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Stora Enso North America

> *Tools are finally available to economically create information transparency across entire industries. This transparency will drive the next major increase in societal productivity by eliminating supply chain waste and by sharing core competencies among business partners. Linked modules of software code will be developed one at a time by members of the supply chain and shared with all.*
> —Robert Leach, VP of IT, Stora Enso North America

Through the late '90s, excitement about the Internet focused on the potential of the dot-coms and their futuristic visions. But Robert Leach, VP of information technology for Stora Enso North America (SENA)—and Federal Reserve chairman Alan Greenspan, for that matter—were more inspired by methods for achieving increased business efficiency. Though these methods had been technologically possible for decades, they were just becoming economical, thanks to advancements in the Internet and related technologies.

Every repeated task or process within a corporation generates information, much of which needs to be stored, manipulated, and later retrieved. In addition, some information needs to be *shared* internally and externally to facilitate related business processes. Systems existed that stored data for multiple functions within a business but they were developed independently, with little thought of future integration. Finance systems could readily assist accountants, and account managers were well served by customer databases, but the two systems couldn't easily share data. There was a great deal of repeated "Go to system A, print out the information you need, and reenter it in a different format in system B" going on within corporations.

The Internet and internetworking technologies made it possible to streamline information flows that crossed functional boundaries within a corporation—even across corporate boundaries—without completely rewriting these systems. This created a clear opportunity for unprecedented productivity growth. These technologies also created the opportunity to minimize the volatility that all traditional industries face to varying degrees by enabling more precise inventory planning through accurate, up-to-date information from multiple industry sources.

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New Services for an Old Industry

Robert Leach had a vision that extended beyond creating information transparency throughout the paper industry. He visualized offering a new set of services, the most important of which he believed was an inventory management service across the entire paper supply chain. He also visualized ancillary services enabled by the collection of industry data related to waste, product quality, and forecasts.

Leach had made encouraging progress with a key client, Time Inc., and in July 2001 the companies jointly announced a major milestone: completion of the first transaction using a new industry e-commerce standard (Exhibit 1). Still, simply integrating information systems across the industry—never mind getting new services off the ground—would take cooperation from many companies. Leach hoped that the announcement would instigate a chain reaction in which other companies adopted the new standard in an effort to keep up with SENA as they pursued their new vision for information technology (IT) interconnectedness.

But Leach was far from realizing his ultimate vision. Many potential barriers stood in the way. Cultural differences, lack of trust, scarcity of capital, and varying levels of IT sophistication all could hinder the cooperation required to create the necessary industry information infrastructure. Even if the infrastructure was completed, could Leach position SENA to capture and sustain value from data availability by offering a new inventory management service?

The Paper Industry

The forest and paper products industry encompassed products and services as diverse as timberland management and the production of facial tissue. The value chain of this roughly $600 billion worldwide industry started with raw material—wood—that was harvested from forests and delivered to saw mills and pulp mills (Exhibit 2). At pulp mills, the wood was debarked, broken down into small chips, and made into pulp. Pulp was then transported to paper mills where it was blended into a mix that was 98% water. It was finally pressed, dried, and bleached by paper machines, which were typically decades old, hundreds of feet long, processed at speeds of 30 to 40 miles per hour, and produced "parent rolls" as wide as 40 feet. These machines were the heart of papermaking. State of the art machines cost hundreds of millions of dollars.

Towards the end of the production process, paper could be "calendared" to create a smooth finish and/or "coated" to improve printability. Publishers purchased the large parent rolls and fed them directly into the printing presses that produced newspapers, magazines, and other publications. Other parent rolls were "converted" into more manageable sizes and sold to merchants or distributors, who sold to retailers and small commercial printers.

Although many paper manufacturers were active in upstream businesses, such as forestland operations and pulp production, these markets remained highly local and fragmented. Paper manufacturers purchased a substantial portion of their pulp and wood supplies on the open market. Paper-manufacturing companies often had a diverse line of products but tended to focus primarily on one segment of the paper industry, such as newsprint, coated papers, paperboard, or personal papers.

Industry Dynamics and Industry Economics

The paper industry was characterized by high fixed costs, inconsistent demand, periods of overcapacity, volatile raw material prices, and service-based differentiation. The two major fixed costs in the industry were land and manufacturing equipment. As with any high fixed-cost industry, capacity management drove profitability—every ton under capacity significantly decreased margins.

Capacity management was difficult because paper demand was volatile. In addition to Christmas advertising spikes, demand was sensitive to the condition of the economy at large. A significant portion of the paper industry supplied advertising-driven industries, such as newspaper and magazine publishers, that were particularly sensitive to economic downturns.

Capacity management was also complex because of the long lead times required to build or upgrade mills. There was no way to add short-term, incremental capacity to meet a slight increase in demand. A period of burgeoning demand often resulted in multiple players adding capacity at the same time. Because companies were often not aware of the total new industry capacity that was under construction at any given moment, overbuilding for the industry as a whole was likely. This resulted in periods of overcapacity and diminished profitability.

Another threat to the bottom line came from regular fluctuations in raw material prices. In a three-year period, from January 1998 to January 2001, the market price per ton of pulp started at $570, dropped to $485, peaked at $710, and ended at $680.[1] These fluctuations were driven in part by the same capacity management difficulties that paper manufacturers faced.

While the significant capital investment required to enter the paper industry limits the number of new entrants, the paper industry remained a highly competitive commodity business. Price competition could be intense. Although paper quality and consistency were once differentiators, by the late 1990s, most papermaking techniques were well known throughout the industry. Therefore, paper manufacturers sought to differentiate through excellent customer service and other ancillary services.

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[1] Jaffe, Michael, "Paper & Forest Products," *Standard & Poor's Industry Surveys,* April 12, 2001, p. 2

Paper Industry Trends: Globalization and Consolidation

In the '90s, improvements in communication technology and declines in transportation costs enabled paper manufacturers to expand geographically from regional to global. Globalization benefits included broader market reach, economies of scale, the ability to improve production efficiency by sharing best practices, optimized sales and logistics operations, and increased bargaining power with suppliers.

Growth strategies focused primarily on acquisition. Weyerhaeuser Company purchased MacMillan Bloedel Ltd. for $2.45 billion in November 1999, becoming the second biggest wood-products maker. In May 2000 International Paper bought Champion Paper Corporation for $7.3 billion in cash and stock, increasing its North American market share from 22 percent to 30 percent. Stora Enso Oyj completed an August 2000 purchase of Consolidated Papers, Inc. (which became SENA following the acquisition) for $4.8 billion, solidifying the number two world ranking in both paper and combined paper and packaging. Later that year, in November 2000, Georgia-Pacific Corp. took over Fort James Corporation for a total of $11 billion, becoming the world's leading tissue maker, with 40 percent share in the North American tissue markets. A great deal more consolidation seemed likely, as the top player still controlled only 5 percent of worldwide paper production capacity.

Foreign exchange markets shaped the globalization process. For example, the strength of the U.S. dollar led U.S.-based firms to consider foreign production. It also created opportunities for competitors, especially those in Asia-Pacific markets, to penetrate the U.S. market.

Customer Segments: The Merchant and Magazine Markets

Paper merchants sold primarily to smaller commercial printers who produced small-run publications, brochures, and other items. Paper manufacturers held inventories of the standard stock keeping units (SKUs) most frequently ordered by merchants. But manufacturers offered a dauntingly wide product line, including extensive combinations of weight, grade, size, and finish, making it impractical to hold inventories of all SKUs. As a result, sales were often lost to competitors when items were out of stock. Sales were also affected by delivery times, and therefore geographic proximity, because merchants were increasingly seeking logistical efficiencies.

Direct sales to large publishers (such as Time Inc.) generally involved multi-year contracts with performance discounts below list price. Paper purchases represented roughly 30 percent of most publishers' total production costs, so relationships with paper manufacturers were critical. Typically, publishers would regularly purchase from at least two paper manufacturers.

Publishers entered into multiyear agreements with printers to manage both the printing process and the paper inventory management function. Paper manufacturers typically did not hold inventory of the lightweight coated papers that were sold to publishers; paper purchased by publishers was loaded directly onto truck or rail and shipped to the large commercial printers. Four major firms dominated the large commercial printer market: RR Donnelley & Sons Company, Quebecor World Inc., Quad/Graphics, and Banta Corporation.

Merchant Consolidation and a B2B Marketplace

Other late-'90s developments in the paper industry included continued consolidation in the distribution channels as well as a joint venture to create a B2B marketplace. Leading paper and plastics distributor Unisource Worldwide Inc. was purchased in 1999 by papermaker Georgia-Pacific, and another large distributor, xpedx, was created by International Paper. (IP had been steadily acquiring local merchants for years and by 1999 had consolidated them under one brand.) These two distributors controlled about half of all paper distribution and targeted large accounts that sought to benefit from their multiple locations and relationships with numerous paper manufacturers. Several dozen regional or local merchants served the other half of the market.

In the spring of 2000, Georgia-Pacific, International Paper, and Weyerhaeuser jointly announced the establishment of a global business-to-business electronic marketplace, ForestExpress.com. Soon after, Boise Cascade, Mead, and Willamette joined the marketplace as strategic partners. The mission of ForestExpress was "to provide a web-based solution that enables participants to reach new trading partners, share information, streamline business transactions, reduce operating costs, and increase profits. Features and services include programs sales, catalog functionality, RFQ, auctions, transaction processing, and third-party programs."[2] ForestExpress completed more than 100 transactions across the industry in its first two months of activity in early 2001.

Consolidated Papers, Inc./ Stora Enso North America

For more than one hundred years, Wisconsin-based Consolidated Papers, Inc. (CPI) had set the standard for R&D and innovation in the paper industry. The company's notable achievements included building the world's first electrically powered paper machines in 1904 and, in 1935, producing the first coated paper manufactured by a single high-speed operation.

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[2] ForestExpress.com website, August 2001

In August 2000, CPI completed a seven-month acquisition process and became the North American operations of Nordic paper powerhouse Stora Enso Oyj. The combined $13-billion corporation pushed parent company Stora Enso into the top echelon of the paper industry—on scale with $28-billion industry leader International Paper. The acquisition made Stora Enso the worldwide leader in coated papers and was expected to create cost savings of $110 million by 2002. CPI became Stora Enso North America and remained the number one supplier of coated paper in North America, with 20 percent of the U.S. coated printing paper market. SENA added more than $2 billion in annual revenues to Stora Enso and, with more than two million metric tons of paper shipped annually, accounted for 17 percent of Stora Enso's total capacity.

By 2001 SENA had more than $2 billion in fixed assets (Exhibit 3). Regular capital investments, on the order of tens to hundreds of millions of dollars, had increased capacity and improved on environmental standards and waste management. Between 1995 and 1997, SENA spent $166 million to install a new paper machine at its mill in Steven's Point, Wis., and more than $500 million on a paper machine installation in Wisconsin Rapids. SENA had 22 paper machines among its 12 paper mills in North America, and it owned and managed 700,000 acres of forestland in Wisconsin, Michigan, and Minnesota in the U.S. and in Ontario, Canada. The forestland generated 12 percent of SENA's wood needs, and its pulp mills generated 66 percent of its manufacturing needs; the remaining pulp was purchased in open pulp markets.

SENA's Product Lines and Customers

SENA generated 85 percent of its revenues from lightweight-coated, heavyweight-coated, and "super-calendared" printing papers. It also sold paperboard and paperboard products, pulp, and other specialty papers. Just over half of paper sales came from lightweight-coated grades used for magazines, catalogs, newspaper inserts, and coupons. Heavyweight-coated grades accounted for 29 percent of paper sales, and super-calendared grades accounted for 14 percent of paper sales. Both typically were sold through merchants and distributors and were used for annual reports, brochures, books, and advertising communications. Coated specialty papers, used for food and consumer product packaging and labeling, composed the remaining 6 percent of paper sales.

SENA's paper sales were divided almost evenly between merchants and magazine publishers. The merchants selected heavyweight and super-calendared grades from SENA's inventory of about 500 standard SKUs. SENA served the needs of these customers by carrying about two months' inventory, stored in warehouses in Wisconsin and Pennsylvania; the latter was built as part of an effort to decrease delivery times to eastern U.S. customers.

The other half of revenues came from magazine publishers who purchased lightweight-coated paper, which CPI pioneered. As the name implies, this paper was lightweight and therefore had lower raw material costs, and the coating improved printability and made it opaque and difficult to tear. In 2000 SENA boasted the largest market share of the North American magazine publisher market—20 percent of the 3.8 million tons sold—and had contract relationships with most of the top 15 publishers in the U.S. The company's most notable relationship, with Time Inc., was 66 years old and was one of Stora Enso's largest customers worldwide. Orders from magazine publishers were placed 60 days in advance and were the controlling factor that determined how paper production was scheduled. Four mills and 10 paper machines were dedicated to magazine paper production.

SENA Value Proposition

Historically, product innovation was the strength of SENA/CPI. In prior decades, CPI had refined its focus on coated papers and predominantly divested of unrelated businesses. It was the market leader in coated paper in North America, with strong distribution channels, a proprietary coating technology, and modern milling and converting processes. Additionally, CPI's brand name was well recognized in North America, and the company had gathered an experienced and knowledgeable workforce. By the late '90s, the importance of service-based differentiation was abundantly clear, and CPI envisioned not just offering the best customer service in the paper industry, but becoming a model for customer service regardless of the industry.[3]

Company Culture

CPI's traditional top-down, centralized organizational structure proved extremely successful throughout the '80s. Based on key financial measures, such as return on equity, return on investment, and return on net assets, CPI was an industry leader. But in the '90s, the competitive environment intensified, drastically shrinking operating margins. Better management of costs and capital investments was essential. The paper industry was rapidly globalizing, and CPI's earnings per share dropped from 1995 to 2000. The board of directors, under the leadership of CEO Gorton "Buck" Evans, concluded during the strategic planning process that either a merger with or an acquisition by a larger global player was desirable. As a result, CPI was acquired by Stora Enso in August 2000. To handle the new global organization, a decentralized matrix organization was put in place—exactly the opposite of what had existed at CPI.

The acquisition by Stora Enso led to other significant changes, including changes in organization and incentive structure. Historically, the paper mills had been organized

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[3] Shaw, Monica, "Getting to the Core of Customer Service," *Pulp & Paper Magazine*, June 2001, p. 31.

and managed as cost centers, and individual managers tended to be isolated within their specific areas of responsibility. After the acquisition, most of the mills' organizational structures were changed to what was called a "line concept," meaning managers and supervisors were charged with controlling whole lines rather than just single elements of a line. The objective was to create a more entrepreneurial environment and to allow employees to be more self-managed and self-directed. The incentive system was changed as well. The stock-options-based program that had stretched deep into the organization was reduced to upper-level management—entrepreneurial activity was encouraged in other employees through bonuses of 10–20% of salary based on achieving corporate, mill, and individual goals.

The Evolution of the IT Strategy

As part of the turnaround effort in the late '90s, Gartner Consulting was hired to complete a thorough study of the state of the IT department, including the information services delivery model, the application infrastructure, and the IT organizational structure at CPI. The consultants discovered a culture driven by seniority rather than skill. CPI's history of rewarding too many people with promotions had resulted in a top-heavy organization. In addition, the IT department suffered from a lack of respect by other departments; it was considered strictly a means for automating existing processes rather than improving them or creating new processes. Non-IT executives tended to hamper progress because they hesitated to share information with other divisions and generally didn't see the value in IT. One IT manager recalled an incident from the early '90s when a VP surveyed a room of 40 to 50 IT staff, turned to the IT manager, and said, "I would trade all of these people for about 10 good process engineers."

Even worse, according to Gartner's study, was Consolidated Paper's outdated IT infrastructure. Information was not thoroughly gathered and was difficult to access. The management team had not wanted to make significant investments in IT and instead continued to emphasize product quality and consistency as the primary drivers of success. CPI had successfully leveraged these differentiators into the early '90s and was hesitant to shift to a technology-focused strategy.

The consulting firm identified several important business drivers that CPI needed to target to improve the state of IT. The most critical need was improved customer service. The combination of an undeveloped IT infrastructure and several significant acquisitions in the mid-'90s had created a collection of incompatible information systems. Customer service reps (CSRs) were overburdened by trying to act as manual interfaces between multiple computer systems, most with which they had little experience. Information about pricing and inventory availability could take so long to gather that CSRs often would be forced to tell customers they'd have to get back to

them later in the day with answers to basic questions. Information could be inaccurate if multiple CSRs promised the same inventory to different customers.

Gartner suggested implementing an enterprise resource planning (ERP) solution to integrate the various IT systems. It also recommended hiring a new VP of IT, both to manage the transition and to turn around the image and influence of the IT function at CPI. An executive steering committee, headed by Jim Shewchuk, senior vice president of administration, was named to oversee the IT overhaul and, in January 1999, Robert Leach was hired as VP of information technology. Leach brought with him extensive technology management experience from his tenure at General Electric and Pella Windows.

A New Approach to IT: Customer Focus and Time Compression

Leach immediately began to pursue a new vision for IT, one that he communicated using the "IT Strategy Globe" (Exhibit 4). The globe defined three major areas of IT responsibility. The outer crust was e-commerce and supply chain activities, the middle layer was business information (ERP), and the core was mill process data (MES). Leach's strategy was to leave the core alone, ensure the middle layer was functional, and focus on the outer crust, the area that would produce functionality most visible to the customer. He felt that the mill-level systems, though old, were working adequately and just needed better interfaces to other software serving the entire corporation.

He also emphasized a philosophy based on the idea that "time compression drives savings," insisting the benefits of all IT projects should be realized within one year. In addition, Leach had a relentless customer focus, targeting both external customers and the internal departments IT supported.

In order to increase internal customer focus (the IT department viewed other CPI departments as their customers), Leach reorganized his department around customer-centric teams. These teams were composed of six to ten members and were co-located with their customers. Project prioritizations were controlled by the local customer steering committees. Prior to the reorganization, customers controlled less than 10 percent of the IT resources. After the reorganization, customers directly controlled 90 percent. This allowed IT managers to better understand the needs of the organization and craft better technology-based solutions for meaningful problems.

Though Leach had been hired to help CPI "catch up" on technology, he knew that winning financial support from his superiors would be difficult. Unlike his dot-com counterparts who were building B2B exchanges, there were no deep-pocketed venture capitalists to finance his efforts. Typical IT budgets in the industry were approximately 1-2% of revenues. To gain credibility with the board, he immediately began *cutting* the costs under his direct control. Within three quarters, he had cut his budget by 10 percent. He halted several dubious projects, allowing a handful of

external IT contracts to be discontinued and refocusing numerous internal personnel on more customer-centric work.

Leach planned initiatives such that multiple projects were in progress at all times, and promised a convincing deliverable every three months. By cutting costs, showing quarterly progress to the board of directors, and highlighting feedback from the sales staff about the level of attention customers were giving to e-commerce initiatives, he was able to secure funding. In fact, he was able to start the process of researching and piloting some new initiatives without promising specific deliverables.

From ERP to XML and Beyond

Between 1999 and 2001, SENA implemented three critical IT initiatives (Exhibit 5), each contributing to the eventual goal of offering a service of managing inventories across the supply chain. The first project focused on improved customer service performance, which, as of 1998, was notably worse than competitors' and becoming a crisis. Backed by the 1998 Gartner analysis and an ensuing vendor assessment by Andersen Consulting, completed in May of 1999, CPI elected to install a J.D. Edwards (JDE) ERP solution to remedy this situation. While packaged-applications vendors such as JDE offered standardized applications for most every business process, from human resources to finance to sales, the installation at CPI was targeted almost exclusively at improving the customer service systems. Contrary to past IT project development, Leach went to the highest level to get the support for this new initiative.

The scope and functionality of the JDE system was defined and implemented based on feedback from multiple steering groups, departmental teams, and executive committees. Andersen consultants and CPI IT staff collaborated to develop the new system while integrating ongoing feedback from throughout the organization. The JDE system went live in February 2000—nine months after Andersen completed its assessment—marking a dramatic improvement in the way the IT department was viewed internally. As a result, people were better able to think creatively of new IT possibilities and believed that something actually might happen. Palmi Möller, marketing and sales applications manager, described IT's new image as follows:

> *"The image of IT has changed since 1997. In the past, employees felt if they asked IT to do something, it was either going to take forever, it was going to cost too much, or there would be political problems. I used to be very offended by the view of the IT department—I was basically looked at as an expense item. But it just changed. It was incredible to live through it. When we rolled out the system, we were basically hailed as heroes in the paper industry."*

Differentiating Using Technology

With the customer service initiative underway, Leach was free to start looking at other IT projects that could create competitive advantage rather than just catch up with the competition. Ideas were generated for both of the major customer segments—merchant and magazine sales—but merchant initiatives never got off the ground. Merchants were generally small and local operations, and by and large didn't have the necessary IT sophistication to participate in the initiatives being considered. Many didn't even have websites, and accessed the internet via dial-up connections.

The magazine segment, however, offered more promising opportunities, and more strategic ones. Leach was concerned that printers were trying to disrupt the industry's traditional mode of operation, in which publishers negotiated contracts with both printers and paper manufacturers. In an effort to convince publishers to deal only with them and not with the paper manufacturers, printers were arguing that they could drive prices down by consolidating publisher demand. Publishers were hesitant to give that much power to printers, but potential cost reductions were attractive.

Leach felt that a supply chain service could prevent this shift and allow paper manufacturers to continue to own the relationship with publishers. In late 1999 he wrote a memo to the executive steering committee outlining the three supply chain services he hoped to offer: (1) an inventory management tool, (2) a paper utilization and forecasting tool, and (3) a waste-tracking and quality-monitoring service. Leach believed that no one in the supply chain, outside of the manufacturers, had mastered inventory management and consequently there were gains to be made across the chain.

By offering to manage publishers' inventory, potentially for no additional fee, Leach hoped to enlist their assistance in forcing printers to connect their operating systems to industry-wide internetworks. The agreement he planned to propose was that CPI would own paper inventories now managed by the publishers and accept major penalties if paper was ever unavailable.

The second service Leach felt CPI could offer was a demand forecasting service. He believed building an industrywide information infrastructure would provide access to the data necessary to create a forecasting module that publishers and printers would want to use for planning purposes. As a side benefit, better access to publisher forecasting data would allow CPI to generate savings through better production planning. Specifically, the company would be able to control the tradeoff between the benefits of better capacity utilization (achievable by producing for future expected demand during slack times) and the resulting extra inventory carrying costs.

The third service Leach envisioned, waste tracking and quality monitoring, promised to offer multiple benefits. Data already was being collected to trace the root causes of expensive paper breaks on printing presses to the specific paper machine on which it

was rolled as well as the manufacture date and time. This data could determine whether paper quality issues or operator error at the printer caused the break, and facilitate reports to publishers of exact waste statistics. However, contracts between publishers and printers included defined allowances for waste, so when printers produced less than the contracted waste, the value of the excess paper went straight to their bottom lines. Because of this built-in benefit, printers had little incentive to share their waste data.

CPI Developed an Industry-leading Internet Application

By early 1999, business-to-business exchanges began to appear in the industry. Concerned by the potential strategic implications of the development, CEO Buck Evans tasked Leach with crafting CPI's response, approving $250,000 for experimentation with Internet applications. Nothing specific was promised in terms of delivery—no reduction in staff, time, or costs. Leach intended to make data available externally on a secure website. Möller described the vision for the new application this way:

> "The goal was to go after what was easy for computers to do. In customer service, we know that many of the calls are, "Where is my order?" We have human beings that are well-paid management people, and we're thinking a computer can do this. Why don't we let the customer service people do what is complicated, like looking for a production run that could satisfy a unique customer request?"

Leach looked to internal departments, such as sales and marketing, to help clarify the vision but discovered those departments had a hard time articulating the specific functionality that was needed; they knew only that their customers were asking them what CPI was doing to respond to the Internet. So Leach joined forces with a supply chain improvement team that had been assembled in 1997 and included representatives from sales, marketing, customer service, and information technology. At the suggestion of CPI, major magazine customer Time Inc. had created a similar team. The teams combined efforts at annual summits, discussing how operations between the companies could run more smoothly.

Leach approached Time Inc. through the supply chain team to offer a new Internet-based application: CPI e-Biz (renamed SENA e-Biz after the acquisition). Time Inc. was an ideal customer for this early exposure because it was a large customer that did business with one mill, which made it easier to build the new Internet application. Time Inc. initially responded that the CPI e-Biz proposal would not be of significant value. Undaunted, Leach started to develop the website anyway. For four months, he and his team worked with no customer feedback and a limited budget to create what they thought was a good solution.

In October 1999 CPI presented Version 1 to Time Inc.'s internal purchasing organization. Purchasing realized that, with a few adjustments, this version would enable access to data that they had been trying to get from their own IT systems for years, such as purchases by title. Although Time Inc.'s purchasing systems could indicate total paper purchases, they could not indicate purchases by title or trends by title.

Quick results and positive feedback from Time Inc. built momentum within the initiative and helped ensure continued funding. Leach asked for and received $1 million to continue development in 2000, promising to have a deliverable every three months. The site was expanded during the first half of 2000 to include data from other customer accounts, both on the magazine and the merchant side. This was near the peak of the Internet boom. Worse, as corporate IT departments were finally freed from Y2K projects, B2B exchanges had become the focus of most of the Internet hype. CPI's customers were overwhelmed and, because of the success of CPI e-Biz, they looked to CPI for guidance. As Möller noted,

> "Everything was very confusing in 2000, especially during the beginning of the year. We were getting stronger and stronger support from sales and marketing for CPI e-Biz. That is because the dotcoms were creating an incredible amount of confusion in the marketplace. Our sales reps were being asked, "What is your response to this dotcom versus that dotcom? What are your strategies?" Our sales reps were turning to us, saying, "Help!""

Although the website was an industry innovation, as late as July 2001 customers were not able to use SENA e-Biz to place an order. They could check the status of an order, but they still had to call or send email to make a change. Leach felt that customers were using the system but not as much as it could be used—SENA needed to better educate customers on its benefits. Meanwhile, employees in Time Inc.'s purchasing department were happy with the system but wanted to go the next level. They wanted to eliminate the inefficient step of taking data from the website and then re-keying it into their systems or converting it into a spreadsheet. Better integration was necessary to really reap the rewards of this new data availability.

XML Opened the Doors to Integrated Systems

By third quarter 2000, CPI had become SENA and the JDE customer service system was the standard across its North American systems. Account data was readily available to customers through the newly renamed SENA e-Biz website. To make further improvements, SENA would have to integrate its IT systems with its customers' systems.

Fortunately, as SENA e-Biz was being developed, Time Inc. was rebuilding its order management system (OMS), which tracked paper demand for each of its magazines,

handled paper order and delivery information, and managed consumption reports from printers. SENA hoped to influence the development of Time Inc.'s new system in such a way that there would be greater automation of information flows going in both directions between the two companies. John Gillen, VP of magazine sales, explained part of SENA's perspective:

> "We were ultimately trying to get better demand numbers on titles where we were the sole supplier so we could balance out our production and be a little more efficient. Fifty percent of the demand for one mill is scheduled based on Time Inc.'s needs. We can't schedule production until all those orders come in. At the same time, we have some customers who will place orders with us 90 days in advance, but we can't schedule those until the Time Inc. order comes in."

In order to improve information flows, SENA and Time Inc. needed to link the Time Inc. OMS system with the systems behind SENA e-Biz. CPI had been conducting electronic commerce with Time Inc. for years using electronic data interchange, known as EDI, an expensive system that uses a proprietary technology to exchange business data through a limited set of standard forms. Although EDI was ideal for a high volume of routine data exchange and transactions between large companies, it had limited flexibility and its high cost was prohibitive for smaller supply chain partners.

A better solution was extensible markup language (XML). XML mixed the cross-platform, Internet-based functionality of HTML with the electronic transaction capabilities of EDI. It surpassed both because it eliminated the expensive limited systems of EDI and offered new ways of "tagging" data that were not possible with HTML. Because of its flexibility, XML had the potential to change the way SENA interacted with its whole supply chain, including Time Inc. Still, it would take many months to integrate systems. As a first step, SENA and Time would have to agree on a set of data-formatting standards. No industry-wide standards existed at that time.

Setting Industry Standards Proved Complicated

Establishing industry-wide data standards is always a difficult process. It requires coordinating the needs of all players within an industry, who naturally experience conflicting desires to cooperate and to compete. By the early twenty-first century in North America, two forest products industry organizations were vying to take on the role of standard bearer—the Graphical Communications Association (GCA), made up of a few paper manufacturers and many publishers and printers, and a broader organization called the American Forest & Paper Association (AF&PA). GCA focused on representing the paper manufacturer/printer/publisher portion of the forest products industry.

Time Inc. and SENA together were highly influential within GCA, especially in setting IT standards; an IT committee within GCA that Time Inc. and CPI had driven for the previous 16 years was recast as an XML committee. In mid-2000 GCA adopted the standards that had been designed jointly by Time Inc. and SENA. Around this time, the Confederation of European Paper Industries (CEPI) decided that it wanted to sponsor a set of standards for XML. CEPI was to the European market what AF&PA was to the North American market.

Since CPI had just become part of Stora Enso, Time Inc. and GCA had some leverage when working with CEPI to approve a new XML standard. The resulting standard, named papiNet, was viewed as a global standard, but it was really a European/North American XML standard for the first five transactions developed by Time Inc. and SENA: request for quote, purchase, acknowledgement, invoice, and shipping manifest or weight inspection. Leach described the process of adopting the XML standards this way:

> "It is dramatic that, in less than a year, the Europeans have been able to come together and agree on a standard. Part of the reason they were able to agree on a standard so quickly is because we had a standard ready. It hadn't yet become the official U.S. standard, so as part of Stora Enso we were coming in as much a European producer as a North American producer. The first five transactions are basically our five transactions—the joint ones Time Inc. developed with us."

Once involved on a global basis, CEPI recognized that the papiNet standards were only useful for a fraction of the corporations which they served, so it tried to get AF&PA, an organization with a similar breadth of interests, involved as well. That created conflict between the two North American organizations because AF&PA didn't have a standards-setting group like GCA but still wanted to be the official North American standards-setting body.

The Road to a New Supply Chain Service

As of July 2001, Leach felt that SENA had completed 25 percent of the development needed to offer the supply chain management services he envisioned. SENA was beginning to work with other publishers and even a major printer. XML-based systems were being created on a customer-by-customer basis. But there still were significant hurdles to making this service a reality, including establishing trust along the supply chain, convincing printers to share data, and encouraging the U.S. adoption of papiNet.

Asking a publisher to trust that a paper manufacturer will have inventory available when it is needed is a big leap of faith, especially given the havoc that a paper stock-out would cause a publisher. And, although publishers own the inventory sitting in printers' warehouses, printers control most of the key information, including

production schedules, paper quantities used, and the waste factor. Making that data available takes the joint efforts of paper manufacturers and publishers. And, finally, while the papiNet standards were making headway, there was still no guarantee that AF&PA and the rest of the industry would adopt the XML transactions that SENA and Time Inc. had created.

Nevertheless, significant progress had been made. In fact, SENA's initiatives in the 1999–2001 timeframe propelled the company to near the top of *Information Week's* list of 500 most innovative corporate IT departments. From its 1999 rank of 489, SENA jumped to the 29th position.

How could the company maintain this position? Leach, in preparing for the fiscal 2002 budget meetings, was faced with several tough decisions. The business environment was changing, and he was pondering some fundamental questions about how to pursue existing goals, and how those goals should be prioritized against IT issues that had received less attention since his arrival.

Was it more important to offer e-commerce capabilities to Stora Enso's European customers, or enhance e-commerce functionality for customers already using it? Did it make sense to continue to focus primarily on magazine customers, or was it time to focus on merchants? Would it be prudent to put some effort into creating an XML-based marketplace transaction clearinghouse, available to the entire industry? (Would such an exchange ever be viable? If so, wouldn't it make sense for SENA to try to develop it?)

Alternatively, was now the time for a dramatic shift in focus? Perhaps it made sense to pursue e-commerce initiatives with suppliers. And how much focus should be given to SENA's antiquated mill systems? There were major opportunities for improving those systems and reducing production costs, and cost-cutting initiatives had much more predictable returns than revenue-enhancing initiatives.

Discussion Questions

1. Compare SENA's approach to creating information transparency throughout the industry to ForestExpress.com's approach. Which is more likely to succeed?

2. SENA wants to offer a service to other players in the supply chain; they want to track and manage inventory across the entire chain. Why would this create value?

3. If there was information transparency throughout the supply chain, how would this change the balance of power in relationships among the players along the chain? Who is likely to capture this value? Who stands to lose? Why?

4. If there were value to be gained through better coordination of the supply chain, would vertical integration make more sense than building interfaces between independent information systems?

5. How could SENA accelerate its progress towards being able to offer this service?

6. What are some of the key barriers the company has had to overcome to achieve progress so far? What are the key barriers it will still have to overcome?

7. What are some additional e-business initiatives that might represent significant opportunities for SENA?

8. What was Leach's strategy for funding IT initiatives? How did he convince executive committees that innovative IT development should be part of SENA's strategy?

Exhibit 1

Press Release Announcing XML Transactions with Time Inc.

Stora Enso North America Implements E-Commerce Connection with Time Inc.

July 12, 2001

WISCONSIN RAPIDS, Wis.—Papermaker Stora Enso North America announced that it recently completed a paper order with Time Inc. using "Extensible Markup Language" (XML), an initial step in the evolution of e-commerce between forest and paper product producers and their customers.

The June 13 paper order, made via the papiNet standard, is the first production implementation of a papiNet standard message in North America.

The purpose of papiNet, created by a global coalition of forest product companies, is to develop, maintain, and support the implementation of global electronic business transaction standards for parties engaged in the buying, selling, and distribution of forest and paper products. The aim is to improve the reach and richness of communication throughout the supply chain, increase efficiencies, and support interoperability among trading partners.

Stora Enso North America Project Leader Kevin Shibilski said, "The implementation of this e-commerce system under Stora Enso North America will provide added value to our relationship with customers by reducing costs, improving timeliness, and enhancing business efficiencies."

Time Inc. and Stora Enso North America are currently testing electronic invoicing.

Anne Considine, E-Commerce Manager for Paper Purchasing at Time Inc., said, "With a common style-sheet shared between buyer and seller, it is much easier to test and monitor the purchase order flow and is a major improvement over the current systems."

Time Inc., the world's leading magazine publisher, is a wholly owned subsidiary of AOL Time Warner Inc. Stora Enso North America, a division of global paper and forest products company Stora Enso Oyj (NYSE: SEO), promotes communication and the well-being of people by turning renewable fiber into paper, packaging, and processed wood products.

Exhibit 2

Forest and Paper Products Industry Value Chain

```
                    ┌─────────────────┐
                    │   Forestland    │
                    │   Operations    │
                    └────────┬────────┘
                    ┌─────────────────┐
                    │      Pulp       │
                    │    Producers    │
                    └────────┬────────┘
                    ┌─────────────────┐
                    │     Paper       │
                    │  Manufacturers  │
                    └────────┬────────┘
         ┌─────────────────┐       ┌─────────────────┐
         │   Publishers    │       │    Merchants    │
         └────────┬────────┘       └────────┬────────┘
         ┌─────────────────┐       ┌─────────────────────────┐
         │    Printers     │       │ Local Printer, Retailer, or │
         │                 │       │   Business Customer     │
         └────────┬────────┘       └─────────────────────────┘
         ┌─────────────────┐
         │    Consumer     │
         └─────────────────┘
```
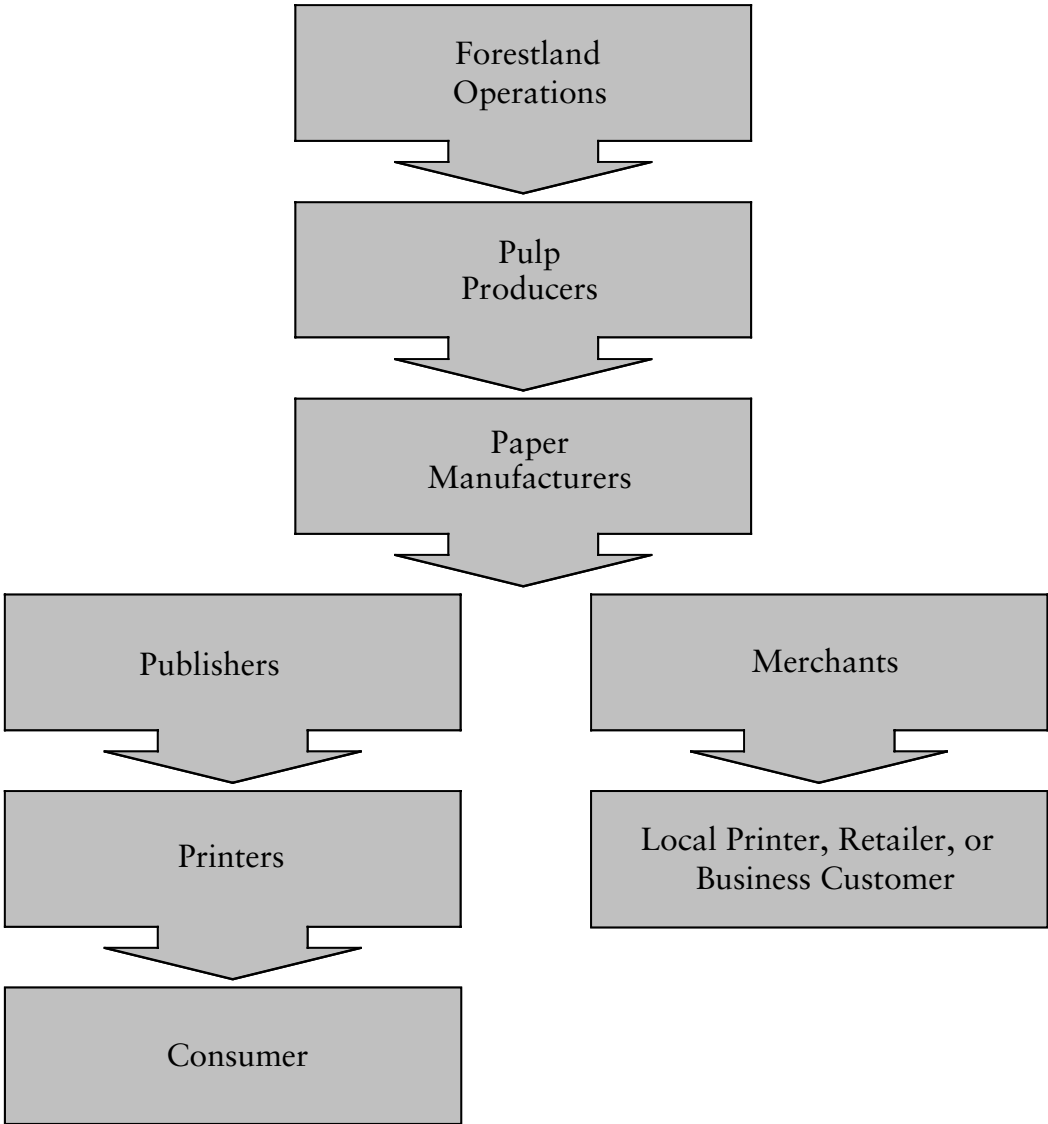
Exhibit 3

Selected Financials
(FY 2000 data unavailable due to Stora Enso acquisition)

(millions)	**1999**		**1998**		**1997**		**1996**		**1995**
INCOME STATEMENT									
Sales	$	1,839	$	1,989	$	1,679	$	1,545	$ 1,579
Gross Income	$	266	$	340	$	293	$	370	$ 452
Operating Expense	$	102	$	102	$	84	$	79	$ 67
Operating Income	$	164	$	238	$	210	$	291	$ 385
Pretax Income	$	110	$	178	$	190	$	289	$ 380
Net Income	$	66	$	102	$	118	$	179	$ 229
Gross Margin		14.5%		17.1%		17.5%		23.9%	28.6%
Profit Margin		3.6%		5.1%		7.0%		11.6%	14.5%
BALANCE SHEET (partial)									
TOTAL ASSETS	$	3,526	$	3,627	$	3,348	$	2,532	$ 1,933
Cash	$	6	$	3	$	13	$	13	$ 5
Receivables	$	128	$	147	$	161	$	126	$ 140
Inventory	$	169	$	189	$	205	$	138	$ 132
Fixed Assets	$	2,554	$	2,601	$	2,306	$	1,648	$ 1,468
TOTAL DEBT & EQUITY	$	3,526	$	3,627	$	3,348	$	2,532	$ 1,933
Current Liabilities	$	311	$	223	$	209	$	164	$ 242
Longterm Obligations	$	1,270	$	1,520	$	1,325	$	735	$ 197
Equity	$	1,354	$	1,355	$	1,318	$	1,270	$ 1,159
CASH FLOW STATEMENT									
Net Income	$	66	$	102	$	118	$	179	$ 229
plus Dep. & Amort	$	189	$	181	$	129	$	108	$ 91
plus Deferred Taxes	$	37	$	35	$	25	$	20	$ 45
CF from Operations	$	292	$	318	$	271	$	307	$ 365
less Capital Expenditures	$	159	$	349	$	236	$	288	$ 159
less Dividends	$	80	$	79	$	75	$	75	$ 64
Excess Cash Flow	$	54	$	(109)	$	(40)	$	(56)	$ 143
Return on Ave. Equity		4.6%		8.0%		9.1%		14.8%	21.5%
OTHER FINANCIAL DATA									
Ave. Shares Outstanding		90.6		90.2		89.7		89.4	88.8
Earnings per share	$	0.73	$	1.13	$	1.31	$	2.01	$ 2.58
Dividends per share	$	0.88	$	0.87	$	0.84	$	0.84	$ 0.72
Employees		6,792		7,261		7,244		5,930	5,930
Revenue per employee	$	270,760	$	273,929	$	231,824	$	260,540	$ 266,273

Exhibit 4

Leach's IT Vision

Vision - To positively change the competitive dynamics of our marketplace

STORAENSO.
What paper can do

E-Commerce & Supply Chain

Mill Process Data (MES)

Business Information Layer (ERP)
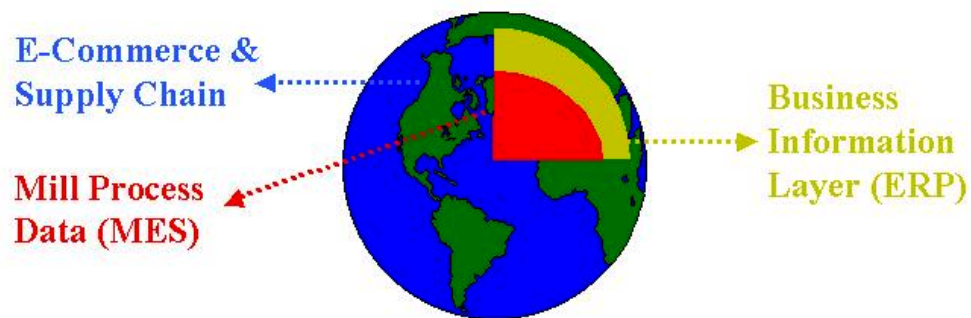
- Strategies
  - Focusing on customers ensures we do the right things
  - Time compression drives savings
    - Phase work so that benefits start in less than one year
    - Work in all areas simultaneously rather than serially

Exhibit 5

Timeline of IT Initiatives

April 1998	Gartner completed study of IT department at CPI
January 1999	Leach hired as VP of IT
March 1999	$250,000 allocated to begin development of CPI e-Biz
April 1999	Began research on CPI e-Biz, working with IBM Global Services
May 1999	Andersen completed assessment of ERP vendors for customer service project
September 1999	J.D. Edwards software selected for ERP implementation
October 1999	Board approves funding for ERP implementation
October 1999	CPI e-Biz Version 1 presented to Time Inc. purchasing dept.
February 2000	JDE system live internally
	CPI e-Biz available to 60 percent of customers (by sales)
June 2000	JDE system fully functional for magazine segment of business
August 2000	Stora Enso Oyj acquired CPI
November 2000	JDE system fully functional for merchant customers
June 2001	Joint announcement with Time Inc. of first XML transaction

Appendix 1

Executives Interviewed as Part of This Research

Interviewee	Title	Date
Robert Leach	VP, Information Technology	June 20, 29, & July 7, 2001
Palmi Möller	Manager, Marketing & Sales Applications	June 21, 2001
Tom Davis	Manager, Order Entry Systems	June 21, 2001
Ron Swanson	SVP, Magazine Papers	August 1, 2001
John Gillen	VP, Magazine Publishing, Coated Magazine	August 3, 2001
Aulis Ansaharju	SVP, Fine Papers	June 21, 2001
Asko Hyttinen	SVP, Strategy, Investments and M&A	June 20, 2001
Gary Parafinczuk	SVP, Human Resources	June 21, 2001
Mike Glynn	VP, Business Development	June 20, 2001