



For Xbox 360 Production, Microsoft Speeds Deliveries 20 Percent, Cuts Inventories 10 Percent

Overview

Country or Region: United States

Industry: Technology

Customer Profile

Based in Redmond, Washington, Microsoft Corporation is the worldwide leader in software, services, and Internet technologies for personal and business computing.

Business Situation

Microsoft wanted to speed on-time deliveries and cut inventory costs for production of its next-generation Xbox 360™ video game and entertainment system.

Solution

Microsoft created a Business Integration and Intelligence Framework based on Microsoft® Windows Server System™ components including Microsoft BizTalk® Server 2004 and BizTalk Accelerator for RosettaNet.

Benefits

- On-time delivery estimated to rise 20 percent
- Inventory costs estimated to decline 10 percent
- ROI estimated at 126 percent
- Productivity increase estimated at 20 percent
- Development time, costs cut 50 percent

“By making our supply chain process faster and more efficient, we expect to see significant savings on the bottom line—while increasing product quality and on-time delivery.”

Larry Hamlin, Supply Chain Manager, Silicon Operations, HED, Microsoft

For the next-generation Xbox 360™ video game and entertainment system, Microsoft faced more complex manufacturing requirements than it saw with the original Xbox® console. It also faced a need to speed production and reduce inventory costs compared to the performance of its earlier, EDI-based supply-chain solution. To provide full, real-time visibility into the supply chain for the product's graphics chips, Microsoft created an integrated business process automation solution based on Microsoft Windows Server System™ integrated server software components, including BizTalk® Server 2004 and BizTalk Accelerator for RosettaNet. As a result, the company expects to speed on-time deliveries by 20 percent and reduce inventories by 10 percent. Those gains, plus increased productivity of manufacturing and IT staffs, will help deliver a first-year ROI of 126 percent. Developing the solution was 50 percent faster and more cost-effective than using EDI, saving six months and U.S.\$500,000.

“A one-day increase in responsiveness is huge in outsourced manufacturing. It means you have the time to respond to problems... [to] save thousands of dollars in unnecessary air freight and expediting costs.”

Robert Meshew, Group Program Manager,
HED-IT Systems, Microsoft

Situation

When it comes to the Xbox® video game system, Microsoft has given itself an extremely tough act to follow.

The Xbox video game system has become immensely popular with gamers worldwide since its introduction in 2001. Now, as Microsoft prepares the next-generation Xbox 360™ video game and entertainment system for availability in late 2005, it has to outperform itself. It has to deliver game and entertainment experiences that are even better than those it provided in the original Xbox.

To do so, Microsoft has developed entirely new hardware principles for Xbox 360, including:

- Delivery of more than a teraflop of targeted computing performance.
- A multicore processor architecture.
- A custom-designed graphics processor co-developed with ATI Technologies and designed for high-definition era games and entertainment.

The more sophisticated hardware requirements for the next-generation Xbox 360, compared to its predecessor, put new demands on the Microsoft Home and Entertainment Division (HED), which produces it. The pressure to build on existing Xbox momentum by delivering an outstanding product, and to do so in time for the holiday season, magnifies those demands. And making the matter even more challenging is the Microsoft outsourced process for manufacturing and delivering the Xbox 360.

Microsoft engages a variety of suppliers and contract manufacturers to deliver the components and key services crucial to the new product. At the same time that Microsoft is outsourcing key manufacturing operations, it needs to retain tight control over those external processes, to ensure that service

level agreements for on-time delivery and component quality are met.

During manufacture of the original Xbox systems, Microsoft interacted with its contractors through a system based on electronic data interchange (EDI), which sent batch transmissions daily. This solution lacked real-time visibility into the supply chain, resulting in supplier inefficiencies and inventory write-offs. And the tightly coupled nature of EDI required expensive and time-consuming development work to bring each contractor into the solution. Microsoft was determined to correct that situation as it geared up for production of Xbox 360—particularly for the crucial graphics processing unit chips that are at the heart of the product’s enhanced functionality.

“Without real-time visibility into the semiconductor manufacturing process, we’re steering a ship with a blindfold on,” says Robert Meshew, Group Program Manager, HED-IT Systems, Microsoft. “We need to be able to see when delays in the stages of supply and production are occurring and when yields are not meeting expectations, so that we can take immediate corrective action. Microsoft is on the hook for supplying its contract manufacturers with the graphics processing units that go into the Xbox 360. If we don’t get those parts to them on time, we can’t expect ontime delivery of the Xbox 360 from them.”

Moreover, Microsoft needed a solution that would validate the data coming from its suppliers, so that there was no delay in requesting and receiving corrected data when necessary. And there was a third requirement, as well: vendor acceptance of the solution.

“Whatever system we used to get visibility into the supply chain, we needed to get our partners’ buy-in, and we needed to get them

“We needed development to move quickly in order to initiate production on schedule. Thanks to BizTalk Server and RosettaNet, the solution was ready for us on time and on budget.”

Larry Hamlin, Supply Chain Manager, Silicon Operations, HED, Microsoft

onboard as quickly and cost-effectively as possible,” says Larry Hamlin, Supply Chain Manager, Silicon Operations, HED, Microsoft. “And because this is a dynamic situation in which we expect additional partners—perhaps another three to five—to join our supply chain over time, we needed a solution that we wouldn’t have to rewrite to accommodate future partners. We couldn’t meet either of those requirements with EDI.”

Solution

Microsoft considered and rejected standard manufacturing software solutions because the private processes Microsoft would have needed to develop for supply-chain integration would have driven up both initial development costs and ongoing support costs.

Instead, as Microsoft gears up for production of the next-generation Xbox 360, has deployed a Business Integration & Intelligence (BII) Framework based on Microsoft® BizTalk® Server 2004, which is part of Microsoft Windows Server System™ integrated server software, and BizTalk Accelerator for RosettaNet 3.0. The BII solution supports integration and performance monitoring of the participating customer-owned tooling contract manufacturers and sub-contractor suppliers. It is being used initially to support the manufacturing processes that supply the Xbox 360 system’s graphics processing unit (GPU) chips.

BizTalk Server is being used to create standardized data exchange between the enterprise resource planning (ERP) and shop floor systems used by Microsoft contract manufacturers and suppliers, and three systems on the Microsoft side:

- The SAP R/3 ERP system used to manage financial processes (for example, purchase orders, payables, and material ledger) for Xbox production.

- Microsoft Business Solutions–Axapta® solution (now part of Microsoft Dynamics™) used for manufacturing planning, work-in-progress tracking, and yield management.
- Microsoft SQL Server™ 2000-based BII data warehouse used to provide data for reporting and deep visibility into the supply chain particularly around supplier performance.

BizTalk Accelerator for RosettaNet is being used to facilitate the creation of private-to-public data integration processes to enable the standardization of the data exchange interfaces. RosettaNet is an industry standard based on XML, designed especially to allow companies to integrate applications and processes with their supply-chain partners.

The Web-based user interface into the system is a digital dashboard based on Microsoft Office SharePoint® Portal Server 2003, another part of Windows Server System. SharePoint Portal Server 2003 provides the solution’s end-to-end visibility into the supply chain—including order disposition, inventory reconciliation, and a supplier scorecard that tracks several measures of supplier performance. Those measures include actual performance against service level agreements (SLAs) for on-time delivery and the quality of supplier information provided to the solution—since invalid data (for example, an empty field on a purchase order) can impede the real-time view throughout the supply chain.

The solution manages a range of processes needed for Xbox production, including work-in-progress, advanced shipping notifications, purchase order transmissions and receipts, and inventory synchronization message exchanges. These processes are expressed as a series of RosettaNet Partner Interface Processes (PIPs) that provide a standard way for Microsoft and its vendors to exchange this

Figure 1: BizTalk Server and BizTalk Accelerator for RosettaNet (RN) enable a single, loosely coupled system with end-to-end visibility throughout the supply chain.

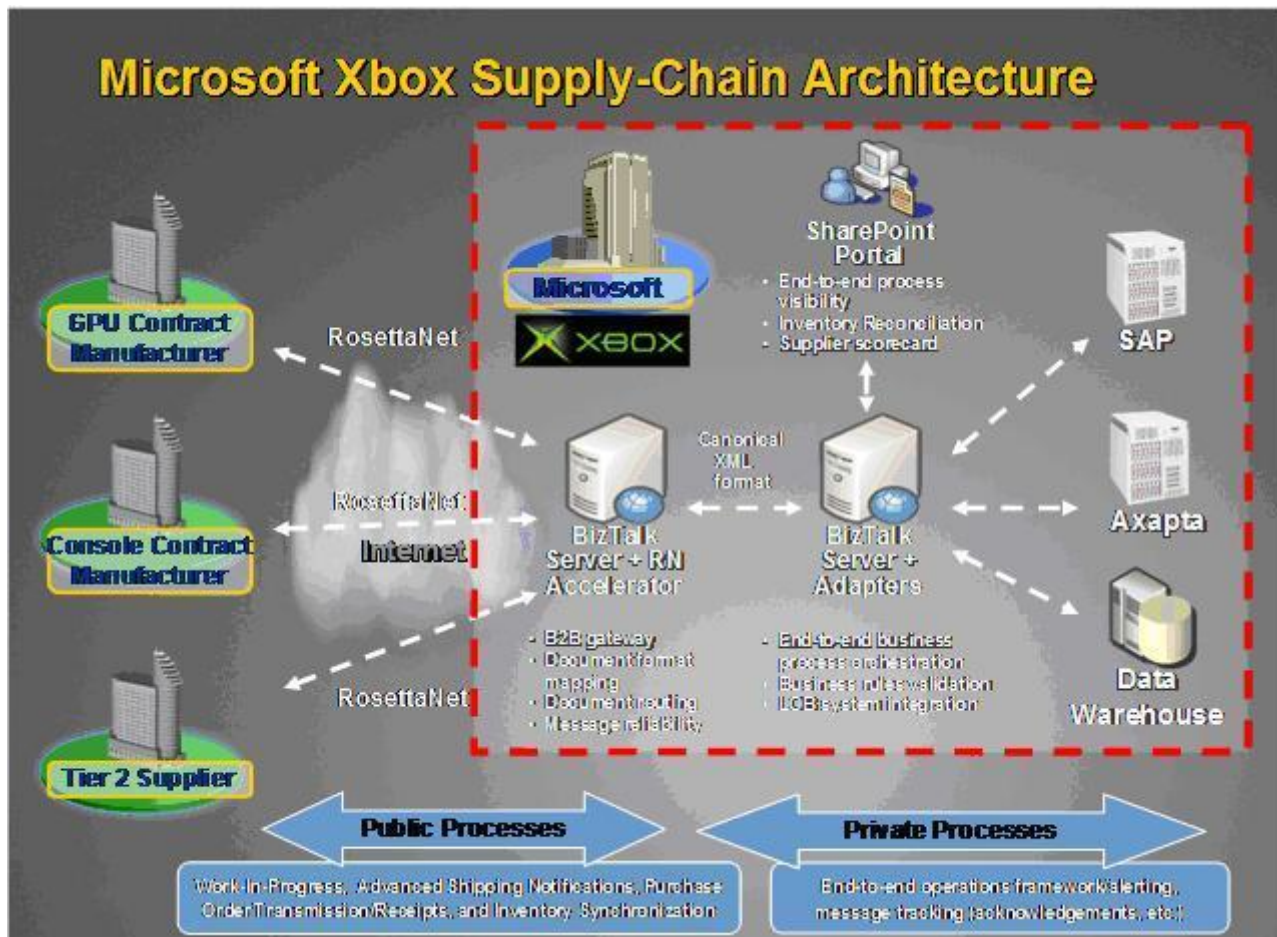
information without needing custom code to encapsulate the information. The PIPs used by the solution are:

- 3A4 (request purchase order) – allows purchase orders to be sent from Microsoft to its vendors
- 3B2 (shipping notification) – allows vendors to inform Microsoft when they have shipped against purchase orders
- 4B2 (ship receipt) – allows Microsoft to know when inventory has been received at the assembly and test facility, in order to update Microsoft SAP and Microsoft Axapta
- 7B1 (work in progress) – allows Microsoft visibility into the manufacturing stages of the GPU chips so it can update its

schedules and financial systems

Beyond moving data between various points in the system, the solution includes messaging and orchestrations—including file-handling and notification protocols—for evaluation and acknowledgement of received documents and information. In addition to supporting integration between Microsoft and its suppliers, the solution also supports application integration between SAP R/3 and Microsoft Axapta on the Microsoft side.

An overview of the solution is seen in Figure 1. A sample data flow through the solution is as follows:



- When the console manufacturer (far left, center) requires additional GPU chips, it initiates a purchase order request, which is sent from its ERP system as a RosettaNet PIP over the Internet to Microsoft.
- It is received by the BizTalk Accelerator for RosettaNet, the first of two computers running BizTalk Server in the solution, which serves as the B2B gateway.
- BizTalk Server forwards the purchase order (PO) to the second computer running BizTalk Server, which serves as the hub of the solution, connecting to SharePoint Portal Server, the data warehouse, and SAP R/3 and Microsoft Axapta systems.
- The second computer running BizTalk Server validates the PO request according to its business rules, then uses orchestration to route the request to Microsoft Axapta, where it is used to generate manufacturing process updates.
- Microsoft Axapta sends its own PO request information through the BizTalk Server hub to the SAP system, which formulates a Microsoft PO for the chips.
- The Microsoft PO is then forwarded through the BizTalk Server hub to BizTalk Accelerator for RosettaNet, where it is converted to the appropriate PIP.
- The PIP is sent over the Internet to the GPU manufacturer, who prepares to fulfill the order, and who initiates a similar process loop through the solution by acknowledging the PO.

Benefits

The BII Framework is expected to speed the supply-chain process while reducing its cost, for a significant first-year return on investment (ROI) for Microsoft. In addition, the solution was relatively fast and cost-effective to develop, and its loosely coupled structure ensures that suppliers can be added later, as needed, without extensive coding or regression testing.

On-time Deliveries to Rise by 20 Percent

By providing real-time visibility into the supply chain, the BII Framework will shave a day off the time it took for Microsoft manufacturing executives to identify problems through the previous, EDI-and-batch-based process.

“A one-day increase in responsiveness is huge in outsourced manufacturing,” says Meshew. “It means you have the time to respond to problems, for example by rerouting production or changing parameters to potentially save thousands of dollars in unnecessary air freight and expediting costs.”

As a result of increasing agility throughout the manufacturing process, BII is expected to increase on-time deliveries by about 20 percent for the next-generation Xbox 360 production, according to Meshew. The real-time visibility into the supply chain, combined with tighter integration with supplier work-in-progress processes and Microsoft planning systems, should contribute to an expected 10 percent reduction in inventory costs.

126 Percent ROI Anticipated in First Year

Microsoft expects to see a 126 percent ROI on the BII solution in its first year. The majority of that return comes from an anticipated \$500,000 reduction in inventory carrying costs. Microsoft also anticipates a 20 percent increase in productivity among the Microsoft manufacturing staff for GPU production and distribution, saving \$165,000. And because the solution will alert IT staff to technical issues that now can be addressed more quickly and cost-effectively, Microsoft expects to save another \$82,500 in increased IT productivity.

“By making our supply chain process faster and more efficient, we expect to see significant savings on the bottom line—while

increasing product quality and on-time delivery,” says Hamlin.

Development Time, Cost Cut by 50 Percent

By using BizTalk Server and BizTalk Accelerator for RosettaNet, Microsoft estimates it saved 50 percent off the time and cost of developing a supply-chain solution, compared to using traditional EDI. That cut six months and \$500,000 off the development budget.

In EDI, the developers would have had to code a separate interface for each process feed from each vendor—34 interface points in all. In contrast, by using standard RosettaNet PIPs that could be understood by each vendor, Microsoft only needed to create 12 loosely coupled interface points due to the publish/subscribe paradigm made possible by BizTalk Accelerator for RosettaNet and BizTalk Server 2004. And those same PIPs will enable other suppliers to be added to the system quickly whenever they’re needed, reducing future development costs.

The use of BizTalk Server as an internal integration tool on the Microsoft side also eliminated the need for separate SAP and Microsoft Axapta point-to-point interfaces, which further reduced development time and complexity.

“We didn’t have a lot of time to get the solution up and running,” says Hamlin. “We needed development to move quickly in order to initiate production on schedule. Thanks to BizTalk Server and RosettaNet, the solution was ready for us on time and on budget.”

For More Information

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Microsoft Windows Server System

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