

Value Drivers of e-Commerce Business Models[?]

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Abstract

The rapid emergence of e-commerce is radically transforming the business landscape. Startup firms are capturing new opportunities in the electronic market place through innovative business models. Established firms are racing to transform and adapt their old business models to the new environment. Anchored in the entrepreneurship and strategic management literatures, we develop the theoretical foundations of the business-model construct, which depicts the ways in which value creating transactions are enabled by a network of firms, suppliers, complementors, and customers. We examine the value creation potential of business models of 59 American and European e-commerce companies that have recently become publicly traded corporations. Grounded in the rich data obtained from these case studies, we develop a value driver model that enables an evaluation of the value-creation potential of e-commerce business models along four identified dimensions, namely, novelty, lock-in, complementarities, and efficiency. Our central proposition is that a firm's business model is an important locus of innovation and a crucial source of value creation for all stakeholders.

Key words : Business model, e-commerce, transactions, value drivers, virtual markets.

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INTRODUCTION

As we enter the twenty-first century, e-commerce, with its dynamic, rapidly growing and highly competitive characteristics, promises new avenues for the creation of wealth. Established firms are creating new on-line businesses, while new ventures exploit the opportunities the Internet provides. These developments generated more than \$500 billion in revenues in 1999, representing about 6% of the US GDP, and a growth rate of over 100% per year since 1993. The sale of goods by US firms over the Internet was estimated to be \$170 billion in 1999. This figure is predicted to reach \$1.3 trillion by 2003.¹ Although US firms are considered world leaders in e-commerce, the rapid growth of businesses that use the Internet as a medium is a global phenomenon. Europe is expected to bridge the e-commerce gap with the US by experiencing triple-digit growth in this area over the next three years. By 2004, European enterprises are expected to have on-line sales of \$1.6 trillion,² which represents about 6.3% of total expected European trade. The increase in the number of e-commerce transactions at major web sites (60,000 per day in 1999 compared to 29,000 per day in 1998)³ highlights the extraordinary growth and transformation of this new business landscape.

E-commerce is clearly generating tremendous new wealth, mostly through entrepreneurial start-ups and corporate ventures. It is also transforming the rules of competition for established businesses in unprecedented ways. One would thus expect the subject of e-commerce to have attracted the attention of scholars in the fields of entrepreneurship and strategic management. Indeed, the advent of e-commerce presents a strong case for the confluence of the entrepreneurship and strategy research streams, as advocated by Hitt and Ireland (2000) and by McGrath and MacMillan (2000). Yet, academic research on e-commerce is sparse. As a result, the literature has neither articulated the central issues related to this new phenomenon, nor developed theory that captures the unique features of virtual markets.

This paper begins to fill this theoretical gap. In the first part of the paper we derive the business-model construct by building on the value chain framework (Porter, 1985), strategic network theory (Dyer and Singh,

1998), and the transaction perspective (Williamson, 1975). A business model depicts the ways in which transactions are enabled by a network of firms, suppliers, complementors, and customers. We suggest that this relatively new construct in the academic literature fosters a deeper understanding of the strategic behavior and value creation in this emerging arena than is possible with other units of analysis, such as the firm or the industry. While the business-model construct applies to both on-line and off-line businesses, the rapid growth of electronic markets highlights the need for rethinking the unit of analysis in entrepreneurship and strategy research.

In the second part of the paper, we develop a model to describe the value drivers of e-commerce business models. Our theory development is grounded in observations that emerge from data on e-commerce business. In order to identify the major value drivers of e-commerce firms, we study the business models of 59 European and American e-commerce firms that have recently become publicly traded corporations. The value driver model enables an evaluation of the value-creation potential of different e-commerce business models along four identified dimensions, namely, novelty, lock-in, complementarities, and efficiency. These are explored in more detail below.

Our central proposition is that a firm's business model is an important locus of innovation and a crucial source of value creation. It goes beyond the value that can be realized through the configuration of the value chain (Porter, 1985), the formation of strategic networks among firms (Dyer and Singh, 1998), or the exploitation of firm-specific core competencies (Barney, 1991). The term "value driver" refers to a factor that enhances the total value created by a business model. Total value created is the sum of all the values that can be appropriated by the participants in a business model, the firm, its partners, and its customers (Brandenburger and Stuart, 1996). By addressing the central issues in e-commerce that emerge at the intersection of strategic management and entrepreneurship, we hope to contribute to theory development in both fields.

The rest of this paper is organized as follows. In the next section we develop and discuss the business model construct and its elements. This is followed by a description of the data set and the research method used for grounding the value driver model in the data. We then introduce the value driver model and discuss the four value drivers of business models mentioned earlier. The final section presents the conclusions of this study and

draws some implications for future research.

THEORY

In this section, we derive the business-model construct by drawing on value chain analysis, network theory, and transaction cost economics. We begin the section with a review of the characteristics of virtual markets and surmise that the received theories of how value is created do not fully explain the value creation potential enabled by virtual markets. We develop the business-model construct, which builds on the aforementioned theoretical perspectives, as a new unit of analysis that captures the unique opportunities for value creation present in virtual markets. Lastly, we examine how the business model differs from other units of analysis, such as the firm or an industry.

Virtual markets. Virtual markets refer to settings in which business transactions are conducted via open networks based on the fixed and wireless Internet infrastructure. These markets are characterized by high connectivity (Dutta and Segev, 1999), a focus on transactions (Balakrishnan, Kumara and Sundaresan, 1999), the importance of information goods and networks (Shapiro and Varian, 1999), and high reach and richness of information (Evans and Wurster, 1999). Reach refers to the number of people and products that are reachable quickly and cheaply in virtual markets; richness refers to the depth and detail of information that can be accumulated, offered, and exchanged between market participants. Virtual markets have unprecedented reach because they are characterized by the near lack of geographical boundaries. Any discussion of national markets and regional barriers to entry (Bartlett and Ghoshal, 1989) is thus less relevant in the case of businesses that allow instant access to customers and suppliers across regional and national borders.⁴

As an electronic network with open standards, the Internet supports the emergence of virtual communities (Hagel and Armstrong, 1997) and commercial arrangements that disregard traditional boundaries between firms along the value chain. Business processes can be shared among firms from different industries, even without the awareness of the end customers. As more information about products and services becomes instantly available to customers, and as information goods (Shapiro and Varian, 1999) are transmitted over the Internet, traditional intermediary businesses and information brokers are circumvented, and the guiding logic

behind traditional industries (e.g., travel agencies) begins to disintegrate.

There are several other characteristics of virtual markets that challenge the conventional structure of industries. These include the ease of extending one's product range to include complementary products, the potential reduction of asymmetry of information among economic agents through the Internet medium, and the proliferation of innovative market exchange mechanisms (such as on-line auctions). Industry boundaries are thus easily crossed as value chains are being redefined (Sampler, 1998). As shown below, taken together, these characteristics of virtual markets challenge conventional theories of how value is created, and hence call for a careful definition of the unit of analysis for investigating wealth creation.

Value chain analysis. Porter's (1985) value chain framework analyzes value creation at the firm level. Value chain analysis decomposes the firm into its activities and then studies the economic implications of those activities. It includes four steps: (1) defining the strategic business unit, (2) identifying critical activities, (3) defining products, and (4) determining the value of an activity. The main questions that the value chain framework seeks to address are as follows: 1) what activities should a firm perform, and how? And 2) what is the configuration of the firm's activities that would enable it to add value to the product and to compete in its industry? Value chain configuration includes primary activities that have a direct impact on value creation, while support activities affect value only through their impact on the performance of the primary activities. Primary activities involve physical products and include inbound logistics, operations, outbound logistics, marketing and sales, and service.

Value chain analysis can be helpful in analyzing value creation in virtual markets. For, example Amazon.com decided to build its own warehouses in order to increase the speed and reliability of the delivery of products ordered on-line. By doing so, it was able to add value to sales and fulfillment activities. However, value chain analysis may have only limited applicability for virtual markets. Stabell and Fjeldstad (1998) found the value chain model more suitable for the analysis of production and manufacturing firms than for services firms where the resulting chain does not fully capture the essence of the value creation mechanisms of the firm. Citing the example of an insurance company, they ask: "What is received, what is produced, what is shipped?" (1998:414).

Similar questions can be asked regarding the activities of e-commerce firms such as Amazon.com. It can be argued that the main good that flows through an e-commerce firm is information. Building on this insight, Rayport and Sviokla (1995) propose a “virtual” value chain that includes a sequence of gathering, organizing, selecting, synthesizing, and distributing information. While this modification of the value chain concept corresponds better to the realities of virtual markets, and in particular to the importance of information goods (Shapiro and Varian, 1999), it still falls short of fully describing e-commerce activity. First, it may not fully capture the value creation opportunities that result from new combinations of information, physical products and services (the realization of which, according to Schumpeter, 1934, is a distinguishing hallmark of the entrepreneur), innovative configurations of transactions, and the reconfiguration and integration of resources, capabilities, roles and relationships among suppliers, partners and customers. This last characteristic offered by e-commerce firms highlights the importance of networks in virtual markets. Second, even though a firm’s value chain may be embedded in a system of inter-linked value chains, such as those of suppliers and distribution channels (Porter, 1985), value chain analysis still focuses on the firm as unit of analysis.

Strategic networks. Strategic networks are “stable interorganizational ties which are strategically important to participating firms. They may take the form of strategic alliances, joint-ventures, long-term buyer-supplier partnerships, and other ties” (Gulati, Nohira and Zaheer, 2000:203). The main questions that strategic network theorists seek to answer are as follows: 1) Why and how are strategic networks of firms formed? 2) What is the set of inter-firm relationships that allows firms to compete in the marketplace? and 3) How is value created through inter-firm asset co-specialization? The appearance of networks of firms in which market and hierarchical governance mechanisms coexist has significantly enhanced the range of possible organizational arrangements for value creation (Doz and Hamel, 1998; Gulati, 1998), for example through the exploitation of relational rents (Dyer and Singh, 1998).

Strategic networks offer a wide array of sources of value creation. As Gulati, Nohira, and Zaheer (2000) point out, these structures for collaboration may enable a firm to gain access to information, markets, and technologies. In addition, they potentially offer sharing of risk, economies of scale and scope, learning benefits

(Anand and Khanna, 2000), and benefits that accrue from interdependent activities such as workflow systems (Blankenburg Holm, Eriksson, and Johansson, 1999). Some of these value drivers are explored in Baum, Calabrese and Silverman (2000). The authors perform an empirical analysis of a set of Canadian biotech startup firms to study the effect of alliance network composition on performance. They find that startups can improve performance by establishing alliances and by configuring them into networks that enable them to tap into the capabilities and information of their alliance partners.

Burt (1992) also emphasizes the importance of network configuration, or structure for value creation. According to the author, networks can provide parties with informational advantages, such as access, timing, and referral benefits. The configuration of the network in terms of density and centrality (Freeman, 1979) plays an important role in determining these network advantages. Moreover, the size of the network and the heterogeneity of ties may also have a positive effect on the availability of valuable information sources to participants in a network (Granovetter, 1973). Other sources of value in strategic networks include improved access to valuable resources and capabilities that reside outside the firm (Gulati, 1999), shortened time to market (Kogut, 2000), enhanced transaction efficiency, reduced asymmetries of information, and improved coordination between the firms involved in an alliance (Gulati, Nohira, and Zaheer, 2000).

The strategic network perspective is relevant for understanding wealth creation in virtual markets because of the importance of networks in this business space. Of particular importance are the insight that there is a link between network configuration and value creation (e.g., Burt, 1992), and the idea that the spectrum of potential alliance partners encompasses suppliers, complementors, customers and other partners with which the firm must cooperate or compete. Brandenburger and Nalebuff (1996) refer to the latter idea as a “value net,” whereas in the context of alliance formation within the strategic management literature, it is commonly referred to as the “relational view” (e.g., Dyer and Singh, 1998). It is worth emphasizing that customers can play a critical role in value creation (as lead users, for example). They may work with the firm to better assess their needs, acting as beta sites before the product is released to a larger customer base (von Hippel, 1986; Prahalad and Ramaswamy, 2000).

We conclude that it is important to take network components (e.g., partners) and their configuration (e.g., the ties between them) into account when analyzing value creation in virtual markets. However, the strategic network perspective may not fully explain the value creation potential of organizations that operate in virtual markets and that enable transactions in new and unique ways within network structures. For example, it may be difficult to employ strategic network theory, or the tools provided by network analysis to explain the value creation potential of Priceline.com's business model. This business model centers on the idea of reverse markets for airline ticket purchasing whereby a customer posts desired prices for ticket providers' acceptance. As this example indicates, virtual markets, with their unprecedented reach, connectivity, and information processing speed, open entirely new possibilities for value creation through the structuring of transactions in novel ways.

We believe that our understanding of value creation through networks of firms and customers in virtual markets can be augmented by arguments that are central to the value chain framework (Porter, 1985), in particular the idea that processes matter. However, because of the conceptual difficulties that arise in the context of virtual markets with processes *centered on product flows* (e.g., Rayport and Sviokla, 1995; Stabell and Fjeldstad, 1998), we propose to complement this perspective by concentrating on processes that are *focused on enabling transactions*.

Transaction perspective. One of the main effects of doing business over the Internet, or in any highly networked environment, is the reduction in transaction costs it engenders (Dyer, 1997). In addition to decreasing the direct costs associated with economic transactions (such as customer search costs), e-commerce also holds the potential of changing several other types of transaction costs. These include a reduction in agency costs, such as the costs of opportunism, that results from the increased frequency of transactions (because of open standards, anyone can interact with anyone else), a reduction in transaction uncertainty (by providing a wealth of transaction-specific information), and a reduction in asset specificity (for example, through lower site specificity—the next site is only “one click away”). Under these circumstances, the implication of transaction cost economics is that transactions are more efficiently governed by market-type institutional arrangements, and less efficiently governed within fixed firm boundaries (Williamson, 1975).

Williamson suggests that “a transaction occurs when a good or service is transferred across a technologically separable interface. One stage of processing or assembly activity terminates, and another begins” (1983: 104). He thereby implies that a transaction is a discrete event. For the purpose of this study, however, we propose the following definition:

Definition: A **transaction** refers to the economic exchanges (digital or physical) that lead to the fulfillment of a perceived customer need.

This definition of a transaction extends Williamson’s (1975) transaction cost perspective in a number of ways. First, our definition builds on the central tenet of exchange network theory, which holds that two exchange relations are connected if the exchange in one relation is contingent on the exchange in the other (Cook and Emerson, 1978). According to our definition, a transaction is composed of multiple, discrete economic exchanges. This contrasts with the traditional transaction cost economics perspective, from which any given economic exchange is valuable by itself, as it is assumed to reflect the choice of the most efficient governance form and hence be a source of transactional efficiencies. However, in the context of virtual markets, considering any given exchange in isolation from other exchanges that may complement or facilitate the transaction, makes it difficult to assess the value created by a specific economic exchange. This is evident from the absence of direct empirical validation of the relationship between exchange attributes and market and firm performance (Poppo and Zenger, 1998), and the absence of estimates of transaction costs themselves (see Shelanski and Klein, 1995, for a review)

Second, we build on Williamson’s (1975) focus on the efficiency of alternative governance structures that mediate transactions, to suggest that in addition to efficiency enhancements, there are other factors that contribute to value creation (namely, novelty, lock-in of customers, and complementarities). As well, value can be created through any combination of exchanges within a firm and through the market. In fact, by electronically supplying information in real time, the customer can “co-create value” (Parahald and Ramaswamy, 2000), as vendors can better tailor their offerings to the customer.

Business model. We propose to use a transactions focus to synthesize insights from Porter's (1985) value chain framework with strategic network theory. From this synthesis we derive the business-model construct.

Definition: A **business model** is the architectural configuration of the components of transactions designed to exploit business opportunities.

A transaction component is defined as follows:

Definition: A **transaction component** refers to (1) the specific information, service, or product that is exchanged and/or (2) the parties that engage in the exchange.

As a transaction is frequently comprised of multiple exchanges, there are often multiple components to a transaction. The components are the participants in the business model and the products (including information) and services (including information processing) that they provide. Transaction components may refer to activities from deconstructed value chains that are reorganized and enriched by information processes. They are the value-added steps that, when combined through a business model, enable the fulfillment of customer needs. While the components to a transaction are the pieces of the puzzle, the architectural configuration is the picture of the assembled puzzle.

Definition: The **architectural configuration** depicts and characterizes the linkages among the components of transactions and describes their sequencing.

In other words, the architectural configuration outlines the interactions among the transaction components that allow the business model participants to exploit business opportunities.

Our definition of a business model is applicable to firms doing business in virtual markets as well as to more conventional businesses. A business model describes the way in which the elements of market exchanges are combined and structured, that is, the way in which the flow of goods (products, services, and information) among participants is coordinated to enable transactions. Each business model may facilitate multiple transactions. In addition, note that each business model is centered on a particular firm. In other words, a particular firm is the business model's main reference point. This is why one can refer to a particular business

model as “firm x’s business model.” However, the business model as a unit of analysis has a wider scope than does the firm, since it encompasses the capabilities of multiple firms in multiple industries. A business-model perspective on value creation in virtual markets seeks to answer the following questions: How do the participants to a transaction, especially the firm, which is the reference point of a business model, enable transactions? And how is value created in the process of enabling transactions?

As an illustration of the concept outlined above, we give the example of Autobytel.com, a company listed on NASDAQ, which provides consumers with automotive solutions. In one of the transactions that its business model enables, Autobytel.com (through its Autobytel DIRECT unit) acts as a broker on behalf of its affiliated car dealers, finance and insurance companies who, among others, constitute important business model components. The architectural configuration of the business model can be sketched as follows. Dealers upload information on their inventory directly onto Autobytel.com’s Web site, providing information on pricing and vehicle features. Potential auto buyers engage in a transaction by downloading a virtual car lot and filling in an on-line purchase order. Following that, an Autobytel.com sales consultant contacts the consumer within 24 hours to review various options such as at-home test drives (provided by a partner, Enterprise Rent-A-Car), or at-home delivery (provided by another partner, Movecars.com). In addition, Autobytel.com’s Customer Care Center will suggest possible vehicle financing, leasing and insurance options. Buyers interested in obtaining credit may apply directly through the Web site. Autobytel.com passes their request on to a financing partner (such as Chase Manhattan) who will contact the consumer and eventually grant a credit. In the last step, the customer will either pick up the car at the dealership, or it will be delivered to her or his home. This rounds off the one-stop car-purchasing process, which is the opportunity that Autobytel.com’s business model addresses. In this process, Autobytel.com takes responsibility for transaction handling and closing, and for the coordination of the transaction with its business-model partners. However, important roles, activities and capabilities remain with the latter. Sources of value created by Autobytel.com’s business model include accelerated transaction speed, convenience and ease of searching, evaluating and choosing a vehicle, reduced bargaining costs, and provision of complementary products such as financing and insurance.

With the theoretical foundations of the business-model construct anchored in the transaction perspective and value chain and strategic network theories, we can now turn to the definition of the value that is created through a business model. In doing so, we generalize Brandenburger and Stuart (1996) who define total value created in a simplified supply chain with one supplier, one firm, and one customer as the customer's willingness-to-pay minus the supplier's opportunity costs. Total value created can be expressed as the sum of the values appropriated by each party. We extend their approach by positing that total value created equals the sum of the values appropriated by all the participants in a business model, over all transactions that the business model enables.⁵

Discussion of the business model construct. The perspective of the business model is nearly absent from the academic literature. There are however, a few exceptions. Venkatraman and Henderson (1998) define a business model as a coordinated plan to design strategy along three vectors: customer interaction, asset configuration, and knowledge leverage. Hamel (1999) relates the high capitalization of Silicon Valley firms to a certain business model rather than to the talents of the entrepreneurs. Prahalad and Ramaswamy (2000:81) state that "the unit of strategic analysis has moved from the single company to...an enhanced network of traditional suppliers, manufacturers, partners, investors *and* customers." And Timmers (1998:4) defines a business model as an "architecture for the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; and a description of the sources of revenues."

These authors offer interesting insights about business models, which broadly support our conceptualization of the term. However, the theory of the "business model" is not well developed in these pieces. The same can be said about the non-academic literature, where ambiguity, contradiction, and misconception about the concept prevail. For example, a business model is often conflated with a mode for generating revenues (e.g., Green 1999). In order to avoid further confusion, we offer the following definition of "revenue model."

Definition: A **revenue model** refers to the specific modes in which a business model enables revenue generation.

E-commerce firms generate revenues through subscription fees, advertising fees, and transactional income (including fixed transaction fees, referral fees, fixed or variable sales commissions, and mark-ups on direct sales of goods). They sometimes use variants of these basic revenue-generating modes, and they often use them in combination. As our definitions show, the business model and the revenue model are complementary yet distinct concepts. A business model refers primarily to value creation whereas a revenue model is primarily concerned with value appropriation.

The business model differs from its theoretical antecedents in several important ways. First, the product value chain is a flow concept that centers on the flow of products through an organization. It describes the processes by which value is added through activities that are performed on certain inputs to produce a desired output. In contrast, the business model is centered on transactions. That is, a business model does not follow the flow of a product from creation to sale, but describes the steps that are performed in order to complete a transaction (i.e., a set of economic exchanges). Another distinction between the value chain concept and the business model concept is that the value chain perspective is mainly concerned with how one particular firm adds value in the production of a product (Porter, 1985) while the business model perspective includes all the participants to a transaction, including final consumers.

Second, the notion of a business model draws on network theory by building on the insight that unique combinations of inter-firm, cooperative arrangements such as strategic alliances and joint ventures can create value (Doz and Hamel, 1998; Dyer and Singh, 1998). However, while the strategic alliance and joint venture perspectives suggest that these are usually strategic choices made as extensions to a firm's core competencies, the business model perspective views inter-firm cooperative arrangements as necessary elements to the firm's ability to carry out transactions.

We believe that the business model concept enables us to address a unique set of questions that cannot be sufficiently addressed by either the value chain construct or by strategic network theory alone. We also suggest that as a firm's scope and its boundaries become less clear through the advent of virtual markets and through the impact of sophisticated information technology, strategic analyses of e-commerce ventures will have

to move beyond the traditional conception of the “firm” as the unit of analysis. Scholars of strategic management increasingly recognize that the source of value creation may lie in networks of firms (Bettis, 1998; Dyer and Nobeoka, 2000; Gulati, Nohira and Zaheer, 2000). We build on this line of reasoning to suggest that value is created by the way in which business transactions are enabled. In e-commerce in particular, enabling such transactions requires a network of capabilities drawn from multiple stakeholders including customers, suppliers and complementors. Business models may thus span industry and firm boundaries.

Indeed the business model perspective offered herein also builds on the resource-based view (RBV) of the firm (Wernerfeld, 1984; Barney, 1991; Peteraf, 1993; Amit and Schoemaker, 1993). Clearly, the value embedded in the business model increases as the bundle of resources and capabilities it encompasses becomes more difficult to imitate, less transferable, less substitutable, more complementary, and more productive with use (rather than depreciate with use, as is the case with capital assets). The business-model perspective therefore takes into consideration the ways in which resources can be valuable, and is consistent with the VRIO framework offered by Barney (1997).

In the next sections, we adopt the business-model perspective to explore the value drivers of several e-commerce business models.

DATA AND METHOD

Research strategy. A lack of prior theorizing about a topic makes the inductive case study approach an appropriate choice of methodology for developing theory (Eisenhard, 1989). Hence to develop new theory that describes value creation of e-commerce business models, we conducted in-depth inquiries into the business models of 59 e-commerce firms. We had field researchers take notes for each firm on about 50 mainly open-ended questions that had been enumerated in a questionnaire. The fieldworkers then wrote up the answers to the questions by integrating evidence from multiple data sources, writing up to several paragraphs in response to each question.

Our research design was based on multiple cases and multiple investigators, thereby allowing for a replication logic (Yin, 1989). That is, we treated a series of cases like a series of experiments. Each case served

to test theoretical insights gained from the examination of previous cases, and to modify or refine them. Such a replication logic fosters the emergence of testable theory that is free of researcher bias (Eisenhard, 1989), and it allows for a close correspondence between theory and data (Glaser and Strauss, 1967). Such a grounding of the emerging theory in the data can provide a fresh, frame-breaking perspective on an already researched topic (e.g., Hitt, Harrison, Ireland and Best, 1998). However, it is especially useful in the early stages of research on a topic, when it is not clear yet to what extent the research question is informed by existing theories (for a recent example of such an inductive study, see Galunic and Eisenhard, 2000).

Using case studies is a good research strategy for examining “a contemporary phenomenon in its real-life context, especially when the boundaries between phenomenon and context are not clearly evident “ (Yin, 1981: 59). In our case, the phenomenon of interest is the value creation of e-commerce business models and its drivers, which may be closely linked with the characteristics of virtual markets. Hence, it is often difficult to draw the boundaries between the former and the latter. This difficulty is highlighted by the frequent treatment of value drivers and market characteristics as synonyms (e.g., Evans and Wurster, 1999).

Population of e-commerce firms. We define e-commerce companies as firms that derive a significant proportion of their revenues by participating in transactions over the Internet. This definition of e-commerce companies is quite broad. It includes, for example, Internet Service Providers (e.g., European ISP Freeserve), and companies that have not aligned all of their internal business processes with the Internet but that use the Internet solely as a sales channel (e.g., companies such as the speech recognition software provider Lernout and Hauspie). On the other hand, it excludes providers of Internet-related hardware or software, that is, firms that facilitate e-commerce but do not engage in the business activity themselves (e.g., a backbone switch manufacturer, such as Packet Engines Inc.).

Companies that derive all of their revenues from e-commerce (so-called “pure plays”) are relatively easy to identify using publicly available descriptions of their major lines of business (e.g., barnesandnoble.com). In other instances, however, it is more difficult to establish whether a firm derives significant revenues from e-

commerce. This is the case for many incumbents (e.g., the British retailer Iceland). We consider a significant revenue stream to be at least 10% of total revenues. It is often impossible to assert if this criterion has been met since companies seldom report their e-commerce revenues as a separate category. In these cases, we used other information to determine the company's fit with our target population. For example, we checked whether trade publications were referring to the company as an e-commerce firm, or whether publications such as The Wall Street Journal and The Financial Times considered the company an e-commerce pioneer or early innovator in the virtual market space.

Sample. For the US, we created a list of e-commerce firms that went public between April 2, 1996 (Lycos) and October 15, 1999 (Women.com Networks) using information available on www.hoovers.com. This list includes about 150 firms, most of which are "pure plays." Our initial sub-sample of 30 US e-commerce companies was then taken at random from this list. It represents a broad cross-section of businesses (see Appendix). By contrast, the challenge in creating the European sub-sample was identifying public e-commerce firms in the first place. Indicators of Internet usage and e-commerce activity in Europe, as well as the number of European firms engaged in e-commerce, have lagged behind the corresponding figures in the US in recent years (Morgan Stanley Dean Witter, 1999). Despite these difficulties, we managed to establish a sample of 29 public European e-commerce companies (also listed in the Appendix). Companies were found on all major European exchanges, as well as on new venture markets (such as Germany's *Neuer Markt*).

To be eligible for inclusion in our sample, an e-commerce firm had to (a) be based either in the US or in Europe, (b) be publicly quoted on a stock exchange, and (c) involve individual consumers in some of the e-commerce transactions it enables. The international scope of our study not only reflects the decreasing importance of geographic boundaries in virtual markets, it also strengthens our theory development. Theory building on e-commerce value drivers from inductive case studies is less idiosyncratic if one allows for cases from different economic environments.⁶

We chose to include only public companies in our sample to ensure the availability and accuracy of information. We are aware that this limits the scope of our analysis somewhat, as there are many private firms

with interesting business models. However, unlike private firms, publicly traded companies provide a wealth of data that can be collected, organized, and analyzed. At this point, it is unclear whether or not this choice introduces a large-company bias into our sample, and hence into our conceptual development, because there are many large, private e-commerce operations, and several large, public firms not included in our sample (e.g., AOL, and Yahoo).

Including only public companies in our sample may bias it towards surviving companies. All companies chosen were reasonably successful, as all were listed on a public exchange. While limitations on the availability of data prevent us from broadening the sample to firms that “failed” (according to some definition of failure), we do not believe that the survival bias affects the theoretical development. First, some of the firms we studied will likely fail eventually. Second, the argument can be made for theoretical rather than random sampling of cases, and for studying “extreme situations and polar types in which the process of interest is transparently observable” (Eisenhard, 1989: 537).

As implied by criterion (c), we focused our study on e-commerce companies that enabled transactions in which individual consumers were involved. These companies are hereafter collectively referred to as “with-C” companies. For example, our sample included so-called “B-to-C” (business-to-consumer) companies, which are companies that directly and exclusively engage in transactions with individual customers. We did not sample businesses that solely engaged in commercial activities with other businesses (so-called “B-to-B,” pure plays, or “business-to-business” companies). We made this choice primarily because the quality of data available for “with-C” firms was higher than that available for “B-to-B” firms at the time this research project was launched.⁷

Data collection. We gathered detailed data on our sample companies mainly from publicly available sources: IPO prospectuses (our major source), annual reports, investment analysts’ reports, and companies’ web sites. A structured questionnaire was used to collect information about (a) the company (e.g., founding date, size, lines of business, products and services provided, and some financial data), (b) the nature and sequence of transactions that the firm enables (e.g., questions included: “What is the company’s role in consummating each transaction?” and Who are the other players involved?”) (c) Potential sources of value creation (e.g., questions

included: “How important are complementary products or services?” and “Are they part of the transaction offering?”), and (d) the firm’s strategy (e.g., questions included: “How does the company position itself vis-à-vis competitors?”). Most of the approximately 50 questions enumerated in the questionnaire were open-ended, which was consistent with our primary objective of developing a conceptual framework that was informed by empirical evidence.

Much high-quality data about US firms was obtained from the SEC’s EDGAR database, which is available to the public on-line. Data on companies included in the database adheres to a single, US standard set by the SEC. In Europe, however, there is no central data depository. In addition, company reporting requirements vary across European countries, ranging from strict (e.g., the UK) to relatively lax (e.g., Italy). European firms also vary widely in their accounting and disclosure practices, making comparisons across firms difficult. This made the use of multiple sources of information particularly important.

Data analysis. In inductive studies, data analysis is often hard to distinguish from data collection because building theory that is grounded in the data is a highly iterative process in which the emergent frame is compared systematically with evidence from each case (Eisenhard, 1989). Some researchers argue for a deliberate process of joint data collection and analysis (e.g., Glaser and Strauss, 1967). We employed this joint process by frequently moving between the data and the emerging theory as we developed our model. The value driver categories derived from our preliminary analysis of the initial data clearly influenced the design of the subsequent questionnaire that we used for further data collection.⁸

We used standard techniques for both within-case analysis and cross-case analysis (Eisenhard, 1989; Glaser and Strauss, 1967; Miles and Huberman, 1984; Yin, 1989). Within-case evidence was acquired by taking notes rather than by writing narratives. For this purpose, members of the research team answered the questions enumerated in the questionnaire, integrating facts from the various data sources mentioned above. As observed by Yin (1981: 60), “The final case studies resembled comprehensive examinations rather than term papers.” Different members of the research team then analyzed these products sequentially and independently, and periodically discussed their observations in order to reach agreement about the findings. These analyses were the

basis for verifying the business-model construct developed earlier, for generating initial hypotheses about the value driver categories, and for helping us gain insight into what makes e-commerce firms tick.

The final model was shaped through intensive cross-case analysis. We first split the sample into two groups, with different researchers responsible for each set. Eisenhard (1989) notes that this strategy of dividing the data by data source is valid for cross-case analysis. We then identified what we considered to be the predominant value drivers and compared these patterns across the sub samples. In order to corroborate our findings, we tabulated the evidence underlying the value driver constructs as suggested by Miles and Huberman (1984). The next section outlines the value driver model that emerged from this process.

THE VALUE DRIVER MODEL

Figure 1 depicts the value driver model we have developed. As emphasized throughout the paper, the term “value” refers to the total value created for all parties involved in the transactions that a business model enables. As stated earlier, this value can be measured as the sum of the values that can be appropriated over all participants in the business model and over all transactions enabled by the business model. Because the value driver model considers a firm’s business model to be the unit of analysis, it facilitates an assessment of the value-creating potentials of different e-commerce business models. Each of the four major value drivers that were identified in the analysis –efficiency, complementarities, lock-in, and novelty– and the linkages among them, are discussed below. We suggest that the value creating potential of any business model is enhanced by the extent to which these factors are present.

[INSERT FIGURE 1 ABOUT HERE]

Efficiency. Efficiency refers to a particular transaction enabled by a business model. Transaction efficiency increases when the costs per transaction decrease, where “costs” are broadly defined, as elaborated in detail below. The greater the transaction efficiency gains that are enabled by a business model, the more valuable that business model will be. Efficiency enhancements relative to off-line business models (i.e., those of companies operating in traditional markets), and relative to other on-line business models (i.e., those of

companies operating in virtual markets), can be realized in a number of ways. One is by reducing information asymmetries between buyers and sellers through the supply of more up-to-date and comprehensive information. Improved information can also reduce customers' search and bargaining costs, enable faster and more informed decision-making, provide for greater selection at lower costs by reducing distribution costs, streamline inventory management, simplify transactions and thus reduce the likelihood of mistakes, allow individual customers to benefit from scale economies through demand aggregation, and bulk purchasing, streamline the supply chain, and speed up transaction processing and order fulfillment, thereby benefiting both vendors and customers. Marketing and sales costs, transaction-processing costs, and communication costs, can also all be reduced in an efficient business model.

Autobytel.com's business model is a case in point. Potential auto buyers are supplied with detailed and comprehensive comparative shopping information on different models and the costs to dealers' of these models, and hence they can quickly make well-informed decisions. The buying process is also substantially simplified and accelerated, and bargaining costs are reduced. While vendors' margins on each sale might be lower, sales volumes increase at essentially no marginal costs.

Efficiency gains in highly networked industries are well documented in the management literature. A study of highly networked Japanese firms, for example, suggests that information flows and reduced asymmetries of information, among other factors, are important in reducing the potential transaction costs associated with specialized assets (Dyer, 1997). More generally, information technology is believed to lead to a reduction of the costs of coordinating and executing transactions (Evans and Wurster, 1999). These arguments can be related to the efficiency gains generated by e-commerce business models. They confirm that the appropriate level of analysis in studying value creation through e-commerce is the business model anchored in the transaction perspective.

Complementarities. Complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately. In the strategy literature, Brandenburger and Nalebuff (1996) have highlighted the importance of providing complementary outputs to

customers.⁹ They state that, “A player is your complementor if customers value your product more when they have the other player’s product than when they have your product alone” (1996:18).

E-commerce firms can leverage this potential for value creation by offering bundles of complementary products and services to their customers. These complementary goods may reflect vertical complementarities (e.g., after-sales service) or horizontal complementarities (e.g., one-stop shopping, or cameras and films) that are often provided by partner firms. They are often directly related to a core transaction enabled by the firm’s business model. For example, E-bookers, a European on-line travel site, grants its customers access to weather information, currency exchange rate information, and appointments with immunization clinics. These services enhance the value of the core products (airline tickets and vacation packages) and make it convenient for users to book travel and vacations with E-bookers.

Similarly, off-line assets can complement on-line offerings. Customers who buy products over the Internet may value the possibility of getting after-sales service offered through bricks-and-mortar retail outlets, including the possibility of returning or exchanging merchandise. This complementarity between on- and off-line businesses is the essence of “click-and-mortar” business models, such as that of barnesandnoble.com. The business model used by barnesandnoble.com also creates value for its partners by cross-marketing their products in Barnes & Noble bookstores and offering online customers the opportunity to browse, order, and receive books in its bricks-and-mortar stores.

Customers may also benefit from a range of complementary goods that may not be directly related to the core transactions enabled by a business model. Consider, for example, the business model of Xoom.com, which is a company that facilitates community building among Internet users and exploits its customer base through a mix of e-commerce activities, such as auctions, sales, and direct marketing. Xoom.com attracts customers by offering an array of free Internet services, such as home page building and hosting, access to chat rooms and message boards, e-mail, online greeting cards, downloadable software utilities, and clip art. These services are not directly related to the products they sell or to the auctions they host. However, they fit well with the community aspect of Xoom’s business model since they facilitate communication among members.

Business models may also create value by capitalizing on complementarities among activities (such as supply-chain integration), and complementarities among technologies such as linking the imaging technology of one business-model participant with the Internet communication technology of another, thereby unleashing new value.

Efficiency gains made possible by information technology pave the way for the orchestration and profitable exploitation of complementarities among components of business models. Weaving together transaction components delivered by distinct firms in a business model is economically compelling when transaction costs, and hence the threat of opportunism, are low. However, the reverse is also true: complementarities may lead to increased efficiency of a business model, at least from a customer's point of view. Customers may benefit from complementary products and services, for example, through reduced search costs (e.g., when purchasing a car with the help of Autobyte.com, one is automatically offered car insurance, a complementary product) and improved decision-making.

Lock-In. The value-creating potential of a business model also depends on the extent to which it is able to motivate customers to engage in repeat transactions. This characteristic can be described as the "stickiness" or "lock-in" property of a business model. It prevents migration to competitors and increases transaction volume through repeat transaction. Lock-in refers to the switching costs faced by customers who consider using alternative business models.

There are several ways in which customer retention can be enabled by a business model. First, loyalty programs can be established that reward repeat customers with special bonuses (Varian, 1999). These programs are similar to airline frequent flyer reward programs. Second, firms can develop a dominant design proprietary standard (Teece, 1987) for business processes, products, and services (e.g., Amazon's patented shopping cart). Third, firms can establish trustful relationships with customers, for example, by offering them transaction safety and reliability guaranteed by independent and highly credible third parties. The business model of Consodata, a European direct mailing firm, demonstrates this ideal. Consodata promotes in-house systems to protect data from misuse, but, more importantly, also accommodates inspections by the French government agency CNIL

(Commission Nationale Informatique et Libertes). To the extent that customers develop trust in an e-commerce company through such measures, they are more likely to remain loyal to the site rather than switch to a competitor.

Switching costs might include the costs of switching firms after an Internet user has customized products, services, or information to his or her needs. Alternatively, the companies that participate in the business model may have used methods to personalize goods (products, information, and services). These methods might include the ability to set up personalized storefronts or conduct direct advertising, analyze submitted customer information, use cookies, analyze click streams, analyze past purchases, create a personalized interface, target emails, and target cross selling on web page. Furthermore, the creation of virtual communities also bonds participants to a particular business model (Hagel and Armstrong, 1997). Such communities enable frequent interactions on a wide range of topics and thereby create a loyalty and enhance transaction frequency.

As well, Smith *et al.* (1999) contend that familiarity with the interface design of a web site represents customer learning and thus prevents customers from switching to other sites. This argument certainly gains strength when customization features such as “one-click ordering,” a standard feature of many e-commerce sites, are available. Personalization can also be achieved with filtering tools that compare a customer’s purchase patterns with those of like-minded customers and make recommendations based on inferred tastes. This mechanism exhibits the interesting property that the more the customer interacts with the system, the more accurate the matching results become. Customers thus have high incentives to use the system. This creates a positive feedback loop (Arthur, 1990). More importantly for our discussion of business models, however, is the idea that increasing returns (Arthur, 1996) and positive feedback may derive from network effects (Katz and Shapiro, 1985; Shapiro and Varian, 1999).

E-commerce business models connect various parties that participate in transactions and can thus be considered network generators. Networks may exhibit externalities in that the production or consumption activities of one party connected to the network have an effect on the production or utility functions of other participants in the network. This effect is not transmitted through the price mechanism. Network externalities are

usually understood as positive consumption externalities in which “the utility that a user derives from consumption of the good increases with the number of other agents consuming the good” (Katz and Shapiro, 1985:424). Henceforth, we will refer only to consumption externalities when discussing network externalities. In the context of a business model, network externalities are present when the value created for customers increases with the size of the customer base. Consider, for example, a community site such as Fortunecity, where a user benefits when there are more participants with whom she or he can interact in chat rooms, on bulletin boards, etc. After a new member has joined the community, it becomes even more attractive for other potential members to subscribe. The opposite is also true -- if a site is unattractive and loses members, it becomes less attractive for existing subscribers, who may drop out. A dangerous downward spiral is set in motion that, in the extreme case, can destroy the business.

There may also be *indirect* network externalities that arise when economic agents benefit from the existence of a positive feedback loop with another group of agents. Consider, for example, the business models implemented by on-line auction companies such as eBay or QXL. A buyer on one of these auction sites has no immediate advantage from the presence of additional buyers. On the contrary, other buyers who are willing to purchase the same merchandise may prevent the desired trade. However, the presence of more buyers (a signal of current and future market liquidity) makes it more attractive for potential sellers to put their products up for sale at that particular site. This, in return, enhances the site’s attractiveness to potential buyers. Buyers thus benefit indirectly from increasing numbers of other buyers. The same logic holds for sellers.

The indirect network effect, which Katz and Shapiro (1985) term the “hardware-software paradigm,” can be attributed to the complementary nature of some of the major components of the network that constitutes a business model (Economides, 1996). In an auction business model, the complementary components of the network would be the buyers and sellers. Here, the total value created is a direct function of network size.

Although some business models (for example, those revolving around on-line communities and auctions) are more likely than others (for example, those focusing mainly on direct, on-line sales) to exhibit important network externalities, e-commerce business models can be designed to harness the power of this lock-in

mechanism. Amazon.com, for example, has incorporated several community features into its business model (Kotha, 1998). Among other things, it has created a “community of interests” by allowing its customers to write book reviews. Even stronger are the network effects created by on-line vendors of video game software, such as Cryo-Interactive or Gameplay.com, that provide a web location where customers can interact and play games (obtained from the web provider) with each other.

The efficiency and complementarities value drivers can be helpful in fostering lock-in. A business model’s efficiency features and complementary product and service offerings may serve to attract and retain customers and partners. The higher the relative benefits offered to existing and prospective participants, the higher their incentives to stick with or join the network established by the business model. The increasing return properties inherent to network effects then magnify the relative benefits offered, thus triggering positive feedback dynamics.

Conversely, when a business model creates lock-in, it can also have positive effects on its efficiency and on the degree to which it provides for complementarities. For example, many auction sites enable buyers to rate sellers. This feature increases buyers’ trust in the fairness of transactions and therefore fosters the stickiness of the respective business model. This feature also provides a strong incentive for repeat sellers to refrain from cheating, which clearly enhances transaction efficiency. Moreover, a business model’s strong potential for lock-in also constitutes an incentive for high-profile partners to become contributors of complementary products and services because of the promise of high-volume (repeat) business. There are thus important relationships between lock-in, efficiency, and complementarities. The potential value of an e-commerce business model depends to an important extent on the combined effects of all the value drivers.

Novelty. Schumpeter (1934) defined innovation as the introduction of new products or services, new methods of production, distribution, or marketing, or as tapping new markets. None of these modes of innovation, however, captures the essence of the novelty introduced by the business models adopted by companies such as eBay, Priceline.com, and Autobytel.com. For example, eBay was first to introduce customer-to-customer auctions in which even low-value items could be successfully traded between individual consumers.

Priceline.com introduced reverse markets, whereby individual buyers indicate their purchase needs and reservation prices to sellers. Autobytel.com revolutionized the automobile-retailing process in the US through linking potential buyers, auto dealers, finance companies, and insurance companies, thus enabling around-the-clock one-stop car shopping from home. These companies all introduced new ways of conducting and aligning transactions, thereby eliminating inefficiencies in the buying and selling processes. These cases indicate that the business model has become a locus of innovation. Innovative business models create value through capturing latent consumer needs (such as haggle-free car purchasing from the convenience of your home) and by creating new markets (e.g., auctions for low-ticket items).

The unique characteristics of virtual markets (i.e., the removal of geographical and physical constraints, possible reversal of information flows from customers to vendors, and other novel information bundling and channeling techniques) make the possibilities for business-model innovation appear almost endless. There are a vast number of architectural configurations of transactions that can be constructed based on any given set of components. However, not every combination makes economic sense. Timmers (1998) claims that only eleven basic types of e-commerce business models can be observed, among them e-shop, e-auction, e-mall, virtual communities, and information brokerage.

E-commerce firms can uncover latent sources of value by identifying and incorporating valuable new complementary products and services into their business models in novel ways. One dimension of innovation in business models refers to the appropriate selection of participating parties. For example, firms can direct and intensify traffic to their web site by initiating affiliate programs with third parties, who are compensated for enabling the execution of transactions from their own web sites.

There can be substantial first-mover advantages for business model innovators. Being first to market with a novel business model makes it faster and cheaper to create switching costs by capturing “mindshare,” and developing brand awareness and reputation. As well, business-model innovators can gain by learning and accumulating proprietary knowledge, as well as by preempting scarce resources.

Novelty and lock-in, two of the four main value drivers in our model, are linked in two important ways. First, business model innovators have an advantage in attracting and retaining customers, especially in conjunction with a strong brand. Second, being first to market is an essential prerequisite to being successful in markets that are characterized by increasing returns. First movers are in a good position to initiate the positive feedback dynamics that derive from network externalities, and to achieve a critical mass of suppliers and/or customers before others do. In “winner-takes-most” or “winner-takes-all” markets, it is paramount to enter a new market first.

Novelty is also linked with complementarities. The main innovation of some e-commerce business models refers to the complementary components of transactions. Cyberian Outpost, a US Internet-only computer retailer, lets customers select computer configurations along with accessories and peripheral solutions by giving them access to an up-to-date database containing over 170.000 products, including information on their functionality and compatibility. The database contains information on many complementary products from partner firms (computer hardware manufacturers, accessories producers, and software developers to name a few). Each product is presented to interested buyers together with possible complementary solutions, including warranty options. Of course, the database also contains much information on substitute products. From the customer’s perspective, however, information about any of these products is complementary because it enables them to make better choices. Cyberian Outpost’s business model is thus a prime example of a novel transaction architecture that is based entirely on the logic of harnessing complementarities for consumers.

Finally, there is also an important relationship between novelty and efficiency. Certain efficiency features of a business model may be due to novel transaction components. For example, Artnet.com, a European company that has adopted a business model that enables on-line art auctions, reduces the asymmetry of information between buyers and sellers of art (traditionally a source of severe inefficiencies) through maintaining and expanding a database of transactions (including information on price) that is accessible to its clients. This information service, which allows participants in auctions to benchmark current transactions against historic art sales, is novel in the art auction business and increases transaction efficiency. Efficiency can also derive from

novel configurations of transaction architectures. That is, even if transaction components remain similar, changing the linkages between them may increase transaction efficiency. Small reorganizations within existing business models may lead to considerable efficiency gains.

Table 1 illustrates, in summary form, the results of our in-depth, case-based analyses of the value drivers of the business models developed by six of the sample's firms. The table depicts the specific ways in which the value drivers are manifested in the business models of the 3 US based and 3 European firms that are displayed. These four value drivers emerged from multiple case analyses and are uniquely applicable to the examination of value creation through business models. While the traditional value chain, five force industry analysis and the RBV frameworks focus on the competitive advantage of firms, (and hence on value creation for the firms' shareholders) the value drivers, depicted by Figure 1, focus on value creation by all participants in the business model. Put together, the four value drivers distinctively focus on the transaction enabled by the business model, and reflect the unique way in which the network of capabilities, which span firm and industry boundaries, has been configured to enable transactions. The novelty of the value driver model therefore lies in the linkage between the business model construct and the configuration of the four drivers along with the interrelationships among them: The business model depicts the ways in which transactions are enabled by a network of firms, suppliers, complementors, and customers, while value drivers capture the factors that enable value creation within the context of a business model.

[INSERT TABLE 1 ABOUT HERE]

CONCLUSIONS

In this paper, we draw on a wide body of literature to link the unique characteristics of virtual markets with new approaches to value creation. The theoretical development leads to the introduction of the business-model construct as a unit of analysis that enables the examination of new ways in which value can be created.

The business model, namely, the manner in which a firm coordinates and combines the flow of information, products, and services among parties to enable transactions, is applicable to both on-line and traditional, off-line firms. It does, however, derive much of its rationale from the possibilities for business-model innovation offered by the emergence of e-commerce. Armed with the business-model construct, we use a unique e-commerce data set we developed to conduct case analyses aimed at identifying common patterns of value creation in the process of enabling transactions. The analysis of the business models of the sample firms led to the development of the value-driver model, which includes four factors that enhance the value creation potential of e-commerce business models: efficiency, complementarities, lock-in, and novelty.

In this paper, we attempt to bridge the strategic management and the entrepreneurship literatures. Specifically, we have grounded the development of the business-model construct and the value driver model in the received strategy and entrepreneurship research and in the data set, respectively. The ideas that underlie this new paradigm build on the extensive research on value chains, inter-firm strategic networks, and transaction costs, and also bear relation to the resource-based view of the firm. The focus of this paper is on new wealth creation, which has occupied much of the entrepreneurship literature. We suggest that research on e-commerce and, more generally, on competition in highly networked markets will benefit from an integrative approach that combines both strategy and entrepreneurship perspectives.

This paper is a first step in attempting to understand the strategic issues faced by e-commerce firms in the emerging context of the Internet. It raises a number of interesting and challenging paths for future research including such questions as: 1) what are appropriate strategies in a world where business model innovation has become a dominant competitive force? And 2) Are strategy tools that were formulated based on a competitive landscape inhabited by off-line firms still relevant in the new world of e-commerce? Our paper suggests that the perceived shift to business-model innovation may require a parallel shift in strategic thinking towards more dynamic, adaptive, and entrepreneurial strategies. The research also leads us to examine how business models emerge, and how do they evolve. Although the possibility to deliberately design inter-firm networks (Lorenzoni and Lipparini, 1999) and the importance of adapting business models are increasingly acknowledged in the

strategy and entrepreneurship fields, we need more in the way of methodological approaches to the study of business-model dynamics and design.

We hope to have laid some of the foundations necessary for future research on the business-models. The evolution from a focus on firm to a focus on the business model, which spans firm and industry boundaries, is at its early stages and additional research to further develop the foundations of this perspective is called for. The rapid pace of technological developments and e-commerce growth gives rise to enormous opportunities for the creation of new wealth through the formation and growth of firms that deploy new business models. Thus research that lies at the intersection of strategy and entrepreneurship should rise to the challenges that emerge from this new business landscape.

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.Appendix

US Firms

Company	Core Product/Business	Country	Foundatio n Year	IPO Date	No. of Employee s	Where Traded
1-800-FLOWERS.COM	Flowers	USA	1992	08/03/99	2100	NASDAQ
Alloy Online	Portal	USA	1996	05/14/99	120	NASDAQ
Amazon.com	Books	USA	1994	05/15/97	7600	NASDAQ
Ask Jeeves	Search engine	USA	1996	07/01/99	416	NASDAQ
Autobytel.com	Automobiles	USA	1995	03/26/99	255	NASDAQ
barnesandnoble.com	Books	USA	1997	05/25/99	1237	NASDAQ
Beyond.com	Computer accessories	USA	1994	06/17/98	389	NASDAQ
CareerBuilder	Job portal	USA	1995	05/12/99	179	NASDAQ
Careinsite	Healthcare portal	USA	1996	06/16/99	160	NASDAQ
CBSsportsline	Sports content	USA	1994	11/13/97	453	NASDAQ
Cyberian Outpost	Hardware, software retailing	USA	1995	08/05/98	234	NASDAQ
E*TRADE	On-line brokerage	USA	1982	08/16/96	1735	NASDAQ
eBay	Auctions	USA	1995	09/24/98	138	NASDAQ
eToys	Toys	USA	1996	05/20/99	940	NASDAQ
fashionmall.com	Clothing and accessories	USA	1994	05/21/99	43	NASDAQ
Fatbrain.com	Books and information	USA	1995	11/20/98	315	NASDAQ
Healtheon	Healthcare portal	USA	1995	02/11/99	1825	NASDAQ
iTurf	Community/retail for youth	USA	1995	04/09/99	153	NASDAQ
Log On America	ISP	USA	1992	04/22/99	13	NASDAQ
MapQuest.com	Mapping	USA	1996	05/04/99	335	NASDAQ
Medscape	Medical portal	USA	1996	09/28/99	298	NASDAQ
musicmaker.com	Customized CDs	USA	1997	07/07/99	73	NASDAQ
N2H2	Internet filtering	USA	1995	07/30/99	179	NASDAQ
Net2Phone	Internet telephony	USA	1997	07/29/99	333	NASDAQ
NextCard	On-line credit	USA	1996	05/14/99	287	NASDAQ
Priceline.com	Reverse auction	USA	1997	03/30/99	373	NASDAQ
Streamline.com	Delivery goods	USA	1993	06/18/99	350	NASDAQ
Talk City	Communities	USA	1996	07/20/99	197	NASDAQ
VerticalNet	Trade communities	USA	1995	02/11/99	669	NASDAQ
Xoom.com	Retail/auction/advertising	USA	1996	12/09/98	92	NASDAQ

Appendix (Continued)

EU Firms

Company	Core Product/Business	Country	Foundation Year	IPO Date	No. of Employees	Where Traded
AB Soft	Communications software	France	1987	12/03/97	69	Nouveau Marché
Amadeus	Airline tickets	Spain	1987	10/19/99	2,860	Madrid
Artnet.com	Art	Germany	1989	05/17/99	97	Neuer Markt
Beate Uhse	Erotic goods	Germany	1946	05/27/99	706	Frankfurt
Boursedirect	On-line brokerage	France	1996	11/10/99	22	Nouveau Marché
Buecher.de	Books	Germany	1996	07/05/99	45	Neuer Markt
Commtouch	E-mail	Israel	1991	07/13/99	214	NASDAQ NM
Consodata	Consumer data	France	1995	10/07/99	220	Nouveau Marché
Cryo-interactive	Computer games	France	1992	12/08/98	218	Nouveau Marché
e-bookers	Travel booking	UK	1999	11/11/99	160	NASDAQ NM/Neuer Markt
Fortunecity	Community	Germany	1996	03/19/99	164	Neuer Markt
Freeserve	ISP	UK	1998	07/26/99	16	NASDAQ NM
Gameplay.com	Computer games	UK	1999	08/02/99	37	LSE
i:FAO	Travel booking	Germany	1977	03/01/99	112	Neuer Markt
Iceland Group	Grocery	UK	1970	10/16/84	11,895	LSE
ID Media	Community/software	Germany	1988	06/17/99	99	Neuer Markt
Infonie/Infosources	ISP	France	1995	03/20/96	450	Nouveau Marché
Lernout & Hauspie	Speech-related software	Belgium	1987	06/23/97	2500	EASDAQ/NASDAQ NM
QXL.com	Auctions	UK	1997	10/07/99	105	LSE/NASDAQ NM
Ricardo.de	Auctions	Germany	1998	07/21/99	73	Neuer Markt
Scoot.com	Directory services	UK	1993	03/10/97	1000	NASDAQ NM
Sportingbet	On-line betting	UK	1998	02/22/99	33	OFEX
Terra Networks	ISP	Spain	1998	10/29/99	928	Madrid/NASDAQ NM
The eXchange	Financial services	UK	1991	08/06/99	235	LSE
Tiscali	ISP	Italy	1997	10/27/99	178	Nuovo Mercato
Topjobs.net	Job portal	UK	1996	04/28/99	64	NASDAQ NM
Town Pages	Directory services	UK	1995	05/05/99	270	AMEX
Vocaltec	Internet telephony	Israel	1994	02/07/96	343	NASDAQ

Figure 1: Value Drivers of e-Commerce Business Models

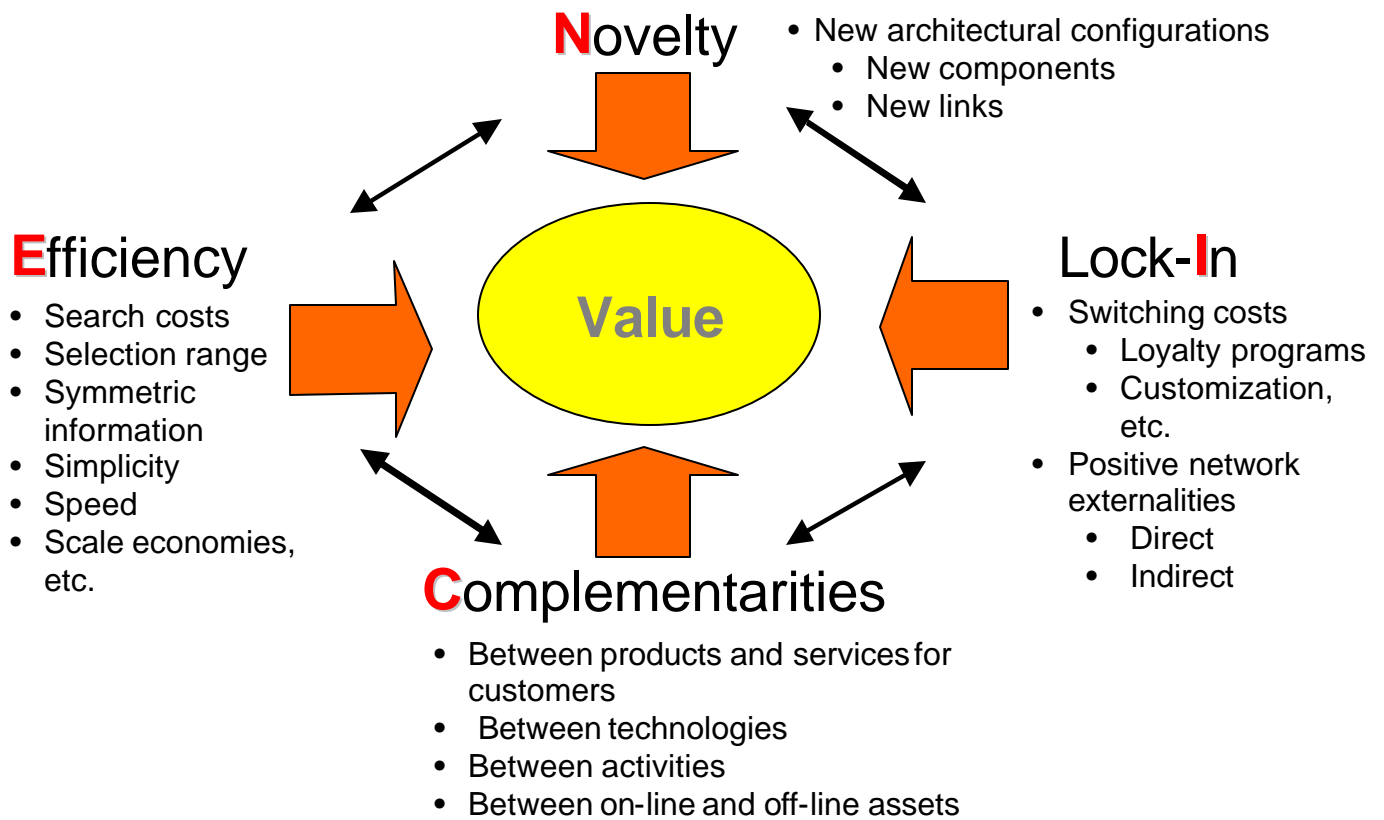


Table 1: Value Drivers Attributes of Selected Business Models

	Efficiency	Complementarities	Lock-in	Novelty
Autobytel.com (ABT) (Automobile retailing) (US firm)	<ul style="list-style-type: none"> ☞ Informed customers decisions enabled by rich online content, valuation reports, photos of vehicles, and inspection reports for used vehicles ☞ Dealers benefit from lower inventory costs due to automated online order taking, higher volume, lower selling costs, lower marketing, advertising, and personnel costs ☞ Product research is faster than with off-line models 	<ul style="list-style-type: none"> ☞ Complementary services offered by business model participants (cars, insurance, financing) ☞ Company combines the reach and richness of virtual markets with the bricks-and-mortar necessities (viewing, test drive, delivery, service) ☞ Hence, ABT achieves important vertical and horizontal complementarities 	<ul style="list-style-type: none"> ☞ Repeat purchases supported by strong incentive schemes (reward points) ☞ Affiliated dealers have high switching costs because of investments in the Extranet connection and subscription contracts ☞ Products and services offered to end-users are personalized (click stream analysis, cookies, targeted emails, “Your Garage”) 	<ul style="list-style-type: none"> ☞ Introduced reverse on-line markets to auto retailing ☞ Compared with off-line competitors, the quality and depth of links between business-model members is novel ☞ Company is recognized as a pioneer—continuously implementing tailored and innovative services (online vehicles auctions)
barnesandnoble.com (Book retailing) (US firm)	<ul style="list-style-type: none"> ☞ Customers make informed decisions enabled by extensive editorial information and product reviews (rare in brick-and-mortar stores) ☞ Internet technology suppliers have demographic info on product buyers and can better forecast inventory levels ☞ Transactions are more transparent for customers due to online order status tracking 	<ul style="list-style-type: none"> ☞ Products are actively cross sold with partners through promotions and banner ads ☞ Click-and-mortar complementarities support business model (bn.com and B&N share purchase discounts, distribution centers, inventory, database, consumer purchasing data) ☞ Technology complementary with others technologies, especially for audio products 	<ul style="list-style-type: none"> ☞ Incentive scheme for customers through Click miles program ☞ Extensive privacy policy and encryption technology promote transaction safety ☞ Offers personalized products by storing credit card info (additionally enabling one-click shopping) and uses cookies 	<ul style="list-style-type: none"> ☞ Expanded product range, strong links with suppliers, other means of ordering such as mobile phones ☞ Compared with off-line models, links between participants are stronger (e.g., chat sessions with authors and readers) ☞ Involves new participants such as online course providers

<p>Cyberian Outpost (Ordering PCs, software solution)</p> <p>(US firm)</p>	<ul style="list-style-type: none"> ☞ Customers can take informed decisions through extensive information ☞ Online presence allows the company to offer a larger range of products than offline competitors (over 170.000 products) and powerful search capabilities ☞ Warehouse, shipping, purchasing and order processing information are integrated in order to deliver “the next day” 	<ul style="list-style-type: none"> ☞ Online presence has no “shelf space” constraints therefore a wide range of complementary products is offered ☞ Large number of participants and goods enable cross-selling ☞ Vertical and horizontal complementarities are very important for this business model (never achieved on such scale in brick-and mortar firms) 	<ul style="list-style-type: none"> ☞ Customers can customize products by comparing product features and choosing according to their preferences ☞ Affiliate programs enable virtual store creation on individual affiliates’ pages ☞ Click Miles program is offered: for each purchase subscriber receives points 	<ul style="list-style-type: none"> ☞ Business model enables novel competencies division (Outpost focus on client acquisition, while suppliers on product innovation and competitive offerings) ☞ Integration of information flows enables overnight and same day delivery ☞ Outpost picks product returns at the client’s house / office
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Table 1 (cont.)

	<i>Efficiency</i>	<i>Complementarities</i>	<i>Lock-in</i>	<i>Novelty</i>
E-bookers (Airline tickets) (European firm)	<ul style="list-style-type: none"> <i>Clients can use the high quality information and a wide range of services to make informed decisions</i> <i>Asymmetric information is by clearly stated conditions and negotiated fares</i> <i>Compared with off-line models, service search is faster</i> 	<ul style="list-style-type: none"> <i>Partners offer a wide range of complementary products (tickets, hotels, car rental)</i> <i>Many complementary products enhances cross selling (offering complementary services through personalized banners)</i> <i>Partners benefit from strong supply chain integration</i> 	<ul style="list-style-type: none"> <i>Promotes transaction safety (consumer data encryption, password protection)</i> <i>Clients offered customized products (tickets in terms of date, carrier class)</i> <i>Personalization achieved through the use of cookies, analysis of submitted info, and “My e-booker” program</i> 	<ul style="list-style-type: none"> <i>Quality and depth of links among supply chain participants is novel</i> <i>Model relies on trade secrets (negotiated fares database)</i> <i>Company claims to be a pioneer with a commercial introduction of its business model and continuously expanding international services</i>
Ricardo.de (auctions) (European firm)	<ul style="list-style-type: none"> <i>Transaction actors are either identified or reviewed, therefore clients can take informed decisions</i> <i>Information asymmetry reduced through photo and product description</i> <i>Clients find online bidding easier than the off-line one</i> 	<ul style="list-style-type: none"> <i>Participants in business model offer many complementary products</i> <i>Company sometimes takes possession of items offered in auctions, thus provides complementary products itself</i> <i>Strong supply chain integration</i> 	<ul style="list-style-type: none"> <i>Offers loyalty program</i> <i>Partners promote transaction safety and reliability through goods insurance, password, and encryption technologies</i> <i>Participant lock-in is created through reputation, building upon transactions history, and participant rating system</i> 	<ul style="list-style-type: none"> <i>Online auction of low-cost goods</i> <i>New incentive for bidding has been introduced, i.e., entertainment</i> <i>Continuous introduction of innovative solutions and offerings (expansion into B2B offerings, life auctions pioneering)</i>
Fortunecity (community) (European firm)	<ul style="list-style-type: none"> <i>Clients use information on responsibilities of registration and Web site building tips to make informed decisions</i> <i>Creation of a large community (6.1 million users) with a large range of categories of interest</i> <i>Business partners marketing costs reduced through the revenue sharing, co-branding, low-cost content (provided by members)</i> 	<ul style="list-style-type: none"> <i>Vertical complementarities in terms of technical service, FAQ, and technology provided by various partners and external companies</i> <i>Provides complementary services such as Web page building (as well as add-ons) and e-mail</i> <i>Complementarities exists between company technologies (home page building software) and technologies provided by others (Java)</i> 	<ul style="list-style-type: none"> <i>Incentives offered to participants through best site contest, e-mail, Web page hosting. Stickiness created by giving people a sense of ownership and responsibility</i> <i>Members make a time specific investment regarding site navigation and digital toolbox use</i> <i>Users can customize services to their needs (“citizens” build homepages and supply them with content they desire)</i> 	<ul style="list-style-type: none"> <i>Company relies on trade secrets regarding proprietary technology and database of “citizens”</i> <i>Expanded into innovative areas such as WAP technology</i> <i>Richness of links between participants is novel compared to off-line models (sense of community, knowledge sharing)</i>

Footnotes

¹ Based on estimates made by the Center for Research in Electronic Commerce, University of Texas, Austin and Forrester Research.

² Forrester Research.

³ Data available from Jupiter Communications.

⁴ The difficulty that some e-commerce firms experience in establishing a pan-European presence indicates that there still exist certain barriers, due, for example, to local languages and tastes, or to cross-border logistics. However, the importance of geographical boundaries still appears to be vastly reduced relative to the traditional “bricks-and-mortar” world.

⁵ The Customer’s willingness to pay is defined as the amount of money at which the customer is indifferent between owning a product/service or the money. Opportunity costs of the vendor is defined as the amount of money at which the supplier is indifferent between owning the resource (and hence deploying it in an alternative use) or trading it for money. A more formal definition of the value created through a business model that extends Brandenburger and Stuart’s (1996) approach is as follows. Let $P(t)$ be the price that a customer pays for a good acquired in a transaction t , or for the right to participate in the transaction, and let $B(t)$ denote the customer’s perceived net benefit from participating in t . $B(t)$ is net of the transaction, purchasing, and user costs that accrue to the customer (Besanko, Danove and Shanley, 1996:443). Then $V_C(t)=B(t)-P(t)$ is the value that is appropriated by a customer in transaction t . Denote the firm on which the business model is centered as F , and denote its partners (other than its customers) as i (where i is an index). Let $R_i(t)$ be the revenues that firm F gets from partner i in a particular transaction, let $C_i(t)$ denote the flow of revenues from F to i , and let $OC_F(t)$ be F ’s opportunity costs for providing its own resources. Then $V_F(t)=P(t)+S_i R_i(t)-S_i C_i(t)-OC_F(t)$ is the value that is appropriated by firm F in transaction t . Let furthermore denote the opportunity costs of partner i of supplying resources (including, for example, complementary products or services) to F as $OC_i(t)$. Then $V_i(t)=C_i(t)-R_i(t)-OC_i(t)$ is the value that is appropriated by partner i in transaction t . Assuming that the set of participants in a business model comprises customer, firm, and partners, it follows that the total value created in transaction t is $TV(t)=V_C(t)+V_F(t)+S_i V_i(t)$. $TV(t)$ can be expressed as $B(t)-OC_F(t)-S_i OC_i(t)$. This is a generalized version of Brandenburger and Stuart’s (1996) formula for total value created, focusing on a particular transaction rather than on a particular product or service. Lastly, the total value created through a business model, TVC , is the value created over all the transactions that it enables, or $TVC=S_i TV(t)$.

⁶ The decision to include US as well as European firms in our sample has several implications. E-commerce activity in Europe is dominated less by start-ups, as is the case in the US, and more by established companies (Morgan Stanley Dean Witter, 1999). For example, the UK’s Freeserve is a spin-off of Dixons, a large “bricks-and-mortar” retailer, and Spain’s Terra Networks is a spin-off of Telefónica, a large telecom firm. An affiliation (past or present) with established companies probably influences the particular business models of respective e-commerce firms. For example, some spin-offs may benefit from the alliance network of their parent companies, while others may suffer from imposed organizational constraints. However, a possible sample bias toward (mostly former) subsidiaries of established companies should not affect our ability to develop a general framework for evaluating the value creation potential of e-commerce firms. In fact, such a general framework should be independent of the mode of business creation.

⁷ We do not believe that our focus on “with-C” firms seriously affects the theory development. The business-model construct introduced in this paper accommodates any type of transaction, and any type of participant in a transaction. In other words, it applies to “with-C” firms as well as to “B-to-B” firms and other types of firms. In addition, the value driver categories identified in the analysis apply to “B-to-B” models, albeit perhaps with different weights.

⁸ We started with an initial version of the questionnaire that reflected a working framework we had constructed early on to bring focus and clarity to the questions asked. This initial questionnaire had been pre-tested on several cases. Subsequently, we modified, added, and dropped questions about two months into the research project, and made similar revisions again about one month later. After every revision, all cases that had hitherto been examined were updated accordingly.

⁹ Complementarities can be defined with respect to outputs or inputs, that is, with respect to the determinants of a firm’s profit function. A profit function that is well-behaved (i.e., concave, continuous, and twice continuously differentiable) is complementary in its inputs if raising the level of one input variable increases the marginal return to the other input variable. This notion of complementarity goes back to Edgeworth. Milgrom and Roberts (1990, 1995)

present a generalization of this idea that is relevant for the strategy field.