



Leading Truckload Carrier Makes In-Cab Solution More Powerful, Functional, Usable

Overview

Country or Region: United States

Industry: Transportation

Customer Profile

U.S. Xpress is a truckload carrier serving customers throughout North America. It is headquartered in Chattanooga, Tennessee, and employs 8,000 people.

Business Situation

U.S. Xpress wanted to enhance its popular in-cab solution, known as XPE Truck, with improved data-collection and communications capabilities and a more intuitive and functional user interface.

Solution

U.S. Xpress enhanced its solution using Microsoft® rich-client technologies, and began deploying it to its fleet of 4,600 trucks. The company also is deploying modules for specific business needs.

Benefits

- Boosts employee productivity
- Enhances customer service
- Helps retain skilled drivers
- Reduces IT maintenance costs by 35 percent
- Simplifies application targeting

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Ken Crane, Systems Manager, Mobile Technology, U.S. Xpress

U.S. Xpress is a Tennessee-based truckload carrier with a reputation for delivering excellent customer service and using innovative technology to do so. In the mid-2000s, the company deployed an in-cab solution that automates engine diagnostics and provides communication, navigation, and training-video presentation capabilities. The solution was so successful that U.S. Xpress decided to expand its effectiveness by redesigning the user interface using Windows® Presentation Foundation (WPF) and other rich-client technologies from Microsoft. Having deployed the new version of its solution to roughly half of its 4,600-truck fleet, the company anticipates that the enhancements will help it boost the productivity of key employees, retain skilled drivers in this high-turnover industry, enhance safety management, and significantly reduce IT costs.

Situation

Founded in 1986, U.S. Xpress (a division of U.S. Xpress Enterprises) is a leading truck-load carrier with expertise in long-haul, expedited, dedicated, and regional services. U.S. Xpress takes pride in its reputation for providing outstanding customer service—a reputation that is reflected in its top ranking for overall quality for three years in a row in *Logistics Management* magazine's Quest for Quality awards. The company also is known for its tradition of technological innovation. This tradition includes early adoption of satellite communications and Internet-based tracking services for customers, and the implementation of a sophisticated e-business platform.

In the mid-2000s, a key part of that e-business platform was an in-cab solution developed internally using Windows® Forms. Windows Forms are a set of classes in the Microsoft® .NET Framework that enable quick development of Windows-based client applications. Deployed on DriverTech DT4000 TruckPC hardware running the Windows XP Embedded operating system, the solution supported

e-mail and other communications among drivers, fleet managers, and customer service agents. Known as XPE Truck, the solution also provided automatic engine diagnostics and reporting, navigation, driver-performance monitoring, and a way for drivers to view training videos. With all these capabilities, XPE Truck became so successful that U.S. Xpress executives

decided to use it as the company's standard platform for future enhancements.

"With the excellent reception of XPE Truck among drivers and other employees, and with the advantages it afforded us in terms of vehicle performance and safety management, we considered it an ideal platform for leveraging our reputation as a company that uses IT technology at the leading edge," says Ken Crane, Systems Manager of Mobile Technology at U.S. Xpress. "Consequently, we began thinking of ways we could make XPE Truck even more powerful by enabling it to collect additional types of vehicle data; share information more rapidly and widely; and provide drivers with a richer, more intuitive, and more functional user interface."

Solution

To help implement such enhancements, Crane and his colleague Scott Davison, Chief Applications Architect at U.S. Xpress, evaluated both Windows Forms and Windows Presentation Foundation (WPF), both part of Microsoft .NET Framework 3.5 Service Pack 1 (SP1). "Because XPE Truck was originally developed with Windows Forms, we considered using it for the enhancements as well," Davison says. "But when we encountered WPF, with its full integration into the Microsoft .NET Framework, out-of-the-box support for 'skinning' [tailoring the user interface for different audiences or needs], rich visuals, and flexible content delivery, we decided to give it a try."

According to Davison, developers were unsure whether WPF would run successfully on the DriverTech DT4000 TruckPC hardware. "The device relied on an embedded video card with limited memory that wasn't designed to support desktop-level graphics performance," he reports. "So we decided to develop and deploy a quick WPF-based

Figure 1. The main menu in XPE Truck provides access to information at a glance. All functions are available when the vehicle is stopped.



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Mobile Technology, U.S. Xpress

prototype—and it ran beautifully. This made the decision to use WPF an easy one.”

Using WPF capabilities such as transparencies and folding, developers made significant enhancements to the XPE Truck user interface for easier, faster, and safer access to essential information. These enhancements include e-mail message preview, dynamically scalable fonts, a reduced-glare “night skin,” and full-screen maps with navigation instructions and secondary information available in collapsible screens.

In addition to .NET Framework 3.5 SP1, the U.S. Xpress development team employed Microsoft Visual Studio® Team System 2008 Team Foundation Server and Microsoft SQL Server® Compact version 3.5 data management software to build and support the enhanced version of XPE Truck. Also central to the project was an application programming interface (API) from DriverTech, which enabled communication between XPE Truck and device-specific modules for engine control, message management, and state-health delivery.

As in the original version of XPE Truck, developers also integrated two third-party software products into the solution: ALK CoPilot for navigation and ITI Pro-TREAD In-Cab for delivery of video-based training. For the installation—which reached half of the company’s fleet of 4,600 trucks by mid-2009 as part of a plan for full installation by year end—U.S. Xpress used remote deployment management software from DriverTech.

Benefits

With deployment of the newly enhanced version of XPE Truck, U.S. Xpress is raising employee productivity by optimizing assets

in the field and responding more rapidly to changing business conditions. The company also is improving its ability to retain skilled drivers, who have enthusiastically embraced the new version, and is helping those drivers perform their jobs more safely than ever before. U.S. Xpress is saving significantly on IT development and maintenance costs, as well, so it can continue enhancing XPE Truck rapidly and cost-effectively for the company’s long-term competitive advantage.

Boosts Employee Productivity and Customer Satisfaction

With the enhanced XPE Truck solution, U.S. Xpress is simplifying the collection, delivery, and sharing of information on driver hours, routing, scheduling, fuel usage, engine diagnostics, and other vital data. “XPE Truck can present more data in the same screen space, and do it in a way that is easy for drivers to understand,” Crane says.

For example, with clearer routing instructions, drivers are finding it easier to avoid getting lost. This reduces the need for drivers to call fleet managers or even customers for help, which saves time for everyone. Correspondingly, the rate of on-time delivery is up, which makes customers happier. In addition, with features such as arrival autodetection, “blue sign” directions, and a check-in screen that eliminates three of the four previously required steps, drivers are moving faster through delivery gates. “The difference may be just a few minutes, but by avoiding backups, drivers are maintaining a better relationship with dock personnel,” Crane explains. “This, in turn, makes the arrival process that much smoother.”

It’s not just drivers who are enjoying easier access to data. With XPE Truck, U.S. Xpress is making more data available to more people throughout the company, and in a

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timely way. "In this business, time is especially precious; so, for U.S. Xpress to work most effectively, drivers, fleet managers, and customer service agents need to be accessing the same information at the same time," Crane says. "Thanks to this solution, they are."

A related benefit, says Davison, is that U.S. Xpress is now able to push much of the company's day-to-day decision making closer to where it belongs: in the cab of the truck. "By eliminating the delay between recording what a truck is doing and distributing that information to everyone who needs it, we can support stronger collaboration among drivers, fleet managers, and customer service representatives," he says. "In turn, we can enable drivers to become more active participants in the business process, helping us to optimize assets in the field and respond faster to rising fuel costs and other business challenges."

Helps Retain Skilled Drivers

By making drivers more central to the business process, U.S. Xpress is also helping to increase job satisfaction among these skilled professionals. And that, Crane explains, is essential to the success of any long-haul truckload carrier. "Turnover is high in the trucking industry, and good drivers have greater flexibility than most working people to move from one employer to another," he says. "Anything we can do to help a driver get more miles, make more money, and feel more connected to the company is a major plus. This is even more important considering the costs of identifying, hiring, and training a new driver—from \$5,000 to \$7,000 per instance, according to the ATA [American Trucking Associations]."

According to Davison, U.S. Xpress drivers are very pleased with what he calls the "more attractive and functional" user

interface (UI) of the new version of XPE Truck. "With the transparencies and folding built into WPF, we are able to provide a consistent look and feel for all data elements, making the solution more intuitive and far easier to use," he says. "For safety reasons in particular, drivers like the solution's support for widescreen switching on the navigation page—a vast improvement over the earlier UI. Its 'night skin' mode is useful after dark, and its 3-D mode is useful on winding roads in fog."

U.S. Xpress drivers themselves are saying much the same thing—that this version of XPE Truck provides significant safety enhancements. "XPE Truck is a fantastic safety-guidance tool, one I couldn't envision before actually seeing it," says Bob Maleschusky, Dedicated Fleet Driver, U.S. Xpress. "It has earned my stamp of approval."

Not surprisingly, drivers also are expressing a clear preference for the solution. "I have used various in-cab systems over the years, and XPE Truck is definitely the best," says Tolly Taliaferro, Solo Fleet Driver, U.S. Xpress.

Like Taliaferro, other solo drivers feel much the same way. As Crane explains, in up to a dozen different cases, a driver was so impressed after using the newer version of XPE Truck that he or she was unwilling to move to a new truck that did not have that version installed. "In every case, the driver liked the new vehicle, but didn't like that the vehicle was installed with a hardware device running the older version of XPE Truck," Crane reports. "So before agreeing to the move, the driver asked that the shop manager replace the older device with a newer one that was running the enhanced version of XPE Truck."

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Scott Davison, Chief Application Architect, U.S. Xpress

With the way drivers have welcomed the enhanced XPE Truck solution, Davison considers it a significant component of the company's driver-retention strategy—for present and future alike. “Now that we have a solution with such rich network connectivity, we can start looking at possibilities of providing Internet browsing and streaming media so that drivers can use the solution during breaks for personal calendaring, entertainment, and connecting with friends and family,” he explains.

At least one driver is already looking forward to future enhancements of the solution. As Cornelius White, Leased Truck Owner/Operator at U.S. Xpress, explains, “After what I've seen so far of XPE Truck, I can't wait to see what's next.”

Reduces IT Maintenance Costs

Whatever future possibilities Davison, Crane, and their colleagues at U.S. Xpress might envision for XPE Truck, turning those possibilities into reality will be easier thanks to the Microsoft rich-client technologies they have used to this point. One technology that U.S. Xpress developers are finding particularly helpful is LINQ (Language Integrated Query), a component of the Microsoft .NET Framework that adds native data-querying capabilities to .NET languages. “With LINQ, we were able to build route-tracking capabilities into XPE Truck in two weeks, from conception to pilot,” Davison says. “Without LINQ, we would have spent four times that long just dealing with edge cases and state-machine management.”

Another Microsoft technology that U.S. Xpress is using very effectively in the XPE Truck solution is SQL Server Compact. To manage data persistence in the original version of XPE Truck, for example, the company relied on XML files—historically, a “nightmare” to maintain, according to

Davison. By using SQL Server Compact for data management in the enhanced XPE Truck, the company can manage data persistence with the help of a full relational data store. “As a result, we are anticipating IT maintenance savings of 35 percent,” he says.

Simplifies Application Targeting

Last, but far from least, are the IT maintenance and support benefits that U.S. Xpress is enjoying thanks to the modular approach it used in developing this solution. One such benefit comes specifically in the area of testing.

“Using a mock version of the DriverTech and third-party APIs, developers can prototype and test further XPE Truck enhancements on their workstations instead of having to first put the code on the DriverTech device,” Davison explains. “This helps us deliver new modules faster, and enables us to spend just half the resources on XPE Truck testing that we used to.”

Targeting is a related benefit of the modularity. Now, U.S. Xpress can easily add new capabilities to XPE Truck based on the needs of drivers using a selected vehicle or in a selected business unit or region. “Drivers serving a given type of customer or carrying a given type of load will have their own workflow requirements, and we can support those requirements with highly targeted modules for XPE Truck, including different skins as required by different business units,” Crane explains. “All of this helps us to make XPE Truck work optimally for U.S. Xpress drivers and our other employees, for U.S. Xpress customers, and for the company as a whole.”

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