



# Performance measurement systems: A consensual analysis of their roles



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## ABSTRACT

Competitive pressures and advances in product and process technologies challenge performance management systems in terms of their design and their strategic and operational use. Understanding the roles of such systems is a first step in developing and employing the appropriate system capabilities and functions. This paper first identifies the roles a performance measurement system can perform. A synthesis is then used to capture expert views through interviews and a Delphi exercise. Twenty international operations management experts participated in the study—eleven academics and nine industry professionals. The study resulted in a refined list of proposed roles of performance measurement systems from the existing operations literature. The findings from the study show that continuous improvement, organisational learning and change management are new elements that characterise the refined measurement system roles, and that the appropriate PMS roles are contingent on design recommendations. The study provides insights for the design, management and use of PMS in organisations.

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## 1. Introduction

Competitive pressures and advances in product and processes technologies are forcing enterprises to revise their strategies and redesign their operations management systems. Developing the necessary position, process and trajectory may provide operations management systems with a more dynamic strategic management capability (Wibe, 2008; Kathuria et al., 2007; Binder and Clegg, 2007; Fernandes et al., 2006; Neely, 2005; Marr and Schiuma, 2003; Teece et al., 1997). Particularly, organisations are paying close attention to the changing nature of operations performance to the point that Operations Strategic Management Systems used for managing performance is a main focus of many redesign projects (Gomes et al., 2004). The belief is that there will be a positive impact on overall organisational performance if the performance management system is designed, or redesigned, appropriately.

However, a body of research suggests that there is no causal link between such redesign initiatives and overall improvements

in performance. (Vergidis et al., 2008; Pinheiro de Lima et al., 2008; Bourne et al., 2005, 1999). Research does suggest that for improved performance, strategic management systems should be employed enterprise-wide, instead of narrowly constrained to the performance measurement system. Such systems should be dynamic rather than static and facilitate capabilities to cope with organisational change (Neely, 2005).

Understanding the role of a Performance Measurement System (PMS) is a first step in defining system capabilities and functions that will support such strategic management system (Pinheiro de Lima et al., 2008). Authors such as Phusavat et al. (2009), Tan and Platts (2009), Folan et al. (2007) and Franco-Santos et al. (2007) explore the theoretical fundamentals of PMS. They highlight the importance of establishing causal links between business strategy and PMS design, and suggest there are theoretical constructions that mediate the relationship between strategy and performance measures and that these links should be studied in terms of their structural and dynamics characteristics. These mediating elements should be stated in terms of system roles, capabilities and design recommendations.

The research reported in this paper seeks to advance understanding of PMS design and use in general terms, and of qualified measure choice to include in PMS design in particular. The study identifies PMS roles as a mediating construct for strategy development and design. It also explores the roles a performance measurement system should perform as part of an operations strategic management system. Neely (2005) has noted that

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research in performance measurement and performance management has evolved. The theoretical models were developed about two decades ago. Content or structural and process frameworks guided design and implementation of performance measurement systems during the following 10 years, leaving a knowledge gap in the application of PMS and the validation or reassessment of the existing theoretical constructs. This contemporary challenge is addressed in this study. Moreover, Slack et al. (2004) discuss a dialectic process between theory and practice that defines operations management as an academic discipline, commenting that operations managers' decision models are tested on a day-to-day basis.

This study uses these premises to explore the use of performance measures based on expert perceptions that represent the continuous interchange between theory and practice. The study uses a Delphi exercise to capture the views of academic and industry professionals on the roles of PMS in contemporary practice. The experts were chosen for their contribution and experience in performance management. The academic group have researched performance management topics, while the industry professionals have substantial experience in PMS implementation and management. The study provides a synthesis of various PMS roles based on existing literature and the experts' perceptions. These PMS roles could be used to define PMS capabilities, which could form a set of design recommendations. Although some of the findings relating PMS roles to continuous improvement, organisational learning and change management capabilities appear to be a natural consequence of theoretical development, it is important to understand the experts' perceptions of actual PMS roles.

The study's approach is influenced by the process framework proposed by Folan and Browne (2005), and work by Chenhall (2005) on the function of operation management. The study also complements research by Neely et al. (2000) and Acur and Bititci (2004) in identifying PMS roles for operations strategic management system implementation and management. The study provides an overview of the evolutionary element of performance measurement and management. Neely (2005) states that concepts, processes and methods proposed in the 1980s and 1990s are both tested and challenged by actual application. Studies by Bourne (2005), Bourne et al. (2005), Franco-Santos et al. (2007), Franco-Santos and Bourne (2003), Herzog et al. (2009), Kathuria et al. (2007), Kennerley and Neely (2003, 2002), and Neely (2005), Nenadal (2008), Nudurupati et al. (2011), and Verbeeten and Boons (2009) focus on empirical evidence related to the theme 'managing through measures'. Popova and Sharpanskykh (2010), Phusavat et al. (2009), Tan and Platts (2009), and Taticchi and Balachandran (2008) identify the need for research that assesses and discusses practical and theoretical implications of performance information use. The study reported in this paper adds to the PMS discourse by further exploring performance measurement roles and their conceptual and empirical implications.

The paper is structured as follows. In Section 2, a theoretical set of assumptions for studying PMS is presented. Three fundamental visions characterize PMS theoretical foundations in terms of PMS content, PMS process and PMS strategic context. In Section 3 the research methodology is discussed and justified, defined by the adopted research approach, research strategy choices and research planning. In Section 4, results from the Delphi exercise are presented and discussed. Finally, results are synthesised into a consensual list of strategic PMS roles.

## 2. Theoretical foundations

This section on theoretical foundations of the study covers three main domains: PMS content, process and strategic context.

This follows guidelines proposed by Pettigrew et al. (1989) for studying organisational and management systems.

### 2.1. Performance management system content

Conceptually, PMS lacks an agreed established definition. According to Amaratunga and Baldry (2002), a strategic performance management system is a system that uses information on performance to produce a positive change in organisational culture, systems and processes. Similarly, Zu et al. (2010) add that there is an embedded role for PMS as part of Operations Strategic Management Systems. Folan et al. (2007) even note that PMS is responsible for the management of operations strategy implementation.

Performance measurement recommendations provide the building blocks for initiatives that materialize within a given PMS. These recommendations define measures, their content and structure, which provide a framework to inform the PMS design (Folan and Browne, 2005). Content definition, structure and subsequent selection and organisation of measures for PMS are strongly linked to their utility. The focal point is the process of selecting PMS measures. A framework for their selection process may be found in manufacturing or service operations competitive dimensions, as these should help to define overall performance dimensions organised around competitive patterns, such as price (cost/operational efficiency), quality (process and product), time (dependability and agility), flexibility (process and product) and innovation (process and product) (Verbeeten and Boons, 2009; Pinheiro de Lima et al., 2009; Platts, 1995; Leong et al., 1990; Slack, 1987).

Having defined basic PMS roles in the context of a strategic management system, its associated core functionalities are identified next. Pinheiro de Lima et al. (2008) notes that causality links can be established by relating PMS roles to functions and capabilities. The performance criteria of Globerson (1985) define system functionalities as strategic orientation, whereby performance criteria are chosen from organisational objectives, organisational control over performance criteria evaluated, and performance criteria resulting from stakeholder participation. There is a strategic realisation function, as performance criteria follow organisational objectives. PMS characteristics emerge from management definitions. Systems should have a participative conception process and facilitate control over the evaluated organisational unit (Colledani and Tolio, 2009). Maskell (1991) developed relevant principles for PMS design that cover the dynamic nature of measures—measures as part of a fast feedback subsystem, and measures designed to stimulate continuous improvement capability rather than simply monitoring the ongoing operations strategy. While a strategic management function is identified by the performance measures implemented, its important role in developing continuous improvement capabilities is evidenced by Popova and Sharpanskykh (2010), Li and Tang (2009), Herzog et al. (2009), Alegre and Chiva (2008), Olsen et al. (2007) and Wu and Chen (2006).

Blenkinsop and Davis (1991) expand functional definitions of measurement systems by identifying properties that the system should have, especially when related to organisational integration and differentiation. These properties cover management system integration and improvements differentiation in both horizontal and vertical dimensions of organisational structure. They also emphasise the importance of covering long, medium and short-term perspectives of an organisation life cycle in PMS design. This explores systemic properties of management systems design as defined by Pinheiro de Lima et al. (2008), Folan et al. (2007), Binder and Clegg (2007) and Gargeya (2005). Following

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