

# Strategies of E-Commerce Business Value Optimization

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## INTRODUCTION

The Internet economy is becoming an integral part of many countries' economies, creating new jobs, giving rise to new companies like the dot coms and transforming traditional jobs and traditional companies. The Internet is increasingly becoming a part of the basic business model for many companies as organizations around the world are adopting new e-business models, integrated solutions to explore new ways of dealing with customers and business partners, new organizational structures and adaptable business strategies (Singh & Waddell, 2004). There are many definitions of electronic commerce (e.g., Wigand, 1997). Here, a classic definition by Kalakota and Whinston (1996) is adopted, where e-commerce is "the buying and selling of information, products and services via computer networks today and in the future via any one of the myriad of networks that make up the 'Information Superhighway (I-way)'" (p.1). A distinction between physical and digital products can be made. A digital product is defined as a product whose complete value chain can be implemented with the use of electronic networks; for example, it can be produced and distributed electronically, and be paid for over digital networks. Examples of digital products are software, news, and journal articles. The companies selling these products are usually Internet-based "digital dot coms" such as Yahoo and America Online. On the contrary, a physical product cannot be distributed over electronic networks (e.g., a book, CDs, toys). These products can also be sold on Internet by "physical dot coms", but they are shipped to the consumers. The corporations using electronic commerce are distinguished into "bricks and mortar" companies, hybrid "clicks and mortar" companies (such as Amazon.com) and pure dot coms (Barua & Mukhopadhyay, 2000).

Many studies from the early days of deployment of information technology (IT) in organizations have struggled to measure the business value and profitability of information technology (Barua & Mukhopadhyay, 2000). Many of these studies have showed that productivity gains are small or non existent and that the effects of information technology and electronic commerce have

to be often looked upon from a competitive advantage point of view (Barua, Konana, Whinston, & Yin, 2001; Porter & Miller, 1985; Scupola, 2003). Recent research has argued that increasing the business value of electronic commerce to a corporation is important to shift the focus from whether electronic commerce creates value to a company to "how to create value" and "how to optimize such value" (Barua, Konana, Whinston, & Yin, 2001). This can be achieved by exploring complementary relationships between electronic commerce, strategies and complementarity (Scupola, 2002, 2003).

## BACKGROUND

Since the early days of IT use in commercial organizations, researchers and professionals have struggled with the problem of measuring the bottom line contribution of IT investments (Scupola, 2003). Six main areas of IT business value research can be distinguished: information economics-based studies; early IT impact studies; production economics studies that did not find positive impacts; microeconomics studies that found positive impacts of IT; business value studies; and studies involving complementarity between IT and non-IT factors. The information economics-based studies date back to the 1960s, and though relevant to the economic contribution of IT investments, they mainly focus on the changes in information due to IT use and their impact on the single decision-maker. Therefore, while the information economics approach is theoretically sound and rigorous, its unit of analysis, which is either the individual or team decision, makes it difficult to obtain meaningful and insightful results in broader organizational contexts (Barua & Mukhopadhyay, 2000).

In the early 1980s, a stream of research emerges focusing on assessing the contribution of IT investments to performance measures such as return on investment and market share (Barua, Konana, Whinston, & Yin, 2001; Barua & Mukhopadhyay, 2000). The majority of these studies did not find much positive correlation between IT investments and firm performance metrics up to the early 1990s. The lack of correlation between IT investments and

productivity made Roach (1988, 1989) to coin the term “IT productivity paradox”.

In the 1990s, research on measuring the economic and performance contributions can be divided into two main streams: one based on production economics and one based on “process-oriented” models of IT value creation. The IT production studies based on production economics hypothesize that IT investments are inputs to a firm’s production function. These studies (e.g., Brynjolfsson & Hitt, 1993, 1996) finally started finding signs of productivity gains from IT. For example, Brynjolfsson and Hitt (1996) identify three sources of IT value to a corporation: productivity, consumer value, and business profitability. The study shows that information technology contributes to increases in the productivity and consumer value, but not business profitability. Simultaneously, process-oriented studies started hypothesizing relationships between IT and other input factors to performance measures at various levels of aggregation. These studies (e.g., Kauffman & Kriebel, 1988) have laid the foundation of the business value approach to the impact of IT on firm performance. This approach on the contrary of the production function-based approach might have the explanatory power to point out where and how IT impacts are created and where management should act to increase the payoff from IT investments. These explanations are more difficult to get with production function-based approaches since they operate at a very high level of aggregation, thus making it difficult to distinguish between different types of IT investments and their impacts on specific areas of business. After having dispelled the productivity paradox, new refinements to existing approaches are emerging to measure the contribution of IT to business performance. An important stream of research is pointing to complementarity theory to investigate the interactions between IT and other organizational factors (e.g., Barua, Konana, Whinston, & Yin, 2000, 2001; Barua, Lee, & Whinston, 1996; Barua & Mukhopadhyay, 2000). In fact, production economics and business value approaches have mostly ignored the synergy between IT and other related factors such as the level of fit with business strategies, employee empowerment, and team orientation of business processes. Barua and Mukhopadhyay (2000) present a generalized business value complementarity model that explores the synergies among such factors. The basic idea of their business value complementarity model (BVC) suggests that investments in IT should be first related to intermediate performance measures such as time to market, customer service, response time and extent of product mass customization to be able to see any positive results from such investments. In a second moment, the intermediate performance measures can be related to high-level performance metrics such as profitability, return on investment (ROI), market share. The focal

point of a business value complementarity model is the complementarity that potentially exists at each level of the model (Barua & Mukhopadhyay, 2000; Barua, Konana, Whinston, & Yin, 2001; Scupola, 2003).

The advent of the Internet, based on open standards and a universal Web browser, raises the question of whether investing more in Internet technology lead to a better financial performance in electronic commerce. This calls for more attention to the specific business processes that have to be reengineered for online commerce and the way they should support the company strategy (Scupola, 1999, 2003).

## **MAIN THRUST OF THE ARTICLE**

A business value complementarity (BVC) model of electronic commerce could be used as a methodology to optimize e-commerce initiatives when entering the e-commerce arena (Scupola, 2003). The BVC model presented here is based on the value chain (Porter, 1980), the theory of BVC (Barua, Lee, & Whinston, 1996; Barua & Mukhopadhyay, 2000; Barua et al., 2002; Milgrom & Roberts, 1990) and the concept of strategy (Porter, 1982). In this model, it is hypothesized that complementarity (represented in Figure 1) exists between the variables of the same level and different levels of the model. It is furthermore hypothesized that the exploration of complementarities and possible synergies between the company strategy, the primary activities of the value chain, corresponding business processes and supporting technologies should: 1) maximize the business value of electronic commerce to a corporation and 2) lead to a better fit between the overall organizational strategy, the business processes that have to be transformed for the online market place, and the information system that should be designed and implemented to support these strategies. The exploration of complementarities, it is hypothesized, can also contribute both to avoid investments into an information system that could not be used at a later point if new e-business processes should be added to the system and avoid the implementation of a business model that does not correspond to the corporation’s strategy. It is argued that to succeed in electronic commerce it is important to reengineer the parts of the value chain and the corresponding business processes relevant to the product in question and the company strategy.

The main objective of the model is to make the business value of electronic commerce as close to optimal as possible in terms of one of the performance measures, such as company profitability, competitive advantage, increase in market share, shareholder value or customer satisfaction. This can be done by exploring

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