Cisco vs huawei study essay

Case #1-0001 Cisco Systems (A): Evolution to E-Business " We view the Internet as a prototype of how organizations eventually will shape themselves in a truly global economy. It is a self ruling entity. " —John Morgridge, Annual Report, 1993 Cisco Systems, says president and CEO John Chambers, is " an end-to-end networking company. " Its products and services enable the construction of corporate information superhighways, a driving concern of today's CEOs, seeking to become " e-business" leaders in their industries. Defining " e-business" can prove more difficult than embracing it, however.

In executive programs at the Tuck School, Professor Phil Anderson frequently asks participants, " How will you know when you have seen the first e-business within your industry? " Typically, there is little consensus. Is it mass customization? Streamlined production processes? Oneto-one marketing? Cisco's Internet Business Systems Group (IBSG), an internal consulting group, advises senior executives on information technology investment strategies. The group is closer to major corporate buying decisions than anyone at Cisco.

As advocates for Cisco's equipment, group members' main struggle is identifying the benefits of becoming an e-business, which are wide, varied, and difficult to quantify. Additionally, the initial infrastructure investment is large enough to prompt many CEOs to wonder whether it's really worthwhile to become an e-business. Trying to build a business case (calculate an ROI) for making a major IT investment can be an exercise in frustration. Says Sanjeev Agrawal, a director within the IBSG, " Can you show me the ROI of going to sixth grade? The amount of time it is going to take to try to go

through the logic of that is not worth it. The IBSG hopes that potential customers will look to Cisco as an example of how a company can make the most of information technology. In fact, Cisco has evolved successfully from a Silicon Valley garage startup to arguably the most sophisticated eThis case was prepared by Professors Philip Anderson, Vijay Govindarajan, and Chris Trimble, and by research assistant Katrina Veerman T'01 of the Tuck School of Business at Dartmouth. It is intended as a basis for classroom discussion rather than to illustrate effective or ineffective handling of an administrative situation. The authors gratefully acknowledge the support of the William F.

Achtmeyer Center for Global Leadership and the Glassmeyer/McNamee Center for Digital Strategies, which funded the research and development of this case. Version: June, 2001. © 2001 Trustees of Dartmouth College. All rights reserved. For permission to reprint, contact the Center for Global Leadership at 603-646-0898, or the Center for Digital Strategies at 603-646-0899. Cisco Systems (A) no. 1-0001 business in the world. As of September 2000, nearly 90 percent of all orders were placed on Cisco's website, the Cisco Connection Online (CCO), 1 and nearly 80 percent of all products were built and shipped from a supply partner. The CEOs with whom the IBSG works generally have two questions about investing heavily in IT: 1. Can my corporation benefit from being an e-business to the same extent that Cisco does, or, perhaps, to a greater extent? 2. What can I learn from Cisco's transformation to an e-business that will help me transform my own corporation? This case gives a brief overview of Cisco as it exists today, and then traces its history, focusing in particular on its evolution to an e-business. Cisco Today Cisco Systems provides products and services that

enable the sharing of information (including data, text, voice, and video) across disparate networks.

Its goal is to provide customers with a complete set of tools to help them build the most appropriate network for their needs. Cisco identifies four major segments within its customer base: Enterprises are large organizations with 500 or more employees and complex networking needs, usually spanning multiple locations and types of computer systems. Enterprise customers include corporations, government agencies, utilities, and educational institutions. Service providers are firms that provide data, voice, and video communication services to businesses and consumers.

They include regional, national, and international telecommunications carriers as well as Internet, cable, and wireless service providers. Small/medium–sized businesses are defined as companies that have fewer than 500 employees, need their own networks and Internet connectivity, but have limited expertise in networking technology. Consumers are a new market for Cisco. The company recently entered the consumer market with a variety of home networking products. 1 2 www. cisco. com Interview with Barbara Siverts, Cisco Systems Tuck School of Business at Dartmouth— Glassmeyer/McNamee Center for Digital Strategies 2 Cisco Systems (A) no. 1-0001

To reach its customers, Cisco sells through several channels, including the IBSG, a direct sales force, third-party distributors, value-added resellers, service providers, and system integrators. Cisco originally was founded as a router company, but as the corporation evolved, so did its products. These

range from simple bridges and routers to optical switches, software, and even services. All of the products are scalable and easy to upgrade, allowing Cisco to provide customers with maximum possible flexibility when designing their networks. Cisco's product offerings are divided into the major categories described below (see also Exhibit 1). Routing is a foundation technology for computer networking. Cisco routers move information from one network to another, applying intelligence in the process to ensure the information reaches its destination securely and in the fastest way possible. LAN-Switching (Local Area Network Switching) products help users migrate from traditional shared LANs to fully switched networks that support the varying levels of flexibility and cost effectiveness required for desktop, workgroup, and backbone applications. Cisco solutions support most popular networking technologies, including

Ethernet, Gigabit Ethernet, Token Ring, TCP/IP, and Asynchronous Transfer Mode (ATM). WAN-Switching (Wide Area Network Switching) products extend this functionality over long distances. Access solutions provide remotely located individuals and groups with the same connectivity and information access they would have if they were located at their company's head office. Integrated Services Digital Network (ISDN) remote-access routers, dialup access servers, Digital Subscriber Line (DSL) technologies, and cable universal broadband routers provide telecommuters and mobile workers with Internet access and branch-office connectivity.

SNA (Systems Network Architecture) LAN integration products allow modern LANs with open network architectures to be integrated with IBM legacy systems based on SNA standards. (In the 1990s, most large organizations

had both LANs and older IBM mini and mainframe computing systems.) Internet appliances improve a network manager's ability to cope with challenges posed by the growing popularity of the Internet, such as network traffic volume and network address shortages.

These include firewalls, which prevent unauthorized access to a network; products that scan, detect, and monitor networks, looking for security risks; virtual private networks (VPN); cache products; and load-balancing products. 3 Cisco. com and most recent 10K, July 31, 1999. Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 3 Cisco Systems (A) no. 1-0001 Cisco IOS Software is a networking software product that has been deployed across Cisco Systems' products to provide intelligent network services, such s Quality of Service, loadbalancing, and multicast functions that enable customers to build flexible network infrastructures. These intelligent network services also support next-generation Internet applications. At the top of Cisco's organization structure is John Chambers, president and CEO. His direct reports include Mike Volpi, chief strategy officer, Larry Carter, chief financial officer and Pete Solvik, chief information officer. More than 30 senior vice presidents report to them. Cisco also boasts a very active board of directors which includes former CEO John Morgridge and venture capitalist Don Valentine.

Cisco's Evolution Early History Cisco was founded by Stanford University computer scientists Sandy Lerner and Leonard Bosack, who recognized the need for large-scale computer networks based on industrystandard technologies. 4 Lerner directed computer facilities at Stanford Business School, and Bosack directed Stanford's computer science department. While

at Stanford, both recognized the inefficiency of the existing computing infrastructure which, in 1982, had 5, 000 different on-campus computers and 20 incompatible email systems. With so many mismatched technologies, employees and students found it difficult to share information electronically. Lerner and Bosack enlisted several other Stanford employees and set out to build a better system: ...[W]orking without permission or an official budget, [they] first created the interface by which they could connect the DEC minicomputers to a bootleg Ethernet network. The network consisted of a few miles of coaxial cable. The guerrilla team pulled wires through manholes, and sewer pipes– everywhere that made sense. The project was a success.

The router enabled the connection of normally incompatible individual networks. It allowed data to be read by any computer in the network, even across different operating systems. Soon 4 5 Cisco Annual Report, 1990 David Bunell, Making the Cisco Connection: The Story Behind the Internet Superpower, pp. 4 and 5 Tuck School of Business at Dartmouth— Glassmeyer/McNamee Center for Digital Strategies 4 Cisco Systems (A) no. 1-0001 enough the bootleg system became the official Stanford University Network6 Shortly after their campus-wide success, Lerner and Bosack left Stanford to start their own company.

Initially, they custom built routers in their living room. They called their products ciscos, a name derived from the last five letters of San Francisco. A rendition of the Golden Gate Bridge became their logo. By 1986 they had outgrown their living room and were forced to move to an office in Menlo Park, California. Until this point, the company relied heavily on word-of-mouth referrals. Most customers were former colleagues from Stanford and

were connected via an early version of email. Lerner and Bosack began using email as a promotional medium to supplement the referrals.

In doing so, Cisco quickly developed a solid reputation among academic " nerds. " Soon they were using email as a medium for technical and general customer support. The partners also created Packet, a magazine focused on " linking customers to Cisco and delivering complete coverage of cutting edge trends and innovation. " Lerner and Bosack recognized that they needed to expand and enter new markets, and that this would require additional funding. After visiting 75 venture capital firms, Cisco closed its first round of $2. 5 million in 1987 with a single investor—Don Valentine of Sequoia Partners.

Valentine had a history of backing winning companies, including Apple and Crescendo. Other venture capitalists were unconvinced that Lerner and Bosack, technical wizards who had no experience building a company, could turn Cisco into a success without timeintensive senior-level guidance. But Valentine believed, and took a large gamble. He not only underwrote the initial investment but attracted top-notch executives to the company. Among the most influential of these was John Morgridge. The Morgridge Years Valentine hired Morgridge from Grid Systems in 1988 to be president and CEO of Cisco.

Unfortunately, he did not consult either of Cisco's founders before he acted. The summary demotion of Lerner to customer service VP and Bosack to chief technology officer generated stress between them and the new chief executive officer. Soon the entire company was feeling the strain. Morgridge

tried to address the problem by hiring a company psychologist, but even that failed to extinguish the simmering tension. While the four principals— Lerner, Bosack, Morgridge, and Valentine— agreed that Cisco's goal was to please its customers, they disagreed on almost every aspect of how to accomplish this.

Unable to overcome their differences, Lerner agreed to leave Cisco in 6 Ibid, p. 6 Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 5 Cisco Systems (A) no. 1-0001 August 1990, and Bosack left not long after. By 1993 both founders had sold all their Cisco stock back to the company. (Lerner eventually left the high-tech world altogether to establish a cosmetics company called Urban Decay.) Alone at the helm, Morgridge set some changes in motion. He modified the name of the company from cisco to Cisco, for example, basing his decision on customer feedback.

He also clamped the lid on spending, requiring all employees to fly tourist class and to limit their expenditures. His frugality and commitment to maximizing customer satisfaction— attributes upon which the company had been founded—paid off. Cisco's annual revenues leaped from $1. 5 million in 1987 to $70 million by the end of fiscal year 1990 (see Exhibit 2 for summary financials). As the company grew, Morgridge sought out executive team members who supported his ideas. In 1991 he hired John Chambers to be senior vice president of business development. It was clear that Chambers eventually would succeed Morgridge as CEO.

John Chambers John Chambers graduated second in his high school class, attended Duke University, and earned a law degree from West Virginia University and an MBA from Indiana University— all despite suffering from dyslexia. Chambers subsequently worked for IBM and Wang—experiences he credits with shaping his leadership style. At IBM, for example, he was once given a poor evaluation after meeting nine out of ten self-determined objectives. As a result, he tends to focus on a few achievable goals. At Wang he had to oversee the layoffs of more than 4, 000 people, 7 an experience he vowed never to repeat.

Shaped by these experiences, Chambers had cultivated a coaching, hands-off leadership style by the time he arrived at Cisco. He encouraged other executives to lead, to make good decisions, and to take risks willingly: I tell my own leaders that you've got to have mavericks in Cisco—you've got to have people who challenge you. However, the mavericks have to follow within reasonable bounds the course and direction of the company. So I would take a gamble on Dennis Rodman if I felt that I had the team that could help him play within the framework of their capability. Teamwork, risk, responsibility, and especially customer satisfaction make up Chambers's resounding refrain. Today most employees who have met him agree that Chambers is the man they most admire at Cisco. However, all also agree that Cisco could not have become 7 LAN Times, 7/08/96. Interviewed by Editor in Chief Leonard Heymann, Executive News Editor Jeremiah Caron, and Senior Writer Michelle Rae McLean Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 6 Cisco Systems (A) no. 1-0001 he company it is today without its early adoption of

the Internet and Internet-related technologies. Early E-Business Initiatives Under Morgridge and Chambers In 1991 Cisco launched an official Internet site, primarily dedicated to company and product information. Cisco also worked hard to improve its non-Internet-based customer support. To meet demand, it: 1. Hired more engineers as quickly as possible, growing the engineering staff at 160 percent a year. 2. Extended telephone support hours from 6: 00 A. M. to 6: 00 P. M. 3. Established an internal system to prioritize telephone calls. 4.

Integrated remote network diagnostics into its support package. 5. Experimented with different customer support projects, including SMARTnet, a package of the most popular service options, and improved access to service information. 6. Trained customers, offering 21 networking classes and teaching close to 400 people how to service their own networks in 1991. That year—1991—Cisco boasted 50 percent of the internetworking market8 and, despite its new initiatives, struggled to keep up with the 300 calls per day it was receiving. Nineteen ninety-one was also a tumultuous year at the executive level.

In addition to hiring John Chambers, the VP of Finance, John Bolger, resigned in August and was replaced by John Russell. In 1992 Cisco's market share increased to 85 percent, complicating efforts to manage customer service requests. The company began offering consultation services in addition to its customer-training programs. It also set up electronic bulletin boards. This foray into online technical assistance was not embraced initially, but Cisco realized that electronic dissemination of knowledge could help ease the burden on its engineers and customer service representatives.

The company was undergoing growing pains and sought to alleviate them by finding other ways to leverage information technology. In 1993 Cisco began using a Telnet site for tech support. Customers, generally engineers, could log on and download software updates, check manuals, and even email Cisco employees with questions. The company's 1993 annual report stated, " Communications, flowing through internetworks, built largely with Cisco technology, are truly the lifeblood of 8 Boston Globe, November 3, 1991.

Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 7 Cisco Systems (A) no. 1-0001 our enterprise. " 9 More than 5, 000 visitors a month were logging in. Still, no one could predict that by 1997, Cisco would sell over half its products across the Internet. Cisco Comes of Age By the end of fiscal year 1993, Cisco boasted an average annual growth rate of over 270 percent, revenues of $649 million, a net margin of 26 percent, and 1, 000 employees. It was no longer a niche technology company. Morgridge recognized Cisco needed to revisit its goals.

He asked several key executives, including John Chambers and then-CTO Ed Kozel, to write a formalized business plan, the first in Cisco's nine-year history. This business plan outlined four strategic goals10: 1. Provide a Complete Solution for Businesses 2. Make Acquisitions a Structured Process 3. Define the Industry-wide Networking Protocols 4. Form the Right Strategic Alliances In order to achieve these directives and continue its phenomenal growth rate, Morgridge knew that Cisco would have to hire many more talented employees—even increasing the already high headcount growth rate.

Unfortunately, talented employees were becoming hard to find. The search for personnel acquired some urgency when customer service ratings for Cisco dipped to an all-time low. Morgridge and Chambers decided to ask their customers for advice. At the suggestion of Boeing, Cisco bought Crescendo, a 60-person firm in Sunnyvale, California, that provided " high speed switching solutions for the workgroup. " 11 The acquisition of Crescendo provided some relief, but it was not an easy acquisition from a technical standpoint.

Cisco's Unix databases were state-of-the-art, but the systems and information were unconnected and not appropriately scalable. Until 1993 all IT had been funded based on a company-wide budget of 0. 75 percent of sales. While this allowed the IT department to service immediate needs, and to patch existing systems, it was totally inadequate for an acquisitive, half-billion-dollar company predicted to grow by more than 50 percent per year. Chief Information Officer Pete Solvik recognized the technical problems Cisco was facing.

He and another senior executive, Doug Allred, approached the board of directors during a 9 Cisco Annual Report, 1993 Bunell, David, Making the Cisco Connection: The Story Behind the Internet Superpower 11 John Chambers in Press Release, September 21, 1993 10 Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 8 Cisco Systems (A) no. 1-0001 board meeting in 1993 and asked if they thought the IT funding mechanism was appropriate. The directors acknowledged that they had no idea and tasked the two officers to research other possibilities.

What they came up with was nothing short of revolutionary. Allred and Solvik implemented a system which delegated authority for IT expenditures to individual business units, not administrative executives in a head office. They named it the Client Funded Model (CFM). It enabled Cisco's business units to make technology spending decisions where such investment would support customers and directly increase sales. Most companies funded IT as a percentage of revenues. Typically, the IT department reported as a cost center directly to the chief financial officer.

Projects typically were evaluated based on reducing the cost of doing business, not on improving sales, customer satisfaction, or employee retention. With the CFM, only core IT infrastructure spending was centralized and spent out of general overhead accounts. By redistributing responsibility for IT costs, Cisco aligned IT spending with its corporate goal—doing everything possible to support the customer. The changes outlined by Solvik and Allred were as follows: • • • • IT would report to a newly formed Customer Advocacy (CA) group, which Doug Allred would lead.

Managers would be encouraged to proceed with any reasonable project, as long as it improved customer satisfaction. While managers would be empowered to make decisions on what projects would get funded, IT would decide how to implement them. Cisco's internal network would play a strategic role in providing the connectivity necessary for business units to build applications creatively. The Big Leap The last item on this list led to a major decision. Solvik recognized that the network infrastructure at Cisco needed a tremendous upgrade if managers were to meet their customer satisfaction goals.

The modifications would cost millions, and Cisco was famous for its padlocked coffers. Nevertheless, Pete Solvik proposed the upgrade to the board. In early 1994, Cisco's systems broke down and the company was forced to close for two days. In the wake of this and several other small crashes, the board made an unprecedented decision and approved Solvik's proposal, a $15 million Oracle ERP system. (This investment alone was 2. 5 percent of 1993 revenues, more than three times the previous year's IT budget. Total budget for IT upgrade exceeded $100 million.) The Oracle system

Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 9 Cisco Systems (A) no. 1-0001 was to become the backbone of Cisco's e-business. Not only did it integrate all of the Unix servers, it also provided Cisco with a centralized information source. Morgridge made it clear to Solvik that his career depended on the successful implementation of this initiative. Solvik ultimately received a tidy bonus for his work. Subsequent E-Business Initiatives Once the ERP system was in place, Cisco revisited its worsening customer service problem.

Despite an enviable ability to attract talented engineers and call center representatives, the company was unable to hire enough of them to support its growth rate. Customers increasingly complained of inadequate technical assistance. In response, Cisco enhanced the Cisco. com site and launched the Cisco Information Online (later named Cisco Connection Online). The company also added a Technical Assistance Center (TAC) to the site and posted a bulletin board where customers could solve technical problems.

Additionally, it published a list of product faults and remedies. The site was a huge success.

It saved Cisco time as well as the cost of hiring additional employees, and it saved customers the time and hassle of making a phone call. Instead of dialing into a busy support line, they could log on to the website, browse up-to-date information, and fix most problems on their own without waiting to talk with a technician. Cisco's customer service ranking once again began to improve. Early in 1995, under Chambers's direction as the newly installed CEO, Cisco moved from Menlo Park to a new campus in San Jose. Chambers had chosen an area close to the highway with room to expand.

The new Cisco buildings were high-tech architectural marvels, and Chambers had spent the money necessary to ensure that they would scale. Each of the four buildings was wired for state-of-the-art connectivity and each was identical. Cisco also began to look for other ways to leverage its website. The sales force complained that they were constantly asked by customers to perform mundane tasks, such as re-printing a customer invoice. In response, in 1995, Cisco expanded the online offerings and allowed customers to reprint invoices, check the status of service orders, and even configure and price products.

This initiative was described in Cisco's 1995 Annual Report: Cisco Connection – a family of online and CD-ROM based services introduced during late [1995] provides our worldwide customers, partners and employees with easy and efficient access to the latest information from Cisco. 12 12 Cisco Annual Report, 1996 Tuck School of Business at Dartmouth—Glassmeyer/McNamee

Center for Digital Strategies 10 Cisco Systems (A) no. 1-0001 As the website was integrated into the ERP system, customers were able to access more information. For many Cisco employees, it meant an end to data entry—a welcome reprieve.

The IT department began to experiment with other ways to leverage the power of the Internet. The department's efforts led to three separate Internet initiatives: Cisco Connection Online (CCO, for customers), Cisco Employee Connection (CEC), and Manufacturing Connection Online (MCO) [see Exhibits 3A, 3B, 3C for screen shots]. The Cisco Connection Online By early 1996, customers could access technical help, reprint invoices, and search through product information without assistance, but they still had to talk with a sales rep whenever they wanted to buy something.

Much of the time, this involved an initial phone call to place an order and more phone calls to make sure the order was accurately entered into the order queue. Only 75 percent of orders were entered correctly; the remaining 25 percent had to be re-entered. As a result, Cisco started to think about how it could use the web as a purchase tool. In 1995 the company appointed an Internet Commerce Group (ICG) to look at different ways to leverage the Internet. The project was divided into three phases.

During Phase 1, the ICG analyzed the existing site and expanded its product offerings to include order-status capabilities, product configuration, and pricing as well as installation guides and tech tips. The group also analyzed call center calls and other customer requests. Research showed that most phone calls were focused on information housed in the Oracle ERP system. In

Phase 2, the ICG concluded that it could redesign the website to allow customers to configure and buy products. The e-commerce site was completed and launched in July 1996.

By 1997, 27 percent of all orders were placed using the Internet, a much higher percentage than the ICG had expected. In addition, the CCO was rated among the top ten technology and computing websites by Interactive Magazine. Cisco described the site in its 1996 annual report as follows: [Cisco Connection Online] provides customers, partners, suppliers, and employees with easy desktop access to a wealth of product information, software documentation, technical assistance, customer service applications, and interactive training. 13 Within the first four months online, Cisco had sold $75 million worth of products on the Internet.

The site was simple but sophisticated enough to ensure products were accurately 13 Ibid Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 11 Cisco Systems (A) no. 1-0001 configured. As a result, Cisco was able to drop its customer-order error rate from 25 percent to 1 percent. By 1997 70, 000 registered users were accessing the site 700, 000 times a month. Although Cisco believed that the site was not as user-friendly as it could be, 60% of Cisco's technical support from customers and resellers was now delivered automatically via the web, saving Cisco close to $150 million a year.

Better still, Cisco's customer satisfaction ratings were improving, Cisco was seeing internal productivity gains of 60 percent, and customers were seeing productivity gains of 20 percent. Nonetheless, Cisco wasn't satisfied. In

Phase 3, Cisco set out to address other concerns, including integrating its site with customers' ERP sites. Cisco attempted to produce a software product in house but, after an initial investment, discovered other companies were entering the marketplace with better products. After careful research, Cisco settled on a partnership with Ariba and Commerce One.

As of this writing, Cisco was working with Ariba to expand its base offerings and make the product compatible with the RosettaNet standards. 14 The CCO underwent considerable revisions and updates. Each time Cisco redesigned its website, it worked closely with the Internet Commerce Advisory Boards (ICABs). ICABs, which included both Cisco employees and customers, were used to perform market research on customers globally. As of August 2000, the site had 10 million pages and was available worldwide. The first few page levels were translated into various languages, such as Japanese.

However, all prices were quoted in the appropriate currency, based on an accurate exchange rate. The Cisco Employee Connection The Cisco Employee Connection (CEC) is Cisco's intranet site. Initially, it was designed to hold company information and act as an internal newsletter. When launched in 1995, it consisted only of a bulletin board of information, simple search engines, and email. But as the CCO grew in popularity and function, Cisco's tech department started toying with a more advanced site. At the time, the Human Resources department was swamped, and was handling a variety of inconsistent HR forms manually.

As such, the team working on the CEC first attempted to consolidate and digitize a number of the forms in an effort to streamline and speed up the hiring process. But Java had not yet debuted on the high-tech landscape and the project proved too unwieldy and time consuming for Cisco to implement. After months of painstaking effort, the team gave up. 14 RosettaNet is an industry consortium that develops standardized protocols and platforms for facilitating B2B e-commerce. Tuck School of Business at Dartmouth— Glassmeyer/McNamee Center for Digital Strategies 12 Cisco Systems (A) no. -0001 Not long after, the team tried to " webify" the process of expense reimbursement. This time, they combined the lessons from their first efforts with fresh ideas and new technologies, like Sun's Java. The team faced several seemingly insurmountable technical issues, such as linking expense approvals with the American Express corporate card systems, as well as significant internal resistance to change. Senior executives, who were responsible for approvals, demanded that any new system prove easier to use than the old paper-based system. Consequently, many approvals were eliminated.

Cisco's software engineers were forced to design the program internally because there were no there were no off-the-shelf programs that could handle the task. They succeeded. Cisco employees were able to submit expenses online and get reimbursed by direct deposit within a few days. (Four years later, Cisco was prepared to ditch its own system in favor of externally designed programs, convinced that software companies would be better able to build scalable solutions.) Following the successful launch of

the new expense reporting system, the IT department revisited the task of digitizing many HR processes.

This time they were successful. All HR forms—for new hires, health insurance, donations, 401K, etc. —were included on the CEC, and directly integrated into the ERP system. The CEC also enabled employees to access certain personnel information, including a directory of all Cisco employees, their calendars, and their positions within the company, including to whom they reported. If they wished, employees could upload additional information, including their photographs. Despite the site's usefulness, most employees used the CEC sparingly. Few chose it as their home page or included it on their top ten view list.

An internal poll to discover what employees were looking at revealed the number-one favorite was My Yahoo! , which allowed people to customize their pages. Instead of banning Yahoo, ignoring the problem, or forcing all employees to have the CEC as their home page, Cisco approached Yahoo! about setting up a customized My Yahoo! website for Cisco employees. The site was intended to allow Cisco employees to view sports scores, horoscopes, weather, and other areas of interest, in addition to automatically uploading certain Cisco-only announcements. After several iterations, Yahoo! reated a design that Cisco adopted almost immediately. The company was able to give its employees the content it wanted them to have, along with the content the employees wanted to have. The Manufacturing Connection Online (MCO) Cisco's Manufacturing Connection Online (MCO) has been crucial in allowing Cisco to scale. Just as Cisco had problems hiring enough engineers and customer service reps, it also had long been plagued by

problems scaling its manufacturing operations sufficiently to meet Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 3 Cisco Systems (A) no. 1-0001 the surging demand for its products. Faced with a choice of limiting growth or outsourcing manufacturing, Cisco chose to outsource. Originally, Cisco used contract manufacturers. Cisco forwarded orders, warehoused the components, and performed final assembly and testing before shipping finished goods to its customers. But warehousing and maintaining a large inventory were expensive. In order to cut inventory costs and improve customer delivery times, Cisco began to cultivate closer relationships with its suppliers.

It sought integrated partners, not just suppliers. Cisco asked these partners and contract manufacturers to integrate and network their supply chains with its own. The result was an automated order fulfillment process. The MCO became the facilitator, allowing Cisco's partners direct access to customer information, sales projections, and product specifications. Partners could also alert Cisco to work stoppages, part shortages, and other issues. Once a customer placed an order on the Cisco. com site, the manufacturing partner was immediately notified.

Each order was issued a specific order number and product number, and all orders were customized. Once the manufacturing partner received the information electronically, the order was sent to the assembly line and placed in the queue—all without human intervention. The manufacturer then built the product to order. Initially, Cisco preferred to retain the final testing and certification processes on site. However, with the advance of competitors like Nortel, time-to-market and delivery speed became critical

differentiators. Again, Cisco looked to the Internet to improve its competitive advantage.

This new impetus inspired the creation of the Cisco Systems Auto Test. The system tested products to ensure they were up to Cisco's specifications and ready to ship. This usually took less than three days. Once an order was ready for shipment, Federal Express, Cisco's shipping partner, was automatically alerted, the order was assigned a shipping number, picked up at the manufacturer, and delivered by Federal Express to the customer. In the event of an assembly line problem or auto test concern, the manufacturer immediately alerted Cisco through the MCO, which then alerted the customer.

Multiple products that needed assembly by different manufacturers or required completion at different times were delivered all at once or as ready, according to the customer's preference. Federal Express's Merge-In-Transit service managed all shipping regardless of location to ensure orders were delivered to the customer's specifications. Neither Cisco nor the contract manufacturer was responsible for the order once Federal Express picked it up. Because the MCO and the CCO were integrated, customers could check on their order's status at any time. The CCO also provided installation support for customers who requested it.

When there were problems that required spare parts, Cisco's depot partners were able to handle them, in nearly every case. Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 14 Cisco Systems (A) no. 1-0001 Additional E-Business Functionality In addition to the

Cisco Connection Online, the Cisco Employee Connection, and the Manufacturing Connection Online Cisco's accounting and HR departments boasted an impressive level of automation. Cisco executives could view up-to-the-minute sales figures from around the world at any time. Additionally, Cisco was able to close its books within a day.

Automated functions within HR included the capability to accept job applications online and to review and sort candidates by critical variables, such as skill level or former employer. Flexibility was as critical as functionality to Cisco's e-business systems. When the company reorganized its R&D and marketing departments from multiple business units to only three, the required changes to e-business applications were completed in less than 60 days at a cost of under $1 million. 15 Summary Cisco was an early leader in adopting innovative techniques and technologies to service customers.

Its ability to harness information technology to streamline its own business made it a leading-edge e-business. The company used email to communicate with customers as early as 1984. Once the Internet was deregulated in 1993, Cisco adopted the Internet to process and service orders, solve technical problems, support customers, integrate manufacturing and distribution, and streamline employee services. Neither Cisco, nor the members of the Cisco team have looked back since. In 1995 John Chambers assumed the helm as CEO and John Morgridge moved up to chair the board..

During the last five years of the twentieth century, Cisco continued to grow at an average rate of over 40 percent a year, eclipsed the market cap of

even GE and Microsoft in 2000, and acquired more than 70 companies to further develop and expand its market presence, product offerings, technological expertise, and headcount (see Exhibit 4). Along the way, Cisco reinvented itself as an e-business, saving more than $800 million a year ($350 million of which was attributed to the Cisco Connection Online16), a sizable portion of their 2000 net earnings of $2. 6 billion. 5 16 Net Ready, p. 252. Ibid, pp. 258, 268 Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 15 Cisco Systems (A) no. 1-0001 Case Questions 1. Can other corporations benefit from investing in e-business functionality to the same extent that Cisco has? 2. What can other corporations learn from Cisco's approach to guiding the e-business transformation? Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 16 Cisco Systems (A) no. 1-0001 Exhibit 1: Cisco's Market Segments Source: Cisco Systems

Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 17 Cisco Systems (A) no. 1-0001 Exhibit 2: Summary Financial for Cisco YEAR Revenues Revenue Growth COGS (as % of Revenues) Gross Margin R&D Sales and Marketing General and Administrative Operating Margin Net Profit Margin YEAR Revenues Revenue Growth COGS (as % of Revenues) Gross Margin R&D Sales and Marketing General and Administrative Operating Margin Net Profit Margin YEAR Revenues Revenue Growth COGS (as % of Revenues) Gross Margin R&D Sales and Marketing General and Administrative Operating Margin 986 129 33. 3% 66. 7% 38. 8% 19. 4% 36. 4% -27. 9% -25. 6% 1991 183, 184 162. 5% 34. 1% 65. 9% 6. 9% 19. 0% 3. 8% 36. 1% 23. 6% 1987 1988 1, 485 5,

450 1051. 2% 267. 0% 55. 3% 44. 7% 14. 0% 7. 6% 14. 3% 8. 8% 5. 6% 44. 9% 55. 1% 14. 0% 15. 2% 15. 8% 10. 2% 7. 1% 1989 27, 664 407. 6% 42. 2% 57. 8% 7. 7% 19. 6% 6. 1% 24. 4% 15. 1% 1990 69, 776 152. 2% 34. 3% 65. 7% 8. 8% 20. 9% 5. 3% 30. 7% 19. 9% 1992 1993 1994 1995 339, 623 649, 035 1, 334, 436 2, 232, 652 85. 4% 91. 1% 105. 6% 67. 3% 32. 8% 67. 2% 7. 9% 17. 8% 3. 5% 38. 1% 24. 8% 32. 4% 67. 6% 6. 8% 16. 9% 3. 2% 40. 6% 26. 5% 33. 8% 66. 2% 8. % 16. 9% 3. 9% 37. 5% 24. 2% 33. 3% 66. 7% 13. 7% 17. 9% 3. 8% 31. 3% 20. 4% 1996 1997 1998 1999 2000 4, 096, 007 6, 440, 171 8, 458, 777 12, 154, 000 18, 928, 000 83. 5% 57. 2% 31. 3% 43. 7% 55. 7% 34. 4% 65. 6% 9. 7% 17. 7% 3. 9% 34. 2% 34. 8% 65. 2% 18. 7% 18. 0% 3. 2% 25. 3% 16. 3% 34. 5% 65. 5% 19. 1% 18. 5% 3. 1% 24. 9% 16. 0% 34. 9% 65. 1% 17. 0% 20. 1% 3. 4% 24. 6% 17. 2% 35. 6% 64. 4% 21. 4% 20. 7% 3. 0% 19. 2% 13. 4% Net Profit Margin 22. 3% Source: Various Cisco Systems SEC Filings Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 18 Cisco Systems (A) o. 1-0001 Exhibit 3: Cisco Connection Online Source: Cisco Systems Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 19 Cisco Systems (A) no. 1-0001 Exhibit 4: Cisco Employee Connection Source: Cisco Systems Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 20 Cisco Systems (A) no. 1-0001 Exhibit 5: Manufacturing Connection Online Source: Cisco Systems Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 21 Cisco Systems (A) no. 1-0001 Exhibit 6: Cisco's Acquisition History

Date Sept 2000 Sept 2000 Aug 2000 Aug 2000 July 2000 July 2000 July 2000 June 2000 May 2000 May 2000 April 2000 April 2000 Company Vovida Networks, Inc. IPCell Technologies, Inc. PixStream Ipmobile, Inc. NuSpeed Internet Systems, Inc. Komodo Technology, Inc. Netiverse, Ltd HyNEX Qeyton ArrowPoint Communications Seagull Semiconductor, Ltd Pentacom, Ltd March 2000 March 2000 March 2000 March 2000 Feb 2000 Sightpath, Ltd Infogear Technology Corporation JetCell, Inc Atlantech Technologies Growth Netwroks, Inc Jan 2000 Jan 2000 Dec 1999 Altiga Networks Compatible Systems Corp Pirelli Optical Systems

Product Voice over IP software Voice and data integrated access software Digital video streaming servers and software Software systems for 3G wireless service providers IP-enabled data storage networks Voice over IP devices Internetworking hardware with content-based switching intelligence IP over ATM access devices Dense wave-division multiplexing optical networking hardware Internetworking hardware with content-based switching intelligence Silicon for high speed (terabit) networks Highly reliable hardware for metropolitan IP data & voice networks Internetworking hardware with content-based switching intelligence Network management software and appliances In-building wireless telephony Network management software Switching fabrics (new category of networking silicon) for high-speed (terabit) networks Enterprise Virtual Private Network (VPN) solutions VPN solutions for service providers Optical internetworking equipment Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 22 Cisco Systems (A) no. 1-0001 Exhibit 6: Cisco's Acquisition History (continued) Dec 1999 Worldwide Data Systems,

Inc. Nov 1999 Nov 1999 Oct 1999 Sept 1999 Sept 1999 Sept 1999 Aug 1999 Aug 1999 June 1999 June 1999 April 1999 April 1999 April 1999 V-Bits, Inc Aironet Wireless Communications, Inc. Tasmania Network Systems, Inc. Webline Communications Corp Cocom A/S Cerent Monterey Networks MaxComm Technologies StratumOne Communications, Inc. Transmedia Communications, Inc. Amteva Technologies, Inc GeoTel Communications Corp Sentient Networks, Inc

Consulting and engineering services for converged (data and voice) networks Digital video processing systems Wireless LANs Internetworking hardware with content-based switching intelligence Customer interaction management software for e-commerce Access solutions over cable-TV networks Optical internetworking Optical internetworking DSL related equipment Optical Internetworking Multiple network convergence (voice/data) equipment IP-based unified communications software (voice mail, email, fax) Call routing solutions for distributed call centers Circuit emulation services on ATM networks (links circuit-switched telephony networks and ATM data networks) Voice and data convergence hardware for ATM networks SONET routers which can carry both circuit-switched voice and packetswitched data PBX systems for voice over IP networks Wireless access hardware for data networks April 1999 Dec 1998 Fibex Systems PipeLinks Oct 1998 Sept 1998 Selsius Systems, Inc Clarity Wireless Corporation Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 23 Cisco Systems (A) no. 1-0001 Exhibit 6: Cisco's Acquisition History (continued) Sept 1998 July 1998 American Internet Corporation Summa Four, Inc.

May 1998 March 1998 March 1998 Feb 1998 Dec 1997 CLASS Data Systems Precept Software, Inc NetSpeed, Inc WheelGroup Corporation LightSpeed July 1997 June 1997 June 1997 June 1997 March 1997 Dec 1996 Oct 1996 Sept 1996 Aug 1996 July 1996 April 1996 Jan 1996 Oct 1995 Sept 1995 Aug 1995 Dec 1994 Oct 1994 July 1994 Sept 1993 Dagaz Ardent Communications Corp Global Internet Software Group SkyStone Systems Group Telesend Metaplex Netsys Technologies, Inc Granite Systems Nashoba networks Telebit's MICA Technologies Stratacom, Inc. TGV Software, Inc Network Translation, Inc Grand Junction Networks Combinet, Inc. LightStream Kaplana Inc. Newport Systems Solutions Crescendo Communications, Inc

Software for IP address management Programmable switches which allow new features for existing telephony networks and voice over IP networks Network management software Multimedia networking software and IP/TV DSL hardware Network security solutions Signaling technologies which allow voice communications over data networks DSL hardware Access hardware for converged (data and voice) networks Network security software SONET/SDH internetworking hardware DSL Hardware SNA to IP transition products Network performance monitoring and management software Gigabit Ethernet switching Token-ring switching solutions Digital modem technology and access servers WAN Switching equipment Internet software products Internet software products Fast Ethernet switching products ISDN networking products ATM switching, LAN switching and routing Ethernet LAN hardware Routers for remote network sites LAN Switching solutions Tuck School of Business at Dartmouth—Glassmeyer/McNamee Center for Digital Strategies 24