

## THE DIGITAL ORGANIZATION: SEVEN PRACTICES OF HIGHLY PRODUCTIVE FIRMS<sup>1</sup>

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### Overview

Since 1995, the United States has experienced a remarkable resurgence in productivity with current productivity rates nearly double those of the preceding twenty years. Despite an official recession, productivity growth has maintained its strength, defying the pattern of previous recessions. This recent robustness of productivity levels has been linked to record improvements in the quality-adjusted price of IT equipment, and high levels of investment in these technologies. However, investment in IT capital alone does not guarantee productivity in an organization. As part of an ongoing study at MIT, Professor Erik Brynjolfsson is conducting an analysis of a number of firms that use the Internet and related technologies most extensively and productively to uncover the distinguishing characteristics that may be responsible for heightened productivity.

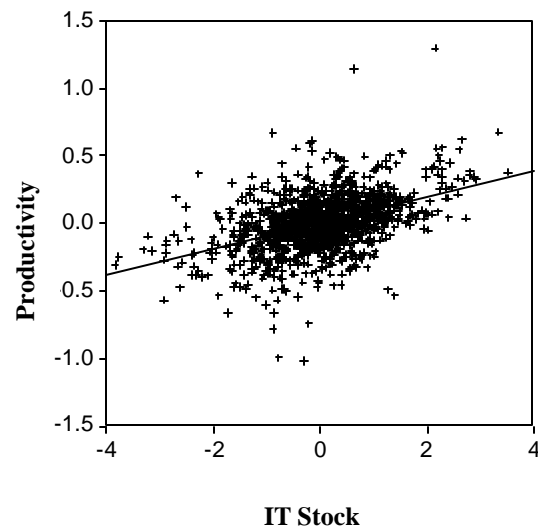
### Research Findings

Through a series of interviews with executives at over 1000 large U.S.-based firms, Brynjolfsson gathered data of various types, including sales, inputs of labor, capital, materials, purchased services, R&D, a number of distinct metrics of computer and communications technology, business practices, and corporate culture. The data was analyzed using Multi Factor Productivity (MFP) as the key performance metric. MFP measures the amount of output per all inputs, including labor and various types of capital used, taking into account prices as well as quantities of inputs and outputs. Unlike labor productivity metrics, which divide output by labor input alone, MFP is more closely related to the economic concepts of how firms can

create value, and has been linked to profitability and shareholder value.

Analysis of the data indicates that, while investment in IT capital is strongly associated with higher productivity, technology alone has not been the most important driver of productivity (see figure 1). Brynjolfsson's research instead reveals a distinct set of organizational practices and corporate culture common to the most effective users of IT, defining what Brynjolfsson calls the "Digital Organization."

Figure 1: IT and Productivity



Statistical analysis shows that the characteristics common to Digital Organizations include:

1. **Converting traditional analog processes to digital processes.** By embedding standard procedures in technology, employees (as well as customers) are able to work with less supervision. Two examples of this are Cisco's policy of minimizing paperwork by routing all processes through the Internet, and UPS's system of providing tracking information to customers online.
2. **Distributing decision rights and empowering line workers,** through increased decentralization and delegation when it comes to choosing which

<sup>1</sup> For more information, please see "Intangible Assets: Computers and Organizational Capital" by Erik Brynjolfsson, MIT CeB Working Paper No. 176, October 2002 and related work at <http://ebusiness.mit.edu/erik>

tasks to do, the methods to do them, the pace of work and the allocation of tasks.

3. **Adopting a policy of free information access and communication**, which includes: encouraging open information access to internal and external documents throughout the organization, using technology to foster both lateral communication (coordination among employees) and vertical communication (between employees and their managers).
4. **Offering strong performance-linked incentives**, including individual performance-based incentive pay and use of stock options for a broader set of employees.
5. **Maintaining corporate focus and communicating strategic goals**. A sharp corporate focus is maintained by weeding out marginal or non-core products and services, and then regularly communicating strategic goals throughout the organization with an emphasis on promoting a strong corporate culture.
6. **Recruiting and hiring top-quality employees and committing the necessary resources to the process**. Executives in these firms tend to be more involved in the recruitment process, and new employees are more likely to be screened for interpersonal skills and for fit within the corporate culture, as well as across a variety of criteria such as education, analytical skills, and computer skills.
7. **Strong emphasis on the investment of “human capital,”** including hiring highly educated employees and then providing ongoing training (much of which is provided online).

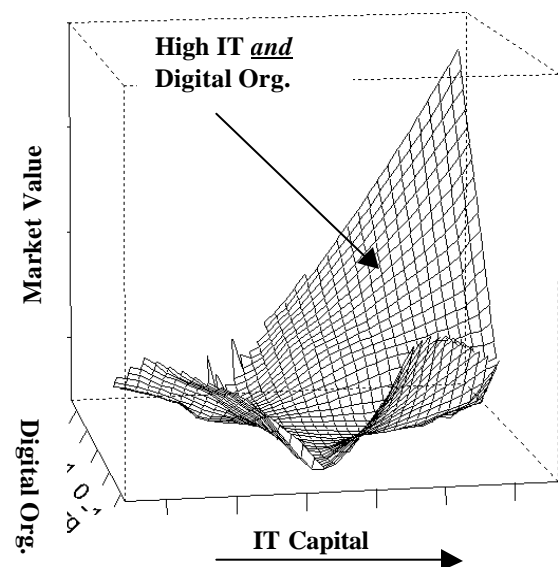
These seven characteristics work together to form a coherent system of complimentary practices within an organization. It is necessary that the practices are adopted together as a whole system; adopting any of the processes in isolation may in fact result in an adverse effect on productivity by introducing barriers to change.

Just as IT investment creates a capital good, so too does “investment” in these organizational practices. In fact, Brynjolfsson’s research reveals that the stock market value of firms which invest heavily in both organizational capital and IT capital is substantially higher than those who invest in one without the other (see figure 2).

## Application of the Research

Brynjolfsson’s research provides a framework for better understanding specific organizational characteristics that correlate with productivity gains. However, understanding these practices does not translate into automatic success for firms. There are a couple important factors that prevent the system from being applicable to all firms. The first is that not all of these practices are well known or understood within firms, and even when they are, there may be circumstances particular to an individual firm that make certain practices inappropriate. The second factor that prevents many firms from adopting such a system is that knowing what to do is, at best, only half the battle. A number of the managers Brynjolfsson interviewed reported significant barriers to implementing any new set of organizational practices, such as financial constraints, technological infrastructure, existing work rules and contracts, and in some instances even corporate culture.

### Figure 2: Interactions between IT and Digital Organization



### About the Researcher

Erik Brynjolfsson is Director of the Center for eBusiness at MIT (<http://ebusiness.mit.edu>), Professor at the MIT Sloan School, an award-winning researcher and Director or Advisor for technology-intensive firms. He lectures worldwide on Internet strategy, pricing models and intangible assets. Erik has Bachelors and Masters Degrees from Harvard and a Ph.D. from MIT.

**CENTER FOR eBUSINESS MISSION**

Founded in 1999, the Center for eBusiness is the largest research center in the history of the MIT Sloan School. Our research is supported by the National Science Foundation and corporate sponsors. We fund more than 45 faculty and more than 60 research projects. Our mission is to be the leading academic source of innovation in management theory and practice for eBusiness.

Examples of Current Focused Research Projects:

- Theory T: Trust-Based Marketing
- Implications of e-Commerce for New Services and Structure of Logistics Systems
- How Do Intangible Assets Affect the Productivity of Computerization Efforts?
- Wireless and Mobile Commerce Opportunities for Payments Services
- Two-Tier Support Business Models
- The Impact of the Internet on the Future of the Financial Services Industry
- Pricing Products and Services in the High-Tech Industry

The Center for eBusiness has recently entered into Phase II, adjusting its agenda to focus more explicitly on business value, while at the same time including technologies beyond the Internet in its purview. The early period of exploration and experimentation is coming to an end and there is now the opportunity, and the necessity, to focus more explicitly on using digital technologies to deliver measurable business value. Amidst all this change, the business fundamentals of investment, revenues, expenses, profits, and satisfying customers have only grown more important. At the same time, a broader, inter-related set of technologies is at our disposal. While the Internet has been an important catalyst, related digital technologies are often at least as relevant.

We are co-located with MIT Sloan's Center for Information Systems Research initiative and the Center for Coordination Science to facilitate collaboration. Amongst these sister Center's at the Sloan School, we also collaborate with the Media Lab and the Program on Internet and Telecoms Convergence.



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