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Creating Sustainable Value: A Framework for IS Value Sustainability

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ABSTRACT
More than two decades of research on information systems (IS) value still leaves the issue of IS value in an organization a
less understood concept. Considering that information systems require significant investments and commitment, the
compelling issue for organizations, from a strategic perspective, is to sustain and prolong the value accorded by IS to the
firm. In this study, we propose a framework, grounded in the resource-based and dynamic capabilities views of the firm, that
integrates IS value creation capabilities and IS value appropriation capabilities. The premise of this study is that creation of
IS value is necessary but not sufficient to sustain it. To sustain IS value, an organization should be able to appropriate the
value that it creates during the value creation process. We expect to contribute to IS value research by providing insights into
capabilities that help organizations to sustain IS value.

Keywords
Sustainability, IS Value, IT Capability, IS Capability, IT Governance, Value Appropriation

INTRODUCTION
The issue of value of information systems (IS) for an organization remains a complicated and less understood issue because
of the lack of understanding of the process through which such benefits are realized. The issue whether IS adds value to the
organization is rendered even more complex because IS value tends to dissipate over time, owing to changes in internal and
external environment of the firm. The challenge, therefore, facing organizations today is not only how to create value from
their IS investments but also how to sustain that value. From a managerial perspective, identification of capabilities that help
organizations to create IS value and the ones that help organizations to appropriate it, is of particular interest to manage the IS
function effectively. Therefore, the main research question being addressed in this study is how IS value can be sustained in
organizations. The three related research questions are: (1) Which capabilities are required to create IS value in an
organization? (2) Which capabilities are required to appropriate IS value created through value creation process? (3) How do
capabilities required to create IS value and capabilities required to appropriate IS values relate to IS value sustainability?

The objective of this research is to develop an understanding of the capabilities that lead to IS value sustainability. The
approach adopted in this research applies the concepts of value creation and value appropriation, derived from strategic
management literature, to develop a IS value sustainability framework incorporating both value creation capabilities and
value appropriation capabilities.

LITERATURE REVIEW
The concept of sustainability is complex and lends itself to interpretation. Gladwin et al. (1995) expect that the notion of
sustainability will remain fuzzy, elusive, contestable, and/or ideologically contestable. From an organizational perspective,
sustainability refers to the notion of meeting the triple bottom line of achieving economic, environmental, and social goals
simultaneously (Elkington, 1997). Translating the notion of sustainability in context of information system value, Kettinger et
al. (1994) posit that information systems that can not offer sustained competitive advantage have only transient value or my
even have negative or declining value if matched by a superior response by a competitor. From this standpoint, IS value is
sustainable if an organization can continue to creatively and innovatively leverage fewer or existing resources better than its
competitors.

From a strategic perspective, value sustainability is usually considered an outcome of two processes – value creation and
value appropriation (Mizik and Jacobson, 2003). Considering that IS investments are significant and strategic in nature, IS
value sustainability can be meaningfully analyzed using processes of value creation and value appropriation because these processes underline the strategic processes at firm level that are critical to the concept of sustainability.

Resource-based-view (RBV) and dynamic capability literature identifies some of the firm capabilities that are critical for value creation and value appropriation processes as outlined earlier. Conceptually, RBV assumes that firms can be visualized as bundles of resources, that those resources are heterogeneously distributed across firms, and that resource differences persist over time (Penrose, 1959). The resources identified as valuable, rare, inimitable, and non substitutable, can form the basis of value creation strategies and processes (Barney, 1986). Using this perspective, IS researchers have identified IT capability as one important resource for creating IS value (Bharadwaj, 2000). In addition to IT capability, quality of information system use is also identified as an organizational resource that helps enhance IS value (Boudreau, 2003).

On the other hand, dynamic capabilities have been identified as the organizational and strategic routines by which firms achieve new resource configurations as markets emerge or evolve (Eisenhardt and Martin, 2000). From this standpoint, dynamic capabilities are related to the gain and release of resources, including those pertaining to knowledge creation routines that enable new thinking (Eisenhardt and Martin, 2000) and innovation on part of managers and subsequently, the firm. Using this perspective, dynamic capabilities can help a firm either appropriate the value it has created better than its competitors or recreate the value to take it to another level. Some of these dynamic capabilities include strategic flexibility (Grewal and Tansuhaj, 2001), innovation capability (Tuominen and Hyvonen, 2004), and capability to use information strategically (Marchand et al, 2000). Our proposed research framework is grounded in the strategic processes of value creation and value appropriation based on RBV and dynamic capabilities.

We identify multiple gaps in current IS value literature. First, the notion of sustainability as applied to IS value is not well developed. Second, while IT capability has been identified as one of important capabilities that lead to IS value creation, its treatment in current literature is problematic. Current operationalization of IT capability coalesces two distinct capabilities such as technological capabilities and capabilities associated with its management and related processes. The other issue with conceptualization of IT capability is that effect of aspects like IS governance or information management capability on IS value has not been adequately explored. Third, few studies have empirically validated the role of how information systems are used by organizations on IS value derived by them. The conceptualization and operationalization of quality of IS use construct has not received sufficient attention. Finally, even though the context of information use in organizations is partly defined and supported by the organizational information systems, its discussion has been limited in IS value literature as to how it could potentially help organizations achieve flexibility.

**RESEARCH MODEL AND HYPOTHESES**

We use the RBV perspective and identify IT capability and IS capability as two key capabilities. We define IT capability as the ability of the technology that helps an organization to share information across different business functions seamlessly (Bhatt and Grover, 2005). We define IS capability as an organization’s ability to harness and leverage complementary organizational resources in designing, acquiring, and deploying computer-based information systems to create value for the organization (Grant and Liebenau, 1997; Feeny and Willcocks, 1998). We also recognize quality of information system use as an important organizational capability that contributes to IS value (Boudreau, 2003). Quality of information system use is defined as the ability to appropriately exploit the capabilities of the IS applications (Boudreau, 2003). Therefore, we identify three capabilities namely, IT capability, IS capability, and Quality of IS use, as core capabilities that lead to IS value creation in an organization.

During the IS value appropriation process, two key capabilities are examined in our framework. First is the capability to use information generated in the organization effectively for strategic purposes, referred to as quality of information use (Marchand et al, 2000). Second is a higher order organizational capability referred to as value appropriation capability, that stems from strategic flexibility (Grewal and Tansuhaj, 2001) and innovation capability (Tuominen and Hyvonen, 2004). We posit quality of information use as an antecedent to value appropriation capability.

We conceptualize IS value using Balanced Scorecard (BSC) which allows for multidimensional view of value from financial, customer, internal, and learning and growth perspective in one single framework. Our research model is presented in Figure 1.
Based on the proposed research model, we posit:

**H1a:** There is a positive relationship between IT capability and IS value.

**H1b:** Quality of IS use moderates the relationship between IT capability and IS value.

**H2a:** There is a positive relationship between IS capability and IS value.

**H2b:** Quality of IS use moderates the relationship between IS capability and IS value.

**H3:** Quality of information use has a positive relationship with IS value appropriation capability.

**H4:** Value appropriation capability moderates the relationship between IS value and sustained IS value.

**RESEARCH DESIGN**

We propose to conduct this study in context of Enterprise Resource Planning (ERP) application users because of the strategic benefits and implications of ERP application for the organizations. We plan to have a survey based research design. We intend to survey about 300 respondent organizations that have successfully implemented and have been using ERP for at least three to four years in two major areas of business operations. We plan to use validated items from prior literature for the proposed constructs in the research model and conduct a pilot survey to validate them in ERP context.

**EXPECTED CONTRIBUTIONS**

The expected contributions of this research are many fold. First, this research is among the few to address the issue of IS value sustainability. Second, this research contributes to IS value literature by identifying the capabilities that lead to IS value sustainability and could help organizations to sustain the IS value. Third, using the concepts of IS value creation and IS value appropriation, this research highlights the significance of segregating the capabilities that help firms to appropriate or sustain IS value from the ones that help firms to create IS value. By doing so, IS and business managers in organizations can focus on developing interventions that will help them to sustain IS value over a longer period of time. Finally, this research provides a better and more comprehensive view of IS value at the firm level compared to earlier research on IS value.

**CURRENT STATUS OF RESEARCH**

We are working on the survey instrument which we hope to be ready by September, 2006. We expect to do final survey of the organizations during October-January, 2006. This research is expected to be completed by Summer, 2007.
REFERENCES


