NORTH-HOLLAND

Industrial Marketing Management 32 (2003) 291–300

INDUSTRIAL MARKETING MANAGEMENT

The relationship between technology adoption and strategy in business-to-business markets The case of e-commerce☆

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Received 28 May 2001; received in revised form 4 April 2002; accepted 4 June 2002

Abstract

Firms have been traditionally advised to adopt information and communication technologies (ICT) to support the achievement of existing business objectives. However, entry into business-to-business e-commerce may require the concurrent adoption of new business strategies. This paper argues, therefore, that ICT analysis needs to be considered at the same time and at the same strategic level, as internal, competitor and market analysis. This is because the source of the competitive advantage brought by ICT has changed, to be largely obtained through increase in customers' perceived value. The literature presents a confused picture of the likely consequences to a firm of its adoption of e-commerce. This paper concludes that any such adoption must be evaluated in the environment of the individual firm. A multidimensional analytical framework, taking a combined informational and marketing perspective, is presented to assist with such evaluations.

Keywords: E-commerce; Technology adoption; Business objectives; Business strategies; Competitive advantage; Analytical framework

1. Introduction

Business-to-business markets have fewer partners, closer buyer–seller relationships, better technology and better information exchange than business to consumer markets [1]. Not surprisingly, they form the largest growth sector in terms of e-commerce and earn somewhere over 80% of the e-commerce revenues [2]. The proportion of these firms engaged in business-to-business e-commerce that have developed specific strategies for their use of the Internet, cognisant of its potential impact on existing business practices, is not known.

Digital technology, particularly the Internet, has been described as an enabler of a new, quasi economically efficient marketplace: one that is only limited by the unpredictability of consumers' behaviour. The new marketplace has been characterised by "perfect information for all," or at least, "equal access to information about products, prices and distribution" (Ref. [3], pp. 157–163). The Internet and e-commerce have also been predicted to underpin a structural shift in business orientation, towards price convergence, with subsequent realignment of business networks [4,5].

However, the impact of information and communication technologies (ICT) remains uncertain. Moderating environmental and circumstantial constraints include, *inter alia*, the variable rate of business representation on-line, logistics inefficiencies, imperfect information search capabilities, political boundaries and the black-box that business relationships are still today. Grover and Ramanial [6] cite six myths and what they call counter-myths concerning the impact of emerging ICT on markets, listing competing influences, which could, for instance, challenge the conventional assumption that the new business environment benefits the customer side of a supply relationship, rather than the supplier.

If a firm adopts ICT-based innovations without a clear understanding of the scope and implications of that adop-

☆ A multidimensional analytical framework that help firms evaluate whether to adopt e-commerce.

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0019-8501/02/$ – see front matter
doi:10.1016/S0019-8501(02)00237-7

tion, then not enough attention may be paid to realigning business strategy. As a result, business resources needed to achieve competitive advantage from the ICT investment may not be made available [7] and the investment in innovation may in the end be wasted, or even be detrimental to the firm's pre-adoption competitive position.

The development of effective marketing strategy involves conducting internal, competitor and customer analyses as preliminaries to formulating strategies for market segmentation, targeting and positioning. Within this process, ICT is mostly considered either as (a) an environmental influence on the business-to-business market, along with economic, political and competitive influences (Ref. [1], p. 33) or (b) as an element of internal analysis, under the potentially misleading label of "technological environment analysis" (Ref. [1], p. 168). The conventional wisdom is that "technology strategy must reinforce the competitive advantage a firm is seeking to achieve and sustain" [8].

This paper argues that ICT analysis needs to be considered on par and interdependently with internal, competitor and market analyses. More specifically, it argues that decisions about potential adoption of business to business e-commerce affect these analyses and, therefore, e-commerce adoption may require the concurrent adoption of new business strategies. Here, e-commerce is interpreted generally as "the use of electronic means and technologies to conduct commerce" [9].

In developing this argument, the paper looks first at the way the source of the competitive advantage brought by ICT has changed over time. Next, lack of consistency in the use of the term "e-commerce" is linked to the confusing picture of the advantages and disadvantages of e-commerce adoption that has been painted in the literature. It is concluded that e-commerce adoption must be evaluated in the environment of the individual firm. The need for marketing strategies to be adjusted interdependently with adoption strategies is then justified. Section 6 presents a framework that may assist managers in designing a marketing/adoption strategy, by taking into account informational and market considerations.

2. Competitive advantage

The impact of ICT innovation on business can be viewed as a succession of stages over the history of ICT. In the initial stages, the technological environment could be described in terms of product technology—the set of ideas embodied in a good or a service—and process technology—the steps involved in producing that good or service [10]. Decisions about the adoption of ICT were, therefore, able to be made in the framework of production theory, in which adoption creates benefits in the form of lower production costs for a given level of output. Productivity benefits included operational gains (via rationalisation, product standardisation and such) and economic gains (via lower costs of labour, economies of scale, knowledge acquisition and such). Technology adoption by a firm led to competitive advantage through productivity based efficiency, provided that access to the technological development was restricted, that is, provided there were effective barriers to entry [8,11–14].

Porter's prerequisite of barriers to entry for the achievement of competitive advantage was tested as ICT became more affordable and accessible. Accordingly, the idea of ICT-based, production related, competitive advantage became less sustainable during the 1980s and 1990s, when ICT penetration increased rapidly. Indeed, by the late 1990s, technology was increasingly forcing business operations to follow the standardised models of behaviour and terminology required by off-the-shelf business software, whether small business accounting packages or sophisticated enterprise wide systems such as SAP [15–17].

In the face of wide diffusion of production technology and a market increasingly perceived as global, firms therefore needed to differentiate themselves and/or their products in the consumers' eyes, in order to establish or maintain competitive advantage [18]. During the last decade, the source of competitive advantage has increasingly been seen to reside in the supplementary benefits provided to customers, leading to the creation of sustainable perceived value for customers [19,20]. As well as high perceived quality, control over costs, and product innovation (all of which are helped by ICT support), a firm has to have excellent service, a market-driven learning-oriented culture and speed, that is, the ability to deliver quickly and to quickly solve customer problems [20]. In business markets, speed also involves time to market [21], because being first to the market is usually associated with competitive advantage [22]. Managerial attention refocussed on ICT, therefore, not for production, but for management of procedures associated with sales and business administration [10]. Thus, for example, Kalakota and Whinston (Ref. [23], p. 9) claimed that "in order to be competitive, marketing executives must employ technology to develop low-cost customer-prospecting methods, establish close relationships with customers, and develop customer loyalty."

Value creation is important for business because customers compare the perceived net value associated with each competing business offering and choose the highest value [24,25]. However, competition based on customer's perceived value has a two-tier consequence for firms. First, it shifts business orientation towards the market [26]. Specifically, adoption of the marketing concept directs the efforts of the firm as a whole to satisfaction of customers' needs, subject to business objectives and societal interest. Because the acquisition of new customers is believed to be more expensive than the retention of existing ones, business strategy focuses on customer loyalty and the development of long-term relationships with good customers [20]. This focus in turn has the consequence that a firm needs to know its market and, more precisely, what actual and potential