Business Models for Internet-Based E-Commerce:

AN ANATOMY

B. Mahadevan

The growth of Internet-based businesses is truly meteoric. It has dwarfed the historical growth patterns of other sectors. Over the years, several organizations doing business through the Internet have come out with their own set of unique propositions to succeed in the business. For instance Amazon.com demonstrated how it is possible to "dis-intermediate" the supply chain and create new value out of it. Companies such as Hotmail and Netscape made business sense out of providing free products and services. On the other hand, companies such as AOL and Yahoo identified new revenue streams for their businesses. Similarly companies such as Vertical Net engaged in building on-line communities. It is increasingly becoming clearer that the propositions that these organizations employed in their businesses could collectively form the building blocks of a business model for an Internet-based business.[1] Several variations of these early initiatives as well as some new ones being innovated by recent Internet ventures have underscored the need for some theory-building in this area.

This article develops a framework that can help practicing managers understand the notion of a business model in the Internet context. Is there a basis on which one can classify these new propositions? Are there any factors that could potentially influence an organization in identifying an appropriate sub-set of these propositions for its business?

Barua et al. proposed a four-layer framework for measuring the size of the Internet economy as a whole.[2] The Internet *infrastructure layer* addresses the

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issue of backbone infrastructure required for conducting business via the net. It is largely made up of telecommunication companies and other hardware manufacturers of computer and networking equipment. The Internet *applications layer* provides support systems for the Internet economy through a variety of software applications (ranging from web page design to security) that enable organizations to commercially exploit the backbone infrastructure. The Internet *intermediary layer* includes a host of companies that participate in the market making process in several ways. Finally, the Internet *commerce layer* covers companies that conduct business in the context provided by the other three layers.

The Internet infrastructure layer and the applications layer play a crucial role in moderating and setting trends for the growth of the Internet economy. However, the notion of a business model must focus on the last two layers for two main reasons:

- The growth of the intermediary and the commerce layer is significantly higher than that of the other two layers. Barua and Whinston reported a 127% growth in the commerce layer during the first quarter of 1999 over the corresponding period in 1998.[3] Furthermore, one in three of 3400 companies that they studied did not even exist before 1996. They also reported that 2000 new secure sites are added to the web every month indicating the creation of new companies and a migration of existing brick and mortar businesses.
- The extensive customer interaction in these two layers has offered more scope for creating unconventional business models and hence offers more scope for identifying certain typologies.

There has been no attempt to provide a consistent definition for a business model in the Internet context. Meanwhile, consultants and practitioners have often resorted to using the term "business model" to describe a unique aspect of a particular Internet business venture. This has resulted in considerable confusion.

For present purposes, the term "Internet-based e-commerce" does not include organizations that have merely set up some web sites displaying information on the products that they sell in the physical world. Only those organizations that conduct commercial transactions with their business partners and buyers over the net (either exclusively or in addition to their brick and mortar operations) are considered. Henceforth, the term "Internet economy" is also limited by the scope of this definition.

The Emerging Market Structure

The Internet economy has divided the overall market space into three broad structures: portals, market makers, and product/service providers. A *portal* engages primarily in building a community of consumers of information about products and services. Increasingly, portals emerge as the focal points for influ-

encing the channel traffic into web sites managed by product/service providers and other intermediaries. They primarily play the role of funneling customer attention or "eyeballs" into these web sites in a targeted fashion. Companies such as AOL and Yahoo largely cater to the business-to-customer segment. ZDNet and MarketSite.net (promoted by Commerce One) are examples of portals serving the business-to-business segment.[4]

The *market maker* is another emerging structure in the Internet market space.[5] Market makers play a role similar to that of a portal in building a community of customers and/or a community of suppliers of products and services. However, they differ from portals in several ways. Market makers invariably participate in a variety of ways to facilitate the business transaction that takes place between the buyer and the supplier. Consequently, a market maker is often expected to have a high degree of domain knowledge. For instance, a portal such as Yahoo can funnel the traffic of prospective computer and software buyers into web sites that provide services related to selling these products. However, a market maker such as Beyond.com requires a higher domain knowledge related to the buying and selling of computer and software products. Also, unlike a portal, a market maker endeavors to provide value to suppliers and customers through a system of implicit or explicit guarantee of security and trust in the business transaction. Auction sites such as eBay are the early market makers in the business-to-consumer segment. Some examples of the large number of market makers evolving in the business-to-business segment include Chemdex (Chemicals), HoustonStreet.com (Electricity), FastParts (Electronic components), BizBuyer.com (small business products), and Arbinet (Telecommunication minutes and bandwidth). The business-to-business segment has several characteristics that promote a bigger role for market makers. They include huge financial transactions and a greater scope for reducing product search costs and transaction costs. Since the business-to-business e-commerce application is poised for spectacular growth, the role of market makers will be increasingly felt. The predominant forms the market makers take in business-to-business segment include organizing auctions and reverse auctions, setting up exchanges, and product and service catalogue aggregation.

Product/service providers deal directly with their customers when it ultimately comes to the Internet business transaction. This calls for extensive customization of their information system and business processes to accommodate customer requirements on line. Notable examples in this category of market structure include Amazon.com and Landsend.com in the business-to-consumer segment and Cisco and Dell Computers in the business-to-business segment.

These emerging market structures reveal some of the characteristics of Internet-based e-commerce business applications. First, each of these structures addresses a key constituent in the business that is carried out over the net. Secondly, they exist in both business-to-business and business-to-consumer segments (Table 1 provides a representative list of companies). Third, there is a high level of overlap and inter-dependency among the players in the three market

TABLE 1. A Sample List of Internet-Based Businesses in the Emerging Market Structure

Market Structure	Business to Consumer Segment	Business to Business Segment[a]
Portals	AOL.com Askjeeves.com Compare.com MSN.com Personalogic.com Yahoo.com Orlando.com	Cnet.com ec-portal.com MarketSite.net Netmarketmaker.com Questlink SmartOnline.com VerticalNet
Market Makers	Autobytel.com Beyond.com Buy.com Cameraworld.com Careerbuilder.com Ebags.com Ebay.com Etrade.com NetMarket.com Priceline.com Travelocity.com Ubid.com	@griculture Online AdAuction.com AsianSources.com Bloomberg ChemConnect Manheim Auctions MRO.com NetBuy.com PaperExchange.com PlasticsNet.com Ultraprise Works.com
Product/Service Providers[b]	Amazon.com Egghead.com EthnicGrocer.com Landsend.com Stacianewyork.com	Cisco Compaq Dell

a. Many portals in the B2B segment have evolved into market maker structure.

b. Several existing brick and mortar retailers such as Wal-Mart, Barnes & Noble, and Sears also engage in Internet based businesses with newly incorporated dot coms. Similar examples exist in B2B segment also.

structures. For instance, players in the product/service provider market succeed in marketing their products and services through their web site only when they catch the attention of prospective customers. In order to do this they may often need the support of a portal. Meanwhile, the revenue stream of a portal or a market maker depends to a large extent on its relationship with product/service providers. Finally, since the fundamental purpose for each of the three market structures is very different, they have different approaches to the value that they offer to their business partners and customers and the manner in which they organize their revenue stream.

Business Models for Internet-Based E-Commerce

There have been few attempts to formally define and classify business models in the Internet context. Schlachter identified five possible revenue streams for a web site.[6] These included subscriptions, shopping mall operations, advertising, computer services, and ancillary business. The emphasis was to show how revenue models existing in the brick and mortar scenario would be exploited in a web-based business. Fedwa identified seven revenue-generating business models.[7] In addition to those identified by Schlachter, Fedwa added timed usage and sponsorship and public support as possible revenue streams. Parkinson stressed the role of business affinities such as logistic providers in creating the value proposition.[8]

These models were too narrow in their scope and did not cover the gamut of alternatives employed by today's Internet-based businesses. Timmers provided a broader description and identified eleven business models that currently exist and classified them on the basis of the degree of innovation and functional integration required. [9] However, these models described a particular aspect of doing business over the net and ignored other aspects. A good theory should ensure comprehensiveness.[10] For instance, Timmers's example of Amazon.com for building a virtual community does not bring out another of its unique features, e.g., dis-intermediation of the supply chain.

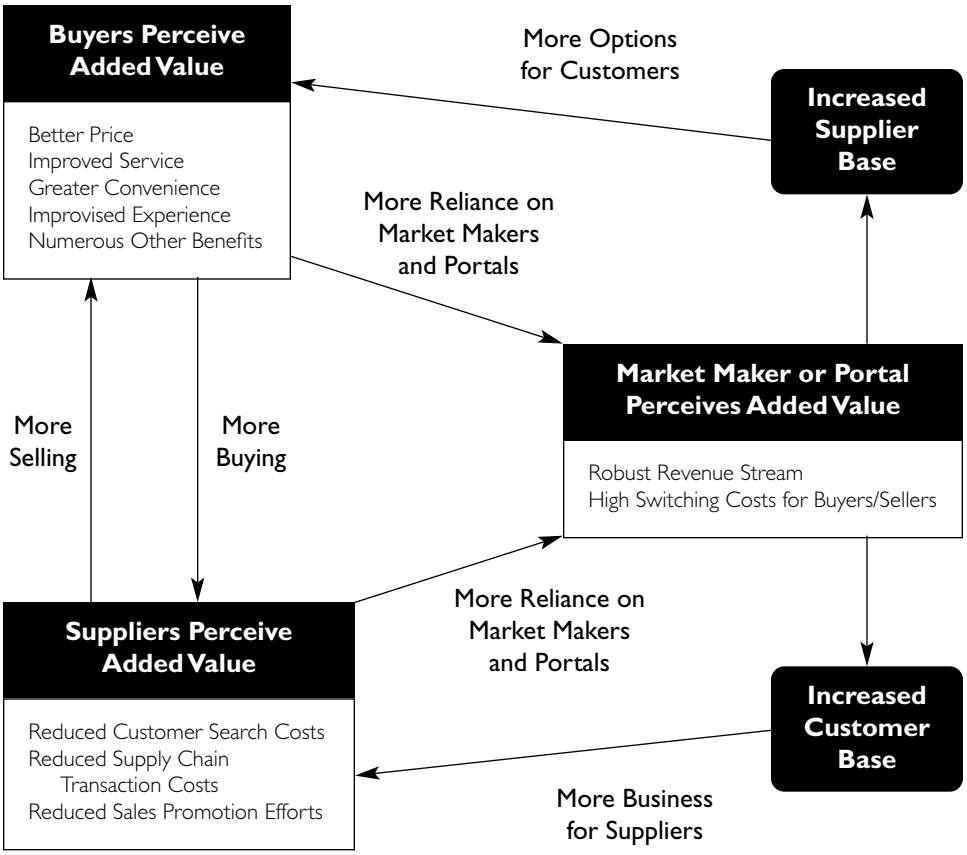
A business model is a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream, and the logistical stream. The value stream identifies the value proposition for the buyers, sellers, and the market makers and portals in an Internet context. The revenue stream is a plan for assuring revenue generation for the business. The logistical stream addresses various issues related to the design of the supply chain for the business.

Value Streams in Internet-Based Business

The long-term viability of a business largely stems from the robustness of the value stream, which influences the revenue stream and the logistical stream. Figure 1 illustrates the value streams in Internet-based business. Often, buyers perceive value arising out of reduced product search cost and transaction costs. Further the inherent benefits of the "richness and reach"[11] of the Internet provide an improved shopping experience and convenience.

Suppliers perceive value arising out of reduced customer search costs, product promotion costs, business transaction costs, and lead time for business transactions. These benefits are likely to be substantial in the business-to-business segment. For instance, Siebel and House reported that car dealers spend an average of $ 25 to close business with a buyer referred by autobytel.com as opposed to several hundreds of dollars in the brick and mortar operation.[12] There is virtually a zero customer search cost in such referrals.

FIGURE 1. Value Streams in Internet-Based Business



The introduction of a market maker or a portal is likely to increase the value for both the suppliers and buyers, creating a virtuous cycle for all three players. As more suppliers join in the market-making process, the buyers begin to see more choices. As more buyers join, the suppliers begin to experience the beneficial effects of a wider customer base and lower customer search costs. Then the buyers themselves benefit from the growing community of buyers. Finally, both the buyers and the suppliers begin to rely on the market maker/portal, ensuring a robust revenue stream for the market maker/portal.

There are four possible value streams in an Internet-based business:

Virtual Communities

Virtual communities offer a multitude of values to the buyers, sellers, market makers, and portals. Communities have a distinctive focus that brings together people with common interests. Vertical Net is a business-to-business

site that caters to 56 vertically focused communities. WebMD/Healtheon is another community site that caters to medical professionals. Community sites provide an ideal platform for the focused groups to generate value and knowledge and share it among the members. Hagel observed that it is extremely difficult to replicate the value proposition of virtual communities because much of the value of these communities is member generated.[13] Moreover, communities induce a high switching cost for its members and thereby provide first mover advantage for the organizations that host these communities.

Dramatic Reduction in Transaction Costs

An electronic market place is an inter-organizational information system that allows buyers, sellers, independent third parties, and multi-firm consortiums to exchange information about prices and product offerings. Moreover, the cost of product and price comparisons becomes negligible. A major impact is that they typically reduce search costs for both the buyers and the sellers. Bakos argued that as search costs come down, the prices come down both in a commodity and in a differentiated market.[14] Furthermore, as more and more participate in this process, the benefits increase due to network externalities.[15]

Gainful Exploitation of Information Asymmetry

The effects of asymmetric information on market equilibrium have been studied in a multitude of economic situations and proposed models. The models can be differentiated as search models[16] and bargaining models.[17] These models provide a role for intermediaries who seek to bring the price-quality combinations close to efficient informational combinations. Coupled with the effect of network externalities, the ubiquitous nature of Internet business operations has opened up new value streams that can exploit the information asymmetry that exists in many business transactions.

In situations that involve numerous buyers spread over large geographical areas and sellers who have perishable products and services it is possible to exploit the benefits of information economy into a value proposition. In the travel, hotel, and tourism industry there are a variety of product offerings and a high level of uncertainty of patronage. Since the services are perishable in nature, it is possible to buy out left-over services at a competitive price and re-sell them at a higher value. The sellers do not have perfect information on demand. Similarly, the buyers do not have perfect information on the supply. Therefore, an intermediary can create value arising out of this information asymmetry. Priceline.com is an example of such a value stream in a business-to-consumer segment. Even in the case of non-perishable items, it is possible to exploit the information asymmetry by the setting up online bids and reverse auctions.

In the business-to-business segment, information asymmetry often exists when there are several potential suppliers for an industrial bid. By enabling an online real-time bidding and negotiation process, it is possible to

obtain substantial reductions in the final bid value. An intermediary who enables this process usually creates a value proposition and a revenue stream that is linked to the value of the reduction obtained for the buyer. Free Markets Online Inc., a Pittsburgh-based intermediary is an example of this category.[18] Free Markets assists industrial buyers in posting requests for proposals and holding Internet-based reverse auctions for their products. By automating the flow of information, a pre-determined number of suppliers can be effectively included in the requests for proposal process, resulting in more competition and lower costs for the buyer.

Value-Added Market-Making Process

Value streams in the Internet context are sometimes augmented by additional value propositions, which can become the main value-generating stream in some cases. Security and trust, for instance, are major concerns in Internet-based e-commerce and can be used to create a value proposition. When the market maker vouchsafes the transactions that take place under its domain, it provides significant value to buyers and sellers. The seafood industry often brings small buyers and sellers together who don't know each other. By providing its trusted third-party credit rating information, Seafax imparts to buyers and sellers the confidence to trade with unknown trading partners, thereby improving the market liquidity. A similar role in the business-to-consumer segment is played by eBay. Providing financial instruments and establishing guarantees for the transactions, as well as addressing privacy and delivery reliability concerns, also have the potential for creating new value streams. Other potential value propositions include buying guides, risk management, procurement management, order fulfillment, financial instruments such as Cyber Cash, and escrow.

The value streams identified above are not mutually exclusive. For instance, organizations creating a value stream on the basis of online communities can exploit the benefits of reduced transaction costs or some additional value through providing enhanced security. However, organizations often build their model on the basis of one dominant value stream. The value derived from others is incidental and supplementary to the main value stream.

Revenue Streams in Internet-Based Business

Value streams address the long-term sustainability of the business proposition and often set the context for identifying revenue streams for an organization. The revenue steam is nothing but the realization of the value proposition in the short term, usually on a yearly basis. In addition to the traditional modes of revenue generation, the Internet economy has allowed organizations to exploit new revenue streams that are hard to replicate in a brick and mortar operation. Following are six such revenue streams.

Increased Margins over Brick and Mortar Operations

There are several factors why Internet-based businesses invariably have increased margins. As noted, the most prominent are reduced transaction costs and reduced customer search costs. Cost reduction can also be achieved through dis-intermediation of the supply chain. The classic example of dis-intermediation of the supply chain is Amazon.com's offering as much as a 50% discount on *New York Times* best sellers and 30% discount on other titles. The increase in margins can be further compounded by an increase in sales turnover. The cost reduction attained in this fashion is likely to be partly offset by the additional costs incurred in hosting banner ads on other sites in order to funnel customer attention into one's own web site. However, it appears that the net effect of these is an increase in margins.

Revenue from Online Seller Communities

By providing free membership,[19] market makers can build a community of buyers and get access to a host of information about their interests. Similarly, by promising an untapped source of buyers, market makers can also build a community of suppliers. The suppliers experience a reduction in customer search costs by entering into such markets. Once the community of suppliers and buyers are in place, the market maker can then build a revenue stream out of charging the suppliers a one-time membership fee and a variable transaction fee linked to the amount of business performed through the market maker.

Advertising

Many organizations look towards advertising as the main source of revenues. Portals (including the search engines) and large business-to-consumer and business-to-business community sites such as Yahoo, AOL, CommerceOne, and Agriculture Online play a crucial role in funneling the customers into the target web sites. It is natural for these web sites to host banner ads, which generate huge revenue to support their operations.

Variable Pricing Strategies

Organizations that sell electronically delivered products[20] have unique characteristics of the information economy to exploit. High initial cost and nearly zero marginal cost characterize such information production and dissemination. Therefore, a pricing scheme based on marginal costs is not applicable for this class of products. However, it is possible to use a range of alternatives involving variable pricing and option pricing. Different consumers have different valuations for the same product, and thus have a different *willingness to pay*. Varian argued that if the willingness to pay is correlated to some observable characteristics of the consumers such as demographic profile, then it could be linked to the pricing strategy.[21] Student and educational versions of software are examples of this category. Another strategy is the bundling of goods to sell to a market with heterogeneous willingness to pay.[22]

Revenue Streams Linked to Exploiting Information Asymmetry

As noted, an intermediary exploiting the information asymmetry between the buyer and the supplier generates a revenue stream often linked to the amount of savings accruing to the buyer. Several variations of the auction format are being used in this area.

Free Offerings

The fundamental philosophy behind free services is one of giving up today's revenues in return for assured future revenues. The case of Adobe Systems giving away Acrobat Reader free exploits this idea. As more and more users read documents with Acrobat Reader, they feel the urge to create documents using Acrobat and will eventually end up buying the full version of Acrobat.

Organizations such as Hotmail and Netscape identified several other revenue streams arising out of giving out free products and services. When Hotmail provided free e-mail service, it built a huge online community of consumers waiting to be channeled into a multitude of web sites for products and services. Such a large community attracts the attention of potential sellers of products and services who are willing to pay for advertising. If the organization decides to build a community of suppliers, the suppliers will be willing to pay a membership fee and a variable transaction fee. Sometimes, the free option results in free customer feedback and product improvement initiatives. The success of Netscape browser and the Linux operating system is attributed to this phenomenon. Figure 2 demonstrates the spin-offs effects of free offerings leading to other revenue streams.

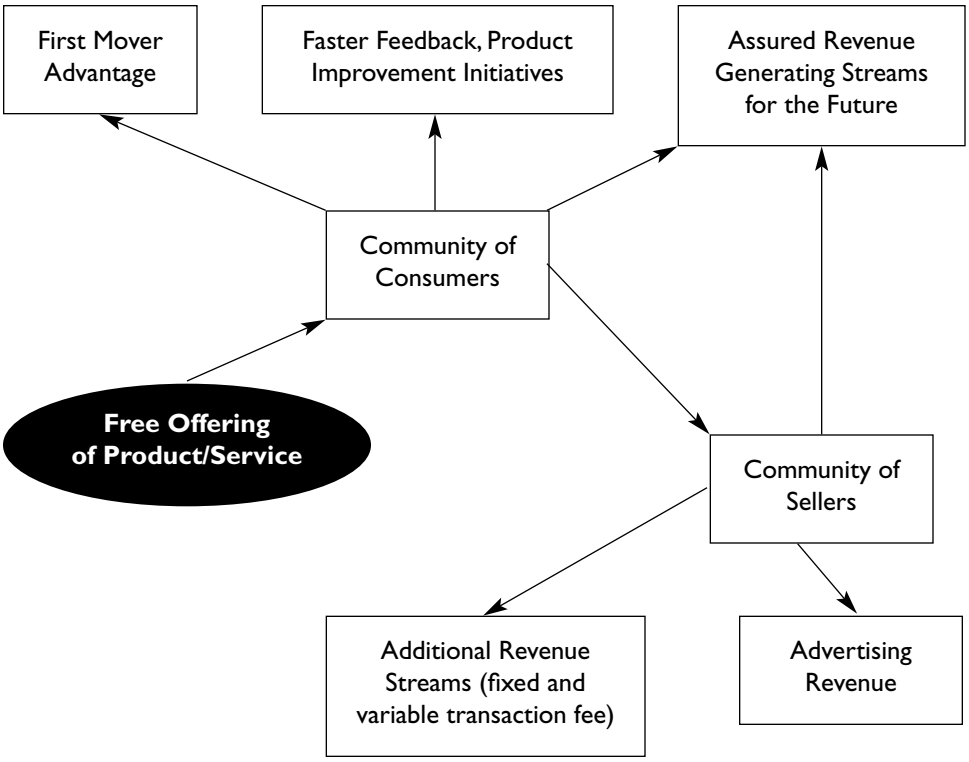
Logistic Streams for Internet-Based Business

The Internet economy allows an organization to position itself at an appropriate level of the supply chain depending on the nature of its business. Three distinctive logistical streams exist in the Internet economy and all three have evolved out of the need for creating the maximum value for the customers. Dis-intermediation is the process by which the logistical stream is shortened, leading to better responsiveness and lower costs. On the other hand, Internet-based business also calls for new forms of intermediation. Infomediaries and meta-mediaries seek to add value to the logistical stream by addressing certain problems arising out of information overload and transaction cost inefficiencies. Players in the product/service provider market are able to exploit the dis-intermediation stream for their business model. Portals utilize the infomediation stream and market makers utilize the meta-mediation stream.

Dis-Intermediation

Due to the nature of certain products and services, the Internet has made it possible to shrink the supply chain by a process of dis-intermediation.

FIGURE 2. The Spin-Off Effects of Free Offerings for Revenue Streams



Consequently, transaction costs have been reduced and responsiveness to customer requirements has improved considerably. These improvements often lead to price reduction and/or increased margin and sales turnover. The success of Amazon.com over Barnes & Noble and that of Encarta over Encyclopedia Brittanica have adequately demonstrated the benefits of this logistical stream. In the business-to-business segment, the success of Dell Computers and Cisco is largely attributed to this phenomenon. Similarly, companies selling information databases consisting of a large number of journals in electronic form have found success by bringing down the cost of maintaining libraries.

Infomediation

In the market for information, the number of sources and suppliers of information as well as the amount of information is much higher than a single information seeker can handle. This is primarily due to a spectacular growth of Internet sites. Individual information seekers can not contact every possible source of information, nor can they estimate the accuracy and true value of the information offered. This has necessitated a crucial role for intermediaries to

address the information requirements of users. This often involves storage and dissemination of meta-information, for example, references to information concerning a particular topic. Examples of information intermediaries offering this meta-information are primarily portals consisting of search engines and electronic product catalogue aggregators. Hagel and Rayport argue that infomediaries act as custodians, agents, and brokers of customer information and market it to businesses on customers' behalf while protecting their privacy at the same time.[23]

Meta-Mediation

Meta-mediation is a process that goes beyond aggregating vendors and products and includes additional services required for facilitating transactions. Certain markets in the business-to-business segment are characterized by fragmented supply chains leading to high vendor search costs, high information search costs, high product comparison costs, and huge workflow costs. Under these conditions, meta-mediation adds value to the buyers, sellers, and the intermediary.

Towards an Appropriate Business Model

The alternatives presented here under each stream merely indicate the possible options available to an organization. However, the process of arriving at an appropriate business model involves choosing the right mix of alternatives. The following factors affect the choice of a business model:

- Role in the Market Structure—Organizations can narrow down their choices by understanding the role that they play in the Internet economy. Table 2 illustrates the alternatives available for organizations in each market structure. For instance, the logistical stream sharply divides the three market structures. Similarly, while a market maker can utilize all the four value streams, streams such as reducing transaction costs and exploiting information asymmetry are not relevant to a portal. Although the information presented in the table is a useful beginning to the process of arriving at an appropriate business model, it is abstract and at best offers broad guidelines. Within each market structure there are significant variations in the activities that organizations perform. For example, Ethan Allen (which manufactures and sells furniture) probably cannot replicate the dis-intermediation model of Amazon.com (which sells books and music) and hope to achieve the same degree of success.
- Physical Attributes of the Goods Traded—Goods traded over the net can be either informational goods (soft goods, that can be transported electronically) or physical goods (hard goods that need physical transportation by a logistics provider). This influences the choice of an appropriate revenue stream. Informational goods are characterized by high initial costs to produce the first copy and almost no cost to make additional

TABLE 2. Potential Applications of Business Model Streams for the Three Market Structures

Business Model Building Blocks	Market Structures		
	Portals	**Market Makers**	**Product/Service Providers**
Value Streams			
Virtual Communities	✓	✓	✓
Dramatic Reduction in Transaction Costs		✓	✓
Gainful Exploitation of Information Asymmetry		✓	
Value-Added Market-Making Process	✓	✓	
Revenue Streams			
Increased Margins over Brick and Mortar Operations			✓
Revenue from Online Seller Communities	✓	✓	
Advertising	✓	✓	
Variable Pricing Strategies			✓
Revenue Streams Linked to Exploiting Information Asymmetry		✓	
Free Offerings	✓	✓	✓
Logistical Streams			
Dis-Intermediation			✓
Infomediation	✓		
Meta-Mediation		✓	

copies. This allows such firms to employ revenue streams such as variable pricing strategies, free offerings, and a combination of a one-time fee and a variable transaction-based fee. Organizations trading hard goods often have to resort to unique options that provides increased margins and/or premiums over brick and mortar operations. In the case of organizations engaged in providing a variety of services for Internet-based businesses, it is possible to employ a combination of the proposed revenue streams. The choices with respect to logistical streams are obvious for an organization trading soft goods. Such organizations eventually gravitate towards dis-intermediation. However, in the case of hard goods there are other factors that govern an appropriate choice of the logistical stream.

- Personal Involvement Required in Buying/Selling Process—The choice of the logistical stream for hard goods is significantly affected by this factor.

Goods traded over the net broadly fall into two categories: experience goods and economy goods. Experience goods require greater personal involvement in the buying process. This could be in the form of making an assessment of the suitability of the buy by physically handling and examining the good to be purchased and participation in the design of the product itself by the user. Attributes such as color, texture, and the experience of using it on a test basis are crucial determinants of the buying decision in business-to-consumer markets. In the case of the business-to-business segment, a variety of technical specifications and joint efforts in design are sometimes important. Dis-intermediation of the supply chain is a risky strategy for such goods. On the other hand, the use of infomediaries and meta-mediaries greatly enhances the value by facilitating the process. Moreover, they can also play a significant role in reducing search costs and transaction cost inefficiencies. On the other hand, economy goods are ideal candidates for dis-intermediation. The driving force in this case is to reduce the costs by eliminating portions of the value chain that do not seem to add any value. Many MRO supplies and commodity goods traded in the business-to-business segment fall in this category.

Conclusions

The unprecedented growth in Internet-based business in a short period of time has underscored the need for understanding the mechanisms and theorizing the business models adopted by successful organizations. The framework presented here provides a means to understand how business models are designed for organizations in the Internet economy and allows for theory building. For instance, it is possible to develop several propositions and constructs using this framework for further empirical testing. These could relate to the market structure, the three streams, or the specifics of the business as applicable to this framework. A deeper empirical understanding of the relationship between the market structure and the choice of the business model can be investigated by specific case studies.

Notes

1. In this article we use terms such as "Internet-based business," "Internet-based e-commerce," and "business over the net" in an interchangeable fashion. We do not draw any distinction among them.
2. A. Barua, J. Pinnell, J. Shutter, and A.B. Whinston, "Measuring Internet Economy: An Exploratory Paper," working paper, University of Texas, Austin, July 1999; http://cism.bus.utexas.edu/works/articles/internet-economy.pdf
3. A. Barua and A.B. Whinston, "Measuring the Internet Economy," Cisco Systems-University of Texas report, October 1999. The full report is available at http://www.internetindicators.com

4. There is a noticeable trend among portals to evolve into the market maker structure over a period of time by partnering with some third-party service providers. Such a trend is particularly significant in the business-to-business segment.
5. Traditionally, a market maker takes possession of goods allowing people to buy and sell goods from it. Because it takes possession of goods, it could also take positions in these goods, thereby profiting from price movements. In the definition used here, a market maker in an Internet context does not take possession of goods. Instead, it plays the role of matchmaker and facilitates the transaction between the buyer and the seller.
6. E. Schlachter, "Generating Revenues from Websites," http://boardwatch.internet.com/mag/95/jul/bwm39.html, July 1995.
7. C.S. Fedwa, "Business Models for Internetpreneurs," http://www.gen.com/iess/articles/art4.html, 1996.
8. J. Parkinson, "Retail Models in the Connected Economy: Emerging Business Affinities," http://www.ey.com/global/gcr.nsf/us/insights_-_eBusiness_-_Ernst_&_Young_LLP, 1999.
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10. D.A. Whetten, "What Constitutes a Theoretical Contribution?" *Academy of Management Review*, 14/4 (1989): 490-495.
11. For a good discussion on the implications of richness and reach in Internet-based e-commerce, see P.B. Evans and T.S. Wurster, "Strategy and the New Economics of Information," *Harvard Business Review*, 75/5 (September/October 1997): 70-82.
12. T.M. Siebel and P. House, *Cyber Rules* (New York, NY: Currency Doubleday, 1999).
13. John Hagel III, "Net Gain: Expanding Markets through Virtual Communities," *Journal of Interactive Marketing*, 13/2 (1999): 55-65.
14. J.Y. Bakos, "A Strategic Analysis of Electronic Market Places," *MIS Quarterly*, 15/3 (1991): 295-310.
15. For a theoretical treatment of the topic, see M.L. Katz and C. Shapiro, "Network Externalities, Competition and Compatibility," *American Economic Review*, 75 (Spring 1985): 70-83.
16. Y.M. Ioannides, "Market Allocation through Search: Equilibrium Adjustment and Price Dispersion," *Journal of Economic Theory*, 11 (1975): 247-262.
17. K. Chatterjee and L. Samuelson, "Bargaining Under Incomplete Information," *Operations Research*, 31/5 (1983): 835-851.
18. A detailed case study on this can be found at V. Kasturi Rangan, "Free Markets Online," *Journal of Interactive Marketing*, 13/2 (1999): 49-65.
19. During the early stages of adopting this aspect of the business model, organizations were charging a membership fee for the customers. However, increasingly organizations have come to realize the importance of providing free membership.
20. By electronically delivered product we mean all those that could be downloaded over the net. These include soft copies of books, electronic journals and research reports, software, music, and games.
21. H.R. Varian, "Pricing Information Goods," working paper, University of California, Berkeley, in *Proceedings of the Research Libraries Group Symposium on "Scholarship in the New Information Environment,"* Harvard Law School, May 2-3, 1995.
22. See, for example, H.R. Varian, "Versioning Information Goods," working paper, University of California, Berkeley, 1997.
23. John Hagel III and J.F. Rayport, "The Coming Battle for Customer Information," *Harvard Business Review*, 75/1 (January/February 1997): 53-65.