ROXANA VILLA

The other end of the **supply chain**

Jan Holmström, William E. Hoover Jr., Perttu Louhiluoto, and Antti Vasara

By tweaking the demand-supply chain, suppliers can offer their customers completely new value propositions and improve their own operations—without having to weigh the benefits of customer service against its cost.

The idea that suppliers should work much more closely with customers to give them better value is no longer a new one, as anyone who regularly follows the automotive industry knows. Yet close partnerships of this kind are still not at all common, largely because, until quite recently, integrating the information systems of two or more companies was a lengthy, expensive, and technically difficult process.

Fortunately, the recent widespread adoption of enterprise resource-planning systems, and the still more recent rise of the Internet, have made it much easier and cheaper for customers and suppliers to exchange data. Does this development prefigure the emergence of closer, more committed relationships? Closer, yes; more committed, no. In the world of electronic commerce, customers can easily find the best price and will choose their suppliers on that basis—unless they want (and are willing to pay for) something

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beyond it. Suppliers that can credibly promise to improve their customers' performance can avoid the commodity trap and reap cost benefits. The means to this end is supply-chain innovation.

Improving your customers' performance

In the past, suppliers reengineered only their end of the supply chain, by reducing obsolete inventory or inventory in general, cutting throughput times, and so forth. But what if a supplier could adjust its supply chains in ways that improved the service its customers received and thus their performance? This kind of reengineering is much trickier.

Most of the changes that suppliers implement in their supply chains **do not add much value** from their customers' point of view

In reality, most of the changes that suppliers implement don't add much value from the customer's point of view. A supplier, for example, might typically cut its inventory by reducing the variety of its products—which isn't very helpful for the customer or for the customer's customer. Neither is making (or assembling to order) products that the supplier formerly delivered from stock, since that approach intermittently increases delivery times. Even so, the cause isn't hopeless: by mastering the demand-supply chain, suppliers can design mutually beneficial supply chain systems for particular customers.

From supplier to customer

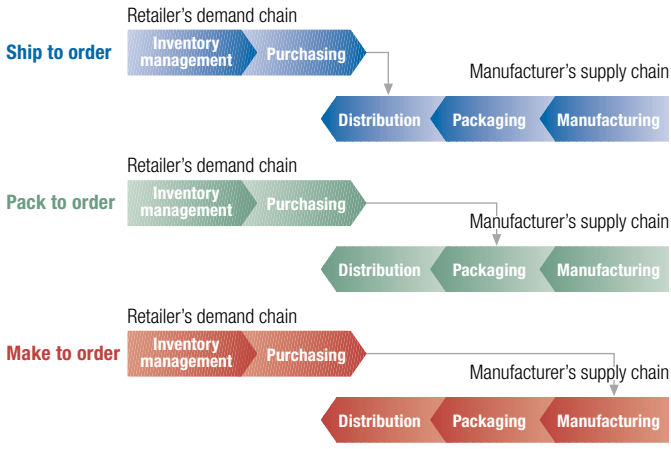
A supply chain is the process of transferring goods from their points of origin to markets or to end consumers. The supply chain of a packaged consumer goods manufacturer, for instance, comprises manufacturing, packaging, distribution, warehousing, and retailing. The concept of the customer's demand chain, which transfers demand from markets to suppliers, is significantly less familiar. To give one example, a retailer's demand chain would consist of assortment planning (deciding what to sell), inventory management (deciding the quantity of supplies needed), and the actual purchase. Together, these two chains form the demand-supply chain. They are linked in two places—the order penetration point and the value-offering point.

The order penetration point (OPP) is the place in the supply chain where the supplier allocates the goods ordered by the customer. Goods might, for instance, be produced after orders come in ("make to order") or allocated from a warehouse once the orders have been received ("ship to order"). Each

order penetration point has different costs and benefits for the supplier and its customer (Exhibit 1). When the supplier allocates orders from its distribution center, it can deliver them quickly if they are in stock. Rapid delivery (a benefit for the customer) therefore depends on holding a large inventory (a cost for the supplier). Of course, the wider the product range, the bigger the inventory, so the supplier either incurs large inventory costs to minimize delivery times or cuts inventory and risks delays in fulfilling orders.

EXHIBIT 1

The three main order penetration points



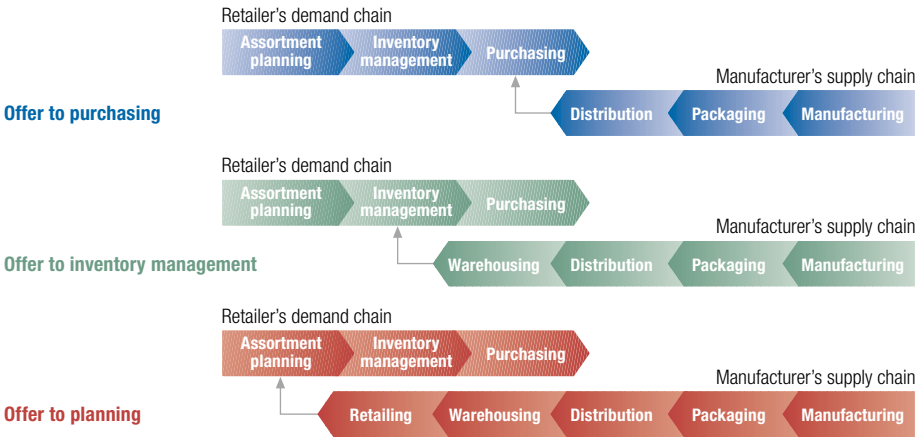
It is possible to move the OPP back to packaging or assembly: the point when goods are turned into finished products—when soap, for instance, is poured into boxes and sealed or components are assembled into personal computers. This approach ("pack to order") gives the supplier the benefit of lower inventory expenses, but the customer must wait for the goods to be packaged (a cost). To reduce that delay (a benefit for the customer), the supplier must bear the cost of additional packaging capacity. Moving the OPP back still further to manufacturing on demand makes it possible for the supplier to meet the specifications of individual customers (a benefit for them). But the delivery time rises (a cost for them), and the supplier's process efficiency declines each time a customized design replaces a standard one (a cost for the supplier and the customer alike).

To sum up, the further back in the supply chain the supplier moves the OPP, the more steps there are to complete without disruption and the more difficult it becomes to fulfill orders promptly. The advantage to the supplier of this approach depends on the amount of cost savings it can achieve from lower inventory, on the one hand, compared with the reduction in sales that may be brought about by longer delivery times and higher total costs for customers, on the other. Customers and suppliers never benefit equally.

The value-offering point (VOP)—the second place where the demand and supply chains meet—is where the supplier fulfills demand in the customer's

EXHIBIT 2

The three main value-offering points



demand chain. Moving the VOP back in the demand chain largely benefits the customer, requiring more work from the supplier. There are three principal VOPs (Exhibit 2).

In the conventional, arm's-length buyer-seller relationship, the VOP is the purchasing department, which accepts an "offer to purchasing" by choosing the supplier and deciding when goods are needed.[1] An "offer to inventory management" moves the VOP further back in the demand chain: by carefully monitoring the customer's inventory levels, a supplier can cut down on stock that is unlikely to sell and ensure that the customer never runs out of goods that move briskly. These benefits, however, mean more work for the supplier, since it must now have a separate inventory control process for each customer.

An "offer to planning" moves the VOP back to merchandising (in the case of retailing) or production (in the automotive and personal-computer industries, for example). In other words, by joining forces to analyze the consumer demand categories served by products from the supplier, both retailer and supplier can avoid new products or promotions that lack a market. Suppliers are also expected to use this kind of collaboration to improve their delivery performance. The result is a more profitable use of retail space by retailers, but unless suppliers can charge a premium or increase their sales through this kind of collaboration, they don't benefit from it.

A fourth (and still largely unexplored) VOP is the "offer to end user," such as Dell Computer's direct-sales model for business clients. Rather than fulfill

[1] Although the offer-to-purchasing approach means that suppliers make money from excess unsold merchandise, a customer that gets stuck with it will buy less, demand higher discounts, or demand the right to return goods—or all three—the next time around.

orders from wholesalers (an offer to purchasing), Dell went all the way back in the demand chain to the end consumer by fulfilling orders for customized PCs—complete with software and network configuration. All employees have to do is turn on their machines. Corporate customers reap an enormous advantage: the ability to eliminate half of their PC support teams, which spend most of their time setting up computers.

Win-win

Although moving the VOP back in the demand chain is largely in the customer's interest, the supplier can benefit if it simultaneously moves the OPP. Ordinarily, moving the OPP benefits one party at the expense of the other. But by coordinating movements in both the demand and the supply chains, suppliers can improve their customers' performance and at the same time generate step changes in the efficiency of their own operations.

By coordinating changes in both the supply and demand chains, a supplier can **raise its customers' efficiency,** as well as its own

A manufacturer might, for example, be keen to move the VOP back to inventory management in order to help a customer reduce its lost sales and obsolescence costs, but to do so the manufacturer must assume the high expense of integration. In fact, managing the customer's inventory gives the manufacturer much earlier access to information about that customer's demand. Such access permits the manufacturer to cut its own inventory costs by packaging products to order rather than stocking all its products at a distribution center; none of this comes at the expense of the customer's delivery times.

Likewise, Dell can profitably offer excellent service to end users—by pushing the VOP all the way back to them—only because it has pushed the OPP back in the supply chain by assembling PCs to order. Since Dell receives early information about customer demand, the company can take the time it needs to assemble PCs out of the front end of the process rather than the back end, where it would delay deliveries to customers. Dell has also eliminated inventory costs and can buy components later than its conventional competitors do, thus taking advantage of continually falling prices. (*See* sidebar, "Case study: Würth Oy," on the next spread.)

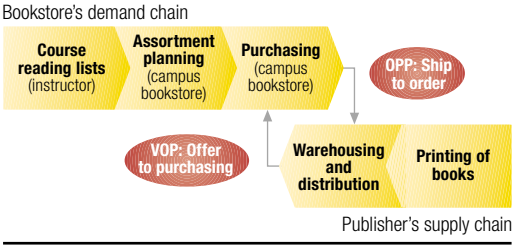
New value propositions

Manipulating the demand-supply chain does more than improve customers' performance and benefit suppliers; suppliers can also use this approach to discover completely new value propositions for customers.

Suppliers can thus extract new value from current accounts by escaping the commodity trap (and also, in some cases, find new customers). Consider a real-life example.

EXHIBIT 3

The conventional demand-supply chain: College textbooks



A typical university bookstore decides which books to sell (assortment planning), estimates how many of them it needs (inventory management), and then places its orders with publishers. Each publisher's VOP is thus a straightforward offer to purchasing, and the ship-to-order OPP is the publisher's warehouse or distribution center (Exhibit 3). This

Case study: Würth Oy

The Finnish subsidiary of the German Würth Group, which had worldwide 1998 revenues of more than $3.6 billion, is called Würth Oy. It sells businesses varieties of 28,000 fasteners as well as other kinds of assembly products, such as nuts, bolts, screws, and screwdrivers. Demand for these products generally comes from the customers' maintenance, repair, and assembly operations. This demand drives the customers' inventory management systems, which in turn drive purchasing.

Relatively small products like those handled by Würth Oy can be expensive because job lots are small and purchases are therefore frequent, requiring much paperwork. Ordering and handling costs, such as conducting quality checks, making up receipts, and unpacking, are substantial: a recent study found that for a typical industrial customer, such expenses amounted to more than $18 per order line—the price of many order lines themselves. As a result, the customer must choose between ordering fasteners in relatively large lots and holding unnecessary inventory, on the one hand, or paying the higher cost of many small orders, on the other.

The original value proposition of the company was its ability to offer appropriate fastener and assembly solutions by meeting face-to-face with the metal-engineering companies that needed them (an offer to purchasing). But over the past ten years, just-in-time success stories from Japan and the United States prompted Finnish customers to streamline their purchasing operations. Würth began to locate its stores next to the assembly lines of its customers—a move that reduced their purchasing and materials-handling costs and improved their operations.

Today, Würth Oy operates these stores for upward of 1,000 customers in Finland. Its field sales force replenishes the stores twice a week

system may seem to work nicely for bookstores, but for students it works less well: books are expensive; some of the cost is unnecessary, since teachers often assign only parts of books; and if the bookstore underestimates demand, some students must wait for the publisher to make extra shipments. What should a publisher do to help its customers (the bookstores) help their customers (the students)?

The publisher can start by examining the whole demand-supply chain. Although the retailer's assortment-planning process appears to respond to student demand, it is really shaped by instructors, who choose the reading lists for courses. One publisher, McGraw-Hill, therefore moved its VOP back to instructors, offering to tailor collections of reading materials for each of them. How? By moving the OPP out of the warehouse and forward to the retailer. McGraw-Hill's Primis electronic-publishing

on average, totally eliminating the customers' purchasing and handling costs, and an additional 10,000 customers have borrowed the idea and now operate their own on-site stores. The heart of this new value proposition is an offer to planning: by collaborating with customers on the shop floor, where they carry out maintenance and plan changes in their assembly line operations, Würth's representatives can find out exactly which products they will need and which to keep on hand.

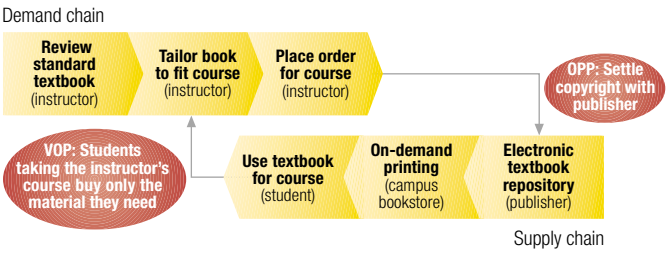
Typical industrial customers save a minimum of $12 in purchasing and handling costs on each item they order. Thanks to those savings, Würth can charge a 40 percent ($7.25) premium over the price of the lowest-cost (offer-to-purchasing) competitor's average order line. Setting up and managing in-plant stores is complex, however, and expensive. Even with the price premium, it would probably have been impossible to make a profit solely by moving the VOP, but doing so also gave Würth a chance to move the OPP and thus to make the company's own supply chain much more efficient.

Earlier access to customer demand information has permitted Würth to move the OPP from local service centers to a national distribution center while continuing to make deliveries in a timely manner. In addition, more accurate information has also helped the company reduce safety stocks and streamline sourcing. Indeed, Würth gathers information on its customers' needs so early and accurately that it is now considering a plan to move the OPP back to its own suppliers for high-risk items (those with just a handful of customers).

Cases like this show the enormous advantages available even to suppliers of commodity goods. Meanwhile, Würth's competitors have been forced to cut prices, which has in turn forced them to cut costs by cutting services—thus further eroding the value these companies offer their customers.

EXHIBIT 4

The new demand-supply chain: College textbooks



system allows instructors to choose standard McGraw-Hill textbook chapters from a database and to add complementary materials (such as course objectives, instructions, old test questions, and teaching cases) from a variety of sources (Exhibit 4). All of the readings are then combined into a single package that is printed and bound in the bookstore.

This assemble-on-demand system benefits bookstores, students, and publishers in several ways. Even if a bookstore has the syllabus for a course in hand well before the first day of classes, the manager can't know precisely how many students will enroll in the course that year. The new model largely eliminates this problem, and the bookstore also saves display and storage space. As for students, most tailored textbooks are cheaper than their standard mass-produced counterpart because they include only the readings instructors actually require. Furthermore, on-campus print technology makes the publisher's unit costs independent of batch sizes, so print runs don't have to reach a certain minimum, and the publisher can avoid the crushing cost of returns, which can amount to 30 percent of sales. McGraw-Hill has used this new value offering to win over teachers on more than 1,000 US college campuses, and several competitors are now following suit.

Another area of innovation is the ordering of physical goods such as groceries. Consumers want the convenience of shopping from home, but they must usually pay extra for home delivery: after all, the goods still emanate from local supermarket shelves, so retailers have no way to achieve offsetting economies. Moving the OPP by allocating and then delivering the order from a more distant warehouse might permit the retailer to save money on site costs, but delivery to the customer would take longer.

A company called Streamline takes a different approach with a service called Don't Run Out. Every week, for every customer, Streamline automatically fulfills a customized standing order for a selection of standard grocery products, such as milk, juice, pet food, and diapers. It delivers them to a company-owned refrigerator it installs in the garage of the customer, who therefore doesn't have to be at home when they arrive. By getting early access to demand information and thus moving the VOP, Streamline has also been able to move the OPP from a supermarket or a grocery store to an efficient

distribution center. Moreover, once the customer has chosen the items on the standing order, Streamline can not only deliver them at its own convenience; it can also plan bulk purchases and keep its own inventories low. Although the service is still young, Streamline is already considering how to move the VOP back for a wider range of products and how to manage the contents of the refrigerator (the customer's "inventory") so that it is always stocked correctly, even with items the customer requires infrequently.

By tweaking the demand-supply chain, suppliers can offer their customers completely new value propositions and improve their supply chains—without being forced to weigh the benefits of customer service against its cost. The means to this end are the repositioning of the value offering point at the customer's end of the supply chain and the exploitation of better information about customer demand. MQ