Strategic performance measurement systems: a discussion about their roles

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Summary

Purpose – *The purpose of this paper is to present a theoretical discussion about the roles that a performance measurement system should perform. The enterprises' operations systems and environments, characterized by their complexity and dynamics, are challenging the strategic operations management models.*

Design/methodology/approach – *The developed theoretical construction is based on a literature review. The measurement system is studied in the context of a strategic operations management system.*

Findings – *The structures, processes and spaces were the lens used to study the performance measurement system and contributed to organize the concepts in tables, that is, roles statements were created based on these guidelines. These tables synthesized and identified the main roles that the system should perform, stating their definitions and related perspectives.*

Research limitations/implications – *The generated framework is theoretical in essence and needs to be tested, although the theoretical exercise showed a common sense around the articulated main concepts.*

Practical implications – *The understanding of the performance measurement system roles contributes to improve design, implementation and use of the performance system.*

Originality/value – *The paper's main contribution is the theoretical underpinning used to develop the performance framework. The system design approach used will enable further research into strategic performance measurement application for the design and use of such a system. Continuous improvement, organizational learning and the management of change process will be required properties for the strategic management of the operations function.*

Keywords *Operations management, Performance measures, Strategic management*

Paper type *Research paper*

Introduction

The multi-dimensional characteristics of enterprise performance are challenging the operations system management models. Such characteristics are exemplified by the complexity of factors involved; the dynamic associated with the internal and external variables that define the strategic management of the operations system, and their external environment; strong links that inter-relate short and long term perspectives of operations strategy planning systems; and the increasing use of resource and competence based views in operations strategy specification and design.

The process of strategic management system redesign necessitates a more ''balanced'', ''integrated'', ''linked'', ''flexible'', ''multifaceted'' and ''multidimensional'' management system (Gomes *et al.*, 2004). Such properties should reflect the performance measurement system specification when describing the whole strategic operations management system. The properties are currently not well developed and integrated to the strategic operations management processes, and could not offer the opportunity for firms to better understand

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their operations systems environment and to increase their performance level (Slack, 2000; Platts, 1995). Although, the firms are increasingly utilizing non-financial performance measures in their decision-making processes (Burns *et al.*, 1997), there is very little evidence that these measures are formal and directly linked to the firm's strategy and effectiveness.

There is a common belief in the operations management practices in organisations that if the performance measurement system is redesigned, there will a positive impact in the organisation's overall performance (Bourne *et al.*, 1999). That belief is often the basic reason for starting the redesigning process; however, the recent research results suggest that there is no success guarantee. In fact, the main issue is related to the operation and management of a strategic system (Bourne *et al.*, 2005).

It is also important to highlight that for improved performance, the strategic management system that encompass the measurement subsystem should be conceived to: deploy enterprise strategic performance management instead of performance measurement systems; develop dynamic rather than static strategic management systems; enhance the flexibility of performance measurement systems, improving its capability to cope with organisational changes (Neely, 2005).

The presented paper shows a theoretical discussion about the roles that a performance measurement subsystem should perform as being part of an operations strategic management system. The paper is structured in the following sections: initially it is defined a methodological approach; and after defining founding assumptions the discussion is developed in the context of the system content. The theoretical synthesis is developed in the format of Tables that identify, organize and define the measurement system roles.

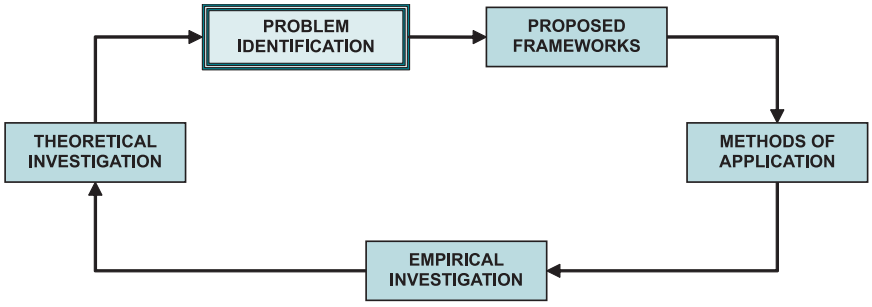
The operations strategic management approach

This paper is focused on the understanding of the performance subsystem role, as part of an operations strategic management system. Initially, it is important to understand the propositions of this research work in three different levels. First, it will be related to the rationalities used in the operations management – OM – field, specifically in the domain of the performance management – PM – discipline, for producing knowledge that will be consolidated in theories, models, frameworks and processes. For this purpose, the theoretical constructions developed by Neely (2005) and Slack *et al.* (2004) are used to position the contribution domain of this paper.

Slack *et al.* (2004) question if OM research should in fact produce new ideas, as its main orientation in creating and developing knowledge and theories for the OM field evolution. They propose that the real orientation that must be taken by the field is to continually look for a point of reconciliation between research and practice. They acknowledge that this is not a trivial task, but if it is accepted that OM's principal academic role is to ''conceptualise'' practice and ''operationalize'' theory, the rationality that founds the OM field evolution will be finally comprehended. The research presented in this work assumes the role of research and practice reconciliation, contributing to the development and test of practical solutions for the operations strategic management system design, implementation and management.

Neely's (2005) theoretical construction, which is represented in Figure 1, could be used as a meta-framework to position the presented discussion in the evolutionary life cycle process that founds the discipline of performance management. In the early stages of the discipline, a great effort was developed to identify the main problems, followed by a structuring activity based on theoretical frameworks proposition that organized and addressed the knowledge body of the discipline to solve the identified problems. Based on the proposed frameworks, processes were developed to test them and it was possible to verify the robustness and correctness of the developed models and methodologies through empirical investigation. This interplay between analysis and synthesis allows the evolution and consolidation of the theoretical body of the PM discipline knowledge. There is a specific context that could be used to explain the approach of this paper in producing and testing the models and methodologies developed in the PM domain.

Figure 1 The evolution of the field of performance measurement



Source: Neely (2005)

For the purposes of this research, the specific context is represented in Table I.

The discussion presented in this paper embraces the proposed framework and methods of application phases. It is intended to identify and to propose a reviewed set of design, implementation and management specifications for the operations strategic management system and to understand the role of performance measurement subsystem in this reviewed strategic management system. This reviewing process is strong linked to the ''real world'' operations systems and all the theoretical constructions will be formulated based on previous work and experiences related to the continuous flow of knowledge production in the OM field and the PM discipline. Therefore, it should be recognized that the operations management field is in a continuous, complex and dynamic evolution. Operations managers and professionals, the OM practioners, are facing in their day-to-day decision process situations that are questioning their mental models (Slack *et al.*, 2004; Zilbovicius, 1997).

The second level that the presented research is related explains how it addresses practical issues, in designing, implementing and managing the operations strategic management systems. The process approach (Cambridge Approach) could be used to found all the implementing activities, integrating design and management processes (Platts *et al.*, 1996; Platts, 1994; Platts, 1993). The operational characteristics of an operations strategic management system could only be truly understood, if the process of continuous reviewing its operations system design is fully comprehended. The underpinning rationality of the design process addresses the implementation and managing processes, creating the conditions for a double loop learning process development. Slack (2000) identifies three main phases in the process of redesigning a manufacturing system, which are: the structuring activity, the suppositional activity and the assimilation activity. The structuring activity is used to construct,

Table I The research context

Phase	*Description*
Problem identification	The real benefits of strategic performance management systems are not being achieved
Proposed frameworks	The developed concepts, frameworks and theoretical assumptions area being reviewed
Methods of application	The design, implementation and management processes are being modified to attend the new specifications of the operations strategic management system
Empirical investigation	These new methodologies and systems will be tested
Theoretical verification	a new cycle of knowledge producing will be started as results are consolidated in the OM and PM approaches and theories

in social terms, a common sense of the design objectives and options. The design options could be defined in terms of the performance trade-offs within the systems' strategic context. The suppositional activity extends the common language developed to approach the performance issues in the structuring activity, to a process of creating the scenarios for the design choices. This phase stimulates the debate around the resource capabilities needed and the trade-offs of the design process. The externalization process developed in the suppositional activity creates the right conditions for identifying the knowledge gaps. At this point, an assimilation activity is running as a result of a learning process, which was emerging in the suppositional phase and was consolidated in the assimilation phase, with the identified knowledge gaps. The three interrelated activities could play a special role in integrating design, implementation and management of an operations strategic management system.

It is intended as the main objective of the presented work, not in fact treated in this paper, but guiding all the shown developments; that is to conceive a methodology for designing the operations strategy management system. The main rationality of the methodology would follow the Slack (2000) framework as the first prescription and would be managed or implemented using the process approach developed by Platts (1993).

The presented approaches were selected to provide some specific features for the operations strategic management system, which could be summarized as:

- The system will structurally provide organizational learning as an important outcome of the design process (Slack, 2000), the implementation process (Platts, 1993) and the management process, which is set by definition as a strategic management system.
- It will develop a better understanding of the companies' operations processes dynamics, allowing them to develop a strategic vision based on dynamic capabilities. In that sense, the paths and trajectories for development could be chosen, as a result of the better understating of their positions and processes (Slack, 2000; Teece *et al.*, 1997).
- The learning processes and the enhancing knowledge basis could lead to a improvement of the perception of having the strategic management system under control. This confidence could reinforce a continuous and virtuous cycle of learning and improvement (Slack, 2000).

The third level of analysis is defined by declaring some theoretical assumptions that will be found in the theoretical constructions developed in this paper. These assumptions could act as recommendations (Folan and Browne, 2005) informing the theoretical development and delimiting their scope as a strategic management system (Henry, 2006).

It is important to formally declare the theoretical assumptions about performance measurement systems, particularly when they are being studied in the context of strategic management:

- According to Neely *et al.* (2005), the performance measurement is the process of quantifying the efficiency and effectiveness of action and measurement is the process of quantification. A performance measurement is a metric used to quantify the efficiency and/or effectiveness of an action. A performance measurement system is the set of metrics used to quantify both efficiency and effectiveness of actions. Central to these definitions is that action leads to performance and that there are internal and external factors that affect the efficiency and effectiveness of this relationship.
- Mintzberg (1978) argues that only through a consistent pattern of actions, a strategy could be identified. In fact, the strategy only exists if it is realized. It is assumed that there is an interplay between the actions' results and the consistency that is established over time; the performance measurement system could mediate that interaction.
- The performance measurement systems should be designed, implemented and managed as part of a strategic management system. The measures should be derived from strategy and should provide consistency for decision-making and action. Particularly, the production function will be managed in terms of its own strategic management system (Skinner, 1969; Neely *et al.*, 2005).

- The strategic management control systems should be used as a means to provide surveillance, motivation, monitoring performance, stimulating learning, sending signals, anticipating events, introducing constraints and managing scenarios to the operations systems. The control function is being defined exploring the complementary features of mechanic and organic behaviour, i.e. reacting and tracking the strategy but also reviewing the system design (Neely *et al.*, 2005; Henry, 2006).
- The performance measurement systems should be able to manage the determinants and results of the operations systems outputs, exploring the causalities between them and developing a predictive approach for the whole operations strategic management system (Kaplan and Norton, 1992; Fitzgerald *et al.*, 1991; Keegan *et al.*, 1989).

The three levels of analysis contribute to the understanding of this research. The work is based on the practice versus theory reconciliation logic (Slack *et al.*, 2004), using a process that continuously interplays empirical and theoretical assumptions (Neely, 2005). The practical application was delimited by the operational and management processes described by the rationalities developed by Slack (2000) and Platts (1993), respectively.

Content analysis

A strategic performance management system may be defined as a system that uses information to produce a positive change to organisational culture, systems and processes. This impact on organizations is achieved by the agreement on performance goals, the allocation and definition of resources priorities, informing managers to review or to maintain the current policy or plans to meet these goals, and the sharing of the performance results in the task of pursuing those goals (Amaratunga and Baldry, 2002). Implicitly, a role for the performance measurement subsystem is identified as part of the strategic performance management system content definition. The performance measurement system is responsible for the strategy implementation management process. The strategic management system should be able to follow and ''control'' the strategy implementation process.

There is a common view that the initial building blocks of all performance measurement initiatives, as they are materialized in a performance measurement system, are performance measurement recommendations (Folan and Browne, 2005). These recommendations define the content and structures of the measures, which in turn could be organized in a framework that informs the performance measurement system design.

The content definition of measures, their structure and the subsequent selection and organization of those measures are strongly linked to their ''utility'' which defines the measurement system. In this instance the focal point is the process of selecting measures to be included in the system design. A framework for the measures selection process may be founded in the competitive dimensions of manufacturing or service operations, as those dimensions are customized and refined for that purpose. The dimensions categories are organized around competitive patterns as price (cost/operational efficiency), quality (process and product), time (dependability and agility), flexibility (process and product) and innovation (process and product). These competitive dimensions may be performance dimensions of the operation system (Platts, 1995; Leong *et al.*, 1990; Slack, 1987).

Having defined the role of the performance measurement system in the context of a strategic management system, the core ''functionalities'' associated to the system are identified next. The association between roles, functions and capabilities of the operations strategic management system can be very useful for its design specification by establishing causality between roles and organisational resources. Globerson's (1985) performance criteria define the system functionalities as: strategic orientation as performance criteria are chosen from the organization's objectives; evaluated organizational unit has control over the performance criteria; and the performance criteria definition should be a result of a participative interaction of the involved actors (e.g. customers, suppliers, employees, managers). There may be a strategic realization function, as the criteria follow the organization's objectives. Another function emerges from the management definitions, which state that the system

should have a participative conception process and also have ''control'' over the evaluated organizational unit. A strategic management function can be identified based on those assumptions.

Maskell (1991) has also developed relevant principles for the performance measurement system design: a changing nature in measures; measures conceived as part of a fast feedback subsystem (the performance measurement subsystem); and measures designed to stimulate the development of a continuous improvement capability rather than simply monitor the operations strategy. Although a strategic management function is identified in the implementation of performance measurements, this role is related to continuous improvement development.

Blenkinsop and Davis (1991) expand the functional definitions of measurement systems when they identify properties that the system should have, especially, when those are related to organizational integration and differentiation. The properties cover improvements of management system integration and differentiation in both horizontal and vertical dimensions of the organizational structure. They also emphasise the importance of covering the long, medium and short-term perspectives of the life cycle of an organization when designing the performance measurement system.

Based on a literature review, Gomes *et al.* (2004) identify several characteristics of performance measurement systems:

- Measures must involve relevant non-financial information based on key business success factors (Clarke, 1995).
- Systems should be implemented to articulate strategy and monitor business results (Grady, 1991).
- Measures and related systems should be based on organizational objectives, critical success factors, and have a customer orientation. One of the main tasks should be monitoring both financial and non-financial aspects of the obtained results (Manoochehri, 1999).
- Performance system must dynamically follow the strategy (Bhimani, 1993).
- Performance system should accomplish the requirements of specific situations in operations, be long term oriented, and be simple to understand and implement (Santori and Anderson, 1987).
- Performance system should be linked to reward systems (Tsang *et al.*, 1999).
- Financial and non-financial set of measures should be coherent and consistent with the strategic framework (Drucker, 1990; McNair and Mosconi, 1987).

It can be seen from Gomes *et al.* (2004) analysis that there is a changing nature in the performance system (re)design and management. The system should be integrated with the business strategy, adapting to and monitoring its financial and non-financial aspects. The performance measurement system is an integrative management system that interrelates the business performance dimensions with the functions action plans (e.g. strategy of operations, human resources, technology, marketing, and finance).

The content analysis of the role of a performance measurement subsystem that is part of an operations strategic management system is summarized in Table II.

Having developed an understanding about the performance measurement system's role, it is possible to use these construction as a guide for performance measurement system (re)design.

Conclusion

Comprehension of the role of the performance measurement system is essential for the understanding of the entire operations strategic management system dynamics. The dialectics of the roles played by performance measurement systems, acting as medium for operations strategy realization or as enabler for strategic management system redesign, is

Table II The structural roles of a strategic performance measurement system

Role	*Perspective*	*Author*
Produce positive change in organisational culture, systems and processes, in order to contribute to the strategic vision realization	Strategic performance management system definition	Bourne *et al.* (2005); Neely (2005); Amaratunga and Baldry (2002); Manoochehri (1999); Bhimani (1993); Blenkinsop and Davis (1991)
Performance measurement system should provide a closer understanding of customer needs, in order to create a perceived value for customers	Customer driven strategy	Neely *et al.* (2005); Bourne *et al.* (2005); Kennerley and Neely (2003); Neely *et al.* (2002); Kennerley and Neely (2002); Johnston *et al.* (2002); Kaplan and Norton (2001); Manoochehri (1999); Lingle and Schiemann (1996); Ghalayini and Noble (1996); Kaplan and Norton (1992); Band (1990); Globerson (1985)
Implement strategic management functionality in the strategic operations management system, providing the system with the jointly improvement of operational efficiency and overall business effectiveness	Strategic management function	Henry (2006); Neely (2005); Gomes *et al.* (2004); Kaplan and Norton (1992); Band (1990); Globerson (1985)
Develop a continuous improvement capability through implementation and management of an integrated operations strategic management system	Continuous improvement capability development	Neely (2005); Gomes *et al.* (2004); Kennerley and Neely (2003); Kennerley and Neely (2002); Johnston *et al.* (2002); Kaplan and Norton (2001); Medori and Steeple (2000); Noci (1995); Ghalayini and Noble (1996); Lynch and Cross (1991); Maskell (1991); Johnson and Kaplan (1987)
Ensure that the performance management system covers long, medium and short term perspectives	Life cycle orientation for performance system design	Henry (2006); Neely *et al.* (2005); Chenhall (2005); Bourne *et al.* (2005); Flynn and Flynn (2004); Gomes *et al.* (2004); Slack *et al.* (2004); Maslen and Platts (2000); Flynn *et al.* (1999); Simons (1991); Blenkinsop and Davis (1991)
Performance measurement system result of measures definitions and performance frameworks recommendations (This assumption explain the performance measurement design process role)	The systemic and hierarchical approach	Folan and Browne (2005); Gomes *et al.* (2004); Blenkinsop and Davis (1991); Maskell (1991); Globerson (1985)
Performance responsible for articulating strategy and monitoring business results	Strategy realization through the monitoring of the organization's results	Gomes *et al.* (2004); Neely *et al.* (2005); Bhimani (1993); Kaplan and Norton (1992); Oge and Dickinson (1992); Blenkinsop and Davis (1991); Grady (1991); Santori and Anderson (1987)
Measurement of business results implemented using financial and non-financial aspects of business performance (In fact the performance design should guarantee)	Financial and non-financial nature of the organization's performance	Gomes *et al.* (2004); Neely *et al.* (2002); Manoochehri (1999); Clarke (1995); Kaplan and Norton (1992); Blenkinsop and Davis (1991); Drucker (1990); Maskell (1991); McNair and Mosconi (1987)

the key foundation for organizational learning. Capabilities were identified to support measurement system design, implementation and management. In particular, organizational learning capability, continuous improvement capability and strategic management capability were highlighted.

The market and resources based approaches used in operations strategy could be integrated to the operations strategic management system through different feedback loops that implement the retroactive and predictive strategic control strategies. Structurally the strategic management system could integrate the long and short-term perspectives. The process of performance measurement creation and operation is related to a life cycle model of interplay between design and implementation. The strategic control system architecture should also represent the multi dimensions of the operations performance, approaching them with multivariable techniques. It also important to manage the hierarchy that is

established between the business performance dimensions (e.g. price, quality, time, flexibility, innovativeness), according to the competitive patterns and set by the operations strategy. The operations strategy formulation process analyses the qualifying and the winners competitive dimensions, dealing with the trade-offs and planning the paths and trajectories for capabilities development. The predictive control could be realized through capabilities development, which belongs to the operations vision definition. Supported by concepts like positions, processes, paths and trajectories, the framework for the predictive control strategy could be conceived.

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