



Change and Challenge: The Impact of E-Business From an Organizational Management Perspective

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ABSTRACT

E-business is a significant disruptive force to organizations. In addition to changing the ways organizations compete, and the formulation of new business models and products, the adoption of E-business forces significant changes to the organizations themselves. This paper describes the fundamental characteristics of E-business that impact organizations and focuses on four major ways in which organizations are impacted: the way organizations are managed and controlled, the way they are designed; technology transfer management; and the nature of work itself.

1. INTRODUCTION

In addition to changing the competitive landscape and introducing new ways of doing business, new products, and new ways to deliver them, the extensive and rapid deployment of E-business has caused significant changes to organizations. Netcentric organizations—those which conduct significant business on internal and external digital networks—are finding that business-to-consumer, business-to-business, and other applications and business models are converging to form the E-enterprise, in which the entire value chain, from procurement to customer service, is fully digitally integrated. Adoption of E-business thus forces many organizational changes that provide new and complex challenges for leaders and managers engaged in electronic business.

Technological, economic, and societal factors have contributed to create the modern netcentric organization. The technical capabilities of the Internet, combined with intranets and extranets, enable new ways to communicate and exchange information at any time, in any place, in a variety of ways. The rapid and continuing decline in technology costs relative to productivity encourages the adoption of these technologies. Economic pressures that support the creation of network-based organizations include the development of the global economy, a competitive environment that demands better-faster-cheaper products and processes, business-to-business alliances, the fast pace of market change, and the increased power of consumers. Societal pressures include changes in the expectations of consumers and workers—for example, in the amount and types of information expected about commercial goods and commercial and government services. More and more, consumers expect 24-7 service levels accessible via the Internet. As the technology matures, mobile commerce will become an expectation as well.

The extent to which organizations are impacted by E-business is, of course, a function of how thoroughly and how rapidly they adopt netcentric business processes. A company that uses the Internet merely for posting an online catalog (an early, first-stage implementation of E-commerce) is not as extensively impacted as the organization that participates in enterprise wide inter-organizational E-business. Companies that are culturally open to change and which have leaders who understand the capabilities and benefits of digital, information-based, processes will be affected most.

This paper describes the general characteristics of E-business that force fundamental change to organizations and focuses on four significant dimensions of the organizational impact of E-business: the way organizations are managed and controlled; the way they are designed; technology transfer management; and changes to the nature of work—what workers do and how, where and when they work.

2. E-BUSINESS: A DEFINITION

A definition of E-business, as used here, is necessary, particularly in regards to E-commerce. There is certainly debate among information technologists and academics about the meaning and coverage of the terms “E-business” and “E-commerce.” Rayport and Jaworski (2000) argue that E-commerce encompasses the entire set of electronically based organizational activities, including the information systems infrastructure. Kalakota and Robinson (2001), on the other hand, use “E-business” as the more inclusive term, and posit E-commerce as a precursor, developmentally, in an organization’s progression to E-business. Laudon and Traver (2001) suggest that E-commerce primarily involves transactions that cross firm boundaries, while E-business concerns use of digital technologies for processes within the firm—thus viewing the concepts as mostly exclusive with some overlap.

For this paper, a broad view of E-business is adopted, one that encompasses E-commerce and includes all digitally based transactions, processes, and communication, both internally and externally directed, which support the organization. Organizations that fully embrace E-business are “netcentric.” They conduct significant business on intranets, extranets, the Internet, and other networks of various protocols and technologies. Under this definition, in addition to Internet protocol technologies and online commerce, E-business technologies include collaborative software, electronic data interchange (EDI), enterprise wide databases, real time information exchange, enterprise applications (such as Supply Chain Management and Customer Relationship Management), mobile commerce and more.

3. DISRUPTIVE FORCES

Historically, technology has been an enabler of business transformation, and E-business technologies are certainly no exception. The concept of information technology as a disruptive force within organizations is one that was developed at least a decade ago and incorporated into basic concepts of re-engineering (Champy, 2001).

As a set of technologies, E-business is arguably the most disruptive force in organizations in many decades. At the core of the impact of E-business is its capability to “collapse” time and space, allowing organizations to dissolve boundaries to better-faster-cheaper commerce (Ashkenas, Ulrich, Jick, and Kerr, 1995). The Internet, for example, reduces or eliminates time boundaries by enabling fast, instantaneous, or

simultaneous communication and sharing of information. E-business technologies lessen geographic boundaries that physically separate employees and organizations from one another and from their customers. Network based collaborative software, for example, allows for synchronous or asynchronous communication and effective team building across boundaries. Workers use search engines and intelligent agents ("bots") to scour global resources for the latest news, research, and other information to support organizational objectives. Streaming video, as an example, has the capability of delivering complex, content-rich information in real time mode whenever the viewer is ready.

Operating with an E-business paradigm is also disruptive in relation to the balance of power between companies and their customers. Fingar, Kumar, and Sharma (2000) suggest that because of the access to information, the Internet "turns the producer-consumer relationship upside down, with the balance of power going to the customer". This is very different from earlier business paradigms in which information was tightly controlled by companies.

The primary characteristics of E-business which contribute to its being a disruptive force in organizations include:

- **Ubiquity.** Traditional commerce is limited by place. The E-marketspace is available to consumers nearly everywhere at times and in locations convenient to them. Organizations change structurally to support this.
- **Reach.** Most traditional commerce is local or regional, concentrated in geographically accessible merchants. E-business encompasses global reach and introduces global management and control challenges.
- **Richness.** This refers to complexity and content of a message or product. In traditional commerce there is a tradeoff between richness and reach—in order to provide rich content a seller needed to be face-to-face with a customer. Through online business and mass customization of digital content, E-business can dispel that tradeoff.
- **Interactivity.** E-business technologies support easy, two-way synchronous or asynchronous communication among workers, between the organization and its customers and suppliers, and between organizations.
- **Information transparency.** This refers to the ease, efficiency and effectiveness of information collection, distribution, and exchange that surrounds the netcentric organization.

These disruptive forces fundamentally alter the competitive environment in which organizations operate and force them to change in order to compete successfully and, in the long run, to survive.

4. ORGANIZATIONAL IMPACT: MANAGING E-BUSINESS

4.1 Management and Control

One major impact on the organization is the way it is managed and controlled. The fundamental challenge to management is the need to implement the processes and infrastructure that support information management, in addition to the traditional product management paradigm. The introduction of disruptive E-business technologies cannot help but significantly (and appropriately) impact the organization's management structure and management processes.

Through the deployment of networks, information quality and richness has improved; and its facile and rapid movement throughout the organization has been greatly enhanced. Information transparency can provide lower-level workers the information they need to make decisions with less direction from upper management. Thus managers and workers who previously merely served as conduits of information can be bypassed, and eventually eliminated. This facility of knowledge transfer tends toward less structural formality, decentralization of decision authority and a greater reliance on skills (Wang, 1997). It therefore promotes a flatter managerial hierarchy because employees have greater independence and managers have a wider span of control.

Technological innovations themselves introduce new managerial challenges. Organizational leaders need to understand new ways to compete effectively (Porter, 2001). E-business infrastructure is complex,

requires high levels of consistency and reliability, and often is globally implemented. For example, technical managers must acquire new skill sets for rapid development and implementation. They need to understand the capabilities and limitations of new technologies and develop strategies for integration into existing processes and systems. Yourdon (2000) suggests that newer flexible, rapid development approaches to project management are necessary for E-business projects. Managing the interfaces and relationships in inter-organizational systems and networks is particularly challenging.

In planning for E-business, organizations need to carefully evaluate their own current capabilities and identify new capabilities needed. In the rapidly changing digital environment, traditional top-down planning is often viewed as too cumbersome and inflexible (Kalakota, 2001). Because of this, the insights of front-line employees have increased significance and tend to support a more bottom-up strategy (Wang, 1997). Unfortunately, the "just do it" approach, which de-emphasizes planning and delivers products more quickly, also has a high level of risk. Arguably, dissatisfaction with early implementations of E-commerce applications is a result of poor planning and design.

4.2 Managing the Transition: Technology Transfer

A second major impact for the organization is managing technology transfer for E-business. A major concern of corporate leaders and managers is how to effectively and efficiently transform an organization from an older business design and model to one that is competitive and fully operational in the digital world. They must function as change agents, anticipating the need for transformation and carefully guiding the organization through planning and implementation of all the facets of new business paradigms. The transformation may be gradual or quick, narrowly or widely focused, involve only internal components or extensively involve customers and suppliers and other external entities.

In order to be effective, organizations that choose to participate in E-business must adopt new technologies, change existing business processes, and transition workers to new roles and skills. Major characteristics and processes for successfully managing the transition include vision, process re-engineering, and architecture redesign.

Inter-organizational relationships are a significant aspect of E-business. Businesses are extending their internal processes and strategies into inter-organizational space in order to gain benefits, such as cost reduction, and there is a growing reliance on inter-organizational learning to improve performance (Scott, 2000). These extensions introduce an additional level of complexity in inter-organizational relationships. Supply Chain Management systems, for example, contribute value through the sharing of data and processes, but require a high level of trust among participants (Hoffman, Novak, and Peralta, 1999).

4.3 Organizational Re-design

A third major way that organizations are impacted is organizational design. Information technology (IT), in general, has long been a source of consideration regarding its impact on organizational design (see, for example, Malone and Rockart, 1993). Lau *et al* (2001) argue that design and culture are the two most significant ways in which IT impacts the organization. Lucas and Baroudi (1994) provide a strong view of E-business technologies as agents for organizational change, particularly for new organizational forms such as virtual organizations, negotiated organizations, and vertically integrated conglomerates.

One way in which design is impacted is because of the ubiquity and transparency of information. As noted previously, these forces tend toward supporting a flatter organization. Another way organizations redesign themselves is through alliance building for E-commerce, something even small companies can use effectively. Because of the facility of communication and the lowering of coordination costs, companies can more easily exchange information as a resource and as a commodity. The result is increased value-added partnering, such as for supply chain management systems (Hitt and Brynjolfsson, 1997). The E-enterprise includes organizations in the same and other industries that work together through complex processes that bring together customers, suppliers, distributors, and others. This leads to an interesting

phenomenon—the cooperation of competitors, for example in establishing industry exchanges that facilitate purchasing.

Still another significant way organizations change their structure for E-business is via globalization, which is enabled by telecommunications networks and is a feature of advanced E-business adaptation. At the simplest level of implementation, companies can adopt E-business with little change to structure. However, as organizations begin to fully exploit the E-business capabilities that reduce or eliminate space and time barriers to commerce, they need to adopt structures that support a global IT infrastructure. Consultant Robert Heller (2001) argues that no matter how well a CIO wires a global enterprise, a top-down inflexible structure will keep it slow and inefficient.

The ease and low cost of communication via the Internet has also facilitated further growth in outsourcing (Wang, 1997). The virtual organization extends the outsourcing facility to its maximum capability (Donlon, 1997). As an example, application service providers sell access to Internet based software applications. Organizations that contract for these services can reduce costs and eliminate the difficulties of developing and maintaining complex systems, particularly those systems that are fundamentally operational and do not deliver competitive advantage. Organizations that adopt significant levels of outsourcing require different organizational structure than those that do not (Lucas and Baroudi, 1994).

5. ORGANIZATIONAL IMPACT: WORK AND WORKERS

A very significant way in which organizations are impacted by E-business adoption is in the change in the way people work. Efficient and effective communications, access to a wealth of various types of information, and the automation of processes inevitably lead to work redesign and an increase in “virtual” (i.e., netcentric) work. In fact, to fully exploit the capabilities of these technologies and processes, an organization must redesign what tasks workers must perform, where and when they perform them, who does the work and what kinds of skills are needed.

Some tasks are best done by people, but many others within the E-commerce realm can be effectively done by computers. As more and more organizations adopt E-commerce and its functionality expands, more and more processes will be automated. Disintermediation efforts—for example, the replacement of telephone order clerks with web-based ordering—replace workers who once performed basic sales and customer service tasks (Kalakota and Robinson, 2001) and introduce knowledge workers who need to be capable of collecting, analyzing, and integrating information. They handle the more complex transactions and queries that require more integrated complex skills and which cannot be easily automated.

Where and when people work is also changing. Network based work is information and knowledge intensive and is less tied to restrictive time and place parameters (Hitt and Brynjolfsson, 1997). Although the wireless data communication industry has had a rocky start (Dunne, 2001), mobile E-business retains the potential to deliver real time information to remote locations and to enable many types of commercial transactions that can be executed outside the traditional work environment and work hours, thus supporting a more mobile work force. Web-enabled personal devices will greatly extend functionality and mobility and Virtual Private Networks will provide the flexibility and security workers need. Organizations will more frequently face the challenges of managing, evaluating, and rewarding virtual workers who are globally dispersed.

As noted earlier, the changing communication patterns of workers lead to a flatter organizational structure. They also lead to more collaborative work (Rudnick, 1996). Cross-functional integration, inter-organizational and intra-organizational structures are common components of E-commerce that are facilitated by collaborative technologies. Task oriented work teams are not limited by geographic proximity. Virtual communities, uniting managers, workers and professionals within and across organizations, and even across industries, can be more easily developed and maintained for supporting knowledge sharing and learning (Lau, 2001).

From the worker's point of view, there are several major negatives for workers. One is the worker stress that is an inevitable result of extending the work into leisure time and into homes and cars and other traditionally non-work spaces. The fast pace of change, the need to adopt new skills quickly, and independence in knowledge work, are also stress factors. Another concern to workers is the ease with which processes can be outsourced. Once an infrastructure for virtual work is established, work can be accomplished abroad as easily as it can be done domestically. While easier access to less costly human resources is a financial benefit to companies, “electronic immigration” can result in job losses.

6. E-BUSINESS: A “SYSTEMS” PERSPECTIVE

Because of its extensive impact on the core parameters of an organization, organizational leaders and managers must approach E-business with a “systems” perspective. E-business is not *just* about changing business processes and the way products are developed, marketed and distributed. A systems perspective will approach the adoption of E-business as a systemic change, affecting multiple aspects of an organization's components, including organizational culture. It is too easy for managers to see E-business as an “external” objective entity that is about *what* to manage, instead of one that directly affects *how* to manage. Managers who recognize the significant expected impact will be better prepared for changing the way that people are managed, changing the structures that support management, supporting employees as they change how, when, and where they work, and enable an organizational culture that will support effective and successful E-business.

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