

EDITORIAL ESSAY

Information Technology Can Be Made To Matter: The Importance of E-Collaboration Research

Varun Grover, Clemson University, USA

ABSTRACT

Understanding information technology's impact on firms is critical, particularly in light of the increasingly utilitarian nature of IT. This essay argues that the impact is positive, but in order to create research value, we need to spend more time understanding the processes that convert IT to positive outcomes. E-collaboration is discussed as an important concept in our understanding of these conversion processes.

Keywords: competitive use of IS; electronic collaboration; IS impact; IS performance; productivity

Nicholas Carr rattled a few nerves when he put forth his discourse provocatively titled "IT Doesn't Matter" (Carr, 2003). His thesis suggests that with ubiquitous IT, there is no differential advantage that can be obtained, since everyone has access to the same resources. Therefore, he recommends that firms should drastically reduce their spending on new IT and manage it like the utility that it is. Although he has somewhat retracted his position (Carr, 2004), I believe that his stance is dangerous, since it sends the wrong message to non thinking CEOs who, in their quest for cost savings, use this as an opportunity to slash budgets and do things that are detrimental to the long-term prosperity of the firm.

In this paper, I first rebut Carr's position by arguing that IT can indeed create beneficial outcomes for firms, which could be the source of differentiation. I then argue that

we are inadequately informed on how to do this, and unless we focus on the conversion process in our research, our prescriptions are limited. Finally, I discuss e-collaboration (the focus of this journal) as an important intermediate concept between IT and outcomes that helps us to understand the conversion process.

IT CREATES POSITIVE ORGANIZATIONAL OUTCOMES

IT Does Create Value

Most recent research demonstrates a relationship between IT investments and productivity or other firm level outcomes. Whether it is due to process changes that have allowed firms to leverage their IT re-

sources, investments in complementary resources, or improved assessments of intangible benefits of IT, the productivity paradox is long gone (Brynjolfsson & Hitt, 2003).

IT Can Create Competitive Advantage

Notice I say *can*—not *does*. IT, if considered merely as a stock of undifferentiated assets like hardware and software, could yield productive value, but such value could be theoretically obtained by any firm that has access to the same resources. What differentiate firms are the capabilities that are created from these undifferentiated stocks. I categorize these into two boxes: capabilities of exploitation, and capabilities of exploration. The former refers to the ability of the firm to use its IT assets to better exploit existing organizational capabilities. For instance, by improving storage of data on production processes, communicating information through the supply chain, and processing information to support superior decision making, IT can improve the efficiency of organizational processes and decisions. Gaining greater outputs or lowering inputs is the essence of exploitation for productivity gain. Alternatively, capabilities of exploration involve the use of IT to increase intelligence of the organization on the feasible set of opportunities. These capabilities involve IT, which senses the environment, enables tacit knowledge exchange, and facilitates the interactions required for new innovations. Both capabilities of exploitation and exploration involve deep interactions of IT itself with the organizational processes, knowledge, and relationships. For instance, IT can interact with the knowledge stock of the organization by creating knowledge maps that reflect the people and their knowledge (Grover & Davenport, 2001). By enabling the ability to search for information on knowledge, IT is enabling both a capability of exploitation (i.e., the ability of people to learn and apply lessons from

others in the firm without reinventing the wheel) and a capability of exploration (i.e., the ability for people to identify and recognize the skills and experience needed for a new innovation). Therefore, while the undifferentiated IT might be ubiquitous across firms, the capabilities produced are not. In terms of resource-based thinking, converting valuable but ubiquitous IT assets to capabilities of exploration and exploitation creates heterogeneity across firms, which can be a source of competitive advantage (Mata et al., 1995). In hypercompetitive environments, competitive advantage is no longer based upon long-term strategic systems that are difficult to imitate because of unique in-house development or idiosyncratic protocols. Instead, competitive advantage is based upon sensing opportunities (e.g., product-market gaps) and then leveraging them. Capabilities of exploration and exploitation can do that. Of course, progressive firms must have executive leadership with the foresight to be able to recognize business opportunities, and the understanding of the firm's IT capabilities.

Looking at the notion of IT from an economic standpoint, we can arrive at similar conclusions (Hitt & Brynjolfsson, 1996). As a production function, assessment of IT stock in terms of its contribution to gross marginal output can be assessed. Numerous studies have demonstrated this to be positive and significant, regardless of the production function chosen. Alternatively, we can examine the relationship between IT and profitability. However, this could be influenced significantly by competitive forces. Any IT value created through improvements in productivity could be dissipated, if the IT involved becomes a competitive necessity for the industry. Another perspective could be assessed through the notion of customer surplus. This reflects the difference between the competitive price of a product in the marketplace and its value to a consumer. Firms in

highly competitive markets are forced to lower prices and give up their surplus to the consumer. To prevent that from occurring, they might use IT to engage in strategies (particularly in an e-business context) like customization, versioning, bundling, and so forth that inhibit product comparison across suppliers and force consumers to accept prices closer to the value that they (the consumer) assess (Grover & Ramanlal, 1999). In this case, the surplus goes to the seller. So the impact of IT on the firm reflects a battle between buyers and sellers, each trying to grab as much of the surplus as possible. Take the example of data mining technologies. By collecting good quality data on the consumer, firms might be able to determine how consumers value their products, and then version or customize the product to extract surplus.

WE NEED TO UNDERSTAND “HOW”

All these perspectives lead us to one inescapable conclusion—IT indeed may be ubiquitous, but it certainly matters. The relationship between IT and firm outcomes is far more complex than Carr asserts. Progressive firms can and do achieve tremendous benefits from IT. However, in this information age, the process used to generate these benefits is contingent, exploratory, and under-researched.

Most of the work on IT and outcomes has focused on content issues and variance models. However, by understanding better the conversion processes from IT to outcomes like productivity, profitability, or consumer surplus, we can address the “how” questions of IT impacts, and be in a better position to offer reasonable prescriptions to practice. To do so, however, would require better understanding of intermediate variables and processes. What aspects of the organization are affected in the conversion process? How are

they affected? Once affected, what other aspects are transformed, and how do these changes benefit the firm?

RESEARCH ON E-COLLABORATION CAN OFFER CRITICAL INSIGHT

The focus of this journal is e-collaboration. E-collaboration involves people working together on a common task through IT. I see e-collaboration as a powerful concept that defines the intermediary focus needed to better understand conversion processes between IT and outcomes. The interesting issues that emerge when framing e-collaboration this way should focus on how (conversion process) IT (investments and technologies) improve organizational outcomes (behavior, process, financial) through better collaboration of people (innate characteristics, social context). These relationships could vary by the nature of the task (structure, type), level (strategic/operational), incentives and controls (behavioral/outcome) and scope (functional, organizational, inter-organizational).

By better understanding the impact of IT on collaboration, we are better positioned to add more granularities to the outcome-oriented streams of work described earlier. This is important to *really* understand how IT contributes to organizational outcomes.

However, in order for this work to mature, it needs to draw upon and build on a variety of rich theoretical perspectives, rather than reinvent the wheel. For instance, in the interorganizational context, there are a number of issues pertaining to collaboration across firms. Much on the IS research has focused on transaction cost thinking and the role of IT in influencing governance structure like hierarchies and markets (Malone et al., 1987) and other intermediate structures that reflect levels of integration (Zaheer & Venkatraman, 1994). Within this context, there is opportunity to observe collaboration mechanisms that

can have a dyadic relationship with governance. The cost of these structures and the role of IT in reducing these costs (e.g., coordination costs) could yield interesting insights. For example, the outsourcing context requires various forms of collaborative arrangements that can be informed by theories of organizational control and agency (Eisenhardt, 1985). How does IT affect collaboration so that goal conflict is minimized? Similarly, the notion of relationship building and trust is argued to augment the economic arguments. The role of IT in facilitating relationships so that more effective collaboration can occur is an important area of investigation, particularly in an e-business context where firms are establishing a myriad of relationships with their customers, other firms, and e-markets. Innovation within collaborative relationships is another important area that can benefit greatly from the rich tradition of innovation theory (Swanson, 1994).

Internal to the firm, we can examine collaboration from a process standpoint (although many of the concepts also are applicable to interfirm coordination). Much of the research on process redesign discusses the communication and sharing of IT infrastructure and data to enable more efficient processes (Kettinger & Grover, 1995). Coordination theory that looks at task interdependencies could yield insight into effective collaboration across functions and new structural forms (Crowston, 1997), some of which do not even have direct collaboration. The specific categorization of technologies and matching with task context could be informed through media richness theory. Network theory can add insights into communication patterns and formal and informal communication structures (Monge & Contractor, 2003). At the individual and group levels, there has been significant work on group dynamics and GDSS that can be brought to bear on e-collaboration. Also, computer-mediated communication is a related stream that ex-

amines the impacts of IT mediation on group communication. Individual factors and their influence on perceptions and use of collaboration technologies could form building blocks for this area.

In summary, this intermediate concept of e-collaboration offers fertile ground to examine a plethora of relevant and interesting issues. I also see it as an opportunity to synthesize a number of diverse theoretical perspectives under a common umbrella. But most importantly, it is a concept that I see as integral to the concept of conversion processes—the process of leveraging IT investments into firm benefits. I believe Carr overstated his case. By opening up the conversion box, we can better understand the role of IT in building capabilities of exploitation and exploration that not only matter in terms of firm-level benefits, but also unique differential benefits that are crucial to success. The more we understand the interaction of IT with the organizational context; the better will be our understanding of the intermediate collaboration variables in the ultimate creation of positive outcomes for the firm and its position within the marketplace. This will lead us to the inexorable conclusion that IT can be made to matter!

REFERENCES

- Brynjolfsson, E., & Hitt, L. (2003). Computing productivity: Firm-level evidence. *Review of Economics and Statistics*, 85(4), 793-808.
- Carr, N.G. (2003). IT doesn't matter. *Harvard Business Review*, 81(5), 41-49.
- Carr, N.G. (2004). *Does IT matter?* Boston: HBS Press.
- Crowston, K. (1997). A coordination theory approach to organizational process design. *Organization Science*, 8(2), 157-175.
- Eisenhardt, K.M. (1985). Control: Organizational and economic approaches. *Management Science*, 31(2), 134-149.

- Grover, V., & Davenport, T.H. (2001). General perspectives on knowledge management: Fostering a research agenda. *Journal of Management Information Systems*, 18(1), 5-21.
- Grover, V., & Ramanlal, P. (1999). Six myths of information and markets: Information technology networks, electronic commerce, and the battle for consumer surplus. *MIS Quarterly*, 23(4), 465-495.
- Hitt, L.H., & Brynjolfsson, E. (1996). Productivity, business profitability, and consumer surplus: Three different measures of information technology value. *MIS Quarterly*, 20(2), 121-142.
- Malone, T.W., Yates, J., & Benjamin, R.I. (1987). Electronic markets and electronic hierarchies. *Communications of the ACM*, 30(6), 484-497.
- Mata, F.J., Fuerst, W.J., Barney, J.B. (1995). Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly*, 19(4), 487-505.
- Monge, P.R., & Contractor, N.S. (2003). *Theories of communication networks*. New York: Oxford University Press.
- Swanson, E.B. (1994). Information systems innovation among organizations. *Management Science*, 40(9), 1069-1092.
- William J. K., & Varun, G. (1995). Special section: Toward a theory of business process change management. *Journal of Management Information Systems*, 12(1), 9-30.
- Zaheer, A., & Venkatraman, N. (1994). Determinants of electronic integration in the insurance industry: An empirical test. *Management Science*, 40(5), 549-566.

Varun Grover is the William S. Lee (Duke Energy) distinguished professor of IS at the College of Business & Behavioral Sciences, Clemson University. Previously he was a business partnership foundation fellow and professor of information systems at the University of South Carolina. His current emphasis at Clemson is on building quality graduate and doctoral IS programs. Dr. Grover has published extensively in the information systems field, with three books and more than 150 publications in refereed journals. His current research focuses on the impact and effectiveness of IS at the organizational and market level. A number of recent articles have ranked him among the top five researchers based on publications in top IS journals over the past decade. His work has appeared in journals such as ISR, MISQ, JMIS, CACM, Decision Sciences, IEEE Transactions, California Management Review, among others. He is currently an AE for a number of journals, including MISQ, JMIS, JOM, Database, and IJeC and on the board of editors of numerous others. Dr. Grover has also received recognitions for his research from the Decision Sciences Institute, PriceWaterhouseCoopers, AIS and Anbar Intelligence and has been the recipient of a number of teaching awards.