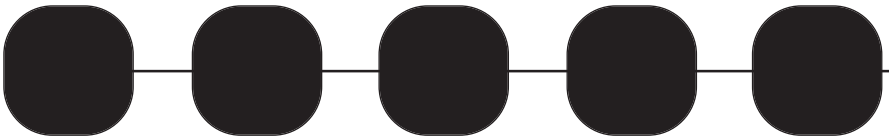

Part 5

Integration Issues

24 Cisco Systems: The Supply Chain Story[1]

A Company in Trouble

In August 2001, the San Jose, California-based, computer-networking company Cisco Systems Inc. surprised industry observers by announcing its first ever negative earnings in more than a decade. In the third quarter of fiscal 2001, the company's sales had decreased by 30%. Cisco had to write off inventory worth U.S. $2.2 billion and lay off 8,500 people. By the end of 2001, the market capitalization of the company was down to U.S. $154 billion and per employee profit was U.S. $240,000 (down from U.S. $700,000 in 2000). This was in sharp contrast to the situation in early 2000, when Cisco was one of the most successful companies in the Internet world with a market capitalization of U.S. $579 billion.

Cisco—The Networked Supply Chain

Cisco was founded in 1984 by a group of computer scientists at Stanford. They designed an operating software called IOS (Internet Operating System) that could route streams of data from one computer to another. The software was loaded into a box containing microprocessors specially designed for routing. This was the router, a machine that made Cisco a hugely successful venture over the next two decades.

In 1985, the company started a customer support site through which customers could download software and also upgrade the downloaded software. It also provided technical support through e-mail to its customers. By 1991, Cisco's support center was receiving around 3,000 calls a month. This figure increased to 12,000 by 1992. In order to deal with the large volume of transactions, the company built a customer support system on its website. In 1993, Cisco installed an Internet-based system for its large multinational customers. The system allowed customers to post queries about their software problems.

Encouraged by the success of its customer support site, Cisco launched Cisco Information Online in 1994. This online service offered not only company and product information but also technical and customer support to Cisco's customers. By 1995, the company introduced applications for selling products or services on its website. The main idea behind this initiative was to transfer paper, fax, e-mail and CD-ROM distribution of technical documentation and training materials to the Web, thus saving time for employees, customers and trading partners and broadening Cisco's market reach.

In 1996, the company introduced a new Internet initiative called the 'Networked Strategy' to leverage its network for fostering interactive relationships with customers, partners, suppliers and employees. Cisco wanted to ensure enhanced customer satisfaction through online order entry and configuration. Customers' order information flowed

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through the supply chain network, which consisted of Cisco employees, resellers, manufacturers, suppliers, customers and distributors.

Orders from customers were stored in Cisco's enterprise resource planning database and sent to contract manufacturers over their Virtual Private Network VPN2. Cisco's suppliers could clearly see the order information as their own production schedule was connected to Cisco's ERP system. According to the requirements, the suppliers shipped the needed components to manufacturers and replenished their stocks. The business model aimed at enabling Cisco's contract manufacturers to start manufacturing build-to-order products within 15 minutes of receiving an order.

Cisco gave top priority to order fulfillment and project management to achieve on-time delivery to customers. Third party logistics providers were plugged into Cisco's database via the Internet. As a result, Cisco could, at any time, provide customers with information regarding the status of their order. Direct fulfillment led to a reduction in inventories, labor costs and shipping expenses. Through direct fulfillment, Cisco saved U.S. $12 million annually.

Cisco's Internet-linked supply chain network enabled the automatic testing of products from any of its locations worldwide. While earlier prototyping used to take weeks, Cisco engineers were now able to do the same within a matter of days. This was because prototyping could take place at the manufacturer's site itself. After manufacturing, the product was connected to one of Cisco's 700 servers worldwide.

Because of rapid sharing of demand information across the supply chain, customers could receive products faster. To sum up, this networked supply chain ensured:

- Shorter engineering-to-production cycle times,
- Flexibility in designing, revamping and retiring products in response to market demand, and
- Product quality, though major portions of the fulfillment process were outsourced.

Even though Cisco dealt with technically complex products like routers, it did not hesitate to hand over the manufacturing to a set of contract manufacturers. In order to ensure the quality of its products, Cisco relied on automatic testing. The company developed test cells on supplier lines and ensured that the test cells automatically configured test procedures when an order arrived. Cisco defined its core competence as product designing and delegated the rest—manufacturing, assembly, product configuration and distribution—to its partners.

In August 1996, Cisco launched transactional facilities like product configuration and online order placement. These facilities were connected to its ERP systems. In the same year, Cisco upgraded its network infrastructure to better handle the increasing number of transactions. By the end of 2000, more than 75% of the orders for Cisco's products were being placed over the Internet. Aided by Cisco's Internet initiatives, the company's net sales grew at an impressive 78% annual growth rate, from U.S. $2 billion in 1995 to U.S. $9 billion in 1998. The company's fourth quarter revenues in 2000 were U.S. $5.7 billion, up 61% from the same period in 1999. Operating profits also went up from U.S. $ 710 million in 1999 to U.S. $1.2 billion in 2000.

According to many analysts, the company's networking strategy had played a major role in its success over the years. Industry observers noted that ever since its inception, Cisco had demonstrated the power of networking and the benefits it could offer. Cisco owned just two of the 40 facilities that manufactured its products. It did not own the distribution system that delivered the products to its customers, but through its network

of suppliers, distributors, partners, and resellers and customers, it successfully coordinated all the activities necessary to provide products to its customers on time.

In spite of an efficient supply chain network, Cisco ran into some problems. Cisco's partners typically worked out their supply-and-demand forecasts from multiple points in the company's supply chain. Transactions between suppliers and contract manufacturers were not always smooth. There were time lags in delivery and payment, and thus greater opportunity for error. As a result, suppliers were plagued by long order-to-payment cycles. In June 2000, Cisco discovered, to its alarm, that it was running short of some key components for some of its equipment.

Due to the shortage of components, shipments to customers were delayed by 3–4 weeks. Though demand for Cisco's products remained healthy, the revenues of customers who were used to delivery within two weeks were affected badly. The delivery performance was out of character for a company that prided itself on its relationships with customers and even compensated many of its executives on the basis of customer satisfaction.

The CCO and ICS Initiatives

In order to address the above problems, Cisco revamped its supply chain management system to reduce the long ordering cycles. The company launched Cisco Connection Online (CCO), which connected Cisco with all its suppliers and contract manufacturers online. As a result, when a customer placed an order, it was instantly communicated to all its suppliers and manufacturers. In most cases, a third-party logistics company shipped the product to the customer.

CCO ensured increased coordination and connectivity between supply partners, thus reducing the operating costs of all constituents. Automated processes within the supply chain removed redundant steps and added efficiencies. For instance, changes in market demand were communicated automatically throughout the supply chain. This enabled the networked supply chain suppliers to respond appropriately.

CCO reduced payment cycles for suppliers and eliminated paper-based purchasing. As a result, suppliers agreed to charge lower product mark-ups. Consequently, Cisco saved more than U.S. $24 million in material costs and U.S. $51 million in labor costs annually. CCO enabled Cisco's contract manufacturers to find out the exact position of demand and inventory at any given point of time. As a result, they could manage replenishment of inventory with ease. This resulted in a 45% reduction in inventory and a doubling of the inventory turnover. Cisco slashed the inventory holding of its suppliers and manufacturers and brought it down from 13,000 units (approx.) to 6,000 units within three months.

To get the most out of CCO, Cisco used intranets and extranets extensively. The extranet was used for communicating with suppliers, manufacturers, customers and resellers, while employees used the intranet for communicating about the status of orders. Thus, through an online information and communication system, Cisco linked suppliers, manufacturers, customers, resellers and employees seamlessly.

However, some of Cisco's large customers were not able to access CCO because it did not connect seamlessly to their back-end or electronic data interchange systems. These firms, typically telecom equipment distributors or network operators, lacked the time to visit the supplier websites to order the equipment they needed. So, Cisco introduced the Integrated Commerce Solution (ICS) for these customers. ICS provided a dedicated server fully integrated into the customers' or resellers' Intranet and back-end ERP

systems. It facilitated information exchange between Cisco and them, besides speeding up transactions. It had all the e-commerce applications of CCO, with the additional capability of pulling order related data directly from Cisco's back-end ERP systems online. At the same time, as the server was integrated into the customers' and resellers' back-end ERP systems, the end-users needed to enter the order information only once; this order was simultaneously distributed to both resellers and Cisco's back-end systems, eliminating the need for double entry.

With these new Internet initiatives and sound financials for fiscal 2000, Cisco seemed all set to register even higher growth figures. However, in early 2001, the global IT business slowdown and the dotcom bust altered the situation. Reportedly, Cisco failed to foresee the changing trends in the industry and by mid-2001 had to cope with the problems of excess inventory. As a result, the company had to write off inventory worth U.S. $2.2 billion in May 2001. Cisco blamed the problems on the "plunge in technology spending," which Chambers called as unforeseeable as "a 100-year flood." Company sources said that if their forecasters had been able to see the downturn, the supply chain system would have worked perfectly.

The Problem and the Remedy

Analysts felt that the flaws in Cisco's systems had contributed significantly to the breakdown. During the late 1990s, Cisco had become famous for "being the hardware maker that did not make hardware." Its products were manufactured only by contract manufacturers, and the company shipped fully assembled machines directly from the factory to buyers. This arrangement led to major troubles later on.

According to analysts, Cisco's supply chain was structured like a pyramid, with the company at the central point. On the second tier, there were a handful of contract manufacturers who were responsible for final assembly. These manufacturers were dependent on large sub-tier companies for components such as processor chips and optical gear. Those companies in turn were dependent on an even larger base of commodity suppliers who were scattered all over the globe. The communication gaps between these tiers created problems for Cisco. In order to lock-in supplies of scarce components during the boom period, Cisco ordered large quantities in advance on the basis of demand projections made by the company's salesforce. To make sure that it got components when it needed them, Cisco entered into long-term commitments with its manufacturing partners and certain key component makers.

These arrangements led to an inventory pile-up since Cisco's forecasters had failed to notice that their projections were artificially inflated. Many of Cisco's customers had ordered similar equipment from Cisco's competitors, planning to eventually close the deal with the party that delivered the goods first. This resulted in double and triple ordering, which artificially inflated Cisco's demand forecasts. Cisco's supply chain management system failed to show the increase in demand, which represented overlapping orders. For instance, if three manufacturers competed to build 10,000 routers, to chipmakers it looked like a sudden demand for 30,000 machines. As Cisco was committed to honor its deals with its suppliers, it was caught in a vicious cycle of artificially inflated demand for key components, higher costs, and bad communication throughout the supply chain.

Cisco's inventory cycle reportedly rose from 53.9 days to around 88.3 days. According to analysts, Cisco's systems failed to model what would happen if one critical assumption—growth—was removed from their forecasts. They felt that if Cisco had tried to run modest

declining demand models, then it might have seen the consequences of betting on more inventory. They felt that Cisco should not have assumed that there would be continuous growth.

Having realized these problems, Cisco began taking steps to set things right. The company formed a group of executives and engineers to work on a "e-Hub" remedial program. Work on eHub began in late 2000. The project was intended to help eliminate bidding wars for scarce components. According to Cisco sources, eHub was expected to eliminate the need for human intervention and automate the flow of information between Cisco, its contract manufacturers and its component suppliers. eHub used a technology called Partner Interface Process (PIP) that indicated whether a document required a response or not. For instance, a PIP purchase order could stipulate that the recipient's system must send a confirmation two hours after receipt and a confirmed acceptance within 24 hours. If the recipient's system failed to meet those deadlines, the purchase order would be considered null. This would help Cisco to find out the exact number of manufacturers who would be bidding for the order.

According to the e-Hub set-up, Cisco's production cycle began when a demand forecast PIP was sent out, showing cumulative orders. The forecast went not only to contract manufacturers but also to chipmakers like Philips semiconductors and Altera Corp. Thus, overlapping orders were avoided and chipmakers knew the exact demand figure. e-Hub searched for inventory shortfalls and production blackouts almost as fast as they occurred.

However, work on e-Hub fell behind schedule due to its complexity and the costs involved. According to Cisco sources, the company originally planned to connect 250 contractors and suppliers by the end of 2001, but it could link only 60. It was reported that the number might rise to around 150 by mid-2002. Company sources said that e-Hub was just the first stage of its plans for automating the whole process of ordering and purchasing.

Meanwhile, the company's poor financial performance prompted analysts to comment that if the inputs were wrong, even the world's best supply chain could fail. They added that only the next boom phase in the IT business would prove the efficiency of e-Hub.

Discussion Questions

1. Study the networked supply chain concept as implemented by Cisco. What are its strengths and weaknesses?
2. Analyze why Cisco landed in financial trouble in early 2001. Would you agree that Cisco's problems were largely caused by inherent defects in the company's systems? Or possibly was it just because they had failed to forecast a market downturn? Give reasons to justify your stand.
3. Aside from the information systems problems referred to above, what other specific problems did you see in the case?