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e-business case studies

Shell Chemical:

Using Lotus Domino and Notes to strengthen partnerships via supply chain extranets

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Putting e-business to Work

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- An independent U.S. based Chemical unit of Royal Dutch/Shell Group
- Employs 4,500 in the United States
- Manufacturing sites in seven U.S. locations

The Web Site

- *www.shellchemical.com*

The Application

- Domino/Notes-based corporate supply chain extranet

The Technology

- Lotus® Domino™
- Lotus Notes®

The Benefits

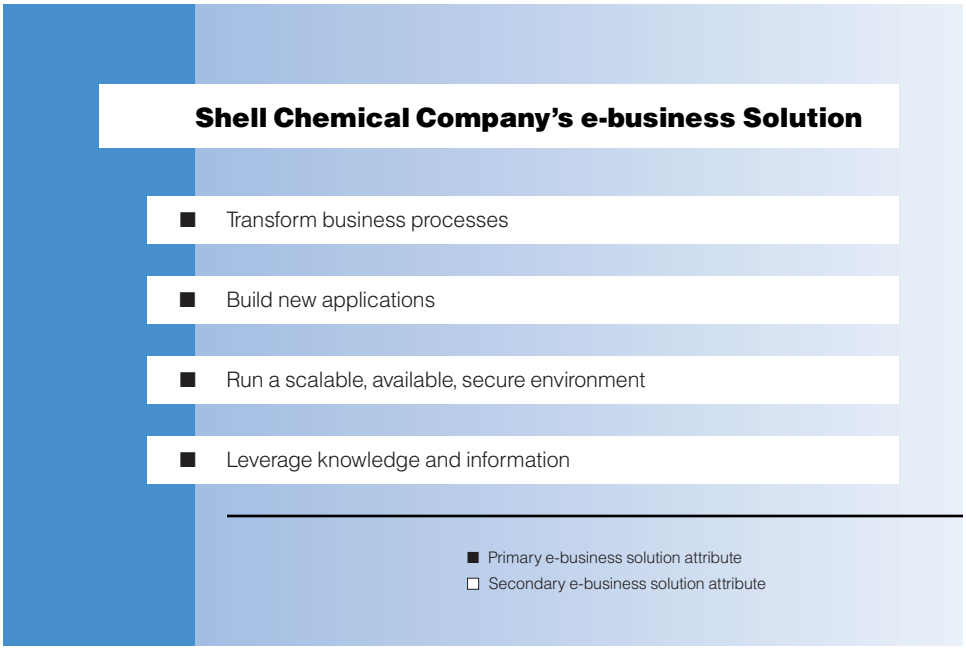
- Since 1995, Shell Chemical Company (SCC) created over $20 million in value (cost savings plus revenue) for its customers and itself through the use of SIMON.
- SIMON differentiates SCC's service to customers.
- SCC customers using SIMON increased inventory turns by 15% on average.
- SCC is now beginning to measure improvements in emergency shipments. Customers analyzed to date have experienced an 82% reduction in emergency shipments on average per year.

Overview

e-business Case Study: Shell Chemical and SIMON™

Shell Chemical Company (SCC) is an independent unit of Royal Dutch/Shell Group based in Houston, Texas. SCC employs approximately 4,500 in seven U.S. locations. This case study examines SCC's use of a Lotus Domino and Notes-based supply chain extranet known as SIMON (Supplier Inventory Management Order Network). Developed jointly by SCC and Shell Services International Group of Companies (SSI), SIMON is designed to streamline the supply chain of process-oriented manufacturing companies through advanced inventory planning.

Due to the outstanding acceptance of the SIMON platform by SCC's customers, SIMON was launched as a commercial software product in 1998 as an offering of SSI – a technical and consultancy service organization within Royal Dutch/Shell Group that was spun off as an independent unit in 1995.



The Roots of SIMON

SIMON is a Lotus Domino and Notes application whose central function is to enable suppliers such as SCC to assume the inventory management role on behalf of their customers. In addition to inventory and consumption monitoring, SIMON also enables suppliers to generate demand forecasts, calculate safety stock, track shipment status, and generate a resupply plan for its customers. SIMON is also designed to interface with a number of ERP platforms, including SAP R/3, which has allowed SCC to create sophisticated supply chains with its customers. The current version of SIMON, version 3.1, is configured to run using either a Lotus Notes client (using version 4.5) or a standard Web browser.

SIMON's origins can be traced to 1993, when SCC began examining various supplier managed inventory (SMI) options. According to Cindy Bishop, Logistics Planning and Optimization Manager at SCC, the idea for implementing SMI sprang from the collaboration of an SCC manager and the purchasing manager of a large customer, both of whom saw the opportunity to achieve major benefits by streamlining their supply chain.

Bishop notes that while SCC's SMI goals were ambitious, its first SMI platform was very manual. "When SCC's SMI was first implemented, it was very manual and very archaic," says Bishop. "We started the SMI process by looking at the entire stock of product residing between us and the customer, and deciding mutually what the total pipeline should consist of at any given time." Bishop defines the total "pipeline" as product supply stored in rail cars en route to customers, product in rail cars on the customer's site, and product stored in the customer's tanks. A sample output of the early SMI system could determine, for example, that 1.2 million pounds in total should be in the pipeline at any given time, in theory allowing SCC to take appropriate action on behalf of the customer.

SCC realized that they needed to automate their SMI to be more proactive and less reactive. "This was not seen as the most efficient way of managing inventory because it was very reactive," says Bishop. "The problem was that the early system did not allow a granular view into the different components that made up supply." To address this, SCC created a supply chain tool that would provide information on various segments of a customer's supply, including safety stocks, and would further allow SCC to determine the point at which they need to resupply the customers. In addition to addressing the granularity issues of the first system, it also represents the first time that SCC used demand to influence resupply ordering.

Featured IBM Technology

Lotus Domino

The Domino Server family is an integrated messaging and Web application software platform for growing companies that need to improve customer responsiveness and streamline business processes. Domino Servers set a new standard for rich Internet messaging, ease of administration, integration with backend systems and reliability.
www.lotus.com/domino

Lotus Notes

If you need a simple way to harness a world of information, Lotus Notes is the software that lets you securely, easily and efficiently manage information and collaborate anytime, anywhere. Notes is the leading integrated software for the Internet, offering an easy-to-use, open powerful way to work.
www.lotus.com/notes

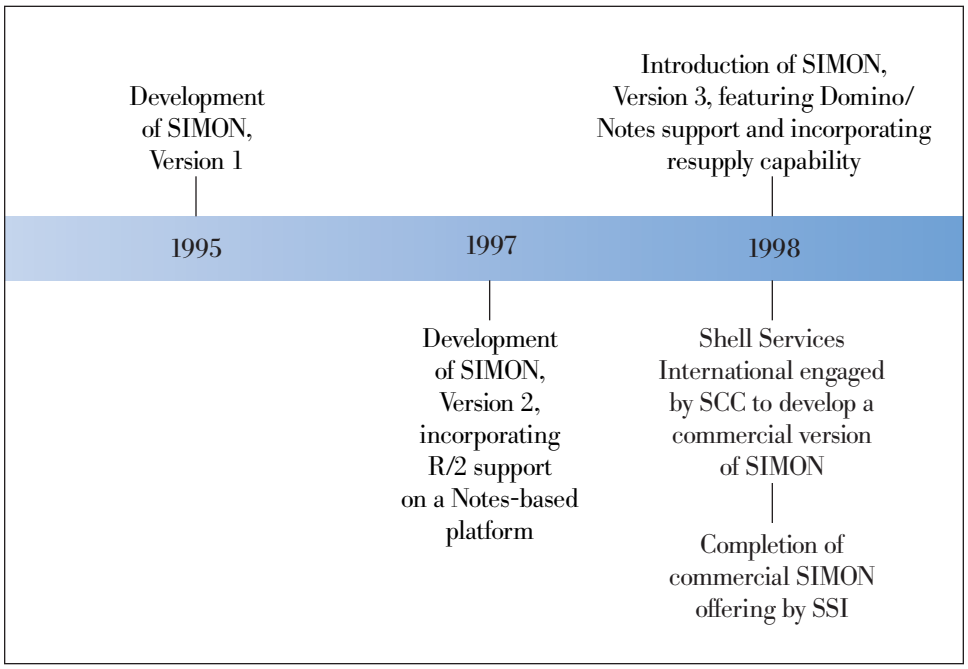
The Birth of SIMON

The critical point in SIMON's development occurred in 1994, when Shell Chemical Company embarked on a redesign of its key processes, notably Production Planning and Operations (PPO), and Customer Ordering, Inquiry and Fulfillment (COIF). Concurrent with its process redesign, SCC stepped up its supplier collaboration efforts, and also began to closely examine Lotus Notes as a collaborative communications platform, which ultimately became the technology platform for the SIMON product. SCC developed its first version of SIMON in conjunction with SSI.

After working with SSI to build the prototype, SCC began testing the system among a select group of customers, who provided valuable feedback that was fed into subsequent versions of SIMON. This culminated in the development of the first production version of SIMON in 1995. Yearly releases of SIMON continue to add supply chain functionality such as resupply and safety stock calculations. Also included are interfaces to SAP R/2, and now SAP R/3 (supported in Version 3).

Version 3 provides Domino support, which allows users to access the system via a Web browser. Version 3 also incorporates a rich charting and graphing capability designed to indicate the performance of the supply chain between Shell and its customers.

In 1998, SCC, encouraged by the success of SIMON within its own customer base, engaged Shell Services International to formalize SIMON as a commercial product offering. According to Cindy Bishop, SCC's primary motivation was to be on the leading edge of the market with a decidedly superior product. "SCC saw the underlying need for the services that SIMON could provide and wanted to be the first to market. This would position SIMON as the *de facto* standard for supply chain extranet solutions among commodity chemical buyers." SSI completed the development of SIMON as a commercial offering and its first deployment outside of Shell was in the second quarter of 1998. It is now deployed at nearly 50 customer sites, both within and outside the United States.



Source: Shell Chemical

Figure 1. Development Timetable for Shell Service International's "SIMON" Notes Application

SIMON in Action at Shell Chemical Company

In day-to-day usage, SCC customers use either a Notes client, automated satellite messaging, or a Web browser to enter daily inventory levels, confirm receipt of shipments, and analyze historical inventory and consumption data. SIMON's real value to SCC's customers lies in its ability to automate the resupply function, thus shifting the inventory management burden from customers to SCC. Based on inventory and/or forecast data uploaded periodically from the customer to SCC, SIMON automatically generates a resupply plan for customers by calculating when a shipment of a given product would be needed by the customer. As discussed previously, these resupply calculations are typically performed by utilities within SIMON, and can also be provided through an external interface to an MRP system, such as SAP R/3.

Based on resupply calculations, SCC automatically delivers the product to the customer and bills the customer at regular (*e.g.*, monthly) intervals – not for each shipment. Kay Burns, manager of the SMI solutions group at SSI, points out that SIMON enables suppliers like SCC to function as a *de facto* utility. "When you want to take a shower in the morning, you don't call the water company and tell them," she says. "Instead, they have already anticipated your demand based on what you have used before, and when you turn the faucet on, the water is there. That's the idea behind SIMON."

SIMON is a software product that uses flexible templates. At the outset, suppliers receive a standard template and then configure that template accordingly. Configuration of SIMON is done to meet the operational requirements of the supplier-customer relationship and typically includes such tasks as the designation of appropriate units for each product database, such as measurements (pounds, gallons, etc.) or intervals (number of weeks in forecasts, etc.).

Another factor that distinguishes one SIMON implementation from another is the frequency with which the customer uploads inventory or forecasts data to SCC or other suppliers. Inventory and forecasting are done based on customer requirement for daily, weekly, or monthly processing cycles.

Lotus Notes/Domino: An Ideal Platform for SIMON

According to Cindy Bishop, SCC considered Lotus Notes the ideal platform for SIMON because of its strong collaborative capabilities, as well as its ability to allow SCC and its customers to work from the same set of information. "By providing a common user interface, both parties can look at the same information in the same format and make decisions based off that. This was a big plus," says Bishop.

Strong security is another major plus for Notes and Domino, given the critical importance of security for customers that exchange mission-critical data with SCC. "Security is an absolute requirement," says Bishop, "and the built-in security of SIMON, combined with that of Notes and Domino ensures that financial transactions, corporate data and production plans remain secure at all points in the information chain." SSI's Kay Burns sees another major benefit of Notes' core security features as the ability to avoid having to program security into the SIMON solution, which enabled SSI to bring SIMON to market faster. "Notes' built-in security features saved us development time, which allowed us to get to market faster, and has also saved us substantial maintenance time down the road," says Burns. "Security is clearly a key driving factor."

SIMON Outside of Shell Chemical Company

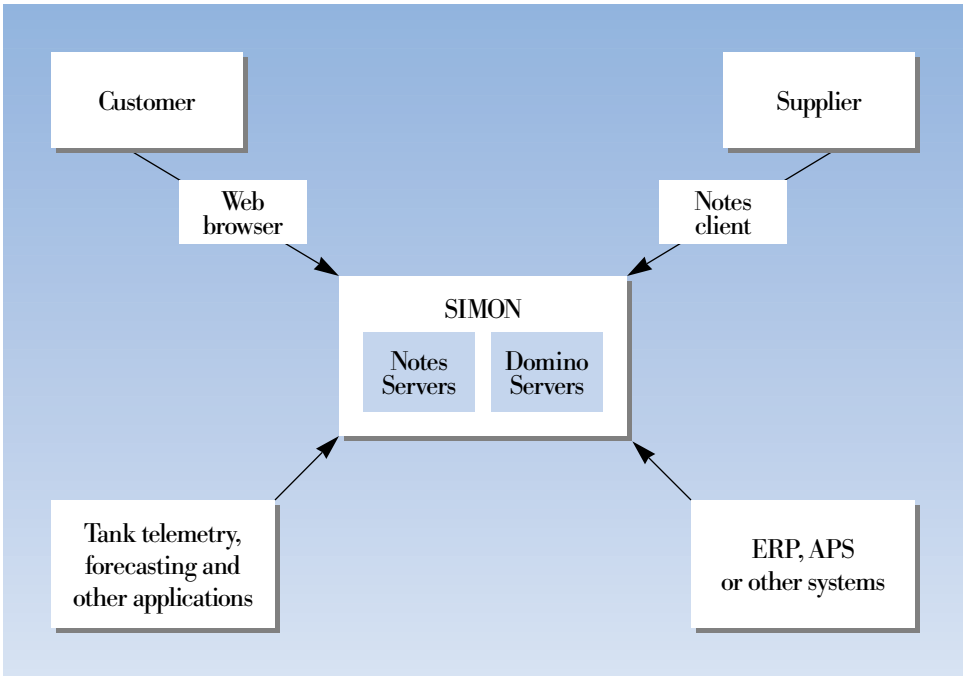
Shell Services International targets SIMON to companies involved in process manufacturing, more specifically those that either manufacture or purchase things in bulk or packaged quantities. While industry segments such as chemicals, petrochemicals, pulp and paper, and pharmaceuticals benefit from SIMON as suppliers in the value chain, consumer goods companies are more likely to derive their SIMON benefits on the purchasing side, for production inputs such as raw material ingredients and feedstocks.

Companies implementing SIMON can run it on a Notes or Domino server at their own premises or have their implementation hosted at SSI's SMI Data Center facility. Under either option, customers have wide latitude as to the features, scope, and timing of their implementation, notes SSI's Kay Burns. "SIMON can be tailored depending upon how the user wishes to roll it out. Suppliers first need to determine which customers they would like to involve in the implementation, and then establish a plan for how it would like to implement it – either 'big bang' or incrementally."

Since SIMON is a Lotus Notes application, customers considering the premises option must have Notes and Domino installed at their location. SSI views the first step towards implementation as business process consultation, a typically two-week process in which SSI assigns a business consultant to examine the implementing vendor's current supply chain business processes. This stage is designed to produce both a set of recommendations, as well as an estimate of SIMON's quantifiable benefits to the implementing vendor. "This helps people in the company to convince higher level decision makers such as CEOs of the soundness of the business case," says Burns.

Once the supplier gives the green light on the SIMON implementation, a planning process is begun, with the focus on processes and associated activities, such as the assignment of roles within the implementing organization. The first stage of this process is to assign a project manager, who lays out the timing of the expected deployment, as well as a business consultant who works with the supplier on business-level planning. Key questions addressed by the business consultant include:

- Which personnel on the supplier side will assume the role of SMI analyst(s)?
- Which personnel on the supplier side will assume responsibility for managing inventory?



Source: Shell Services International

Figure 2. System Architecture for the SIMON Domino/Notes Extranet

Business consultants build a staffing plan and look at administrative areas to streamline basic business practices, such as payment processes, as billing shifts to monthly from a per-delivery approach.

After business level issues are addressed, the actual systems work on the SIMON deployment begins. The first tasks would be for SSI's systems personnel to meet with the Lotus Notes administrators, providing instruction on the installation of the SIMON template on the Notes server, as well as on the setup of the initial databases. Before leaving the engagement, SSI staff ensure that the company's Notes administrators are able to set up subsequent databases themselves.

After all key stakeholders in the company have been consulted and the SIMON template is installed, the SSI staff works with the supplier's customers to prepare them for SIMON. Again, SSI business consultants conduct meetings for the supplier on matters such as roles and responsibilities, and timing of data entry. These supplier meetings, which typically last 2 days, frequently provide valuable feedback that assists the supplier in configuring its SIMON implementation. As discussed earlier, configuration of SIMON is relatively straightforward process, using standard templates to set such parameters as units (gallons, etc.) and the frequency of forecast updates.

The final step in the implementation is end-user training. SSI would complete the process with training of both supplier and customer staff, requiring approximately 1½ days and ½ day, respectively.

Business Process Changes

According to Cindy Bishop, the implementation of SIMON allows SCC and their customers to enjoy streamlined business processes. The most obvious example of process streamlining for customers is the effective elimination of their need to perform inventory management, reducing a significant administrative burden. Other examples of streamlined administrative processes include a reduced need to perform purchase order processing (resulting from a smaller number of purchase orders required) as well as administrative resources required to address customer inquiries and order revisions. "With SIMON, customers can release some of their resources to perform other functions, since they don't have to proactively manage the inventory on their side, and they don't have to call in to place an order anymore," declares Bishop. "It's really a combination of the tools and processes that make the solution work."

But Bishop believes that SIMON's most valuable business process improvement is the way it helps suppliers help their customers make better informed decisions. "We have seen the greatest benefit for our customers in cases where SCC can be a direct extension of our customers' weekly plant operations supply meetings, where our customers discuss their upcoming production runs" Bishop says. "Shell Chemical SMI analysts, each of whom is assigned to a specific customer, work very closely with the plant locations to become a virtual participant of these meetings. With supplier managed inventory, SCC has become an integral part of these meetings, allowing us to be better in touch with the customer and where we can best deliver value to the customer. In many ways, SMI allows SCC to assume the role of a business adviser to its customers, working with them on issues that extend from inventory management all the way to supply chain optimization."

Bishop is quick to point out that process improvements have also flowed to suppliers. Forecasting methods represents a strong example of how information exchanged through SIMON has altered SCC's production planning processes for the better. Bishop notes a large customer now provides information to SCC, which is used to create long-term forecasts impacting production planning. "We've worked very hard to try to streamline this information chain," says Bishop of the forecast data, "and we've succeeding in making a very fragmented chain of information into a valuable pipeline that benefits us."

In addition to both streamlining and enriching core business processes for suppliers and their customers, SIMON also fundamentally alters the relationship between them. Thus, believes Bishop, relationships evolve from a traditional buyer/seller relationship toward a mutually beneficial strategic partnership model. "In the chemicals industry we're seeing strategic relationships forming up and down the supply chain," she says. "Companies are forming alliances with key suppliers that are going to help them secure the proper supply and help them cut costs. SIMON fits into this by helping SCC function more as partners in the supply chain."

Return on Investment

SCC's Bishop sees the benefits of SIMON extending up and down the supply chain. On the supplier side, SCC itself benefits from the fact that by performing SMI through SIMON, it can establish closer long-term partnerships with its customers, thus increasing its revenue opportunities from existing accounts. Since 1995, SCC created over $20 million in value (cost savings plus revenue) for its customers and itself through the use of SIMON.

In addition, the closer partnerships enabled by SIMON also led to an increase in the overall efficiency of supply chains. SSI's Burns believes that the unique dynamics of the commodity chemicals market represent an especially good rationale for a supplier to introduce a relationship-enhancing tool such as SIMON. "In the chemicals industry, customers are always trying to negotiate lower prices, and often move their business to different suppliers," says Burns. "Establishing longer-term relationships and building trust between trading partners benefits the value chain overall."

Overall Benefits	
Supply Chain Segment	**Benefit**
Customers	Ability to outsource inventory management functions, thus reducing administrative costs and freeing up administrative staff for other tasks Reduction in on-site and in-transit inventory stocks, resulting in lower working capital costs Reduction in the need for emergency and/or short-term shipments, resulting in lower transportation and administrative costs, as well as an increased ability to avoid paying high spot market prices
Suppliers	Reduced administrative costs by enabling shift from per-order billing to a more regular billing cycle Transforms customer relationships into supply chain partnerships Ability to differentiate themselves from competitors on the basis of their value-added service offerings
Mutual Benefits	Since 1995, Shell Chemical Company created over $20 million in value (cost savings plus revenue) for its customers and itself through the use of SIMON.

Source: Shell Chemical

Figure 3. Benefits of Shell Chemical Company's e-business Solution

SIMON also represents a strategic sales and marketing tool by virtue of its ability to assist SCC sales personnel in differentiating what is essentially a commodity product to a value-added service product. Thus, SCC can tout its ability to provide an uninterrupted supply of product, inventory management services, and convenient billing, as an effective means of attracting new customers.

On the customer side of the supply chain, SIMON enables significant cost reduction by streamlining supply chains through more effective inventory planning. Bishop points out that historically SCC has observed a tendency among its customers to store more inventory than needed. "When a supplier like SCC takes over inventory planning, they can reduce the inventory stored at the customer site, and increase the inventory turns," says Bishop. "This reduces the costs associated with holding inventory, and reduces the total working capital costs in the system." One customer using SIMON increased inventory turns from 5.2 times annually to 17.1 from 1997 to 1998, saving significant working capital costs. SCC customers using SIMON increased inventory turns by 15% on average.

SIMON also produces more subtle – yet significant – cost savings for customers. For example, customers have experienced a reduction in the number of emergency deliveries. In addition to avoiding the major additional transportation costs associated with emergency shipments – shipments made by truck rather than rail – customers also avoid significant administrative costs. SCC is now beginning to measure improvements in emergency shipments. One major customer using SIMON cut its emergency shipments from 64 in 1998 to zero through the first half of 1999. On average, customers analyzed to date have experienced an 82% reduction in emergency shipments.

Future Plans

SCC plans to continue to work with SSI to implement the latest technology to maximize the robustness of the SIMON application. The next version of SIMON will be fully Web enabled in order to take advantage of the capabilities of Domino 5.0 and will use Java™ to run more intensive functions such as charting and automated re-supply calculations. "We're ahead of the curve technology wise," says SSI's Burns. "While the Web client doesn't presently offer all of the Notes client's functionality, the next version will add more functionality to Web clients through the addition of Java components. Where possible, SSI plans to use both "canned" applets within the Lotus product suite and VisualAge® in cases where SSI must write its own applets."

To further enhance SIMON's ability to be deployed worldwide, SSI has teamed with IBM to market, sell and service SIMON. "The IBM and SSI team allows other companies in process industries to draw on the best practice experience of industry leaders," says Craig Hodges, vice president of marketing, IBM Global Chemical and Petroleum Industry. "SIMON is a comprehensive e-business solution that combines the best of technology and consulting services that our two companies have to offer."

SSI's Burns sees the success of SIMON, and the resulting word-of-mouth, as one of the principal factors driving its penetration into new groups of suppliers and customers. "Shell Chemical has implemented SIMON on such a wide scale that many of its customers and suppliers have become prospects due to their positive experience with it. They want to start using SIMON with some of their other customers and suppliers. This may be the best way to get the word out about SIMON."

Shell Services International

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