

Chapter XI

Business Model Innovation in the Digital Economy

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ABSTRACT

INTRODUCTION

Since the beginning of Internet commerce in the early 1990s, we have witnessed the first boom and bust cycles of the Internet economy. Is the Internet economy going anywhere? Is the e-commerce revolution over? The answers are yes and no, respectively. The current correction has forced a more cautious approach that focuses on feasible business models and solid performance. The Internet and e-commerce are here to stay. E-commerce will continue to enhance operational efficiencies and bring new opportunities for growth and competitive advantage.

Most of the failed Internet ventures did not have viable business models and feasible long-term strategies. Their business models failed to ask the two fundamental questions of the Internet economy:

- Does your e-commerce business model follow the fundamental principles or economic logic of the Internet economy?
- Does your e-commerce business model capitalize on the “disruptive attributes” of the Internet economy?

These two questions lead business executives to consider several strategic questions regarding building and implementing a viable e-commerce business model:

- What are the components of a viable business model in the Internet economy?
- What are the disruptive attributes of the Internet, and how do you capitalize on them for competitive advantage and profits?
- How do transaction costs and network effects in the Internet economy change a company’s competitive position?
- How do the cost and pricing structures in the Internet economy differ from the traditional industrial economy?
- What are the new economies of scale and scope in the Internet economy?

This chapter first defines and identifies several business models in the digital economy. We then identify and discuss a number of disruptive characters of Internet commerce, and compare and contrast the business transformation process and value creation strategies in both physical and digital economies. The next section presents an analytical method to evaluate and determine a viable business model in the digital economy. The approach takes into account various cost and revenue models from both demand- and supply-side perspectives. Finally, we offer our conclusion.

BUSINESS MODELS IN THE DIGITAL ECONOMY

Each firm that exploits the Internet should have an Internet business model, i.e., how it plans to make money now and how it plans to do so in the long term using the Internet (Afuah & Tucci, 2001). A business model is the method of doing business by which a company can generate revenue to sustain itself (Rappa, 2002; Turban, King, Lee, Warkentin, & Chung, 2002). It describes the basic framework of a business. It also tells what market segment is being served (who), the service that is being provided (what), and the means by which the service is produced (how) (Chaudhury & Kuilboer, 2002).

A firm's business model should also spell out how the company is positioned in the value chain or within the business ecosystem. Weill and Vitale (2001) define an e-business model as a description of the roles and relationships among a firm's consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants. According to Timmers (1998), a business model is:

"... an architecture for the product, service, and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues."

In a broader approach, Slywotzky (1996) defines a business model (design) as:

"... the totality of how a company selects its customers, defines and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resource, goes to market, creates utility for customers, and captures profits. It is the entire system for delivering utility to customers and earning a profit from that activity."

A business model consists of multiple components or elements. Rayport and Jaworski (2001) argue that a "new economy" business model requires four choices on the part of senior management. These include the specification of: (1) a value proposition or a value cluster for targeted customers; (2) a scope of marketspace offering, which could be a product, service, information, or all three; (3) a unique, defendable resource system, i.e., the associated resource system to deliver the benefits; and (4) a financial model, which includes a firm's revenue models, shareholder value models, and future growth models. In a similar effort to bring together the various lines of thought and to establish a common denominator for the business model discussion, Alt and Zimmermann (2001) distinguish six generic elements of a business model. They are: (1) mission, i.e., a high-level understanding of the overall vision, strategic goals, and the value proposition; (2) structure that determines which roles and agents constitute and comprise a specific business community as well as the focus on industry, customers, and products; (3) processes, which provide a detailed view of the mission and the structure of the business model; (4) revenues, which are the bottom line of a business model; (5) legal issues that have to be considered with all dimensions of business models; and (6) technology, which is both an enabler and a constraint for technology-based business models. In a similar effort, Dubosson-Torbay, Osterwalder, and Pigneur (2002) propose that an e-business model framework consists of four principal components: product innovation or value proposition, customer relationship, infrastructure management, and financial aspects that can be found throughout the three former components, such as cost and revenue structures.

Specifically, Rappa (2002) identifies eight basic Internet business models. They are: brokerage, advertising, infomediary (e.g., recommender system, registration model), merchant, manufacturer (direct marketing), affiliate (provide commission for online referrals), community (voluntary contributor model or knowledge networks), subscription, and utility (e.g., pay by the byte). In addition, Turban et al. (2002) also identify several types of Internet business models including name your price, find the best price, dynamic brokering, affiliate marketing, group purchasing, electronic tendering systems,

online auctions, customization and personalization, electronic marketplaces and exchanges, supply chain improvers, and collaborative commerce.

In sum, a business model in the new economy consists of many dimensions. Although there is no clear consensus on the definition and elements of a business model, business models are largely believed to determine the success of an Internet venture (Alt & Zimmermann, 2001). In order to sustain a successful business venture, an Internet business model should address a number of issues or generic elements and the dynamics of the respective elements (Alt & Zimmermann, 2001) that include: what value to offer customers (strategic goals and value proposition); which customers to provide the value to (scope of offerings), how to price the value (pricing); how much and who to charge for it (revenue models); quantity of resources required and the associated costs to provide the value; what strategies, structures, and processes need implementing to offer value; and the legal issues that may influence the general vision of the business model. In addition, in order to prosper in e-commerce, a firm's Internet business model must capitalize on the "disruptive" attributes and characteristics of the Internet or digital economy to enable it to offer innovative solutions and value to customers.

E-COMMERCE IS A DISRUPTIVE INNOVATION

The changes made possible by the Internet are strategic and fundamental (Ghosh, 1998). The changes are beyond the traditional boundary of an organization. The Internet has also changed the way in which supply chains are managed, planned, and controlled (Anderson & Lee, 2000). Even though the changes caused by the Internet are "disruptive" and have profound impacts on business strategies and operations, the underlying technologies are not radically different from the existing technologies that support business operations. This is not atypical, given that the technological changes that damage established companies are usually not radically new or difficult from a technological point of view (Bower & Christensen, 1995). For example, the technologies underlying the Internet—computing and communication technologies—have both been improved incrementally over the past decades.

Disruptive innovations have two important characteristics. First, they typically present a different package of performance attributes. Second, the performance attributes that existing customers do value improve at such a rapid rate that the new technology can later invade those established markets (Bower & Christensen, 1995). Disruptive innovations introduce a very different package of attributes from the one historically valued by mainstream customers, and they often perform far worse along one or two dimensions that are particularly important to those customers. For example, e-commerce still needs to improve the performance of several attributes, such as transaction security, system reliability, privacy, and trust.

Internet commerce is disruptive to the traditional way of doing business in that it is transforming the rules of competition and inventing new value propositions and business models. The successful implementation of e-commerce requires a paradigm shift. In moving toward e-commerce as an enabler, a business executive must be able to identify the disruptive nature of the innovation and then capture the benefits. Several disruptive attributes brought by the introduction of e-commerce include:

- *Network effects.* Network effects exist in the industrial economy (e.g., regular telephone service) but are much stronger in the digital economy. For knowledge-intensive products, such as software operating systems, characterized by high upfront costs, network effects, and customer groove-in (Arthur, 1996), achieving a critical mass of installed customer base is vital for success.
- *Open platform.* The Internet provides an open and nonproprietary platform for communication and collaboration. The open source movement in software development (see Raymond, 1999) has contributed to Internet-enabled collaboration and free information sharing.
- *Connectivity and interactivity.* E-commerce enables close connections with customers and among supply chain or business ecosystem partners' information systems. The benefits include real-time pricing, flexible products and services versioning, gathering customer information, and a very low cost for the distribution of information goods.
- *Exchange and sharing of information.* In the digital economy, the traditional trade-off between richness and reach in information exchange no longer exists (Evans & Wurster, 1997). In e-commerce, information can reach many customers or business ecosystem partners through the Internet without sacrificing the richness of the contents.
- *Convergence of production and consumption.* The term *prosumption* was introduced by Tapscott (1996) to describe the convergence of design with development process and the production of goods and services by customers in the e-commerce environment. Internet-enabled collaborations can reduce both concept-to-design and design-to-production cycle times.
- *Digital assets as the input into the business transformation process.* A firm that exploits the Internet should build and utilize its digital assets (Rayport & Sviokla, 1995), which is all the information about its customers, in order to provide value across many different and disparate markets. In the digital economy, information is a source of revenue and every business is an information business (Earl, 1999). Therefore, a firm should use information to create new businesses and/or reinvent customer relationships through the implementation of virtual value chain (Rayport & Sviokla, 1995).
- *Cost transparency.* The vast amount of information about prices, competitors, and features that is readily available on the Internet helps buyers "see through" the costs of products and services (Sinha, 2000).
- *Virtual display of merchandise.* General online merchandise stores (e.g., Amazon.com) and all purposes business-to-business mega exchanges can offer enormous variety without building huge physical display areas that rack up costs and alienate many shoppers. Therefore, upgrading the physical aspects of the supply chain to match the speed and complexity of the e-commerce environment to reduce order-to-delivery time to customers is vitally important.
- *Speed and frequency of changes.* Change is fast and frequent in the digital economy. Firms in every industry must learn to adapt quickly to changing business and economic environments. Adaptation in a turbulent environment means watching for the next wave that is coming, figuring out what shape it will take, and positioning the company to take advantage of it (Arthur, 1996).

- *Industry boundary.* Value generated in Internet-enabled business transcends traditional industrial sectors. A firm or business ecosystem (Gossain & Kandiah, 1998) or business web (Tapscott, Ticoll, & Lowy, 2000) must provide unique (and customized) “solutions” (as opposed to single product or service) to individual customers.

Traditional organizations facing the challenge of transforming their businesses in the digital economy must understand and be able to capitalize on the disruptive attributes of e-commerce. A firm’s ability to compete in the future, as well as its very existence, will be in question if it cannot capture the benefits of the disruptive nature of e-commerce.

VALUE CREATION IN THE DIGITAL ECONOMY

In the digital economy, a firm must be able to create value in both marketplace and market. A firm’s business transformation process can be represented by an input-transformation-output model. In the industrial economy, input is raw materials or all of the necessary inputs that are required to produce the finished products or services. Output is finished products or intermediate goods used as inputs to another transformation or value-creation process. According to Meredith and Schaffer (1999), the “physical” transformation process involves one or more of the following four value-adding activities: alter, transport, inspect, and store. In the industrial economy, management’s focus is to improve the physical transformation process by implementing management techniques such as total quality management, lean manufacturing, and just-in-time production. In the digital economy, data or information (in digital form) has become the input into a business transformation process. Information can be used directly to create values for individual customers by identifying their needs or preference based on their previous purchase patterns and profiles. Rayport and Sviokla (1995) identify five steps to create customer value in the digital economy: gather, organize, select, synthesize, and distribute. Since physical and digital economies *coexist* within a firm or business ecosystem, management should go beyond concentrating on improving the transformation process itself to focus on leveraging information assets and taking advantage of the disruptive nature of e-business to create more value (a package of solutions) for the customers (Lee, 2001).

Table 1 compares and contrasts these two transformation processes. Table 2 presents value-creation strategies in the digital economy. In the physical part of the value-creation process, information is the glue that holds a firm’s internal units and the entire supply chain together and allows it to function (Chopra, 2001). With the introduction of e-commerce and virtual value chain, information itself has become a source of value. Since information (as an input) will not be consumed or depleted during the business transformation process, a firm or supply chain can redefine economies of scope by drawing on a single set of “digital assets” to provide value across many different and disparate markets (Rayport & Sviokla, 1995). Consumers are able to receive a “package of solutions” offered by a single “trust” vendor, supported by a business ecosystem of partners, to meet their needs.

Table 1. Business Transformation in the Physical and Digital Economies

	Physical Economy	Digital Economy
Input	Raw materials or intermediate products (e.g., parts and components)	Data or information in digital form
Business transformation or value creation activities	Alter, transport, inspect, and store	Gather, organize, select, synthesize, and distribute
Output	Intermediate products or finished products or services	<ul style="list-style-type: none"> • Information/knowledge products or services • New information services bundled with physical products to provide customer a “package of solutions”
Strategic role of information in the business transformation process	<ul style="list-style-type: none"> • Information is a supporting element that facilitates the physical transformation (production) activities • Information serves as the connection between the various value-adding stages within a supply chain 	<ul style="list-style-type: none"> • Information is a source of value that enable firms to offer new value propositions • Real-time information enables integration, collaboration, and synchronization within a supply chain or virtual organization • Information (as an input to a transformation process) will not exhaust after the transformation (production) process; therefore, firms operating in the digital economy should capitalize on the economic principle of abundance

Many companies have transformed their operations according to this value-creation principle. For example, Intel Corporation has transformed its operations from a traditional semi-conductor manufacturing company to an “e-business” solution company by creating an ecosystem centered on its core technologies. Online mega merchant Amazon.com is able to utilize a set of “digital assets,” facilitated and supported by a group of ecosystem partners.

COST AND REVENUE MODELS IN THE DIGITAL ECONOMY

A viable business model needs to meet the fundamental economic principles of the digital economy. A framework based on the concepts of economies of scale and scope, as well as the theories of transaction costs and switching costs, is introduced in this section. Table 3 summarizes the basic concepts, key issues, and strategies for the four cost models. The purpose of this framework is to provide business scholars and

Table 2. Value-Creation Strategies in the Digital Economy

Business Transformation Process	Input	Transformation	Output
Strategic goal for e-commerce applications	<ul style="list-style-type: none"> • Design innovative products and services • Reach the critical mass by building an installed base of customers • Take advantage of the network effects to build a successful e-business 	<ul style="list-style-type: none"> • Improve efficiency and effectiveness of business or supply chain transformation process • Match the performance of the physical activities to the digital world 	<ul style="list-style-type: none"> • Create numerous innovative products and services • Provide a package of solutions to satisfy or exceed customer's expectations
E-commerce strategy and management	<ul style="list-style-type: none"> • Increase collaboration throughout the product design process • Synchronize product design requirements within a supply chain or business ecosystem in the early stages of the development process • Leverage knowledge capital critical to the design process through external linkages (e.g., alliance partners, research labs, and universities) • Achieve demand-side economies of scale by increase installed customer base's collective switching costs • Reduce customer's transaction costs (i.e., make it easy for customers to do business with you) 	<ul style="list-style-type: none"> • Sustaining innovation approach: Apply conventional management techniques (e.g., lean manufacturing and total quality management) to improve process efficiency • Achieve production economies of scale and scope • Disruptive innovation approach: Take advantage of the lower transaction costs in the digital economy to redesign organizational structures and to reconfigure value-creation systems 	<ul style="list-style-type: none"> • Transform value proposition by taking advantage of the network effects and demand-side economies of scope, i.e., leverage on a single set of "digital assets" to provide many solutions to individual customers • Increase user's (or buyer's) switching costs by offering value across many different and disparate markets • Influence users' decision-making process through the use of extranet and Web-based collaborative planning tools • Look beyond costs as the sole arbiter of value

Source: Adapted and Extended from Lee (2001)

practitioners a basic knowledge of the underlying cost structures in the digital economy. Rather than searching for the single dominant effect or cost advantage that will provide a long-term sustainable competitive advantage for a company, companies wishing to take full advantage of the disruptive power of e-commerce must understand the underlying strategic logic of a digital economy.

Table 3. E-Commerce Cost Model

	Demand	Supply
Economies of Scale	<p>Basic Concepts:</p> <ul style="list-style-type: none"> • Demand-side economies of scale (network effects or positive network externalities) • Metcalfe’s law: the usefulness or utility of a network equals the square of the number of users <p>Key Issues: How to build a large installed base of users? How to reach the critical mass to sustain the business?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Provide superior technologies, products, or services 2. Manage customer expectations (e.g., competitive pre-announcements) 3. Timing of strategic moves 4. Establish strategic alliances and partnerships 	<p>Basic Concepts:</p> <ul style="list-style-type: none"> • Supply-side economies of scale: the production cost of a single product decreases with the number of units produced • E-commerce and the virtual value chain has redefined the concepts of economies of scale as an entry barrier <p>Key Issue: How to lower the unit cost of providing products and/or services in the digital economy?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Physical product/economy: increase scale to minimize average cost (subject to natural capacity limits—law of diminishing returns) 2. Digital (or knowledge-based network) economy/information products: volume-driven strategy to spread fixed (sunk) cost 3. Spread fixed costs over a large customer base and product lines

	Demand	Supply
Economies of Scope	<p>Basic Concepts:</p> <p>Demand-side economies of scope: base don a single set of digital assets, i.e., customer information as the input to the business transformation process, a firm can offer individual customers a set of customized solutions to meet their needs</p> <p>Key Issues: How to leverage on a single set of “digital assets” to provide value across many different and disparate markets? How to capitalize on the economic principle of abundance?</p> <p>Strategy:</p> <ol style="list-style-type: none"> 1. Re-invent customer relationships by identifying their individual needs and being able to offer a package of “solutions” (i.e., physical products bundle with services) 	<p>Basic Concepts:</p> <ul style="list-style-type: none"> • Supply-side economies of scope are cost-saving externalities between product lines • Economies of scope realized when costs are reduced by producing two or more products jointly (rather than in specialized firms) <p>Key Issue: How to supply a bundle of outputs demanded by the market at lower total cost than some combination of two or more single products or service providers?</p> <p>Strategy:</p> <ol style="list-style-type: none"> 1. Identify and take advantage of the economies of scope in production and distribution

Table 3. E-Commerce Cost Model (continued)

	Demand	Supply
Switching costs (The extent of a customer's lock-in to a given supplier)	<p>Basic Concepts: Demand-side switching costs are measured by the monetary value of:</p> <ul style="list-style-type: none"> • Hassle or inconvenience of switching suppliers, and • Investment in multiple complementary and durable assets specific to a particular technology or system • Customer perceptions of a product or service <p>Key Issue: How to increase customer's switching costs of using your company's products or services?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Provide superior products and services 2. Involve consumer in design and production process 3. Build and sustain online communities <ol style="list-style-type: none"> 1. Develop strong trust relationship with the end-customer 	<p>Basic Concepts:</p> <ul style="list-style-type: none"> • Switching costs are nonlinear. Companies need to estimate their revenue stream from a new customer to figure out how much to spend to acquire that customer: Marketing cost (price discounting and/or advertising) plus R&D and setup cost • Total switching costs = costs the customer bears (demand side) + costs the new supplier bears (supply-side) <p>Key Issue: How to maximize the value of an installed customer base by selling complementary products or services?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Switching costs must be evaluated relative to the future streams of revenues on a per-customer basis; then add up these costs across the entire installed customer base to value that base <p>Invest in multiple complementary and durable assets specific to a technology or system</p>
Transaction Costs (The costs that the consumer and/or the producer pays to make the transaction happen)	<p>Basic Concepts: Demand-side transaction costs include customer's search, information, decision, bargaining, contracting, policing, and enforcement costs</p> <p>Key Issue: How to reduce your customer's (transaction) costs of doing business with you?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Make easy for customers to obtain and compare product- or service-related information (e.g., an effective e-commerce site) 1. Identify customer decision process (pre-purchase, purchase, and post-purchase) and be able to provide assistance 	<p>Basic Concepts: Firm tends to expand precisely to the point where the costs of organizing an extra transaction within the firm becomes equal to the costs of carrying out the same transaction by means of an exchange on the open market</p> <p>Key Issue: How to transform value proposition and organizational structures to enhance value creation for the customers?</p> <p>Strategies:</p> <ol style="list-style-type: none"> 1. Lower transaction costs in the digital economy enable companies to effectively redesign organizational structures and reconfigure the entire value creation network or system <p>Lower transaction costs allow virtual integration of independent organizations or ecosystem partners</p>

Economies of Scale

Economies of scale exist when the production cost of a single product decreases with the number of units produced. In traditional manufacturing industries, larger firms tend to have lower unit costs. The textbook strategy is to optimize the level of production at maximum efficiency (least-cost scale). In the digital economy, Rayport and Sviokla (1995) argue that e-commerce and the virtual value chain have redefined the concepts of economies of scale, allowing small companies to achieve low unit costs for products and services in markets dominated by big companies. For example, FedEx was able to enter successfully into a nature monopoly market dominated by the U.S. Postal Service by allowing individuals with access to the Internet to track packages through their website. Online superstores such as Amazon.com are also able to spread fixed costs (e.g., technology infrastructure costs) over a larger customer base and offer a wide selection of goods to frequent visitors.

A product exhibits demand-side economies of scale if the more people that use such a product, the more valuable it is to its users—a classic function of network externalities. Shapiro and Varian (1999) indicate that the success and failure of a product with strong network effects are driven as much by consumer expectations and luck as by the underlying value of the product. Marketing strategy in markets that exhibit strong network effects must be designed to influence consumer expectations in order to achieve a “critical mass” of users. Yahoo!, eBay, and Amazon.com are three pure e-commerce companies that were able to achieve a critical mass of users to sustain their business models.

Overall, demand-side and supply-side economies of scale reinforce each other in a virtuous circle. Demand-side growth reduces the unit cost (and price) on the supply side and makes the product even more appealing to other users. The result is further fueling of demand growth. The nature of the product, of the technology, and of the market will place limits on such growth.

Economies of Scope

Economies of scope are cost-saving externalities between product lines. In the manufacturing case, economies of scope exist when the production of Good A reduces the production cost of Good B (Tirole, 1988). In e-commerce, businesses can redefine economies of scope by drawing on a single set of “digital assets” (i.e., information companies collected about their customers) to provide value across many different and disparate markets (Rayport & Sviokla, 1995).

The combination of demand-side economies of scope and demand-side economies of scale reinforces network effects in the digital economy. Building and sustaining a critical mass of installed customer base (scale effect) is valuable because growth on the scale side increases the number of potential customers for cross-selling merchandise (scope effect), which in turn will enable the company to build an even larger customer base. For example, Amazon.com is able to expand its scope of offerings to provide customers a package of “solutions” (i.e., products bundled with services) across numerous industrial sectors due to the ability to exploit its large installed base of customers. eBay is also trying to expand its scope beyond the online auction business model. In contrast, unable to differentiate themselves from the superstores and failing to capitalize on the demand-side scope economies, many product-specific e-commerce

specialists (e.g., eToys, CDNow, toysrus.com, reel.com, furniture.com, borders.com, and homegrocer.com) either closed the operations or regrouped under different owners and strategies, or teamed up with e-commerce superstores that have been able to achieve both scale and scope economies.¹

Switching Costs

According to Tirole (1998), switching costs are a case of idiosyncratic investment, i.e., investment in multiple complementary and durable assets specific to a particular technology or system. Total switching costs include those borne by the new supplier to serve the new consumer (e.g., marketing, research, and development costs), and those borne by the consumer to switch suppliers (e.g., inconvenience of switching suppliers, investment in specific assets, and the perceptions of a product or service). Once the two parties have traded, staying together can yield a surplus relative to trading with other parties.

In e-commerce, Riggins and Rhee (1998) suggest that companies can open part of their extranet to allow partners access to trade-specific information and their internal processes. In doing so, companies will be able to alter the way in which the users, typically external managers, make decisions related to the use of the extranet and make the trading partners dependent upon this information.² Strategies to increase a trading partner's or customer's switching costs in the digital economy include prosumption³ (Tapscott, 1996), building and sustaining online communities⁴ (Armstrong & Hagel, 1996), and developing a strong trust relationship with the end-customers by participating in the new business ecosystems (Gossain & Kandiah, 1998) or b-webs⁵ (Tapscott et al., 2000).

Transaction Costs

Transaction costs theory (Coase, 1937; Williamson, 1975, 1985) suggests that a firm will tend to expand precisely to the point where "the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market." Transaction costs are all costs associated with a market exchange, which include searching, negotiating, monitoring, and enforcement costs.⁶

Theoretically, transaction costs depend on four major factors: opportunism (how opportunistic the trading parties are), asset specificity, uncertainty, and the frequency of the transactions. Since individuals and organizations are cognitively limited, and cannot collect and process the information they need to make all decisions, it is difficult to foresee all the possible contingencies in a transaction. In addition, the coordinating costs (i.e., the cost of coordinating resources and processes) and contracting costs associated with market transactions can be prohibitively costly. As a result, economic benefits from vertical integration (collaboration) arise when internalization (partial internalization) overcomes transaction difficulties associated with market exchange (Lee & Vonortas, 2002).

It can be argued that the advent of the digital economy has dramatically reduced the costs of many kinds of market transactions (e.g., connectivity and interactivity). It may even be possible to negotiate a separate deal at each step of the value-creation stage (Tapscott et al., 2000). If so, it could prove easier and cost effective to disaggregate many

value-creating activities out to the open market.⁷ Such a development changes the rules of competition and the way companies organize their value-creating activities. Business executives must transform the value proposition for the benefit of the end-customer by understanding how Internet technologies enable them to add new forms of value in every step of the value-creating process. In addition, they must be able to creatively “reaggregate” a new set of value offerings as well as the enabling resources, structures, and processes.⁸

Pricing Issues and Revenue Models

Table 4 presents several issues associated with e-commerce pricing and revenue generation. E-commerce offers companies new opportunities to test prices, segment customers, and adjust to changes in supply and demand. Companies are able to set prices with far more precision online than can offline. They can create enormous value in the

Table 4. E-Commerce Revenue Model

Source of Revenue	
<p>E-commerce provides companies with additional opportunities for revenue:</p> <p>Website advertising, referral, subscription or membership fee, commission or transaction fee, and service or consulting fee, and other.</p>	<p>Basic Concepts: Total e-commerce profit = total revenue – total cost + [other e-commerce revenues]. New sources of revenue, independent of original products or services sales, which were enabled by e-commerce and information technology (e.g., using information to create additional value for the customer)</p> <p>Key Issues:</p> <ul style="list-style-type: none"> • How to identify new sources of revenue? • How to test prices, segment customers, and adjust to changes in supply and demand in real time? • How to achieve synergy effect (cross-selling opportunity) in e-commerce? (Does customer value the benefit of one-stop shopping?) • How to use information to create value in both marketplace and marketspace? • How to build online brand equity and enhance loyalty effect? <p>Strategies:</p> <ol style="list-style-type: none"> 1. Exploit virtual value chain to create new sources of revenue 2. Analyze digital assets and experiment new way of pricing 3. Bundle a product with other products and services to obscure the product’s costs to counter cost transparency 4. Offer a stream of innovative products and services and implement creative pricing strategy 5. Be a member of the business ecosystem—a system in which companies work cooperatively and competitively to support new products, satisfy customers, and create the next round of innovation in key market segments

process because online pricing allows companies to make adjustments in a fraction of the time and to profit from even small fluctuations in market conditions, customer demand, and competitors' behavior (Baker, Marn, & Zawada, 2001). E-commerce product or service pricing can be done in real time with prices below unit cost as long as other e-commerce revenue models, such as online advertising and referral fees, are sustainable. In addition, the abundance of free, easily obtained information on product pricing and quality, supplier reliability, service offerings, etc., raises cost transparency, thus increasing downward pressure on prices.

E-commerce suppliers and vendors can react to competitive pressures by implementing creative pricing strategies that go beyond traditional price-cutting, by bundling products and services, or by innovating (Sinha, 2000). Creative pricing strategies, enabled by e-commerce technologies, include price optimization software,⁹ designed to figure out the right prices that companies can charge for their products or services. Companies can offer a variety of options for products and services to specific customers charging different prices for the value delivered. For information goods where the marginal cost of reproduction tends to be very low, the smart way to sell them is to offer different versions of the products based on several product dimensions, such as time, format, features, comprehensiveness, and user interface. In their purchases of different product versions, customers reveal the value they place on (information) products and what they are willing to pay for them (Shapiro & Varian, 1998).

Companies must also understand that the Web is not a mass medium. Rather, it is a personal medium creating the opportunity to personalize the experience of individual users. The best approach is by convincing online users to provide information about themselves and their habits (i.e., reveal their preferences). Although e-commerce makes it easier for customers to compare the prices of similar offerings by different companies, advanced information technologies, such as data mining and personalization software,¹⁰ are now able to gather profile information, session and event-based observations, and transaction information in real time to help companies understand their online customers. A customer's purchasing history and behavior constitutes a digital asset that companies can use to model individual customer's preference and make predictions and recommendations for their next purchases. Companies will be able to price the customized products or services according to a buyer's willingness to pay. In such cases, little or no consumer surplus will be enjoyed by customers.

Another pricing issue in e-commerce is the online vs. offline pricing strategy. Should the same products be priced higher or lower online by companies doing businesses in both marketplace and marketspace? Convention thinking is to price lower online due to higher price elasticity of demand in the Internet market segment. However, a higher price can be charged if the Web increases the chances of finding a buyer willing to pay a higher price and/or expands the buyer base (Baker et al., 2001). Online companies can segment their customers quickly using many sources of information (e.g., clickstream data, customers' buying histories). The process is first to identify particular online customer segments, and then to offer each segment-specific price or promotion immediately.

In the digital economy, information plays a strategic role in itself. More and more value-creating activities are conducted electronically. Evans and Wurster (1997) argue because of the new economics of information, new business opportunities will arise for traditional brick-and-mortar businesses as the result of the fragmentation and

reconfiguration of physical value chains. Therefore it becomes imperative for companies to integrate virtual value chain (marketspace) activities with physical value chain (marketplace) activities (Rayport & Sviokla, 1995). E-commerce provides companies with new sources of revenue via opportunities to offer new “customized” information services in addition to, and sometimes independent of, the traditional products or services sales. Companies must do more than create value in e-commerce. To sustain competitive advantages, companies must also reinvent their relationships with customers by identifying and fulfilling customers’ needs at lower cost, and by offering additional information services through various digital channels. For example, mail and package delivery service providers, such as the U.S. Postal Service, UPS, and FedEx, allow customers to obtain tracking and delivery information on the Web.

Syndication is an emerging model for business in the Internet era that capitalizes on the new economics of information to generate new sources of revenue. Syndication involves the sale of the same product to many customers, who then integrate it with other offerings and redistribute it. In e-commerce, information can be replicated an unlimited number of times and can be reassembled and recombined in infinite combinations. Information can also be distributed everywhere all the time. Werbach (2000) argues that syndication is not limited to the distribution of content. Commerce can also be syndicated. For example, by acting as a syndicator (e.g., the online affiliate program) and a distributor (e.g., zShop) of e-commerce, Amazon is turning the absence of scarcity, which derives from the vast number of sites offering goods and services on the Web, from a threat to an advantage (Werbach, 2000).

The “synergy effect” (Kay, 1984) may present another revenue opportunity in e-commerce. Do companies benefit by offering cross-selling opportunities online? Do customers value the benefit of one-stop shopping in e-commerce? The question is whether the total revenue generated from one single e-commerce “corporate” site or generalist (e.g., Amazon.com and Yahoo!) is greater than some combinations of two or more independent single-product providers or specialists (e.g., camcorder.com and barnesandnoble.com). Generalists have advantages over specialists in the areas of new economies of scale and scope. Online specialists must capitalize on their market niches and in-depth product knowledge to reduce customers’ transaction costs (e.g., information and search costs), and offer customized services to increase customers’ switching costs.

Finally, it is argued that, in the new business ecosystems, customers perceive greater value in one-stop shopping with a known and trusted company (Gossain & Kandiah, 1998). Customers demand “a package of solutions” that satisfies their needs or solves their problems, rather than purchasing individual products or services from different vendors or solution providers. For example, e-commerce companies, such as Amazon.com, Edmunds.com, and Marshall Industries, offer complementary products or services (supported by their ecosystem alliance partners) to end-customers from a single “trusted” source. Automotive companies such as GM and Ford, electronics firms such as Intel and IBM, and retail chains such as Wal-Mart and Target stores, each have their own business ecosystem and associated ecosystem business partners. Companies must maintain a trust relationship with their end-customers through constantly providing value-added information, products, and services, and through the consistent level of experience and overall quality of the time that customers spend at companies’ e-commerce sites.

CONCLUSION

E-commerce can be implemented as a sustaining innovation to enhance the current way of doing business (i.e., focus primarily on improving the business transformation efficiency). In such case, companies fail to identify and capitalize on many of the Internet's opportunities. In fact, e-commerce is a disruptive innovation—an innovation that revolutionizes and transforms traditional commerce. To capture its full benefits, the disruptive attributes or characters of e-commerce innovation must be identified and implemented in a viable business model.

The framework introduced in this chapter can be applied to evaluate whether a company's e-commerce business model is viable. Specifically, a viable e-commerce model satisfies many of the following characteristics (see also Lee, 2001):

- Design programs that take advantage of the Internet network effects and other disruptive attributes to achieve a critical mass of installed base of customer
- Leverage on a single set of digital assets to provide value across many different and disparate markets
- Build trust relationships with customers through e-business communities or e-webs to increase their costs of switching to other vendors
- Transform value propositions and organizational structures for enhanced value creation
- Generate synergy effects on e-commerce product and service offerings

In sum, a viable business model in the digital economy must follow the fundamental economic principles (various costs and revenue/pricing models) and, most important, must be able to identify and capitalize on the disruptive attributes of the Internet commerce.

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ENDNOTES

¹ For example, Amazon is diverting the online traffic from CDNow, toysrus.com, and borders.com to its main site.

² Riggins and Rhee (1998) use Lucent Technologies' AllView™ system as an example to demonstrate the strategic advantage of allowing parts of a company's extranet accessible to business partners. AllView™ is an extranet system that provides internal engineering teams and external customers with online access to several types of engineering documentation via the Internet. In doing so, Lucent has created a market where it controls the functionality of the new systems, sets the pricing of the information goods, and provides various levels of support to the telecommunication equipment vendors.

- ³ For example, Dell Computer Corporation's build-to-order e-commerce business model.
- ⁴ For example, iVillage.com, fool.com, and tripod.com.
- ⁵ For example, CDNow, ToysRUs, and many other independent vendors have joined Amazon.com's business ecosystem to take advantage of both scale and scope economies and to increase customers' switching costs.
- ⁶ For example, e-commerce companies that provide a good user interface and high usability (i.e., the ease with which a site can be used and navigated by users) will be able to reduce customers' transaction costs.
- ⁷ The transformation of retail banking provides a good example. See Evans and Wurster (1997).
- ⁸ eBay has capitalized on the logic of low transaction costs in the digital economy (e.g., zero inventory and distribution costs, near-zero editorial content development, revenue risk, and product liability) and transformed its value proposition from online auction to liquidity, i.e., converting goods into a desirable price. See Tapscott et al. (2000).
- ⁹ Two types of software help retailers set prices to their greatest advantage. Price optimization software, developed by companies such as DemandTec, Retek, and Manugistics Group, is for mass retailers like grocers and drug chains that have hundreds of thousands of items to track across multiple stores and e-commerce sites. The markdown optimization software, provided by i2 Technologies, ProfitLogic, and Spotlight Solutions, is for retailers that regularly refresh their inventory with new products (e.g., apparel) (Tedeschi, 2002). Both technologies give companies the ability to look at prices strategically.
- ¹⁰ Personalization software provides guided selling and online customer assistance solutions that help companies more profitably acquire and retain customers. Current technologies that help companies to implement personalization or one-to-one marketing strategy include: (1) rule-based personalization systems (e.g., BroadVizion.com) offer businesses a solution for creating a personalized experience over the Internet and wireless devices; (2) collaborative filtering systems (e.g., NetPerceptions.com) that compare the input of many users to come up with recommendations; and (3) case-based personalization systems (e.g., Firepond.com), which are designed to deliver specific answers to specific questions. By implementing personalization software, companies such as Barnes & Noble (bn.com) and E!Online's movie finder (movies.eonline.com) can acquire and maintain strong relationships with their customers.

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