

**Business Models of
Business-to-Business Internet Commerce**

By

Kyu-Eun Jeong

THESIS

Submitted to

School of Public Policy and Management, KDI

in partial fulfillment of the requirements

for the degree of

MASTER OF BUSINESS ADMINISTRATION

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ABSTRACT

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This thesis analyzes the current B2B E-Commerce models and their evolution through case studies of three types of business models: aggregators, auctions and exchanges. These models are categorized by their transaction and pricing characteristics and suggest how B2B E-Commerce models can evolve by adding more functionality. The evolution process is necessary for the models to survive and to be profitable because their revenue models are not yet established. In fact, among the four companies studied in this paper, none has generated profits. As a way to become profitable, this paper suggests the gradual convergence between on-line and off-line companies and the need to focus on specific niche market with high functionality.

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I. Introduction

Background of B2B E-Commerce

Business-to-Business E-Commerce is defined as transactions between businesses involving purchasing and selling of goods and services over the Internet¹. B2B E-Commerce enables buyers to link up with customers, suppliers and other members of the value chain to electronically exchange information and procure products and services. This concept of B2B E-Commerce is not entirely new.

Before the emergence of B2B E-Commerce, the corporations have utilized electronic data interchange (EDI) software and value-added-networks (VANs), which offered closed, proprietary networks between buyers and suppliers². The utilization of EDI and VANs were restricted to only large corporations due to its expensive deployment and lack of flexibility³. However, the proliferation of the Internet provides the opportunity to apply the concept of EDI to the market, cost effectively and with flexibility through B2B E-Commerce.

The most conspicuous feature of B2B E-Commerce is high efficiency. B2B E-Commerce enables web-based transactions in real-time electronic marketplaces, reducing unnecessary processes. B2B market makers, or eMarketplaces, as we call them,

¹ Rakesh Sood, Jamie Friedman, Michael Parekh, Rick Sherlund, Lilly Bahramipour and Thomas Berquist, *B2B: 2B or Not 2B?*, Goldman Sachs Investment Research, September 14, 1999.

² Todd Weller, *BtoB eCommerce-The Rise of eMarketplaces*, Legg Mason Equity Research, Spring 2000.

help the participants to save costs, improve productivity, increase customer service, and reengineer workflow processes⁴. The benefits that B2B market makers bring to the market vary from industry to industry⁵. The industry which enjoys the most benefit is characterized by highly fragmented market, complex and expensive procurement processes, and lack of price information. Table 1 shows cost savings from B2B by industry reported by Goldman Sachs.

Table 1. Estimated Potential Cost Savings from Adopting B2B Solutions

Industry	Cost Savings
Aerospace Machinings	11%
Chemicals	10%
Coal	2%
Communications/Bandwidth	5%-15%
Computing	11%-20%
Electronic Components	29%-39%
Food Ingredients	3%-5%
Forest Products	15%-25%
Freight Transport	15%-20%
Healthcare	5%
Life Science	12%-19%
Machinings (Metals)	22%
Media & Advertising	10%-15%
MRO	10%
Oil & Gas	5%-15%
Paper	10%
Steel	11%

Source : *B2B: 2B or Not 2B?*

Goldman Sachs Investment Research

In addition, B2B E-Commerce has huge growth potential. According to Forrester Research, B2B market (for goods) in the U.S. is projected to grow to \$1.3 trillion in

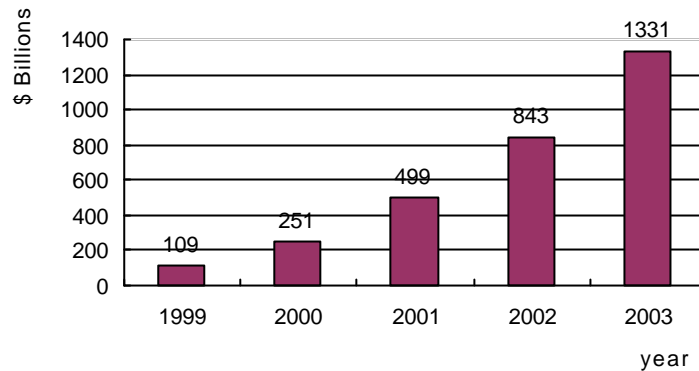
³ Merrill Lynch & Co., Global Securities Research & Economics Group, *The B2B Market Maker Book*, February 3, 2000.

⁴ Arthur Sculley and William Woods, *B2B Exchanges*, ISI Publications, 1999

⁵ Rakesh Sood, Jamie Friedman, Michael Parekh, Rick Sherlund, Lilly Bahramipour and Thomas Berquist, *B2B: 2B or Not 2B?*, Goldman Sachs Investment Research, September 14, 1999.

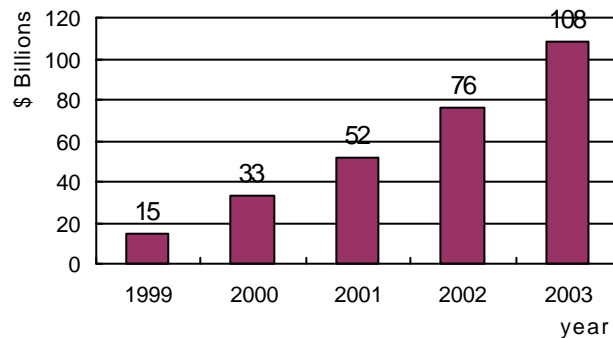
2003 from \$109 billion in 1999. This is a dramatic growth compared to the U.S. B2C market which is projected to be around \$108 billion in 2003 from \$8 billion in 1998.

Figure 1 : B2B E-Commerce in the U.S.



Source : Forrester Research

Figure 2 : B2C E-Commerce in the U.S.



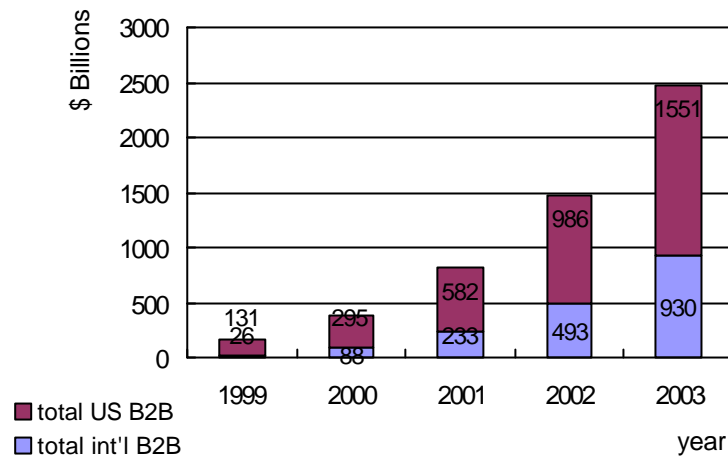
Source : Forrester Research

Still, B2B markets are concentrated within the U.S. However, considering the high efficiencies and growth potentials of B2B E-Commerce, more international players are likely to adopt B2B E-Commerce ⁶. Industries like steel, automotive, telecommunications and electronics have already formed a global market. Consequently in 2003, according to Forrester Research, 37.5% of B2B E-Commerce revenue will be

⁶ Forrester Research

generated internationally.

Figure 3: Worldwide B2B Market Forecast



Source: Forrester Research

Structure of This Paper

This paper is focused on business models of B2B E-Commerce and tries to analyze the evolution of the various models. The evolution of models is worth examining because they bring different efficiencies to the market. In addition, the efficiencies they bring not only have an impact on the on-line business but also on the off-line business accelerating the convergence between them. The purpose of this thesis is to analyze the current B2B E-Commerce models through case studies and examine how these models evolve to the next level.

This paper consists of two major parts. The first part elaborates three business models and their evolution. Even though there are several ways to categorize business models, the three business models – aggregators, auctions, exchanges – are categorized by their transaction and pricing characteristics.

The second part, case studies of individual companies are conducted. Since currently more than 77% of B2B E-Commerce occurs within the U.S., case studies conducted in this paper are also focused on U.S. cases. These case studies include industry background, revenue model, competition and key success factors. For the empirical analysis, four case studies were conducted – Chemdex, Ariba, Freemarkets, and AltraEnergy. All four of them are in their initial stages and are trying to further develop their business models. The direction and future evolution for these models in order to be profitable are suggested in the conclusion.

II. Business Models of B2B

There are several ways to categorize B2B business models: by their industry focus (vertical and horizontal), by their functions (auctions and exchanges), by their biases to the users (buyer-centric, supplier-centric and neutral), by their revenue models (transaction-based, license-based, advertising-based and contents-based), by their relationships with the existing companies (Internet-pure play and consortium of existing industry players) and so on⁷.

Recently, convergence of these models is occurring⁸. B2B market makers are trying to enlarge their revenue sources by adopting other business models and multiplying industries they are involving. Convergence of business models is happening in two dimensions; one is purchasing and selling methods and the other is the number of industry. Convergence can occur in either dimension or both dimensions. If it happens in both dimensions, convergence of the models moves toward a trading hub that could offer various purchasing and selling models with diversified industries.

However, by combining purchasing and selling models and different pricing methodologies, three different forms of basic B2B business models can be extracted. These are aggregator, auction, and exchange.

⁷ Steven Kaplan and Mohanbir Sawhney, "E-Hubs: The New B2B Marketplaces", *Harvard Business Review*, May-June 2000

I. Aggregator

Aggregator is the simplest evolution from off-line purchasing method and the most common B2B business model. It aggregates demands from buyers and supplies from sellers and provides multiple product catalogs with a one-stop shop, so that buyers can find out what they want easily and quickly⁹. In the industries with high search costs and where both purchasing and selling processes are highly fragmented, aggregator can effectively offer product comparison and rapid identification of products through relevant search tools within their sites¹⁰.

Since aggregator generally guarantees purchasing of the listed products at the list price, price is pre-determined and static. Sometimes, price may not reflect true market conditions. Because of the static pricing characteristics, aggregator cannot be efficient for the industry with price volatility¹¹. However, there is also the opportunity that specific buyers and sellers can negotiate individual price by themselves.

Aggregator enables buyers to lower search costs by offering catalogs with one-stop shop and lower transaction costs by eliminating unnecessary process based on paper and broaden supply base so that they can strategically purchase the products. On the other hands, aggregator enables sellers to reach customers, broaden customer access at

⁸ Sarah Skinner, *Business to Business e-Commerce-Investment Perspective*, Durlacher Research Ltd.,2000.

⁹ Scott Ehrens and Peter Zapf, *The Internet Business-to-Business Report*, Bear Stearns Equity Research, Sep. 1999.

¹⁰ A.T. Kearney Research Team, *Building the B2B Foundation-Positioning Net Market Makers for Success*, 1999

lower cost than traditional channels by their web presence and lower transaction costs by reducing marketing and distribution costs¹². In addition, they can keep contacting with customers on the web and improve customer satisfactions. Considering all the characteristics that aggregator has, this form of business model is best fit to the industry, which has low price volatility and constant demands such as chemical reagent, semiconductors, and electronic components¹³. One of the differentiating factors of aggregator is simplicity and speed¹⁴. So, if the quantity of the products is not big enough so that the benefits of auction are negligible and if it is a time critical purchasing, aggregator has a lot more advantage over other business models

Aggregator' revenue model is usually dependent on the volume of transaction. Therefore, keeping critical mass of buyers and suppliers is one of the most important key success factors. Some of the aggregators have additional revenues from products listing fees and advertising. But, nowadays, more and more aggregators don't charge for the product listings because of severe competition.

This model can be re-categorized by the industries they cover-vertically focused aggregator and horizontally focused aggregator or by the bias to the users – buyer-

¹¹ Eric Upin, *The B2Bs Are Coming*, Robertson Stephens, February 2000.

¹² Merrill Lynch & Co., *The B2B Market Maker Book*, Global Securities Research & Economics Group, 3 Feb. 2000.

¹³ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

¹⁴ A.T. Kearney Research Team, *Building the B2B Foundation-Positioning Net Market Makers for Success*, 1999

centric aggregator, seller-centric aggregator and third-party aggregator¹⁵.

Third-party aggregator is usually emerging as a new entity looking to bring buyers and suppliers together. Third-party aggregator starts from specific industry for which it has strong knowledge and experience of the business processes. For the aggregator, keeping neutrality is important to attract both buyers and sellers¹⁶. Sometimes, it forms strategic alliances with leading players in a given industry. However, it has to keep an eye on the change the alliance could bring. Because it might hurt the neutrality it already formed. The best example of this category is Chemdex.

II. Auction

Auction has been widely and successfully applied in B2B E-Commerce from traditional market places. Since auction is already very popular in some of traditional markets, which deal with unique products, the way how auction is applied to on-line market is critical in determining the success of this business model.

According to Purchasing's recent Internet survey, only 9% of buyers use or plan to use auctions on the Internet. However, Forrester Research predicts that the value of the business auction market will grow to \$52.6 by billion by 2002 from \$ 8.7 billion at 1998.

¹⁵ Steven Kaplan and Mohanbir Sawhney, "E-Hubs: The New B2B Marketplaces", *Harvard Business Review*, May-June 2000

Unlike aggregator, auction provides dynamic and real-time price through bids submitted on unique and individual items over certain period of time¹⁷. Auction model usually favors the initiator of the request in terms of the price. Because of the competitive bidding, price moves toward one direction either moves-up or moves-down.

Auction provides benefits not only to the sellers but also to the buyers. In addition to the benefits from aggregator such as cost reduction and broad supplier and customer access, it provides better matches and price through real-time transactions. It reflects the market price of the products better than aggregator.

Auction model works best for the products and services that are unique and whose value is difficult to determine such as used capital equipment, perishable capacity and hard-to-specify products¹⁸. One of the differentiating factors of auction is dynamic pricing. So, it can flourish only where price volatility offers either buyers or sellers an advantage.

The process of auction is not as simple as that of aggregator. The process is

¹⁶ Sarah Skinner, *Business to Business e-Commerce-Investment Perspective*, Durlacher Research Ltd.,2000.

¹⁷ A.T. Kearney Research Team, *Building the B2B Foundation-Positioning Net Market Makers for Success*, 1999

¹⁸ Broadview Int' l LLC, *E-Business Software & Services Perspective-The Emergence Of B2B Digital Marketplaces*, Dec.1999.

complex and takes time. So, it is not fit for the time-critical purchasing¹⁹. Another weakness of auction is that price is typically the only buying criteria incorporated. Usually, the highest bidders win the auction. If other criteria such as quality vary among suppliers quite a lot, auction may not give appropriate information to the bidders. Because not every buyer and seller has enough time and patience to go through the bidding process, this business model cannot be applied in all the industries²⁰.

To use auction market, buyers and sellers have to be members of the auction site. Membership process gives the information such as who participate into the market, what are their backgrounds and shows their credit checking. The membership fees are one of the revenue sources of auction model. However, most of the revenue source is sales commission fees based on transaction volume.

This model can be re-categorized by the degree of bias to the buyers and sellers – buyer-centric auction and seller-centric auction²¹. Seller-centric auction is regular and common auction both in traditional and on-line market. It gives more benefits to sellers by driving price up and usually information is not widely available. This model is popular in commodity for oil, natural gas, and electricity. Independent auctions are for surplus manufacturing goods and private auctions are geared toward dealers and

¹⁹ A.T. Kearney Research Team, *Building the B2B Foundation-Positioning Net Market Makers for Success*, 1999

²⁰ Elizabeth Baatz, “Online Auctions Start to Pick up Stream”, *Purchasing*, 21 Oct.1999.

resellers.

Buyer-centric auction is much less common in Internet market places. It gives more benefits to buyers by driving down the price²². However, quality of the products is not guaranteed. Sometime, products are misrepresented on the web and that results in fulfillment problems. To solve this problem, even though the seller is not the highest bidder, buyer can choose to buy the products from that seller²³. The best example of this category is FreeMarkets.

Buyers must understand the rules of the auction from site to site. For example, TradeOut requires that the highest bidder win while, at FreeMarkets, the buyer is not required to buy from the highest bidder. Factors like transportation costs, delivery date and product quality can be considered to decide seller at FreeMarkets.

III. Exchange

Exchange provides the market where buyers and sellers bid and ask for the same products and services in real time²⁴. It is like a two-way auction platform, which enables temporal matching of supply and demand. This model is fit for the commodities or easily defined products with high volatile price. And it is appropriate for the repetitive

²¹ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

²² Rakesh Sood, Jamie Friedman, Michael Parekh, Rick Sherlund, Lilly Bahramipour and Thomas Berquist, *B2B: 2B or Not 2B?*, Goldman Sachs Investment Research, 14 Sep. 1999.

²³ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

purchases, translating to significant timesavings through online transactions²⁵. Since exchange model deals with the well-known and easily defined products, there is less risk involved in understanding product and this product requires minimal interaction between the buyer and the seller. In addition, exchange model has best combination of true market price and immediate purchase of goods.

This model provides more flexibility than auction model and allows both buyers and sellers to make bids and offers for some underlying commodity. Offers can be made at any time and can often be withdrawn or revised. Unlike auction, price moves in both directions. Online exchange works to replace or extend existing offline brokers by offering faster transactions with a lower cost. In addition, because exchange model deals with commodity-like products with high liquidity, immediate purchase of goods is possible²⁶.

Since exchange provides great liquidity and neutrality in the market, it gives the same benefits to buyers and sellers²⁷. Both of them are benefited from electronic hedging, anonymity and cost and time reduction. And exchange model enables to execute transactions automatically based on preset preferences and create financial instruments

²⁴ Sarah Skinner, *Business to Business e-Commerce-Investment Perspective*, Durlacher Research Ltd.,2000

²⁵ A.T. Kearney Research Team, *Building the B2B Foundation-Positioning Net Market Makers for Success*, 1999

²⁶ Broadview Int'l LLC, *E-Business Software & Services Perspective-The Emergence Of B2B Digital Marketplaces*, Dec.1999.

²⁷ Arthur Sculley and William Woods, *B2B Exchanges*, ISI Publications, 1999

which inflate trading volume. The buyers benefit from better matches and better prices. They have real time access to market opportunities and greater negotiation power. Sellers benefit from greater access to buyers as well as the ability to liquidate excess supply and manage volatility.

This model's revenue sources are mainly from transaction fees and a little bit of membership fees. However, transaction fees in exchange are relatively low compared to the other model requiring frequent trading of the products²⁸. And most exchanges offer no integration in the back-end systems of the buyers and sellers in their market place. The other problem is that some of buyers value their supplier relationship so highly that they would not like to transact in the online market. Also, there is a case those customers who learn from a supplier through an exchange but go directly to the suppliers' web site for all future transaction. To overcome less transaction fees and to induce more transactions, players in this model had better offer revenue-generating value added services including settlement, credit services, and back-end system integration as additional revenue streams.

Lastly, exchange model will only emerge in a few select industries due to the specific combination of characteristics required for its success²⁹. It is not applicable to industries with stable prices and not all industry market makers can achieve liquidity.

²⁸ Merrill Lynch & Co., Global Securities Research & Economics Group, *The B2B Market Maker Book*, 3 Feb.2000.

²⁹ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

Altra Exchange and PapaerExchange are good examples of this model.

The three business models described above are just the starting points. They are quite traditional compared to the recent modifications of business models. These early models are concentrated more on minimizing the purchase price and consequently easy to be buyer-oriented. However, without a critical mass of participants, they cannot have enough liquidity. And liquidity requires participation from both buyers and sellers.

IV. Evolutions of the Models

Many B2B market makers plan to develop their current models to more advanced models that will better meet participants' needs. B2B market makers will increasingly use multiple trading mechanisms to address the needs of their communities and this selection will depend on the industry and the type of buying. Nowadays, many types of hybrid models are occurring.

The process of evolution of B2B business models has three different stages³⁰. The first stage is characterized by a small number of buyers and sellers. Market participants can get advantage of automating their transactions. However, they cannot find enough product information or new trading partners because the market has little breadth and depth. To move to the next stage, exchange like Altra Energy have hired traditional brokers to bring buyers and sellers into the market.

³⁰ Rakshya Bhadra, Gabriel Claret and Ingrid Yang, *Business Exchanges*, KPMG Consulting, 2000

In the second stage, enough players are involved to make the market the first destination for buyers and sellers. Market participants can get a reasonable amount of information discovery including price, product, inventory and value resulting reduced search costs and product costs. In this stage, market makers can make additional revenues such as advertising and membership fees. According to the liquidity that the market makers have, they can move into the next stage, exclusive marketplaces³¹. Aggregators are usually difficult to reach this stage because they don't have exclusive access to suppliers.

In the last stage, market makers can be the exclusive destination for both buyers and sellers, so no one needs to go to another marketplace³². Compared to the previous stage, eliminating searches of other markets provides a greater benefit than automating more transactions. In addition, they will increasingly link up with value added services offering procurement management, financial settlement and quality assurances. They will become full service marketplaces. Business model in this stage can be represented by exchanges or auctions or mixtures of the both that add important collaborations including the full range of business processes and interactions between trading models. This three-stage evolution is developed to the degree of liquidity and additional services of each stage.

³¹ Sarah Skinner, *Business to Business e-Commerce-Investment Perspective*, Durlacher Research Ltd.,2000

In addition, convergence of the models happens within these three business models. The aggregator model with relatively static pricing will tend to include some degree of auction or exchange functionality³³. In addition, this model will increasingly look to offer value-added services to diversify revenue sources. Auction and exchange models may look to replicate each other's functionality to address the widest possible trading base. And auction and exchange models will generate dynamic content that will be made available to trading members.

The most distinguishable feature that can be found out nowadays is the mixture of online and offline businesses³⁴. In some cases, market makers have acquired off-line exchanges with an attempt to bring a significant base of B2B transactions and liquidity to their marketplaces. This is considered as a positive strategy because acquisition of off-line business will consolidate its position in the market.

However, in many cases, off-line industry leaders create their own exchanges. At first, they would create their own proprietary on-line procurement exchanges. But, later, large industrial players in all major industries have announced intentions to form B2B exchanges, more often than not, by collaborating with their competitors. They build on cooperative rather than strictly price-driven relationships. Consortium of auto

³² Kevin Jones and Peter Teige, "Analysts Describe Conditions, Evolution of Net Market Models", *Net Market Makers-Newsletter*, Sep. 1999.

³³ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

³⁴ Ranjay Gulati and Jason Garino, "Get the Right Mix of Bricks & Clicks", *Harvard Business Review*, May-June 2000.

industry by GM, Ford, Chrysler and Renault/Nissan is a good example³⁵. This consortium of auto industry, which is called Covisint, is a buyer-centric collaboration. Their suppliers consist of hundreds of thousands of suppliers across multiple vertical chains. It will target the inefficiencies of its fragmented supplier communities across multiple vertical supply chains. Most of the industry consortiums have been made by groups of buyers because they bring the most value to the B2B table and can therefore command a more important role by driving transaction volume. But, the importance of including suppliers as vital partners should not be underestimated. Buyer-centric exchanges may cause some hesitation on the part of some suppliers to join the exchanges. Suppliers' major concerns are being disintermediated and brand erosion³⁶. In this case, the exchange must demonstrate other value propositions to the suppliers like greater number of new buyers and supply chain process efficiencies. These are the consortiums of industry-led exchanges, which were established recently or are in the establishment processes.

Table 2: Industry-led Exchanges

Industry	Exchange Name	Participants
Aerospace & Defense	No name yet	Boeing, Lockheed Martin, Raytheon, BAE Systems
Automobiles	Covisint	GM, Ford, DaimlerChrysler, Renault / Nissan
Electronics/ Computers/ Telecommunications	E2open.com	IBM, Hitachi, Matsushita, LG Electronics, Nortel Networks, Solectron, Toshiba

³⁵ Patrick Walravens and Se Chung, *Guide to Industry Consortia: Version 1.0*, Lehman Brothers, 2000

³⁶ Lynn Trepp, *Valuing The New Industrial Model: B2B Internet Exchanges*, Electronic Market Center, Inc., 4 Aug. 2000.

Energy	Pantellos	21 companies including: Carolinn Power & Light, DTE Energy, El Paso Energy, GPU, and Ontario Power, Cinergy, Consolidated Edison International, Inc., Edison International, Entergy, PG&E, and Unicom
Food, Beverage, and Consumer Products	Transora	50companies including Coke, Gillette, J&J, Nabisco, Nestle, Novartis, P&G, Pepsi, Unilever
Metals	MetalSpectrum	Alcoa, Allegheny Technologies, Kaiser Aluminum, North American Stainless, Olin, Raynolds AluminumSupply, Thyssen and Vincent Metal Goods/ Atlas Ideal Metals
Oil	Petrocosm	Chevron, Texaco
Real Estate	Landlord Procurement Exchange	13 companies, including Boston Properties, Brookfield Properties corp. Oxford Properties Group
Retail	GlobalNetXchange	Sears, Carrefour, Metro AG, Sainsbury PLC, Kroger
Tire and Rubber	Rubbertnetwork.com	Goodyear Tire & Rubber, Continental AG, CooperTire & Rubber, Group Michelin,Pireli SpA, and sumitomo Rubber Industries, Bridgestone.

Source: "Examples of Consortium Abroad", *Electronic Newspaper*, 13 May 2000.

None of the announced industry-led exchanges are up and running at full capacity and functionality yet. And all of them will face challenging systems development, integration, and governance issues before they become fully operational.

However, if this kind of model gets popular in each of the industry, it will definitely threaten the pure online market makers. Because they have big buying powers and already established relationships with suppliers, they can easily make suppliers be involved in the online transactions, thus, making it difficult for independent market makers to gain critical mass. In addition, the old economy participants that are stepping up to make consortium are armed with cash while many Internet pure play exchanges have already spent so much of their funding that some may find it impossible to fund

ongoing operations. Cash-rich brick and mortar companies moved more swiftly into B2B Internet commerce compared to their movement into B2C Internet commerce³⁷. This being the case, only a handful of mega-industry online marketplaces will emerge and the majority of online marketplace activity will take place in fragmented industry segments with low buyer concentration or in niche industries³⁸.

For example, As of July, AviationX changed its strategy after leading players in airline industry formed their own exchange making it difficult for the fledgling net market maker to attract liquidity³⁹. In March, Boeing, Lockheed Martin, BAE Systems PLC of Britain, Raytheon and Commerce One announced plans for an online aerospace exchange. In addition, in April, six major airlines said that they would build their own B2B exchanges. AviationX will focus on developing Web-based software application for the aviation industry including procurement and workflow applications. The company laid off four full-time employees, slashed its marketing and advertising budget, and sold some assets to cut its overhead. Nonetheless, AviationX is now ceasing its operations⁴⁰.

On the other hand, there is a case that on-line and off-line players make peace benefiting to each other. For example, in the energy industry, HoustonStreet.com and

³⁷ Ranjay Gulati and Jason Garino, "Get the Right Mix of Bricks & Clicks", *Harvard Business Review*, May-June 2000

³⁸ "A Market for Monopoly?", *The Economist*, 17 June, 2000.

³⁹ Lynn Trepp, *Valuing the New Industrial Model: B2B Internet Exchanges*, Electronic Market Center Inc., 4 Aug., 2000.

⁴⁰ Kevin Jones, "Net Markets Make Peace with B&M Rivals", *Net Market Makers Newsletter*, 17 July 2000

Enron made an agreement. Under this agreement, North American electricity and natural gas prices posted on EnronOnline will automatically be posted on HoustonStreet.com⁴¹. Traders will be able to act on the EnronOnline prices via either platform. Both sites benefit. Enron reaches more buyers, while HoustonStreet gets in bed with the energy trading industry's brick-and-mortar leader.

Environments for the Internet pure players are getting worse. It being the case, consolidation of online and offline players through merger & acquisition and industry-led exchanges will be getting popular⁴². Only few players linked with large buyers will survive. Online pure business that improves efficiency and adds value to the existing business has its limitation. The market size can be bigger as the affiliated off-line business gets greater. However, the market positioning itself is very narrow suggesting that a few big and well-structured players are enough for this market. For this reason, first mover advantage is very critical in these players. Consequently, this market situation will cause oligopolistic structure in this business⁴³. Still, few on-line pure players could find room to survive in the niche market⁴⁴.

⁴¹ Kevin Jones, "Net Markets Make Peace with B&M Rivals", *Net Market Makers Newsletter*, 17 July 2000

⁴² Jon Ekoniak and Tim Klein, *B2K-Musings On M&A*, Usbankcorp, 30 June 2000.

⁴³ "A Market for Monopoly?", *The Economist*, 17 June, 2000.

IV. Case Studies

I. Chemdex

Company Overview

Chemdex Corporation is a builder and operator of business-to-business e-commerce marketplace for life science industry. It aggregates enterprises, researchers, and suppliers together to buy and sell products over Internet in the Chemdex marketplace. Founded in 1997 by David Perry, president and CEO, and Jeff Leane, it provides procurement solutions and by leveraging the Internet and e-commerce technology, delivers integrated supply chain solutions to the fragmented life science market⁴⁵. Including 95 enterprise customers, now, it has over 24,000 registered users and provides 1.3 million products from more than 2200 suppliers⁴⁶. Chemdex had 354 employees as of February 2000.

In July 1999, Chemdex successfully completed initial public offering at \$15 per share and raised \$112.5 million. Its main investors are Kleiner Perkins Caufield & Byers, Warburg, Pincus Ventures, The Bay City Capital, [CMG@Ventures](#). These institutional investors' portions are about 50% of all investment and individual investors including executive officer and director of Chemdex and other life science

⁴⁴ Richard Karpinski and Sean Callahan, "Industry titans vs. Independents", *B to B; Chicago*; 19 June 2000

⁴⁵ www.chemdex.com

⁴⁶ Annual Report of Ventro corp.

industry CEOs portions are the rest 50%. In march, 1999, VWR Scientific product corporation made a 10% investment as a partnership with Chemdex.

Chemdex formed Ventro Corporation in Feb. 2000 to broaden its marketplace by diversifying into the other industries. Ventro Corporation consists of five companies including Chemdex, a life science company, Promedix, a specialty medical company, Broadlane, a healthcare supply company, Industria, a fluid processing company, and Amphire, a food service company, which is newly incorporated into Ventro Corporation⁴⁷. By leveraging the assets and experience that it gained from Chemdex, Ventro expanded the scope of marketplace to the related industries. In addition, Chemdex Europe launched in April 2000 by using its experience in the U.S. Most recently, Ventro with alliance with American Express Co., launched MarketMile, an exchange for office suppliers and services whose market is worth \$1.4 trillion every year.

Industry Background

Life science industry has \$15 billion market size within U.S. and \$36 billion market size worldwide⁴⁸. It's not that big market. However, it is very much fragmented and need to be streamlined effectively. In life science industry, there are more than 5,000 suppliers offering over one million products. Its main products include reagents,

⁴⁷ www.ventro.com

chemical compounds, specialty chemicals, consumables, research instruments and other equipment⁴⁹.

Traditionally, purchasing in the life science industry was conducted by phone, fax, direct personnel or other paper based catalogs. These purchasing methods entail manual preparation, approval, order tracking, billing, and reporting across multiple departments. It's costly and at the same time, time consuming process. In addition, because of the product complexity, customers have to have specific and unique knowledge regarding product selection.

Since there are a lot of customers and suppliers in this industry, it's very difficult to find right one and usually they are not accessible easily. Price and other information are not transparent⁵⁰. The primary purchasers and users of life sciences products are research scientists working in pharmaceutical and biotechnology companies, and academic and research institutions.

The growth in this industry is driven by increasing research and development expenditures by pharmaceutical and biotechnology companies. In addition, as new technologies developed, researchers experiment with thousands of chemical compounds at the same time, which results in more usage of reagents and other life science research products.

⁴⁸ Annual Report of Ventro corp.

⁴⁹ www.chemdex.com

However, life science industry is pretty much mature in the U.S. and it is not a big market. Therefore, Chemdex tries to expand into global market such as Europe and Japan and diversify into the related industries such as specialty medical, healthcare supply, fluid processing and food service. These industries give it \$ 145 billion, \$ 75 billion and \$ 150 billion additional potential market size respectively⁵¹.

Business Model

Chemdex business model is based on buying products from suppliers at a price individually negotiated and reselling products to customers. Chemdex marketplace consists of a database of approximately 1.5 million life science research stock keeping units (SKUs) and advanced search engine and transaction software that help users to identify, locate and purchase the products they need⁵². Chemdex marketplace aggregates customers and suppliers by providing industry specific knowledge and streamlining the process of purchase⁵³. To use Chemdex marketplace, customers have to register as a member.

Chemdex takes orders from customers and purchase the products at a price discount. After it arranges for the shipment of products, it establishes the total purchase

⁵⁰ Mary Meeker and Chuck Phillips, *B2B E-commerce: Shift Happens*, Morgan Stanley Dean Witter, Dec. 1999.

⁵¹ Annual Report of Ventro, First half of 2000.

⁵² Annual Report Ventro corp.

⁵³ "Business and The Internet", *The Economist*, 26 June 1999.

price of the products and shipping fees. Collecting of payment is followed and it ensures that the products reach the customers.

During the process, customers can customize the marketplace. Customers can choose preferred suppliers so that only their catalogs can be displayed and they can enforce their particular business rules and aggregate purchases. In addition, Chemdex marketplace offers paperless automation, consolidation and monitoring of the approval and invoicing process as well as the order placement and delivery information for the customers. It also enables for the customers to obtain volume discounts by aggregating purchases and it requires minimal software installation.

The key features of Chemdex marketplace are extensive marketplace of hundreds of thousands of products, streamlined creation of multi-supplier orders, advanced, easy-to-use product search engines, detailed product information at the click of a mouse, personal favorite lists for fast, easy re-ordering, and rapid, real-time review of order status. The estimated savings by using Chemdex marketplace range from 12% to 19% of total costs⁵⁴. Chemdex's main customers are pharmaceutical and biotechnology companies, academic research institutions such as Genetech, Dupont, Biogen, Johnson & Johnson, 3M, University of Rochester and so on.

For the suppliers, Chemdex offers a cost-effective opportunity to reach new customers by establishing or enhancing their Internet presence and providing links to

⁵⁴ Annual Report of Ventro corp.

existing online or electronic catalogs. Chemdex marketplace is less costly than traditional distribution or representation arrangements. It has the ability to process large volumes of complex catalog information and the ability provides maximum flexibility to suppliers in loading data and updating information. In addition to that, they can improve customer knowledge and scalability and security. Chemdex's main suppliers are manufacturers and distributors of life science products such as Biotech, Genome systems, ICN Biomedicals, Pierce chemicals, United States Biologicals and so on.

The characteristic of Chemdex marketplace is that it is a neutral and unbiased marketplace to purchase and sell life sciences research products. It is neutral in that its search capability identifies products that meet the researchers' search criteria, and provides an unbiased comparison of product characteristics and pricing to allow the researcher to make a reasoned choice based on the information provided by suppliers. Any bias that Chemdex marketplace favors one supplier over another could have a negative impact on the ability to maintain or increase supplier base resulting in also negative impact on customer base. It is also neutral in that there are a lot of buyers and sellers so that the price is not biased toward one of them.

In this business model, most of the revenues are from transaction based commission from customers. Not revenues consist primarily of product sales to customers and charges to customers for outbound freight. There is no membership fees and up front listing fees. Chemdex buyers pay 5-6% transaction fees and it comprised

96% of the revenue in 1999⁵⁵. Under some of the agreement, suppliers treat Chemdex as an agent of the supplier, in which case Chemdex receives a percentage fee on product sales. This revenue from agency-based supplier agreements comprised 4% of the revenue in 1999.

Since Chemdex makes revenue based on the transaction in its marketplace, attracting and maintaining critical mass of customers is important. To attract critical mass of customers, it has to have large variety of products and to have large variety of products, it has to attract and keep a lot of suppliers. So, once, the critical mass of customers or suppliers gathered, it forms the network effect.

Sales and Growth Strategy

Chemdex sells its marketplace and purchasing solutions by three ways: direct sales, internal telemarketing and strategic relationship with VWR & BIO. For large pharmaceutical and biotechnology companies, academic institution and research center, Chemdex uses direct sales method and for the small biotechnology companies and research group, it uses internal telemarketing method and for the specific distributors and organization, it uses strategic relationship method.

It also conducts a variety of marketing programs to educate target market and attract customers to Chemdex marketplace. These programs are one on one education

⁵⁵ Annual Report of Ventro corp.

and training, marketing activities such as seminars, direct mailings, trade show, speaking engagements and web site marketing. These marketing strategies are designed to maintain long-term relationships with customers and suppliers and help them to understand both business and technical benefits of the Chemdex marketplace.

With the strategic relationship with VWR, Chemdex can offer approximately 350,000 VWR-distributed products to the Chemdex customers and VWR customers can have access to the Chemdex marketplace. And with the strategic relationship with BIO (The Biotechnology Industry Organization), BIO members can use Chemdex marketplace.

By using acquisition and strategic alliances, Chemdex broadened its marketplace⁵⁶. Using strategic relationship as a sales method is one example of growth within one industry. However, Chemdex successfully leverages its existing assets and technology to diversify into other industries. By acquiring Promedex.com, it entered into the specialty medical industry and by joint venture with Tenet and with DuPont, it entered into healthcare supply market and fluid processing industry respectively. In addition, it formed Amphire resulting in the presence of the food service industry jointly venture with a food industry e-commerce provider, Entangible.com and recently, it formed exchange for office suppliers and services, MarketMile, with American Express Co. There are no customers yet in its new exchange. American Express, however, brings

50,000 suppliers to the table. The acquisition and alliances can combine other companies' industry experience and strong customer and supplier relationships with Chemdex' technology platform and e-commerce solution for vertical marketplaces. Partnering with industry leaders is a key component of Chemdex' s growth strategy and it helps to facilitate rapid critical mass of participants in the marketplace. In the long run, Ventro' s growth will be tied in part to its ability to penetrate new vertical markets.

However, from none of the six companies, it cannot realize profits. Without considering profitability, if Chemdex just comes into the new industry on and on to compensate the invested technological costs, this model cannot succeed in the end.

Competition

The market for e-commerce and Internet purchasing in life science industry is quite new and rapidly evolving. Even though Chemdex launched its on-line marketplace for the first time, it faces severe competition not only from on-line players but also from the existing traditional players.

Competitors can be categorized by four main areas: other companies with e-commerce offerings, traditional suppliers and distributors, life science companies that have developed their own purchasing solutions and enterprise software companies that

⁵⁶ Merrill Lynch & Co., Global Securities Research & Economics Group, *The B2B Market Maker Book*, 3 Feb.2000.

offer internet purchasing solutions⁵⁷. SciQuest.com and Anderson Unicom Group provide Internet purchasing solutions for the life sciences industry. Traditional suppliers and distributors such as Sigma Aldrich Corp., Fisher Scientific International and VWR sell their products through paper catalogs and web sites. If they enter into Internet marketplace, there will be further competition in the future. In addition, life science companies may already have their own purchasing solutions. Since they have longer history and more industry specific knowledge, if they succeed in launching on line marketplace, it will threaten the survival of on line pure players. Lastly, enterprise software companies such as SAP, IBM ,Oracle and Ariba could develop purchasing solution that customers could customize to link to their suppliers.

However, compared to SciQuest.com, which provides on-line pure marketplace, Chemdex has much more advantages. Even though SciQuest was founded earlier than Chemdex, Chemdex on line marketplace was facilitated and started to provide services earlier. Chemdex (24,000) has more number of customers than that of SciQuest (10,000)⁵⁸. Specially, in terms of product numbers, Chemdex (1.3 million) has much more varieties than SciQuest (550,000). Chemdex's competitive advantage is because of the network effect that Chemdex forms through its product depths.

Technology

One of the Chemdex marketplace's strength points is its technology. The

⁵⁷ Annual Report of Ventro corp.

Chemdex market place is a purchasing solution accessible by standard browsers which require minimal software installation at the customer site.

In process and communication layer, Chemdex integrates its system with its customers' client applications using internet technology protocols that can pass through an enterprise's network security wall to provide seamless operation of its marketplace and purchasing solution. And electronic services layer delivers all of Chemdex system's functionality. It delivers Internet catalog development and maintenance tools, search functionality and workflow integration, product pricing and estimated shipping, handling and freight charges. Lastly, in enterprise services layer, Chemdex delivers financial services, development and maintenance of the product master database, customer service systems and the data warehouse.

The other feature of Chemdex's technology is customer integration. The Chemdex marketplace can be configured and integrated to meet customer's needs. For example, the Chemdex purchasing solution integrates with commercial purchasing applications, such as Ariba or CommerceOne, as well as internally developed purchasing applications.

Key Success Factors and Challenges

Chemdex has been successful in gathering critical mass of enterprise customers

⁵⁸ www.sciquest.com, www.chemdex.com

in life science industry. Among the six areas that its holding company has, Chemdex produced most of the revenue. One of its success factors is market expertise. In B2B e-commerce, market or industry expertise is required to be successful in the business. Because it deals with work process of specific industry product purchasing and most part of supplier and customer relationship and specially, provides industry specific information to attract customers. Chemdex knew the characteristics of life science industry and its fragmented market. CEO of Chemdex, David Perry, has work experience in Biotechnology Company and other executives also have pharmaceutical and biotechnology or computer software industry experiences. This industry background is critical. However, maintaining professional personnel can be a challenge for Chemdex because it doesn't have long-term contract with them.

In addition, it has a superior technology both in system architecture and in customer integration. Even though 33.4% of its operating costs goes to the R&D part⁵⁹ to update and enhance software used for the Chemdex marketplace, it can deliver detailed services to customers and improve customer convenience. It can provide scalable, high-throughput electronic catalogs and search capabilities and domain-specific search engines as well as strong system integration.

Comprehensive services and supports are also the differentiating factors. Once, customers order from Chemdex marketplace, Chemdex is responsible for the whole

⁵⁹ Annual Report of Ventro corp.

process including payment and delivery. It often use third-party companies to deliver the products. In addition, Chemdex provides long term account care by account development teams and serves as an advocate to make ordering and fulfillment process as streamlined as possible.

Lastly, Chemdex has been using appropriate strategy to enlarge its customer base. It concentrated on product depth to attract customers. In fact, it provides the most variety of products in life science industry. It was an initiating point of the network effect by attracting more customers and suppliers. Also, life science industry is fit for the aggregator model because of its relatively static price and constant demands of the products⁶⁰.

However, it is not proven that how many of industry participants are to be involved in the e-commerce. According to purchasing survey, 12% of respondents are going to conduct transactions in chemical industry while 33% are going to use Internet to find data. Narrowing the gap is critical to increase industry involvement in e-commerce.

Moreover, diversifying strategy of Vetro Corporation from Chemdex focused on life science industry is risky considering net loss of \$ 90.2 million. It might give the company the opportunity to grow further and apply its technology, however, if it could not attract critical mass of customers in each industry, it can not be profitable. Therefore,

⁶⁰ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", Purchasing, 21 Oct.1999.

its strategy has to be focused on maintaining and attracting customers and enlarging revenue source from transaction fees. It made net loss of \$90.2 mil. for the first half result of 2000 and its market capitalization is \$193 million as of 20th of Oct.

Figure 4: Stock Price of Ventro

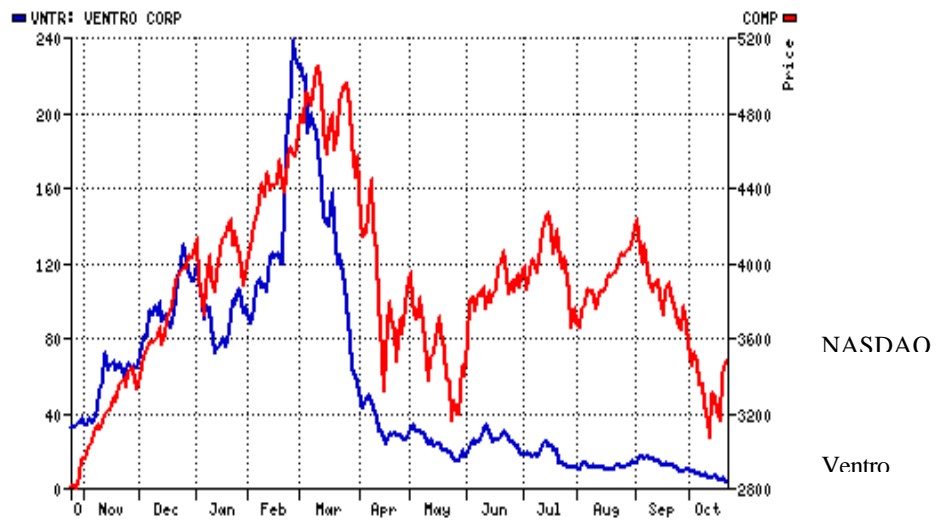


Table 3: Revenue and Loss Table of Ventro

\$ In thousands

	97	98	99	2000(1H)
Net Revenue	n/a	29	30,840	47,578
Net Loss	404	8,448	48,573	90,209

II. Ariba

Company Overview

Ariba started its business by providing e-procurement solutions for operating resources through Ariba ORMS (Operating Management Resource System). It was founded in Sep.1996 by Keith Krach, a former executive at General Motors and Rasna Corporation, and six other individuals. It was a first mover in operating management market⁶¹. By using Ariba ORMS application, a buy-side, intranet-based software solution, which automates a corporation's entire purchasing process from requisition to payment, buying organizations realized they could save costs by millions of dollars.

Since it provides purchasing solutions to many big companies, these buying powers induced suppliers quickly moved to provide goods and services. By leveraging its customer base in Ariba ORMS, it launched Ariba Network in March, 1999 which provides buyers and suppliers with services such as supplier directories, access to supplier contents, secure transaction routing and supplier catalog maintenance. In addition, it also provides auction, reverse auction, and exchange service through Ariba market suite.

In June 1999, Ariba successfully completed initial public offering at \$11.5 per share. Currently, 258 financial institutions invest in Ariba, whose shares amount to 31% of total shares. Among them, Benchmark Capital Management's share is 15.2% and

⁶¹ Annual Report of Ariba.

Crosspoint Venture Partners' share is 12.4%. And insiders' share reached 59% of total shares. It has \$ 31.2 billion market capitalization as of 20th of October 2000.

Its offices were spread out in 27 cities worldwide and it employed 425 workers and currently, has 78 big enterprise customers. Ariba started as a buy-side technology platform and tried to enlarge the scope of business to global mega-trading portals.

Industry Background

Ariba targeted Operating resource market to provide purchasing solutions. Operating resources are the goods and services required to operate a company, ranging from significant items, such as information technology, telecommunications equipment and professional services, to recurring items, such as MRO suppliers, travel and entertainment expenses, and office equipment⁶². According to Killen & Associates, operating resource expenditures are often the largest segment of corporate expenditures, approximately 33% of an average company's total revenues.

Traditionally, buying procedure of operating resource is paper-based, time consuming and complex. This procedure often includes the re-keying of information, lengthy approval cycles and significant involvement of financial and administrative personnel. In addition, cost per procurement transaction often exceeds the cost of the items being purchased. The amount of Maverick buying, which occurs when preferred

suppliers be not used, is high and this results in a 15% to 27% premium on the purchase⁶³.

Business Model

Ariba initially focused on streamlining the end-to-end procurement process for indirect materials. Later, it introduced Ariba Network, an Internet-based system that provides supplier contents and value-added services to enable commerce among trading partners⁶⁴.

Ariba ORMS connects large numbers of end-users, approvers and administrative personnel through web-based applications that automate procurement and finance processes. It basically gives benefits to the buyers by providing real-time electronic access to important procurement information, such as supplier product specifications, price lists, web sites and order status. It is user friendly, web-based interface and provides flexible workflow by customization, and connects to enterprise resource planning systems from vendors such as PeopelSoft, SAP and Oracle. In addition, it provides maintenance and support service such as software upgrade, technical support, and connectivity to Ariba Network.

⁶² Scott Alaniz, *E-Procurement-A Guide To Buy-Side Applications*, Stephens Inc. Internet Research Team, 27 Dec.1999.

⁶³ Scott Alaniz, *E-Procurement-A Guide To Buy-Side Applications*, Stephens Inc. Internet Research Team, 27 Dec.1999.

Major customers are large multinational market leaders in a broad range of industries and public sector organizations. Ariba targets companies with revenue of \$ 500 million or more and 20 out of Fortune 100 companies are Ariba customers⁶⁵. Benefits to customers are reduced processing costs and increased productivity. By streamlining and automating complex and unusual business processes including purchase requisitions and purchase orders, expense reports, service requests, buying organizations can focus on value-added activities and end-users order and receive requested items more quickly and with less effort. Moreover, Ariba solution enables buyers to reduce costs of operating resources by maximizing procurement economies of scale through favorable contracts with preferred suppliers.

On this solution side, Ariba charges license fee based on the customer's annual volume of items of purchasing transactions⁶⁶. The volume licensing of the server capacity allows customers to scale the total cost of their purchase of the Ariba ORMS system to their needs.

Ariba Network is an Internet-based corporate resource commerce network designed to provide access to large amounts of supplier product information and to enable electronic commerce transactions over the Internet. It aggregates customers and

⁶⁴ Scott Alaniz, *E-Procurement-A Guide To Buy-Side Applications*, Stephens Inc. Internet Research Team, 27 Dec.1999

⁶⁵ Annual Report of Ariba.

⁶⁶ Christopher Shilakes and Peter Goldmacher, *Ariba Incorporated-Foundation Technologies for Net Exchanges*, Merrill Lynch & Co., Global Securities Research & Economics Group, February 2000.

suppliers and offers electronic payment, catalog and content management, order transaction routing and multi-protocol support for numerous electronic commerce standards. If buyers send transactions from Ariba ORMS in one standard format, it can convert the order into the suppliers' preferred transaction format.

For suppliers, Ariba Network provides greater access to new and existing customers through a global presence and availability around the clock. It also enables suppliers to differentiate and market their goods and services in their preferred format through web-based catalog capabilities. In addition, by automating transactions and distributing electronic catalog, suppliers can reduce sales costs.

Suppliers of Ariba Network are individual manufacturers, distributors, resellers, content management solution providers, and sourcing organizations. Suppliers are listed in Ariba Network for free of charge and buyers pay transaction fees. The benefit of Ariba ORMS and Ariba Network create a network effect that increases growth cycle and value of Ariba to both buyers and suppliers. As buyers benefit from the efficiencies of the Ariba solution, more suppliers will be drawn to Ariba Network by the aggregated purchasing power of buyers. As more suppliers offer products and services through the network, more buyers are encouraged to join the network.

Revenue sources of Ariba, currently, are mostly from Ariba ORMS. Revenues have been derived from licenses of software, from maintenance and support contracts and from the delivery of implementation consulting and training services. Revenues

from licenses are composed of 59% and revenues from maintenance and service are 41% of the total revenue as of 1999⁶⁷. In addition, Network related revenues are expected in near future from services and other functionality in the form of transaction and subscription fees.

This business model is combination of buy-side solution and marketplace. It aggregates buyers by providing procurement solution and value-added services and other information. Ariba's network revenue model is a new B2B model and has three major components: subscription fees, transaction fees and license fees. In addition, Ariba continues to garner revenue for traditional services as implementation consulting and training.

Ariba recently added network services such as electronic payment and electronic auction in addition to the traditional services on the Ariba platform.

Sales and Growth Strategy

Ariba sells its software primarily through worldwide direct sales organization. It has 111 sales professionals and 9 international offices: Canada, Australia, Belgium, Germany, Japan, The Netherlands, Sweden, Switzerland and the United Kingdom⁶⁸. Through direct sales method, it provides professional services on strategy, methodology,

⁶⁷ Christopher Shilakes and Peter Goldmacher, *Ariba Incorporated-Foundation Technologies for Net Exchanges*, Merrill Lynch & Co., Global Securities Research & Economics Group, February 2000

⁶⁸ www.ariba.com

and technical implementation of Ariba ORMS to augment the implementation efforts of customers and system integrators. In addition, through strategic partnership with Andersen Consulting, Cisco Systems, Hewlett-Packard, Sun Microsystems and other companies, it gains broad market acceptance as well as enhance marketing, sales and distribution capabilities⁶⁹.

Ariba's marketing programs are to educate target market, generate new sales opportunities, and create awareness for its e-commerce solutions. Ariba conducts a variety of marketing activities such as business seminars, trade shows, press relations and industry analyst programs and advisory councils. Specially, advisory council meetings are made up of numerous industry experts and provide forums for discussing customer needs and requirements.

Ariba has grown by using network effect, outsourcing and higher barrier to exit. E-procurement solutions that make corporate purchasing activities more efficient and cost-effective are moving from the early adopter stage to rapid adoption by mainstream companies. Since Ariba initially targeted Fortune 500 companies, it is easy for it to market small and medium size companies. Targeting big market is one of the advantages that it has to grow rapidly.

Since it aggregated buying powers from major industry leaders, it is easy for Ariba to enlarge the scope of business into the marketplace using network effect. It can

⁶⁹ Rakesh Sood, Jamie Friedman, Michael Parekh, Rick Sherlund, Lilly Bahramipour and Thomas

also further enlarge its business to supply chain management by keeping its core competence and outsourcing other services. Ariba also use acquisitions and strategic alliances to provide comprehensive solution and system integration⁷⁰. In addition, by providing the procurement technology to the members of the trading network and by integrating the transactions with members' back office system, Ariba can lock in customers and establish a barrier to exit.

. E-procurement market naturally has large potential to grow because functionally it can grow to trading portal and supply chain management, and horizontally, it can be applied to every industry. The critical factors for the growth is how large buying power it has, which means attracting and maintaining customers, because it is the initial stage for the network effect.

Competition

Ariba encountered competition with respect to different aspects of solution. Its competitors can be categorized by 4 areas: Internet-based ORM pure players, companies with Internet-based expense management background, companies with enterprise asset management background, and ERP background. ORM pure players include CommerceOne, Clairs, Elcom and Netscape Communication⁷¹. Even though

Berquist, *B2B: 2B or Not 2B?*, Goldman Sachs Investment Research, September 14, 1999

⁷⁰ Scott Alaniz, *E-Procurement-A Guide To Buy-Side Applications*, Stephens Inc. Internet Research Team, 27 Dec.1999.

⁷¹ Annual Report of Ariba.

they are targeting a little bit different sectors of the market considering size of customers and functionality, these companies are the main competitors. For the companies with Internet-based expense management background and enterprise asset management background, they try to leverage their workflow rules engines and get into procurement space. Oracle, PeopleSoft and SAP with ERP background leverage their existing infrastructures, client bases and start to compete on indirect material procurement.

Considering target customers, business model and core competence, CommerceOne is Ariba's main competitor. In fact, they have some similar strategies. They both start as a buy-side technology platform and entered trading marketplace. Ariba and CommerceOne provide auction, exchange service by acquisition of TradingDynamics and CommerceBid respectively⁷². They also competitively entered into the government procurement market. However, the most severe competition can be found in customer attraction. Since both of them are very much dependent on the buying power of customers, they reduced the price of service and even provided equity to keep main customer. CommerceOne's case that it gave its 20% equity to GM in exchange for future revenue obviously shows how many hefty prices it has to pay to attract customer.

⁷² Scott Alaniz, *E-Procurement-A Guide To Buy-Side Applications*, Stephens Inc. Internet Research Team, 27 Dec.1999.

Ariba and CommerceOne target Fortune 100 companies and their revenue sources such as transaction fees and license fees are also similar. However, Ariba has longer business history and more number of customers (78) than CommerceOne (43)⁷³. These advantages easily disappear if Ariba cannot follow up strategic alliances with other manufacturing companies. To keep the industry leader's position, Ariba has to further leverage its network effect and develop value-added services so that it can lock in and attract main customers in its system.

Key Success Factors and Challenges

Ariba is credited to have invented e-procurement market. Benefited from the first mover advantage, it can attract large, multinational corporations and public sector institutions. In fact, Ariba's ORMS was released one year before CommerceOne's product became available. At the same time, large buying power from customers can attract suppliers through Ariba Network and attract more buyers. These growth cycle creates a network effect, where the value to each participant in the network increase with the addition of each new participant, increasing the overall value of Ariba solution. This is the main success factor with which Ariba can grow very fast.

In addition to that, Ariba provides higher customer satisfaction and superior technology. By establishing customer advisory council, it keeps focus on customer

⁷³ www.ariba.com

requirements and its technology enables broader functionality, relatively smoother implementation and better integration with existing back office ERP system. Since ERP system was largely used before Internet based solution, integration with ERP system gives Ariba competitive advantage over the other solutions. Lastly, targeting big market strategy gives it the potential opportunity to grow further.

However, since it's a big market, competition is also severe. If the companies with the existing ERP system enable procurement solution over the Internet, Ariba will face a great threat⁷⁴. And if their main customers change solution provider or competitors made acquisitions or alliances with another customer, it will damage Ariba's revenue source. To overcome this customer vulnerable market situation, Ariba can extend its industry to the supply chain management bringing wider business scopes or add value-added service, which the other solution provider doesn't offer.

Figure 5: Stock Price of Ariba



⁷⁴ Annual Report of Ariba.

Table 4: Revenue and Loss Table of Ariba

\$ In thousands

	97	98	99	2000(1H)
Net Revenue	760	8,363	45,372	120,707
Net Loss	4,679	10,593	29,300	443,099

III. FreeMarkets

Company Overview

FreeMarket provides buyer-centric auction for industrial parts, raw materials, commodities and services. Co-founded by Glen Meakem, former manager of GE, and Sam Kinney, ex-consultant in McKinsey & Company, Inc. in 1995, it has created online auction for products in more than 70 supply verticals. And its purchasing orders worth over \$2.7 billion in 1999 and \$ 1 billion in 1998 respectively⁷⁵. FreeMarkets expanded into Europe and launched its new service -Asset Management- in 1998. Currently, it has more than 5600 suppliers from over 50 countries and 64 clients⁷⁶. The number of employees is 497.

In Dec. 1999, FreeMarkets successfully completed initial public offering at \$48 per share. However, its stock price moves more volatile compared to the move of NASDAQ stock price. Even though its revenue increased rapidly from \$ 1.8 million in 1997 to \$20.9 million in 1999 and \$30.2 million in 1H of 2000, it is not profitable yet making net loss \$64.6 million for the first half of year 2000. Market capitalization of FreeMarkets is \$ 1.785 million as of 20th of October 2000. Its cash and cash equivalents amounted to \$148 million, which should let the company live off internal funding until it is profitable.

⁷⁵ Annual Report of FreeMarkets.

Industry Background

Freemarkets involved in two main markets such as industrial purchasing and surplus asset management⁷⁷. Based on industry research and government statistics, the purchasing of manufacturers worldwide is approximately \$5 trillion each year of direct materials. Direct materials are often custom-made to buyers' specifications and there are no catalogs or price lists. Price comparison is difficult and process of purchasing is complicated and fragmented making buyers pay high price for the products⁷⁸. In addition, product quality is not easily noticeable. Freemarkets leverages its industry-leading platform for direct materials and enters into indirect material market. Indirect material includes services such as tax preparation, packaging materials, communications, electricity, security guard, transportation, relocation, MRO items, hotel services and office furniture and installation. Purchasing of indirect materials is also characterized by complex processes.

Market for surplus asset management has \$300 billion market size annually. It deals with surplus equipment and inventory for almost all industries. It has nearly 200,000 dealers and end-users and its process of purchasing is also complex and fragmented.

⁷⁶ www.FreeMarkets.com

⁷⁷ www.FreeMarkets.com

⁷⁸ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", *Purchasing*, 21 Oct.1999.

Business Model

FreeMarkets is buyer-centric marketplace for industrial parts, raw materials, commodities and services. Unlike traditional auctions, it has one buyer and multiple sellers that make the price go down by bidding. By providing information and technology, FreeMarkets works with buyers to select bidders to participate in each auction and to specify the products to be purchased. The FreeMarkets model combines the auction process with customized research and services.

FreeMarkets auction helps buyers and sellers to conduct auction in every stage of the process. Before the bidding, buyers assemble request for quotations (RFQs), which provide detailed, clear and consistent information for the purchasing. Suppliers use these RFQs as a basis for their competitive bids. After buyers fill out RFQs, they select the appropriate suppliers for that and invite them to the auction⁷⁹. FreeMarkets helps buyers to select the right supplier through the global market operations staffs in Brussels. FreeMarkets delivers a complete package that includes superior technology, in-depth knowledge of supplier markets, e-commerce solution and a service organization. During the auction process, FreeMarkets monitors the bidding and provides technical supports.

Benefits to buyers include low search and transaction costs, broad supplier access and better matches and prices. Among all of them, cost reduction is most

⁷⁹ Annual Report of FreeMarkets.

distinguished. Cost savings ranges from 2% for commodity items to 25% for customized items. United Technology can be a good example, which made a lot of cost savings through FreeMarkets auction. Since 1996, FreeMarkets has held over 45 auctions for United Technologies. United Technology saved average \$1.2 million annually through the three-year contract from 1997 to 2000. It is approximately 12% savings compared to what United Technologies previously paid for the same items. In addition, in March 2000, bidding event for \$ 7.3 million of simple machinery parts generated 25% cost savings. Currently, it holds between two to three bidding event every month. In addition, FreeMarkets manages and develops highly specialized market information about many different product categories and maintains a data about thousands of potential suppliers including information on their manufacturing process, quality assurance practice, market focus and facilities. Such information isn't easy for buyers to generate on their own.

FreeMarkets main clients are United Technologies, Quaker Oats companies, FirstEnergy corporation, Delphi automotive systems and so on. Buyers pay fixed fees ranged from \$75,000 to \$ 200,000 per month for a four-to-six month pilot program⁸⁰. Sometimes, they pay incentive payment based on auction volume.

For the suppliers, if they want to use FreeMarkets auction or exchange, they have to register first. Then, if they are qualified, they will be invited to the bidding by buyers. During the process, suppliers get fact sheets about Competitive Bidding Events

⁸⁰ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", Purchasing, 21 Oct.1999.

(CBEs). It is a summary of the products or services being purchased. And based on the information, suppliers fill out request for information of individual CBEs. Suppliers have to do that because many of the buyers want specific custom-made products from the auction. If the products that supplier provides is different what the buyer wants, buyer can choose the other supplier regardless of the auction result. For the RFI, suppliers describe their business such as manufacturing quality and delivery capability. Then, if buyers choose them, they get detailed RFQs which tell them remaining schedule, required steps, agreements and contact information of FreeMarkets staffs. Before the bidding, buyers and suppliers contact to each other through FreeMarket staffs or e-mail that FreeMarkets provides to both of them to keep the anonymous transactions. Lastly, FreeMarkets provides training session such as mock bidding session for the suppliers, which conduct the auction for the first time. There is no up front fees for the suppliers. In most of the case, payment is made by buyers. Suppliers pay only when it is clearly stated in the RFQs.

Suppliers benefit by broad market access which is unattainable or closed because of traditional inefficient purchasing channels. They can generate new accounts and additional revenues. In addition, through its technology, auctions can be conducted without regard to the currency and language making larger market potentials for suppliers⁸¹. FreeMarkets asset exchange works similarly to the auction. However, in this

⁸¹ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", Purchasing, 21 Oct.1999.

case, seller pays transaction fees of 5% of the purchase price and buyer pays for transportation. One of the characteristics of FreeMarket is that it provides its software-Bidware, to both of sellers and buyers for free of charge, which enables buyers to watch auction and suppliers to submit bids. This technology provides multi-currency and language and various auction periods.

In this business model, most of the revenues are come from service agreements with clients. It includes fixed monthly subscription fees tied to its BidWare software and performance incentive payments based on volume, savings, and sales commissions. Fixed monthly fees are negotiable and the agreements range in length from a few months to as many as four years. Since clients can terminate their agreement without any penalty, FreeMarkets has unstable revenue stream year by year. In addition, suppliers also pay sales commissions depending upon the terms of agreement. These commissions are mostly for the shipment of the auctioned items from the winning supplier to the client. FreeMarkets has conducted more than 5,000 auctions worth more than \$7 billion.

However, seen from the revenue source, most of its revenue relies on the short-term contract with clients. Specially, two major clients – United Technology and GM - were composed of more than half of its revenue. In 1999, revenue from United Technology and from GM comprised 34% and 15% of total revenue respectively⁸². Therefore, that GM terminates its contract with FreeMarkets will influence the revenue

⁸² Annual Report of FreeMarkets.

stream of FreeMarket for the future.

Because of the characteristics of auction, long and complex preparation procedure compared to other purchasing, this model cannot be applied to broader industries. It works really well when a company has low-tech, pre-engineered items and a large number of suppliers. Usually, for these kinds of products, price is the most critical consideration. However, FreeMarkets structures its bidding events to take other factors into account as well.

Sales and Growth Strategies

FreeMarkets started as a buyer-centric auction provider and tries to develop its business model containing a seller-centric auction and exchange. These two models are for the surplus asset management. It leverages success in creating downward price auction for buyers of direct materials and creates upward price auction for the sellers of surplus assets. There are some network effects between them because many of surplus assets sellers are buyers of direct materials in FreeMarkets auctions and many of surplus assets buyers are sellers of direct materials in FreeMarkets. The network effects can be applied to the exchange model, too. FreeMarkets knows the players on both sides of the transactions.

FreeMarkets broadens their business model by acquisition. It acquired iMark.com and Surplus Record and SR Auction to provide b2b online marketplace for

surplus equipment and inventory. In addition to that, using other strategic alliances and marketing alliances, FreeMarkets enlarges its client bases.

On the product side, it also expands its business from direct materials to indirect materials. Since its technology can be applied beyond the boundary of industries, expansion into indirect materials is natural way of market extension. It can leverage the buying powers from direct materials and apply to the indirect materials.

Lastly, FreeMarkets expands into global market. Since the U.S. market for purchasing is pretty much matured, it is suffering from severe competitions and the advantage of auction is not substantial. It expanded into Europe with headquarters in Brussels and Belgium which features a market operation center staffed by employees who speak over 15 European languages. In May 2000, it opened another office in London. Currently, B2B auctions in Europe reached 15% of total sales.

Competition

FreeMarkets is a market pioneer in buyer-centric auction. Even though it has enjoyed its first mover advantage and unique business model, now, it faces severe competitions from many follow-up companies. There is no such company, which deals with the exact scope of FreeMarkets' business. However, its competitors can be categorized by three types: vertical market makers, manufacturing companies and

horizontal marketplace providers⁸³.

Vertical market makers such as MetalSite, FastParts, Inventory LocatorService, and Affiliated Network Inc provide auction service in their specific areas: steel, computer components, airline parts and marine supplies and boats. These companies have advantage because they can focus on one industry and provide other value-added services. There will be more competition in this category because many vertical market makers, which don't provide auction service, are planning to add auction services in near future. Manufacturing companies such as big three auto companies, British Airways, Sears, Shell and Uniliver are planning to have their own auction site. These companies own industry expertise and take advantage with the existing relationship with suppliers. And horizontal market place providers such as Ariba and CommerceOne also added auction function in their existing market. Horizontal market place providers enable broad market access and their solutions are easily applied to the other software.

Facing competition from a variety of companies, FreeMarkets entered European market. B2B auction in Europe is in its start-up stage and it can enjoy monopolistic market share there. However, if the other competitors also expand into European market, it will lose its competitive advantage as a first mover. Considering that, it had better focus on developing other services and revenue sources. It could generate more revenue by adding value-added services. For example, it formed a strategic alliance with

⁸³ Annual Report of FreeMarkets.

webPLAN Inc to deliver web-based B2B e-market place and supply chain management to customers. Customers can integrate supply chain management, customer relationship management, and product lifecycle management with existing manufacturing systems and processes. These alliances enlarge its services available and could attract more customers to use FreeMarkets.

Key Success Factors and Challenges

FreeMarkets positioned as an industry leader in buyer-centric auctions. Because of its unique business model, it can attract big companies as its clients. FreeMarkets helps these Fortune 1000 companies create single-day online bidding events in which suppliers are pitched in battle via computers⁸⁴.

In addition to its first mover advantage and unique business model, it provides superior technology. Using this technology, FreeMarkets can easily enter into global market without regard to the currencies and languages. One of the characteristics of FreeMarkets is that price is not the only considerations of the auction. In that sense, it is slightly different from traditional auction. It leaves some rooms to consider quality, delivery service and preferred suppliers. So, buyers can overcome the weakness of auction such as fulfillment problem and product mismatching. That is unique feature of FreeMarkets. But, the critical success factors will be depending on integration into other

⁸⁴ Elizabeth Baatz, "Online Auctions Start to Pick up Stream", Purchasing, 21 Oct.1999.

services. It provides broad range of service partnered with third party companies such as payment and shipping. The differentiating factors in auction market will be what kinds of services will the market player provide before and after the bidding.

However, it's so vulnerable to the termination of the agreement with its clients⁸⁵.

If competition gets severe and it loses its market share, its revenue will decrease.

Maintaining and attracting critical mass of customers is very important same as in the

other business models. In addition, because of the characteristics existing in the auction,

it has limited market potentials. Not all the products necessitate complex procedure and

price bidding. And only 9% of the buyers use or plan to use auction on the Internet

according to Purchasing's recent survey. FreeMarkets can solve this problem by adding

other business models or by increasing industry involvement into the auction through

other services. To increase industry involvement into the auction, FreeMarkets has to

develop technology that makes auction process more simple and convenient. The other

concern is that many older brick-and-mortar companies start to provide more innovative

e-procurement and supply-chain strategies. Its success depends on what FreeMarkets

offers beyond the actual auction and how can it differentiate customized services and

research from other competitors.

⁸⁵ Merrill Lynch & Co., Global Securities Research & Economics Group, *The B2B Market Maker Book*, 3 Feb. 2000.

Table 5: Revenue and Loss Table of FreeMarkets

\$ In thousands

	97	98	99	2000(1H)
Net Revenue	1,800	7,800	20,900	30,182
Net Loss/income	(1,600)	230	(21,800)	(64,659)

Figure6: Stock Price of FreeMarkets



IV. AltraEnergy

Company Overview

Altra Energy Technologies is specifically focused on providing B2B e-markets and software solutions to the energy industry. Through the company's exchange, users can trade natural gas, power, and crude oil on-line. It was founded in Jan. 1996 by joint venture of PanEnergy, which is in charge of back office management systems, and Williams, which provides e-trading system⁸⁶. In Dec. 1997, it was recapitalized by its employees and venture capital companies and operated as an independent company from the joint venture. Williams and PanEnergy (now Duke) are no longer involved in Altra's ownership structure.

It is privately owned companies financed by major venture companies. Third round \$ 15 million financial injection completed in June 1999 by GM Pension Fund. Investors in round 1 and 2 include Battery Ventures, Austin Ventures, Capital Resource Partners and Bank America Ventures. In Oct. 1999, Altrade, which is a real-time, anonymous exchange for energy industry, was launched. Altra employs 300 workers and has 125 customers. Its number of users is over 6000 around the world. Currently, it has distributors in Europe, Latin America, and Australia.

⁸⁶ www.altranet.com

Industry Background

Energy industry's market size is \$ 340 billion, which includes natural gas, crude oil, natural gas liquids (NGLs), and wholesale power⁸⁷. Traditionally, transactions were conducted by brokers or paper-based transaction chains. Purchasing process is highly fragmented and complicated and also costly. Because of energy products' price volatility, without transparent information, buyers cannot know the appropriate market price of energy products⁸⁸. In addition, government had been controlling energy industry for quite long time. The electronic power industry has been typically slow to develop new products because innovation in this space has never been rewarded. However, it was recently deregulated. Electronic commerce has been and is continuing to be a key enabler of energy's transition from a regulated industry to a competitive marketplace. After the deregulation, energy market becomes a market of increasing choices. Energy consumers are gaining the opportunity to select their supplier and the level of service they want. The same is true of the companies that supply the energy. Deregulation is a key driver in Altra's formation and subsequent rapid growth⁸⁹.

Today, electronic trading is a rapidly growing segment of the energy marketplace. Even though around 10% of the total volume of natural gas was traded

⁸⁷ Saroja Girishankar, "E-Commerce Strategies—Trading Hubs Gain Respect", *Internetweek*, 1 Nov. 1999.

⁸⁸ Robert Schwartz, David Gremmels and Drew Brosseau, *Business-To-Business E-Commerce-Here Come The Online Intermediaries*, SG COWEN, Dec. 1999.

⁸⁹ www.altranet.com

electronically for last few years in the U.S., Forrester agrees that the Energy/Utility sector will surpass \$170 billion in e-commerce by 2003. In addition, for the electronic trading of natural gas and electricity, a transaction value will surpass \$30 billion by the year 2002. As the energy business becomes increasingly efficient, communicating and processing transactions in the most cost effective manor becomes a key to survival.

Business Model

Altra provides enterprise software and electronic commerce solutions for the buying, selling and transportation of energy and provides also energy trading transaction management systems. The company's application software solutions include Altra Power, Altra Gas and Altra Crude/NGL. These solutions provide electronic trading, scheduling and delivery and risk system⁹⁰. Buyers such as utility, energy marketing, pipeline companies and local distribution companies license the software and these software solutions can be linked to its trading exchange, integrated energy transaction process. Altra's main clients are American Electric Power, Boston Gas, Constellation Energy Services, Foothills Pipe Lines and so on.

Altrade is a real time on line system for trading energy. Buyers and sellers can view and exchange bids and offers quickly, remaining anonymous until the deal is consummated. Even though there is a little bit difference in the trading systems of each

⁹⁰ www.altranet.com

product, the main structure of the exchange is similar. Participants set specific credit criteria for trading partners and assemble a slate of approved trading partners. Then, they can create buy, sell or buy/sell positions. During the whole processes, customers can control everything about posting or withdrawal of a position. If the transaction is completed, identity is revealed only to the trading partner. Then, Altrade sends confirmation electronically or by fax.

This process is like Altrade Crude/NGL and it works like a kind of brokerage system for cash trading. In the case of Altrade Power, it is an integrated transaction management system that facilitates the management of physical, administrative and financial transaction processes.⁹¹ And in Altra Gas, customers are guaranteed the transaction performance and get delivery service through third party companies.

Altra also provides a variety of services. It has a training program and provides online services such as an energy resource library, technical support and customer services such as warranty and user group. Through this trading place, customers can enjoy speedy transactions, flexible control over the bidding and confidentiality resulting in a generally fairer market. Specifically, for buyers, they can lower transaction cost and enjoy streamlined sourcing, real-time access to the market opportunities and greater negotiation power. On the other hand, sellers also benefited from increased exposure to new sales opportunities and elimination of obsolete and excess inventory. This exchange

⁹¹ Arthur Sculley and William Woods, *B2B Exchanges*, ISI publications 1999.

business model is characterized by neutrality, that means, not biased to either buyers or sellers⁹². Otherwise, it can not attract enough buyers and sellers to produce liquidity.

Revenue sources of Altra are composed of three parts: subscription and transaction fees, professional service fees and software license fees. In 1999, subscription and transaction fees are 50% of the total revenues and professional service fees and software license fees are 25% respectively⁹³. Buyers pay 0.1% and suppliers pay 0.2% of commission fees. Its revenues are transaction-based and approximately, 5000 daily transactions go over Altra's trading system reaching \$12 billion transaction volume in 1999. And more than 125 companies are presently licensing Altra's software⁹⁴.

Main revenue source of this business model is transaction fees. However, in exchange model, transaction fees are relatively low compared to the other model. Even though it is best fit for the products, which is frequently traded, and with high price volatility, if it doesn't have liquidity, this model cannot make enough revenue to survive.

Sales and Growth Strategies

To grow in this energy electronic trading market means to expand industry involvement. Since energy industry is quite big market, Altra doesn't need to diversify into the other industries as Chemdex has been doing. Global energy industry market is

⁹² Arthur Sculley and William Woods, *B2B Exchanges*, ISI publications 1999

⁹³ Merrill Lynch & Co., Global Securities Research & Economics Group, *The B2B Market Maker Book*, 3 Feb.2000.

\$340 billion, which gets multiplied to \$750 billion in repeated transactions. Instead, Altra need to increase its liquidity by attracting more buyers and sellers. Once, it has enough liquidity, liquidity acts like network effect resulting in more market participants. If it achieves the necessary liquidity, it is developing financial instruments to allow options, spreads and futures to be traded over the system driving up transaction volume⁹⁵. In addition, through strategic partnership with Sema group, Altra's exclusive European distributor, it tried to boost its distribution worldwide.

Since Altra consolidated a leading position through acquisitions in natural gas trading market, it had better focus on newly deregulated electricity trading market. It can also increase its market share further through streamlining of connections among participants in energy market value chain, eliminating duplications, delays, and payment complications.

Competition

After deregulation of the energy market, many trading platforms want to participate in this industry resulting in severe competitions. These trading platforms foster their own distinct business models and customer bases. For instance, in the wholesale arena, there are companies such as Houston-Street.com, Enron Online, the Automated Power Exchange and others (Altra Energy Technologies belongs to this

⁹⁴ Saroja Girishankar, "E-Commerce Strategies –Trading Hubs Gain Respect", *Internetweek*, 1 Nov.1999.

arena). In retail, Essential.com, BrightOptions.com, Enermetrix.com and all suppliers to large retail buyers are active players. And exchanges like the California Power Exchange and the New York Mercantile Exchange are taking a more market-monitoring role. This is all about the electricity market, which is much less mature and still very fragmented. For the gas market, Altra already consolidated leading position by acquiring Quicktrade-one of its competitors- and TrnasEnergy and by providing superior services such as security and payment insurance program⁹⁶.

In addition, enterprise software companies such as CommerceOne, Ariba and Oracle can be potential competitors when they provide energy industry specific solutions and marketplaces.

Among the other competitors, Enermetrix.com deals the most similar market to Altra Energy. Both of them deal natural gas and electricity and their revenue sources are transaction fees and licensing fees. Enermetrix has longer business history founded in 1995 from an energy broker while Altra was founded in 1996 from a software maker. Altra discloses buyer and seller identities after match-up, but only manages and guarantees transaction performance in physical natural gas trades. And Enermetrix guarantees a transaction once it is executed on the system⁹⁷. That makes it totally unique in the online energy industry. However, Altra has more customers (125) than Enermetrix

⁹⁵ Arthur Sculley and William Woods, *B2B Exchanges*, ISI publications 1999.

⁹⁶ www.altranet.com

⁹⁷ www.enermetrix.com

(50) and distribution channels outside America such as Europe, Australia, and Latin America.

There is only limited room for a few players to compete in energy industry. Their models differ in terms of services, but none has a clear technological advantage. The subtle differences that make customers feel easy-to use can be an important factor in attracting customers.

Key Success Factors and Challenges

One of the success factors of Altra is that it targeted big market so that it doesn't need to diversify into the other industries. And energy industry is best fit for its business model. Exchange model provides true market price and allows for immediate purchase of goods. The delivery mechanism must also be considered because significant delays in shipping the product may make it difficult to execute real-time transactions. In energy industry, quick delivery can be arranged and executed via a digital network, bringing liquidity to the spot market. So, Altra enjoyed a perfect match between business model and industry.

In addition, Altra was the first company which received official certification by Gas Industry Standard Board by its Altra pipeline 512 and Altra exchange 2.0. The certificate helps to consolidate Altra's leading position in gas industry and increase market share. It also developed several highly successful auction systems for energy

products.

For the customer services, Altra provides discussion area for its members and industry specific information. It has an energy resource library for public viewing that contains comprehensive information. Moreover, Altra offers professional services such as gap analysis between client's specific needs and solution, project management on quality control and business process review. Specially, by setting up user group, Altra maintains an active customer focus group to provide an additional forum for communication on suggested system enhancements or to share ideas with other organizations. Based on customer feedback, Altra modified its approach to ensure client satisfaction.

However, to survive in the newly opened competitive energy industry, it has to provide more value-added services such as guarantee of performance in electricity products. Currently, for Altra power, customers themselves have to handle the delivery and payment and after the bidding, Altra is not involved in the transaction any more. But, companies like Enermetrix provide guarantee of a transaction resulting in increased customer satisfactions.

The greatest obstacle that Altra face is how to get traditional monopolists involved in its trading platform⁹⁸. Traditional monopolists already have existing

⁹⁸ Robert Schwartz, David Gremmels and Drew Brosseau, *Business-To-Business E-Commerce-Here Come The Online Intermediaries*, SG COWEN, Dec.1999

customer relationship and various choices in choosing trading platform due to the competitions. Another thing to consider is environmental concern. Like many other companies, Altra has to consider providing new environmentally friendly energy products.

V. Conclusion

B2B E-Commerce business models have evolved to attract more market participants. The more buyers and sellers access the marketplaces, the more benefits they can have through networking effect. This kind of business structure results in concentrated trading on a few market makers. The evolution of the business models from aggregators to auctions and exchanges shows that by adding more functions, market makers can widen their customer access. In addition, more advanced trading models customized to specific industry can enjoy large trading volumes.

The most important point for the market makers regardless of their business models is attaining critical mass of buyers and sellers. This is because their revenue models are mainly based on transactions. Even though many other services such as maintenance, insurance, and education services also contribute to the revenues, the portion is still negligible. To attain critical mass of participants, they need to choose the business model that best meets the specific industry characteristics, support marketplace with enough information, and establish connections that join buyers and sellers.

However, as explained in the above case studies, none of these business models are profitable. The reasons for this is as follows:

1. The technology is far more complicated and expensive than expected.
2. The market makers underestimated existing but lower- tech alternatives.
3. Commission rates and volumes are too low for market operators to make profits.

4. High value transactions often bypass marketplaces.
5. The target industry is over-crowded with new marketplaces

The main reason is that they haven't yet transacted large trading volumes, which generate revenues above their break-even point. This means that these models need to be developed further to attract more participants, otherwise, they will not survive the competition. The recent skepticism on ECommerce is also because of the lack of appropriate profit generating models.

There are several ways to make these models profitable.

1. Alliance with large companies which lack technology and management teams dedicated to operating an online marketplace.
2. Add value-added services such as logistics, information, financial or analytical services which can generate high margin sales in the niche market.

However, industry-led exchange model is different from the other models in that it already has large buying power by itself making it easier to conduct enough trading volumes. Moreover, consortium by industrial players enjoys the largest buying power. In addition, these exchanges as well as consortium have been establishing long-term relationships with suppliers. Another advantage is that they have large amount of cash from off-line business to invest for integrating on-line business.

Today, traditional manufacturers are participating in B2B E-Commerce actively by making their own marketplaces. If many industry leading manufacturing companies

create their own marketplaces, independent market makers will lose their position and will end up being a smaller player focusing on a niche market. Independent market makers have only two options: to be a small player in niche markets or to be acquired by industry-led exchanges or off-line players.

Still, none of the announced industry-led exchanges or consortiums are running at full capacity and all of them will face challenging systems development, integration, and governance issues before they become fully operational. However, backed by large buying power, these consortiums will survive with profitability and finally they will be accepted as a key element of much larger process, business automation, covering both on-line and off-line business.

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