Organizational Assimilation Capacity and IT Business Value

Vincenzo Morabito
Bocconi University, Italy

Gianluigi Viscusi
University of Milano, Italy

INTRODUCTION

IT business value represents important outcomes in firms (Banker & Kauffman, 2004; Gable, Darshana, & Chan, 2003; Ravichandran & Chalermsak Lertwongsatien, 2005) whereas information systems (IS) integration represents a relevant amount of the IT spending. Notwithstanding, while most firms are making major investments in information technology, particularly in information systems integration (e.g., ERP and data warehouse solutions), not all of them apply IT effectively in their business activities (Brynjolfsson, McAfee, Zhu, & Sorell, 2006; Dehning & Stratopoulos, 2003; Jason, Vijay, & Kenneth, 2003) obtaining IT business value and organizational competitive advantage.

This research is based on an integrative model of IT business value, aiming to evaluate the mediating effect of an "IT organizational assimilation capacity" between IS integration and organization competitive advantage. Taking into account the theoretical premises that IT business value is generated by the exploitation of both IT and organizational resources, we develop a research model and propose two research hypotheses.

The model and the related hypotheses are based on a large-scale sample survey (Francalanci & Morabito, 2006). The responses were obtained from 466 CIOs and senior business executives, who were members of the firms' top management teams in Italian companies.

BACKGROUND

The term IT business value is commonly used to refer to the organizational performance impacts of IT resources at both the intermediate process level and the organization-wide level, comprising both efficiency and competitive impacts (Melville & Kraemer, 2004). In fact, IT resources generate business value when they are "assimilated" as a routinized element of firms' value-chain activities and business strategies (Aral, Brynjolfsson, & Wu, 2006).

Researchers have employed several theoretical paradigms in examining the organizational performance impacts of IT, including microeconomics (Brynjolfsson & Hitt, 2003; Tanriverdi, 2005; Wade & Hulland, 2004), industrial organization theory (Belleflamme, 2001; Mahnke, Overby, & Vang, 2005), sociology and socio-political paradigms (Chatfield & Yetton, 2000; Devaraj & Kohli, 2003; Hatami, Galliers, & Huang, 2003) and, finally, strategic perspective (Bharadwaj, 2000; Caldeira & Ward, 2003).

Analyzing this stream of studies by focusing on the "focal firm", we can summarize that if the right IT is applied and assimilated within the right business process, the IT application improves processes and organizational performance/competitiveness, conditional upon appropriate investments in complementary organizational resources. In particular, the competitive environment, including industry characteristics and trading partners, as well as the macro environment are relevant to IT business value generation (Melville et al., 2004). Our research is focused at firm level, where IT business value is generated by the deployment of IT resources (including both technology IT resources and human IT resources) through a process that involves the deployment of complementary organizational resources within business processes. Referring to technological IT resources, there are studies that aggregate diverse technological IT resources into a single measure, and studies that examine specific information systems and types of IT.

In the first case, scholars use large-sample data sets, finding support for a positive association between aggregate measures of the technological IT resource and organizational performance (Bharadwaj, 2000; Kohli & Devaraj, 2003). The idea that the technological IT resource confers economic value is preserved when considering alternative econometric specifications, assumptions, data sets, and time frames (Aral et al., 2006). Early evidence indicates both a positive impact (Brown et al., 2000) and no association between technological information resources (TIR) and sustainable performance advantages (Powell & DentMicallef, 1997). Whereas others point out the relevance of managerial IT

skills and culture in order to confer a competitive advantage (Hafeez, Zhang, & Malak, 2002; Mata, Fuerst, & Barney, 1995; Zahra, Hayton, & Salvato, 2004).

Considering the second research approach introduced earlier, scholars have examined specific information systems and types of IT. Several studies find a positive impact on cost reduction, for example, in the context of a production data management system in the clothing industry (Tatsiopoulos, Ponis, Hadzillias, & Panayiotou, 2002), and supply chain management in the food industry (Hill & Scudder, 2002). Enterprise resource planning systems are associated with higher financial market valuation, although short-term effectiveness is reduced after implementation (Hitt & Wu, 2002).

Focusing on organizational performance, the firm's absorptive capacity (Cohen et al., 1990) plays a strategic role, exploiting IT business value by transforming into performance the IT-driven change of the organization, and mediating the assimilation of new external knowledge (Malhotra, Gosain, & El Sawy, 2005; Zahra & George, 2002). In this context, there are studies that assess the degree to which complementary organizational resources mediate organizational performance/competitive advantage impacts, and studies that analyze the highly contextual value generation process.

In the first category, mainly by using quantitative empirical methods applied to large samples of firms, the findings confirm that firms must not only customize technological systems and deploy and maintain them, but also must manage teams of IT and non-IT resources, together generating greater value than they do alone (Brynjolfsson & Hitt, 2000). Non-IT resources include organizational practices and structures that complement the functions of information systems. Empirical analyses discover decentralization of decision authority in firms with higher levels of IT, these firms having disproportionately higher market valuations (Brynjolfsson, Hitt, & Yang, 2002). Another set of organizational resources that may be complementary to IT are firm characteristics, such as worker composition, size, financial condition, and culture. Francalanci and Galal (1998) find that IT business value, as measured by productivity, differs according to employee category: firms with higher IT investment that have also decreased their clerical and professional ranks have higher productivity.

Focusing on the second category of studies introduced previously, the well known example from Clemons and Row (1988) documents IT-enabled efficiencies at McKesson, where customers benefit from rationalizing operations in preparation for the new order entry and distribution system adopted by McKesson. Other case and field studies examine, for example, package delivery (Williams & Frolick, 2001). The co-introduction of IT and complementary organizational changes may not result in immediate success, due to adjustment costs, learning, and other factors (Melville et al., 2004).

In summary, empirical evidence supports the claim that the technological IT resource (TIR) has economic value (Kohli et al., 2003), and that complementary organizational resources interact with IT in the processes of IT assimilation value generation.

Taking these findings into account, *we propose that competitive advantage can result from a specific information systems characteristic* (also realized by mixing different technological IT resources, i.e., ERP and EAI as in our case) *that is, in our case, the "information systems integration"*. But how "IS integration" improves organizational performance? In line with this question, we propose that "IS integration" effect is mediated by a specific complementary organizational resource: the "IT organizational assimilation capacity".

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Based on theoretical proposition that IT business value is generated by the deployment of IT and complementary organizational resources, we develop a research model and propose two hypotheses. In particular, taking into account the role of firm's absorptive capacity (Cohen et al., 1990; Malhotra et al., 2005; Zahra et al., 2002), we propose that the IS integration business value is generated by the mediating effect of the IT organizational assimilation capacity. Although it is possible to apply IT for improved organizational performance with few organizational changes (McAfee, 2002), the IT business value is often generated by the deployment of IT and complementary organizational resources within business processes (Melville et al., 2004). In addition, firm-specific organizational resources tend to be tacit and deeply embedded in the organization's social fabric and history; what is not understood is what specific resources qualify the complementary effect, under what conditions, and how are the attributes of complementary resources related to business process and organizational performance impacts. Due to these issues, we propose a multi-variables concept defined "IT organizational assimilation capacity". We introduce four distinct groups of constructs that represent the elements of an IT organizational assimilation capacity: *training* (or *knowledge*) *orientation*, *change orientation*, *flexibility orientation* and *process orientation*. Further, we point out that the presence of IT organizational assimilation capacity largely influences how well the organization assimilates the business potential of IT, that is, in our case, the "information system integration". This "assimilation capacity" includes devising new IT-ways in which knowledge is distributed and accessed throughout the organization, tasks are accomplished, and so forth. As a result, IT organizational assimilation capacity may amplify or enhance the organizational effects of IT in general and information system integration in particular. Indeed, we propose that:

Hypothesis 1: *Stronger IT organizational assimilation capacity leads to a higher level of firm competitiveness.*