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A structural analysis of business-to-business digital markets☆

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Abstract

Digital markets allow sellers and buyers to conduct transactions electronically and are becoming major driving forces in business-to-business e-commerce. This article explores the theoretical and managerial foundations of digital markets. This study first investigates the structure and components of digital markets. A comprehensive sample of 196 digital markets is then examined to uncover the structural dimensions and success factors of digital markets. The findings of this study provide important managerial insights into various issues that are pertinent to the functioning of digital markets, such as how the nature of founding companies may affect the dominant function chosen for a digital market and what factors may affect the market-making mechanisms used by the digital markets.

Keywords: B2B; E-commerce; Digital exchanges; Vertical hubs; Functional hubs

1. Introduction

Electronic commerce (or e-commerce) represents a new way of conducting business transactions, including buying, selling, or exchanging products, services, and information, usually through communications networks such as the Internet, intranet, and extranet. According to Kalakota and Whinston [1], e-commerce provides the business world with the following functions: electronic delivery of information, products, services, or payments; automation of business transactions and work flow; reduction in service costs while improving the quality of goods and increasing the speed of service delivery; and use of online services. E-commerce is rapidly reshaping the marketing domain and many of its traditional practices, such as business-to-business transactions [2].

E-commerce can be classified by the nature of business transactions, including business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), consumer-to-business (C2B), and intraorganizational e-commerce. Among them, B2C and B2B e-commerce have attracted the most attention so far. B2B e-commerce reflects that both sellers and buyers are business corporations. B2C e-commerce, however, reflects that buyers are individual consumers.

Although B2C e-commerce and its glamorous high fliers (such as Amazon.com) often capture the media headlines, B2B e-commerce actually enjoys the biggest slice of e-commerce pie and has been growing rapidly during the past 1 or 2 years [3]. According to the forecast by Forrester Research, B2B e-commerce transactions in the U.S. will total US$2.7 trillion by 2004. The B2B side of e-commerce is seen as more lucrative than B2C e-commerce because it is 10 times larger than the retail market and business consumers are generally less fickle than retail consumers [4].

A conspicuous occurrence in B2B e-commerce is the rapid development of digital markets. A digital market is an online business transaction platform for buyers and sellers. The new business models in digital markets include auctions, aggregators, bid systems, and exchanges [5]. Forrester Research estimates that by 2004, digital markets will capture 53% of all online business trade.

B2B e-commerce is restructuring the global business pattern. As indicated by Gartner Group, by 2000, the US will no longer be the dominant B2B e-commerce player in the world. North America accounted for 63% of the B2B digital market in 1999. However, Europe is investing

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heavily in the B2B digital market and North America's share of the B2B market will drop to 40% by 2004. The growth of B2B e-commerce in Asia and the Pacific will also be significant in the near future. As Gartner Group pointed out, B2B e-commerce will be truly worldwide by then [6].

B2B e-commerce covers a broad range of applications that allows companies to form electronic relationships with their distributors, resellers, suppliers, and other partners. The Internet allows B2B e-commerce players to link their companies to the digital market easily and inexpensively. B2B also facilitates supply chain management. Supply chain management involves the coordination of order generation, order taking, and order fulfillment/distribution of products, services, or information [1].

Electronic payment is a financial exchange that takes place online between buyers and sellers. A successful digital market possesses the capability for electronic payment, thus reducing operational and processing costs, decreasing technology costs, and speeding up completion of transactions.

B2B e-commerce also can play an important role in procurement management for purchasing companies. They can reduce purchase prices and cycle time by taking advantage of the digital market's liquidity and transparency [7]. Purchasing companies can eliminate redundant steps from the buying processes through streamlined electronic workflow.

A digital market typically offers a wide variety of supplementary services as needed by the trading members, such as authenticating buyers and sellers and streamlining procurement workflow; electronic payment services, risk management, contractual and settlement services; conflict resolution and legal services; and logistics services. Therefore, a capable B2B digital market could lower purchasing costs, reduce inventory and warehouse costs, enhance the efficiency of logistics and procurement, lower marketing cost, and increase sales in the market.

This article provides a structural analysis of the B2B digital markets. A structural analysis allows marketing researchers and practitioners to uncover the underlying dimensions, structure, and various characteristics of the subject. The purposes of this research are fourfold: identify the types of existing B2B digital markets, investigate the key characteristics of current digital markets, identify successful factors of running B2B digital markets, and assist start-up companies' investment decision making on participating digital markets. The article first identifies various business models in e-commerce, including B2C- and B2B-based business models. The objectives, design, and findings of structural analysis on 196 digital markets are presented in the later sections. Management implications and conclusions are given in Section 8.

2. Business models in e-commerce

Business models for e-commerce are classified into three categories by Jutla et al. [8,9]: the e-broker or cybermediary model, the manufacturer model, and the auction model. The cybermediary or e-broker model is characterized by use of an intermediary between suppliers of goods and/or services and the customer. The intermediary or cybermediary adds value to its online supplier sites, either by marketing a large range of similar products from one site, enabling comparison shopping, or facilitating coalition industries that provide multiple company listings. This model can support the sourcing of a product or service from many suppliers and may provide customers with more products/service choices, better delivery terms, or bulk discounts [8,9]. Companies such as Amazon.com and 1-800-FLOWERS belong to the cybermediary model. The cybermediary model has several advantages. It reduces the inventory management overhead, in terms of staffing and space, and it reduces capital tied in inventory. Most importantly, it provides expertise (such as marketing and delivery) across the supply chain from manufacturers to customers. Cybermediary companies are marketing specialists that provide services to reduce the market prices of products/services.

The manufacturer model, unlike the cybermediary model where the finished good is bought from suppliers and resold, indicates that the manufacturer creates value-added products through its internal manufacturing processes. This model works best for organizations with configurable products, mature marketing staff, and sophisticated customer service processes. Established businesses such as car and computer product manufacturers fit this model; Dell, Cisco, and General Electric (GE) are examples of companies that pursue this business model [9].

The auction model, or the Internet exchange model, allows buyers to set the price of the product by soliciting bids and determining the willingness of suppliers to sell at the bidding price. Many auction sites charge suppliers a small fee when a sale is made and also may charge a fee for a listing of goods for sale at their sites. Buyers, however, are not charged any fees. Businesses that use this model need large customer bases in order to make profits [9]. Companies such as priceline.com and eBay.com are examples of companies that pursue this business model.

The above three models that involve customers and product/service suppliers or manufacturers are also called "industry hubs" [7]. They are two-way networks that deal directly with buyers and create benefits mostly for sellers. The value created by industry hubs tends to increase *linearly* in the number of buyers. However, the value created by B2B hubs increases as does the *square* of the number of participants [7]. Because of their importance in B2B e-commerce, we need to closely examine the business models associated with B2B digital markets.

2.1. B2B e-commerce model

The B2B e-commerce model can be classified by the market's operators, including supplier, customer, and intermediary [10]. Most of the manufacturer-driven electronic