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Measuring the Business Value of IT: A Resource-Based View of Leading Indicators

Penelope Sue Greenberg, Department of Penelope Sue Greenberg, Department of MIS/DS, School of Business Administration, Widener University, Chester, PA 19013, Tel: (610) 499-4475, Fax: (610) 499-4614, psg0001@mail.widener.edu

Ralph H. Greenberg, Department of Accounting, Fox School of Business & Management, Temple University, Philadelphia, PA 19122, Tel: (215) 204-6830, Fax: (215) 204-5587, greenber@temple.edu

Kevin E. Dow, Department of Accounting, College of Business Administration, Kent State University, Kent, Ohio 44242, Tel: (330) 672-1109, Fax: (330) 672-2548, kdow@kent.edu

Jeffrey Wong, Department of Accounting, College of Business, Oregon State University, Corvallis, Oregon 97331, Tel: (541) 737-4890, Fax: (541) 737-6044, jeff.wong@bus.oregonstate.edu

ABSTRACT

The business value of IT is a topic of importance to both IT and business sides of the organization. However, despite the growing body of research on assessing the value of IT, there are still issues and debates concerning the appropriate approach. Most of the research has focused on ex post measurements, which are dependent on factors that influence the measurements in innumerable identified and unidentified ways. This paper contributes to this literature by proposing a set of metrics that focus on *leading* indicators of value as opposed to ex post measurements. To develop these leading indicators, we use the resource-based theory of the firm and resource dependency theory to adapt and extend two previously identified sets of metrics. The first is the balanced scorecard, which is widely used by business managers to align internal performance measures with strategic goals. The second is DeLone and McLean's measures of IS success. The extension focuses on two additional areas. The first is measuring system and business flexibility, which critical in today's fast-changing environment. The second addresses inter-organization and network IT measurement issues.

OVERVIEW

The business value of IT is a topic of importance to both IT and business sides of the organization, as evidenced by the number of professional seminars, workshops and conferences offered by professional organizations and consulting companies, the recent research interest by economics, organizational behavior and IT scholars, and the number of articles published in both academic and professional journals. While various conceptualizations of IT and the appropriate related metrics exist, recent literature reviews (Melville, Kraemer and Gurbaxani 2004; Kohli and Devaraj 2003) indicate that IT value research has focused on efficiency (productivity) and effectiveness (profitability) measures. The measurements are usually taken ex post to test hypothesized models of the IT value. Here, we propose that for both investment and evaluation purposes, leading indicators would be useful additions to the previously identified set of metrics.

In addition, much of the IT value research has been at the firm level. On one hand, this approach uses aggregate measures which limit the ability to differentiate among types of IT investments and outcomes (Kumar 2004). On the other hand, this approach ignores the value chain relationships pervasive in the networked economy (Straub, Rai and Klein 2004). The value of IT can be seriously underestimated if complementarities between IT infrastructure and e-commerce capabilities are ignored (Zhu 2004).

The objective of this research is to develop a more comprehensive set of measures that address the problems identified above. To accomplish this, we build upon two widely-accepted sets of measurement variables, one from systems, DeLone and McLean's (1992) six-factor taxonomy of IS success (system quality, information quality, IS use, user satisfactions, individual impact and organization impact) and one from business, Kaplan and Norton's (2001, 2004) balanced scorecard (efficiency of the internal business process, quality to the customer, and financial, and continuous improvement measures). But what is missing from these is the measurement and evaluation of flexibility. Flexibility is necessary because of the hyper-competitive nature of e-commerce and the short life cycles of products and services, which require firms to adapt their products and services rapidly.

Also missing from these sets of variables is any measurement of value-chain or network level performance metrics. Straub, Rai and Klein (2004) indicate that "There is a pressing need to move forward with measuring performance at a networked organizational level, …" (p. 85).

To accomplish the development of a more comprehensive set of measures, we will rely on the resource-based theory of the firm (Penrose 1959, Wernerfelt 1984) and resource-dependency (Scott 1987). The resource-based view of the firm emphasizes heterogeneous resource endowments as the basis for competitive advantage to the firm. The conditions necessary for a sustainable competitive advantage are value, rareness, inimitability, and non-substitutability (Barney 1991).

Resource-dependency theory argues that organizations must engage in exchanges with their environment to obtain resources. This need creates dependencies that need to be addressed in developing network and value chain performance measures.

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