



# Online Market Makers

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# Online Market Makers

Market makers are intermediaries that aggregate three services for market participants: a place to trade, rules to govern trading, and infrastructure to support trading. *Online* market makers provide these services for parties conducting transactions over electronic networks. By late 2000, online market markets were exploiting the low-cost connectivity provided by the Internet to re-engineer many different markets. The impact of Internet technologies in some markets has been remarkable. For example, a CD ROM containing all U.S. phone directories cost \$10,000 when it was introduced by NYNEX in 1986; today, the same information is freely available over the Internet.<sup>1</sup> In 2000, five record companies controlled a \$40 billion market in music CD sales. Enter Napster, an online market maker that facilitates the exchange of MP3 music files. Napster, launched in May of 1999, had spent less than \$20 million through late 2000, yet it had the potential to re-engineer the worldwide market for recorded music.

Two observations may help put the emergence of online market makers into historical perspective. First, market making was not invented with the Internet; indeed, it has been around since merchants first gathered to trade in Bronze Age cities! The New York Stock Exchange, currently the largest market maker with 1999 transactions worth \$8.9 trillion, traces its origins to the Buttonwood Agreement signed in 1792.<sup>2</sup> Second, the Internet is by no means the first instance of a new technology with the capacity to disrupt business models and re-engineer markets. The growth of railroads and telegraph lines during the Victorian Age led to dramatic changes in trading patterns. In 1841 the trip from London to Exeter (175 miles) took 21 hours by stagecoach. Six years later, an express train made the journey in six and a half-hours at less cost.<sup>3</sup>

This note describes the online market maker business model. The first section of the note proposes a definition of market making and presents different ways to categorize online market makers. The second section describes how online market makers create value for market participants. The third section examines the economics of market making, focusing on revenue and cost drivers and using both online and offline examples. The final section examines the risks and potential payoffs to online market makers from pursuing a “Get Big Fast” strategy, i.e., investing aggressively in customer acquisition.

## What Are Online Market Makers?

### Definition

At its core, market making is an information discovery process; before they complete transactions, market participants come to a market to share information about products

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<sup>1</sup> Shapiro and Varian, *Information Rules*, pp.21-22, Harvard Business School Press.

<sup>2</sup> Nate Sleeper, *The New York Stock Exchange: Taking Stock of a Changing Landscape*, Harvard Business School course project, May 2000, p. 2.

<sup>3</sup> *Encyclopedia Britannica*, Volume 28, p. 767.

and services including their features, pricing and availability.<sup>4</sup> There are three sets of services that characterize market makers and distinguish them from brokers, retailers, distributors, and other market participants. Market makers are intermediaries that provide, on behalf of multiple buyers and sellers, a place to trade, market governance, and infrastructure to enable transactions.

- **A place (physical or virtual) for participants to meet and trade.**<sup>5</sup> Traditionally, market makers furnished a physical location for participants to meet and trade. Examples stretch from the markets of ancient Babylon to the New York Stock Exchange. The advent of computer networks allows markets to be built in cyberspace. For instance, NASDAQ does not maintain a physical presence, it simply provides access to electronic networks that link broker dealers who make markets in NASDAQ securities.<sup>6</sup>
- **Market governance.** Market makers develop and enforce the rules for membership and engagement for market participants. Typically, market makers define the types of goods and service sold, specify a list of permitted transactions, provide for dispute resolution and payment terms, and set ground rules as to data ownership. eBay, for instance, supports two types of auctions (English with or without a reserve, and Dutch) and offers anonymous bidding. eBay requires market participants to register and accept a detailed agreement defining their relationships with eBay and each other. In addition, eBay reserves the right to ban participants for rule violations and publishes the results of a rating system through which parties to transactions grade their trading partners' performance.
- **Infrastructure to enable and enhance transactions.** Market makers supplement publicly-available infrastructure in order to create a smoothly functioning market. Infrastructure falls into two categories: commercial and technical. Publicly-available commercial infrastructure includes money and the legal system's commercial code. Examples of commercial infrastructure privately provided by market makers include vetting and provenance services, payment settlement, and logistical support. Online market makers also must provide technical infrastructure to facilitate information exchange and trading. Publicly-available technical infrastructure includes the public Internet itself, including the network of telecommunications lines, routers, and host computers as well as the software, protocols, and programming languages used to transfer information (e.g., browsers; TCP/IP; HTML, XML; Java; etc.). Additionally, some Internet market makers need to supply a software integration platform that

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<sup>4</sup> There are a number of newly coined terms, some of which are quite colorful, used to describe what we call market makers: fat butterfly markets, paradigm violators, vortex markets, and dynamic pricing infomediaries, just to name a few. Critics of our use of the term *market maker* will note that in the financial services industry, the term is specifically reserved for intermediaries on an exchange who maintain market stability and who, trading for their own accounts, profit from bid/ask spreads.

<sup>5</sup> John Hagel, McKinsey & Company, as quoted in *The Economist: The Net Imperative / The rise of the Infomediary*, p.23, June 26, 199999.

<sup>6</sup> Nate Sleeper, *The New York Stock Exchange: Taking Stock of a Changing Landscape*, Harvard Business School course project, May 2000, p. 2.

provides links to market participants' legacy information systems, for example, their existing enterprise system software. As of late 2000, companies including Ariba, Commerce One, SAP and i2 Technologies were racing to build software tools that would bridge the gap between existing Internet infrastructure and proprietary information systems.

Four features of this definition are important. First, market makers aggregate all three services cited above; i.e., a place to trade, governance, and infrastructure. In this regard, they are distinguished from brokers (e.g., real estate agents), who provide matching services on behalf of a client, and who sometimes help a client negotiate transactions. Brokers are also intermediaries in the process of information discovery, but they do not set the rules for the transactions they facilitate. In some cases, established industry norms dictate the rules of engagement; in others, market makers or even government regulatory bodies handle rule-making. Likewise, brokers do not provide the technical infrastructure required to complete a transaction.

Second, market makers are defined as *intermediaries* who provide services to participants on both sides of a transaction. This excludes retailers and distributors from our definition of market makers. In the case of market makers, buyers and sellers transact directly with each other; the market maker serves as an intermediary, facilitating their transaction. In some cases, the market maker may briefly take title to the products being exchanged, and may even profit from a "spread," reselling them to the buyer for a higher price than the market maker paid to the seller. But market makers only act as a resellers in the context of specific transactions; unlike retailers and distributors, they do not hold inventory as principals, speculating that they will be able to sell it for a higher price.

Third, defining market makers as intermediaries who serve *multiple* participants on both sides of a transaction also excludes single corporations who have web-enabled their internal procurement processes. In doing so, companies may provide their suppliers with a place to trade, rules of engagement, and enabling infrastructure, but they do so strictly as *principals*, not as intermediaries. Some market makers are organized by consortia of buy- or sell-side participants (e.g., Covisint, a company that facilitates auto part trading, established by the leading auto manufacturers). Such consortia are not *neutral* intermediaries: these principals, as joint owners of the intermediary, have an opportunity to tilt the terms of engagement to their collective advantage, and they may exclude certain competitors (e.g., they may define themselves as an industry coop, with limited membership). However, consortia-backed online market makers still fit our definition because they involve multiple participants on both sides of a transactions.

Fourth, while market making activities are often associated with business-to-business (B2B) transactions, it should be clear from the definition above that market makers may also facilitate business-to-consumer (B2C) and consumer-to-consumer transactions. As explained below, Priceline and Monster.com are examples of B2C market makers; eBay is a consumer-to-consumer market maker.

We can further "stress test" this definition with several examples. First, is a company that provides an online directory which lists contact information and qualifications for patent lawyers a market maker? Clearly not: while the information available on the site may

facilitate matching, the online directory does not maintain a marketplace where specific transactions are completed. Such an online directory is more properly defined as an online content provider.

Second, is Monster.com, a site where job seekers can review “help wanted” ads and can post a resume that may be evaluated by prospective employers, a market maker? On balance, yes, but this is a more difficult call. On the one hand, Monster.com is focused on matching candidates to specific positions (unlike a directory site, which simply lists market participants and describes their qualifications), and the site does provide some governance (e.g., provisions for protecting confidentiality, so that a job hunter’s status is not revealed to her current employer) and infrastructure (e.g., templates for publishing resumes; procedures for forwarding online resumes to prospective employers). On the other hand, recruiters and candidates do not actually complete a transaction online; Monster.com simply facilitates the first step of the hiring process. But requiring a company to handle an entire transaction from start to finish to be defined as a market maker is too restrictive: purchasing transactions, for example, are not complete until goods have been shipped and payment has been settled. Some market makers assist market participants with shipping logistics and payment processing, but many do not.

Third, is Priceline.com a market maker when it allows consumers to “name their own price” for airline tickets? Yes: Priceline does connect multiple participants on each side of a transaction, providing them with a place to trade, clear (and unique) rules of conduct, and proprietary infrastructure. However, many market makers add value by increasing transparency in a market, i.e., they increase the odds that buyers will find sellers who offer the right goods and services at the right price. Priceline, by contrast, profits as an intermediary in a “double blind” pricing process. Priceline knows, but does not publish: (a) the lowest prices that airlines will accept for specific routes; and (b) the prices that consumers’ have named for these routes. By avoiding transparency, Priceline earns a profit when the spread between (b) and (a) is positive.

## **Taxonomy**

Market makers can be categorized along three dimensions: 1) Product Focus: Custom vs. Standardized, Horizontal vs. Vertical, and Direct Purchases vs. Indirect Purchases; 2) Affiliation: Buyer, Seller, or Neutral; and 3) Transaction Type: Catalog, Auction, and Exchange. Choices along these dimensions tend to be driven by the purchasing behavior of targeted buyers, the nature of the underlying product being traded, and the realities of building market liquidity. As explained below, such choices are neither mutually exclusive nor static.

### **Product Focus: Customized vs. Standardized, Horizontal vs. Vertical, Direct vs. Indirect**

An online market maker’s product focus may be described in three ways. First, does the market maker deal in customized or standardized goods and services? Second, is the

market maker oriented toward horizontal or vertical markets? Third, does the company principally make a market for direct purchases or indirect purchases?

**Customized vs. Standardized.** The distinction between customized and standardized goods and services is fundamental for a market maker. Supplying customized products requires a higher level of communication and collaboration between buyers and suppliers. Suppliers must be able to ask questions about product specifications and the acceptability of design modifications and material substitutions that might lower cost or improve product performance. Buyers need assurance that supplier can actually meet quality and delivery standards; they will have a strong preference for dealing with suppliers who have served them reliably in the past. By contrast, for standardized products, less communication and collaboration is required; buyers tend to be more focused on price performance.

**Horizontal vs. Vertical.** Customers from a diverse range of industries purchase the goods and services traded in horizontal markets. Typical items include office supplies, accounting services, steel, electricity, legal services, and personal computers. Examples of horizontal market makers include Ariba and Mondus.

Goods and services sold only to customers within a single industry are traded in vertical markets. Examples of such items include ink used for offset printing, aircraft parts, paper-making machinery, agricultural equipment, sports legal services, and hops used as an ingredient in beer. Covisint, PlasticsNet.com, and MyAircraft.com are typical vertical market makers.

**Direct vs. Indirect.** Finally, business-to-business markets can be described as focusing on either direct purchases or indirect purchases. Direct purchases are items incorporated into a product, e.g., paper in book publishing; memory chips in a PC. Indirect purchases are items consumed in the process of designing or manufacturing a product or delivering a service, e.g., janitorial services; electricity for air-conditioning a factory; test instruments used by engineers. One important category of indirect purchases includes “Maintenance, Repair, and Operating” (MRO) supplies, e.g., spare parts for machines; hand tools used by workers; lubricants for equipment.

Consider, for example, a motor manufacturer that buys ball bearings under long-term contracts for use as parts in its motors—these are a direct purchases. The motor manufacturer undoubtedly also purchases replacement ball bearings for machinery used in its production processes—these are indirect purchases. The following chart summarizes the distinctions between direct and indirect purchases.

## Attributes of Direct vs. Indirect Purchases

	<b>Direct Purchases</b>	<b>Indirect Purchases</b>
Purchase Predictability	Volatile; driven by external market demand	Internally-driven, typically against budgets
Purchasing Approach	Usually large, long term contracts; some spot buying	Varies: some ongoing contracts, some ad hoc RFQs.
Order Size	Large lots, sized to production runs	Often small
Collaboration with Suppliers	Varies: usually high, but low for commodity inputs	Varies: low for MRO supplies, high for equipment and professional services
% of Total \$ Spent	80%	20%
% of Total Number of Purchase Orders	20%	80%
End Customer	External customer	Internal employees; often at department level

Sources: Morgan Stanley Dean Witter, *The Internet B2B Report*, April 2000; Bill Cafiero, *Electronic Commerce Boot-Camp Seminar*, GEIS, October 21, 1999.

While direct purchases represent the bulk of industrial purchases by dollar volume, to date, most purchases made in through online market makers have been indirect, because online market makers have been better able to reduce transaction costs for such indirect purchases. Transaction costs (incurred in searching for items and processing orders) have historically represented a larger share of total spending for indirect goods and services. For direct purchases, which tend to involve a smaller number of very large orders, companies often have been able to reduce transaction costs by relying on Electronic Data Interchange (EDI) technologies.<sup>7</sup> EDI automates the ordering process through dedicated,

<sup>7</sup> According to [www.techencyclopedia.com](http://www.techencyclopedia.com), Electronic Data Interchange (EDI) is a system for the electronic exchange of documents between businesses, e.g., orders, confirmations and invoices. EDI is based on standards developed by the American National Standard Institute (ASC X12) and a United Nations Commission (EDI for Administration and Commerce). Superficially, EDI looks like Internet e-commerce; however, unlike Internet communications, EDI runs across private data networks and is inherently point-to-point. The implications of these two differences are profound. First, because EDI runs across dedicated telecommunications lines, its bandwidth expense is much higher than Internet packet-switched communications, where several users can share the same line. Second, the architecture of EDI is not as flexible as HTML / XML based systems. Third, EDI was designed almost exclusively for point-to-point communication, thus, multi-party online collaboration via EDI is not practical. On the other hand, EDI offers a high level of security and is extremely efficient at communicating high volumes of pre-defined documents between two parties. Based on interviews with Stuart Sawanbini, President, Eventra, the cost to integrate EDI with existing large company enterprise software systems typically falls between \$750,000 and \$1 million. Small company EDI installations cost about \$10,000. These costs are similar to the cost of integrating an XML based Internet system. As a result of its cost and lack of flexibility, EDI has been

point-to-point telecommunications links between buyers and their suppliers. Dating back to the 1970s, EDI was the original e-commerce technology, but its point-to-point architecture is fairly expensive and inherently inflexible; hence, EDI typically has been used by large corporations to automate high volume direct purchase orders, rather than indirect purchasing.

### **Transaction Type: Catalog, Auction, Exchange**

Market making mechanisms may be divided into three categories, ranging from static pricing models (catalogs) to dynamic pricing models (auctions) to exchanges, which are essentially continuous auctions.

**Catalogs.** Multi-vendor catalogs are listings of standardized goods (or services) from multiple manufacturers (or service providers) compiled by a publisher or a market maker. Offline examples include the Official Airline Guide, The Thomas Register, and WW Grainger. Offline catalogs are printed and are not transaction-enabled; customers have to contact a manufacturer or distributor by mail, phone, or fax to place their orders. When market makers publish catalogs online, they tend to be transaction-enabled. Online examples include Napster, OrderZone, and Ventro, which has launched online market makers in several vertical markets, including its Chemdex service, which provides a multi-vendor catalog for laboratory chemicals.

Catalogs present fixed prices; they are most likely to be used when: 1) the transaction costs that would be incurred with a dynamic price discovery mechanism (i.e., the time that would be spent by purchasing agents and sales reps on price negotiations) would be large in relation to value of merchandise ordered; and 2) supply and demand are fairly stable or predictable, so prices are not too volatile. Even with fixed prices, however, online catalogs may still facilitate price discovery, assuming they include multiple suppliers and provide buyers with the capability to search based on price.

Online catalogs also are helpful for matching supply with demand when they allow a buyer to “look” into a supplier’s inventory to check on stock availability; however, this capability requires the integration of a market maker’s databases with sellers’ inventory management systems—a complex and usually expensive project.

**Auctions.** In the popular imagination, auctions are initiated by sellers (e.g., eBay, Sotheby's), but buyers also can initiate auctions—these are known as “reverse” auctions. In B2B markets, reverse auctions often take the form of “request for quotation” (RFQ) processes, which are often used by buyers procuring goods that require customization. FreeMarkets and Mondus are examples of companies that organize online markets around RFQs. Auctions can be very effective mechanisms for price discovery; they are most useful for maximizing the price realized by sellers (or minimizing the price paid by buyers in reverse auctions) for one-of-a-kind items or perishable products and services.<sup>8</sup> In both these instances, there is no published price for the merchandise, and prospective

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primarily used in applications to connect large companies (often retailers and auto companies) with their tier-one suppliers to coordinate direct purchases

<sup>8</sup> Mohanbir Sawhney and Steven Kaplan, *Business 2.0*, 9/99, p.8.

buyers may have very different assessments of value. A well-run auction should net the seller an amount equal to the “willingness-to-pay” of the party with the second highest assessment of value.

Efficient methods of price discovery often lead to price volatility. Unlike exchanges (see below), the price volatility resulting from auctions usually cannot be hedged because there are not enough transactions of a like item or service to develop forward contracts.

**Exchanges.** Exchanges are continuous auctions for standardized products and services (e.g., gold; electric power; trucking capacity from point A to point B) that face changing supply and demand conditions, leading to price fluctuations. Prices are determined by the relationship between bid and ask prices posted on the exchange. Price volatility results from efficient price discovery, but can usually be mitigated by forward contracts. Examples of exchanges include AltraEnergy, Enron's Bandwidth Exchange, and the New York Stock Exchange.

Market Makers often use a mix of transaction types. For example, PaperExchange.com offers a real-time trading exchange for members to buy and sell paper. In addition, it offers an online catalog through which members can buy and sell new and used equipment such as forklift trucks and paper-making machinery. Finally, it offers a job listing service.

#### **Affiliation: Buyer, Seller, Neutral**

Market maker affiliations range from sell-side to neutral to buy-side. Affiliation dictates who sets the terms of exchange, and thus can determine whether a market maker biases those terms to the advantage of either buyers or sellers. Sell-side market makers tend to predominate in industries with fragmented buyers but concentrated suppliers; e.g., VerticalNet's Solidwaste.com. Neutral market makers tend to exist in industries with fragmented buyers and suppliers; e.g., Citadon in construction supplies; The New York Stock Exchange. Buy-side market makers tend to succeed in industries with concentrated buyers but fragmented suppliers; e.g., Covisint, the buying exchange being built by GM, Ford, Daimler/ Chrysler, Commerce One, and Oracle.<sup>9</sup>

Affiliation is a critical consideration when developing a market. Consider the example of Industry Net, one of the pioneer market makers in the Internet B2B space. Headed by Jim Manzi, former president of Lotus, Industry Net burned through \$25 million of venture funding before declaring bankruptcy in 1997. One of the most oft cited criticisms of Industry Net was their strong buy-side affiliation; so strong in fact that they could not attract a critical mass of sellers to their market.<sup>10</sup>

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<sup>9</sup> Internet market makers have the potential to consolidate purchasing power into a single unit called a monopsony. The Federal Trade Commission and the Bundeskartellamt (the German government's antitrust agency) reviewed Covisint to determine its monopsony potential.

<sup>10</sup> Mark Walsh, Chairman VerticalNet, in a speech delivered to the New York Venture Forum, 2/10/00

Affiliations are not necessarily static; for instance, a market maker may assume a sell side affiliation to build volume, then move to a neutral affiliation. As Mark Walsh, president of VerticalNet is fond of saying, "Don't get out of the Trojan horse until you are in the city."<sup>11</sup>

## How Do Online Market Makers Create Value for Market Participants?

Online market makers can generate several different types of benefits for marketplace participants, including increased liquidity, transaction processing costs savings, improved integration of supply chain partners' business processes, and benefits related to anonymity. As they design their sites and seek to recruit users, it is important for online market makers to have a clear sense of which source of value they plan to emphasize.

### Liquidity Benefits

Transaction costs accrue at each of the three stages of the buying process: *search costs* are incurred to identify prospective trading partners; *negotiating costs* are incurred as trading partners seek agreement on the terms of a transaction; and *transaction processing costs* are incurred after an order is placed. Trading partners realize liquidity benefits when they experience cost reductions in the first two stages, i.e., search and negotiation. Liquidity benefits follow from increased transparency in a market with respect to price, product availability, and/or product selection. When search and negotiation costs are high, buyers and sellers may not find it economical to trade with additional partners ; thus, buyers may forfeit opportunities to find products that better meet their needs, to find a better price for the goods they want, or locate items that are out-of-stock. Similarly, sellers may miss opportunities for additional sales to customers who would value the merchandise they offer or the level of service they can deliver. Online market makers can dramatically lower search costs by eliminating the need for costly and clumsy catalogs and for labor intensive phone calls to explore product availability. Market makers also can reduce negotiation costs for customized products by moving the RFQ process online, replacing faxes and phone calls with Web pages and e-mails.

Aggregating suppliers online reduces search costs by bringing together information from a large collection of suppliers in a searchable format. Traditional printed directories (e.g., the Thomas Register) aggregate information in this manner, but face two limiting factors: 1) they are not transaction enabled; and 2) because of printing and distribution costs, they are expensive to keep current. Because it is expensive to add pages and to update the directory, there is a trade-off between the accuracy and *richness* (i.e., the depth of information on any given product) on the one hand, and distribution *reach* of the directory on the other hand.<sup>12</sup> The Internet eliminates the physical carrier of information

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<sup>11</sup> Mark Walsh, Chairman VerticalNet, in a speech delivered to the New York Venture Forum, 2/10/00

<sup>12</sup> Philip Evans, Thomas Wurster, *Blown to Bits*, Harvard Business School Press.

(i.e., the printed directory), and thereby greatly reduces the marginal costs associated with adding information to a directory, updating that information, and distributing it.

Who benefits most from reduced search costs and increased marketplace liquidity? When a buy-side affiliated market maker brings more sellers to an RFQ-style auction, the impact on pricing is straightforward: one buyer + more sellers = better prices for the buyer. For example, FreeMarkets, which organizes and hosts online reverse auctions on behalf of large companies, claims to deliver average cost savings of 10%-15% for large, multimillion-dollar purchases.<sup>13</sup>

However, both buyers and sellers may benefit when they can leverage an online marketplace to identify additional trading partners. For example, before eBay was launched, a Peoria, Illinois musician wanting to buy a second hand, high-end guitar was limited to what she could find in local music stores and through classified ads in the local newspaper. Peoria being a small city, the selection was limited. A seller of a high-end guitar located in Davenport, Iowa would have little chance of finding her; Davenport, also being a small city, has few musicians interested in expensive used guitars. Without the expanded geographic reach available through eBay, the seller ends up taking less for his guitar than he could get if he had a larger audience, and our buyer in Peoria ends up purchasing a guitar that is not exactly what she wants.

Assuming that the reduction of search costs adds buyers and sellers to a marketplace in roughly equal proportions, increased liquidity will not necessarily have a significant impact on average pricing levels. However, data do indicate that larger aggregations of buyers and sellers tend to lead to more uniform pricing.<sup>14</sup> The losers with increased liquidity thus tend to be sellers whose value proposition is based on information asymmetry, specifically, on the ignorance of certain buyer segments. Buyers, low-cost sellers, and sellers who add value in other ways (beyond discounting) will tend to benefit from increased liquidity.

Liquidity benefits tend to be large in asset intensive businesses where yield management is a key profitability driver due to high fixed costs and perishable inventory or services. Examples include airlines, trucking, and bandwidth suppliers. It is estimated that 35% of airline seats go unsold, \$31 billion of trucking capacity is wasted due to dead-heading (returning empty) and sub-optimal scheduling<sup>15</sup>, and 80% of telecommunications infrastructure is idle.<sup>16</sup> By aggregating more buyers, online market makers can increase the likelihood of finding a buyer for under-utilized assets. For instance, Priceline makes a market in unsold airline seats; The National Transportation Exchange makes a market for trucking services; and Enron, BandX, and Arbinet all make markets for bandwidth.

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<sup>13</sup> Scot Ethrens, Peter Zapf, *The Internet Business-to-Business Report*, Bear Stearns Equity Research, 9/99, p.130.

<sup>14</sup> Charles Phillips, Mary Meeker, *The Internet B2B Report*, Morgan Stanley Dean Witter Equity Research, 4/00.

<sup>15</sup> Scott Ethrens and Peter Zapf, *The Internet Business-to-Business Report*, Bear Stearns, September, 1999, p.155.

<sup>16</sup> Ibid p.22

Beyond these attributes of high fixed costs and perishable inventory, potential gains from increasing liquidity are greatest in businesses with the following attributes:

*Buyers and sellers face high search costs.* When few EDI links exist between buyers and suppliers, buyers will be reliant on paper catalogs and on phone calls and faxes to determine product availability, suitability, and price. An online market maker can substantially reduce search costs under these circumstances.

*Customers are willing to switch suppliers.* Customers may be locked into suppliers for many reasons, ranging from personal relationships to long term contracts to tightly integrated information systems.

*There is some basis for supplier differentiation.* If suppliers find it difficult to distinguish themselves, there is not much point in expanding liquidity. Opportunities for differentiation are likely to be greatest in businesses with: 1) large numbers of stock keeping units, because this increases the odds that some suppliers will be out of stock; 2) substitutable products, which benefits suppliers who can give buyers advice on when they can save money by switching to a cheaper product; 3) a rapid rate of new product introduction, so some suppliers have access to new and better items than others, and need a channel to communicate new product benefits; and 4) rapid changes in supply and demand, so suppliers will face frequent stockouts because it is difficult to manage inventories. Note that some of these advantages are easier than others for a previously unknown supplier to communicate to a prospective buyer through an electronic marketplace.

## **Transaction Processing Cost Savings**

Processing a purchase order takes, on average, 14 steps.<sup>17</sup> The process is rich with information and—unless it is automated—very labor intensive. For example, customers may demand: 1) real-time information on product availability and shipping status; 2) the ability to designate different shipping arrangements for distinct line items to optimize shipping expense; 3) options to expedite orders in exchange for a higher price; 4) coordination of deliveries from different suppliers; and 5) the ability to make substitutions for back-ordered items.<sup>18</sup>

Cost savings in these information retrieval and order processing activities can follow from the automation of transactions through an electronic marketplace. Specifically, online transaction processing can eliminate manual effort associated with placing/receiving an order (including providing shipping instructions); checking on order status and verifying delivery; and managing accounts payable/receivable. Automating buyer-seller interaction reduces phone-tag, misplaced faxes, and the probability of

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<sup>17</sup> Bill Cafiero, GEIS, *Electronic Commerce Bootcamp Seminar*, produced by the New England EDI Users' Group, 10/21/99.

<sup>18</sup> Charles Phillips, Mary Meeker, *The Internet B2B Report*, Morgan Stanley Dean Witter Equity Research, 4/00, p. 95.

misunderstood instructions. Studies indicate that the cost to manually administer a purchase order ranges from \$40 to \$200, while the cost to process an electronic purchase order ranges from \$1 to \$20. British Telecom, for example, has reduced its cost of processing purchasing transactions by 90% through use of the Internet.<sup>19</sup>

Transaction processing cost savings are especially important for orders valued under \$1,000, which typically represent more than 70% of a corporation's purchasing transactions but less than 5% of the dollar value of their total purchases.<sup>20</sup> Hence, indirect purchases of low cost items like office supplies often realize significant transaction processing cost savings through automation.

Automating transactions not only reduces labor expenses, but it may result in savings by giving companies more control over decentralized purchasing decisions. "Maverick" purchases, which typically involve indirect goods and services, are orders that do not comply with a company's directives requiring employees to take full advantage of volume purchase agreements; e.g., an office manager buys from Office Depot despite instructions to buy through Staples, which has granted the company a larger discount. Studies indicate that 30% of corporate purchases are maverick and that maverick buyers pay 18% to 27% above the price they would have paid had they used preferred suppliers.<sup>21</sup> Online market makers can help reduce maverick purchases by providing an easily accessible purchasing platform which monitors adherence to company policies.

In general, transaction processing cost savings are most significant in businesses with the following attributes:

*Transaction processing costs are large in relation to the total value of orders.*

This attribute tends to follow from: 1) the nature of the production process (e.g., batch versus continuous process businesses); 2) the level of industry fragmentation (which tends to lead to many small orders); and 3) the direct versus indirect nature of purchases (see discussion above). Consider, for example, a chemical plant's orders for feedstock versus a small business's orders for office supplies. In the former case, transaction processing costs will be a much smaller percentage of the total order value than in the latter case.

*Trading partners lack EDI infrastructure.* As noted above, EDI reduces order processing costs, but historically, such links have been expensive to build and maintain, so it has only been economical to use EDI for exchanges between large buyers and suppliers. In fragmented businesses, the use of EDI tends to be limited.

*Buyers place frequent orders, each with large numbers of items, and require close coordination of delivery schedules.* Consider the volume of orders and

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<sup>19</sup> *The Economist*, 9/23/2000, "Untangling e-conomics," p. 11.

<sup>20</sup> Bill Cafiero, GEIS, *Electronic Commerce Boot-Camp Seminar*, produced by the New England EDI Users' Group, 10/21/99.

<sup>21</sup> Charles Phillips, Mary Meeker, *The Internet B2B Report*, Morgan Stanley Dean Witter Equity Research, 4/00, p. 31.

order status inquiries generated by an electronics assembly facility relying on “just-in-time” production processes: electronic order management can offer large transaction processing cost savings.

*Orders pass through multiple approval layers.* Costs and delays increase substantially when an order is passed manually (by mail or fax) through multiple levels of approval—in the case of construction supplies, this may include the subcontractor seeking approval from the general contractor, who must check with the architect, who must check with the developer, who must check with the building owner.

Offline distributors often are important intermediaries in markets that meet the criteria listed above: by holding inventory from multiple manufacturers, offline distributors reduce transaction processing costs related to ordering, delivery, and payment processing, compared to the costs that would be incurred if manufacturers shipped directly to buyers. In many markets, offline distributors are integrating their information systems with those of buyers and manufacturers to further reduce transaction processing costs. If they are successful, they may usurp the value-added that online market makers aspire to deliver. Online market makers, conversely, are in no position to disintermediate distributors—unless, like distributors, they are willing to hold inventory and ship products to customers. For these reasons, many industry observers believe that online market makers should seek alliances with leading offline distributors.

More broadly, it should be clear from the discussion above that transaction processing cost savings are not unique to the online market maker business model: companies can capture such savings without help from an online market maker when they Web-enable their purchasing processes. In fact, eMarketer, Inc. estimates that in 2000, about 93% of all B2B e-commerce was conducted by companies funneling transactions through their own websites, rather than through sites operated by an online market maker.<sup>22</sup>

### **Integration Benefits**

Managing transactions online allows buyers and suppliers to more tightly integrate a number of processes and thereby increases asset liquidity (i.e., the speed at which assets can be monetized), and can even improve product design. The classic example is the inventory management problem for direct purchases. Companies in the middle of a supply chain cannot readily predict the demand of their customers and cannot view the available capacity of their suppliers. To protect against upstream and downstream surprises, companies must build inventory. One study concluded that US companies collectively have \$1.37 trillion of inventory on their balance sheets, 40% of which is

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<sup>22</sup> Darnell Little, “Let’s Keep This Exchange to Ourselves,” *Business Week*, December 4, 2000, p. 48, citing data from eMarketer, Inc.

obsolete.<sup>23</sup> Dell Computer's Paul Bell says that inventory is "the physical embodiment of bad information."<sup>24</sup>

The traditional way of reducing inventory costs is to push inventory back on suppliers, but this is largely a zero-sum game (or worse, when it forces smaller companies with a higher cost of capital to bear the cost of extra inventory). Tighter integration of buyers and suppliers through electronic networks has the potential to reduce inventory throughout the supply chain by allowing suppliers to peer into their customers' order book and by letting customers view suppliers' inventory levels and work loads. Covisint, the much publicized automotive supply exchange being built by GM, Ford and DaimlerChrysler, is targeting this problem. Software providers such as i2 Technologies, Ariba, Commerce One, and Oracle also are seeking to address the inventory problem with their software platforms.

In a similar manner, tighter buyer-supplier integration holds the promise of solving the accounts payable paradox. Traditionally, small vendors selling to large companies have waited thirty to ninety days to be paid. This is a remnant of delays inherent in paper-based payment systems, but treasury departments also are motivated to stretch their accounts payable as a source of "free" financing. Paradoxically, when large buyers have lower costs of capital than their suppliers, stretching accounts payable in this manner ultimately results in higher costs for buyers. Tighter integration between buyers and sellers should result in faster payments from buyers in exchange for deeper discounts from sellers.

Again, as with transaction processing cost savings, it should be clear that integration benefits are not unique to the online market maker business model: they are available whenever supply chain partners establish electronic links.

### **Anonymity and Off-Exchange Trading**

In some instances, market makers can create value by facilitating anonymous buying and selling. Market participants typically can employ brokers to achieve the same benefits, but depending on their rules for market governance, online market makers may automatically provide anonymity—and at a lower cost. Anonymity sometimes allows market participants to realize better prices for the goods they trade, and to avoid conflict with channel partners. For instance, a mutual fund does not want other securities traders to know that it is selling a large position in a particular stock, because that news may scare off potential buyers, reducing the value that the mutual fund realizes. This problem is relevant in many other markets. For example, the commercial shipping industry features brokers who specialize in discreetly matching ship sellers with ship buyers. Sellers fear that if other market participants learn that they are selling a ship, it may jeopardize their ability to market shipping services. Manufacturers who wish to liquidate obsolete inventory without engendering conflict with their distributors holding similar

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<sup>23</sup> Charles Phillips, Mary Meeker, *The Internet B2B Report*, Morgan Stanley Dean Witter Equity Research, 4/00, p. 95.

<sup>24</sup> Paul Bell, Dell Computer Operations Manager Europe, Middle East and Africa, as quoted in *The Economist E-Management Survey*, 11/11/00, p. 9.

inventory also may benefit from anonymity. Priceline's value proposition hinges on a similar motive: when they name their own price for an airline ticket, Priceline's users do not learn their carrier's identity until *after* they have purchased the ticket. Thus, airlines can liquidate inventory without publicly advertising the deeply discounted fares received by Priceline's users—and without facing demands from travel agents and other customers for similar discounts.

Market participants may have other motives for preserving anonymity, beyond protecting the integrity of their pricing and channel structures. For example, job seekers who do not want their current employer to learn that they are searching for a new position must protect their anonymity when they post their resumes at online job sites like Monster.com. Individuals liquidating art and antiques due to bankruptcy or divorce often request anonymity from an auction house like Sotheby's to avoid personal embarrassment.

In other cases, it may be to the market maker's advantage if prospective buyers and sellers do not learn each other's identity. To the extent that market makers perform only a matching service, they are vulnerable to "off-exchange trading" by parties who rely on the online market maker's pricing information but subsequently conduct offline transactions to avoid transaction fees levied by the market maker. Of course, if the prospective trading partners cannot contact each other, they cannot complete an offline trade. Typically, however, market participants are unwilling to close a transaction unless they know they are dealing with a reliable trading partner. Unless market makers are able to certify that this is the case (perhaps through a user rating system like eBay's), market makers must allow participants to disclose their identities—and necessarily will increase the risk of off-exchange trades.

Online market makers may take several steps to reduce the risk of off exchange trading. For example, they can structure their fees as subscription payments (e.g., a flat rate per month) rather than per-transaction payments, to reduce incentives to circumvent the system. Also, they can draft and enforce rules that penalize participants who engage in off-exchange trades—at the extreme, banning offenders from the marketplace. Ultimately, however, the best defense against off-exchange trading is to broaden the benefits provided to market participants beyond simple matching, to encompass transaction processing cost savings and integration benefits that require electronic links to trading partners' legacy information systems. Online market makers also can reduce the risk of off-exchange trading by offering value-added ancillary services related to logistics, shipping, warehousing, inspection, escrow, and insurance.<sup>25</sup>

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<sup>25</sup> Mohanbir Sawhney and Steven Kaplan, *Let's Get Vertical*, Business 2.0, 9/99, p. 92.

# Online Market Maker Economics

## Sources of Revenue

Market makers have a number of potential sources of revenue, the most important of which are described below.

**Transaction fees.** Market makers may levy fees for each transaction completed by market participants; such fees may be structured as flat payments or as a percentage of the transaction value, and may be paid by the buyer, seller, or both parties. However, transaction fees are usually hard to maintain unless a market maker is able to erect strong barriers to entry; consequently, transaction fees often represent a small proportion of market makers' overall revenues. Leading offline and online auctioneers provide notable exceptions: companies such as Sotheby's and eBay generate nearly 90% of their revenue from transaction fees. Auctioneers benefit from strong entry barriers related to network effects in the market for unique, collectible items: traders in such items tend to congregate in just a few markets.

**Mark-up.** Mark-up, or "spread," is earned when a market maker buys a product then resells the product at a higher price. PriceLine, for instance, generates most of its revenue from the spread between the prices offered by consumers and airlines. Priceline only purchases a ticket from an airline when it has a binding offer from a consumer. Some other market makers trade as principals for their own account and thus take greater inventory risk: they hold stock, speculating that they will be able to resell it and earn a positive spread.

**Membership and subscription fees.** Some market makers have built their businesses around a subscription-based model. Avail's ILS Division, for instance, maintains a database of aircraft parts which is used primarily by aircraft-parts brokers. ILS charges users a subscription fee to access its parts database as well as a parts listing fee; they reported 1999 earnings of \$16.7 million on revenue of \$29.8 million.

**Advertising fees.** Advertising is the principal source of revenue for publishers of directories such as the Yellow Pages and The Thomas Register. Online market makers which offer directories also charge companies for listings; for example, VerticalNet, which has organized online trading communities for dozens of vertical markets (e.g., hydrocarbononline.com; pulpandpaperonline.com; bakeryonline.com; solidwaste.com), derived 53% of its 1999 income from listings; the balance of their revenue came from transaction fees. Listing fee-based business models are fairly easy to implement so long as the market maker can demonstrate value to advertisers in the form of incremental revenue generated. Because directories tend to list sellers rather than buyers, market makers who heavily depend on a listing fees often adopt a sell-side affiliation.

**Data sold to third parties.** Data, e.g., aggregated market statistics, company performance data (delivery, payment, returns, back-orders, etc.), and information on

buyer behavior and preferences, is increasingly seen as a revenue source for market makers. For example, data sales contributed 17% of the New York Stock Exchange's total 1999 revenue, slightly less than transaction fee revenue.<sup>26</sup> DoubleClick's Abacus Alliance also makes a market in data. Abacus is a cooperative arrangement through which direct mail marketers and offline retailers contribute their customers' purchasing histories to Abacus' database in exchange for the right to purchase the full range of Abacus' information and market research services.<sup>27</sup> As evidenced by the recent consumer backlash against DoubleClick's perceived privacy violations, data sales are not without risk. In the B2B arena, data ownership has become a contentious issue: all market participants seem to think they own the data generated by their transactions.

**Software sales and system integration fees.** As of late 2000, several companies in the B2B enterprise software space were blurring the distinction between market maker and software provider. Ariba, Oracle, I2 Technologies, and Commerce One were all licensing market-making software platforms under terms that effectively make them shareholders in the resulting online market makers. Their licensing agreements typically included installation and hosting fees plus revenue sharing agreements. Additionally, each of these firms had plans to create software links between its customers' markets to facilitate trading between those markets.

**Ancillary services.** Market makers generate revenue from ancillary services they provide to market participants. The range of services depends on the needs of the specific market; typical services include credit verification, transaction clearing, insurance, shipping, custody, and warehousing.

## Revenue Recognition

There is some controversy over the revenue recognition policies of online market makers. At issue is whether market makers should report gross (notional) revenue or net revenue. Of course, the choice of accounting approach has no effect on cash flows, but it is very important to keep the gross versus net distinction in mind when interpreting and comparing market makers' financial statements. The SEC's current policy states that a company should report gross revenue when it:<sup>28</sup>

- (1) acts as principal in the transaction,
- (2) takes title to the products,
- (3) has risks and rewards of ownership, such as the risk of loss for collection, delivery, or returns and
- (4) acts as an agent or broker (including performing services, in substance, as an agent or broker) with compensation on a commission or fee basis.

According to the SEC, "If the company performs as an agent or broker without assuming the risks and rewards of ownership of the goods, sales should be reported on a net basis."

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<sup>26</sup> NYSE Annual Report, 1999

<sup>27</sup> DoubleClick 10-K, 1999.

<sup>28</sup> Charles Phillips, Mary Meeker, *The Internet B2B Report*, Morgan Stanley Dean Witter Equity Research, 4/00, p. 351.

For example, consider eBay's business model. eBay organizes auctions and earns fees based on the value of the items auctioned on its site, but does not take title to the products traded. Consequently, eBay reports revenue on a net basis; its 1999 revenue was only \$248 million, while goods worth about \$4.5 billion were auctioned through eBay.<sup>29</sup>

Priceline, by contrast, reports revenue on a gross basis, arguing that it takes title to the airline tickets it sells. Some analysts have criticized this accounting decision, arguing that while Priceline takes title to the tickets it sells, the company takes no significant ownership risks because it only resells tickets when it has a binding order, backed by a non-refundable charge on the consumer's credit card.

## Costs

Market making, like other information-intensive businesses, features high fixed costs. The principal cost categories for online market makers include Cost of Revenue; Product Development; Sales & Marketing; and General & Administrative. This section describes the factors which drive costs for online market maker, using data for the first three quarters of 2000 for a sample of four companies: eBay, Priceline, Vento, and VerticalNet. In interpreting this data, it is important to note that Priceline and Vento report revenues on a gross basis, while eBay and VerticalNet report on a net basis.

**Cost of revenue.** Cost of revenue (COR) as a percentage of revenue differs greatly for online market makers, depending on their accounting policies. For example, eBay and VerticalNet, which report revenue on a net basis, had COR equal to 24% and 19% of revenue, respectively, for the first three quarters of 2000. eBay includes expenses related to customer support and site operations (i.e., hosting) in COR. For VerticalNet, we have defined COR to include "Editorial & Operations" expenses. For Vento and Priceline, which report revenue on a gross basis, COR (equal to 94% and 84% of revenue, respectively) includes only the cost of goods and services sold: site operations and customer service costs were recorded in other cost categories. With the exception of VerticalNet's editorial expenses, "Cost of Revenues" is largely variable for these firms.

**Product development.** At first glance, product development—spending by online market makers to build and maintain their websites—varies considerably among market makers, ranging from just 2% of revenue for Priceline to 44% for Vento. In absolute dollar terms, however, there is less variance between the companies in the sample: spending ranges from \$22 million for VerticalNet to \$42 million for eBay. This suggests that product development is a large and recurring expenditure for market makers. Before they launch, most online market makers must spend heavily to develop proprietary technology and databases for matching buyers and sellers, and then incur significant ongoing expenses to upgrade systems and maintain databases; such costs do not tend to vary with transaction volume. Market makers that seek to provide buyers with visibility into

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<sup>29</sup> George Anders, "The Auctioneer," Wall Street Journal, November 22, 1999, p. R69 interviews eBay CEO Meg Whitman, who says that eBay's fees average 5% to 6% of the value of items auctioned through the site.

suppliers' inventories also must undertake system integration projects, an investment that tends to vary with the number of suppliers added to the marketplace.

Given the information-intensive nature of market making, it is not surprising that established market makers continue to spend heavily on their information systems. For instance, during 1999, Sotheby's spent \$121 million (27% of net revenue) on computer systems and the NYSE spent \$227 million (31% of net revenue) on systems.

**Sales and marketing.** Sales and marketing expenses for the sample of online market makers also varied widely as a percentage of revenue, ranging from 11% for Priceline to 61% for VerticalNet. Priceline's figure is actually inflated, because it includes expenses for credit card processing fees and "charge backs" (bad debt expenses) and for outsourced call center operations. Priceline's actual advertising spending was only 5% of revenue.<sup>30</sup>

The other sample companies illustrate the range of tactics market makers can use to build and monetize liquidity. eBay, for example, spends heavily on portal distribution deals; e.g., it signed a four year, \$75 million agreement to provide auctions for AOL subscribers. eBay also invests in trade promotion: it sets up booths at local fairs to court "power sellers," semi-professional collectors who drive a large share of its volume.<sup>31</sup> While eBay spends heavily on marketing, it also has amassed a huge customer base: eBay spent only about \$10 per new customer acquired in 1999.<sup>32</sup>

B2B online market makers tend to spend heavily on direct sales forces. For example, VerticalNet spent most of its sales and marketing budget—which totaled \$94 million for the first three quarters of 2000—on direct sales personnel who recruit buyers and sellers for its many marketplaces and who sell listings in its online directories. Ventro, likewise, spent most of its sales and marketing budget on direct sales activities; this is typically for newly formed B2B market makers. Ventro's 1999 sales and marketing costs were \$24 million, 78% of revenue. At the end of February 2000, Ventro had 123 sales and marketing professionals serving 95 customers, with the top four customers (3M, Biogen, DuPont and EOS Biotechnology) representing 63% of 1999 revenues. Assuming Ventro acquired all 95 customers in 1999 (the company had 1998 sales of only \$28,000), the average cost of customer acquisition was \$250,000—expensive by any measure. On the supply side, Ventro entered into a strategic alliance with VWR, a distributor of laboratory products. As part of this alliance, Ventro gave VWR 2.5 million shares of Ventro pre-IPO

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<sup>30</sup> While Priceline's modest spending on advertising as a percentage of revenue may appear impressive, it is worth noting that the company reports revenue on a gross basis. On a net basis, Priceline spent 31% of revenue on advertising. Also, Priceline charged \$1 billion in 1999 to "Other Costs" related to the amortization of warrants which were given to airlines in exchange for the airlines participating in their market—more than twice its gross revenue! These expenses might reasonably be considered marketing costs, since they served to build marketplace liquidity.

<sup>31</sup> According to Lisa Guernsey, *The New York Times*, August 20, 2000, Section 3, p. 11., 10% of eBay's sellers account for 80 percent of its sales.

<sup>32</sup> George Anders, "The Auctioneer," *Wall Street Journal*, November 22, 1999, p. R69 quoting eBay CEO Meg Whitman, who says in addition that roughly one-half of eBay's new customers are acquired through word-of-mouth referrals from existing customers. New eBay users who are also AOL subscribers, for example, tell on average 7 friends, co-workers, or family members about their eBay experience.

stock valued at \$14 million (at the time of issuance). While the Ventro-VWR relationship may prove to be extremely valuable, it also has been extremely costly.<sup>33</sup>

Ventro's customer acquisition cost seems high by B2B market maker standards. For example, Marshall & Swift, in building a contractor exchange network for the insurance industry, had spent \$16 million over four years and had acquired 1,500 contractors and 2,000 claims agents. Counting both the contractors and claims agents as "customers", the firm had a customer acquisition cost of \$4,571. During the four-year period, the firm had gross transaction volume of \$136 million, yielding transaction fees of about \$8 million—less than half its spending for customer acquisition.<sup>34</sup>

We can also compare Ventro's results to costs for WW Grainger, a bricks-and-mortar MRO supplies distributor with similar revenue recognition policies as Ventro. Grainger does not break out sales and marketing from its total cost of operations, but the company spent \$1.25 billion in 1999 on sales, marketing, warehouses, customer support, and administration to serve 1.4 million customers; this averages to \$900 per customer. This comparison begs the question: how do the two companies define the term *customer*? Ventro says that among their 95 customers, they have 24,000 registered users. If we count all 24,000 registered users as customers, Ventro's 1999 sales and marketing cost per customer would be \$1,221—still about 30% higher than that of Grainger's total cost of operations.

Of course, it may not be fair to compare Ventro to Grainger; after all, Ventro went from \$28,000 revenue in 1998 to \$31 million in 1999, while Grainger's revenue grew by only 4.5%. It is interesting to note, however, that Grainger spent \$21 million on its Internet businesses in 1999, achieving revenue of \$100 million, up from \$6.7 million of spending and \$13 million of revenue in 1998.<sup>35</sup>

Many new market makers are justifying their heavy early spending on customer acquisition on two premises: 1) network effects will allow them spend less to acquire additional customers after they reach critical mass; and 2) marketing expenditures to *retain* customers will be modest, because they will be "locked in" by the value they realize from marketplace participation. These premises will be examined in detail in the section below entitled, "Get Big Fast: A Strategic Imperative for Online Market Makers?" If the premises turn out to be correct, online market makers may earn outsized gains in the long run<sup>36</sup>

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<sup>33</sup> Ventro 10-K, 1999.

<sup>34</sup> Casewriter interview with Peter Wells, Senior Vice President, Marshall & Swift.

<sup>35</sup> WW Grainger 10-K, 1999.

<sup>36</sup> Of course, as the economist John Maynard Keynes observed, in the long run we are all dead.

## Prospective Profitability

Among the companies in our sample, only eBay earned a modest operating profit during the first three quarters of 2000: \$12 million (4% of revenue) before expenses related to employee stock options and the amortization of merger-related intangibles. Measured on the same basis, Priceline, VerticalNet, and Ventro lost \$20 million, \$52 million, and \$95 million, respectively.

Notwithstanding these less than inspiring early results, for reasons explained above, the advent of Internet market makers appears likely to create tremendous value. However, history suggests that it is difficult to predict who will capture that value.. Just as automobiles transformed the 20<sup>th</sup> century, bringing us suburbs, McDonalds, even the word *motel*, many industry observers believe there is a good chance that Internet market makers will transform the 21<sup>st</sup> century. But turning again to the example of the auto industry, it is interesting to note that while 2,000-odd auto manufacturing firms were launched in the U.S. during the early decades of the 20<sup>th</sup> century, only three have survived.<sup>37</sup>

Consider another network-based business: railroads. Like today's online market maker entrepreneurs, railroad barons pointed to economies of scale and barriers to entry. The fact is, however, few rail companies ever paid a dividend. Of the 5,000 U.S. railroad carriers that have existed during the last 150 years, 99% went out of business. The Great Western Railway, the most admired rail carrier in Britain during the 19<sup>th</sup> century, paid an annual return to shareholders of just 5% from 1835, when it was established, through 1913.<sup>38</sup> It turns out that while tremendous value was created by the rail systems, it was difficult for rail companies to capture that value. Instead, farmers, department stores, and packaged goods companies were among the major beneficiaries of the rail infrastructure.

Finally, consider the NYSE. With \$8.9 trillion in gross notional transactions, the NYSE is by far the world's largest market maker. It enjoys a dominant position, including all of the benefits of network effects, market liquidity, and economies of scale. Given its advantages, the NYSE surely must be an enormous—and enormously profitable—business, right? Not quite: the NYSE reported just \$735 million in net revenue and \$125 million in EBIT for 1999, figures that would fail to place it even in Fortune magazine's list of the 1,000 largest U.S. companies. While the existence of the NYSE creates untold economic value and is critical to the existence of entire industries (e.g., rating agencies; media and news companies like Bloomberg and Reuters; investment banks) the NYSE captures only a small fraction of the value it creates. Why?

The NYSE faces competition from intermediaries that offer off-exchange trading, including Electronic Crossing Networks (ECNs). This competition prevents the NYSE from sharply increasing its fees: for every \$1 of stock traded on the NYSE, the exchange charges on average only \$0.0000155 in transaction fees. Hence, while the NYSE

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<sup>37</sup> *The Economist*, 9/23/00, "Untangling e-economics," p. 19.

<sup>38</sup> *The Economist*, 9/23/00, "Untangling e-economics," p. 19.

provides remarkable liquidity to market participants, its experience demonstrates that liquidity is not necessarily a barrier to entry.<sup>39</sup>

Even when market participants value liquidity, market makers may find it difficult to convert the value they have created into profits. Consider eBay, by far the market leader in the U.S. for online consumer auctions. eBay has demonstrated the value of liquidity and already earns a modest profit margin as proof. However, eBay is under attack by a group of “meta-market makers” including BiddersEdge and AuctionWatch. These companies make a market of markets. Users specify an item at the BiddersEdge web site. BiddersEdge then searches Amazon, Yahoo, eBay and a host of other online auctions, returning a composite of the results. eBay takes BiddersEdge seriously and has sued them, claiming that meta-intermediaries trespass on eBay's intellectual property.<sup>40</sup>

So, will online market makers be profitable? We do believe that online market makers will radically change the business landscape for all the reasons cited above—e.g., increased liquidity, reduced transaction processing costs, improved integration of supply chain partners' business processes. There are many opportunities yet to be developed; put differently, there is much work left to be done: there were 850 Internet market makers in operation as of this writing, but 97% of the payments for transactions they completed were still made offline.<sup>41</sup> According to a study by Broadview International, an investment bank, there were over 20 Internet market makers in each key vertical market.<sup>42</sup> Surely not all of these startups will succeed: simple-minded models (e.g., “by exploiting network effects, we will take a 1% transaction fee of a \$100 billion market”) are especially likely to disappoint investors. Monumental shifts rarely work out as expected, but that does not make them less monumental. Napster, for example, may never make a profit, but its May 1999 launch is likely to mark an inflection point for the record industry.

## “Get Big Fast”: A Strategic Imperative for Online Market Makers?

Many Internet companies have pursued “Get Big Fast” (GBF) strategies, involving massive upfront investment in customer acquisition. The premise of such strategies is that the early days of the Internet are a “land grab:” according to this view, companies will find it easier to stake out wide swaths of empty territory now, rather than try to capture that territory later, after it has been settled by others. A competing strategy might be labeled “Get It Right First” (GIRF). When following this strategy, companies grow at a more measured pace; they expand only when they are sure that their value proposition for customers is sound, and that they can deliver against this promise in a high quality manner. This section explores the conditions under which GBF and GIRF strategies make sense for online market makers.

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<sup>39</sup> Nate Sleeper, *The New York Stock Exchange: Taking Stock of a Changing Landscape*, Harvard Business School course project, May 2000, eBay 10-K, 1999

<sup>41</sup> David Pecaut, President iFormation Group, in a speech delivered to the conference *Managing and Growing on the Internet*, November 6, 2000.

<sup>42</sup> *eBusiness Perspective*, Broadview International LLC, October 2000, p. 21.

## Conditions Supporting a GBF Strategy

Farmers say, "make hay while the sun shines." Amazon's founder, Jeff Bezos, reduced this maxim to "get big fast." The comparison is more than superficial. If a company plans to grow faster than its retained earnings, it must secure outside financing. Through early 2000, Internet companies that funded GBF strategies were pushed by a powerful "supply side" tailwind: the rapid growth of the venture capital market. Consider that in 1996, U.S.-based VCs invested a total of \$11.2 billion. During the first three quarters of 2000, U.S.-based VCs invested \$80 billion, and their total investment in 2000 is predicted to exceed \$100 billion—nearly a 10-fold increase since 1996.<sup>43</sup> With so much money available, entrepreneurs were pressured to put it to work, and VCs often encouraged the adoption of GBF strategies.

Of course, the capital markets tightened significantly after the sharp correction in technology stocks in April 2000. In the wake of that correction, capital providers were only likely to fund GBF strategies when the following conditions applied:

1. **Markets exhibit "winner-take-all" structural characteristics.** The payoff from the GBF strategy tends to be strongest when network effects are strong; scale economies (beyond network effects) are significant; and customer retention rates are intrinsically high. The extent to which online market maker's businesses meet these requirements is explored below.
1. **The cost of customer acquisition is less than lifetime value of customers.** As discussed above, customer acquisition costs can be considerable when building an Internet market maker. In addition, it is typically difficult to estimate the lifetime value of a customer in a new market, because the dynamics of the market are not yet understood.
2. **Competitive risks are "reasonable."** Assessing this risk is a delicate matter: the history of technology businesses is replete with examples of first movers who were not able to hold their market (e.g., Osborne Computer, Prodigy, VisiCalc, Lotus 123, Apple's GUI OS, Japanese and European developers of analog HDTV technologies). On the one hand, it makes sense to accelerate growth strategies when there is a threat that a competitor may preempt the market. On the other hand: 1) if too many competitors simultaneously pursue GBF strategies, the result can be an enormously expensive war of attrition; and 2) second movers often can learn from pioneers' mistakes.
3. **Executional risks are manageable.** Simple enough: only race when you can go fast, but still keep the wheels from flying off your car. In practice, however, it is very hard to grow 100% per quarter and still deliver high quality service. This requires the ability to attract, retain, and train employees at a very rapid rate, and to continuously "scale" information systems and business processes. One of the most impressive aspects of Amazon's performance has been its ability, in the executionally-intensive

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<sup>43</sup> *Venture Economics News*, 11/3/200.

online retailing business, to maintain high service levels while growing to a \$2 billion annual run rate in less than four years.

## Conditions Supporting a GIRF Strategy

From the launch of Netscape in 1995 through the NASDAQ meltdown of April 2000, “Get Big Fast” was the mantra for most Internet companies. In fact, online companies that earned profits were often criticized for sacrificing market share for earnings! Market manias aside, as noted above, there often are solid reasons for pursuing a GBF strategy, yet following a “Get It Right First” strategy may be more appropriate under certain circumstances. GIRF works best in markets with the following attributes:

1. **Protecting quality is imperative.** B2B and B2C market participants tend to diverge on the importance of transaction reliability. For example, B2C market maker eBay's rapid growth has not been without problems. During 1998, eBay's site crashed and was down for several days because its systems were overloaded. In 1999, eBay was the target of a hacker attack which closed the site for several hours. It turns out that while traders were inconvenienced by its outages, eBay's auctions are not “mission critical.” eBay recovered from these problems and still holds the dominant share of the online consumer auction business. Contrast eBay's experience to the situation facing many B2B market participants. Large enterprises have a host of integration issues which must be resolved before they turn over mission critical aspects of their business to online intermediaries. A suppliers' failure to deliver a single order against a “just-in-time” schedule can shut down an assembly facility. While many industrial companies have been criticized by Internet enthusiasts for “not getting it,” it takes time to retool complex supply chains.
2. **“Learning by doing” is important.** Building an online marketplace requires major changes in buyer and supplier behavior, and inevitably involves trial and error as the market maker adapts its business model in response to customers' evolving needs. Under these conditions, following a GBF strategy may be very expensive: market participants are initially sold (at great expense in terms of direct sales activities) on one value proposition, only to be re-sold on a new plan. A shifting business plan is not likely to inspire customers' trust in a new intermediary.

This focus on “learning by doing” raises the question: should online market makers seek *second mover* advantage? As noted above, Industry Net failed to exploit its first mover advantage in building an industrial B2B market and filed for bankruptcy in 1997. Two reasons have been cited for the company's failure: 1) an inability to attract sellers to its market, due in part to its strong buy-side affiliation; and 2) excessive spending on technology (about \$25 million—a relatively modest amount by recent standards). VerticalNet, as a second mover, has been able to learn from some of Industry Net's mistakes. While the early bird may get the worm, according to Paul Saffo of the Institute for the Future, it is the second mouse who gets the cheese.<sup>44</sup>

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<sup>44</sup> Quoted in *The Economist*, 9/23/00, “Untangling e-economics,” p. 34.

## Do Online Market Makers Exhibit “Winner-Take-All” Structural Characteristics?

Three structural characteristics determine whether a business faces “winner-take-all” dynamics: strong network effects; significant scale economies; and intrinsically high customer retention rates. When these characteristics are present, a company that pulls ahead of its competitors will tend to continue to do so at an accelerating pace, as users attract additional users through a network effect, and as these users are “locked in” by factors that promote retention. As the company grows, new users are progressively less expensive to serve due to scale economies. Cost advantages can be plowed back into features that differentiate the service, reinforcing the growth cycle.

**Network effects.** Network effects occur when the adoption of a product or service by a new customer increases the value of that product or service for customers already using it, because existing customers now can “connect” with more parties.<sup>45</sup> The concept of connectivity applies for any network which facilitates point-to-point transactions, e.g., a postal system, a telephone network, a railroad. To use the classic example, the value of each existing fax machine increases very slightly for its owner upon the sale of every new fax machine, because each party in the network can reach additional users. In fact, according to what has become known as Metcalfe's Law (after Bob Metcalfe, inventor of Ethernet), the value of a network is equal to the number of its users squared; hence, there is an exponential benefit from a linear increase in the size of a network.

Almost by definition, online market makers are subject to very strong network effects: for the sake of convenience, buyers and sellers generally will prefer to transact in a single marketplace, so the leading market maker will tend to pull away from the pack. But markets vary in terms of potential participants’ sensitivity to aggregate participation rates. This sensitivity can be expressed through adoption curves, which relate the probability that a typical prospect will join a marketplace to the share of that prospect’s trading partners already active in the marketplace. For some businesses, the presence of just a few partners provides sufficient incentive to participate (i.e., the curve is concave); this is most likely to be the case when the switching costs entailed in participating in the new market (e.g., system integration efforts; employee training) are modest. When switching costs are high, the adoption curve may be “S”-shaped: when a critical mass of the typical prospect’s trading partners have joined the market, the probability that the prospect also will join increases sharply. This “S”-shaped adoption pattern is called a “tipping” model, because adoption accelerates (“tips”) past a threshold point.<sup>46</sup>

Differential sensitivities to aggregate participation rates may explain the rapid growth of B2C market makers like eBay and Napster, versus the slower growth of B2B market makers like Ventro. The costs to a consumer (say, a hobbyist collecting Civil War memorabilia) associated with participation in eBay’s market are minimal: items can be listed for a few dollars, and no special software, hardware, or training is required to

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<sup>45</sup> See Carl Shapiro and Hal R. Varian, *Information Rules* (Boston, MA: Harvard Business School Press, 1999), pp. 173-225 and Philip Evans and Thomas S. Wurster, *Blown to Bits* (Boston, MA: Harvard Business School Press, 1999) pp. 112-113.

<sup>46</sup> Malcolm Gladwell, *The Tipping Point*, Little, Brown and Company, 2000.

participate in auctions. Even if a collector only finds a few items of interest, it is probably worthwhile for him to bookmark the eBay site and check its listings periodically. So, even with low aggregate participation rates, collectors begin to “settle” on eBay. Once they do, the network effect accelerates the arrival of others.

Contrast this pattern to the experience of pioneer buyers and suppliers considering whether to participate in a B2B marketplace, say, in construction supplies procurement. In principle, a contractor may be interested in joining an online marketplace that presents its RFQs to additional distributors; with more bidders, the contractor can expect to realize better prices. But in practice, contractors rely heavily on a few key distributors; if those suppliers avoid online auctions, then the contractor is unlikely to post its RFQs in the online marketplace. In that event, the online market maker will fail to reach critical mass.

There are three principal reasons why a potential B2B market participant might avoid trading through an online market maker: 1) they expect their price realization to suffer when they move online; 2) they are deterred by the costs associated with the move online; or 3) they are concerned about the quality risks inherent in conducting mission-critical transactions through a new medium. The relative importance of the first two barriers may be explained in part by the manner in which online market makers seek to create value for market participants (e.g., liquidity versus transaction processing cost savings) and by the transaction types they employ (e.g., auctions versus catalog). B2B market makers that focus on delivering liquidity benefits often employ auctions (or reverse auctions, i.e., RFQ processes). Increased liquidity tends to benefit the party that initiated the auction. Again, with online RFQ processes, one buyer + more bidders = lower prices paid by the buyer. Some aggressive suppliers (perhaps those with favorable cost structures or a solid basis for differentiation in customer service) may prosper as an online marketplace expands their reach, but most other suppliers are likely to worry about the impact of increased liquidity on their prices and profitability. Unless buyers force their involvement, it may be very difficult to secure suppliers’ participation in online auctions.

B2B market makers emphasizing transaction processing cost savings often offer online catalogs that provide end-to-end visibility into distributors' inventories, and provide links into trading partners' accounting systems. This reduces the time required to check on stock availability, place orders, and track order status, and can automate receivables and payables processing. Of course, when an online catalog aggregates multiple suppliers, buyers may realize value through convenient price comparison features, but such value is likely to be of secondary importance. The primary benefit is from cost savings related to the automation of manual transaction processes, and this benefit accrues to both buyers and suppliers.

Both suppliers and buyers may be deterred by the system integration and employee training costs associated with a move online. Providing the capability to view a distributor's inventory through an online catalog is quite demanding, from a system development perspective. It requires the upfront creation of a database to track products and their specifications. This is important because it allows buyers to undertake parametric searches for equivalent items from different manufacturers. In some industries, a common database is already used by all participants; typically, the online market maker must create a database from scratch. Accessing a distributor's inventory

management systems also requires system integration between the online market maker and the distributor—a potentially costly activity, and one that does not necessarily scale easily. Auction processes, by contrast, do not tend to require such extensive system development efforts: buyers simply specify their requirements, which market makers forward to the appropriate parties, whose bids are sent back to the buyer, and so forth.

It should be apparent from the analysis above that B2B market makers face very different barriers to adoption whether they emphasize liquidity/auctions or transaction processing cost savings/catalogs. In each case, however, the barriers to adoptions are potentially quite strong. This explains why B2B market makers generally have had less success in exploiting network effects, compared to their B2C counterparts.

The customers of B2B online market makers are managers within medium-sized and large companies who are buying and selling items critical to their businesses and, on a personal level, their careers. B2B customer adoption can move only as fast as the required build-out of the supporting technologies. Systems integration costs for a small company to source items on the Internet is in the range of \$10,000; As mentioned above, large EDI installations can cost \$1 million per vendor; typical licenses from Ariba and Commerce One run \$3-\$4 million plus the costs associated with retooling business processes. This leads to fundamentally different adoption patterns than we see with consumer-focused market maker rollouts like eBay's or Napster's, where users are already equipped with PCs, Internet access, and web browsers, and require little else to initiate transactions.<sup>47</sup>

In addition, companies need to re-tool their purchasing practices in order to source through Internet market makers; this takes time. While Internet-based procurement promises enormous benefits, it poses risks as well: people lose jobs over botched purchasing schemes (remember: "No one ever got fired for buying IBM"). Even highly committed companies are finding the going slow. Dell Computer, for example, had planned to register all 1,400 of its suppliers on Ariba's procurement network by April, 2000. Twelve months into its project in November 2000, Dell only had nine of its suppliers fully integrated into its system.<sup>48</sup> While the constraints related to the need for systems integration and behavioral change are formidable, they may eventually lead to favorable economics for market makers who are able to overcome them (i.e., barriers to adoption may become barriers to entry). In the meantime, these challenges make it difficult to execute a GBF strategy in the B2B arena.

**Scale economies.** As noted in the previous section, most online market makers exhibit significant scale economies. For a typical B2B market maker recognizing revenue on a net basis, most costs are either purely fixed (e.g., expenses related to site development, trade marketing, and management overhead), or vary with the number of new users signed up (e.g., direct selling expenses; system integration activities). Furthermore, selling costs per new user may be expected to decline over time if the market maker successfully harnesses network effects. With the exception of hosting expenses (and, in

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<sup>47</sup> Philip Lay, *Under The Buzz*, November, 2000, Published by The Chasm Group LLC.

<sup>48</sup> Alorie Gilbert, "E-Procurement: Problems Behind the Promise," InformationWeek.com, November 20, 2000, p. 56.

the case on market makers who recognize revenue on a gross basis, cost of goods and services sold), few costs incurred by online market makers vary directly with revenues or overall transaction volumes. Thus, in forecasting earnings for SciQuest, a market maker for specialty chemicals, US Bancorp projects that the company will spend a total of \$52.2 million on product development, sales and marketing, and general and administrative expenses in 2000, and \$65.4 million in 2001—a 25% increase. However, SciQuest’s revenues are projected to increase four-fold between 2000 and 2001, from \$66.4 million to \$275.0 million.<sup>49</sup>

**Customer retention.** If a site has a high retention rate, then GBF investments in customer acquisition are likely to have a higher payoff. If retention rates are low, then a website becomes a "leaky bucket:" customers are acquired at a high cost, but they leak away, and need to be replaced, incurring additional acquisition costs.

Assuming they can attract market participants in the first place, most successful online market makers should experience very high user retention rates. Network effects tend to lead to “lock-in”; traders cannot afford to abandon the dominant market maker. Online market makers benefit from other switching costs as well, in particular, users’ investments in: 1) creating transaction history records (easy accessibility to past orders may expedite the preparation of new orders); 2) training employees to use the market maker’s systems; 3) integrating their information systems (accounting; inventory management) with the online market maker’s systems; and 4) building reliability ratings.

On the last point, eBay’s rating system has proved to be a powerful retention tool. Parties to a transaction on eBay rate each other in terms of their performance against expectations (e.g., Were goods shipped on schedule? Was quality consistent with agreed levels? Was payment received on time?). In fragmented markets where transaction partners do not know each other, and where brand reputation cannot serve as a proxy for trustworthiness, such rating systems are especially valuable. Once a user accumulates a large number of positive ratings at an online marketplace, the user faces a switching barrier: she cannot transfer that strong ranking to a competing marketplace, and her lack of a reliability ranking at the new marketplace could reduce prospective partners’ willingness to do business.

## Summary

*As long as the markets reward breadth, exchanges will spend their energies adding new markets, rather than deepening penetration of existing ones. Now, with the stock market’s pullback, we will see investors reject more superficial expansion ... This creates a Darwinian moment during which those firms who can focus fast and hard will gain traction, while those who cling to prior successes will falter. For b-to-b companies, it is time for new metrics—niche market success metrics.*

— Geoffrey Moore, *The Chasm Group*, May 2000<sup>50</sup>

<sup>49</sup> CITE US BANCORP ANALYST REPORT

<sup>50</sup> Geoffrey Moore, “Approaching the Chasm,” *Industry Standard*, May 15, 2000, p. 88.

As noted above, online market makers exhibit characteristics that favor pursuit of a “Get It Right First” strategy. They have complex business models, which implies an opportunity to “learn by doing,” and their customers—especially in the B2B arena—often view reliable execution to be of paramount importance. At the same time, online market makers exhibit structural characteristics that improve the odds of a positive payoff from a “Get Big Fast” strategy: they face very strong network effects, very strong scale economies, and intrinsically high customer retention rates. But companies can only exploit these advantages if they overcome adoption barriers—which are quite strong in many B2B markets—that may discourage market participants from shifting offline trades to online markets. So, how can B2B online market makers rapidly build liquidity (i.e., “get big fast”) in the face of these barriers? More specifically, what tactics can they employ to attract customers, beyond direct selling and trade advertising?

One obvious tactic is to reduce the cost of marketplace participation, by waiving transaction or listing fees or by subsidizing costs associated with system integration. Of course, this is expensive, and it is often hard to raise prices later once introductory prices have been set very low.

A second tactic for building liquidity is to merge with a competitor. With relatively low entry barriers and strong first mover advantages, most B2B categories have become overcrowded with competitors; in the chemical industry, for example, over 25 online market makers have been launched.<sup>51</sup> Merging is one way to avoid the “train wrecks” that can result when several well funded startups simultaneously pursue the same opportunity. Consolidation among Internet market makers is becoming common; recent examples include<sup>52</sup>:

- On October 24, 2000, Cephren and Bidcom, two of the three largest market makers in the construction industry, merged to form Citadon.
- On October 26, 2000, MyAircraft.com and AirNewco announced that they would combine their businesses. MyAircraft.com was formed by United Technologies, Honeywell, BFGoodrich and i2 Technologies. AirNewco was formed by Air France, American Airlines, British Airways, Continental Airlines, Delta Air Lines, Iberia Airlines, SAirGroup, United Air Lines, United Parcel Service and Ariba.
- On October 30, 2000, Seafood Alliance.com and Gofish.com signed a letter of intent to combine their Internet markets.

A third way to rapidly build liquidity is for an online market makers to give a portion of its equity to key market participants in exchange for their commitment to shift transactions to the online market. As mentioned above, Priceline employed this strategy when it granted equity warrants to Delta and other airlines; Ventro did the same through its equity grant to laboratory products distributor VRW.

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<sup>51</sup> Spencer Ante, “Why B2B is a Scary Place to Be,” *Business Week*, September 11, 2000, p. 34.

<sup>52</sup> Audrey Manring, “Net Markets Gather B-To-B Momentum,” *InformationWeek.com*, November 20, 2000, p. 80.

The transaction volume from new equity partners can serve as a catalyst that can put network effects into motion. On the other hand, a key supplier or buyer's investment in a marketplace may raise suspicions among other industry participants about the market maker's objectivity: will the strategic partner have preferential access to information, or perhaps a "first crack" at certain transactions? Priceline made such concessions to secure Delta's support as its first major airline partner. At the extreme, the involvement of a major buyer or seller in an online marketplace may encourage its competitors to back another service. One way to avoid this problem is to give equity to several companies simultaneously. Of course, this approach can be highly dilutive.

Online market makers also can seek to build their user base by skewing their affiliation, without necessarily going as far as giving equity to industry participants. Adopting a strong sell-side affiliation can be an effective way to build liquidity: suppliers are always interested in selling more product. Internet market makers that adopt a sell-side affiliation need to mitigate the potential for channel conflict (e.g., between manufacturers and their bricks-and-mortar distributors) and must find ways to reduce the emphasis on sellers' prices. VerticalNet seeks to accomplish this by providing storefronts (i.e., display ads) where suppliers can explain their points of differentiation beyond price.

Buy-side affiliation also can be a viable model for building liquidity. Ariba, for instance, sells a software platform to a corporation to facilitate online procurement. In addition to selling the software and related services, Ariba takes an equity position, whenever it can, if the resulting online unit is established as a stand-alone company. As explained above, Ariba also offers customers the ability to link with online purchasing units that Ariba has built for other corporations; in this manner, Ariba builds liquidity and slowly evolves into a buy-side affiliated online market maker.

In some industries, major buyers and suppliers resist the idea of dealing with new intermediaries on principle. By 1999, like their counterparts in bricks-and-mortar retailing, many industrial companies had become reluctant to surrender the value created by the Internet to start-ups. As GE executive Jay Pomeroy succinctly put it, "Our policy is not to put anyone between us and our customer."<sup>53</sup> Skewing affiliation to build critical mass is unlikely to be a successful tactic for pure-play online market makers facing such opposition. This "avoid new middlemen" mentality is behind many of the industry consortia that emerged during 2000 to establish jointly-owned online market makers. Covisint and MyAircraft.com are examples of industry consortia for the automotive and commercial aircraft industries, respectively. As noted previously, such consortia are controversial from an antitrust perspective. It may also be difficult for the industry competitors to overcome years of rivalry and learn to work together in order to build an Internet market maker. Finally, industry suppliers may avoid participating in an online marketplace where the rules of engagement are set by buyers, and vice versa. While it is too soon to tell if these industry consortia will get off the ground, if they do, the aggregate purchasing power of their combined owners will ensure that these market makers will enjoy instant liquidity.

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<sup>53</sup> Julia Angwin, *The Wall Street Journal*, p.B1, 4/7/00.

## Exhibit I

### Selected Market Maker Income Statements: 1999

Year ended	Ventro 12/31/99	% net rev.	eBay 12/31/99	% net rev.
<b>Revenue</b>				
Gross (Notional) Revenue	\$ 30,840,000 <sup>1</sup>			<sup>2</sup>
Net Transaction Revenue	\$ 30,840,000 <sup>1</sup>		\$ 220,493,000	
Net Fee and other Revenue	\$ -		\$ 27,653,000 <sup>3</sup>	
<b>Total Net Revenue</b>	<b>\$ 30,840,000</b>		<b>\$ 248,146,000 <sup>4</sup></b>	
<b>Variable Costs</b>				
Cost of Goods and/or Services Sold	\$ 29,306,000	95%	\$ 55,639,000	25%
Other Variable Costs			\$ 1,949,000 <sup>5</sup>	
<b>sub-total, Variable Costs</b>	<b>\$ 29,306,000</b>		<b>\$ 57,588,000</b>	
<b>Gross Profit</b>	<b>\$ 1,534,000</b>	<b>5%</b>	<b>\$ 190,558,000</b>	<b>77%</b>
<b>Fixed Costs</b>				
Sales & Marketing	\$ 23,940,000	78%	\$ 95,956,000	39%
General & Administrative	\$ 10,691,000	35%	\$ 47,414,000	19%
Research & Development	\$ 18,471,000	60%	\$ 23,785,000	10%
Depreciation & Amortization	\$ 1,992,000	6%	\$ 1,145,000	0%
Other	\$ -	0%	\$ -	0%
<b>sub-total, Fixed Costs</b>	<b>\$ 55,094,000</b>	<b>179%</b>	<b>\$ 168,300,000</b>	<b>68%</b>
<b>Total Costs, excluding financing</b>	<b>\$ 84,400,000</b>		<b>\$ 223,939,000</b>	
<b>EBIT</b>	<b>\$ (53,560,000)</b>	<b>-174%</b>	<b>\$ 24,207,000</b>	<b>10%</b>

<sup>1</sup> Ventro, Vertical Net, Priceline & Grainger take ownership of products sold, thus notional and net revenue are equivalent.

<sup>2</sup> eBay did not disclose the notional value of transactions it facilitates.

<sup>3</sup> Income from real Estate rentals (\$4.2 mil.) plus Net Interest Income (\$23.4 mil.). These income streams are a result of the Butterfield & Butterfield acquisition.

<sup>4</sup> Revenue is recognized when a bidder bids over the seller's minimum price.

<sup>5</sup> Variable costs Assigned to real estate rentals.

year ended	Vertical Net 12/31/99	% net rev.	Priceline 12/31/99	% net rev.
<b>Revenue</b>				
Gross (Notional) Revenue	\$ 16,500,781 <sup>1</sup>		\$ 482,410,000 <sup>1</sup>	
Net Transaction Revenue	\$ 16,500,781 <sup>1</sup>		\$ 482,410,000 <sup>1</sup>	
Net Fee and other Revenue	\$ 18,428,485 <sup>6</sup>			
<b>Total Net Revenue</b>	<b>\$ 34,929,266</b>		<b>\$ 482,410,000</b>	
<b>Variable Costs</b>				
Cost of Goods and/or Services Sold	\$ 14,171,345	41%	\$ 423,056,000	
Other Variable Costs			\$ 1,523,000 <sup>9</sup>	
<b>sub-total, Variable Costs</b>	<b>\$ 14,171,345</b>		<b>\$ 424,579,000</b>	
<b>Gross Profit</b>	<b>\$ 20,757,921 <sup>7</sup></b>	<b>59%</b>	<b>\$ 57,831,000</b>	<b>12%</b>
<b>Fixed Costs</b>				
Sales & Marketing	\$ 26,268,370	75%	\$ 79,577,000	16%
General & Administrative	\$ 11,886,681	34%	\$ 27,609,000	6%
Research & Development	\$ 20,996,316	60%	\$ 14,023,000	3%
Depreciation & Amortization	\$ 7,819,351	22%	\$ -	0%
Other	\$ 8,611,317 <sup>8</sup>	25%	\$ 998,832,000 <sup>9</sup>	207%
<b>sub-total, Fixed Costs</b>	<b>\$ 75,582,035</b>	<b>216%</b>	<b>\$ 1,120,041,000</b>	<b>43%</b>
<b>Total Costs, excluding financing</b>	<b>\$ 89,753,380</b>		<b>\$ 1,543,097,000</b>	
<b>EBIT</b>	<b>\$ (54,824,114)</b>	<b>-157%</b>	<b>\$ (1,060,687,000)</b>	<b>-220%</b>

<sup>1</sup> Ventro, Vertical Net, Priceline & Grainger take ownership of products sold, thus notional and net revenue are equivalent.

<sup>6</sup> Advertising revenue.

<sup>7</sup> Vertical Net's Gross Margin is overstated because of its high ad revenue. Transaction revenue less COGS = \$2.3 mil., 14% of trans. rev.

<sup>8</sup> Editorial costs.

<sup>1</sup> Ventro, Vertical Net, Priceline & Grainger take ownership of products sold, thus notional and net revenue are equivalent.

<sup>9</sup> Costs associated with the amortization of warrants given to airlines in exchange for airlines posting excess tickets with Priceline.

year ended	W.W. Grainger 12/31/99	% net rev.	Sothebys 12/31/99	% net rev.
<b>Revenue</b>				
Gross (Notional) Revenue	\$ 4,533,853,000 <sup>1</sup>		\$ 2,300,000,000	
Net Transaction Revenue	\$ 4,533,853,000 <sup>1</sup>		\$ 390,101,000 <sup>10</sup>	
Net Fee and other Revenue	\$ -		\$ 52,484,000 <sup>11</sup>	
<b>Total Net Revenue</b>	<b>\$ 4,533,853,000</b>		<b>\$ 442,585,000</b>	
<b>Variable Costs</b>				
Cost of Goods and/or Services Sold	\$ 2,881,219,000	64%	\$ 85,563,000	19%
Other Variable Costs				
<b>sub-total, Variable Costs</b>	<b>\$ 2,881,219,000</b>		<b>\$ 85,563,000</b>	
<b>Gross Profit</b>	<b>\$ 1,652,634,000</b>	<b>36%</b>	<b>\$ 357,022,000</b>	<b>81%</b>
<b>Fixed Costs</b>				
Sales & Marketing	\$ 1,247,009,160 <sup>#</sup>	28%	\$ 159,686,000 <sup>15</sup>	36%
General & Administrative		0%	\$ 125,711,000 <sup>15</sup>	28%
Research & Development		0%		0%
Depreciation & Amortization	\$ 88,396,840	2%	\$ 17,452,000	4%
Other	\$ -	0%	\$ -	0%
<b>sub-total, Fixed Costs</b>	<b>\$ 1,335,406,000</b>	<b>29%</b>	<b>\$ 302,849,000</b>	<b>68%</b>
<b>Total Costs, excluding financing</b>	<b>\$ 4,216,625,000</b>		<b>\$ 388,412,000</b>	
<b>EBIT</b>	<b>\$ 317,228,000</b>	<b>7%</b>	<b>\$ 54,173,000</b>	<b>12%</b>

<sup>1</sup> Ventro, Vertical Net, Priceline & Grainger take ownership of products sold, thus notional and net revenue are equivalent.

<sup>14</sup> Sales and Marketing are combined with General & Administrative in Grainger's financial statements.

<sup>10</sup> Revenue is recognized the date of sale.

<sup>11</sup> Other revenues consist of revenue primarily from art-related financing (\$15 mil.) and real estate operations (\$30 mil.).

<sup>15</sup> Estimated split between Sales and Administrative.

year ended	NYSE 12/31/99	% net rev.
<b>Revenue</b>		
Gross (Notional) Revenue	\$ 8,900,000,000,000	
Net Transaction Revenue	\$ 138,361,000	
Net Fee and other Revenue	\$ 597,107,000 #	
<b>Total Net Revenue</b>	<b>\$ 735,468,000</b>	
<b>Variable Costs</b>		
Cost of Goods and/or Services Sold		
Other Variable Costs	\$ -	0%
<b>sub-total, Variable Costs</b>	<b>\$ -</b>	
<b>Gross Profit</b>	<b>\$ 735,468,000</b>	<b>100%</b>
<b>Fixed Costs</b>		
Sales & Marketing	\$ 223,446,000 #	30%
General & Administrative	\$ 84,080,000 #	11%
Research & Development	\$ -	0%
Depreciation & Amortization	\$ 38,991,000	5%
Other	\$ 263,982,000 #	36%
<b>sub-total, Fixed Costs</b>	<b>\$ 610,499,000</b>	<b>83%</b>
<b>Total Costs, excluding financing</b>	<b>\$ 610,499,000</b>	
<b>EBIT</b>	<b>\$ 124,969,000</b>	<b>17%</b>

<sup>12</sup> Consists of \$267 mil listing fees, \$125 mil data fees, \$98 mil regulatory fees, \$45 mil equipment fees, \$9 mil membership fees and \$53 mil investment income.

<sup>13</sup> Estimated split between Sales and Administrative.

<sup>15</sup> Consists of \$227 mil systems expense and \$37 mil. professional services costs.

## NYSE 1999 Income Statement

	<b>\$8,900,000,000,000</b>	<b>% of Net Revenue</b>
<b>Gross (Notional) Revenue</b>		
<b>Net Revenue</b>		
Transaction fees	\$ 138,361,000	19%
Listing fees	\$ 267,455,000	36%
Data fees	\$125,368,000	17%
Regulatory fees	\$ 98,499,000	13%
Equipment fees	\$ 44,889,000	6%
Membership fees	\$ 8,505,000	1%
Investment income	\$ 52,391,000	7%
<b>Total Net Revenue</b>	<b>\$735,468,000</b>	<b>100%</b>
<b>Costs</b>		
Systems Costs	\$227,000,000	31%
Sales & Marketing	\$223,446,000	30%
General and Administrative	\$84,080,000	11%
Depreciation and Amortization	\$38,991,000	5%
Professional & Services Costs	\$37,000,000	5%
<b>Total Costs</b>	<b>610,517,000</b>	<b>83%</b>
<b>EBIT</b>	<b>\$124,951,000</b>	<b>17%</b>

Source: NYSE Annual Report, 1999

## NYSE Trading Volume by Shares Traded

<b>Order Size by Shares Traded</b>	<b>% of Total Trades</b>	<b>Cumulative Total</b>	<b>% of Share Volume</b>	<b>Cumulative Total</b>
100 - 2,099	79.9%	79.9%	22.6%	22.6%
2,100 - 4,999	9.7%	89.6%	13.4%	36.0%
5,000 - 9,999	5.7%	95.3%	15.4%	51.4%
10,000 - 24,999	3.6%	98.9%	21.1%	72.5%
25,000 - 99,999	1.0%	99.9%	17.5%	90.0%
100,000 - 249,999	0.1%	100.0%	5.5%	95.5%
> 250,000	0.02%	100.0%	4.5%	100.0%

Source: NYSE, Nate Sleeper, *The New York Stock exchange: Taking Stock of a Changing Landscape*.

## Enterprise Software Cos. or Internet Market Makers?

<b>Company</b>	<b>Revenue 1998</b>	<b>Revenue 1999</b>	<b>Revenue 2000, est.</b>	<b>Earnings (loss) 2000, est.</b>	<b>Market Capitalization 11/22/00</b>	<b>Date of IPO</b>
<b>i2</b>	\$369 million	\$571 million	\$1.07 billion	\$88 million	\$23.2 billion	March-96
<b>Ariba</b>	\$8.4 million	\$45.4 million	\$250 million	\$26 million	\$17.4 billion	June-99
<b>C1</b>	\$2.6 million	\$33.5 million	\$323 million	(\$170 million)	\$7.5 billion	July-99

Sources: SEC filings; earnings estimates from Zacks Investment Research.