



Windows Mobile Customer Solution Case Study



Overview

Country or Region: United States
Industry: Manufacturing—Consumer goods

Customer Profile

Lance is one of the largest producers and distributors of snack foods in the United States. The company has 4,700 employees and is based in Charlotte, North Carolina.

Business Situation

The company's eight-year-old mobile application was difficult to support, and the devices that it ran on were failing with increasing frequency.

Solution

To support direct-to-store delivery, Lance deployed Apacheta RouteACE software running on new Windows Mobile® devices.

Benefits

- Enhanced productivity due to fast startup and synchronization, and direct exchange of data
- Improved customer service
- Faster and easier changes to business rules
- Foundation and knowledge to drive further improvements

New Mobile Solution Improves Distribution Efficiency for Snack Food Manufacturer

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Snack food manufacturer Lance supported direct store delivery (DSD) using a difficult-to-maintain mobile application running on eight-year-old devices, which were failing at an increasing rate. The company addressed those challenges by migrating to Apacheta RouteACE™ workflow software running on new Windows Mobile® devices. Features such as bar code scanning, support for direct exchange of data, and fast startup and synchronization are enhancing customer service and increasing productivity for the company's 1,400 DSD salespeople, while the ability to change business rules and workflows without writing code makes it easier to support the solution. In addition, the solution's extensibility and the visibility it provides into how salespeople work put Lance in a strong position to deliver further gains in business efficiency and productivity.



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Situation

Lance Incorporated, headquartered in Charlotte, North Carolina, manufactures and markets snack foods throughout much of the United States and other parts of North America. The company's products include sandwich crackers and cookies, potato chips, sugar wafers, nuts, restaurant-style crackers and candy, and other snacks. Lance has manufacturing facilities in North Carolina, Iowa, Georgia, Massachusetts, Texas, Florida, Arkansas, and Ontario, Canada. Products are sold under the Lance, Cape Cod, Tom's, and Brent & Sam's brand names, along with a number of private-label and third-party brands.

Lance products are distributed widely through grocery and mass merchant stores, convenience stores, food service outlets, and other channels using a direct store delivery (DSD) system of approximately 1,400 sales routes, a network of independent distributors, and direct shipments to customer locations.

From 1998 to 2006, Lance supported DSD using an internally developed mobile application on an Intermec 6110 handheld computer—one of the first mobile devices to have a touch-screen interface. The application was built with Microsoft® Visual Basic® development system version 5.0, ran on a slimmed-down version of the Windows® 95 operating system, and used a flat-file data store. Users synchronized the devices with server computers running at the company's data center, using built-in modem cards.

Although that mobile solution served the company well for many years, by 2006 the devices were showing signs of age. “Device failure rates had been increasing for several years,” says Shawn Cherry, Director of Applications at Lance. “By 2006, we couldn't tolerate it anymore. Our immediate objective was to eliminate the downtime due to failed devices—and fast.”

In looking for a new solution, merely replacing the devices with a newer model wasn't an option. “Windows 95 was no longer supported by Microsoft, and we knew that we didn't want to keep the mobile application,” says Cherry. “We needed something that we could deploy, change, and support more efficiently. We also saw the project as an opportunity to eliminate many of the problems that were negatively affecting user productivity. The devices took 15 minutes to start each morning and almost as long to synchronize over a modem connection, which is done at least once per day. Performance also was slow due to the flat-file data store, which was prone to corruption.”

In addition, Lance found it difficult to modify the mobile application to support workflow changes. “There was no separation between the application's user interface, business logic, and other tiers, which made it difficult to implement changes to business rules,” says Cherry. “Deployment of those changes to the field was also painful, requiring the download of large, uncompressed software updates.”

In searching for a new solution, Lance needed one that could be easily adapted to meet its immediate needs—and just as easily support future enhancements. “Our plan was to initially replicate existing business rules on a new solution, as a way to quickly address the problem of failing devices without the need for extensive retraining,” says Cherry. “At the same time, we knew that we wanted to optimize those business processes in the future, so the solution's flexibility and the ease with which changes could be made and deployed were of key importance.”

Solution

Lance implemented a new mobile solution using Apacheta RouteACE™ direct store delivery software running on Motorola MC9090-S handheld computers powered by

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Windows Mobile® 5.0. “We were able to implement and deploy our new solution in only six months,” says Cherry. “Salespeople know exactly what inventory is on hand, how quickly inventory needs to be replenished, and what pricing and promotions to offer each customer. Furthermore, we can easily implement and deploy any changes needed to optimize existing processes or meet new business needs.”

Selection Process

The process of choosing a new mobile solution began in mid 2006, with Lance already knowing that it wanted to use Windows Mobile. “We already had experience using Microsoft .NET technology to develop desktop and server applications, and knew that Windows Mobile would enable us to take advantage of that same skill set,” says Cherry. “We also knew that Windows Mobile would enable us to choose from a broad range of applications, so our first step was to eliminate vendors whose solutions weren’t based on the Microsoft .NET Compact Framework.”

Lance eventually selected Apacheta, a vendor of mobile business software for companies in a number of industries, including consumer packaged goods, manufacturing service and repair, and transport. “In addition to offering the best solution in terms of the capabilities that we needed, we saw that Apacheta had a well-qualified team and understood our industry,” says Cherry.

The Apacheta software also offered advantages from a technical perspective. “Apacheta started the company developing on the .NET Compact Framework, which meant there would be no old code,” says Cherry. “And the solution uses a relational database on the mobile device, which we knew would mean better performance and reliability. In addition, with the visual design environment, we can bring business analysts

into the development process, make changes without writing code, and ensure that our process documents are always up-to-date. Finally, the solution’s architecture makes it just as easy to deploy changes to business rules—without having to restart the device.”

Rapid Implementation

After selecting Apacheta, Lance set an aggressive timeline, with the goal of having the first new device on the street in only eight weeks. Implementation was done using an agile methodology, with three or four developers from each company working side by side, alternating between the two companies’ facilities on a weekly basis. During the effort, business rules were specified using Apacheta VisualACE™ Business Process Designer, an add-in tool for the Microsoft Visual Studio® 2005 development system that supports the definition of workflows in a drag-and-drop graphical environment. All required custom code was isolated from the RouteACE core to facilitate future upgrades.

“We printed the solution’s built-in default workflows on a large-format printer, sat down with a business process expert, and marked up the printouts, which we put up on the wall for developers to implement,” says Cherry. “The entire implementation process was very visual, helping accelerate delivery and eliminate any misinterpretation of how business processes should work.”

Streamlined Training and Rollout

Lance met its goal of having the first new device on the street by November 13, 2006, expanding its pilot program to 50 such devices by the end of that year. At the end of January 2007, the company began full-scale rollout. “We trained users on a Saturday, at the rate of about 100 to 150 people per weekend, and had all 1,400 routes rolled out in just a few months,” says Cherry.

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Deployment of the new devices was done during training. “The old devices were synchronized for the last time when people arrived in the morning,” says Cherry. “While they were in the class, delivery trucks were retrofitted with a cradle and printer, and we ran back-end processes to convert the data. At the end of the day, people synchronized the new devices using a wireless base station that we had set up at the training location. By the time people drove out of the parking lot on Saturday afternoon, they were ready to do business as usual.”

Since April 2007, the company’s new mobile solution has supported a full “day in the life” for Lance salespeople, enabling them to accurately manage inventory, streamline delivery logistics, provide delivery confirmation, prepare and print invoices, process payments, manage multiple pricing models, place orders, and run reports. The solution also streamlines deliveries through its support for direct exchange (DEX)—a standard for the electronic exchange of data between mobile devices and the DSD systems used by many large retailers.

Technology and Architecture

The company’s new mobile solution runs on Motorola MC9090-S handheld computers. The ruggedized mobile computer has an Intel XScale PXA270 624-megahertz processor, 128 megabytes of RAM, a 3.8-inch 320 x 240 pixel color display, a built-in bar code scanner, and a large numeric keypad—all in an 8-by-4-by-2-inch form factor weighing less than 24 ounces.

In choosing the device, Lance listened to its salespeople. “We held focus groups, in which we brought in several different devices and let people play with them,” says Cherry. “Because all the devices ran Windows Mobile, we knew that our chosen solution would work on any of them.”

The RouteACE mobile application was developed using the Visual C#® development tool, Windows Forms, and the VisualAce Business Process Designer. The RouteACE workflow engine consumes XML-based representations of business workflows that are output by the VisualACE development tool, using them to drive both the processing of business rules and the application’s user interface. To optimize interface responsiveness, the workflow engine predicts the user’s likely actions and precaches the appropriate forms.

Synchronization is done wirelessly using Apacheta communications middleware. Each user was given a wireless router, which supports dial-up connectivity as well as Ethernet-based Digital Subscriber Line (DSL) and cable modems.

Upon synchronization, data stored in the Microsoft SQL Server® CE 2.0 relational database on the mobile device is uploaded to Web server computers running the Windows Server® 2003 operating system and Apacheta ServerACE™ software, with the communications processes using compression and checkpoints to minimize synchronization times. The Web servers insert the data into the ServerACE database that runs on SQL Server 2005 database software, from which it is accessed by the company’s enterprise resource planning system. Application updates and changes to business rules are automatically downloaded and applied during the synchronization process.

Benefits

With its new mobile solution, Lance is delivering improved convenience and productivity for its 1,400 direct-to-store delivery salespeople, enabling them to run their routes more efficiently. The solution is benefiting Lance as well, making it easier to update the mobile application, modify business rules, and deploy those changes to the field. Moreover, the company’s new solution provides a firm

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foundation for the delivery of future enhancements, such as predictive ordering and the optimization of sales workflows.

“Our sales reps maintain full responsibility for their inventory and are personally accountable for all aspects of their business,” says Mark Carter, Vice President of Strategic Initiatives at Lance. “Our new mobile solution has been a great success because it helps salespeople deliver better customer service, track and manage inventory, and access the reports that they need.”

Enhanced Productivity and Customer Service

Even though Lance has yet to optimize workflows on the new devices, instead choosing to keep them the same to accelerate initial roll-out, the company’s new solution is helping salespeople be more productive and enabling them to deliver improved customer service. “Synchronization times are improved, startup times are down to about a minute, and units aren’t breaking down as they were before,” says Cherry. “With the increased application responsiveness and new capabilities that our salespeople now enjoy, they can complete more stops per day.”

One new capability that’s helping salespeople be more productive is the ability to scan universal product codes (UPCs). “We have more than 300 active stock-keeping units, and salespeople can now scan bar codes instead of having to memorize all those item numbers,” says Cherry. “Not only is this helpful to new salespeople, but it also aids all salespeople in taking inventory.”

Another helpful feature is built-in support for direct exchange, which has enabled Lance to certify the electronic interchange of invoices with 12 retailers—up from only 2 in the past. “We used a third-party DEX tool before, but now that capability is integrated with the RouteACE software,” says Cherry. “By

enabling salespeople to exchange data with retailers electronically, the new devices help them get in and out of stores more quickly, and speeds the order-to-cash process.”

The new solution also has reduced the time that it takes to start and synchronize devices. “Device startup times are down to less than a minute, and synchronization times are at least 50 percent faster,” says Cherry. “Even over dial-up lines, the process takes only a few minutes. And salespeople now can take advantage of the high-speed Internet connections that they have at home. Not only does this provide added convenience, but it also reduces the monthly cost of supporting a dial-up 800 number.”

In the unlikely event of a device failure, salespeople can get a new device up and running the same day. “Our technical support team can rebuild a route on our servers in 90 seconds, and users can download that data to synchronize a new device in 30 minutes,” says Cherry.

Faster, Easier Changes to Business Rules

Thanks to its new solution, Lance has reduced its software development effort. “We can modify workflows, business rules, and forms without having to write code, enabling us to make changes in about one-third of the time that it used to take,” says Cherry. “Deployment of those changes isn’t an issue anymore either. We’re still slow and methodical when it comes to pushing out changes, using a phased deployment over four to six weeks to minimize risk, but the technology is no longer an impediment.”

Changes to reports needed by salespeople also are faster. “In the past, we had to use a custom report writer, which made it very hard to make changes,” says Cherry. “Today, all report development is done using VisualACE. Not only do we need fewer tools now, but also

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reports are much easier to maintain and modify—and can be deployed without users even having to restart the application.”

Foundation and Knowledge to Drive Further Improvements

Though Lance has so far left business processes for salespeople virtually untouched, the company is planning on making enhancements over time—and is in a far better position to do so than before. “We now have a mobile platform that can support new capabilities, such as predictive ordering, which is on our timeline for 2009,” says Cherry. “Salespeople have a lot that they need to keep track of, and such a capability would help them make sure they have enough product in stock to meet the increased demand resulting from a new promotion.”

Detailed logging built into the solution will help Lance improve workflows as well. The RouteACE software tracks every user action, providing detailed information on how the application is being used, including the time that users spend on each screen, all input and decisions that are made, and a complete log of all DEX transactions. “A complete, detailed recording of the user’s entire mobile session is uploaded to our servers every time the device is synchronized,” says Cherry.

Although the primary use of that data so far has been for troubleshooting, Cherry envisions it being useful for analyzing—and thus optimizing—workflows over time. “The analytics capabilities of the solution are phenomenal, and the amount of data collected is immense,” says Cherry. “Today we retain two weeks of such data in a SQL Server database, representing about 80 million rows of information. With such detailed history, we can analyze what’s going on in the field and use those insights to further improve user productivity. We’ve already delivered strong gains in productivity and supportability, but

it’s nice to know that the solution we’ve put in place can support further improvements as well.”

For More Information

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For more information about Lance products and services, visit the Web site at: www.lance.com

Windows Mobile

Windows Mobile brings the power of the Windows operating system to mobile devices, helping businesses and their mobile employees stay connected while on the go. Windows Mobile runs mobile versions of Microsoft programs, including Microsoft Office Outlook® Mobile, Internet Explorer® Mobile, Pocket MSN®, Windows Media® Player Mobile, and Microsoft Office Word Mobile, PowerPoint® Mobile, and Excel® Mobile. With Windows Mobile, information workers get powerful software combined with the familiarity of Windows. Combined with available service plans and connectivity options, Windows Mobile devices, available from 42 device makers and 68 mobile operators in 48 countries, can be used to make calls, send e-mail and instant messages, surf the Web, and access critical business information even when users are away from the office.

More information about Windows Mobile can be found at: www.microsoft.com/windowsmobile

Software and Services

- Windows Mobile 5.0
- Microsoft Server Product Portfolio
 - Windows Server 2003
 - Microsoft SQL Server 2005
- Microsoft Visual Studio 2005
- Apacheta RouteACE, ServerACE, and VisualACE Business Process Designer

Hardware

- 1,400 Motorola MC9090-S handheld computers

Partners

- Apacheta

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