

E-Hubs: The New B2B Marketplaces

by Steven Kaplan and Mohanbir Sawhney



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E-Hubs: The New B2B Marketplaces

BY STEVEN KAPLAN AND
MOHANBIR SAWHNEY

As business-to-business commerce shifts to the Internet, companies like Chemdex and FreeMarkets that control the on-line markets will exert enormous influence over the way transactions are carried out, relationships are formed, and profits flow. Understanding how these electronic hubs work is crucial to creating a successful e-business strategy.

BUSINESS-TO-BUSINESS commerce on the Internet is generating a lot of interest. Companies like Ariba, Chemdex, Commerce One, FreeMarkets, Internet Capital Group, and SciQuest.com have attained breathtaking stock market capitalizations. Venture capitalists are pouring money into more B2B start-ups. Even industrial stalwarts like General Motors and Ford have announced plans to set up their own Web markets.

The appeal of doing business on the Web is clear. By bringing together huge numbers of buyers and sellers and by automating transactions, Web markets expand the choices available to buyers, give sellers access to new customers, and reduce transaction costs for all the players. By extracting fees for the transactions occurring within the B2B marketplaces, market makers can earn vast revenues. And because the marketplaces are made from software—not bricks and mortar—they can scale with minimal additional investment, promising even more attractive margins as the markets grow.

But as new entrants with new business models pour into the B2B space, it's increasingly difficult to make sense of the landscape. In this article, we introduce a classification scheme that gives order to the seeming chaos of the new B2B marketplaces, which we call electronic hubs, or e-hubs. By explaining how the different types of e-hubs work and how they create value, we hope to provide useful guidance not only to entrepreneurs looking to launch e-hubs but also to the many buyers and sellers developing strategies for capitalizing on B2B e-commerce.

The What and How of Business Purchasing

To understand e-hubs, it's useful to understand what businesses buy and how they buy. Businesses buy a diverse set of products and services, ranging from paper clips to computer systems, from steel to machinery. At the broadest level, the purchases can be classified into *manufacturing inputs* and *operating inputs*.

Manufacturing inputs are the raw materials and components that go directly into a product or a process. Because these goods vary considerably from industry to industry—chemical companies don't buy automotive braking systems, and advertising agencies don't buy raw steel—they are usually purchased from industry-specific, or vertical, suppliers

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and distributors. They also tend to require specialized logistics and fulfillment mechanisms—UPS doesn't deliver hydrochloric acid or high-density polyethylene.

Operating inputs, by contrast, are not parts of finished products. Often called maintenance, repair, and operating (MRO) goods, they include things like office supplies, spare parts, airline tickets, and services. Operating inputs tend not to be industry specific; most every business needs computers, copier paper, and cleaning services. As a result, they are frequently purchased from horizontal suppliers—vendors like Staples and American Express that serve all industries. And they are much more likely to be shipped through generalists like UPS.

The second distinction in business purchasing is how products and services are bought. Companies can either engage in *systematic sourcing* or in *spot sourcing*. Systematic sourcing involves negotiated contracts with qualified suppliers. Because the contracts tend to be long term, the buyers and sellers often develop close relationships. In spot sourcing, the buyer's goal is to fulfill an immediate need at the lowest possible cost. Commodity trading for things like oil, steel, and energy exemplifies this approach. Spot transactions rarely involve a long-term relationship with the supplier; in fact, buyers on the spot market often don't know who they're buying from.

Classifying B2B Hubs

By applying this two-way classification scheme—*manufacturing inputs* versus *operating inputs* (the "what") and *systematic sourcing* versus *spot sourcing* (the "how")—we can classify B2B hubs into four categories (see the exhibit "The B2B Matrix"):

- *MRO hubs* are horizontal markets that enable systematic sourcing of operating inputs.
- *Yield managers* are horizontal markets that enable spot sourcing of operating inputs.
- *Exchanges* are vertical markets that enable spot sourcing of manufacturing inputs.
- *Catalog hubs* are vertical markets that enable systematic sourcing of manufacturing inputs.

In MRO hubs, the operating inputs tend to be low-value goods with relatively high transaction costs, so these e-hubs provide value largely by increasing efficiencies in the procurement process. Many of the best-known players in this arena, including W.W. Grainger, Ariba, and Commerce One, started out by licensing expensive "buy-side" software for e-procurement to large companies, which used the software on their own intranets. Now, instead of licensing their software to individual companies,

THE B2B MATRIX

		What businesses buy	
		operating inputs	manufacturing inputs
How businesses buy	systematic sourcing	MRO Hubs Ariba W.W. Grainger MRO.com BizBuyer.com	Catalog Hubs Chemdex SciQuest.com PlasticsNet.com
	spot sourcing	Yield Managers Employease Aداuction.com CapacityWeb.com	Exchanges e-Steel PaperExchange.com Altra Energy IMX Exchange

the e-hubs are hosting it on their own servers to provide an open market. These markets give buyers access to consolidated MRO catalogs from a wide array of suppliers. Newer entrants in this area include BizBuyer.com, MRO.com, PurchasingCenter.com, and ProcureNet. Because MRO hubs can use third-party logistics suppliers to deliver goods, they can disintermediate, or bypass, existing middlemen in the channel without having to replicate their fulfillment capabilities and assets.

Yield managers create spot markets for common operating resources like manufacturing capacity, labor, and advertising, which allow companies to expand or contract their operations on short notice. This type of e-hub adds the most value in situations with a high degree of price and demand volatility, such as the electricity and utilities markets, or with huge fixed-cost assets that cannot be liquidated or acquired quickly, such as manpower and manufacturing capacity. Examples of yield managers include Yutilities (for utilities), Employease and

eLance (for human resources), iMark.com (for capital equipment), CapacityWeb.com (for manufacturing capacity), and Aداuction.com (for advertising).

Close cousins of traditional commodity exchanges, on-line exchanges allow purchasing managers to smooth out the peaks and valleys in demand and supply by rapidly exchanging the commodities or near-commodities needed for production. The exchange maintains relationships with buyers and sellers, making it easy for them to conduct business without negotiating contracts or otherwise hashing out the terms of relationships. In fact, in many exchanges, the buyers and sellers never even know each other's identity. Examples of exchanges include e-Steel (for the steel industry), PaperExchange.com (for the paper industry), IMX Exchange (for the home mortgage industry), and Altra Energy (for the energy industry).

Finally, catalog hubs automate the sourcing of noncommodity manufacturing inputs, creating value by reducing transaction costs. Like MRO

hubs, catalog hubs bring together many suppliers at one easy-to-use Web site. The only difference is that catalog hubs are industry-specific. They can also be buyer focused or seller focused—that is, some catalog hubs essentially work as virtual distributors for suppliers; others work primarily for buyers in their negotiations with sellers. We'll discuss e-hub biases in more detail later. Examples of catalog hubs include *PlasticsNet.com* (in the plastics industry), *Chemdex* (initially in the specialty chemicals industry), and *SciQuest.com* (in the life-science industry). Because the products they offer tend to be specialized, catalog hubs often work closely with distributors to ensure safe and reliable deliveries.

Aggregation and Matching

As we think about the differences between systematic and spot purchasing, it becomes obvious that the market-making mechanism that is appropriate for MRO and catalog hubs is quite different from the mechanism used by exchanges and yield managers. E-hubs create value by two fundamentally different mechanisms: aggregation and matching.

E-hubs that use the aggregation mechanism bring together a large number of buyers and sellers under one virtual roof. They reduce transaction costs by providing one-stop shopping. *PlasticsNet.com*, for example, allows plastics processors to issue a single purchase order for hundreds of plastics products sourced from a diverse set of suppliers. The aggregation mechanism is static in nature because prices are prenegotiated. An important characteristic of this mechanism is that adding another buyer to the e-hub benefits only the sellers. And adding another seller benefits only the buyers. The reason is simple: in an aggregation model, buyer and seller positions are fixed.

The aggregation mechanism works best in the following settings:

- The cost of processing a purchase order is high relative to the cost of items procured.
- Products are specialized, not commodities.
- The number of individual products, or stock-keeping units (SKUs), is extremely large.
- The supplier universe is highly fragmented.
- Buyers are not sophisticated enough to understand dynamic pricing mechanisms.
- Purchasing is done through prenegotiated contracts.
- A metacatalog of products carried by a large number of suppliers can be created.

Unlike the static aggregation mechanism, the matching mechanism brings buyers and sellers together to negotiate prices on a dynamic and real-time

The Emergence of Reverse Aggregators

Reverse aggregators deserve some additional discussion because they are a relatively recent development in the B2B arena. Reverse aggregators, which form groups of buyers within specific vertical or horizontal markets, reduce two major inefficiencies. By gathering together the purchasing power of many buyers—particularly, small and midsize buyers—they can negotiate price reductions. In some industries, volume discounts can approach 20%. The purchasing e-hub can reduce procurement transaction costs by outsourcing the procurement function.

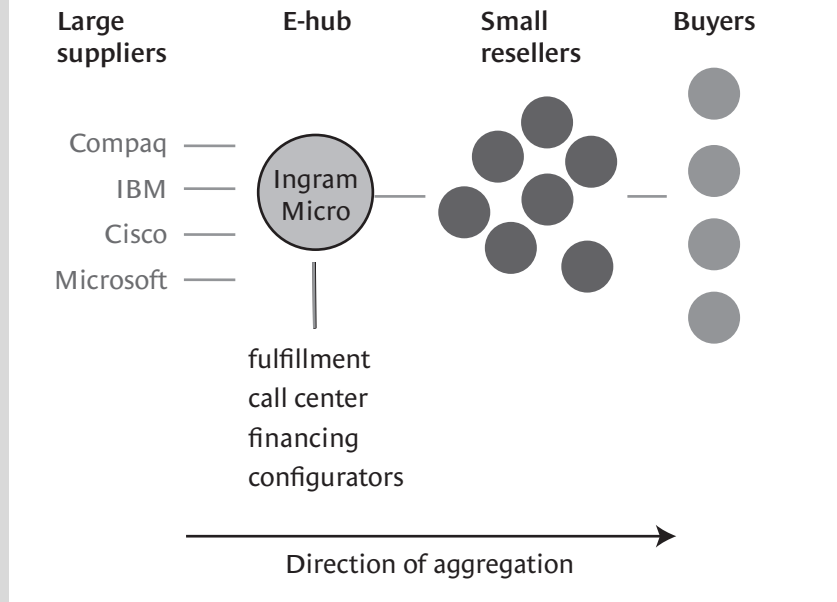
A vertical reverse aggregator, such as *FOB.com*, pursues this in manufacturing inputs. A horizontal reverse aggregator does the same for manufacturing outputs (MRO procurement). *BizBuyer.com* and *PurchasingCenter.com* are a few of many firms pursuing this strategy. An interesting way to think about a reverse aggregator is as “reverse VARs” or “Value-Added Rebuyers.” Traditionally, firms like *Ingram Micro* have worked as “forward aggregators” by aggregating selling power for small value added resellers, providing them with virtual back-office functions and virtual economies of scale in purchasing. (See the chart “The Forward Aggregator Model.”) By contrast, players like *FOB.com* have turned this supply chain on its head—they amass buying power for smaller buyers. (See the chart “The Reverse Aggregator Model.”)

Reverse aggregators have some advantages over neutral e-hubs for the procurement of raw materials and components. For example, reverse aggregators can potentially use both spot and systematic sourcing, but exchanges are largely tied to spot transactions. A manufacturer looking for a long-term supply of steel is less likely to use *e-Steel* than to negotiate directly with a steel manufacturer. Even in those instances where manufacturers do source supplies on the spot market, some fraction of that sourcing is still likely to be systematic and relationship oriented. Not only will reverse aggregators be able to bring together buyers for spot purchases, they will also negotiate long-term contracts with suppliers. In many industries, we suspect that reverse aggregators will have access to at least as large a market as exchanges and catalogs do.

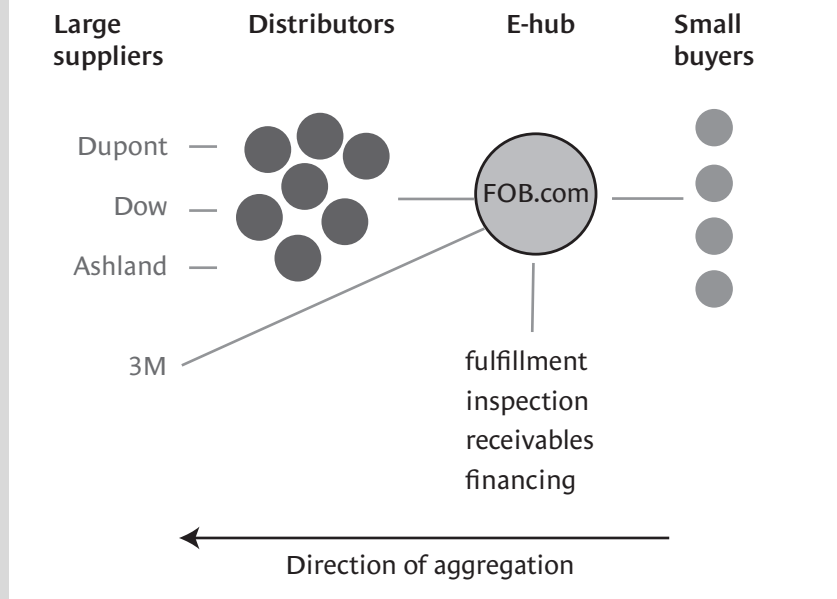
Where will we see reverse aggregators emerge? First, these hubs are likely to spring up in vertical and horizontal markets with fragmented buyers. As mentioned earlier, the market need not be fragmented on both the buy and the sell side. Second, because the primary benefit that purchasing e-hubs provide is demand aggregation, they will thrive in markets where there are a few large buyers and many small buyers. In these situations, larger buyers enjoy significant volume discounts, while smaller buyers don't have the purchasing power to negotiate with sellers, especially large sellers. Third, purchasing e-hubs will be favored in products and services that can be easily broken down into smaller orders. The smaller the lot size the purchasing e-hub can deliver, the greater its added value. Finally, they will add most value in product categories where the number of SKUs is not too large. (Demand aggregation adds less value when product diversity is extremely high because it is more difficult to generate enough demand to obtain better pricing.)

The next logical questions are, Why does the reverse aggregator opportunity exist? Can't the neutral e-hubs destroy these new entrants? Interestingly, we believe that existing neutral e-hubs like Chemdex, SciQuest, and PlasticsNet in the relevant vertical markets or horizontal markets are unlikely to create reverse aggregators. That is because if a neutral e-hub were to favor either the buyer or the seller side too heavily, it would risk losing its liquidity. In addition, neutral e-hubs (especially exchanges) provide marketplaces for buyers and sellers to make spot purchases and sales. Exchanges are not designed to support systematic or contractual purchases. In other words, a manufacturer might use ChemConnect to find chemicals that it unexpectedly needs in the next month. That same manufacturer, however, is less likely to use ChemConnect for the chemicals that it buys under long-term contracts.

THE FORWARD AGGREGATOR MODEL



THE REVERSE AGGREGATOR MODEL



basis. For example, Altra Energy makes a market in energy and electricity by allowing industry participants to list bids and asks on specific quantities of liquid fuels, natural gas, and electric power. The matching mechanism is required for spot sourcing situations, where prices are determined at the moment of purchase. The matching mechanism can also take the form of an auction, as is the case with FreeMarkets.

In the matching mechanism, the roles of the players are fluid: buyers can be sellers, and vice versa. Therefore, adding any new member to the e-hub increases the market's liquidity and thus benefits both

Matching is a more powerful business model than aggregation, but the matching mechanism is far more complex and far more difficult to scale.

buyers and sellers. While catalogs benefit only from the aggregation mechanism, exchanges benefit from both aggregation and matching. Therefore, successful exchanges will reap greater benefits from being first movers. In fact, it is likely that the first exchanges or yield managers to achieve scale will take on natural monopoly characteristics. That makes matching a more powerful business model than aggregation. At the same time, however, the matching mechanism is far more complex and far more difficult to scale.

The matching mechanism works best in the following settings:

- Products are commodities or near-commodities and can be traded sight unseen.
- Trading volumes are massive relative to transaction costs.
- Buyers and sellers are sophisticated enough to deal with dynamic pricing.
- Companies use spot purchasing to smooth the peaks and valleys of supply and demand.
- Logistics and fulfillment can be conducted by third parties, often without revealing the identity of the buyer or seller.
- Demand and prices are volatile.

Biased or Neutral?

Another important characteristic of an e-hub is its bias. Most of the e-hubs we've discussed so far are neutral—they're operated by independent third parties and don't favor buyers over sellers or vice versa. But an e-hub can also be biased. When they favor sellers, biased e-hubs act as forward aggregators that amass supply and operate downstream in a supply

chain or as forward auctioneers that host auctions for buyers. "Forward" in this sense means that the process follows the traditional supply chain model, with the supplier at the start and the buyer at the end. Ingram Micro, for example, is a forward aggregator in the computer industry, and TradeOut.com is a forward auctioneer of excess inventory. Biased e-hubs that favor buyers act as either reverse aggregators or reverse auctioneers. "Reverse" here means that the e-hubs attract a large number of buyers and then bargain with suppliers on their behalf. A reverse auctioneer, for example, hosts an auction where there are many sellers but just one buyer.

Examples here include FreeMarkets, a reverse auctioneer serving *Fortune* 500 companies, and FOB.com, a reverse aggregator serving small buyers in chemicals and

other vertical markets. (See the sidebar "The Emergence of Reverse Aggregators.") Biased e-hubs can exist as aggregators in systematic markets or as matchers in spot markets.

Neutral e-hubs, however, are the true market makers because they are equally attractive to buyers and sellers. That said, neutral e-hubs face some daunting challenges. At first, they confront a "chicken and egg" problem: buyers do not want to participate unless there are a sufficient number of sellers, and sellers do not want to participate unless there are a sufficient number of buyers. To succeed, these e-hubs must attract both buyers and sellers quickly, creating liquidity at both ends. Neutral e-hubs also have to overcome the sellers' channel conflict. After all, sellers usually participate in these markets at the expense of their normal distribution channels. Chemdex solved this conflict by partnering with a large existing cataloger—VWR. VWR promised to send all its business through Chemdex in exchange for an equity stake in the company as well as a concession that Chemdex would not charge a transaction fee to VWR's largest buyers. Finally, neutral e-hubs need to be careful when taking equity investments from large buyers as well as from large suppliers; such investments can create a perception of bias.

By their very nature, biased e-hubs do not have the chicken and egg problem; they just hitch their wagon to one side of the transaction. As a result, they have the potential to grow more quickly than neutral e-hubs. They are also able to focus on smaller buyers or sellers because they can aggregate demand or supply. Furthermore, e-hubs that are biased toward buyers typically don't have to overcome channel conflict.

Beyond Workflow Automation: The Rise of Workflow Redesigners

Many of the B2B hubs we describe make an existing process more efficient by automating transactions and by reducing interaction costs among buyers and suppliers. Now we are witnessing the emergence of a new class of B2B hubs that go beyond automation; they also redesign workflow across businesses in specific industries. These workflow redesigners marry the efficiency gains from workflow automation to the effectiveness gains from the redesign of the processes by which businesses interact in B2B marketplaces. We'll illustrate what we mean by examining one site at the forefront of this trend: Autodaq.com.

Autodaq has created an Internet-based used-car auction market for large-volume sellers such as rental companies, lease finance companies,

and manufacturers. The buyers in this market are automobile dealers, not individuals. In the physical world, when a large-volume seller needs to dispose of a car, the seller must transport the car to a physical auction site. Dealers travel to the auction site to bid on the car. After the auction, the car is transported, for a second time, to the winning dealer.

Compare that process with the Autodaq system. Autodaq inspects, describes, and photographs the car, then puts it up for sale in an on-line auction. Dealers bid on the car from their computers, and the car is transported to the winning dealer. Autodaq has effectively redesigned the process by which used cars are remarketed: the automobile is transported once, not twice, and the dealers don't physically travel

to the auction location. As a result, Autodaq reduces the average time it takes a seller to dispose of a car from 30 days to less than ten days.

By using the Internet as a common platform for car dealers throughout the country, Autodaq also obtains the benefits of an on-line marketplace – a broader and more liquid arena in which dealers can find more of the cars they want and sellers can obtain better prices.

Autodaq estimates that the redesigned process shaves at least 50% off the remarketing costs for a used automobile – a savings of at least \$500 per automobile. With a market of more than 5 million used autos each year, the Autodaq workflow redesign and automation has the potential to generate annual savings of more than \$2.5 billion.

Reverse aggregators do face some challenges, though. They are not attractive to large buyers that already enjoy substantial volume discounts. And

Neutral e-hubs are the true market makers because they are equally attractive to buyers and sellers.

they have to contend with high sales and marketing costs relative to neutral e-hubs, because they focus on smaller buyers with lower revenue potential than the larger buyers targeted first by neutral hubs. Fragmented demand benefits reverse aggregators, but it also poses challenges for cost-effective customer acquisition.

Neutral and biased e-hubs differ in another important way. Neutral e-hubs are most likely to succeed in markets that are fragmented on both the buyer and seller sides. In such markets, neutral e-hubs add value by reducing transaction costs (aggregating) and improving matching (providing liquidity). If only one side of the market is fragmented, the bene-

fits are greatly reduced for the nonfragmented side. Biased e-hubs, in contrast, can succeed as long as one side of the transaction is fragmented. In fact, reverse aggregators like FOB.com add the most value when the supplier universe is relatively concentrated while the buyer universe is fragmented. In these situations, "leveling the playing field" for smaller buyers has significant value.

A Vast Opportunity

Because the B2B marketplace is changing so rapidly, many companies are stumbling to navigate through it. Our classification framework should provide some clarity by explaining what the different e-hubs do and how they add the most value, giving buyers, sellers, and market makers a map to the new landscape. We also hope that the framework helps entrepreneurs identify promising e-hub business models – ones that are both profitable and defensible.

The authors are investors in the following companies discussed in this article: Autodaq, CapacityWeb.com, e-Steel, FOB.com, iMark.com, PaperExchange.com, and PlasticsNet.com.

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