MANUFACTURING

Microsoft Dynamics™ AX

Drive Greater Success with Enhanced Supply Chain Visibility

White Paper

Date: June 2006

Microsoft Dynamics™ AX

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Introduction

Global competition has brought intense new pressures to the supply chains of large manufacturers. Distribution channels and supply networks are becoming more complex in the effort to satisfy customers who want goods faster and at lower cost than ever.

In this difficult and competitive environment, profitability depends on:
- Gaining visibility across increasingly dispersed manufacturing, supply, and distribution networks.
- Reducing costs, inventories, and lead times by shifting the entire supply chain to a demand-pull rather than product-push orientation.
- Rapidly complying with regulatory requirements and customer initiatives such as radio frequency identification (RFID).
- Enhancing supply chain collaboration to bring new products to market faster and offer advanced services such as vendor-managed inventory (VMI) and warranty or after-sales support services.

This white paper reviews the challenges global manufacturers face and outlines ways that technology can help companies speed the flow of accurate information, increase transparency and connectivity, and facilitate collaboration to deliver more value to customers. This white paper will also address specific ways that Microsoft Dynamics™ AX can improve supply chain visibility and integration to help your company and your supply partners compete, grow, and gain a competitive advantage.

Trends and Challenges

In today's increasingly global marketplace and ever-expanding universe of supply partners, most manufacturing supply chains contend with:
- Higher customer expectations and demands, including complete traceability and compliance with a multiplicity of regulatory requirements.
- Global business, including more cost-efficient competitors putting pressure on prices.
- An accelerating race to introduce new products and respond to technological and market changes.
- Increasingly complex global supply chains that must be aligned and connected from a demand-driven perspective.

These trends create significant challenges to achieving profitability.

Key challenge: meeting increased customer demands

Global business has driven higher levels of product and service customization, both for individual customers and to meet the needs of different cultures, consumers, languages, distribution channels, and market requirements. As a result, manufacturers must juggle increasingly complex product line and supply chain requirements. In addition, retail competition is so fierce that retail customers can, and do, demand tailored products, services such as RFID compliance, and even the ability to specify the materials' origin and other characteristics of product packaging.

Meanwhile, market conditions change faster than ever, and customers expect their suppliers to help them adapt. Traditional lead times have become irrelevant, orders may be changed at the very last minute, and as a result, traditional sales forecasting and demand planning no longer work. Customers also expect suppliers to provide complete traceability and chain-of-control management, no matter how complex the

product or how many times the goods change hands. Meeting these demands requires unprecedented operational flexibility and the free flow of accurate data throughout the supply chain.

## Key challenge: reducing costs and increasing efficiency

In a global buyers' market influenced by low-wage competitors in developing countries, the need to reduce costs drives many manufacturers to seek efficiencies anywhere they can find them, including reductions in inventories, outsourcing, and new partnerships with downstream service and third-party logistics providers. Each can represent an effective strategy for cost or quality control, but also introduce new challenges of transparency and communication. Global manufacturers need to connect not only with their own network of facilities, but also with other key supply chain partners. And as more warehouse and logistics management moves outside the scope of internal control, companies deal with greater risk of misplaced goods, costly transportation mistakes, and traceability errors or gaps through multi-tier distribution systems.

Key challenge: speeding innovation and response to change

Even the most effective supply chains need to change to meet new customer demands, innovate, and adapt to global business. Customers demand cutting-edge goods and services. Manufacturers must respond with flexibility and faster new-product launches while continuously reducing waste, improving cycle times, and replicating best practices to control costs. One delay or miscue in the chain, and a customer—or market leadership for a new product—can be permanently lost.

Key challenge: connecting dispersed resources in a global supply chain

Meeting the challenges already discussed demands much greater two-way communication and collaboration throughout an organization and between all participants in its supply chain, despite increasing supply chain complexity. Knowledge that exists anywhere in the company or the supply chain must be easily accessible to partners both upstream and downstream so they can respond to changes and safeguard customer satisfaction.
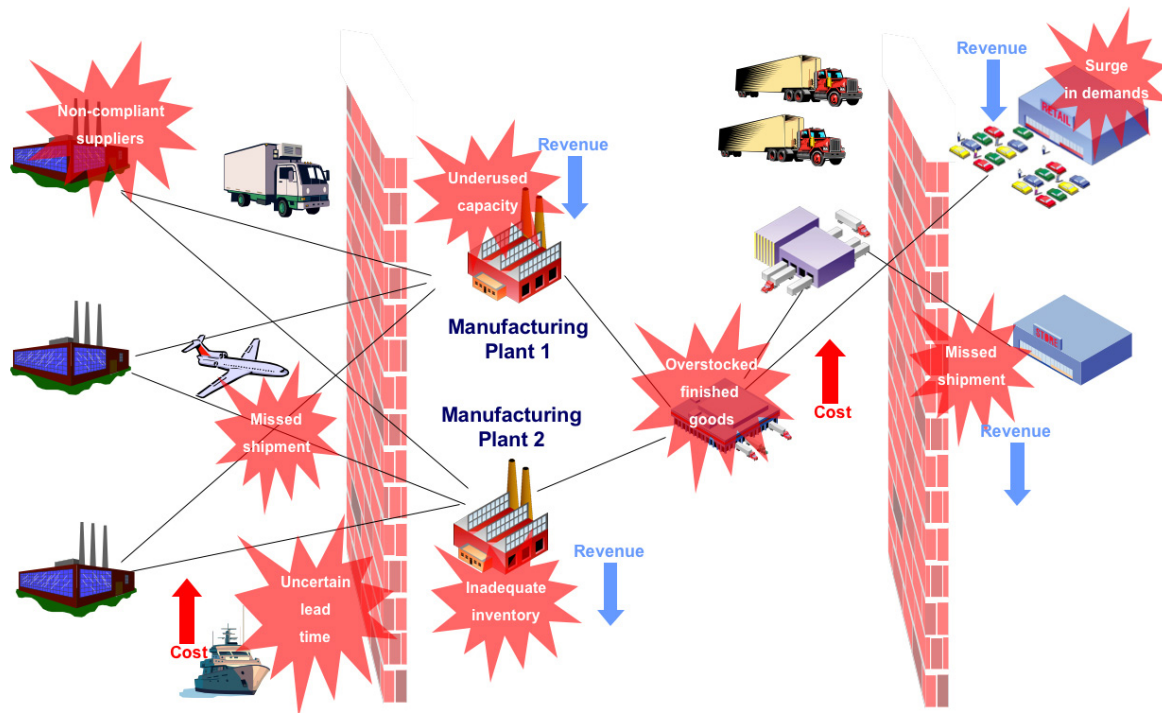
In complex global supply chains, upstream failures can exponentially impact costs and customer satisfaction downstream. That's true within an enterprise as well as with its trade partners. But greater operational visibility can help business managers detect and respond to failures before they affect overall supply chain performance.

Even when partners mesh tightly together, effective, forward-looking collaboration and fast, informed decisions still depend on equal access to accurate, up-to-date data—a single version of the truth. You cannot effectively shift the responsibility for just-in-time inventory to a supplier who cannot access your real-time inventory and order levels or initiate purchasing processes. Suppliers may also be reluctant to accept a supplier-managed inventory model if the automation does not include automatic financial settlement to protect their own cash flows with fast, accurate invoicing and payment. And you cannot trace the source of materials all the way through the supply chain if you cannot share precise, accurate tracking of lots, orders, and shipments.

The relative sophistication of various trade partners' information systems can present a hurdle. So can the complexity and cost of Electronic Data Interchange (EDI). Even data and process barriers within an enterprise can stymie its ability to smoothly share data, manage its supply chain, and profitably deliver value for customers. But tight integration and close collaboration is possible. The remainder of this white paper will present the benefits of a technological solution that effectively integrates a flexible enterprise resource planning (ERP) platform and robust manufacturing software with the visibility and collaboration tools crucial to an effective supply chain. It will also discuss the specific advantages of Microsoft Dynamics AX as a vehicle for providing supply partners with the transparency and connectivity to profitably drive value to customers.

## Turn Challenges into Opportunities: How Technology Can Help

Fortunately, every headache of global supply chain management also represents an opportunity for astute business managers to seize an advantage over competitors. Many manufacturing firms are implementing strategies that include demand-driven supply chains focusing on greater real-time interaction, automated inventory replenishment, and increased manufacturing or logistics outsourcing. The successful implementation of such strategies can be greatly facilitated by an integrated business management technology that increases supply chain visibility, connects trade partners to speed interaction and collaboration, fosters greater efficiency, and provides the cross-organizational insight for confident decisions and actions.

Increase supply chain visibility

By connecting the flow of goods and information through organizations and processes, and by making that information available to everyone who needs it, an appropriate business management solution can:

- Deliver information for faster, proactive decisions and actions at the most effective position in the supply chain and the organizational level.
- Facilitate the interaction between organizations and their often heterogeneous technologies.
- Provide needed data for demand planning and automated replenishment; reducing inventories, costs, and cycle times; and complying with traceability requirements.

Experience shows that demand-driven supply chains depend on supply chain transparency to help ensure high order fulfillment and customer satisfaction.

Shortening Information Lead Times
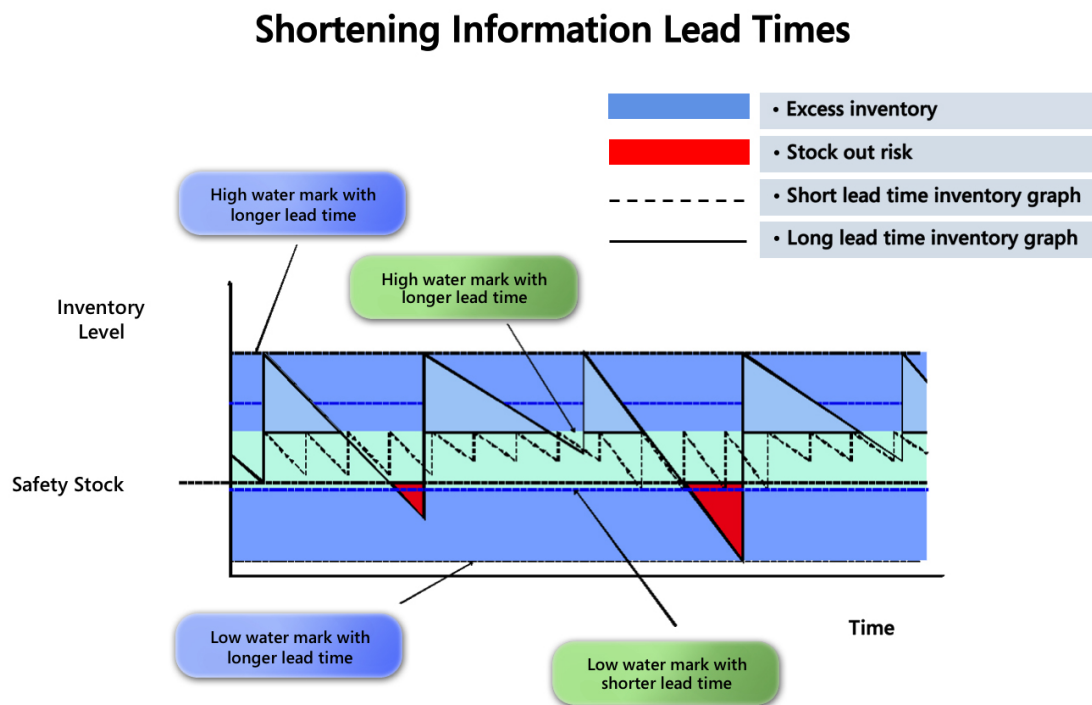
As shown in this diagram, more frequent replenishment results in less inventory.

Connect trade partners to speed collaboration

An integrated business management solution can also provide tools to help link members of the supply chain, including customers, to foster more efficient communication and greater collaboration. IT standards and file-sharing systems make data easier to share between applications and companies, even those with different technologies or systems. Web-based portals can not only give trade partners access to data but also provide self-service for routine tasks such as quotation requests, sales or purchase order generation and status, or invoicing.

Boost efficiency

When you have a technological solution that provides closer integration and greater data accuracy, you can automate manual activities and eliminate redundant data entry throughout purchasing, warehouse, and logistics processes that cross organizations or are within a single company. The result can be fewer errors, lower costs, and reduced cycle times. An effective business management solution can also provide automated notifications to keep goods and data flowing smoothly and help ensure prompt actions on changes, delays, or unexpected events.
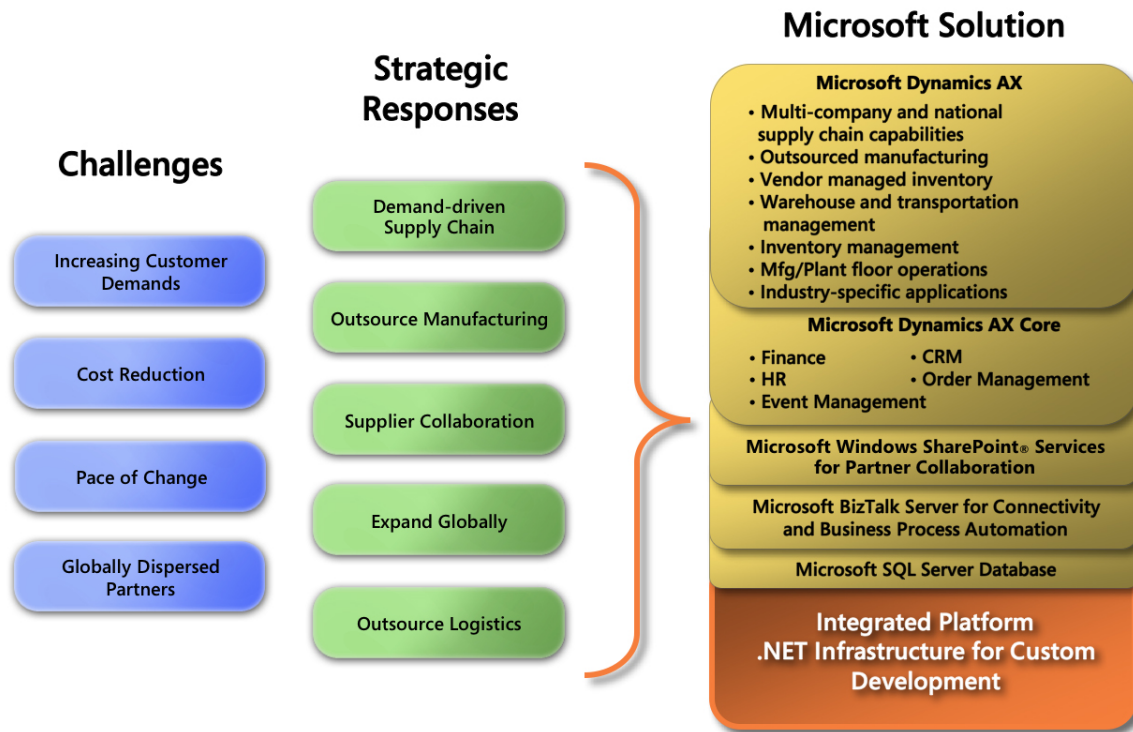
Gain insight for improvement

With accurate, integrated data, business managers can more easily measure and analyze the performance of supply and transportation partners and obtain data for volume purchasing and vendor negotiations. They can track key performance indicators, better manage capacity, and run "what-if" scenarios for outsourcing or other strategic changes in supply chain configuration. Understanding the true costs and profitability of products, processes, and relationships can help you make strategic decisions with confidence.

The Microsoft Dynamics AX Solution

Microsoft Dynamics AX offers global manufacturers a business management solution that provides integrated, real-time data in open, standard formats that can be easily shared through communication and collaboration tools—to effectively bridge the entire supply chain. This technology platform and the supply chain management applications built on it can bring greater transparency and connectivity to global supply chains, empowering the people in your organization to meet the challenges of today's competitive markets. Deploy the solution in either a centralized or decentralized implementation to achieve the benefits of greater supply chain visibility while meeting the varying needs of multi-company organizations.

Most organizations already use Microsoft technology such as Microsoft® SQL Server™, Microsoft Windows Server®, Microsoft BizTalk® Server, and the Microsoft Office system programs. As the de facto standard for office productivity, Microsoft applications such as Microsoft Office Excel®, Microsoft Office Outlook®, and Microsoft Dynamics CRM continue to revolutionize the way people use data and work together. Microsoft Dynamics AX can bring equivalent power to your supply chain management with a solution that works like and with familiar Microsoft software and capitalizes on existing investments. At the same time, Microsoft Dynamics AX increases transparency and business intelligence throughout the supply chain to help you achieve a fast return on investment and empower partners to work together for greater mutual success.

Microsoft Solution

Challenges
- Increasing Customer Demands
- Cost Reduction
- Pace of Change
- Globally Dispersed Partners

Strategic Responses
- Demand-driven Supply Chain
- Outsource Manufacturing
- Supplier Collaboration
- Expand Globally
- Outsource Logistics

Microsoft Dynamics AX
- Multi-company and national supply chain capabilities
- Outsourced manufacturing
- Vendor managed inventory
- Warehouse and transportation management
- Inventory management
- Mfg/Plant floor operations
- Industry-specific applications

Microsoft Dynamics AX Core
- Finance
- HR
- Event Management
- CRM
- Order Management

Microsoft Windows SharePoint® Services for Partner Collaboration

Microsoft BizTalk Server for Connectivity and Business Process Automation

Microsoft SQL Server Database

Integrated Platform .NET Infrastructure for Custom Development

Microsoft Dynamics AX provides the integration, increased visibility, and connectivity necessary to optimize global supply chains and meet the challenges of today's competitive markets.

Achieve real-time visibility deep into the supply chain

Microsoft Dynamics AX provides full order and inventory transparency up and down the supply chain. With access to real-time, consolidated views of material and product data, inventory status, order information, production plans, and receipt or delivery status, people can make better decisions and satisfy customer needs with greater profitability.

Full integration between Microsoft Dynamics AX, Microsoft Dynamics CRM, and Microsoft Office can help you interact more quickly and accurately with your supply chain partners. Greater cross-enterprise transparency can empower sales and operations people with up-to-the-minute, integrated information about promotions, new products, and late-breaking order changes in customer demand planning and production scheduling.

Microsoft Dynamics AX helps provide better supply chain visibility so companies can:
- Reduce exposure to supply chain risks by increasing timely awareness of changes, delays, or unexpected events.
- Gain real-time insight into any aspect of inventory with detailed, dimensional inventory data based on actual production rates and materials use. Configurable inventory classifications and attributes, including batch and serial numbers, can help you to track items throughout production and distribution.

- Save time and money with complete replenishment life cycle management tools, including automated replenishment signals, to reduce inventories, refine purchasing processes, and implement demand-driven, just-in-time, and vendor-managed inventories.
- Improve customer service when sales and customer service people can deliver faster, more accurate quotes, information about availability or lead times, and order status reports.
- Take advantage of a global, cross-enterprise perspective on orders, logistics, and transportation planning to more effectively consolidate orders, select the best carrier, create more efficient loads, and optimize delivery routing.
- Model subcontractor capacities and understand outsourcing costs to help make faster, more informed make-or-buy decisions.
- Reduce response times by configuring custom alerts, delivered by e-mail or onscreen, to notify the right people of changes or key events that require attention.
- More easily manage chains of control with comprehensive traceability of raw materials or components, products, and shipments, including serial numbers and lots.
- Meet customer demands for product and shipment identification and tracking with full, built-in support for Automated Data Collection Systems (ADCS) or radio frequency identification (RFID).

Facilitate supplier-managed inventory when suppliers can gain full visibility into inventory levels and current replenishment activities through the Internet, regardless of the supplier's IT system or sophistication level.

## Capitalize on transparency to attain greater business intelligence

Increased visibility becomes even more valuable when business managers can convert data to business intelligence. Microsoft Dynamics AX empowers people to:

- Easily search for, access, and compare data—regardless of where it is generated or used—thanks to complete integration between the solution's supply chain applications and other customer, manufacturing, and financial business data.
- Quickly manipulate and analyze information and present it in intuitive charts and reports for more accurate planning and better decisions.
- Create key performance indicators (KPIs) and scorecards to better manage productivity, select the highest-performing suppliers and carriers, hold more effective negotiations, build partner relationships, and drive continuous improvement.
- Provide consolidated, actionable business intelligence at the highest levels of the organization.

By uniting the entire supply chain with consistent, transparent, and easy-to-understand information, Microsoft Dynamics AX can help you improve the performance of every link to increase on-time delivery rates, customer satisfaction, and profitability.

Connect and collaborate with all of your trading partners

Extend the transparent data delivered by Microsoft Dynamics AX to the people and organizations that help supply chains succeed. By giving customers, suppliers, and logistics providers direct access to order status, inventory records, load plans, shipment information—whatever data is needed—businesses can save time, avoid redundant data entry, automate supply chain interactions, respond more quickly to change, and increase customer satisfaction.
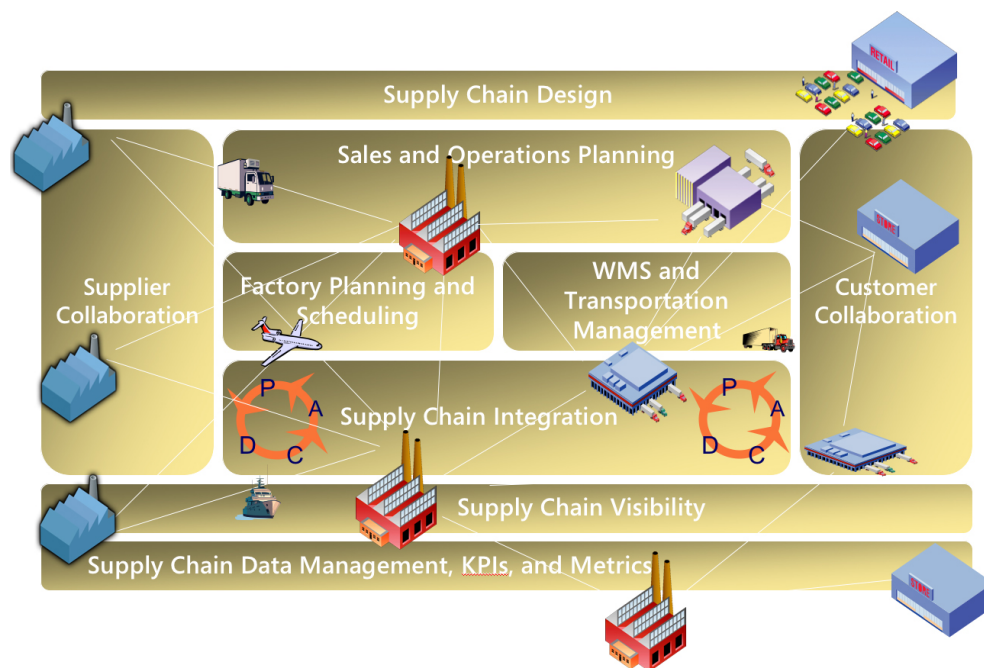
Eliminating barriers between trading partners creates opportunities to streamline processes, speed cycle times, and move goods more efficiently.

Microsoft Dynamics AX and communications solutions such as Microsoft BizTalk Server can help supply chain partners interact with real-time data or initiate key business processes, regardless of those partners' IT systems or technological sophistication. Companies can:

- Offer trade partners the efficiency of self-service through a familiar Web browser.
- Tailor Web portals to each partner's interests or needs and incorporate role-based security management.
- Exchange data across the Internet by using convenient XML-based documents without the expense of formal EDI implementations.

Connect with customers
With Microsoft Dynamics AX, companies can interact more easily with customers, regardless of their IT systems or technologies. Using methods ranging from a simple Web browser interface and e-mail to electronic data interchange based on XML, companies can:

- Reduce information lead times for collaborative demand management.
- Provide self-service order status and order entry.
- Coordinate advanced supply chain services such as VMI or consignment.
- Help ensure accurate customer records by enabling them to update their own account data.
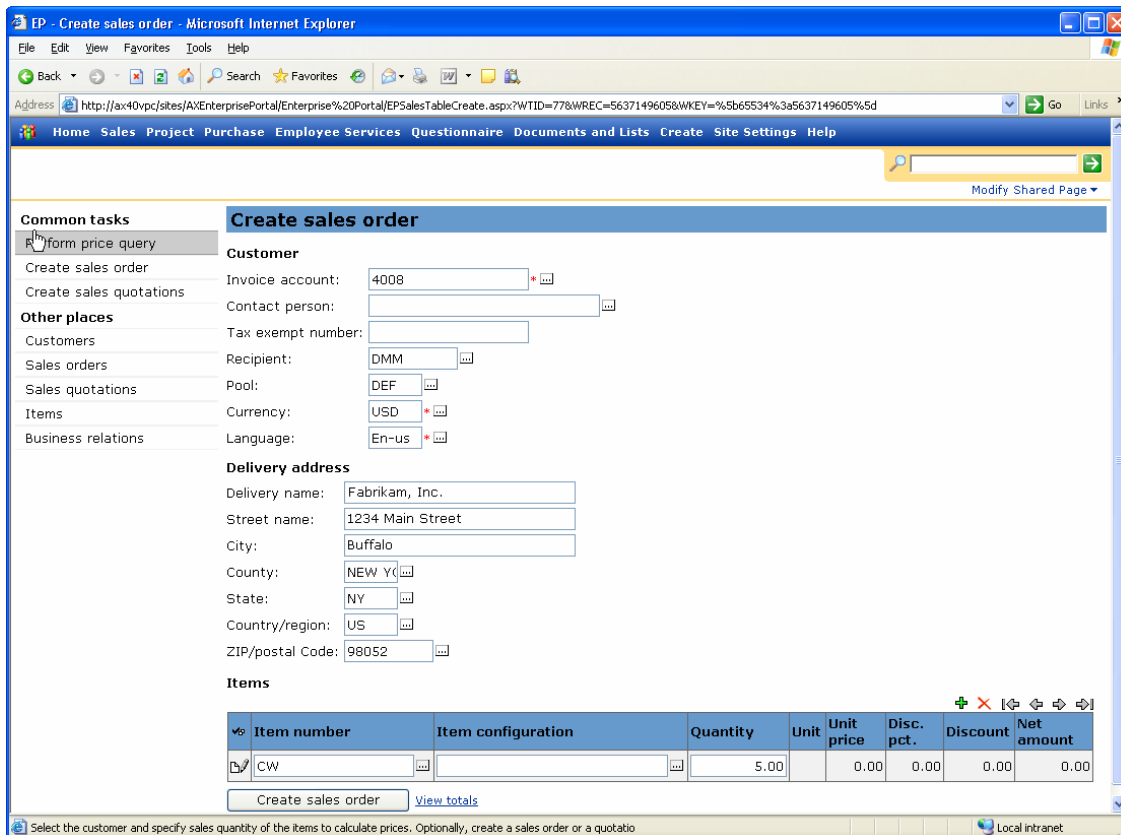
Customers can use a simple Web browser to look up pricing or order status, change their account information, and even place orders.

Connect with suppliers
Companies can respond more quickly to change and increase the flexibility of their entire supply chain when they can:
- Reduce information lead times for supply planning.
- Implement automated inventory replenishment, supplier-managed inventory (SMI), or electronic Kanban capabilities (a system of notifications from one process to the other).
- Gain insight and control over subcontracted work and outsourcing, and even model subcontractor capacity, for faster make-or-buy decisions and better fulfillment synchronization.
- Provide self-service inventory look-up, order status updates, and purchase order generation.
- Coordinate direct deliveries with logistics providers.
- Help ensure accurate vendor records by enabling them to update their own account data.

Connect with subsidiaries and multi-company partners
Bring information from multi-company businesses, divisions, and warehouse locations under one umbrella. Whether deployed centrally or in a decentralized system with interfaces to one or more corporate ERP systems, Microsoft Dynamics AX can help save time and money by empowering sister companies or divisions, subsidiaries, and distribution centers to:
- Automate internal trade processes and transactions such as purchase orders or materials transfers.
- Perform multi-company planning, inventory replenishment, transactions, and scheduling.
- Make inventory availability inquiries across subsidiaries, initiate stock transfers, and automate order management while minimizing inventory levels.
- Manage centralized pricing and promotions.
- Coordinate or transfer order fulfillment responsibilities for optimum customer service, efficient delivery, and profitability.
- Consolidate purchase and logistics contracts to take advantage of volume pricing or gain leverage for negotiations.
- Take control of returns, whether direct-to-manufacturing or to distribution subsidiaries.
- Manage collaborative supply chain execution involving multiple sites while enabling people to work in their own languages and currencies. Support for multiple companies, locations, languages, currencies, and tax and legal requirements for more than 30 countries is built in.

Save time and money by improving efficiency

Microsoft Dynamics AX offers a wealth of tools to streamline and automate processes throughout your supply chain operations, including purchasing, warehouse, and logistics activities. One-time data entry and real-time visibility—both internally and with trading partners in the supply chain—can mean fewer errors and less wasted time. With Microsoft Dynamics AX, businesses can:
- Optimize warehouse operations from automated receiving and directed put-away through timely materials draws and electronic Kanban systems.
- Synchronize the movement of goods and materials to achieve just-in-time shop floor or distribution center provisioning.
- Consolidate pick/pack activities, generate labels effortlessly, and easily prepare shipments or build loads.
- Automatically create manifests and send advance shipping notifications (ASNs) and proof of delivery.
- Track shipments and provide customers with self-service access to the status of their goods.

- Reduce order-to-cash and procurement-to-cash cycles by eliminating manual procedures and data delays between supply chain activities and invoicing.

Proactive event management keeps managers and employees on top of the flow of goods and information and helps avoid costly exceptions and missed deliveries. People internally and throughout the supply chain can receive automated alerts and notifications for a variety of conditions ranging from cost changes and order updates to purchase order approval and task completion. When such information quickly reaches the appropriate people and partners, they can take action to keep deliveries on track and provide the service that builds customer loyalty.

Empower people with a solution that works like they do

Microsoft Dynamics AX works like and with your familiar Microsoft Office system software, including Outlook. That means you can save time and money on training, and people can get working more effectively after a shorter learning curve. People in your organization can extract and share product and operational information by using familiar desktop tools such as Microsoft Office Word, Excel, Microsoft Office Project, Microsoft Office Visio®, and Microsoft Office PowerPoint®. When your business management solution is familiar and easy to use, your people are free to focus on customer satisfaction. And when you and your trade partners can swap information in formats and files that they use themselves, everyone is better able to add value and respond to changes.
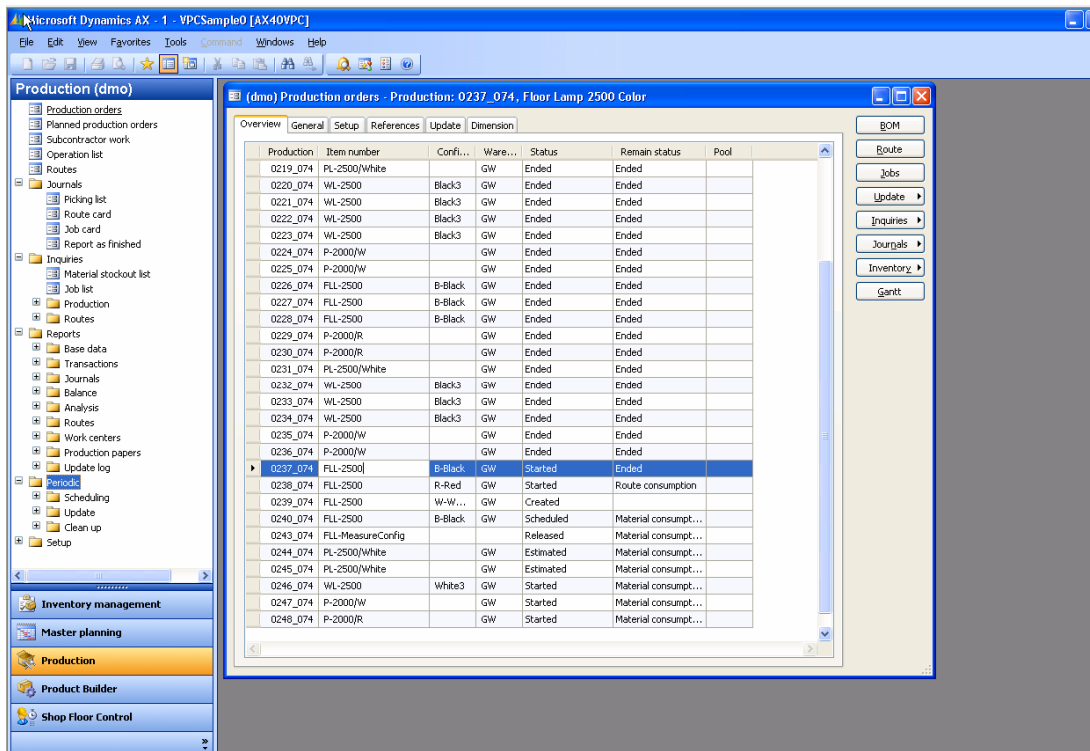
Microsoft Dynamics AX looks and operates like familiar Microsoft products such as Outlook, with views that may be personalized for each role. That means training is minimized, people see only the menus and actions that pertain to them, and they can begin to work efficiently right away.

Achieve a fast return on investment

Close integration with powerful Microsoft technologies such as SQL Server 2000, Microsoft BizTalk Server 2004, and Microsoft Internet Information Services 6.0 maximizes your IT investments. In addition, the Microsoft .NET foundation and Web Services technology of Microsoft Dynamics AX work together to fit smoothly into other enterprise systems by using either a centralized or decentralized model. As a result, companies can communicate with multi-company and trade partners to get critical business information where it's needed, fast.

Microsoft Dynamics AX solutions can be implemented quickly and can often take advantage of existing technologies and products, which helps provide fast return on investment (ROI). An independent study[1] in 2004 found that 75 percent of participating Microsoft Dynamics AX (formerly known as Microsoft Business Solutions–Axapta®) customers achieved a positive ROI within an average of only 23 months. The remainder had used the solution for less than two years and expected to achieve a payback within a few more months. The returns cited in the study ranged from more inventory turns and improved delivery times to productivity gains and changes in working capital.

In addition, Microsoft customers who use the Microsoft Dynamics AX Rapid Configuration Tool typically reduce the cost of implementing Microsoft Dynamics AX by as much as 25 percent, significantly speeding ROI.

This fast ROI contributes to a low total cost of ownership. So does the fact that most manufacturers already have Microsoft technologies and products. You can take advantage of your existing IT investments by extending Microsoft solutions into more profitable management of your supply chain.

Solution map

The following diagram maps supply chain business processes with the capabilities of Microsoft Dynamics AX and complementary solutions for data sharing and analysis.
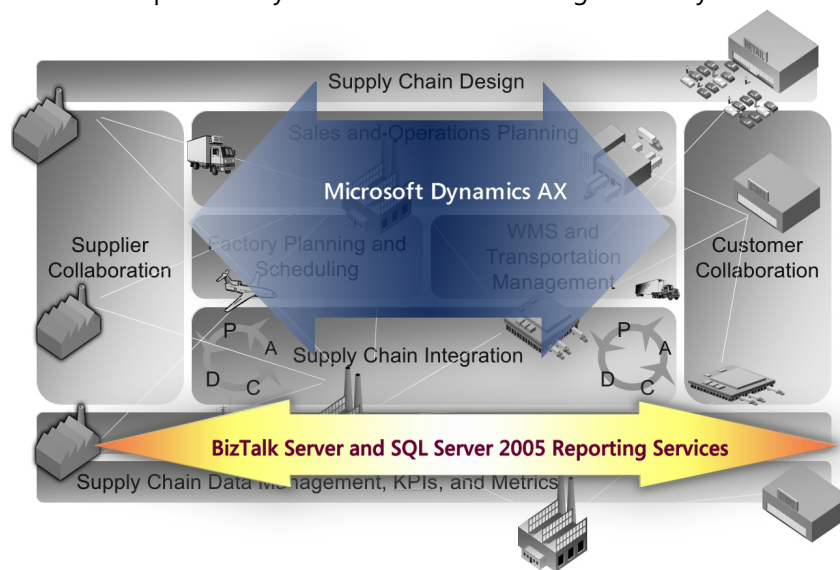
1 Nucleus Research, Inc. *The Real ROI from Axapta.* Research Note E116, October 2004.

In addition to supply chain management functionality ranging from purchasing and order management to distribution planning, the solution's core functionality also includes:

- Financial management and analysis tools, including general ledger, accounting, and reporting components.
- Complete capabilities for make-to-order, make-to-stock, engineer-to-order, and mixed-mode manufacturing.
- Demand planning, flexible scheduling, warehouse management and logistics, and collaboration with all your trading partners.
- Project management tools, including project types and hierarchies, finances, and invoicing.
- Service operations tools, including service order entry and scheduling, service parts and cost tracking, and service contract management.
- Human resources management tools, including components to support business process management, employee recruiting and management, balanced scorecard evaluations, and employee performance management.
- Tools to support design, customization, testing, and debugging of the Microsoft Dynamics AX environment to support a specific business need.

Technology Overview

Microsoft Dynamics AX provides a proven integration framework for automating business processes and applications, both within the organization and across organizational boundaries. The platform can use EDI, XML, or Web Services to easily integrate with other information systems, including ERP demand planning and advanced planning applications, ADCS mobile devices, and warehouse and transportation management systems. Open integration application programming interfaces (APIs) and the solution's application integration framework (AIF) provide real-time connectivity and enable interaction with native Microsoft Windows® applications, non-native applications written in Java, and legacy platforms such as AS/400 and other mainframe systems.

Based on a three-tier, object-oriented architecture, Microsoft Dynamics AX capitalizes on a Microsoft technology stack already well established and proven in ERP systems and customer relationship management (CRM), production management, and general collaboration environments.
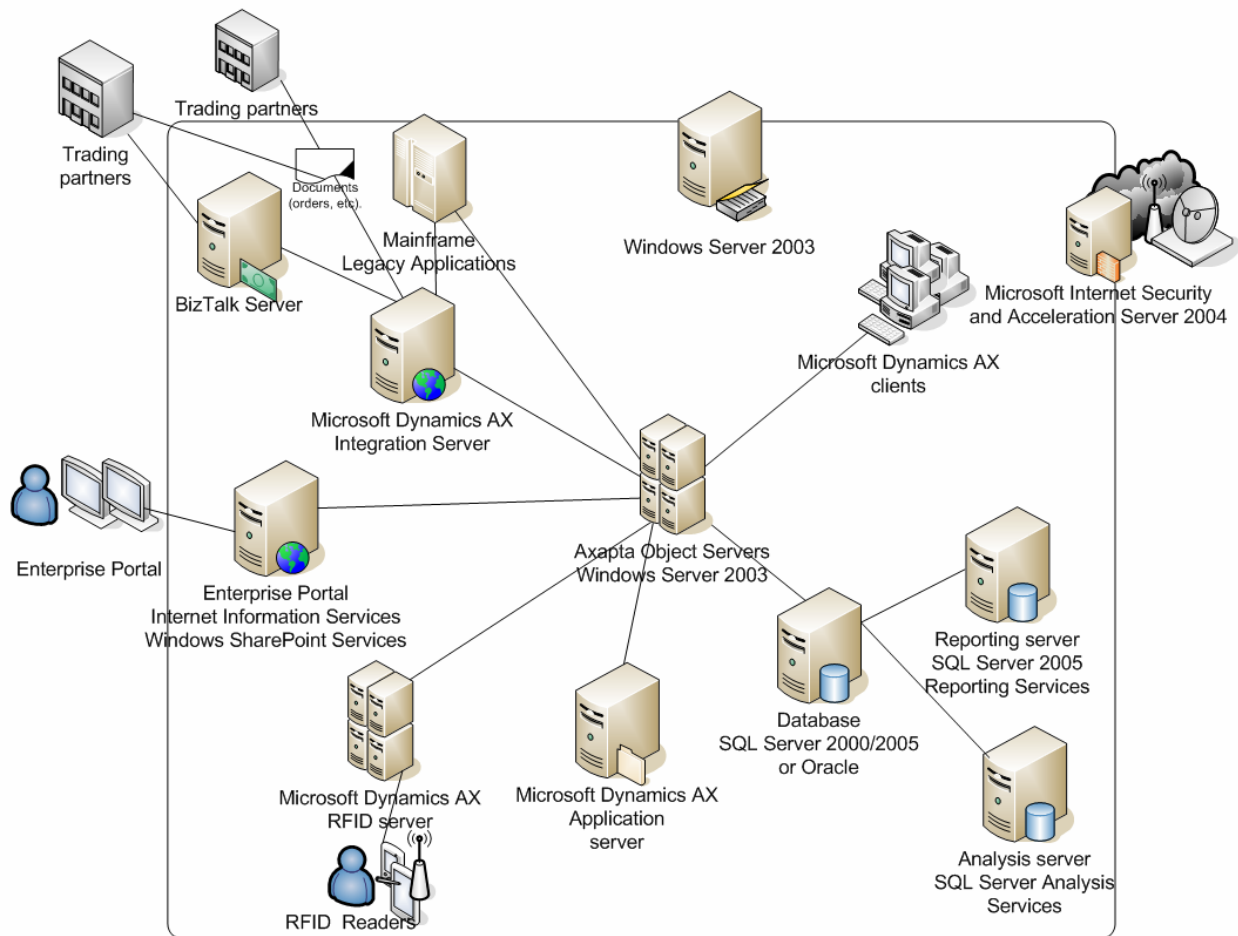
Microsoft Dynamics AX provides a supply chain management solution that can link enterprise systems, trade partners, and the Internet.

The solution is .NET-compatible and can be configured or extended by using either X++® or .NET code and the Microsoft Visual Studio® .NET integrated development environment. Modify the solution for your unique business and future growth by using the same integrated set of powerful customization tools your company may already use to develop Windows client–based functionality. Changes appear within the system quickly with no downtime for employees or interruption to business processes. The solution's layered architecture enables you to customize one layer without affecting functionality on others.

Microsoft Dynamics AX takes full advantage of XML standards to share data with Web Services. This means you can expose key business data to external applications and enable Web Services to invoke processes and respond to object-level calls for information such as order status or inventory availability. With the defined input parameters characteristic of Web Services, information may be retrieved natively via Microsoft .NET code within a Microsoft ASP.NET Web Service. Built-in Web applications enable you to extend your business processes and critical information to the Internet.

When the solution is combined with Microsoft BizTalk Server, your enterprise can also exchange documents directly with any company or trading partner, whatever their system. The high-speed efficiency of EDI and XML connections serve high-volume interactions, while Web Services through a browser

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provide real-time collaboration for exceptions and low-volume activities. For messaging and unstructured collaboration, companies can take advantage of fully integrated e-mail and Microsoft Office capabilities.

Conclusion

Demand-driven supply networks and greater supply chain visibility are high on the list of strategies implemented by multinational companies today to meet the challenges of global business. However, managing and optimizing a well-coordinated, customer-focused supply chain requires an integrated business platform that can deliver end-to-end visibility, real-time data flow across organization borders, and connectivity with every company in the supply chain.

Microsoft technologies and products provide exceptional integration and interaction capabilities. Using solutions built on these technologies, global manufacturers can access up-to-the-minute supply chain information with familiar desktop tools. With the resulting product and process transparency, business managers and their supply chain partners can make fast, proactive decisions to drive efficiency, collaborate effectively, satisfy customers, and innovate together.

To find out more about Microsoft Dynamics AX and how it can help you increase your company's competitive edge, visit **www.microsoft.com/dynamics/ax**.