



Overview

Country or Region: United States
Industry: Transportation and logistics

Customer Profile

A division of TNT N.V., TNT Logistics employs 40,000 people working in 40 countries and manages more than 91 million sq. ft. of warehouse space. TNT Logistics reported 2004 sales of U.S.\$5.38 billion.

Business Situation

The loss of reusable containers represented a significant cost for manufacturers, distributors, and dealers in terms of replacement, inventory, staff time, and business relationships.

Solution

Using the Microsoft® .NET Compact Framework, TNT Logistics developed a solution that enables manufacturers and distributors to collect and maintain status and tracking information on reusable containers.

Benefits

- Customer cost savings
- Sounder business relationships
- Stronger competitive position

Supply-Chain Logistics Provider Expands Business with Container-Tracking Solution

“We set out to design and build a comprehensive system, including wireless support for users and a centralized database.”

Pat Heilmann, Systems Architect, TNT Logistics

In a growing number of industries, reusable containers made of plastic are replacing their cardboard counterparts for shipping certain products. However, manufacturers and distributors using such containers have found them hard to keep track of. To address this problem, TNT Logistics, a global supply-chain logistics provider, used the Microsoft® .NET Compact Framework, Microsoft Windows Server™ 2003, Microsoft SQL Server™ 2000, and Microsoft Windows Mobile™ 2003 to develop and deploy a tracking solution for one of its customers. TNT Logistics also integrated the solution into its Matrix* supply-chain execution system so the company can offer similar benefits to its entire customer base.



“We had already used the Microsoft .NET Compact Framework and Web services...and the overall Microsoft development environment just seemed the best fit.”

Chris Bigden, Software Engineer, TNT Logistics

Situation

TNT Logistics, a subsidiary of Netherlands-based TNT N.V., designs, implements, and operates complex supply-chain solutions on a national, regional, or global scale for medium to large enterprises. TNT Logistics exploits technology to achieve optimization, integration, and visibility across the supply chain, most notably through the company's Matrix* supply-chain execution system.

Matrix integrates transportation and inventory-management functionalities into a single system to provide TNT Logistics' trading partners an “extended enterprise” view of materials within the manufacturing supply chain. Matrix supports inbound just-in-time logistics, outbound logistics, and reverse logistics across multiple industry verticals. To enable global collaboration, Matrix integrates transportation, inventory management, order fulfillment, financial settlement, and e-commerce applications. The software also shares operating data among processes such as strategic planning, optimization, back-office functions, and warehousing activities.

Until recently, one of the warehousing activities that Matrix did not address was the tracking and inventory of reusable shipping containers, plastic bins of various sizes that hold finished goods as they travel from distribution centers to dealers. Reusable containers are commonly used for shipping such goods as smaller consumer products, selected automotive parts, electronic equipment, and published matter. Many manufacturers now using the containers consider them a rugged and cost-effective alternative to cardboard containers.

Conversely, reusable containers can be difficult to keep track of in the supply chain. The containers sometimes end up in storage areas and may not be returned to the distribution center in a timely manner. Containers may also end up at the wrong

distribution centers, resulting in overstock at some centers and understock at others. The result is an industry-wide loss rate that is unacceptable, according to Rick Buda, Systems Architect at TNT Logistics.

As Buda explains, whether a container is lost permanently or only temporarily, the cost to manufacturers, distributors, and dealers is ongoing. Replacing permanently lost containers represents a significant burden to manufacturers and distributors whose stock of containers may be in the thousands. A related cost may occur if a distributor is forced to delay a shipment while waiting for delivery of replacement containers. On the receiving end, the dealer that is waiting for a delayed shipment may lose business because the products its customers want are not on store shelves.

Replacing temporarily lost containers represents another expense for manufacturers and distributors who find themselves with excess inventory when the original and replacement containers vie for space in the warehouse. For all these reasons, Buda stresses the need for real-time visibility into the whereabouts of reusable containers. “All the players in this segment of the supply chain—manufacturers, distributors, and dealers—could benefit from a system that tracks the containers independently of the goods they are holding,” he says.

Solution

Starting in 2003, Buda and his TNT Logistics colleagues began planning a solution for tracking reusable containers for a major customer. The customer had used the containers for about two years and had about 9,000 of them in circulation among five distribution centers. “There was a rudimentary, paper-based tracking solution in place at one distribution center, but it wasn't very effective,” explains Pat Heilmann,

“The manufacturer knows how many containers are located at each of its distribution centers and can plan shipments to dealers with confidence.”

Rick Buda, Systems Architect, TNT Logistics

Systems Architect at TNT Logistics. “So we set out to design and build a comprehensive system, including wireless support for users and a centralized database.”

“Just Seemed the Best Fit”

Buda, Heilmann, and their colleague Chris Bigden, Software Engineer at TNT Logistics, knew right away they would use Microsoft® technologies for developing and deploying the solution. “We had already used the Microsoft .NET Compact Framework and Web services to build a solution incorporating handheld functionality, and the overall Microsoft development environment just seemed the best fit,” Bigden says.

Using the Microsoft Visual Studio® .NET development system with the Microsoft .NET Compact Framework 1.1, the three-person team spent about four weeks writing code. In late 2003, they deployed a pilot version of the solution to three of the customer’s original five distribution centers. Today, the full solution is in place at most of the customer’s distribution centers, which have now grown to more than a dozen and serve nearly 700 dealers.

From Wireless Handheld Devices to a Central Database

The TNT Logistics container-tracking solution for this customer consists primarily of a pair of integrated applications: one operating on handheld devices and one operating on the desktop.

The handheld application, developed with Microsoft Windows® Forms, is used by the customer’s warehouse employees as they load or unload trucks traveling between a distribution center and a dealer. Using a Pocket PC with an integrated scanner and 802.11b wireless network card and running Microsoft Windows Mobile™ 2003 software, the employees record identifying information for each container, including its direction of

travel. The device then sends the information through a Web service call, developed with the Microsoft Visual C#® development tool and running under Internet Information Services 6.0, to the TNT Logistics wide area network. Ultimately, the information is delivered to the central database, which is based on Microsoft SQL Server™ 2000 and runs on servers based on the Microsoft Windows Server™ 2003 operating system at TNT Logistics’ headquarters in Jacksonville, Florida. SQL Server and Windows Server are both part of Microsoft Windows Server System™ integrated server software.

The desktop application, developed with Visual Studio .NET, is used by administrative employees at the distribution centers to create reports against the database, providing proof of delivery to the dealer or proof of return to the distribution center. Through this application, administrative staff members enjoy real-time visibility into the customer’s entire container inventory, including details on all transactions involving the containers and the location of each of those containers at any given time.

Benefits

Buda reports that he and his colleagues at TNT Logistics have received positive feedback from the customer running the container-tracking solution, due largely to the solution’s reliability, functionality, and cost savings. Moreover, based on the favorable response from this customer, TNT Logistics has integrated the solution into its parent company’s Matrix supply-chain solution.

Reducing Costs and Eliminating Shipping Delays

According to Buda, the customer has almost complete visibility of all containers in its network, which so far has helped to cut its loss rate. “This represents a measurable replacement-cost savings,” he says. What’s more, administrative staff are no longer

“Now we can offer the benefits of the container-tracking solution to other existing customers and new customers as well.”

Rick Buda, Systems Architect, TNT Logistics

spending dozens or hundreds of hours yearly trying to find lost containers. “As a result, they can spend their time helping to keep track of products being shipped, which more directly helps their company’s bottom line.”

Another benefit of the container-tracking solution is the virtual elimination of shipping delays resulting from unanticipated shortages of containers at the distribution center. “The manufacturer knows how many containers are located at each of its distribution centers and can plan shipments to dealers with confidence,” Buda says. “This makes the distributors look good to the dealers and helps to keep those business relationships sound.”

Building Stronger Business Relationships at TNT Logistics

Buda acknowledges that TNT Logistics is enjoying a similar benefit. “By providing such a powerful solution to this customer, we have strengthened our relationship with them,” he says. “Consequently, they have contracted with us to provide logistics services above and beyond what we were providing them before.”

Buda goes on to explain that it is the success of the deployment to this customer that led him and his team to integrate the solution into the Matrix product family. “Now we can offer the benefits of the container-tracking solution to other existing customers and new customers as well,” he says. “Being able to solve this problem, which has only grown as more manufacturers rely on reusable containers, puts us in an excellent competitive position.”

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 TNT Logistics products and services, visit the Web site at: <http://group.tnt.com>

Microsoft .NET

Microsoft .NET is software that connects people, information, systems, and devices through the use of Web services. Web services are a combination of protocols that enable computers to work together by exchanging messages. Web services are based on the standard protocols of XML, SOAP, and WSDL, which allow them to interoperate across platforms and programming languages.

.NET is integrated across Microsoft products and services, providing the ability to quickly build, deploy, manage, and use connected, secure solutions with Web services. These solutions provide agile business integration and the promise of information anytime, anywhere, on any device.

For more information about Microsoft .NET and Web services, please visit these Web sites:

www.microsoft.com/net
msdn.microsoft.com/webservices

Software and Services

- Microsoft Windows Server System
 - Microsoft Windows Server 2003 Standard Edition
 - Microsoft SQL Server 2000
- Microsoft Visual C# .NET
- Microsoft Visual Studio .NET 2003
- Microsoft Windows Mobile 2003

Technologies

- Microsoft .NET Compact Framework
- Microsoft .NET Framework
- Microsoft Internet Information Services

Hardware

- Symbol Pocket PC PDT 8046

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