



Leading Petrochemical Manufacturer Enhances Collaboration, Decision Making

Overview

Country: United States and Canada

Industry: Manufacturing

Customer Profile

Founded in 1985 and headquartered in Houston, Lyondell is one of the world's top manufacturers of petrochemicals and other chemical products.

Business Situation

Like other U.S.-based chemical companies, Lyondell faced labor-cost pressures from globalization, and like all chemical companies, it faced raw-materials cost pressures from rising petroleum prices.

Solution

With the help of strategic partner Aspen Technology, Lyondell is deploying a wholly integrated solution for facilitating communication, collaboration, and decision making, particularly as it relates to the planning, selection, and allocation of feedstocks.

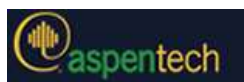
Benefits

- Enhanced decision making
- Potential yearly savings of tens of millions of dollars
- Strong foundation for future solution integration

“We see this solution as the foundation of a long-term approach to optimization that will help Lyondell maintain its competitive edge.”

Kara Achtermann, Manager of Technical Development

As a leading petrochemical manufacturer striving to retain its leadership position in an increasingly competitive market, Houston-based Lyondell needed to address the twin challenges of globalization and rising petroleum prices. Generally, employees needed more powerful communication and collaboration tools; specifically, they needed real-time feedback loops for helping to make decisions about the planning, selection, and allocation of feedstocks, the most costly item for chemical companies. IT executives addressed the problem by using Microsoft® BizTalk Server® and other Microsoft technologies to integrate manufacturing and process-control applications with upstream line-of-business applications throughout the enterprise. The anticipated results: more rapid and strategic decision making and potential savings of tens of millions of dollars yearly.



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Eric Silva, Vice President, Information Technology, Lyondell

Situation

With 10,000 employees worldwide, \$18.6 billion in consolidated revenues, and operations on five continents, Lyondell is a leader in the manufacture of commodity chemicals and polymers. Its products form the building blocks of plastic products used in virtually every industry and every facet of everyday life. The company also is a significant producer of gasoline-blending components.

According to IT executives, the goal at Lyondell is to become the premier chemical company in the world. But taking the steps to achieve such a goal requires facing some hard challenges. “Everywhere you look there is pressure,” says David Chapman, Director of Business Solutions. “With globalization, especially the entry of China into the market, the commodity chemical market is increasingly competitive, with shrinking margins, especially for those of us with large U.S. labor forces.”

Another significant challenge is the rising cost of petroleum. “This raises the cost of the energy needed to transform raw materials into products, and it raises the cost of the raw materials themselves,” Chapman says.

Chapman explains that those raw materials, known in the industry as “feedstocks,” are the No. 1 cost for chemical companies. “As feedstocks become ever-more costly, it becomes ever-more vital to have the right feedstock at the right time and in the right place,” he says. “You have to know which feedstock works best at which plant and in which operations, and you have to be able to replace dwindling feedstocks at the optimum price and to transport them to their destination using the most efficient means available.”

To address such challenges, “Lyondell needs accurate and timely feedback loops and

operational models for dozens or hundreds of people, working in diverse capacities and locations and dealing with unique and specific time horizons for dozens or hundreds of different activities,” says Eric Silva, Vice President, Information Technology.

These are people making decisions about everything from scheduling to plant operation to purchasing and accounting. “But until recently,” Silva adds, “they could not make those decisions as rapidly as they would have liked, because they lacked a timely and comprehensive method of collaborating, communicating, and data sharing. Instead, they relied on conference calls, e-mails, and distributing spreadsheets.”

And that, notes Kara Achtermann, Manager of Technical Development, was a problem that Lyondell IT executives were determined to solve. So they set out to integrate the company’s manufacturing and process-control applications with enterprise resource planning and other line-of-business solutions throughout the company.

Solution

Chapman, Silva, Achtermann, and their colleagues launched the integration project by defining three primary goals: to simplify the management of non-compliant events, to dramatically reduce delays in decision making, and to implement an efficient and cost-effective way of mining the exponentially increasing data emerging from the plants.

“Employees have long used tools to address all three challenges, but these tools did not work as harmoniously as they should,” Silva says. “We needed a way to get everyone on the same page at the same time, to converge the planning horizons of multiple manufacturing operations into scheduling and operational views that users could easily leverage.”

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David Chapman, Director of Business Solutions, Lyondell

Next, the project team specified the business unit that would receive the initial rollout of the solution: the company’s North American olefins business unit. This business unit consists of seven plants throughout the United States and Canada that manufacture a handful of petrochemicals used in applications ranging from packaging and detergents to clothing, window frames, car tires, and paper coatings.

As Silva explains, the olefins business unit was selected because team members felt that it had the greatest potential for optimization thanks to its high levels of flexibility and complexity. “Olefins manufacturing is flexible because the products can be made with a wide variety of feedstocks, operations, and plant types,” he says. “Olefins manufacturing is also complex, with many variables, because it requires large numbers of people and process steps. And, in our experience, the greater the number of variables, the greater the opportunity for optimization. All this made the olefins business unit the ideal target of our initial rollout.”

Finally, to achieve the desired level of application integration with the kind of front end that would enable users to make the most of that integration, members of the deployment team decided to base the solution on Microsoft® BizTalk Server®, Microsoft SharePoint Server, and other Microsoft technologies.

“We have used Microsoft products for over a decade for some database and other server-based application as well front-end systems on the desktop,” Chapman says. “For Lyondell employees, Microsoft is intuitive, it’s what they use at work and at home, it’s the way they are comfortable working.” Another factor in the selection of Microsoft integration technologies was that those technologies also served as the foundation of

the company’s manufacturing and process-control solutions, namely, Aspen One and other applications from strategic partner Aspen Technology.

According to Steve Pringle, Senior Vice President, Aspen Technology, Aspen One is the first major suite of applications designed explicitly for process industries. With modules specialized for the chemical industry, Aspen One supports the following:

- Planning, selection, and allocation of feedstocks
- Translation of feedstocks into an operational plan that can be acted on by manufacturing
- Online control of execution through realtime optimization advanced control
- A rapid-feedback loop based on a sophisticated modeling of the complex interactions among orders, production, inventory and distribution in the supply chain

Aspen One also supports plant design and operation, nonlinear advanced process control, and the comprehensive and integrated management of energy, performance, and production.

For each of the Lyondell olefins plants targeted for deployment, Aspen One will run in the manufacturing control room and will be integrated, through Microsoft BizTalk Server, with upstream systems at headquarters, regional offices, and throughout the enterprise. The front end of the solution, based on Microsoft SharePoint Portal Server, will deliver information to users based specifically on their job and functional requirements.

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Kara Achtermann, Manager of Technical Development, Lyondell

Benefits

As the solution is rolled out to the olefins business unit and then beyond, members of the deployment team anticipate a number of substantial benefits for Lyondell users, customers, and shareholders.

Rapid Decision Making, Major Cost Savings

According to Achtermann, the first benefit of the integration solution will be a more efficient use of human resources through a more effective approach to decision making. “At Lyondell, people are our biggest asset, and through this solution we will deliver information seamlessly and effortlessly to the people who need it,” she says.

“Consequently, we will help ensure that each individual has the information and the delegated authority to make decisions and make them quickly.”

Moreover, adds Chapman, having the information available to implement a rapid feedback loop will enable Lyondell employees to improve throughput, reduce inventories, and streamline feedstock selection and purchase, allocation, and operation. “The result is potentially tens of millions of dollars each year in savings, helping us remain competitive and optimize profitability for our shareholders,” he says.

Value of Technologies, Partnership, Support

For positioning Lyondell to potentially achieve such savings, Achtermann speaks highly of the technologies behind the integration infrastructure. “On the back end, Microsoft Visual Studio® .NET and BizTalk Server are helping us to deploy a solution that is standardized, scalable, reliable, and high performing—and that will provide a foundation for helping us deploy other such solutions in the future,” she says. “On the front end, Microsoft SharePoint Portal Server is helping users make an easy transition

thanks to its similarity with other Microsoft products they know well, such as Microsoft Office and Microsoft Outlook.”

For his part, Pringle considers Microsoft technologies crucial to the success of Aspen One and other Aspen Technology products. “Our products are based on Microsoft technologies because they help us deliver solid benefits to our customers at a lower cost,” he says. “In particular, we are impressed by the advances that Microsoft has made in addressing enterprise-level challenges through scalability, reliability, and performance—a tremendous leap forward.”

Pringle is seconded by his colleague Rik Klavers, Product Manager, Aspen Technology. “The Microsoft technologies and relationship are very important to Aspen Technology,” he says. “Microsoft products such as SQL Server and the .NET Framework have been instrumental in enabling us get our products to market quickly and at a price that is attractive to our customers.”

Silva strikes a similar note when speaking of the partnership between Lyondell and Microsoft. “Over a decade ago, we determined that integration was the way to achieve the lowest total cost of IT ownership,” he says. “As we evaluated the industry and technology and different players for this project, we selected Microsoft because they understood the importance of integration. Today, we appreciate how hard the Microsoft marketing group works to understand what we’re trying to accomplish, to connect us with the technical resources at Microsoft, and to help accelerate our progress.”

According to Achtermann, that support builds on the advantages of having a thoroughly integrated solution based on products from both Microsoft and Aspen Technology—for today and beyond. “With the combination of support and technology from Microsoft and

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For more information about Lyondell products and services, the Web site at: www.lyondell.com

For more information about Aspen Technology products and services, visit the Web site at: www.aspentech.com

Aspen Technology, we're excited and confident about delivering this solution not only to our olefins business unit but also to others throughout the enterprise," she says. "We see this solution as the foundation of a long-term approach to optimization that will help Lyondell maintain its competitive edge."

Microsoft Solutions for the Manufacturing Industry

Manufacturing enterprises must compete in an increasingly global environment. Success depends on finding ever-greater efficiencies throughout the enterprise, while developing a greater agility to react to local and global market opportunities. These challenges are best answered with technology from Microsoft and its partners.

Microsoft-based solutions offer much needed value to manufacturers who are under increasing pressure to generate greater returns on the assets that they have employed. This focus on efficiency scales across all the critical functional areas—from getting products to market faster, to streamlining the supply chain, optimizing the manufacturing operations, and generating new revenue streams.

For more information about Microsoft solutions for the manufacturing industry, go to: www.microsoft.com/resources/manufacturing

Software and Services

- Microsoft SQL Server 2000
- Microsoft Visual Studio 2005 Professional Edition
- Microsoft BizTalk Server 2004
- Microsoft SharePoint Portal Server

- Partner
 - Aspen Technology
- Technologies
 - Microsoft .NET Framework 2.0