



Small Manufacturer Improves Supply Chain Visibility, Cuts Cycle Time and Costs

Overview

Country or Region: United States

Industry: Manufacturing, High Technology

Customer Profile

Killdeer Mountain Manufacturing is a contract manufacturer based in Killdeer, N.D. with 300 employees producing electronic circuit board assemblies, cables and support equipment. Its focus is on-time delivery and quality.

Business Situation

To remain competitive, KMM needed to modernize and automate its supply chain communications to increase efficiency, provide information in real time and reduce human error.

Solution

An RFID-enabled supply chain network based on Microsoft Dynamics™ GP and BizTalk® Server provides real-time information, improves visibility and cuts costs across the enterprise.

Benefits

- Cycle time cut in half
- Increased efficiency and productivity
- Enhanced customer service
- Improved inventory visibility
- Eliminated need for a third party value-added network

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Dan Hedger, VP, Killdeer Mountain Manufacturing

As a small contract manufacturer with big customers ranging from large aerospace contractors to the U.S. Department of Defense (DoD), Killdeer Mountain Manufacturing's (KMM's) efficiency, productivity and responsiveness are key to its success. By moving from a largely manual manufacturing and supply chain process to an automated RFID (Radio-frequency identification)-enabled infrastructure, KMM was able to improve inventory visibility, cut costs, reduce lead times, enhance customer service, and increase efficiency and productivity. KMM achieved this by combining RFID technology with software from Microsoft for its financial, manufacturing and RFID infrastructure. The new system provides KMM with capabilities once limited to sophisticated supply chain systems used by much larger manufacturers. In fact, The Boeing Company will use the system as a model for supply-chain automation, which it will offer to its other small and midsize manufacturing suppliers.



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Situation

Killdeer Mountain Manufacturing Inc. (KMM), a family-owned high tech contract manufacturer, stakes its reputation on providing reliable electronic assemblies on time and within budget. The 300-employee company has done well over the years by forging relationships with leading Original Equipment Manufacturers (OEMs) and government agencies, including The Boeing Company and the DoD. However, KMM's customers recently demanded more automated tracking of work in progress and other capabilities of flow manufacturing. To comply, KMM management needed to modernize its processes to mimic the sophisticated automated processes used by its OEM customers

KMM's existing manufacturing systems had several limitations. Its manufacturing process, for example, didn't track inventory levels in real time. This made sales- and purchase-order processing difficult. Also missing was warehouse system validation for item numbers, lot numbers, serial numbers and quantities. As a result of this missing functionality, KMM experienced too many receiving, picking and shipping errors as well as no real-time visibility into production.

Even more troubling than the internal inefficiencies were the new demands by KMM's leading customers. They required just-in-time (JIT) information, but KMM had a two-day lag time. Customers also wanted more detailed and consistent documentation – something Killdeer had trouble delivering with its outdated systems.

To address these shortcomings, KMM Vice President Dan Hedger says the company's primary goal was to expand control and visibility to meet supply chain mandates from their customers. This would enable KMM to deliver the JIT information its customers needed, but would also lay the groundwork

for future improvements in process efficiency. Improving internal control and visibility and creating the ability to communicate status across their value chain would mean creating checkpoints throughout the lifecycle of an order, including at:

- Order creation;
- Work process initiation; and,
- Final assembly.

Ideally, Killdeer and its partners wanted visibility into every step in the manufacturing process. In this way, when one member of the supply chain changed the schedule, an instant update would be sent to all suppliers so each could see how that change would affect processes and schedules.

The first steps toward greater automation and efficiency were to implement lean manufacturing and Six Sigma. Lean manufacturing is a system of management in which sources of waste, such as over-production or waiting time, are eliminated from the manufacturing process. Six Sigma is a system of practices which improve processes by eliminating defects.

To make the plan work, Hedger knew KMM needed to apply new technology as well. Hedger looked to one of his main partners, Boeing, for direction. He learned that Boeing had improved its supply chain communications using a combination of sophisticated software and RFID technology. Boeing's system, however, was geared toward large OEMs and wasn't appropriate for small to midsize contract manufacturers such as KMM.

“We knew that combining RFID technology with lean and Six Sigma was a relatively new idea,” says Hedger. “But we also knew that if we could do it, we could exploit those sensors throughout our value chain to increase visibility and improve processes.”

In concert with Boeing, KMM was looking to satisfy one of their largest mutual customers: the U.S. Air Force. The Air Force was relying on Boeing and KMM to improve production predictability for the parts and subassemblies for a military aircraft program. A better supply chain network would satisfy the Air Force's demand for shorter lead times and lower cost.

Solution

The combination of RFID with the principles of Six Sigma and lean manufacturing soon became the foundation of the RFID SCOUT (Supply Chain Optimization Universal Toolkit) program. This program is a collaboration among KMM, the Air Force Manufacturing Technology Division, and Boeing, with RFID hardware vendors Alien Technology Corp. and Paxar Corp, as well as system integrator Maximum Data Solutions. RFID SCOUT combines RFID hardware, software from Microsoft and other vendors, integration services, and design recommendations to produce a re-usable blueprint for an RFID-enabled supply chain solution tailored for small to midsized manufacturers.

The RFID SCOUT program is divided into three phases. Phase 1, now complete at KMM, encompasses the lean manufacturing, Six Sigma, RFID readiness assessment, and RFID hardware infrastructure design and deployment. It also includes some basic RFID software integration and electronic tracking among supply chain partners. With Phase 1 in place, KMM can generate an RFID tag, affix it to a single package, and ship the tagged package from its facility to Boeing.

For Phase 2, Killdeer brought in Maximum Data Solutions for integration and consulting services. Currently in process at KMM, Phase 2 is the crux of the project – the capturing and processing of the RFID data. DFC Consultants had previously helped KMM

implement Microsoft Dynamics™ GP for financials, manufacturing and order management, so Maximum Data chose to make it the foundation of the supply chain system.

Microsoft Dynamics™ GP easily incorporates RFID data into a company's internal processes for streamlined automation. "Microsoft Dynamics GP is the backend system for everything we do, and it's a great choice to pair with our front-end collection of sensors," Hedger says.

KMM installed the following hardware components for the data capture process:

- Portal readers from Alien Technology;
- Mobile computers with scanners from Symbol;
- Universal access points from Cisco; and,
- RFID/barcode printers from Paxar.

As part of its solution, KMM is using Microsoft Dynamics GP for financial management and Microsoft® Business Portal for Dynamics GP to create an integrated Web-based system that delivers applications and information availability across their entire supply chain. For example, KMM is using it to make information available to external vendors, such as Boeing via the Internet. Once inside the secure portal, Boeing views pertinent information such as order status and production volumes from Microsoft Dynamics GP. In addition, the portal provides visibility into other applications via Microsoft's BizTalk Server.

One key part of RFID SCOUT is Maximum Data's InTouch series manufacturing and distribution software. This helps ensure that Microsoft Dynamics GP is receiving accurate data. Using mobile computers for real-time updates and barcodes and RFID for data collection, InTouch helps KMM perpetually manage its inventory accurately. It also reduces cycle time, adds Mark Crittenden,

“By combining Microsoft Dynamics GP with BizTalk Server and Microsoft Business Portal you can share or extend knowledge or data that’s already downstream of your current operation.”

Mark Crittenden, managing director,
Maximum Data Solutions Inc.

Maximum Data’s managing director of product quality.

The glue binding all of these systems together is Microsoft BizTalk® Server 2006 R2. KMM and RFID SCOUT rely on BizTalk’s RFID Infrastructure to gather, filter and clean RFID data from edge devices, such as handheld readers. In addition, KMM uses BizTalk Server for Business Activity Monitoring (BAM) alerts. BizTalk enables the overall system to provide more accurate and timely predictive analytics, triggers and business alerts, all of which are generated from BizTalk Server.

The alerts are especially important in a just-in-time environment. BizTalk’s RFID Infrastructure, together with BAM alerts, notifies KMM if the company reaches an out-of-limit or out-of-sync condition on the shop floor, allowing appropriate actions to be taken immediately.

“BizTalk is remarkable in that it has so many sub-applications within it and capabilities for generating and modeling so many different types of manufacturing scenarios,” says Hedger. “What we produce, and what our manufacturing floor looks like, can be different from one week to the next, so our layout and flexibility needs require an RFID solution that’s very flexible and allows us to deal with any type of configuration that might come our way. BizTalk Server, in conjunction with Microsoft Dynamics™ and the InTouch modules, allows us to do just that.”

BizTalk Server will also be used to generate an RFID shipping compliance alert to Boeing, through an EDI 856 ASN notification. Using BizTalk’s native RFID Infrastructure, management tools, and application services for device/tag interaction, Microsoft Dynamics™ GP users effectively have a large-enterprise RFID solution in a box. “By combining Microsoft Dynamics GP with

BizTalk® Server and the Microsoft Dynamics™ GP Business Portal, you can share or extend knowledge or data that’s already in your ERP system to users either upstream or downstream of your current operation,” Crittenden explains.

Once Phase 2 is complete at the end of 2007, KMM will launch Phase 3. This phase will include extending RFID tracking to point-of-use at Boeing, adding e-commerce portal capabilities, and creating a shared operations stream through an integrated IT infrastructure. KMM says that by the end of Phase 3, the system will provide cradle-to-grave inventory tracking.

Benefits

Developing an RFID-enabled supply chain powered by Microsoft® software provides many benefits to both manufacturers and their customers. Among them are greater inventory visibility, reduced costs, reduced cycle and lead times, better customer service, and more efficient processes.

Inventory visibility and cost reduction

Price is a major competitive weapon used by all manufacturers, and one of the biggest drains on finances is holding extra inventory for long periods of time. But with a system like RFID SCOUT, “we can watch Boeing’s back and they can watch ours, because we’ll have visibility into Boeing’s consumption of our product. We can then match our production line and inventory associated with it,” says Hedger. RFID SCOUT is helping KMM implement electronic kanbans and move to a pull-based demand planning model.

If there is a problem along the way, such as an obsolete part in inventory, other supply chain partners are immediately alerted to help get the process get back on track quickly. Inventory visibility also provides immediate notification about quantities from

the point of creation to receipt. The tracking is so complete in RFID SCOUT that customers can know with certainty of any breach anywhere in the chain.

Reduced cycle time and time to delivery

Reducing lead times is a major goal of the RFID SCOUT program. Although the system is still under development, “we’ve seen some of our cycle times in the early stages cut in half,” says Hedger. “It used to take us 40 days to do something, and now we can do it in 20.” That’s critical in real-world manufacturing situations, he notes, because customer demands must be met to remain competitive. And because the system now automatically creates the RFID shipment and updates at Boeing, shipping efficiency will likely also increase during the manufacturing process at Boeing.

Eliminates the need for a third-party VAN

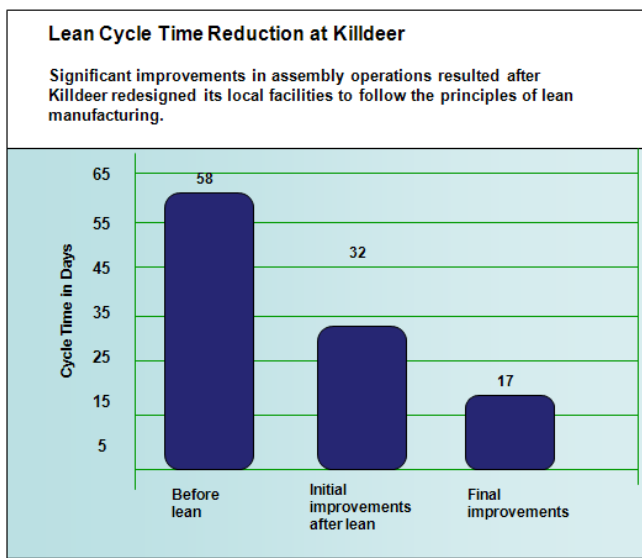
Thanks to Microsoft BizTalk® Server’s RFID Infrastructure, there is no need to integrate a third-party Value-Added Network (VAN) into RFID SCOUT. “With 856 Advance Ship Notice (ASN) generation, we’re validating the B2B RFID shipment communications between Killdeer and Boeing,” explains Maximum Data’s Crittenden. “With validation, either party can expand EDI usage to any other customer it wants. This eliminates the need for a third-party VAN.”

Eliminating this and other costs is good news for both KMM and potentially other smaller manufacturers. By creating a new supply chain model for its customers and suppliers, KMM hopes to be a pioneer in improving supply chains across manufacturing. That means commercializing RFID SCOUT by creating a toolkit that can be used by other small- and medium-sized DoD suppliers. And with a market of about 5,000 companies in this category, everyone on the RFID SCOUT team stands to benefit.

“The work we have done in concert with Boeing and our other partners creates a blueprint that can be used by other small and medium-sized manufacturers if they are looking for full integration to their DoD customers,” says Hedger. “But it’s more than just wanting to profit – we really want to help other DoD suppliers facing similar challenges working with larger organizations. This will help them become RFID-compliant, expand supply chain visibility and functionality upstream and downstream, and build on a proven model.”

Although the project isn’t completed, KMM already is already realizing benefits. Coordination with its supply chain already has improved significantly, and it’s only going to get better.

“By the time we’re finished, we’ll have an integrated IT architecture that aligns internal supplier operations with internal customer operations, providing deeper levels of detail about component production on our end, as well as the reverse – visibility into Boeing’s consumption of KMM components,” Hedger says. “Efficiency, responsiveness and reliability have always been our goals, and with this combination of technology, we’re well on the way to exceeding those goals.”



Source: Killdeer Mountain Manufacturing

For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to: www.microsoft.com

For more information about Killdeer Mountain Manufacturing products and services .visit the Web site at: www.kmmnet.com

For more information about Maximum Data Solutions products and services, call (734)-455-2200 or visit the Web site at: www.maximumdata.com

For more information about DFC Consultants products and services, call (701) 281-6112 or visit the Web site at: www.dficonsultants.com

Microsoft BizTalk Server

BizTalk is a business process management (BPM) server that enables companies to automate and optimize business processes. This includes powerful, familiar tools to design, develop, deploy, and manage those processes.

Everything you need for easy installation is included—integrated management tools, support for Web services, and a new business activity monitoring (BAM) portal. In addition, BizTalk Server 2006 includes 23 application and technology adapters in the box for connecting to legacy systems (mainframe and mid-range) and line-of-business applications (SAP, Siebel, PeopleSoft, Oracle, and JD Edwards).

For more information about BizTalk Server, go to: www.microsoft.com/biztalk

For more information about Service Oriented Architecture (SOA), go to: www.microsoft.com/soa

Microsoft Dynamics

Microsoft Dynamics™ is a line of integrated, adaptable business management solutions that enables you and your people to make business decisions with greater confidence. Microsoft Dynamics works like familiar Microsoft software such as Microsoft Office, which means less of a learning curve for your people, so they can get up and running quickly and focus on what's most important. And because it is from Microsoft, it easily works with the systems that your company already has implemented.

By automating and streamlining financial, customer relationship, and supply chain processes, Microsoft Dynamics brings together people, processes, and technologies, increasing the productivity and effectiveness of your business, and helping you drive business success.

For more information about Microsoft Dynamics, go to: www.microsoft.com/dynamics

Software and Services

- Microsoft Windows Server System
 - Microsoft Windows Server™
 - Microsoft BizTalk® Server
 - Microsoft BizTalk RFID Infrastructure
- Microsoft Dynamics GP
 - Microsoft Business Portal for Dynamics GP
- Maximum Data Solutions' InTouch Series Manufacturing and Distribution

Hardware

- HP Proliant 380 servers
- R16 Symbol MC9090 mobile computers with standard scanners
- 2-4 Symbol MC9060-G RFID mobile computers
- 4 Cisco 1200 Universal Access Points
- 8 Monarch Paxar 9855 RFID/Barcode printers
- Antennae and fixed portal readers from Alien Technology

Partners

- Air Force Manufacturing Technology Division
- Boeing Phantom Works Manufacturing Concepts Division
- Maximum Data Solutions
- Alien Technology Corp.
- Paxar Corp.

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