourages them to consider the extent to which organizations measure the value they deliver to their customers and whether it covers the main aspects of how performance is managed.

Bocci (2004) preferred Neely's definition, and in particular preferred "quantifying" to "evaluating" because the latter referred not only to measuring but also to making a judgment. Moullin responded that evaluating was a better term because it implied interpretation and analysis: "... someone somewhere is going to ask 'how well an organization is doing' or 'what appears to be responsible for the drop in sales'. We can't hide behind the numbers forever" (Moullin, 2005). Pratt (2005) agreed, pointing out that evaluating was much better than quantifying as it encompasses qualitative as well as quantitative measures. Neely himself commented that "in essence I find myself agreeing with Moullin and Pratt – delivering value to stakeholders is clearly essential to an organization's success" (Neely, 2005, p. 14).

Figure 1: A framework for performance measurement system design



Ittner, Larcker and Randall (2003) broadened the area of performance measurement to incorporate strategy development and the taking of action. Given the often quoted adage that "what gets measured gets done", implicit in the growing literature on performance measurement is that performance measurement includes development of strategies or objectives, and the taking of actions to improve performance based on the insight provided by the performance measures. This blurs the distinction between performance measurement and performance management. However the definitions discussed show that performance management is a collection of activities including the setting of objectives or strategies; identification of action plans/decision making; execution of action plans and the assessment of achievement of objectives/strategies. Hence, it is conspicuous that a performance measurement system can form the information system that is at the heart of the performance management process, and integrates all the relevant information from all the other performance management systems as asserted by Bititci et al. (1997) (Figure 2).

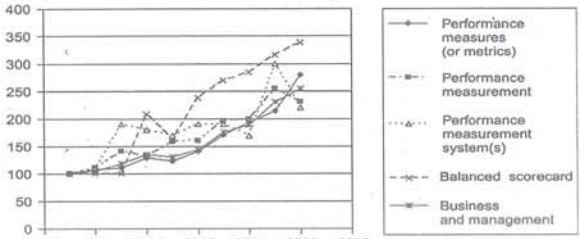
Figure 2: The performance management process and the position of the performance measurement system

3. Traditional VS. Contemporary Performance Measurement

According to Burgess et al. (2007), even though the literature on performance measurement has grown over the last decade, it is growing at the same rate as the literature for management and business on the whole (see Figure 3), thus suggesting an element of dynamic stability.

Gomes et al. (2004) shared with Ghalayini and Noble (1996) the conclusion that the literature concerning performance measurement evolved through two phases. The first phase was started in the late 1880s, while the second phase in the late 1980s. The first phase was characterized by its cost accounting orientation. This

Figure 3: Hits for search terms (1997 - 2006) converted to index numbers



orientation aimed at aiding managers in evaluating the relevant costs of operating their firms. This approach was later modified in an attempt to include some financial measures return on investment, return on sales, price variances, sales per employee, productivity and profit per unit production. Of these performance measures productivity has been considered the primary indicator of performance. Gold (1980) developed a network approach for measuring productivity, integrating labor, material and efficiency of fixed investment.

Gomes et al. (2004) asserted that the mid-1980 was a turning point in the performance measurement literature, as it marked the beginning of the second phase. This phase was associated with the growth of global business activities and the changes brought about by such growth. The book published by Johnson and Kaplan (1987), entitled Relevance Lost – The Rise and Fall of Management Accounting, perhaps signified the end of the first phase and the start of the second phase. This book underscored the need for better integrated performance measurement, as it criticized the traditional performance measures, due to their focus on the minimization of variance rather than on continuous improvement.

The major inadequacies of traditional metrics mentioned in the literature are as follows:

- traditional accounting measures of performance are inadequate for strategic decisions (e.g. Kaplan and Norton, 1992);
- they are too historical and backward-looking (e.g. Ittner and Larcker, 1998);
- they lack of predictive ability to explain future performance (e.g. Ittner and Larcker, 1998);
- they provide little information on root causes (e.g. Ittner and Larcker, 1998);
- they do not link the nonfinancial metrics to financial numbers (e.g. Kaplan and Norton, 1992);
- they report functional not cross-functional processes (e.g. Ittner and Larcker, 1998);
- they do not consider intangible assets (e.g. Ittner and Larcker, 1998);
- they do not measure the value created (e.g. Lehn and Makhija, 1996);
- there are too many measures; new measures are needed that have broader content, being able to describe more with less numbers (e.g. Kaplan and Norton, 1992); and
- traditional metrics do not aggregate from an operational level to a strategic level (e.g. Kaplan and Norton, 1992).

Therefore, new performance measurement systems are required; a broader set of measures, including measures of quality, customer satisfaction and innovation in contrast with the classical approach, which is based only on financial performance measures. Since measurement plays a crucial role in effective strategic implementation, new measurement systems should be able to facilitate the strategic management of companies, being able to correctly state the core capabilities, strengths and weaknesses.

The recognition of the categories "traditional" and "contemporary" was essentially borne out of the need to move away from a reliance upon financial measures and upon financial control as typified by the work of Kaplan and Norton (1992) and toward the concept of "balance", where financial and non-financial metrics are used in harmony. Table 1 displays Gomes et al.'s (2004) summary on the features of the traditional and contemporary types of performance measurement system.

Table 1: Comparison between traditional and contemporary PMSs

Items	Traditional financial-based PMSs	Contemporary PMSs
Basis of system	Accounting standard	Company strategy
Types of measures	Financial	Financial and non-financial
Focus of measures	Internal historical	Internal and external, future-oriented
Audience	Middle and top managers	All employees
Shop floor relevance	Ignored	Used
Frequency	Lagging (weekly or monthly)	Real-time (hourly or daily)
Maintenance	Expensive	Relevant and easy
Integration	Ignored	Integration exists
Linkage with reality	Indirect misleading	Simple accurate direct
Local-global relevance	Static non-varying	Dynamic, situation structure dependent
Stability	Static non-changing	Dynamic, situation timing dependent

Format	Fixed	Flexible/variable
Purpose	Monitoring	Improvement
Function	Allocate blame	Encourage creative and learning
Decision making	Structured	Unstructured
Effect on continuous improvement	Impedes	Supports/stimulates
Linked to strategy	No/less link to strategy	Derived from strategy

There is evidence of increasing use of non-financial measures in Western, American, and Asian countries. Earnst & Young and the American Quality Foundation also report a dramatic increase in the reliance on quality measures for senior management compensation in the U.S., Japan, Germany and Canada (Hauser, Simester, and Wernerfelt, 1994). Hiromoto's (1988) study of Japanese companies also indicates increasing use of non-financial measures in performance measurement. Finding little is known about non-financial performance measurement practices in the non-manufacturing sector such as banks, Hussain and Hoque (2002) investigated the performance measurement practices of four Japanese banks and found management wanted to measure non-financial performance for competitive advantage in satisfying customers by providing quality, on-time, prompt and reliable service, and for banks' corporate social responsibilities such as environmental awareness and social well-being. Hussain and Hoque (2002) also observed that whilst non-financial performance measures were sought in line with the banks' objectives and strategies, most of them were designed to improve and measure financial performance.

4. Agency Theory And Non-Financial Measurement

The use of non-financial measures for performance evaluation is consistent with theoretical work on compensation in agency settings. Financial measures of performance are imperfect and noisy signals of manager's effort. In contrast, non-financial performance measures better reflect the cause-and-effect relations and thus add value by reducing the noise in drawing inferences about agent's efforts.

Feltham and Xie's (1994) analysis motivates the use of non-financial measures by identifying conditions under which the use of such measures in addition to a short-term financial measure (such as profit) results in improved firm profitability. In particular, they suggest that when the agent's effort is multi-dimensional, increasing the number of performance measures may increase the set of implementable actions, and result in the implementation of a preferred action. Furthermore, increasing the number of performance measures may reduce the risk imposed on the agent to induce a particular implementable action. Especially, when the principal's expected gross payoff is a function of both short-term and long-term oriented efforts and if the use of the profit measure induces only the short-term oriented effort, then the loss to the principal from the failure to induce the long-term oriented effort can be diminished by introducing a second performance measure, say a non-financial indicator, that independently reports on the long-term oriented effort. Thus, if non-financial measures are indicators of long-term effort, then they are valuable.

The use of non-financial measures to alleviate the managerial myopia problem is also suggested by Hemmer (1996). Hemmer focuses on the design and use of endogenous non-financial measures when financial measures fail to capture the long-term implications of an agent's actions. Based on a modified Holmstrom and Milgrom framework, he shows that whereas many non-financial measures may be economically equivalent, measurement problems may render one measure more precious. In a relevant study, using a two-period principal-agent model, Hauser, Simester, and Wernerfelt (1994) analyze the profit impact due to the use of customer satisfaction measures in incentive compensation and offer recommendations for measuring customer satisfaction.

In brief, while many reasons are suggested in the practitioner literature for the use of non-financial measures, the main reason is based the argument that non-financial measures are drivers and hence lead indicators of future financial performance. Agency theoretical studies also assume this relationship between non-financial measures and financial performance. Empirical validation of this relationship, is therefore, an essential step in understanding the use of non-financial measures in managerial compensation.

5. Performance Measurement Frameworks

PM frameworks have arguably made the largest impact upon the PM literature, with a plethora of ever-more complex framework models being developed in many fields since the late eighties. The term framework refers to the active employment of particular sets of recommendations: for example, a set of measurement recommendations may suggest the development of a structural framework (e.g. balanced scorecard (Kaplan and Norton, 1992)) or they may give rise to a procedural framework (e.g. Wisner and Fawcett's (1991) framework). A performance measurement framework assists in the process of performance measurement system building, by clarifying performance measurement boundaries, specifying performance measurement dimensions or views and may also provide initial intuitions into relationships among the performance measurement dimensions (Rouse and Putterill, 2003); two types may be envisaged: the structural framework (i.e. a framework specifying a typology for performance measure

management) and the procedural framework (i.e. a step-by-step process for developing performance measures from strategy).

One of the first frameworks put forward for the process of PM was by Sink and Tuttle (1989), which claims that the performance of an organization is a complex interrelationship between seven performance criteria: effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability/budgetability. Keegan et al. (1989) presented the structural performance measurement matrix that examined external/internal and cost/non-cost performance measures, while the results and determinants framework—proposed by Brignall et al. (1991)—has as its core performance measure management typology the distinction between measures of results, which reflect the success of the chosen strategy, and measures of the determinants of the results, which determine competitive success, across six performance dimensions: competitiveness, financial, quality, flexibility, resource utilization and innovation.

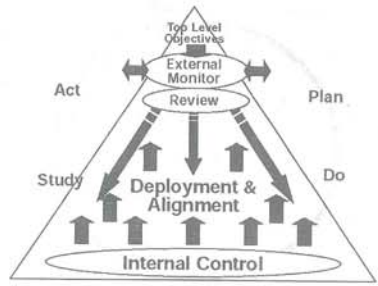
From a hierarchical view of business performance measurement, Cross and Lynch (1992) proposed the structural performance pyramid (see Figure 4), which link an organization's strategy with its operations by translating objectives from the top down (based on customer priorities) and measures from the bottom up.

Figure 4: The performance pyramid

Azzone et al. (1991) developed the framework, which seeks to identify the measures, based upon an internal/external division, most appropriate for organizations that have chosen to pursue a strategy of time-based competition. Wisner and Fawcett (1991) have proposed procedural stepwise framework models, whereas the structural balanced scorecard (Kaplan and Norton, 1992) attempts to introduce the concept of producing a "balanced" set of measures (i.e. non-financial measures "balanced" against financial measures). Brown (1996) developed a structural framework which attempts to distinguish between input, process, output and outcome measures; while the structural PM framework of the European foundation for quality management (EFQM) consists of two segments—enablers and results—which may be further sectioned. Lockamy III (1998) has proposed a normative model for the development of quality-focused performance measurement systems, which begins with functional departments at the division level receiving customer inputs on product quality performance.

However, it is also commonly recognized that the external and internal environment of an organization is not static but is constantly changing, so Bititci et al. (2000) suggest a dynamic performance measurement system (Figure 5), which should have an external monitoring system, an internal monitoring system, a review system, and an internal deployment system.

Figure 5: The dynamic performance measurement systems model



Neely et al. (2001) propose the structural performance prism (Figure 6), which consists of five weighted "faces": stakeholder satisfaction, strategies, processes, capabilities and stakeholder contribution.

Figure 6: The performance prism

De Toni and Tonchia (2001) presented the constructive variables of a PMS in a framework for performance measures, which can be conceptually divided into two: (1) Cost performances, including the production costs and the productivity; and (2) Non-cost performances, regarding the time, flexibility and quality. Rouse and Putterill (2003) have developed the structural integrated performance measurement framework, which attempts an integration of a number of structural frameworks, and combines stakeholder evaluation and strategy with service delivery and process alignment. The structural AMBITE performance measurement cube (Jagdev et al., 2004) introduced a tri-axis cube that is mapped three dimensions: business processes, competitive priorities and manufacturing typology, and it uses metrics to measure enterprise performance from time, cost, quality, flexibility, and environment.

Table 2 outlines these major PM frameworks. As may be seen from the table, the main emphasis in PM framework design has been upon structural framework development. The table also emphasizes that, although PM frameworks have become increasingly more complex in terms of measurement scope (for example, Sink and Tuttle, 1989) attempted to measure in one functional area (planning), while Rouse and Putterill (2003) have attempted to integrate a number of frameworks), a truly holistic PM framework has, so far, been unrealizable.

Table 2: A comparison of performance measurement frameworks

Framework	Researcher(s)	Framework typology	Dimensions of measurement (if any)
Sink and Tuttle	Sink and Tuttle	Procedural	-
Performance measurement matrix	Keegan, Eiler, and Jones	Structural	Cost, non-cost, internal environment, external environment
Results and determinants framework	Brignall, Fitzgerald, Johntson, and Silvestro.	Structural	Results (financial performance, competitiveness); determinants (quality, flexibility, resource utilization, innovation)
Performance pyramid	Lynch and Cross	Structural	Vision, market, financial, customer satisfaction, flexibility, productivity, quality, delivery, cycle time, waste
Internal/external configuration time framework	Azzone, Masella, and Bertele	Structural	Time
Wisner and Fawcett's framework	Wisner and Fawcett	Procedural	-
Balanced scorecard	Kaplan and Norton	Structural	Financial, internal business, customer perspective, innovation and learning
Brown's framework	Brown	Structural	Inputs, process, outputs, outcomes
Quality-focused performance measurement	Lockamy III	Structural	quality
EFQM model	EFQM	Structural	Enablers, results
Performance prism	Neely, Adams, and Crowe	Structural	Stakeholder satisfaction, strategies, processes, capabilities, stakeholder contribution
Framework for PMS measures	De Toni and Tonchia	Structural	Cost performances, including the production costs and the productivity; and Non-cost performances, regarding the time, flexibility and quality.
Integrated performance measurement framework	Rouse and Putterill	Structural	Structure, processes, input, output, outcome and potentially others
AMBITE performance measurement cube	Jagdev, Brennan, and Browne.	Structural	Time, cost, quality, flexibility, environment

Conclusion

The scope of performance measurement is undergoing a "revolution" whose major transformations can be grouped within the following headings:

- From performance measurement to performance management.
- From individual to collaborative performance measurement.
- From lagging to leading performance management.

Performance measurement is merely the practical and technical exercise within the much wider "performance management" practice, so there is a need to look beyond performance measurement and into performance management (Otley, 1999).

The move toward more collaborative type of networks requires new processes, new strategy, new measures and new way of managing performance. Collaborative performance measurement and management means that customers and suppliers get access to performance information beyond their own firm and give access to performance information to the other partners in the network. By sharing performance data with partners, firms can identify bottlenecks and "weak links" in the network, and act in accordance to improve the overall performance (Holmberg, 2000) ■

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