



Metrics and performance measurement in operations management: dealing with the metrics maze

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Abstract

Metrics provide essential links between strategy, execution, and ultimate value creation. Changing competitive dynamics are placing heavy demands on conventional metrics systems, and creating stresses throughout firms and their supply chains. Research has not kept pace with these new demands in an environment where it is no longer sufficient to simply let metrics evolve over time—we must learn how to proactively design and manage them. The intent of this paper is to convey the importance and need for metrics-related research. An outline of the important characteristics of the metrics research topic is provided. Specifically, we address the functions of metrics; their focus and tense; their operational and strategic contexts; as well as discuss the distinction between metrics, metrics sets and metrics systems. Some initial theoretical grounding for the research topic is provided through agency theory. We conclude with a discussion of the intent and process of the special issue, and introduction of the associated articles.

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1. The metrics challenge

One of the most powerful management disciplines, the one that more than any other keeps people focused and pulling in the same direction, is to make an organization's purposes tangible. Managers do this by translating the organization's mission—what it, particularly, exists to do—into a set of goals and performance measures that make success concrete for everyone. This is the real bottom line for every organization—whether it's a business or a school or a hospital. Its executives must answer the question,

“Given our mission, how is our performance going to be defined?” (Magretta and Stone, 2002, p. 129)

The quote from Magretta and Stone (2002) suggests that metrics and performance measurement are the critical elements in translating an organization's mission, or strategy, into reality. Metrics and strategy are tightly and inevitably linked to each other. Strategy without metrics is useless; metrics without a strategy are meaningless. The importance of metrics has been long recognized. Manufacturing and management consultant Oliver Wight almost 30 years ago offered the oft-repeated maxim, “You get what you inspect, not what you expect.” Every firm, every activity, every worker needs metrics. Metrics fulfill the fundamental activities of measuring (evaluating how

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we are doing), educating (since what we measure is what is important; what we measure indicates how we intend to deliver value to our customers), and directing (potential problems are flagged by the size of the gaps between the metrics and the standard). Yet, performance measurement continues to present a challenge to operations managers as well as researchers of operations management. Operating metrics are often poorly understood and guidelines for the use of metrics are often poorly articulated.

As a focus of research, little attention has been devoted to this topic within the field of operations management. A great deal of what we currently know about metrics comes from the managerial literature (e.g., Brown, 1996; Cooke, 2001; Dixon et al., 1990; Kaydos, 1999; Ling and Goddard, 1988; Lynch and Cross, 1995; Maskell, 1991; Melnyk and Christensen, 2000; Melnyk et al., in press; Smith, 2000; Williams, 2001). While there are numerous examples of the use of various metrics, there are relatively few studies in operations management that have focused on the development, implementation, management, use and effects of metrics within either the operations management system or the supply chain. Nascent examples can be found in the research of Beaumont (1999), Leong and Ward (1995), Neely (1998), Neely et al. (1994, 1995), and New and Szwejczewski (1995).

We should point out that topic of metrics as discussed by managers differs from the topic of measurement as typically discussed by academics. This is primarily a byproduct of different priorities between these groups. The academic is concerned with defining, adapting and validating measures to address specific research questions. The time required to develop and collect the measures is of less importance than the validity and generalizability of the results beyond the original context. Managers face far greater time pressures, and are less concerned about generalizability. They are generally more than willing to use a “good enough” measure if it can provide useful information quickly. However, as long as the difference in priorities is recognized there are undoubtedly many lessons academic measurement experts can contribute to managers’ understanding of metrics.

Recent indicators suggest that metrics and performance measurement are receiving more attention. In 1999, the Education and Research Foundation of APICS commissioned a research program dealing

with measuring supply chain performance. The 2002 POMS National Conference included a special session focusing on performance measurement. In late 2002, KPMG in conjunction with the University of Illinois at Champagne undertook a major research initiative aimed at funding and encouraging research in performance measurement (to the tune of US\$ 2.8 million). Finally, the January 2003 *Harvard Business Review* case study focused on the miscues and disincentives created by poorly thought out performance measurement systems (Kerr, 2003). Why the increasing interest? We believe the answer is in the business environment faced by today’s operations managers. Today’s environment is characterized by: (1) “never satisfied” customers (McKenna, 1997); (2) the need to manage the “total” supply chain, rather than only internal factors; (3) shrinking product life cycles; (4) more (but not necessarily better) data; and (5) an increasing number of alternatives. These dynamics make static metrics systems obsolete, and call for new performance measures and metrics approaches that go beyond simple reporting to create means for identifying improvement opportunities and anticipating potential problems. Further, metrics are now seen as an important means by which priorities are communicated within the firm and across the supply chain. Metrics misalignment is thought to be a primary source of inefficiency and disruption in supply chain interactions.

Given this environment, the research challenge is to better understand the roles and impacts of metrics in operating systems, and using this knowledge to design metrics systems and guidelines that provide clarity of purpose, real-time feedback and predictive data, and insights into opportunities for improvement. In addition, these new metrics systems need to be flexible in recognizing and responding to changing demands placed on the operating system due to product churn, heterogeneous customer requirements, as well as changes in operating inputs, resources, and performance over time.

By way of introducing this special issue on performance measures and operating metrics, in the remaining sections of this article we:

- Identify the defining elements and different types of metrics.
- Position metrics within the operations management research environment.

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