

A Forrester Consulting Thought Leadership Paper Commissioned By Sterling Commerce, an IBM Company

Key Strategies For Enterprise Mobile Application Deployment And Measurement

Enterprises Are Achieving Benefits From Using A Wide Variety Of Mobile Applications

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Executive Summary

At the end 2009, Sterling Commerce, an IBM Company commissioned Forrester Consulting to conduct a research study to obtain an in-depth understanding of the use of and measurement strategies for various mobile applications to validate their impact in enterprises with corporate headquarters in Brazil, Canada, France, Germany, the UK, or the US. Participants in this study were responsible for making or influencing mobile application decisions in enterprises, including choosing or recommending vendors, defining mobility requirements, authorizing purchasing decisions, defining mobile application strategy, or setting the mobile application budget for their organization.

The study methodology included an online survey of 296 mobility decision-makers in enterprises representing the following vertical industries: communications/media, distribution/logistics, financial services/banking/insurance, manufacturing, and retail. The respondent sample size in each of the five industry categories was large enough to ensure that statistically significant quantitative survey results were achieved in each industry category. In-depth interviews lasting 45 minutes each were conducted with five mobility decision-makers to gain further insight into corporate deployment and measurement of 15 different mobile applications that help these firms improve overall operations and interactions with employees, customers, suppliers, and partners.

Results from this study show that enterprises in the identified vertical markets are deploying and measuring benefits achieved from many mobile applications. These mobile applications extend beyond sales force or field service applications that improve the productivity of employees who are away from the office or mobile commerce applications that some companies use to expand customer revenue streams. Key study findings include:

- **Mobile devices are deployed to employees representing a wide variety of functional roles in the organization.** Enterprises have deployed mobile devices including smartphones, netbooks, ruggedized devices, vehicle-mounted devices, automatic vehicle location devices, machine-to-machine (M2M) sensors, and RFID tags to a wide variety of employees. It may come as no surprise that nearly 95% of surveyed enterprises have deployed mobile devices to executive management or IT professionals. However, many enterprises are also deploying mobile devices to employees in other functional roles in the organization. For example, between 84% and 87% of enterprises deploy mobile devices to sales professionals or administrative personnel; 75% provide mobile devices to field service personnel; and 60% to 65% of enterprises deploy mobile devices to employees in supply chain, building security, or customer service functions.
- **The handheld device operating system environment is quite fragmented.** For a vast majority of surveyed enterprises, the mobile device operating system environment is extremely diverse, with more than 75% of all surveyed enterprises supporting more than one handheld device operating system. Approximately 45% of these enterprises support three or more handheld operating systems, and about 20% of enterprises overall support four or more handheld operating systems. The level of complexity in the mobile device operating system environment is expected to continue in the future as new types of mobile devices and operating systems make their way into enterprises.
- **Most companies view mobile application deployment as critical to long-term corporate success.** More than three-quarters of enterprise decision-makers agree that mobile application deployment is critical to the long-term success of the organization. In addition, justifying the investment in mobile applications is also a key requirement, with between 70% and 75% of enterprise decision-makers agreeing that it's important to establish a

clear business case justification for each mobile application and to justify mobile application investments by measuring the benefits of each application.

- **Enterprises are deploying a wide range of mobile applications.** Enterprises are implementing many different mobile applications that extend well beyond widely publicized customer-facing mobile commerce applications. Mobile alerts for IT employees are the most commonly deployed, with 43% of all surveyed enterprises saying they are currently implementing or have already implemented this application. Sales force and field service applications are also deployed by nearly 40% of surveyed enterprises. About 25% of all surveyed organizations have deployed or are deploying mobile commerce applications.
- **Significant vertical market differences occur in the types of mobile applications deployed.** The top mobile applications used by firms in each of the five vertical industries vary dramatically. These key mobile applications reflect the unique goals and processes that help position these companies for success. For example, 53% of retail firms are deploying warehouse and logistics mobile applications, and 45% are deploying in-store inventory management and retail operations applications.
- **Enterprises measure the benefits of mobile application deployment using a variety of metrics.** Nearly 75% of enterprises agree it's important to justify mobile application benefits by measuring the benefits achieved from each application. Measurement importance is validated by survey results showing that between 43% and 73% of firms that have deployed each of the 15 mobile applications measure the benefits of these applications separately or as part of other types of business process improvements. The measurement tactics vary widely depending on the type of mobile application deployed.
- **Many different third-party vendors help companies develop mobile applications.** Half of the surveyed enterprises develop some of their mobile applications in-house. However, many of these firms also seek application development assistance from third-party vendors. System integrators (43%), external application developers (39%), and mobile device management vendors (35%) are used by many firms. The key factors to determine which vendor partners to use for mobile application development assistance include ease of integration with back-end platforms, vertical application development expertise, and service-level agreements for mobile application availability.

Complex Enterprise Mobile Device And Operating System Landscape

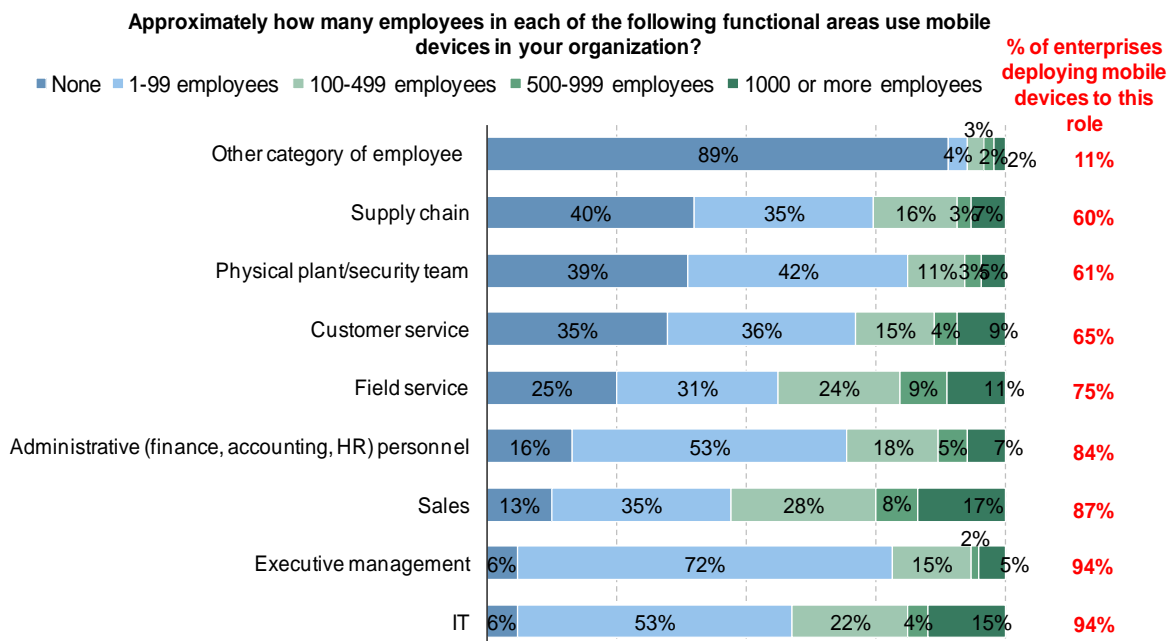
Enterprise organizations across Brazil, Europe, and North America are using a wide range of mobile devices, including smartphones, ruggedized devices, vehicle-mounted devices, automatic vehicle location devices, M2M sensors, and RFID tags. These devices are deployed to many employees in the organization, including not only executive managers and sales professionals, but also task workers in the field service, supply chain, and customer service functional roles.

- **A vast majority of enterprises deploy mobile devices to executive managers and sales professionals.** Mobile information workers include executives who travel frequently or who spend at least one day a week out of the office. Examples of mobile information workers include executive managers, sales professionals, and financial securities traders. These employees are usually the first to receive mobile devices from the corporate IT organization and often use mobile devices, PDAs, and smartphones to improve their productivity while away

from the office. Based on this information worker profile, it's not surprising that nearly 95% of surveyed enterprises deployed mobile devices to executive management employees and 87% deployed mobile devices to sales professionals in their organization (see Figure 1).

- Many enterprises deploy mobile devices to help task workers perform specific daily activities.** Task workers are often found in specific vertical markets, including manufacturing, retail, shipping, and transportation. These task workers include field service workers, transportation and shipping personnel, and retail professionals who use mobile devices (e.g., ruggedized devices, automatic vehicle-location devices, and vehicle-mounted handheld devices) to assist them with completing daily activities more efficiently. The corporate IT organization often drives the mobile device purchasing decision process for task workers because the company must standardize the mobile devices, applications, and processes used by all workers who complete the same business tasks each day. Of the enterprises surveyed in this study, 75% deploy mobile devices to field service personnel and 60% to 65% deploy mobile devices to employees in supply chain, security, or customer service functions.
- The handheld device operating system environment is quite fragmented.** More than 75% of all surveyed enterprises support more than one handheld device operating system, and 45% of these enterprises support three or more handheld operating systems (see Figure 2). In addition, about 20% of enterprises overall support four or more. The level of complexity in the enterprise mobile device operating system environment is expected to continue as new types of mobile devices and operating systems make their way into corporations.

Figure 1
Employees In A Diverse Range Of Functional Roles Use Mobile Devices

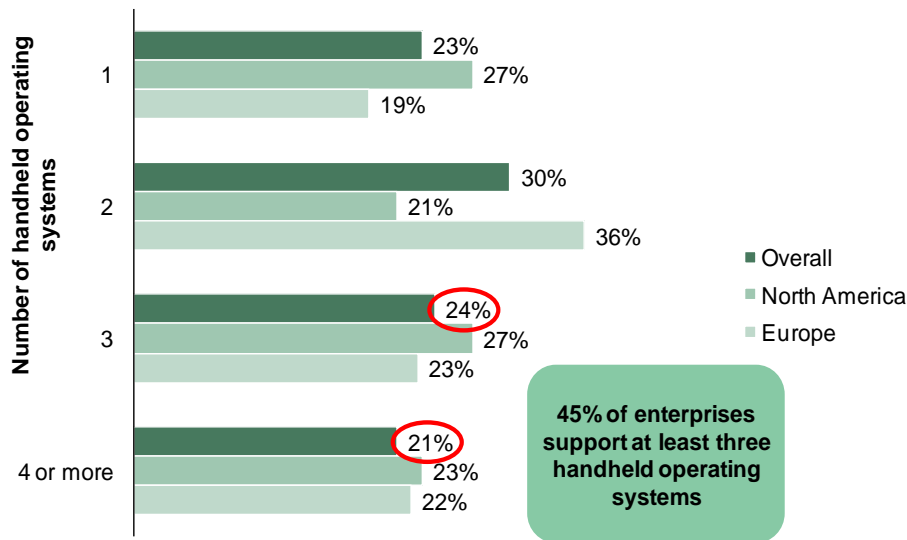


Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Figure 2

Seventy-Five Percent Of Surveyed Enterprises Support Multiple Handheld Operating Systems

How many handheld operating systems does your organization support?



Base: 296 mobile application decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Mobile Application Deployment Is Critical To Future Corporate Success

The strategic importance mobile applications have among enterprises is clearly evident from the quantitative survey results. In fact, when we asked enterprises to rate their agreement with statements related to the importance of mobile applications and measurement within their organization, we found that:

- A majority of enterprises view mobile application deployment as critical to long-term corporate success.** More than 75% of enterprise decision-makers agree with the statement that mobile application deployment is critical to the long-term success of the company. In some vertical markets this perspective is even more pronounced. For example, more than 90% of communications and media organizations agree that mobile application deployment is critical to their long-term corporate success. In addition, most enterprises are proactively deploying a range of mobile applications. Approximately 67% of surveyed decision-makers state that their company is implementing mobile applications for employees, customers, suppliers, and partners.
- Most companies are not deploying mobile applications as a response to competitor activities.** Only 39% of all surveyed decision-makers agree that their company is deploying mobile applications because competitors have already done so. However, significant vertical market differences do exist. More than half (51%) of distribution

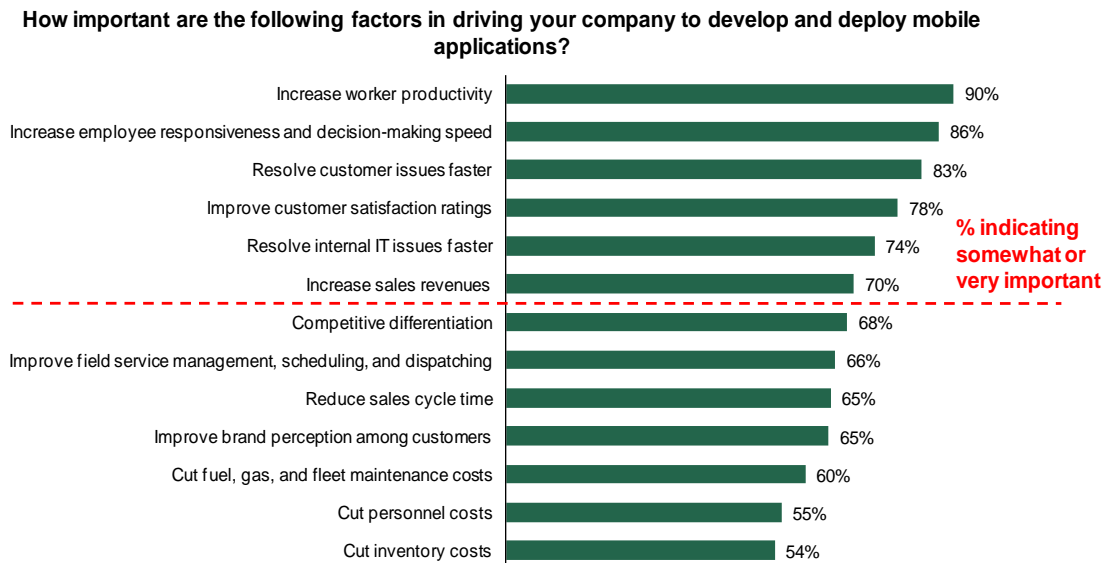
and logistics firms agree that their organization is deploying mobile applications in response to competitor activities.

- **Justifying investment in mobile applications is important to most companies.** Nearly 75% of surveyed enterprise decision-makers agree that it's important to justify mobile application investments by measuring the benefits from each application. In addition, more than 70% of enterprises agree it's important to establish a clear business case justification for each mobile application. These results highlight how critical it is for enterprises to identify measurement tactics to evaluate the impact of mobile applications prior to deployment. These measurement results can be used to validate the business case for existing mobile applications and can help justify future mobile application investments.

A Variety Of Factors Drive Corporate Mobile Application Deployment

So, why are enterprises deploying mobile applications? Surveyed enterprises are using mobile applications to achieve many different benefits, including increasing employee productivity and responsiveness, resolving customer issues faster, increasing revenues, cutting costs, and improving brand perception among customers (see Figure 3).

- **Increasing worker productivity and responsiveness are the top mobile application deployment drivers.** The leading factors driving companies to develop and deploy mobile applications are increasing worker productivity and employee responsiveness. Between 86% and 90% of survey respondents identified these two factors as important reasons their company deploys mobile applications. Productivity-enhancing applications are often used by employees who focus on specific tasks. For example, mobile sales force applications improve the productivity of sales professionals, or warehouse applications enhance the productivity of employees who are tracking inventory status on the warehouse floor.
- **Efficiently addressing customer service issues is also fueling mobile application deployment.** Improving customer satisfaction ratings and resolving customer service issues faster are key factors driving mobile application deployment among 83% to 86% of all surveyed enterprises. Examples of mobile applications that may enable customer service improvements are: 1) proactive mobile alerts to inform IT employees when there is an IT issue that could impact customer experience, and 2) order-tracking applications that enable customers to determine the location and status of purchased products or services.
- **Increasing sales revenues is driving mobile application deployment among many firms.** Generating new revenue streams by deploying mobile applications is important to 70% of all surveyed organizations. Retail firms rated this driver higher than other vertical industries, with approximately 87% of retail firms stating that increasing revenues is an important factor driving mobile application deployment. Examples of these revenue driving applications include mobile commerce and in-store inventory management applications.

Figure 3**Employee Productivity Benefits And Improving Customer Service Drive Mobile Application Deployment**

Base: 296 mobile application decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Enterprises Are Implementing A Wide Variety Of Mobile Applications

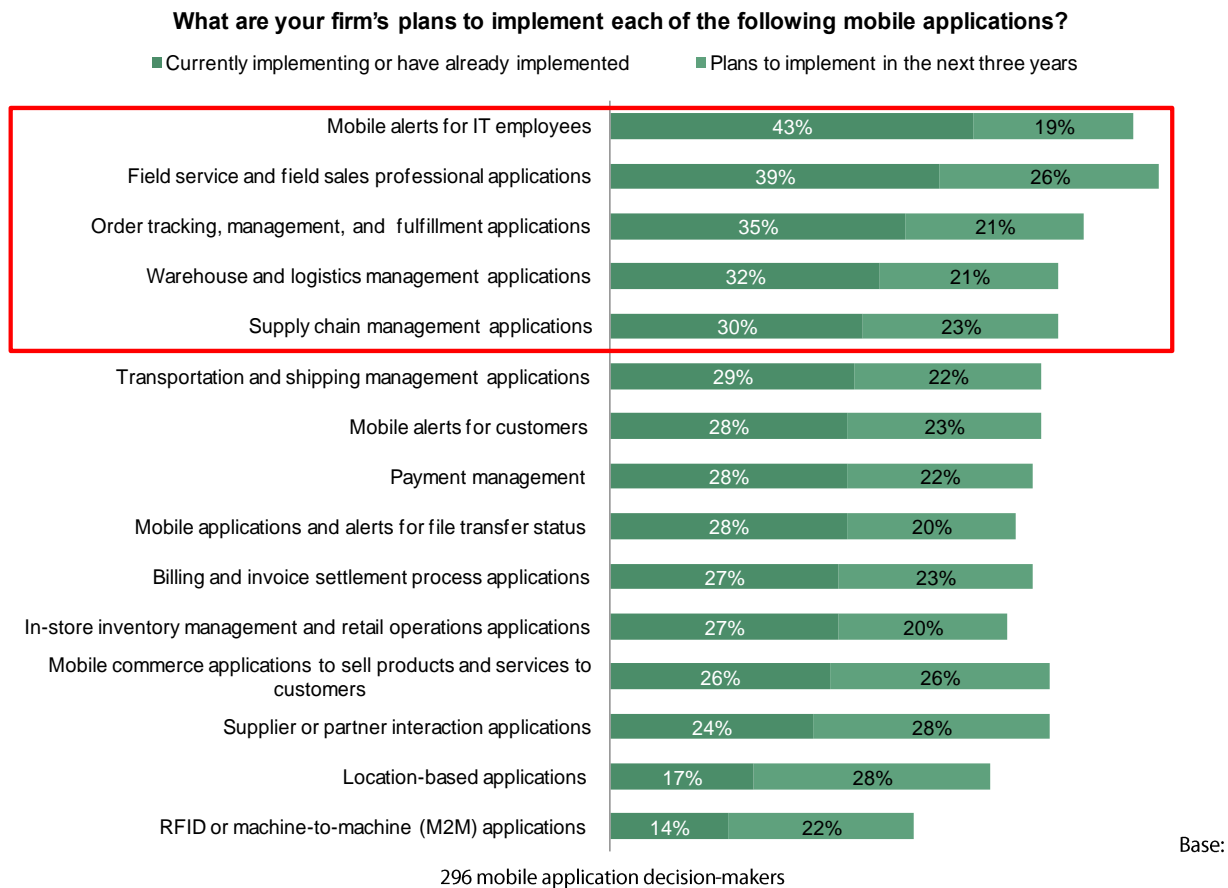
Enterprise organizations are implementing mobile applications that extend well beyond widely publicized customer-facing mobile commerce applications or broadly deployed field service and field sales applications (see Figure 4).

- Mobile alerts for IT employees and mobile sales force or field service applications are prevalent overall.** Mobile alerts for IT employees are the most commonly deployed, and 43% of all surveyed enterprises are in the process of implementing or have already implemented this application. Sales force and field service applications are also deployed by nearly 40% of surveyed enterprises. These mobile applications benefit employees in many different industries, which helps to drive broad adoption of these applications.
- Other common mobile applications include order tracking, logistics management, and supply chain.** Between 30% and 35% of surveyed enterprises are deploying order tracking, warehouse and logistics management, and supply chain mobile applications. These mobile applications address the needs of specific vertical markets. For example 48% of communications and media organizations have implemented or are implementing order tracking, management and fulfillment applications, and 53% of retail organizations have deployed or are deploying warehouse and logistics management applications to track the location of products.

- Mobile commerce applications are deployed by about 25% of surveyed enterprises.** Mobile commerce applications often receive a lot of hype and press because they help companies generate new customer revenue streams. About one-quarter of all surveyed organizations have deployed or are deploying mobile commerce applications. Nearly 35% of communications and media organizations are in the process of deploying or have already deployed these applications.

Figure 4

Mobile Alerts For IT Executives And Field Service Or Sales Professional Applications Are Broadly Deployed



Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Vertical Markets Move Beyond The Basics In Mobile Application Deployment

Mobile alerts for IT employees are deployed by 43% of all surveyed enterprises. However, the top mobile applications deployed in each of the five vertical industries vary dramatically and reflect the goals and processes that are particularly relevant to achieving success in each industry (see Figure 5).

- **Communication and media organizations deploy order tracking and field service applications.** Many communication and media organizations are deploying mobile alerts for customers (50%) and mobile alerts for IT employees (48%). In addition, about half (48%) of these media and communication firms are deploying order tracking, management, and fulfillment applications, and 46% use mobile field service or field sales applications.
- **Transportation and shipping, field service, warehouse and logistics applications lead in distribution and logistics firms.** Nearly 40% of firms in the distribution and logistics arena have deployed mobile transportation and shipping management or mobile field service applications. Mobile warehouse and logistics applications are implemented by 35% of firms in this vertical industry.
- **Manufacturing firms deploy mobile field service or field sales, warehouse, and logistics applications.** Mobile applications deployed by manufacturing firms include not only mobile alerts for IT employees (46%) but also field service and field sales applications (44%). In addition, logistics, warehouse, order tracking, and fulfillment applications are deployed by approximately 40% of manufacturing firms to help improve the efficiency of their daily operations.
- **Financial services firms deploy mobile alerts for IT employees, field sales, and m-commerce applications.** Financial services companies such as banks, investment firms, and insurance agencies deploy mobile alerts for IT employees (48%) and field sales reps (35%). In addition, financial services organizations implement mobile commerce applications to interact with customers (32%), mobile alerts for file transfer status (30%), and payment management applications (30%) to improve the efficiency of completing these critical processes.
- **Retailers are using warehouse, logistics management, and in-store operations mobile applications.** Many retailers are deploying mobile applications to facilitate their interactions with customers or to improve inventory management and retail operations. More than half (53%) of surveyed retail organizations are implementing mobile warehouse and logistics management applications, 45% are deploying in-store inventory management applications, and nearly 40% are deploying mobile supply chain management, order tracking, and fulfillment applications.

Figure 5

Key Differences In The Top Five Mobile Applications Implemented By Each Vertical Industry

	Overall	Comms/ Media N = 46	Distribution/ Logistics N = 57	Manufac- turing N = 78	Financial Services N = 77	Retail N = 38
Mobile alerts for customers	28%	50%	30%	21%	26%	18%
Mobile alerts for IT employees	43%	48%	25%	46%	48%	47%
Order tracking, management, and fulfillment apps	35%	48%	30%	40%	25%	39%
Field service and field sales professional apps	39%	46%	39%	44%	35%	26%
Billing and invoice settlement process apps	27%	37%	18%	29%	27%	21%
Transportation and shipping management apps	29%	28%	39%	36%	12%	37%
Warehouse and logistics management apps	32%	26%	35%	42%	12%	53%
Supply chain management apps	30%	35%	32%	38%	14%	39%
Mobile commerce apps	26%	35%	23%	19%	32%	24%
Mobile app alerts for file transfer status	28%	28%	21%	29%	30%	29%
Payment management apps	28%	30%	26%	26%	30%	29%
In-store inventory management and retail operations apps	27%	33%	28%	28%	13%	45%

Note: The top five mobile applications implemented or being implemented in each vertical are highlighted in bold red font.

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Most Organizations Measure Mobile Application Deployment Benefits

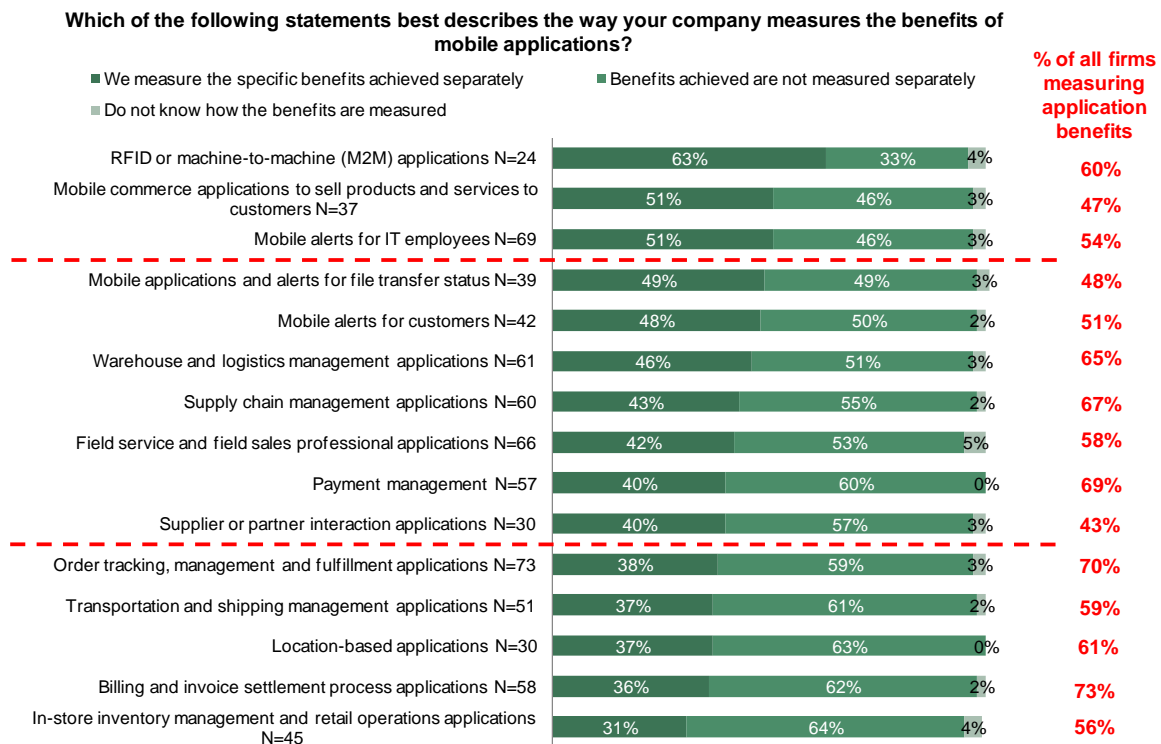
Nearly 75% of enterprises agree it's important to justify mobile application benefits by measuring the benefits achieved from deploying each application. The importance of measuring the benefits of mobile applications is validated by the fact that 43% to 73% of firms that have deployed each mobile application measure these benefits in some manner (see Figure 6). Some firms measure mobile application benefits separately, while others capture these benefits as part of other types of business process improvements. In addition, firms use many different types of metrics to show the benefits of deploying these mobile applications. Examples of these metrics are included below.

- **At least 70% of firms measure the benefits of billing, invoice settlement, and order-tracking applications.** Companies are capturing the benefits of mobile billing, settlement, and order-tracking mobile applications in a variety of ways. Some of the mobile billing and invoice settlement application metrics are: faster ability to identify billing process issues or to approve invoices and increased ability to identify issues that are impacting the invoice

settlement process. Examples of order tracking benefit metrics are: reducing the number of order status inquiry calls per month, increasing the number of completed orders per month, and increasing the speed of order fulfillment.

- **Between 60% and 67% of enterprises measure benefits from RFID, location-based, warehouse, and supply chain applications.** It's also common for firms to measure specific benefits achieved from RFID, location-based, warehouse, and mobile supply chain applications. Examples of benefits achieved in the supply chain include faster identification of supply chain issues or faster ability to fill orders. Benefits from logistics or warehouse management applications include reducing lost or stolen items, decreasing inventory costs, or faster ability to track down items in the warehouse. RFID or M2M application benefits include reducing fuel and maintenance costs and quicker ability to track down the location of items or products.
- **Between 50% and 59% of enterprises measure in-store inventory, sales force, and shipping management application benefits.** The benefits of mobile in-store inventory management applications include reduced inventory costs, faster ability for sales personnel to resolve issues, and increased in-store revenues. Sales force application benefits include ability to increase the number of calls completed by a sales rep and reduced time spent on scheduling and dispatching sales personnel. Shipping management applications enable firms to resolve transportation and shipping issues faster and reduce shipping errors.

Figure 6
Most Enterprises Measure The Benefits Of Deploying Mobile Applications



(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

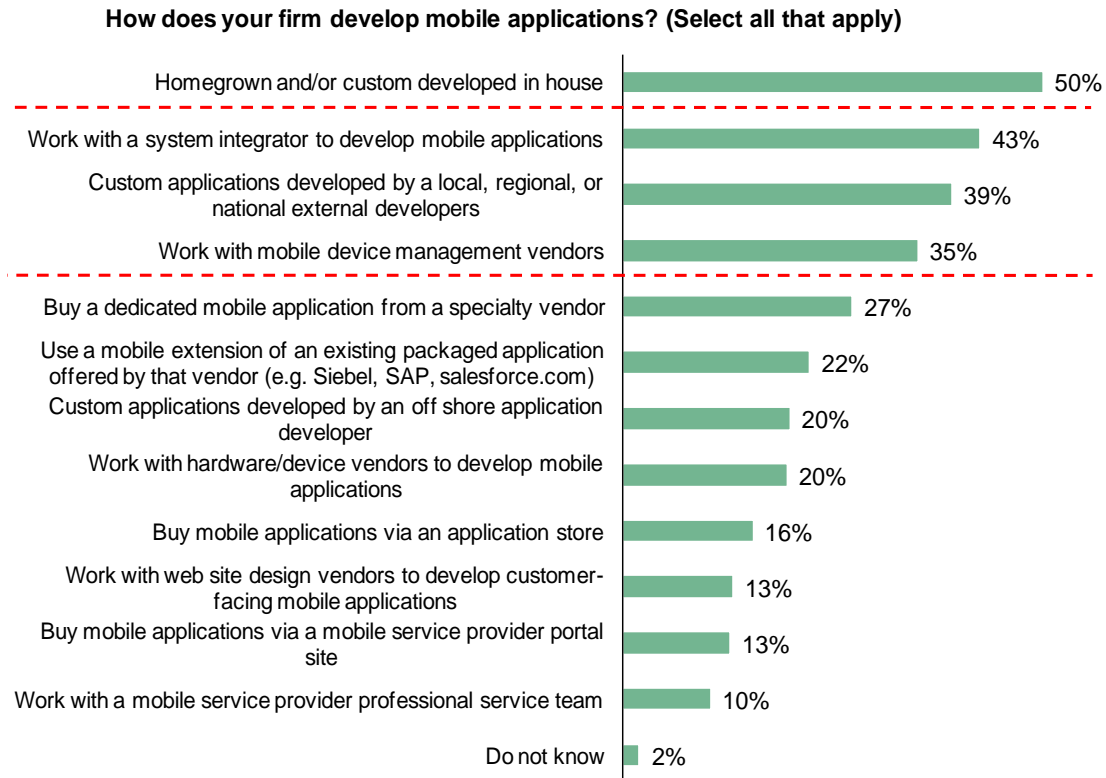
Enterprises Turn To Third-Party Firms For Application Development Help

So, how do companies develop all of these mobile applications? Survey results show that companies use many different strategies to help them develop mobile applications (see Figure 7). Most companies develop at least some of their mobile applications in-house. However, many companies also seek mobile application development assistance from external third-party firms.

- **In-house mobile application development is quite common.** Half of all surveyed enterprises develop some mobile applications in-house. However, there are some vertical differences in mobile application development methods. Nearly 60% of communication and media organizations use in-house development activities to develop mobile applications.
- **System integrators are and custom application developers are also commonly used.** When it comes to sources of external application development assistance, 43% of surveyed organizations use system integrators to help with mobile application development activities. Other sources of mobile application development assistance include external application developers (39%) and mobile device management vendors (35%). Mobile extensions of an existing packaged application are used by 20% of organizations.
- **Companies use many factors to evaluate which third-party vendors to use.** The most important factor for determining which vendor partners to use for mobile application development assistance is ease of integration with back-end platforms. Other factors driving the vendor selection process include vertical application development expertise (76%) and service-level agreements for mobile application availability (74%).

Figure 7

Companies Seek Assistance With Mobile Application Development From Many Different Sources



Base: 296 mobile application decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

Conclusions

Sterling Commerce, an IBM Company commissioned Forrester Consulting to conduct a research study to understand which mobile applications enterprises in five vertical industries are deploying, as well as the measurement tactics to identify the impact of these mobile applications on corporate initiatives. Each of the 296 study participants were responsible for making or influencing mobile application decisions in the corporation. Results show that enterprises are deploying mobile applications well beyond sales force, field service, or mobile commerce applications, and most firms are measuring the benefits of these mobile applications using various types of metrics.

- Enterprises deploy mobile devices to employees performing many functional roles.** Enterprises have deployed mobile devices (e.g., smartphones, netbooks, ruggedized devices, vehicle-mounted devices, RFID tags, etc.) to a wide variety of employees. Almost all the surveyed enterprises deployed mobile devices to executive management or IT professionals. In addition, many enterprises are deploying mobile devices to sales professionals or

administrative personnel, field service personnel, or to employees in supply chain, building security, or customer service functions. To support the range of mobile applications and devices necessary to deploy these applications, more than 75% of firms are supporting more than one mobile operating system.

- **Enterprises are deploying a wide range of mobile applications.** Enterprises are deploying mobile applications primarily to increase worker productivity, improve customer service and support capabilities, and generate new revenue streams. Examples of mobile applications used by firms include mobile field service or sales force applications and widely hyped mobile commerce applications. In addition, many companies are deploying mobile alerts for IT employees or customers and applications that appeal to companies in specific vertical industries such as supply chain management or order-tracking and fulfillment applications. The top mobile applications in each vertical industry vary dramatically and reflect the unique goals and processes that are particularly relevant to industry success.
- **Companies use many different metrics to validate mobile application benefits.** Nearly three-quarters of enterprises agree it's important to justify mobile application investment by measuring the benefits of each application. These measurement tactics vary widely depending on the type of mobile application deployed. For example, many companies capture the benefits of mobile billing and invoice settlement applications by showing faster ability to identify billing process issues or quicker invoice approval processes. Examples of order tracking benefits include reducing the number of order status inquiry calls and increasing the speed at which orders can be fulfilled.
- **Most companies seek external vendor assistance for mobile application development.** Approximately 50% of enterprises develop mobile applications in-house; however, most of firms also seek application development assistance from third-party firms. System integrators are the most common source of external application development help, but external application developers and mobile device management vendors are also used by many firms. The criteria to determine which vendor partners to use for mobile application development include ease of integration with back-end platforms, vertical application development expertise, and service-level agreements for mobile application availability.

KEY RECOMMENDATIONS

Enterprises are investing in and deploying a wide range of mobile applications to improve the productivity of employees in many functional roles of the organization. These mobile applications include broadly applicable sales force applications as well as a wide range of vertically focused applications that address specific requirements in the communications/media, distribution/logistics, manufacturing, and financial services industries. To successfully capture the benefits of these deployed applications, enterprises must:

- **Measure the benefits of deploying mobile applications across business processes.** It's critical for enterprises to measure the benefits of each mobile application deployed. These benefit measurements should calculate the benefits of mobile applications across corporate business processes. For example, mobile applications for the sales force improve the business-selling process by providing sales reps with access to up-to-date customer information while they are away from the office and enabling them to easily answer questions about order status during customer meetings, which reduces the number of calls to the customer service center. Also, manufacturing plants can use mobile inventory management, order processing, and invoicing applications to stock, control, and ensure the availability of parts and raw materials as well as to provide workers with real-time, accurate, information while on the production line floor.
- **Design mobile applications with end user requirements in mind.** Benefits achieved from mobile application deployment are dependent upon employees using these capabilities. However, many mobile applications are underused because employees have difficulty accessing the applications and using nonintuitive interfaces. If workers have problems using mobile applications or do not use them appropriately, the benefits from these applications will be underestimated. Facilitating employee adoption requires developing an intuitive, easy-to-use application interface.
- **Consider unique vertical market requirements when determining the mobile application strategy.** When identifying and prioritizing which mobile applications to deploy, it's critical to consider industry-specific requirements. For example, mobile applications that are particularly relevant in the retail industry (e.g., in-store inventory management and warehouse and logistics) are not very relevant to financial services firms. In comparison, mobile alerts for IT employees are widely applicable across many different industries and have been implemented by nearly 45% of enterprises in all of the surveyed enterprises.
- **Account for various mobile application utilization rates.** It takes time for employees to get familiar with adopting new mobile applications, and this must be incorporated into adoption scenarios for each mobile application. Each adoption curve for mobile applications must consider the usage profile for particular types of employees in the organization (e.g., IT, field service, customer service, etc.). To help increase employee adoption of mobile applications, enterprises must invest in training employees on how to use these applications. It's also important to incorporate the "what's in it for me" benefits of using these mobile applications during the training sessions.

Appendix A: Study Methodology

At year-end 2009, Sterling Commerce, an IBM Company commissioned Forrester Consulting to conduct a research study to get an in-depth understanding of the use of various types of mobile applications among enterprise organizations with corporate headquarters in the US, Canada, UK, Germany, France, or Brazil. These decision-makers were responsible for making or influencing mobile application decisions in enterprises with a minimum of \$250 million in annual revenues. The specific vertical industries focused on in this study are: communications/media, distribution/logistics, financial services/banking/insurance, manufacturing, and retail.

Study Objectives

The study used a combination of quantitative and qualitative interviews with IT decision-makers who are responsible for developing, influencing, or implementing the mobile application strategy for their enterprise organizations. An online survey of 296 mobility decision-makers in the targeted enterprises as well as in-depth interviews with five mobility decision-makers in the targeted enterprises were conducted. The key objectives of this study are identified below:

- Identify the types of mobile applications enterprises are deploying to help them connect, communicate, and collaborate with partners, suppliers, customers, and employees.
- Articulate how the benefits of mobile applications are measured to validate their impact on business processes in the following industries: communications/media, distribution/logistics, financial services/banking/insurance, manufacturing, and retail.
- Provide real-world examples of how enterprises are incorporating mobile applications into their overall strategic initiatives.

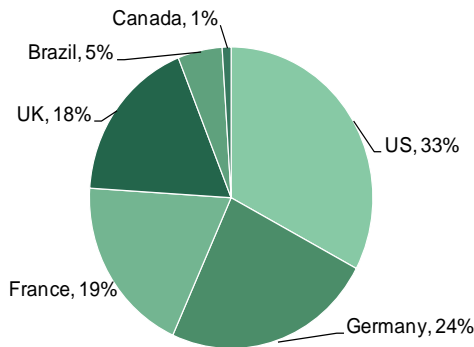
Respondent Profile

To gather insight into the mobile application deployment and measurement initiatives of enterprise organizations, an online quantitative survey was conducted with 296 decision-makers who are responsible for making or influencing mobile application decisions in their organizations. These enterprises are headquartered in the US, Canada, UK, Germany, France, or Brazil and had a minimum of \$250 million in annual revenues. Each enterprise represented one of the following vertical industries: communications/media, distribution/logistics, financial services/banking/insurance, manufacturing, and retail (see Figure A1). The respondent sample size in each of the five industry categories was large enough to ensure that statistically significant quantitative survey results were achieved in each industry category. In-depth interviews lasting approximately 45 minutes each were conducted with five mobility decision-makers in the targeted organizations to gather additional details into corporate mobile application deployment activities and measurement initiatives.

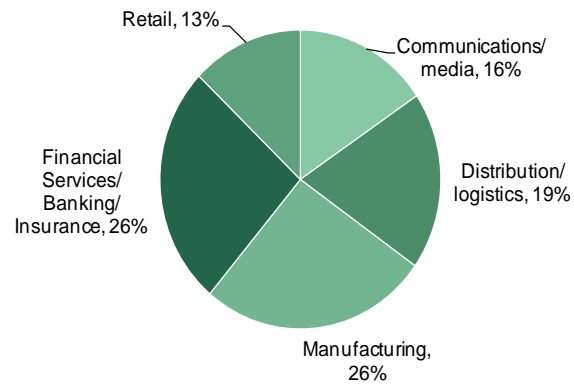
Figure A1

Geographic Location And Vertical Market Segmentation Of Quantitative Survey Respondents

In what region of the world is the company you work for headquartered?



In which industry does your company belong?



Base: 296 mobile application decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Sterling Commerce, an IBM Company, February 2010

The study evaluated corporate use of, deployment plans for, and measurement initiatives related to a wide range of mobile applications that are relevant to organizations in the identified vertical industry categories. A complete list of the mobile applications included in this study is identified below.

- Field service and field sales force.
- Order tracking, management, and fulfillment.
- Supply chain management.
- Transportation and shipping management.
- Warehouse and logistics management.
- RFID or M2M applications.
- Location-based applications (e.g., AVL, GIS).
- Mobile supplier or partner applications.
- In-store inventory management and retail operations.
- Payment management applications (e.g., approvals, exceptions).

- Billing and invoice settlement.
- Mobile commerce applications.
- Mobile alerts for IT employees (e.g., track system status).
- Mobile alerts for customers.
- Mobile alerts and applications for file transfer status.

Appendix B: Enterprise Mobile Application Deployment Case Studies

Companies are taking a variety of different approaches to deploying mobile applications within their organizations. In-depth interviews with five companies show that enterprise organizations are at varying levels of maturity when it comes to deploying mobile applications. A summary of each of these enterprise mobile application case studies is included below.

Case 1: Telecommunications/Utilities Firm

Company profile: This is a US-based energy manufacturing company with 3,500 to 4,000 employees. This company supports 24 power plants and 60 service centers responsible for ensuring continuity of service to customers in four states.

Mobile application deployment strategy: This firm deploys mobile devices to about 1,000 employees, and approximately 90% of this firm's mobile employees are service center personnel who travel from site to site. This company is in the process of standardizing on a BlackBerry platform, and about 50% of all mobile devices are currently BlackBerry smartphones. The mobile application deployment process is on the bleeding edge of technology for this organization. Mobile applications deployed include:

- **Productivity applications.** Mobile applications to improve the productivity of in-house workers include sending and receiving email, viewing calendars, looking at Excel spreadsheets, and sending instant messages.
- **Mobile applications for service center trucks.** Maps, weather alerts, address books, city guides.
- **Application pilots.** The company is piloting a GPS/AVL application with about 200 service center employees who work on trucks in three service centers located in heavily populated regions. This mobile application was developed using a combination of in-house developer and third-party application developer expertise. The in-house developers customized the application to address unique requirements of the utilities industry.

Mobile application measurement activities: Prior to piloting the GPS/AVL application in the service center trucks, service personnel lost 15% to 20% of their productive time in a given week. The GPS/AVL application deployed in pilot-program trucks enables the utility company to determine truck location, how long it takes to get to a designated site, and how long service personnel spend at each site. Initial results from the pilot program show that this mobile application has improved the efficiency of each truck crew by 10% and eliminated 1 hour of downtime per truck crew each week.

Future mobile application plans: In the future, the company is considering deploying an application that enables firms to click to order brochures, check to identify the location of the closest service center, and receive mobile alerts for weather events.

Challenges with deploying mobile applications: A key issue with mobile application deployment is getting buy-in from the older workforce, many of whom have been with the company for 20 to 30 years. The use of mobile devices and applications is new to these veteran workers, and some workers are extremely resistant to using these mobile solutions. Younger workers tend to be more enthusiastic about mobile application usage. Strong sponsorship from the executive team is necessary to overcome resistance from the workforce.

Case 2: International Equipment Manufacturing Firm

Company profile: This international equipment manufacturing firm with more than 5,000 employees develops custom equipment used for construction and manufacturing processes. The company is headquartered in the US, with offices throughout the world.

Mobile application deployment strategy: This manufacturing company deploys mobile applications to two primary types of employees. One category of mobile employees are about 100 sales professionals who work with clients to identify and develop equipment solutions that address their requirements. The second category of mobile application users are 1,000 employees who work on the installation and implementation process. These employees spend a lot of time on the road and are involved in the building, testing, and implementation of the equipment solutions. The company primarily uses third-party applications from external vendors but does do some in-house customization of these applications to address unique requirements:

- **Productivity applications for sales professionals.** Sales professionals use notebook computers with an Apple operating system, and they also have BlackBerry smartphones. These sales professionals show the client what the project design plan is using their notebook computers. In addition, these employees use presentation tools on their smartphones (e.g., finance applications).
- **Order-tracking and management process.** RFID applications are used for order tracking and order management through the supply chain process.
- **Billing and invoice management applications.** Accountants can use their mobile phones to see what options the client has selected for their payment plans.
- **Customer-facing mobile applications.** Customers can look at their iPhone to look at the overall specifications and see what the status is on the project.

Mobile application measurement activities: Benefits achieved from mobile application deployment include improved scheduling of employees who need to be on-site to put equipment pieces together. The mobile tracking application enables the firm to know when all of the parts for a piece of equipment are on-site so that employees involved in assembly can be on-site at the appropriate time. This parts tracking process saves money on travel. Prior to implementing this application, 15 or 20 times a year assembly crews of at least three people would show up at a national or international site to assemble the equipment, only to find that all of the pieces had not arrived. Now that the RFID tracking application has been deployed, these installation scheduling mistakes only occur one or two times per year, which saves many thousands of dollars in travel expense.

Challenges with deploying mobile applications: One key challenge is determining which third-party vendors to use for mobile application development assistance. “We are still learning which application vendors can perform to our expectations and which ones can’t. Some vendors will over-promise, but when it comes down to it they do not meet expectations.” Security concerns are also an issue. It’s important to have a very strong security system in place, especially for mobile extensions of financial applications. “We are still in the early stages of deploying mobile applications over the past two years. To compete in the future our deployment of mobile applications must be expanded.”

Case 3: Transportation/Freight Shipping Organization

Company profile: A US-based freight shipping company.

Mobile application deployment strategy: This freight shipping firm is in the very early stages of mobile application deployment and is considering mobile CRM application deployment. Customers are generally smaller businesses that ship products to large retailers.

- **Application pilots.** The company is seeing a significant increase in the use of iPhones to access its Web site, so it's in the process of determining whether it would be useful to develop an iPhone application for customers. The company has done some internal "skunk work" development to demonstrate shipping applications over the iPhone platform. Developing an iPhone application is also a marketing play because iPhone has the "cool" factor, and the company wants to be associated with the iPhone brand. Developing an iPhone application for customers will also position the company as "forward-thinking" because the sales teams could show this application when they are with customers. Potential partners for developing the customer-facing application would be creative or marketing agencies the company is already working with. These agencies have worked on the company's print ads or Web site, and it would be important to have a similar look and feel to the customer-facing mobile application.

Future mobile application plans: The company is considering deploying a mobile CRM application on BlackBerry devices at mid-to-end of 2010. This mobile CRM application will enable sales professionals to track shipments on their mobile devices. These applications would be developed by third-party vendors. Right now there is not a separate business case for the mobile CRM application. The mobile application and associated benefits from this application would be included as part of overall CRM process improvements.

Challenges with deploying mobile applications: Right now mobile application deployment is not a key focus for the organization. The difficult economic environment has forced the company to put mobile application initiatives on hold and to focus on core issues. Once the economy and business environment improves, there are plans to pursue mobile application deployment more proactively.

Case 4: Wholesale Distributor Of Electrical Parts

Company profile: This firm is an operating company of a US-based wholesale distributor of electrical parts. The company has 28 locations that distribute electrical parts to contractors in the Midwest. The parent company has 5,000 employees and 13 operating companies.

Mobile application deployment strategy: In general, electrical contractors are "low tech." Many of the electrical contractors who are customers do not use mobile applications, so developing customer-facing mobile applications is not a critical focus. This company does not have in-house mobile application developers; instead, the corporate strategy is to use third-party vendors to help develop mobile applications. The company does not officially support the iPhone and is not planning to deploy mobile applications for the iPhone.

- **Sales force applications.** There are 125 outside sales force personnel located in 28 different locations. These sales force reps use BlackBerry applications from a third-party vendor to increase their productivity.
- **Mobile applications for IT.** The IT department receives mobile alerts when there is trouble with the network.

- **Mobile applications for trucks.** An RFID tracking application uses an attachment to Nextel mobile phones that scans the packing slip and captures the delivery status of electrical parts. There is also a GPS tracking application to track the location of trucks.

Mobile application measurement activities: The GPS tracking application enables the company to reroute trucks to address weather issues more quickly and as saves money on fuel costs, maintenance fees, and vehicle insurance.

Future mobile application plans: The company is working on an application that will automatically send a message to the ERP system in real time once a product is delivered to its end destination. Customers would then be able to receive mobile alerts on their phones so that they can track the status of their order.

Challenges with deploying mobile applications: Seamless network coverage is the key challenge with deploying mobile applications. The Midwest region covered by this company has many remote areas, so providing seamless network connectivity is a big issue. Back-end system integration is also an issue because the applications need to be integrated with various ERP systems and network infrastructure. “We are willing to pay extra money for a good system integrator and application developer expertise because they are there for me when I am having trouble.”

Case 5: Wholesale/Retail Product Distributor

Company profile: This is a US-based company that distributes products to wholesale distributors and retail sites.

Mobile application deployment strategy: This wholesale/retail distributor has been deploying mobile applications for the past three years, but the momentum for mobile applications has picked up significantly in the past year. This company outsources its mobile application development activities to an offshore partner.

- **Customer facing mobile applications.** The company has implemented an iPhone and Google/Android mobile commerce application that lets customers purchase and order products using their smartphones.
- **Warehouse management applications.** Windows Mobile RFID applications are used to scan products in each distribution warehouse. A third-party vendor provides the technology platform that ties information from the mobile warehouse applications into the back-end systems.

Mobile application measurement activities: Currently, the revenues generated from the mobile commerce applications are too small to be significant.

Future mobile application plans: Future mobile application plans include deploying mobile IT alerts over BlackBerry devices to identify system failures, track delivery alerts, view status reports, and approve change control processes. In addition, the company would like to deploy a mobile application that lets delivery personnel send an SMS message to notify the firm when a delivery has occurred. This mobile application is not a priority right now, because currently the mobile devices are expensive and it would be too costly to provide each delivery driver with a mobile device.

Challenges with deploying mobile applications: Small, boutique firms developed the customer-facing mobile commerce applications, and not all of these firms had the expertise to successfully develop the applications. In addition, the RF guns are expensive, which limits their deployment. There is also the cost of training employees. Wireless security and wireless performance within the corporate network is also an ongoing challenge.