

SAP Case Study



mySAP™ SUPPLY CHAIN MANAGEMENT AT SI CORPORATION

THE BEST-RUN BUSINESSES RUN SAP



AT A GLANCE

Strategic Goals:

- Enhance profitability through product rationalization, price leadership, and operational efficiency initiatives
- Build market share following profit margin improvements
- Integrate horizontally by offering services and complementary products

Approach:

SI Corporation adopted a lean enterprise approach to minimize costs and achieve high rates of throughput in its supply chain network. This network is made complex by the high number of possible routings through the company's 1,100 work centers. The company improved efficiency by carefully removing non-value-added steps from order-to-cash and manufacturing processes, and enhanced customer service by improving available-to-promise processes and providing realistic order commitment dates. The lean approach also included reducing the number of stockkeeping units (SKUs); considering the full set of sales opportunities represented in an unconstrained forecast; and incorporating manufacturing constraints through a sales and operations planning process. This approach was enabled by mySAP™ Supply Chain Management and other SAP® solutions.

Results achieved over the period December 2000 to June 2003 include:

- **Reduced finished-goods** inventory by 60% and improved inventory turns from 2.8 to 6.5 per year
- **Improved the perfect order rate** from 78% to 91%

Additional results achieved from December 2002 to June 2003 (after implementing enhanced planning processes) include:

- **Reduced total company backorders** by 83% to \$293,000
- **Lowered raw-material inventory** by over \$2 million

POSITIONING FOR GROWTH BY APPLYING LEAN ENTERPRISE CONCEPTS

ABSTRACT

SI Corporation, a leading supplier of polypropylene-based products, wished to be positioned for continued growth, but faced lack-luster profits resulting from shifting market forces, operational inefficiencies, and customer service issues. The company initiated implementation of a lean enterprise approach to better manage its complex supply chain network, focusing on business process improvements and removal of non-value-added work. The company's efforts led to a lowering of inventory levels, backorder reductions, perfect order rate improvements, and readiness for external collaborative processes. SI Corporation selected mySAP™ Supply Chain Management and other SAP® solutions to enable its processes. The company achieved the goals of its implementation and was positioned well for continued growth.

BUSINESS

SI Corporation develops and markets innovative polypropylene-based products. These products provide support, strength, and stabilization solutions for diverse applications in construction, floor covering, automotive, home furnishings, and other markets. With sales of \$394 million in fiscal year 2002, the company employs about 2,300 people, and operates five manufacturing facilities in Georgia, Tennessee, and Idaho.

SI Corporation was founded in 1967 to manufacture sandbag material. In 1969, the company began producing products for the carpet market, and SI has since grown steadily by emphasizing solutions-oriented innovations for its customers. Today, SI's engineers continue to focus on research and development, and the company produces thousands of products, which are distributed in the U.S. and internationally. SI is one of the largest independent buyers of polypropylene in the United States, consuming more than 350 million pounds a year. The company is in the first- or second-place market position in 90% of the markets it serves.

SI is fundamentally a mill products company that produces finished goods through unique applications of textile technologies. The company manufactures woven textiles, textiles made through nonwoven needle punch processes, and fiber-based products. Its markets are served through four primary business units – SI Flooring Systems, SI Concrete Systems, SI Geosolutions, and SI Performance Technology:

SI Flooring Systems: SI Flooring Systems, which focuses largely on carpet backings, is the company’s largest business. SI has evolved from providing a component material in the carpet manufacturing process to becoming a business partner with its customers in the carpet industry. SI has grown to become the second-largest producer of carpet backings in the United States.

Opportunities exist for continued growth. Approximately 67% of all floor surfaces are carpeted, and more than 90% of all broadloom carpet uses primary and secondary backing. SI has studied every step of the carpet-making process, and has developed solutions to problems faced by carpet makers in both the manufacturing and installation of carpeting. For example, carpet makers were having difficulties creating sculpted carpets with repeating patterns for the high end of the market. In response, SI created a carpet backing with proprietary technology, which is able to lock in a pattern and ensure that it repeats consistently.

SI Concrete Systems: SI Concrete Systems supplies fiber reinforcement for concrete to the construction and civil engineering markets, enhancing concrete properties such as impact and fatigue resistance. The division offers both polypropylene fibers and steel fibers, and has become the market leader by providing high quality and a broad selection of products for concrete reinforcement. SI is expanding horizontally in the construction arena to provide one-stop shopping, and its offerings include a range of engineering services for the finishing of concrete systems.

SI Geosolutions: SI Geosolutions is a leader in the supply of geotextiles and erosion-control products. These products provide cost-effective performance in various applications and help shorten construction times. Geotextiles drain, separate, and stabilize soils in construction and civil engineering applications. These products help stabilize subgrades on construction sites, reinforce roads, and cap and contain some of the world’s largest landfills. Erosion control products, such as erosion control blankets and permanent turf reinforcement mats, promote revegetation, provide erosion protection, improve water quality on slopes and in channels, and are effective in meeting government clean water regulations.

SI Performance Technology: SI Performance Technology replaces commonly used fabrics and related materials with efficient, high-performance products that provide support, strength, and stabilization. These products are widely used by the automotive, recreation, landscaping, agricultural, filtration, and home furnishings markets.

“Investments in improving our process infrastructure will prepare us for acquisitions that are complementary to the businesses that we’re in today.”

Charla Hodges, Senior Director of Management Information Services, SI Corporation

Competition: SI competes in diverse markets with a few companies supplying polypropylene-based products, although in the flooring business there are only two primary competitors. Competitors are frequently divisions of large companies in process industries. Although competitors often have not invested in manufacturing assets or in updating business processes, the products in SI’s markets are often viewed as commodities. Therefore, effectively responding to changes in competitors’ prices – and factoring in the changing cost of polypropylene

(comprising about 50% of product cost) – is important to ensuring that the company sustains profitability and market share. Delivery performance is also important, particularly in commodity areas of SI’s business, so improving customer service levels is also a key factor in enhancing market share and overall business performance.

CHALLENGES AND OBJECTIVES

SI Corporation plans to continue to develop its business through acquisitions and some organic growth. However, the company had recognized in 2000 that it needed to address operational inefficiencies and customer service issues that had surfaced over the years. These issues were largely a result of its numerous ad hoc business processes, which had arisen due to independent requirements from customers, suppliers, internal manufacturing operations, and support functions. These inefficient processes emerged due to a lack of visibility into demand and supply, and tended to generate inaccurate information covering SI’s complete end-to-end supply chain (see Figure 1).

“SI was a manufacturing-centric organization,” says Michael Coffin, chief information officer. “Business was done through personal relationships and tribal knowledge, which was reflected in the company’s lack of well-developed business processes.” SI had outgrown its ability to conduct business through these informal processes, and needed to pursue business process improvements in order to improve productivity of manpower and capital resources, reduce costs, and support an increasing scale of operations. In particular, the company’s goal was to continue to grow beyond its origins in the flooring markets. Challenges spanning all businesses included:

Forecasting and planning: In 2000, SI was not able to prepare timely or accurate forecasts and did not have adequate or accurate information from which to develop a business plan. “Our planning and forecasting processes were based on disparate systems that required spreadsheets and time-consuming manual effort,” says Charla Hodges, senior director of management information services.

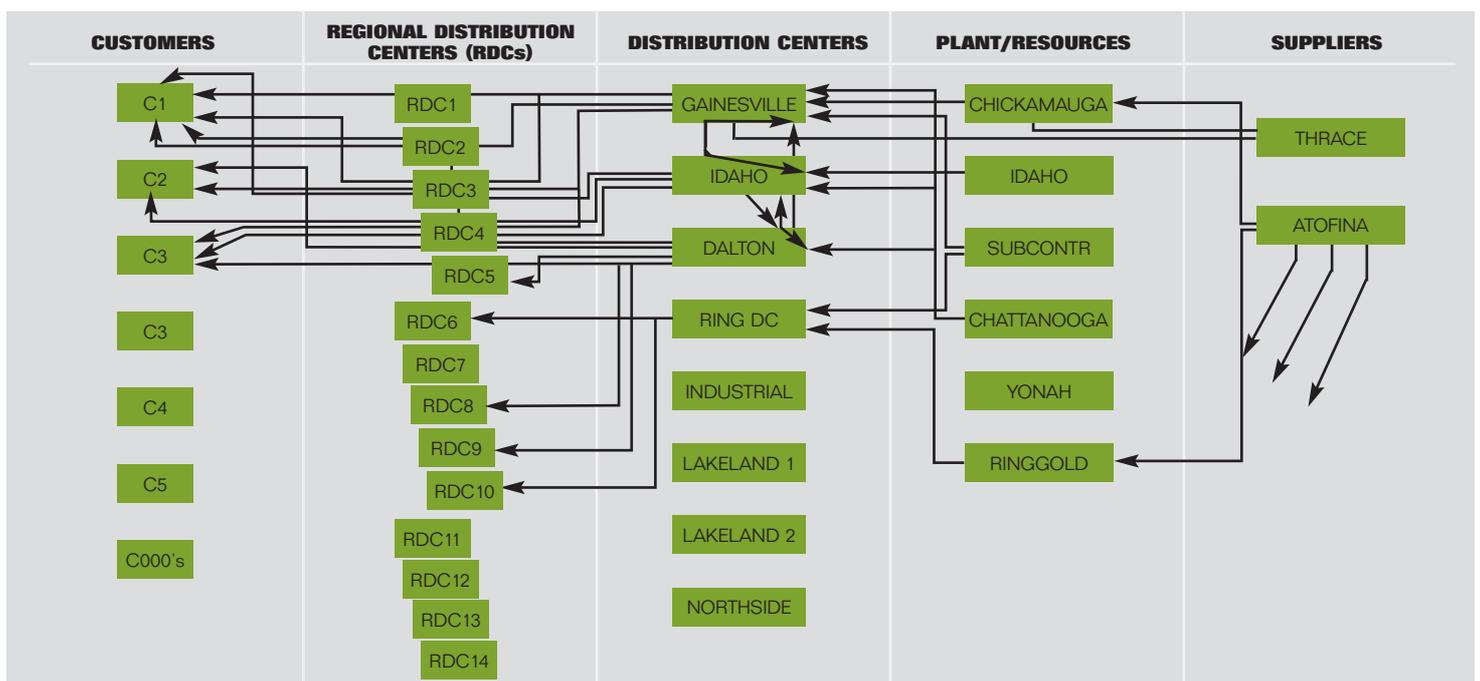


Figure 1: SI Supply Chain Network

Although the company had a sales and operations planning (S&OP) process, it was not effective for balancing demand and supply over a period of several weeks or at a detailed product level. “Planners spent a week and a half to two weeks creating a demand plan,” says Rick Harper, director of sales and operations planning. “It was an arduous process to plan, get consensus within the businesses, and tie the demand signals to the revenue commitments. The constant focus was on the near term. We had limited information about demand, we were constantly reacting to problems, and planners didn’t have time for strategic and contingency planning. Moreover, in our manual format, the thought of even attempting to forecast our demand down to the stockkeeping unit (SKU) level – and more importantly, down to the location level – was just an impossibility.”

Production planning and scheduling: SI has 1,100 work centers contained in its five manufacturing plants. Processing at these work centers for non-woven production includes extruding polypropylene fiber, converting fiber to yarn, executing needle punch operations, and packaging. For woven products, there are work centers for extrusion, positioning material on a weaving beam, weaving material in a loom, washing woven material in a hot bath, packaging, and other steps. Thus, although the company’s 800 looms comprise the majority of the company’s work centers and are characterized as mill products operations, manufacturing at SI also has discrete, repetitive, and process characteristics.

Production required that work-in-process materials are routed through two to six work centers, and a product may have an equivalent step executed at any one of several (or, in the case of looms, one of several hundred) work centers. The company faced challenges to efficiently schedule these work centers, effectively address the large number of possible permutations that a product routing may take, plan production in the face of capacity constraints, and prioritize production. “We had schedulers who were reacting to every phone call – it didn’t matter from whom,” says Hodges. Consequently, SI faced issues with excessive work-in-process inventory, inconsistent work center utilization, and low manpower productivity. “We did have high utilization of some work centers because there was queuing of

work-in-process inventory in front of work centers,” says Greg Smith, director of product management. “We maintained high safety stock levels.”

Tracking work center performance and tracing product sources: To meet requirements of some customers, SI needed to certify quality and work center sources of certain products.

“We did not want to struggle through integration issues. We didn’t want to take a risk with integration when we have the planning and optimizing capabilities we need with mySAP SCM.”

**Rick Harper, Director of Sales and Operations Planning,
SI Corporation**

Moreover, the company needed the ability to trace the root cause of product quality problems. The company also needed to monitor and improve work center performance. However, SI had limited visibility into individual work center operations through its former processes, and thus its ability to detect and respond to issues was limited. “As a result of our growth over several years, we’ve got 1980-vintage equipment, and we’ve got 2003-vintage equipment,” says Smith. “Their outputs and capabilities are very different. When quality and productivity vary so much by work center, and then when you start grouping them, you lose visibility and you lose the ability to manage. That’s what happened to us.”

Order fulfillment: SI creates about 5,000 bills of lading per month, and has several thousand sold-to customers. There are variations in order value, number of line items, and number of customers served in each business, and the company had not developed standard processes to handle these orders. Order fulfillment and related processes had become particularly complex because the company had about 34,000 SKUs in 2000.

Finished goods inventory: SI's product life cycles range from two to many years, and polypropylene products will last for several years in inventory. Thus, the company did not place an emphasis on managing finished goods inventory. "We just had a mindset that we would eventually sell what we made – and in some cases that was true," says Harper. "But we did not really understand what 'eventually' cost us. Our focus was just 'make and sell' – we had a revenue focus, but not a profit focus. Therefore, even though the product eventually moved, it sometimes sat in inventory for so long that all the profit had already been consumed by carrying costs."

Raw materials: About half of SI's product cost is for raw materials. While the company uses about 400 raw materials (including additives to modify product properties, colorants, oils, and finishes), polypropylene is the most significant. Fluctuations in polypropylene prices significantly impact profitability, and the nature of SI's competitive situation is such that it is difficult to pass through cost increases to the customer. Although SI uses just a few different grades of polypropylene, the company tended to have excessive polypropylene inventories as a buffer to ensure that market demands would be met.

Perfect order rates: SI found that it had a limited ability to deliver finished goods in full and on time (as per customer request), with a complete set of invoicing and other documentation. In 2001, the company defined a perfect order rate as a composite of order fulfillment characteristics, and found that there were significant opportunities for improvement across order-related dimensions.

In addition to common challenges across businesses, SI recognized that each business also faced unique challenges, including:

SI Flooring Systems: This business has less than 20 major customers, and its 3 largest customers drive a substantial share of the volume. The 3 key customers operate carpet mills located in northwestern Georgia, near SI's manufacturing facilities. SI's goods are critical to these customers, since they are the base products, which allow the initiation of the

manufacturing process within the carpet mills. Manufacturing lead times range from 14 to 21 days, and goods required for next-day delivery must thus be shipped from stock. Orders in this business tend to be large, with about 30 to 40 line items.

The flooring business is dependent to some extent on construction activity, and as a result has a degree of seasonal demand. SI often builds inventory off-season to prepare for the April-through-October period of increased consumer sales, and had frequently built significant inventories simply to ensure that needs were met. A key challenge has been responding quickly to customer requirements and anticipating demand given weather, economic, and other factors, which are hard to predict. Carpeting is the last item installed in a building or home; timing depends on completion of earlier construction steps.

SI Concrete Systems: SI has a fairly large domestic field sales force serving ready-mix cement companies, and also exports to international markets. The key challenges in this business are serving a diverse set of geographic locations throughout the United States, and handling small orders (sometimes as

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Michael Coffin, Chief Information Officer, SI Corporation

little as \$500). This business is very seasonal and weather-dependent because it serves construction industries; thus, some inventory is built off-season to smooth production levels. SI had a protected position with patented technology; however, the patent expired in 2002. Consequently, the business now has low-entry barriers and has become more commodity-like.

SI Geosolutions and SI Performance Technology:

These businesses have smaller sales forces than the concrete business. They often serve their markets through third-party sales agents, and offer specialty textile products that are less commodity-like than the concrete and flooring businesses. Some of the specialty woven products have long lead times of up to one month. Other specific challenges in these businesses include the diversity in the channel relationships, geographic dispersion of customers, numerous products, needs for custom products, requirements for personal relationships to truly understand demand conditions, and some seasonal demand. In particular, there is significant seasonal demand due to construction activity in geotextiles. Some of the performance technology markets are also seasonal; for example, trampoline applications in the recreation segment experience high demand during the summer, and this business faces the added challenge of serving retail channels.

While there are unique needs among each of the businesses, a key goal of SI is to create a single entity with standardized processes. “We wanted to eliminate the silos that existed for each business operation, and facilitate the mind-set that we have one overall supply chain,” says Harper. By addressing business process inefficiencies, SI can improve profitability and position the company for continued development. “As a first priority, we’ve really wanted to secure our future by taking the existing operational base and making it more profitable.”

The overarching opportunity, however, is to position the company for growth through acquisitions. “If you look at our position in the markets that we’re in today, organic growth is not what we see as our greatest opportunity,” says Hodges. “Investments in improving our process infrastructure will prepare us for acquisitions that are complementary to the businesses that we’re in today – and will build on our core competencies in manufacturing, our knowledge of our markets, and our ability to provide complete solutions.”

IMPLEMENTATION AND OUTCOME

In 2000, SI was acquired by Investcorp. The new owners quickly recognized that SI’s stagnant profitability was in part a consequence of business processes that were not positioned for the future. “The first question Investcorp asked was, ‘How are we going to fix broken procedures, improve visibility, and standardize our processes so that, in these areas, we’ll be second to none in our industry?’” says Coffin. “They recognized that with a sound business-process infrastructure, inventory could be controlled, customers could be serviced well, profitability could be sustained, acquisitions would succeed because we could integrate operations, and SI could grow. The notion was we needed to come up with a strategy that would allow us to redesign SI’s business processes.”

Lean enterprise as a guiding principle: As SI evaluated its order-to-cash and manufacturing processes, the company developed broad objectives, which included minimizing costs, improving customer service levels, and achieving high rates of throughput in its complex network of work centers. “Eventually, we formalized our program under the umbrella of ‘lean enterprise,’ which fully characterized the goals of our initiative,” says Coffin. In line with the lean enterprise concepts, the company focused on improving the efficiency of its business processes, and carefully removed non-value-added steps.

SI realized that improving information systems would be important, but that these systems were simply tools to enable lean processes. “The emphasis on process improvement helped us realize that information systems would just be an enabler for the processes that we needed to get in place,” says Hodges. “The opportunities to optimize are going to come from the additional information and visibility we can give the senior executive team on things such as daily sales activity, sales trends, days sales outstanding, manufacturing activities, adherence to production schedules, and overall efficiencies. Through the use of information systems, management will be able to make better decisions.”

Selecting SAP solutions: In 2000, SI had a diverse portfolio of databases, spreadsheets, and information systems, which handled sales forecasting, order handling, inventory management, production reporting, human resource management, and other applications. These systems, which had been put in place over a period of many years, provided neither visibility into operations nor data that could be trusted. Further, the systems required significant maintenance, and could not support the new lean processes that SI was planning to implement.

SI decided to completely revamp its information systems. Even though the company had installed some SAP R/3® solutions, SI chose to thoroughly consider its options. After evaluating several alternative software solutions, the company decided to more fully implement SAP R/3, coupled with mySAP Supply Chain Management (mySAP SCM).

“As we evaluated our alternatives, we didn’t focus on the software solutions,” says Coffin. “We focused on the processes – and then we searched for the tool that would allow us to best enable those processes. We realized that the integrated approach that SAP offered was superior to a best-of-breed approach, and had a lower total cost. We knew that our new, integrated business processes would be well supported by SAP.” Integration was a particularly important consideration in light of the fact that SI wished to implement SAP Advanced Planning and Optimization (SAP APO), a key component of mySAP SCM. “We did not want to struggle through integration issues,” says Harper. “We didn’t want to take a risk with integration when we have the planning and optimizing capabilities we need with mySAP SCM.”

Two-phase implementation: SI proceeded with a two-phase implementation as follows:

Phase One – Enabling the order-to-cash process

(January 2001 to October 2001): In this phase, SI implemented SAP R/3 capabilities to support subprocesses, which included purchasing, order entry, warehouse management,

shipping, accounting, and spare parts management. The specific SAP R/3 capabilities included finance and accounting, sales and distribution, materials management, and purchasing. For generating management reports, SI implemented the business warehouse capabilities of mySAP™ Business Intelligence.

Phase Two – Enabling supply chain planning and execution processes (January 2002 to December 2002):

In this phase, SI implemented mySAP SCM capabilities to support sub-processes including forecasting, sales and operations planning, business planning, short- and long-term capacity planning, long-term raw-material planning, production planning and scheduling, plant maintenance, and fixed asset accounting.

“Some people think of SAP and they think it’s inflexible, but that’s not true. We found that SAP’s solution can be very flexible and can accommodate our needs, without actually customizing the software.”

Greg Smith, Director of Product Management, SI Corporation

mySAP SCM capabilities implemented included demand planning, supply network planning, and production planning and detailed scheduling. During this period, SI also implemented processes and enabling SAP solutions to support plant maintenance and some available-to-promise capabilities. The implementation was ready for go-live in October 2002, but SI faced increased internal activity due to high market demand, and thus deferred go-live to December 2002.

The success achieved in phase one set the stage for strong organizational alignment to implement the second phase. “When we went into phase two, we had a lot of momentum,” says Coffin. “Everyone was clamoring to figure out ways to get there sooner because we had already seen the benefits from phase one. In fact, we had to keep ourselves from running too fast – we needed to make sure that we did an all-encompassing job in our blueprinting and process redesign.”

Removing non-value-added work: As SI proceeded through phases one and two, the company examined individual steps in its processes in detail, and searched for opportunities to remove non-value-added work – in line with the lean enterprise principles. “SAP gave us a platform for laying out the process maps – for example, in the order-to-cash process – and asking what each transactional step is, and how that step is supported with information,” says Hodges. “When we wished to remove steps, we asked what that meant for our information systems. It’s okay to take out non-value-added steps, but we had to factor in that this creates a gap in the information that’s available to make decisions. We had subject-matter experts who knew the implications for removing these steps. These individuals could consequently communicate with the leadership team regarding the specific processes we wanted to put in place – including the steps we wanted to remove – and how the new process design would best be enabled by SAP.”

“We carefully mapped the flow of the processes so that we could find opportunities for improvement,” says Smith. “We ended up with huge flow charts on our walls. In this way, we found areas where we could pool inventory, use visual kanban signals for managing production flow, consolidate sources for production orders, and group confirmations for steps completed. We were able to push day-to-day decision making to a lower level of the company, saving time and improving accuracy. In line with our use of the standard capabilities of SAP, we often used the system to drive our new processes. For example, we used an indicator in the material master to determine whether

a product is make-to-stock (MTS) or make-to-order (MTO). Based on that indicator, an order for material takes a different path through the SAP-defined order process.”

The concept of examining each step and associated transaction was particularly important, given the unique characteristics of SI’s 1,100 work centers. “We no longer have unnecessary transactions,” says Smith. “We achieved this by looking at both the financial and operational importance of each transaction, and challenging every step. By following our detailed approach, we were able to preserve essential information about each work center in order to provide information to manage operations.”

Product line rationalization: SI focused on reduction of its 34,000 SKUs during the implementation in order to simplify processes, lower costs, and reduce non-value-added work. SI defined core materials as those that would be MTS, and non-core materials as those that would be MTO. SI determined lead times for producing non-core materials so that it could more precisely schedule production. Through its SKU rationalization efforts, SI reduced its SKUs to a total of 5,300, of which 770 are core materials – the focus of MTS planning efforts. The balance of the materials consists of non-core products. Due to the ser-

“Through this implementation, we have been moving away from being a manufacturing-centric organization to a company that is more market-focused, customer centric, and innovation driven.”

Michael Coffin, Chief Information Officer, SI Corporation

vice demands by customers in the flooring business, most flooring materials are categorized as core goods. For special orders, a specific non-core material variant is created. If no further demand is anticipated, the product is then removed as an SKU.

“Rationalization was difficult, because our organization did not understand how we could survive without massive inventories,” says Coffin. “We historically managed our business by having large amounts of costly inventory, thereby ensuring we could meet commitments to customers. There was a lot of concern that we were going to damage ourselves in the marketplace. But as we started to lower inventories and reduce lead times, that didn’t turn out to be the case. In fact, we improved share in virtually all of our businesses through this process, and we achieved an additional 10% savings in strategic sourcing through rationalization. The concern was just the fear of the unknown.”

Postponement: SI now delays final finishing of products, or cutting of master rolls of some of its goods, until orders are confirmed by customers. This postponement strategy, which employs the “make without final assembly” capability of SAP, allows the company to shorten lead times for preparing finished goods and mitigates inventory risk. Further, this capability enables the company to forecast demand (for large rolls, for example) at a level that represents an aggregated total across SKUs, and is thus more accurate. This postponement strategy was implemented primarily in SI’s performance technology business, and to a lesser extent in its concrete and geotextile lines.

Sales and operations planning: Through the implementation, SI was able to improve its sales and operations planning (S&OP) process to better balance supply and demand, to incorporate production constraints in planning, and to align operational plans with revenue commitments in its business plan. “The message to the business is that we want them to find all the opportunity they can,” says Hodges. “We want to keep constant visibility on the opportunity side – constantly challenging ourselves to do more – while maintaining visibility on constraints.

“Moreover, we have an open-book management strategy within the organization, so our demand signals have to dovetail with revenue commitments that we make month to month.” Supporting this open-book approach is fundamental to SI’s management philosophy. All SI employees learn to read financial statements, they are informed of SI’s financials, and shown how their individual performance makes a difference to the bottom line. “So our mission, with support from the leadership team, is to elevate everyone in the organization to realize their role in the supply chain – and the relevance of their role to running our business,” says Harper.

The S&OP process is key to engaging the organization in this way. About a dozen people attend monthly S&OP meetings, representing planning, product management, and leadership perspectives. The implementation has improved information available for decision making at these meetings from demand planners and production planners. As noted in Figure 2, forecast accuracy, which is a key foundation for planning, has materially improved, and planners in general have better information and tools with which to work. “One of the goals going into phase two was to put enough horsepower behind the process to enable the planners to get better quality information, and to get it faster,” says Harper. “We’re able to do more pre-work now. Planners can consider alternatives through what-if analyses – and present plans that better meet our strategic goals. Therefore, we’ve established credibility and can focus on the exceptions. The leadership team now doesn’t need to be involved in every decision.”

In particular, mySAP SCM enables the process for effectively addressing the goal of considering unconstrained demand while incorporating information about supply constraints. “We put in unconstrained demand first,” says Harper. “We then do a capacity check, which considers our production capability holistically and accounts for shared resources. If there is a constraint, then we log the case where we had the demand opportunity but couldn’t supply it. That corrects the revenue projection, and it also gives us the event log that indicates future opportunity available to us when our supply capability increases.”

Prior to the implementation, volume projections were not aligning with financial plans. “In the past, we would first prepare a business plan with revenue projections and then try to link that with the volume determined in our S&OP process,” says Hodges. “Now, there’s a great deal of acceptance for volume plans coming out of the S&OP process. Therefore, we’ve swapped the order of our processes: the S&OP process generates our demand signal, and this data is then flowed through to our financials. So we’ve achieved credibility and alignment – and a much more effective planning process.” In particular, thanks to its set of new processes, SI has a more timely view of its profitability by product and by customer, and of its overall financial position. The financial closing cycle time has been reduced from 10 days to 5 days, and the company expects to further reduce this cycle time to 1 day.

Manufacturing planning and scheduling: SI is using the production planning and detailed scheduling capability of mySAP SCM to schedule production of thousands of products at its 1,100 work centers. Because of the very large number of possible permutations of routings for each product, the company needed to find a creative solution to address scheduling and presentation of required management information.

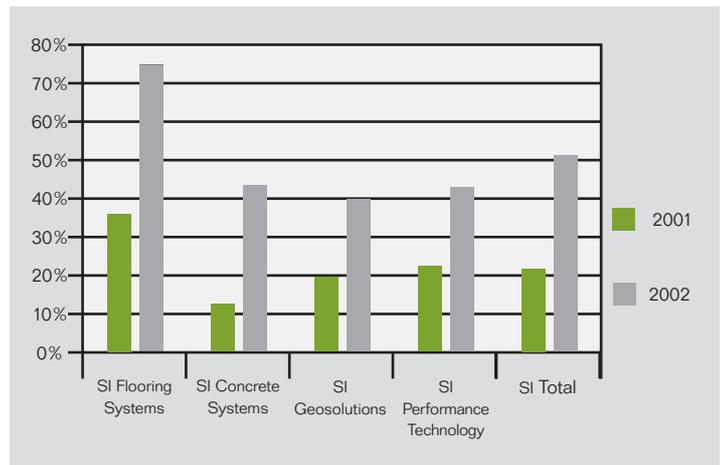


Figure 2: Forecast Accuracy Improvements

“Our work centers are very flexible,” says Harper. “For example, of the 800 looms, the vast majority of them can do anything that the other one does. Therefore, if you take the number of products, bills of materials, and routings, it becomes infeasible to manage the master data. However, by using the capabilities of SAP software, we were able to group products so that we had just 27 routes through our work centers instead of hundreds of thousands. Also, in our rough-cut plans, we are able to manage specific capacity limitations by establishing 17 capacity centers, which are each a group of work centers.

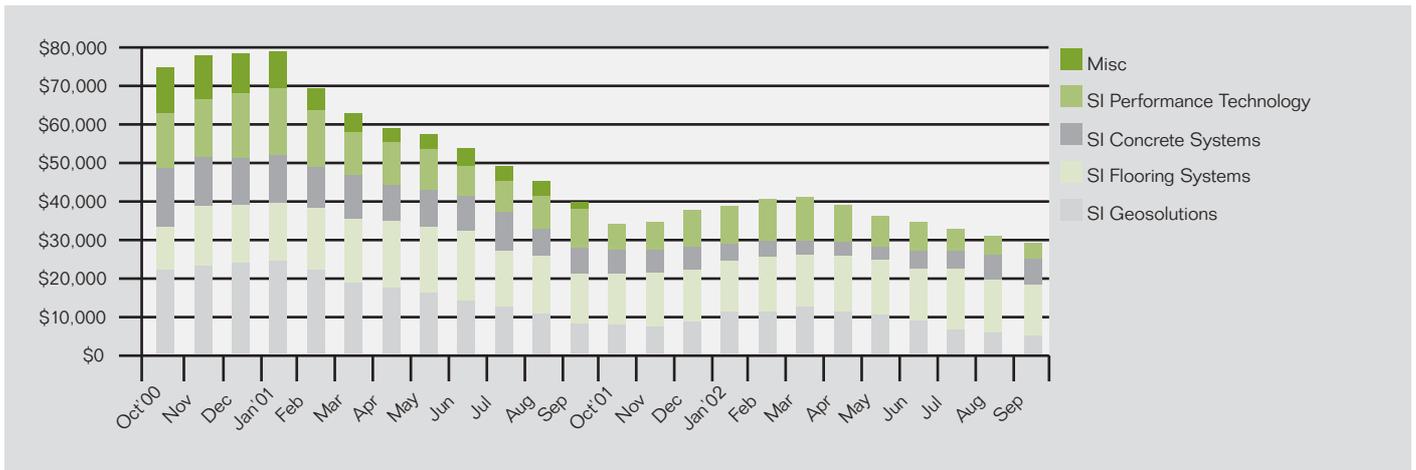


Figure 3: Inventory Reduction over Time (\$000)

With this approach, which included careful mapping of products and work centers to SAP data structures, we were able to manage the complexity of our products and production processes using standard SAP capabilities. We can use a very large amount of data to capture plans and planning options without having to hire an army of people to maintain the master data. We've maintained visibility of production activity at the work center level so that we can manage manufacturing. Moreover, we can trace the source of finished goods when certification is required, or when we need to find the source of quality problems."

Inventory management: Through enhancements to supply chain execution and planning processes, SI has reduced finished goods inventory since implementation began (see Figure 3), and polypropylene (raw material) inventory was reduced by \$2 million. Inventory started to build somewhat toward the end of the implementation period, but this was done strategically to support specific customer service requirements in some businesses. Even though inventory levels were increasing in this time frame, the quality of inventory improved; slow-moving and obsolete products had been largely eliminated.

"We knew very specifically which product lines we were building inventory," says Coffin. "More importantly, we were putting the right items into inventory, because we better understood our demand picture."

Through its process redesign efforts, SI developed a process called "alternative shipping" for the flooring business. Historically, the company had built inventories in order to meet the demands of carpet mills. As a result of the new process, the company was able to ship directly from its looms to its carpet mill customers, thus sustaining customer service levels while reducing inventory.

Available-to-promise: The global available-to-promise capability of mySAP SCM is used to determine whether existing inventory is available-to-promise to a customer order, and rules are used to suggest substitutes if the ordered product or a preferred product location is not available. This contributes to inventory reduction and to improved customer service.

Perfect order rate improvements: As noted in Figure 4, perfect order rates improved continuously during the implementation period as SI improved its planning and execution processes. The results varied by business. For example, SI Corporation's Concrete Systems business achieved a 96% perfect order rate, which was above the average for all businesses. As a consequence of order fulfillment and related improvements, backorders were lowered by 83%.

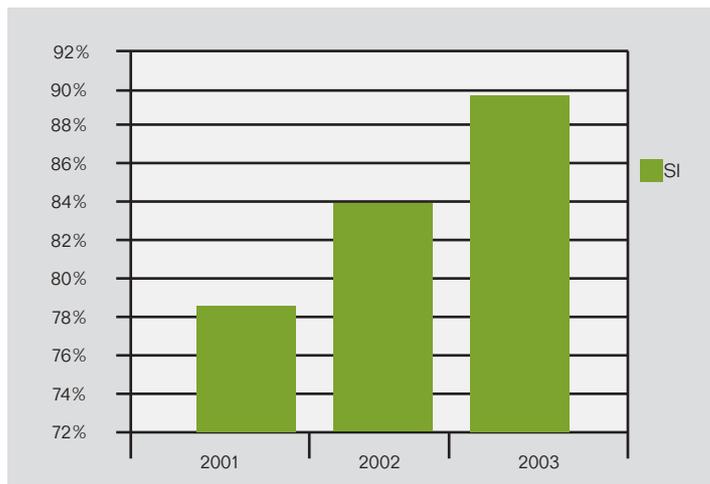


Figure 4: Perfect Order Rate Improvements

Benefits of working with SAP: SI found that SAP solutions could be readily adapted to the company's business processes through well-considered use of the standard software. "Some people think of SAP and they think it's inflexible, but that's not true," says Smith. "We found that SAP's solution can be very flexible and can accommodate our needs, without actually customizing the software."

SAP performed well as a part of the implementation team. "SAP has provided the software that we require, as well as consulting services to ensure that our requirements were met," says Coffin. "When we had issues to deal with, SAP stepped up as an organization and acted as a true partner. The teamwork,

the integration of resources, the common vision, and the attitude that 'We're going to do whatever it takes to be successful' – SAP demonstrated these characteristics throughout all the phases of the implementation, and we're extremely appreciative."

The implementation at SI pushed the limits of SAP technology, which reinforced the need for strong teamwork. "According to SAP sources, we have the largest planning book in the world running today on SAP APO," says Coffin. "With that implementation came some challenges, because we were entering a zone where neither SAP nor we had been. SAP caught the vision and instilled confidence in the team that we could be successful. We achieved our desired outcome, and SAP was a tremendous partner in making that happen."

Project governance and management: SI established a governance committee to oversee the implementation and ensure alignment with company goals. "I served as the executive sponsor for the project, and then our leadership team – the senior management of the company – served as the steering committee," says Coffin. "We met as needed, which generally turned out to be monthly in the early days, and then we moved to quarterly meetings. The decisions that the steering committee made were largely about business process standardization across units, areas where business process changes were necessary, and so forth."

SI invested substantial resources – including the assignment of about 30 individuals – to work on the implementation. Nonetheless, SI recognized that success in the implementation was largely associated with managing change. The company focused on communicating to all levels of the organization about the changes, ensuring that awareness, buy-in, and support were built, and that critical decision makers were engaged and could provide insights. "We had the initial challenge of making sure that people understood that it's a business process initiative, as

opposed to a software implementation,” says Coffin. “Then, I think we dealt effectively with change management because, if anything, we over-communicated about what we were doing. We kept people very aware. We issued publications and held meetings to make sure the entire organization understood where we were in the process, what we were focusing on, what business processes were going to change, and how individuals and organizations might be impacted.”

NEXT STEPS

Reducing logistics costs: SI plans to improve processes for managing goods in its distribution network, and thereby reducing logistics costs. “We may have the correct aggregate inventory levels, but we may not have it in the right place in the distribution network,” says Harper. “Sometimes we had trailers literally meeting on the interstate and swapping goods so that we could satisfy customer needs.” The company is evaluating the use of the transportation planning and vehicle scheduling capabilities of mySAP SCM to reduce these unnecessary costs.

Available-to-promise: SI plans to make additional use of the global available-to-promise capabilities of mySAP SCM – beyond facilitating access to existing inventory and providing substitution capabilities. “We take a lot of blanket orders with many line items from our large customers,” Harper says. “If we want to go back and change line items, we don’t want to do it one order at a time. mySAP SCM will make it easy to reprioritize and reschedule our production activities.” This capability will further improve productivity and customer service.

Collaboration: By establishing sound processes internally, SI is in a good position to improve collaboration with customers and suppliers. “From the very beginning, we realized that we needed to be thinking about how can we achieve closer collaboration with our customer base, especially given the fact that we wanted to reduce inventories and move to an environment that is oriented to just-in-time processes,” says Coffin.

“However, we realized that we didn’t want to commit ourselves to collaborative processes until we were prepared to support them. It would have been a deadly mistake to open ourselves to our customers when they would be able to see how poor our internal business processes were.

“So we are now seeing the benefit of having the infrastructure in place. We are well-positioned to start collaborative efforts with our customers, and we’re evaluating portal strategies for providing order and inventory visibility. In flooring, we are getting some production schedules from several of our customers, which is facilitating adjustment of our own production schedules. We have just begun a collaborative discussion with a large furniture customer, who is facing unpredictable demand signals because its customers are moving offshore. So we’re trying to look further down the value chain to see if we can get better demand signals from our customers, which would in turn allow us to do better forecasting. In general, we want to not just collaborate with our customers, but to engage in true partnerships.”

SI has historically had limited market intelligence. “We only looked to our direct customers for this information,” says Harper. “But we are a couple of links back up the overall value chain. We are hoping to collaborate with these major customers to better understand the driving forces in the market itself, to open the channels of communication, and to be more responsive by getting this information earlier.”

In 2000, SI undertook an initiative to redesign business processes in order to meet emerging market demands. The company understood that SAP solutions were to function as enablers for these new processes. Senior management was engaged in the implementation, and the company continuously communicated to all stakeholders about how processes and individual roles would change. SI was guided by its adherence to lean enterprise principles and by its focus on managing key performance indicators, including inventory and perfect order metrics, that related to the company’s overall strategic goals.

“Through this implementation, we have been moving away from being a manufacturing-centric organization,” says Coffin, “to a company that is more market-focused, customer centric, and innovation driven.”

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