BUSINESS PROCESS AUTOMATION IN MANUFACTURING

The manufacturing landscape is constantly shifting as a result of changes in global competition and company mergers. Government regulation has also taken a new, tougher tone. In addition, your customers demand new services and products and don't want to wait for them. These changes, manufacturers tell us, present them with both their biggest challenge and their biggest opportunity. They need to have a clear, comprehensive, companywide view of their own resources, exchange key information quickly and easily, and combine technology systems in new ways. If manufacturers can do that, then they can make smart decisions, find new value in existing systems, react to ever-changing customer demands, and take advantage of new market opportunities.

Unfortunately, manufacturers do not have the option of purchasing a simple solution that instantly solves all their problems. Many have tried that in the past, investing heavily in technology in an effort to solve business challenges. However, technology by itself is not the solution. The greatest impact on any business is people enabled by effective solutions that deliver results. Today, software and information technology (IT) provide such powerful tools to all manufacturers and their employees. A "connected manufacturer" not only leverages a flexible, economic technology platform that drives business results, but also focuses primarily on its greatest asset: people who are empowered to act on the right information at the right time.

To enable your organization's people assets to extend their potential through the use of software, Microsoft delivers agile and adaptive solutions for business process automation (BPA). BPA solutions provide the tools, technologies, and infrastructure to automate complex business processes end to end in order to help increase competitive advantage and deliver tremendous value and

visibility to your business, customers, and trading partners. This enables you to:

- **Increase personal and organizational productivity.** By automating business policies and best practices, removing manual tasks, and eliminating error-prone reentry of information, BPA boosts individual and team efficiency, which enables manufacturers to deliver results faster and with greater predictability.

- **Make better decisions.** By providing real-time insight into key business metrics and providing proactive alerts and notifications, BPA gives broader insight into essential business processes that are critical to your business (from the plant floor to the enterprise) and provides real-time analytics that enable you to make better decisions faster.

- **Enhance operational excellence.** Business processes in manufacturing operations are mission critical, demanding the utmost levels of reliability to keep your production processes running. BPA provides a rock-solid foundation that delivers the security, performance, scalability, and reliability demanded by the distributed, mission-critical systems of modern manufacturers.

Two key areas of business process innovation in manufacturing that can be transformed through business process automation are the "plant operations" and "supply chain management" priority solution scenarios. These scenarios, or strategic areas of focus, are examined in more detail on the following pages.

Microsoft
Windows Server System

SCENARIO: PLANT OPERATIONS

Overview

Manufacturers face ongoing challenges related to getting real-time information about their plant floor operations. Not integrating the plant control systems with enterprise applications—for example, enterprise resource planning (ERP), SCM, business integration (BI)—results in larger-than-necessary inventories, inaccurate planning and operational decisions, and lower quality and consistency of the manufacturing process. Plant operations solutions from Microsoft enable plant-level production applications and business systems to share information in real time, exchange services with each other based on open standards (like S95 B2MML and OAGIS), and cooperate in end-to-end business processes using the information and services.
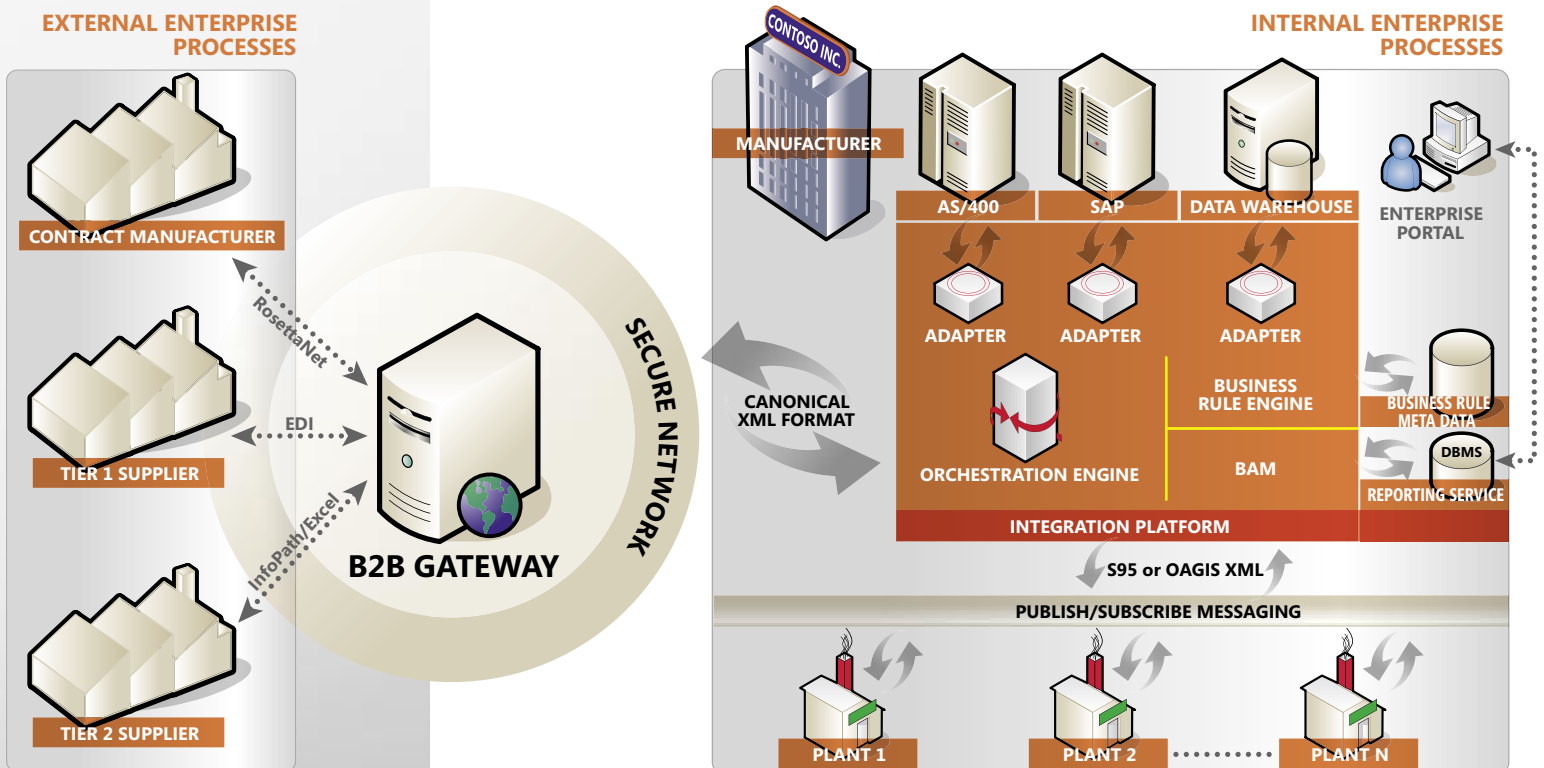
Benefits

Improved business processes, improved responsiveness to business changes, better visibility into production changes, improved business performance, and reduced inventory

Case Study

Corning has the vision to be the world's preferred supplier of unique specialty materials solutions. It previously had separate, nonintegrated infrastructures across seven manufacturing sites. With the introduction of the Six Sigma quality program and a new company directive to develop a collaborative manufacturing strategy among plants, a solution that would integrate all the factories became essential. Corning needed a solution that would help link manufacturing facilities to each other, aswell as help automate complex business practices between the seven factories and the three commercial organizations. Corning implemented a business process automation solution that enabled an integrated plant operations system (named "virtual factory") that provides real-time tracking, visibility, and control across all plants. It captures critical data points during the making of a product and allows for real-time changes to the manufacturing process. This resulted in savings from $750,000 to $2.3 million in MES operational costs, improvements in business and manufacturing processes, and decreases in time to market.

> *"We needed a way to maintain information that reflected activity on the shop floor in real time... BizTalk Server is what makes this possible in our distributed computing environment."*
>
> **—Doug Anderson,**
> *Chief Information Officer of Specialty Materials for Corning*

EXTERNAL ENTERPRISE PROCESSES

- CONTRACT MANUFACTURER
- TIER 1 SUPPLIER
- TIER 2 SUPPLIER

RosettaNet

EDI

InfoPath/Excel

B2B GATEWAY

SECURE NETWORK

INTERNAL ENTERPRISE PROCESSES

CONTOSO INC.

MANUFACTURER

AS/400 | SAP | DATA WAREHOUSE

ENTERPRISE PORTAL

ADAPTER | ADAPTER | ADAPTER

CANONICAL XML FORMAT

ORCHESTRATION ENGINE

BUSINESS RULE ENGINE

BAM

BUSINESS RULE META DATA

DBMS

REPORTING SERVICE

INTEGRATION PLATFORM

S95 or OAGIS XML

PUBLISH/SUBSCRIBE MESSAGING

PLANT 1 | PLANT 2 ·········· PLANT N

Sidmar is a branch of Arcelor, the world's largest steel producer. Like many other manufacturers, Sidmar did not have information about its plant steel production well integrated with its enterprise systems (previously linked through the exchange of reports). Sidmar had an objective of ensuring that its enterprise systems could share data in an automated way that reflected plant production processes, as well as facilitate the sharing of process and production information with its parent company, Arcelor. In addition, this infrastructure had to be operational 24 hours a day, seven days a week. Sidmar implemented a plant operations business process automation solution that leveraged a service-oriented architecture and process orchestration to link information from plant devices (such as scanners or terminals) to back-end systems. This has resulted in greatly reduced total costs of operation, reduced development time, improved operational efficiency, and enterprise-class scalability and reliability without requiring modifications to existing systems.

SCENARIO: SUPPLY CHAIN MANAGEMENT

Overview

In the new global networked economy, real-time visibility, agility, and accuracy are of paramount importance in dealing with demand fluctuations, supply chain disruptions, and expectations of well-informed customers. Enterprises with a closely connected supply chain have a strategic competitive advantage. Supply chain solutions from Microsoft streamline the collaboration across business partners through integration between customers, suppliers, and logistics providers (using open standards like RosettaNet, PIDX, CIDX, or EDI) as well as providing end-to-end visibility into the value chain to help enable the ability to respond to real-time changes in supply or demand.

Benefits

Reduced time to market, reduced cost, improved inventory turns, and increased visibility and agility to react to market conditions

Case Study

Inotera Memories, Inc., produces innovative computer memory chips. Based in Taiwan, the company produces memory chips, including both DDR SDRAM and the new DDR2 SDRAM chips, and has more than 1,000 employees. Relying on manual data entry, the company had an order processing system that was both time-consuming and prone to error. And Inotera could not interface with its parent company's business-to-business platform. Looking to integrate its business networks and streamline its order processing, Inotera deployed a Microsoft-based business process automation solution to implement a RosettaNet interface to its trading partners. Reducing the manual reentry of data has enabled Inotera to decrease order processing time by 90 percent, reduce invoicing and reporting time from weekly to daily (speeding the payment collection process and decreasing interest fees), and greatly increase overall communication and efficiency.

Universal Forest Products (UFP) is a leading manufacturer, distributor, and marketer of treated and structural lumber products and specialty wood packaging for consumer, industrial, and construction markets. The company has grown substantially in the past few years due to both internal and acquisitional growth, which has resulted in siloed and disconnected business processes. Historically, UFP had relied on paper-based projections and inventory management processes to support its supply chain management functions. However, to achieve its corporate strategies, UFP decided to implement a business process automation solution to streamline its supply chain and forecasting processes. The solution has now enabled the company to implement automated manual quarterly and annual forecasting (within a familiar desktop environment based on integrated Microsoft® Office tools), achieve better integration and streamlining of data collection and report generation end to end, and reduce inventory levels through use of better decision-making tools.
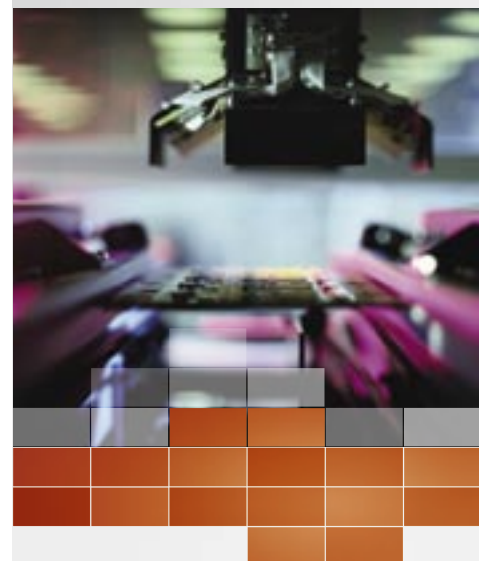
"The integration flexibility between different systems is more powerful than we expected. We were able to integrate our RosettaNet-based business-to-business platform not only with our customers, but also with our internal ERP system."

—***Kun-Yung Wang,***
IT Division Director,
Inotera Memories, Inc.

MICROSOFT SOLUTIONS FOR MANUFACTURING BUSINESS PROCESS AUTOMATION

Plant to Enterprise: Integrating ERP and CRM with Plant Floor Systems

Solution frameworks based on Microsoft BizTalk® Server enable real-time integration between a manufacturer's enterprise systems (ERP, CRM, BI, etc.) and its manufacturing execution and control systems.

• Adapters from Microsoft provide integration with systems from SAP, Oracle, PeopleSoft, J. D. Edwards, Siebel, and Clarify; many more are provided through partners.

• Plant interoperability standards like S95 B2MML and OAGIS are supported through the native BizTalk Server XML engine. With mapping between standards, you can abstract your solution from lower-level protocols as the standards evolve and change.

• Orchestration of the core business processes and rules that span the enterprise and the plant floor enables you to automate previously manual tasks and gain both greater operational efficiencies and end-to-end visibility and monitoring of your processes.

Through integration with Microsoft SharePoint® Portal Server and Microsoft Office InfoPath®, plant personnel can interact with running business processes and collaborate effectively with others who are either within or outside the plant. Information about real-time business processes can be analyzed in real time by plant operations personnel; they have the ability to drill into analytical data (using a graphical scorecard) and identify opportunities to improve overall plant performance.

Integrated components include BizTalk Server, Microsoft SQL Server™, SQL Server 2000 Analysis Services, SQL Server 2000 Notification Services, Microsoft Windows Server™, SharePoint Portal Server, and InfoPath.

Supply Chain Accelerators: Frameworks for Trading Partner Collaboration

Multiple solution frameworks are available to accelerate the development of complex supply chain solutions. They provide an extensible foundation that helps manufacturers comply with industry standards and derive business advantage from enhanced collaboration with and visibility into their supply chain.

• **RosettaNet:** The RosettaNet standard spans numerous manufacturing segments, including computer and consumer electronics, semiconductor manufacturing, logistics, telecommunications, petroleum, and chemical sectors. The RosettaNet accelerator provides support for all current RosettaNet Partner Interface Processes (PIPs).

• **EDI/AS2:** The Covast EDI Accelerator provides support for full, end-to-end, complex EDI requirements, including comprehensive VAN support, use of emerging Internet-based commerce standards (like AS1 and AS2), complete auditing and tracking, and end-to-end functional acknowledgements.

• **Small trading partner integration:** For small suppliers that do not have the system infrastructure and resources needed for full line-of-business systems integration, they can use Microsoft Office with Microsoft Office InfoPath 2003 to be up and running and communicating with a manufacturer in a rapid time frame.

Integrated components include BizTalk Server, SQL Server, Windows Server, SharePoint Portal Server, and InfoPath.

For more information on these solutions and the set of Microsoft business process automation technologies, please visit **www.microsoft.com/biztalk**.

Windows Server System

Microsoft®