Developing Successful B2B Relationships

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A. Presentation Summaries

A.1. The Impact of the Internet on Supply Chain Management: Push-Pull, Exchanges, and Dynamic Pricing

Professor David Simchi-Levi, Professor of Engineering Systems, MIT

Professor David Simchi-Levi, Professor of Engineering Systems at MIT, described how the Internet enables a new supply chain paradigm, a push-pull paradigm that replaces the traditional push model. In the past, most companies operated by forecasting long-term demand, mass-producing inventories of product to fulfill the anticipated demand and then "pushing" the inventories on to the customer. The disadvantage of the push model is that production decisions are based on forecasts, not actual customer demand, which means that companies often end up with too much inventory or the wrong inventory. In contrast, the pull model is based on accurate demand, because it uses explicit demand signals from the customer. But companies traditionally were not able to respond quickly enough to that demand signal. The Internet, however, enables a new push-pull boundary. In this new push-pull model, parts inventory is replenished according to forecasts but assembly is based on customer demand. The push-pull system combines the best of both approaches, giving the accuracy of the pull system with the speed and stock availability of the push model.

The Push Model

Companies have traditionally used a push model to manage their supply chain -- making or stocking products with the expectation of "pushing" those products onto their customers. But, this push model is renowned for creating erratic flows in the supply chain. For example, consumer package goods giant Procter & Gamble noted the problem of erratic variations in its supply chain when it studied the flow of baby diapers. The rate at which babies use diapers is fairly constant. Yet, when retailers placed orders for diapers, their ordering patterns for diapers were slightly erratic, containing small variations in order volume that did not reflect the steady rate of consumption of diapers. P&G distributors filled these slightly erratic orders. The ordering patterns of the distributors, however, were even more erratic than those of the retailers. Furthermore, looking at its own production operations, P&G found that its patterns of production were even more erratic than the already erratic patterns of distributors' orders. This phenomenon of amplified variations as one moves up the supply chain is commonly called the "bullwhip effect."

The bullwhip effect is a natural, but unfortunate, consequence of the push model of supply chain management. In the push model, the participants in an supply chain each order, produce, and distribute goods in the hopes of selling product according to a forecast -- pushing the product on to the customer. Each participant in the supply chain creates their own long-term forecast, which it does not share with others. Any variation in the actual pattern of buying behavior is taken as evidence of a potentially larger change in long-term demand. Inventory policies amplify this variation. An uptick in orders leads to the perception that the company needs to produce a lot of inventory. That is, a slight uptick in retail orders is perceived as evidence of sales growth and
the need for even more product at a later date. Conversely, a drop in orders leads to the perception that the company has large amounts of excess inventory that it needs to get rid of. In the push model, supply chain participants use their increasingly flawed forecasts to make increasingly erratic inventory decisions. The result is increased costs (for inventory and transportation) and high levels of both stock-outs and overstocks.

The Pull Model

The pull model, by contrast, waits for demonstrable customer demand before making products. Under the pull model, a firm order by a customer triggers the minimal set of activities to satisfy that customer's demand (ordering raw materials, manufacturing the order, and shipping to that customer). Under the pull model, supply and demand tend to stay in balance (unless capacity is constrained).

The downside of the pure pull model is that customers must wait for their orders. In the pure pull model, a customer must wait for the raw materials procurement, the manufacturing, and the shipment of the order. A related downside of the pure pull model is that the company is at the mercy of suppliers to deliver the raw materials for each customer order. With the pure pull model, order cycle times can become both long and unpredictable as the impact of the customer's order winds its way up through the supply chain and the materials wind their way back down the supply chain.

The Push-Pull Model

Both of the preceding models have disadvantages. On the one hand, the push model is plagued by erroneous forecasts and erratic activities. On the other hand, the pull model often introduces unacceptable and unpredictable order cycle times. A compromise model, called the push-pull model, combines the best of each model, while ameliorating the drawbacks of each. The key is to use the push model for some aspects of the company's operation and the pull model for other aspects.

For example, Dell Computer has a hard time predicting how many customers will order any particular one of its myriad combinations of possible configurations (e.g., a 700 MHz computer with a 20 GB disk drive and 128 MB of RAM). Trying to forecast demand of every possible combination -- and then building an inventory of every combination -- would bring certain disaster. The company would face both stock-outs and over-stocks. A pure push model at Dell would force either an unacceptably limited product assortment or the risk of high inventories of rapidly obsolescing overstocks. Yet a pure pull model would create unacceptable order cycle times -- customers would have to wait for their hard-disks to come from assemblers in Malaysia or Taiwan.

Although Dell cannot accurately forecast PC configurations, it can more accurately forecast aggregate demand for components, such as total demand for 20 Gb disk drives across all the computer configurations that use them. Aggregate forecasts are more accurate because of what is known as "risk pooling" -- the statistical reduction in variation by averaging across the sources of variation. Thus, Dell uses the push model to efficiently order and stock components in bulk according to aggregate forecast. Then, Dell uses the pull model to quickly build each PC in response to customer orders. Because Dell can assemble a PC in a matter of hours, the customer
sees a very short delivery cycle. Dell uses the pull model for final assembly, when Dell can quickly and reliably satisfy customer orders. Dell uses the push model for component parts, when Dell can reliably forecast demand and order ahead of customer orders.

Many prominent companies besides Dell now use the push-pull model, carefully delineating parts of the business for push model operation and other parts for pull model operations. For example, Amazon.com and Peapod.com both use the push-pull model. Amazon uses the push model for its high-volume products for which it can reliably forecast demand. It stocks these high-volume products in its own warehouses so that it can quickly ship them in response to orders. At the same time, Amazon uses the pull model for lower-volume products, keeping no inventory of them and ordering them from distributors only after it has received the customer's order. For Amazon, the boundary between push and pull is between high volume and low volume products. Other companies, such as GM, are looking at the push-pull model as a means of both satisfying customer demand and avoiding excess inventories of unwanted models.

**Dynamic Pricing Models**

Pricing is a major element of any business relationship. Companies can also manage their supply chain through pricing. That is, companies can dynamically modulate prices to accomplish any of combination of three goals: to match incremental costs, to maximize profit margins, and to help match demand with supply. Dynamic pricing, sometimes called "yield management," means that different customers pay different prices at different times for what is essentially the same product. When capacity is constrained or when demand fluctuates, it makes sense to use dynamic pricing to increase profits during times of high demand. Companies also use dynamic pricing when they can segment the customer base (e.g., airlines charge business travelers more for weekday travel than they charge vacationers who include a Saturday-night stay).

Although dynamic pricing might make good business sense, it can create problems in customer loyalty and public relations. The notion that some people may be paying more (or less) for the same product leads every customer to wonder if they got a bad deal. For example, airlines, who use dynamic pricing extensively, are the subject of unfavorable news reports about how people in the same row on the same plane may be paying dramatically different prices.

Dynamic pricing is more acceptable in markets and industries that have a tradition of fluctuating prices. Commodity auctions and high prices for the latest top-performance PCs are two examples in which customers accept the fact that prices will vary. The rise of online auctions and price comparison websites may imply a return to the widespread use of dynamic pricing.

Dynamic pricing matters most when:

* there are constraints on capacity
* variability is high in demand or in capacity
* customer segmentation is possible (e.g., yield management in airlines)

For example, a study using data from GM compared dynamic pricing strategies (i.e., fixed production with dynamic pricing) and dynamic production strategies (i.e., dynamic production with fixed pricing). The study showed that the dynamic pricing strategy was superior because it removed variability in production while increasing speed. The dynamic pricing strategy lets
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companies control demand. Although dynamic pricing is not for everyone, it works especially well for products with short shelf life or for trendy products like fashion items.

A.2. The Wise Abuse of Market Power: Coordination Decisions in Supply Chains

Jim Rice, Director, MIT Integrated Supply Chain Management Program

Jim Hines, Senior Lecturer, Sloan School of Management

We often think of the dominant player in a supply chain as having a deleterious effect on the chain, in that the player will use its influence to its own benefit and to the detriment of the other players. There is a common image of the 900-pound gorilla that squeezes suppliers and bullies customers. In fact, however, supply chains with dominant players have the capacity to outperform supply chains without a dominant player. The key aspect is how the dominant player uses its power. Jim Rice and Jim Hines put forth the "wise abuse" view of market power, in which dominant firms can exercise their power to bring efficiencies and discipline to a supply chain in a way that improves the performance of the chain to the benefit of all players. Taking a "wise abuse" approach means that the dominant firm does not view its goal as increasing its own slice of the market "pie," but as increasing the size of the market pie for all players.

Admittedly, the wise use of power is not the usual use of power. Currently, dominant companies often use their power to exact a short-term advantage that benefits the dominant firm at the expense of the other firms, such as by shifting inventory costs along the chain or constraining supply and demand. In contrast, an example of the wise abuse of power is when the dominant firm sets technology standards that enable integration along the chain, or when it exerts its influence on other players to improve their ordering process.

Using system dynamics modeling to understand supply chain dynamics reveals how an action such as shifting inventory to a supplier can help the whole chain, while shifting it to a customer would hurt the chain. System dynamics is a methodology for understanding the qualitative and quantitative behavior of the system. This involves documenting and analyzing the loops of cause and effect in a system -- understanding how an increase or decrease of one quantity in the system propagates a change to other quantities in the system.

Should Dominant Firms Foist Inventory onto Subordinates?

Inventory holding policies are an important element of any B2B relationship: should the supplier or the customer company hold inventory of the goods transacted in that link of the supply chain? Dominant firms often insist that the subordinate firm hold the inventory, which reduces the inventory costs of the dominant firm while raising inventory costs for the subordinate firm. System dynamics can be used to analyze the overall impact of this tendency and assess if such behavior by dominant firms is a wise or unwise abuse of power.

Examples: PCs and Soft Drinks

Using the PC supply chain as an example, if a supplier holds the inventory, the supplier can postpone making customizations and therefore reduce obsolescence. Suppliers can reassemble
components in a way that does not obsolete the PC board. Suppliers have greater flexibility in reassembly than their customers, such as Dell, would have. So there is motivation for the inventory to be held at the suppliers, pooling demand and manufacturing risk such that supply-chain wide obsolescence decreases and the profit pie for the whole chain grows.

Similarly, if Coca-Cola shifts its inventory of plastic resin (which Coca-Cola uses for its bottles) back to Eastman Chemical, it pools demand risk. If demand in South America goes down and demand in Europe goes up, then the supplier can ship the resin to the place where it is in demand, rather than if Coca-Cola held onto the inventory and was holding it in South America and had to ship it to Europe. The chain would be paying transport costs twice.

**Key: Risk Pooling is Good**

Companies can pool risk by shifting inventory to the supplier, which lets the chain trade off demand and manufacturing problems. The chain can hold inventory at the supplier in case of either manufacturing or demand problems. Since it is unlikely that both of these problems will occur at the same time, inventory only needs to be held in one place to mitigate the risk of both problems.

**Future Research**

Dr. Hines and Mr. Rice are in the early stages of their research on dominance in supply chains, and they asked sponsors for reactions to their initial research. Some questions and applications which participants saw were:

* How can a company build dominance? For example, P&G is dominant in the US, but Unilever is dominant in South America. How can Unilever leverage that global advantage?
* What is the role of consortia? (Several smaller firms could join together to counterbalance the influence of a dominant firm. Also, supply chains which have no dominant players could create a consortium to create a wise abuse of power.)
* How should non-dominant companies behave in order to get best advantage out of a chain when they are not the dominant player?

eBusiness also impacts the dominance of companies in B2B relationships. Possible impacts might include:

* may make it easier for a dominant firm to influence a change
* may facilitate wise abuse of power
* may uncover and enable new solutions for using dominant power
* may enable the creation of consortia that can act as a dominant power.


Gabriel Bitran, Professor and Deputy Dean, MIT Sloan School of Management

Prof. Bitran discussed the results of his research, sponsored by UPS, that looked at the enablers and obstacles that will accelerate or decelerate ebusiness. UPS had noted that the shift to
ebusiness would greater improve the company's fortunes -- ebusiness meant an increase in parcel-sized shipments versus bulk shipments. The objective of the research was to gain an understanding of the dynamics of channel shift from traditional business to ebusiness, identifying the enablers and barriers of this shift. UPS would use the research to look for means by which UPS could accelerate the adoption of ebusiness.

**Barrier: No Returns = No eBusiness**

One the barriers that Prof. Bitran's research uncovered was that because customers can't touch or interact with products when ordering online, they are more reluctant to purchase the products. Prof. Bitran described how UPS can turn this barrier into a strategic value-added service by focusing on full service reverse logistics and becoming a trusted brand/agent for ecommerce. Imagine being displeased with a product you bought over the Internet and UPS saying, "don't worry, give the product to us, we'll handle the return and we'll credit your account." UPS has the opportunity to offer an end-to-end solution that handles the flow of not only physical goods, but also of information and money. UPS moves the physical product, but it also knows where that product is during that movement, and it can handle the payment associated with that product, in essence converging three previously disparate pieces. This bundled approach offers a unique and valuable proposition to the customer. It also helps e-tailers who do not have retail locations at which to handle returns.

**The Challenge of Service: Making the Intangible Consistent**

UPS faces an additional challenge in that it offers services. Services, unlike physical products, are intangible. Humans collect information about the world through their senses, so it is hard to make sense of the intangible. Services are perishable and can't be inventoried. Worse, the simultaneity of services means that services are produced and consumed at the same time -- there is no opportunity to fix the services. Packages are delivered by people, and people are not as consistent as mass-produced products -- the quality of service can vary. Moving to ebusiness means that many elements of service (such as ordering, payment, product information and status inquiries) can be delivered through the web. This gives companies a way to provide extremely consistent service, if the companies deploy a well-designed interface with reliable infrastructure.

**Summary: Impact of eBusiness**

UPS saw the Internet's potential to change its business, namely an explosion in the numbers of parcels moving in supply chains as companies shifted from "push" model bulk shipping to "pull" model parcel shipping. The Internet brings new dimensions of commerce, enabling new roles for both buyers and sellers as well as movements of information and funds flow. Finally, the Internet shifts power to buyers by enabling new levels of price transparency that were previously too expensive to execute. In short, the Internet accelerates business transformation to a more customer-centric, technology-enabled era. This transform includes the following shifts:

* from supply chain to demand chain (the need to create value to attract the customer)
* from product-driven to customer-driven (7x24 availability, price transparency, ease of comparison shopping)
* from slow-to-change to flexibility and modularity (hypercompetition)
A.4. Using Pricing, Bundling, and Tailored Product/Service Design to Create Strategic Relationships without Bidding Wars

Gabriel Bitran, Professor and Deputy Dean, MIT Sloan School of Management

Pricing is a crucial issue in B2B relationships. On the surface, eBusiness appears to shift the balance of power toward the customer. For sourcing and purchasing, businesses can use the Internet to disseminate RFQs more broadly, to connect to global low-cost suppliers, or to conduct reverse auctions. Such eBusiness tactics erode supplier's revenues and profit margins by commoditizing the supplier's products. Yet eBusiness also provides the tools to fight commoditization. Companies can differentiate themselves by creating bundles of products and services that address specific customer needs. The key to gaining advantage from these unique bundles, however, is to know how to price them in a way that maximizes profit while maximizing customer satisfaction with the offering. This presentation focused on HP as a case study of Prof. Bitran's work in two specific areas: building strategic B2B relationships and making pricing/bundling decisions.

Part 1: Big B to Little b

HP sells many products and services to small and medium size businesses (SMBs). HP's computers, servers, and work-group printers are popular products for businesses of all sizes. The question for HP is how to sell effectively to these individually small but collectively large customers.

Small Business is Big eBusiness

A special class of B2B relationships are the businesses relationships with customers who are small and medium size businesses (SMBs). HP defines SMBs as businesses with fewer than 20 people. Although these companies are small as individual businesses, collectively these businesses account for one half of the economy in terms of employment (53% of non-farm workforce), sales (47% of sales), and total contribution to the U.S. economy (51% of GDP).

SMBs are ideal targets of B2B initiatives for three reasons. First, SMBs buy online -- more than half (52%) of SMBs are online and these online SMS do two thirds (68%) of their purchasing via the Internet. Second, the Internet lowers cost of service, which means that eBusiness lowers the cost of creating a relationship with these smaller business customers. Finally, SMBs tend to be loyal (95% prefer to buy from vendor with whom they have a prior relationship). In short, eBusiness lets large companies like HP profitably target SMBs as B2B customers.

Quality of Experience vs. Quality of Service

The way to build strategic relationships with customers is to understand their needs and then tailor products and services to meet those needs. One of the common mistakes companies make is to focus on quality of service measures, focusing onto ever-smaller improvements. The movement from 99.9% to 99.99% levels of service will push costs ten times higher while creating little perception of improvement to the client. Instead, Prof. Bitran suggested focusing
on "quality of experience" rather than quality of service. Overall, customer satisfaction is more important than the diminishing returns of quality-of-service measures.

**Goal: Join the Ecosystem of the Small Business Customer**

For HP to be successful in selling to small businesses, it needs to implement an ecosystem orientation. That is, it must move from a product orientation to a service orientation, addressing the computing needs of SMBs in a holistic manner. SMBs need to identify HP as their strategic partner, a partner who unites technology trends, services, communications and transactions through e-service. (An e-service is an electronic service that completes tasks and solves problems.) HP will become SMB's strategic partner by providing a value-added orchestration of services, offering a mix of products and services -- even competitor products and services -- in order to deliver solutions to customers and keep their trust.

**Summary: Targeting Small and Medium Businesses**

The keys to creating successful B2"b" eBusiness relationships include:

* build on pre-existing relationships, because most eBusiness is done between companies who have offline relationships as well as online ones
* many of the lessons of B2C apply to SMBs
* manage the lifecycle, not transactions
* personalize and continue to build the relationship (at all times)
* be consistent across channels (this is difficult, but IT helps)
* go direct to customer -- ads through third-party websites do not provide much

**Part 2: Pricing Decisions**

The Internet brings new challenges and opportunities to pricing for companies such as HP. Pricing decisions on products must consider the context of pricing in both direct and indirect channels as well as pricing across coupled products (such as printers and the toner cartridges that go into them). The opportunity for bundling services with products has expanded, along with a host of new services enabled by the Internet, such as online consulting and online tech support. Finally, HP must decide how to price new offerings such as Internet Data Centers that combine computing resources, data storage and data transfer services. Making all these decisions involves examining how to effectively bundle services with hardware.

Pricing is important for many reasons. Pricing decisions have an immediate impact on revenue and profits, of course, but other trends increase the pressure on pricing decisions

* commoditization: many products and services have substitutes and the Internet makes it easier for customers to find these substitutes
* product life cycles are getting shorter: companies have less time to reap profits from hard-fought innovations
* brand loyalty is diminishing: greater access to objective information lessens the importance of brand in making purchase decisions
* dynamic pricing and pricing differentiation are becoming more accepted across industries
One of the particular challenges facing HP is how to price its computing resources. For example, HP runs Internet Data Centers for companies. Currently, HP is using flat-rate pricing or per-megabyte pricing, but the company would like to develop a pricing scheme that drives demand and that helps HP determine the ROI for an Internet Data Center. Another challenge is how to price services like online consulting and information. There is no cost to replicating the information available online, so HP is exploring how to establish the value of these services to the customer.

**HP's 3-Phase Pricing Methodology**

Dirk Beyer of HP Labs Decision Technologies Group explained HP’s 3-phased approach to pricing decisions. The three phases are arranged hierarchically and made at different levels of the HP organization with different frequency. The first phase is called the Pricing Paradigm. In this phase, the firm makes decisions such as whether to be a price leader or follower, whether pricing should be cost-based or value based, whether there should be pricing differentiation, and whether prices should be determined per product/service or on a usage basis.

The second phase is called the Pricing Scheme, and decisions at this level are both strategic and tactical. The decisions include: list pricing, discounts, rebates, negotiated pricing, and price protection policies. These decisions are made every six months. The third phase, the Pricing Implementation phase, takes place at the tactical level and focuses on determining the pricing scheme parameters. This phase involves extensive use of mathematical models.

**Pricing Laptops: Optimizing Bundles of Features**

Working with the specific case of pricing HP laptops, the research explored using pricing not just to sell the product, but to position the product and indeed to design it. The research attempts to define which bundle to build using regression techniques to understand customer value. In particular, HP assumes that the value of a laptop is the sum of the values of its component parts (such as processor, screen size, etc.). Currently, HP uses dealer surveys and third-party data in addition to its own data to determine the ratio of value increment compared to cost increment. For example, bundling higher-end processors into the laptop offers a poor ratio of value to cost. Higher-end processors add substantial cost, raising the price of the laptop, but customers do not perceive much value gained in return. In contrast, offering a larger screen size yields a much better ratio, because customers' perceived value of the larger screen exceeds the incremental cost of the screen.

The result is that every bundle has three attributes: customer attractiveness, price, and cost. HP's goal is to pick some modest number of bundles that cover the marketspace and position those bundles at a price point that maximizes profit. To optimize the bundles, HP is using multinomial logit with the utility function of price, cost, and value-of-features. Research shows that analytical techniques are more powerful and consistent than human intuition for weighing the large numbers of statistical factors inherent in price optimization problems.
B. Themes

B.1. eBusiness and the Push for the Pull Model

eBusinesses are adjusting the boundary between the pull-oriented side and push-oriented side of their business. In the past, most companies operated using a pure push model: making product to forecast, storing it in inventory and then "pushing" it on to the customer. By contrast, the "pull" model waits for explicit signals of demand from the customer -- the customer pulls from the supplier. In the past, only companies that faced extreme uncertainty in demand, high levels of customization, or extraordinary costs in production used the pull model (e.g., aircraft manufacturing and custom engineering).

The Bullwhip Effect in Traditional Push-based Supply Chains

Formal systems dynamic models, real-world experience, and informal simulation games (such as the beer game) all show that variability tends to increase as one moves up the supply chain. Babies may consume diapers at a constant rate, but retail sales show spikes and cycles as consumers come to shop and stock up. Order patterns from distributor sales have even more variability as retailers order in quantity, preorder large quantities to support an upcoming promotion, or cease ordering while selling off excess inventory. Production plans become highly variable to cope with variations in sales and to minimize the changeover of manufacturing lines from one product to another. At the end of the chain, the suppliers see the greatest variability. This amplification of variability, called the bullwhip effect, arises from delays in the supply chain and push-based business models (i.e., the use of forecasting and make-to-stock).

Using Pull to Reduce the Bullwhip Effect

The advantages of the pull model arise from lower inventory costs and reduced risk of overstocks. The pull model also reduces the bullwhip effect, which is caused by the interaction of forecasting and inventory management policies in the push model. Under the push model small changes in order volume cause larger changes in forecasts, perceived inventory needs, and upstream supply chain activities. Reducing the bullwhip effect cures a host of ills in the supply chain that lead to excessive production costs and excess inventory.

But the pull model is not a panacea. The two greatest downsides of the pull model are lead time and the inefficiencies of smaller batch sizes. In a pull-based model, the supplier waits for the customer to submit an order, and the customer waits for the supplier to fulfill the order. Long lead-times during which the supplier processes the customer's order, makes to order, and ships the product lead to delays before the customer receives the product. Often, these long lead times are unacceptable to customers. Careful design of the boundary between the pull-side and push-side of the business can create a solution that eliminates the inefficiencies of Push while speeding the lead times of Pull.

eBusiness Enables the Pull Model

eBusiness techniques enable the pull model in numerous ways. These include:

* reducing internal coordination costs
* accelerating the flow of information in and between companies to reduce lead times
* enabling more complex management of production (from small numbers of fixed make-to-stock production runs to large numbers of make-to-order activities)

One of the causes of the bullwhip effect is that, in the past, companies had no visibility into the actions of their customers. Each customer would issue a stream of orders to suppliers, and suppliers would have to guess the meaning of those orders. For example, a burst of large orders might make the supplier think that long-term demand had risen. These presumed changes in demand, when fed into the supplier's inventory models, would, in turn, cause the supplier to radically boost needed inventories and accelerate production, and which would lead to massive orders of raw materials from further up the supply chain.

But eBusiness is changing this guesswork by replacing it with information-sharing between supply chain participants. With greater information-sharing, a customer can tell the supplier about an upcoming promotion planned for a particular product. This advance information lets the supplier know that the demand for the product will spike when the promotion begins. Communication between suppliers and customers improves coordination throughout the supply chain, and ebusiness fosters this communication by providing 7x24 information sharing capability as well as making system-to-system integration between companies possible.

**B.2. Dominance: In the Eye of the Contract Holder**

Dominance is a key attribute of B2B relationships and is defined by the relative power of the business partners to set prices and terms. Yet, dominance is not a binary property and, strictly speaking, it is not an intrinsic property of a company. Rather, dominance is a property of each B2B relationship between two supply chain partners. Dominance is a function of the relative level of business between the supplier and the customer and the options which suppliers and customers have in transacting with other partners. For example, a sole-source supplier of a unique patented product has more dominance than a supplier of a generic commodity. Likewise, a major large-volume customer has more dominance than a minor low-volume customer. Firms that are dominant enjoy the right (and responsibility) to set prices and terms in their B2B relationships.

Although dominance is a property of individual B2B relationships, and it can vary across the various relationships that a company has, some companies clearly hold dominant positions across most of their relationships. Companies with a top-ranked, high percentage market position (such as Wal-Mart in retail, or P&G in U.S. consumer goods) are often dominant across most of their supply chain relationships. Although a company such as Intel may be dominant in PC microprocessors and a company such as Dell may be dominant with respect to its suppliers, dominance is not guaranteed in all relationships. For example, Jim Rice related the story of how Dell employees complained about the dominance of Intel and Intel employees complained about the dominance of Dell. Each thought the other to be the despot of their mutual supply chain.
Impact of eBusiness on Dominance

eBusiness both lowers and raises the ability of firms to dominate their respective supply chains. eBusiness lowers dominance by lowering the search cost to finding replacements. If suppliers can find new global customers through eBusiness, they are less at the mercy of a dominant customer. In contrast, if a customer can find alternative suppliers (via reverse auctions), the customers are less at the mercy of a dominant sole-source supplier. eBusiness helps subordinate supply chain partners to find alternatives to an odious dominant partner.

But, eBusiness also raises dominance via the same mechanisms that it reduces dominance. That a dominant customer can hold the threat of alternative suppliers (found on the Internet or via a reverse auction) makes that customer more dominant. That a dominant supplier finds more customers for scarce, valued products (via new eBusiness sales channels and auctions) makes that supplier more dominant. Although, in theory, eBusiness appears to have a net-neutral impact on dominance, in practice, asymmetries in the adoption of eBusiness will determine actual changes in dominance.

Measuring Benevolence: Growing the Pie vs. Taking a Bigger Slice

Whether a dominant company exemplifies wise abuse of power or just plain greed depends on the scope and term of the impact of the action. A greedy dominant company seeks to grow its slice of the economic pie at the expense of other companies. In contrast, a benevolent company uses its dominance to increase the size of the pie for both itself and all its partners. Whereas a greedy company looks to cut costs for next quarter's earnings report, the benevolent company plots a long-term, sustainable growth model for its ecosystem. Although every company must survive the next quarter if it is to survive the next decade, benevolent companies are more likely to sacrifice short-term performance to reap long-term gain.

The point is that decisions regarding B2B relationships (e.g., pricing, terms, inventory holding policies, etc.) can be either more or less than zero-sum. Such decisions can be less than zero sum if the decision creates extensive long-term damage for a minor short-term gain. Or such decisions can be more than zero-sum if the decision increases the long-term efficiency and productivity of the entire supply chain. System dynamics is a useful methodology for analyzing the bigger picture of B2B relationships and assessing whether a particular abuse of power is actually wise or not.

B.3. Pricing: Dynamic, Differentiated, or Discriminatory?

eBusiness provides several mechanisms for more complex strategies, tactics, and implementations of pricing systems. First, the Internet means that companies can now get the data needed to run powerful optimization methods that replace faulty intuition about optimal pricing. For example, HP is researching nonlinear models for pricing the features bundled into its laptops. HP would like to create an optimal portfolio of laptop bundles that cover the market space with a minimal number of highest-valued, least-cost product combinations. Second, internal coordination and ERP systems help companies adjust pricing to match anticipated sales and to utilize scarce (or abundant) capacity or resources. Third, online dissemination of price lists mean that companies can adjust prices more often and for more varied reasons. Finally, a
wider range of companies can even implement ultra-dynamic, complex pricing schemes, such as auctions, yield management, or real-time pay-per-use schemes.

**Powerful Pricing Pressures: Yielding and Squeezing**

Several audience members commented unfavorably on the price-setting activities of dominant members of supply chains, namely yield management and price squeezing. The practice of yield management, common in airline and hotel industry, was especially detested.

**Yielding to Yield Management**

Yield management is a practice common to the travel industry in which, for example, the same seat on the same flight (or same hotel room on the same night) might sell for $150 or $1500 depending on who bought it and when. The audience members, as frequent business travelers, often find themselves the unlucky recipient of the $1500 seat/$300 hotel room and complain about this type of price discrimination.

The counterargument, in defense of yield management, is threefold. First, although it looks like business travelers buys the "same seat" as leisure travelers, in fact they do not. Business travelers pay for the privilege of last-minute booking in which the airline forgoes selling the seat at a earlier date in order to hold a seat for a business traveler (who may or may not buy that seat and may or may not show up for the flight). Second, yield management lets the seller capture more of the "value" of their product -- if a last minute business trip is not worth $1500, then business travelers would not fly. Indeed, in the era of eBusiness, on might expect some business travelers to choose virtual travel over expensive physical travel. Third, yield management actually allows more customers to enjoy the service or product. Fewer people would fly if every ticket were priced at some universal average price of, say, $500. Given the miserable state of profit margins in the airline industry (even during the good times), yield management is perhaps a necessity.

Whether customers (both consumers and business customers) will accept analogs to yield management in other parts of the economy is unknown. Everyone is comfortable with telecommunications rates that vary by time of day and day of week. Research by Prof. Simchi-Levi shows that companies can use dynamic pricing for the benefit of all -- both reducing the average price paid by customers while increasing profits and revenues to the company. This research compared two strategies for coping with variable levels of demand: 1) fixed prices with variable production level, vs. 2) dynamic prices with a fixed production level. Dynamic pricing with fixed production was found to be superior.

Besides the travel industry, which has unavoidably fixed production levels (e.g., a 300-room hotel creates 300-room-nights every day) other industries, such as fashion and car manufacturing, also have effectively fixed production and long lead-times that make demand-based production infeasible or provide economic rationale for steady production levels. Currently, these industries use weak versions of dynamic pricing. That is, they use only price-lowering promotions and discounts to clear excessive inventory. Yet these companies could use fully dynamic pricing (both raising and lowering prices) to help match supply and demand over time.
The Dark-Side: Is Dynamic Pricing a Disservice?

As the audience's reaction suggests, a major challenge for dynamic pricing is that, at a very basic level, dynamic pricing can be at odds with quality of experience. Bitran argued that as eBusiness moves the economy from one of purely tangible goods to one of service-enhanced goods, the intangible quality of the service component rises in importance. One of the most important elements of a customer's purchase experience is their perception of the "deal" -- did they get the best possible price. The challenge for airlines, hoteliers and anyone else who adopts dynamic pricing strategies like yield management is in convincing customers that they were not taken advantage of when they paid a high price.

eBusiness exacerbates this challenge because it makes it extremely easy for customers to uncover price minima, i.e., the lowest, "as-low-as" price. This is a major mechanism by which eBusiness increases the power of the buyer. Low online search costs, comparison engines, and online reverse auctions mean that both businesses and consumers enjoy new-found power over suppliers. The experience of the deal can even change in time -- an online travel site might e-mail the customer with a new low fare that is less than the customer paid for a recent trip. Similarly, a PC buyer might find that their recent purchase is now selling at a heavy discount. At the same time, eBusiness acclimatizes customers to dynamic pricing by making new dynamic pricing schemes an acceptable mode of transaction. Consumer sites such as eBay and Priceline, and business sites such as FreeMarkets, will affect how customers view dynamic pricing.

One of the major objections to the proliferation of complex dynamic pricing schemes is that dynamic pricing schemes increase the tangible and intangible costs of purchasing. That sellers use complex pricing schemes forces buyers to spend more effort looking for price minima -- e.g., trying many different itineraries in order to reduce the price of a ticket or in wondering if they should buy now or wait for a better price. One audience member thought that buying new cars was hard enough without adding dynamic pricing into the equation. Wide variations in prices create stress for buyers and lowers their quality of experience. But, eBusiness ameliorates the stress in two ways. First, eBusiness tools help buyers search for the best deal -- the tools create price transparency by providing detailed information about pricing and options. Second, new eBusiness models permit the rise of aggregators and online marketplaces that accelerate the buyer's process of finding a suitable supplier.

Price Squeezing: Death Sentence or Tough Love

A second example of unilateral price action occurs when dominant customers impose price cuts on suppliers. eBusiness can increase the prevalence of this behavior as companies turn to online B2B auctions as a means of ferreting out lower-cost suppliers or gathering price data for use in negotiations with suppliers.

Squeezing suppliers for price concessions can be either a margin-crushing action by a profit-grabbing monopsonist or the tough-love hug of a benevolent despot. On the one hand, unmitigated price squeezing irreparably harms suppliers. Without sufficient gross margins, the squeezed supplier cannot invest in R&D, new equipment, training, or high-quality personnel. Moreover, low margins and poor earnings growth harm the supplier's chances for raising capital for business expansion and business improvement. Price squeezing also pressures the supplier to cut corners or take risks in the quality and safety of the supplied components. If a supply chain
is only as strong as its weakest link, then excessive price squeezing only serves to weaken the weakest links.

On the other hand, if the future world is one of supply chain competing against supply chain, then the dominate members of the chain have a moral and fiduciary duty to impose the tough tactics that maintain the competitiveness of the chain. Companies such as Dell and Wal-Mart view aggressive selection and negotiation with suppliers as one of the key elements of their success -- if one supplier cannot deliver the required product, price and service levels, then that supplier does not deserve to be in business. EBusiness accelerates the movement to chain-vs.-chain competition by supporting the creation of the extended-enterprise business models. Using the Internet for low-cost, real-time coordination means that each supply chain can act as a coherent competitive unit. Dominant firms play a crucial and beneficial role in shaping these extended enterprises by forcing the adoption of eBusiness links, sophisticated management tools, and collaborating on forecasting and planning.

Price Diversity: Reality

Dynamic pricing works because price diversity is a reality -- different customers are willing to pay different prices at different times for ostensibly identical goods and services. For example, on the one hand, a business might gladly pay $1500 for an airline ticket to help close a multi-million dollar deal while, on the other hand, a consumer might not pay $300 to fly to a friend's birthday. Likewise, early adopters of new technology may pay premium prices for the latest improvements in speed and performance. Dynamic pricing, at some level, is a major mechanism by which capitalist markets efficiently allocate scarce resources.

Understanding Price Diversity Using eBusiness Techniques

eBusiness techniques helps companies understand price diversity in three ways. These three ways correspond to Prof. Bitran's 3-element cycle of success. The cycle includes: 1) understanding the customer, leading to 2) designing the product or service, leading to 3) creating an interface with the customer that leads back to further understanding of the customer. First, eBusiness helps companies understand the diversity of customers and their respective price sensitivities. The Internet helps companies collect data on the price/utility functions of customers, to share that data within the company, and to analyze the data to understand both customer segmentation and pricing sensitivity.

Second, eBusiness helps companies design the price-related portions of products and services. EBusiness lets companies create and implement new price schemes such as pay-per-use, auctions, and complex conditional pricing schemes such as customer-specific price lists or yield management. Internally-applied eBusiness technologies help the various departments of a company to collaborate to create pricing mechanisms that reflect a range of issues (from the underlying costs of raw materials to the marketing messages of the company).

Third, eBusiness helps companies create better interfaces to customers. Online search tools, comparison engines, and survey tools elicit valuable data from customers with a minimum of effort by those customers. These interfaces can be backed with powerful tools such as conjoint analysis, online agents, or collaborative filtering that help customers select products even as the tools gather information about customer preferences. The web interface, and the clickstream
data that it generates, offers companies reams of useful customer preference data. The Internet
replaces more cumbersome, informal interfaces such as customer surveys and focus groups with
rigorous, thorough data on actual customer behavior.

For example, HP can optimize the pricing of laptop computers by buying transaction data on
laptop sales. Third-party companies now aggregate, annotate, and sell sales data. HP can see
how much customers are willing to pay for competitor's laptops. HP then merges this data with
data on the raw materials costs of various laptop options to uncover which laptop features have
the greatest profit potential (e.g., the value of adding a better screen to a laptop might be several
times the incremental cost, leading to an extremely high incremental profit, while a
corresponding upgrade to the processor has negligible or even negative incremental profit).
Using multinomial logit, HP can determine the best combination of laptop feature bundles that
fill the marketspace without offering an excessive number of laptop variants.

B.4. Service

As companies adopt eBusiness, service plays a greater role. Indeed, the entire notion of a B2B
relationship suggests that there is more to business than just a transactional exchange of physical
goods for money. Moreover, as companies move from the push model to a pull model or hybrid
push-pull model, the role of service increases in importance. The pull model is more service-
intensive than is the push model for three reasons. First, the pull model increases the volume of
services -- a pull-oriented company will ship larger numbers of smaller shipments instead of a
few bulk shipments. Second, the customer becomes more sensitive to low-quality of service
because in the pull model, the customer rarely holds much inventory. Third, the pull model
requires faster execution of service, which requires more intensive coordination of service -- it is
harder to get a small shipment into the hands of the customer in 48 hours than it is to deliver a
bulk shipment sometime in the next 4 to 6 weeks. Fortunately, eBusiness gives companies the
external and internal tools to improve the volumes, consistency, and timeliness of services that
the pull model requires.

QoE vs. QoS: Intangible Subjectivity beats Measurable Objectivity

Although companies can create tangible, measurable Quality of Service (QoS) metrics (e.g.,
percentage of on-time delivery, order fulfillment cycle time, order accuracy, percentage of
stockouts, etc.), Prof Bitran argues that intangible Quality of Experience (QoE) matters more.
This argument takes two forms. First, objective QoS metrics tend to devolve into an
increasingly expensive quest for the next "9" (e.g., from 99% on-time to 99.9% on-time). Each
added "9" represents a 10-fold reduction in mistakes and an order of magnitude increase in the
cost. Second, the experience of the service creates a more lasting human memory than do the
cold hard facts of the service metrics.

QoE More Important to Small Business

Quality of Experience is especially important with B2B customers who are small and medium
size businesses. The nature of smaller businesses, in which one or a small number of decision
makers have intimate knowledge of each B2B supplier relationship, makes them act much more
like consumers. In contrast, bigger businesses have multiple layers such that the frontline end-
user of some supplier's product or service may be divorced from the manager who chose that supplier. This makes bigger businesses more amenable to objective measures of service because decision makers are more insulated from intangible quality of experience (they just see the PowerPoint presentation that reports the objective quality levels). Although doing business with big business seems very attractive, companies ignore small business at their own risk. Small and medium sized businesses account for half of the U.S. economy. The key to creating a profitable relationship with a smaller business customer is to leverage the low-cost of service inherent in web-based eBusiness methods.

**Low QoE for Arrogant Dominant Firms**

Intangible effects also play a role in the perception of dominant companies. When Rice and Hines discuss the notion of wise abuse of power, it may be the intangible arrogance of dominant companies that people object to as much as the tangible policies of dominant companies. That dominant companies think they know what is best for their B2B partners overshadows the potential that their actions to enforce standards, discipline, and competitive excellence may really be what is best for these subordinate partners. At issue is whether dominant companies act as mentors or as dictators -- creating either a high or low quality of experience for their subordinate B2B partners.

**Delivery of Services: Using eBusiness to Create High QoE**

Prof. Bitran admits that creating high Quality of Experience is difficult because of the simultaneity of services -- service is consumed at the point of creation and the point of creation is at the frontline of the organization. Given this simultaneity, there is no opportunity to "fix" the service or even to supervise it. Whereas objective QoS seems to be under the control of management, QoE is under the control of frontline personnel and processes. Management has a harder time controlling services because services cannot be pre-created, inventoried, assayed, and corrected. Management has more control to create objective SLAs (Service Level Agreements) and less control over surly or apathetic frontline service personnel. Yet the subjective quality of the experience at customer contact points is extremely important to a B2B relationship (vs. a more anonymous transactional approach to business).

Fortunately, eBusiness moves many elements of service to the web, where service can be extremely consistent (assuming the company deploys a well-designed interface on a reliable web infrastructure). Companies can mediate many aspects of service of B2B relationships using the Internet, including online support for ordering, payment, order status, product information, etc. Yet some aspects of service inevitably fall of the shoulders of frontline personnel (salesforce, delivery personnel, and technical staff that support custom engineering, installation, and repair of products). In a service-oriented competitive environment, these staff still define major segments of the customer's experience and thus define much of the competitiveness of the company that they represent.

The web provides a way to accelerate the "cycle of success" -- a framework which Prof Bitran introduced. In this cycle, the first step is understanding the customer, which means collecting information. The second step is to design products and services (knowing what to do with the information collected.) The final step, which closes the cycle, is to design the interface with the customer such that the interface is capable of understanding the customer. Designing a good
interface involves thinking about how to stimulate the customers to provide information which the firm can use to better understand the customer and to design more tailored solutions, thereby continuing the cycle of success. eBusiness accelerates this cycle because the web can be used to collect information about the customer, and speed that information to all points in the firm that can act upon that information.