



Mobile Computing for Field Service

Making Face-to-Face Customer Interactions Profitable

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Mobile Computing for Field Service

Making Face-to-Face Customer Interactions Profitable

Why field service mobilization is a corporate priority

Given today's intense pressure for revenue and profit growth, most corporations are focusing mobile computing initiatives on two areas that promise immediate return on investment: salesforce automation and field service.

The rationale for focusing on the salesforce is obvious—these are the people generating the company's revenue, and mobile solutions enable them to close more deals faster. But why field service? Why are IT investments in an area long regarded as a cost center increasing by more than 50% a year? (source: PDA, Inc./Field Force Automation 2000).

The reason is that mobile computing for field service dramatically reduces the cost of what is often a company's most expensive interaction with customers. At the same time, it can be used to generate revenue from one of the few times businesses engage in face-to-face dialogue with their best prospects—satisfied customers.

“By 2005, 61% of large and medium-sized corporations will support their field service operations with wireless access and support...”

—Blumberg Associates, Inc., 2000

By ensuring that customers are happy with service experiences, companies increase the chances of customer retention and expand the lifetime value of customer relationships. By turning every service call into a sales opportunity, companies produce incremental revenue—and do it at almost zero cost of sales. As a result, mobile solutions for field service can maximize account profitability and substantially improve the corporate bottom line.

This paper examines how handheld computing is enabling the transformation of field service from cost center to revenue producer. We also look at ways to increase service worker productivity, reduce the cost of sending people on site, and improve logistical coordination of all the dynamic variables—customer requirements, service level agreements (SLAs), personnel skills and availability,

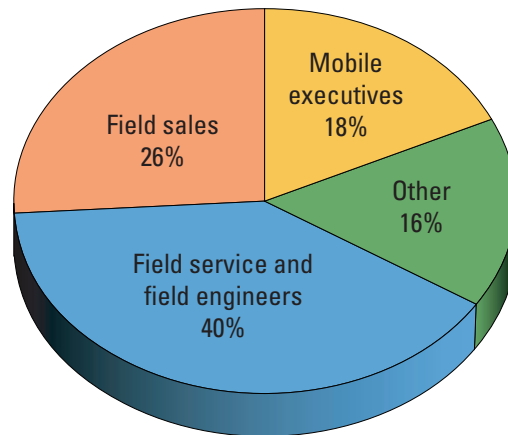
third-party providers, technical and regulatory guidelines, etc.—that go into successful service delivery.

“Field support applications are emerging as an important enterprise testing ground for wireless technology mostly because the benefits are so clear.”

—Dennis Gaughan, AMR Research, quoted in eWeek, August 2000

The results being achieved in mobile field service are important in their own right—field technicians and engineers represent 40% of all mobile workers in the U.S. (Figure 1). In addition, as one of the first areas of the corporation to implement handheld computing, field service is gaining know-how and insights that will be useful to other departments and lines of business.

In this paper, we share the experience of our customers. Users of Palm Powered™ solutions represent the vanguard of field service mobile computing. Of those companies that have standardized on a platform and provide them to their users, 80% have chosen Palm as the standard platform, according to a META Group survey conducted in September 2000. In “Three Basic Principles for Mobile Field Service Success” (page 8) and “Quick Guide to Mobile Field Service Applications and Their Benefits” (page 11), you have the opportunity to learn from what these successful companies know.



Source: The Yankee Group, 2001 Survey Analysis

Figure 1. Distribution of Mobile Workforce

Two business trends affecting field service delivery

The Internet era has brought new challenges and opportunities

At the root of the changes transforming field service are two trends unleashed by the Internet.

Rising customer expectations for personalized service

Today we routinely interact with Web sites that know all about our past transactions and purchasing preferences. We dial toll-free numbers and speak with call center representatives who have our account status and entire service history at their fingertips. While not all companies have done a good job of taking advantage of the technology, the Internet makes possible an astonishing level of knowledgeable, individualized, and proactive customer care.

As a result of these online and telephone interactions, customers bring a heightened set of expectations to field service experiences. Shouldn't field technicians be fully informed about the account and order? Shouldn't they know the customer's history and preferences? It seems incongruent that face-to-face interactions—the most personal of all—are frequently the least personalized. It's irritating when, as sometimes happens, field technicians arrive with incomplete information about job requirements, even though customers have spent time on the phone or the Web specifying those requirements in exhausting detail. It's inexcusable that customers are often forced to play the role of knowledge keeper and coordinator, filling in field technicians on what has been discussed with sales or customer service personnel and correcting mistakes made in the relay of information between internal departments.

Unfortunately, those who interact most closely with customers may have the least access to customer information. Away from their desks and LAN access to internal databases, field technicians may be unaware that the customer has recently made a change to the work order or that a replacement part needed to complete the job has suddenly gone out of stock.

To bridge this gap between expectations and fulfillment, companies are looking for ways to provide field service teams with the same access to information they would have at their desks back at the

office. The expanding range of handhelds and handheld-accessible applications and services provides the means.

Increasing corporate awareness of service cost—and profit potential

The Internet has created the means for companies to offer Web-based self-service. With this opportunity has come an acute awareness of the relative costs of providing other types of customer care. A number of analysts have published comparative figures, with estimates that indicate that business-to-business (B2B) customer support costs on average approximately \$1.00 per Web-based self-service transaction, \$10 per email contact and \$30 per phone call. Sending a field technician on-site, of course, is most expensive of all (Figure 2).

Handheld computing—by optimizing scheduling and routing, eliminating time-consuming, paper-based work order processes, and streamlining parts ordering, reporting and billing—can dramatically reduce the average cost of a field service call. One large service company, for example, expects to save more than \$1 million a year just by transmitting trouble tickets over wireless links and thereby cutting the time it takes to respond to service requests.

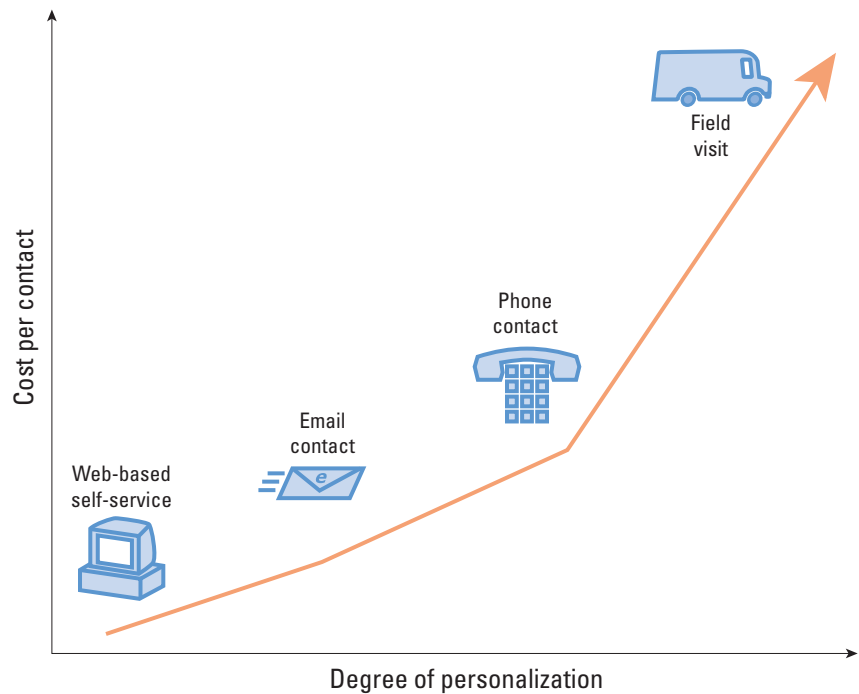


Figure 2. Cost of Delivering Service

At the same time, awareness of costs has also motivated companies to look for ways of offsetting cost through revenue generation. The thinking goes, if you're going to deploy your most personalized and most expensive mode of service delivery, you'd better be able to produce a significant return on that investment!

Field service calls may be the only face-to-face interaction a customer will have with a company, making them a golden opportunity to sell additional products and services. In addition, if performed properly, the end result of a service call is a satisfied customer—and satisfied customers are more likely to buy than anyone else.

Savvy companies, as a result, have begun to view field service as an extension of their salesforce. They're providing field technicians with mobile information that helps them sell complementary products and offer customers appropriate packages, promotions, and discount plans. They're equipping handheld computers with prompts and checklists that make it easy for technicians to capture information during the service call that the company can use to better serve the customer and tailor its offers in the future.

Profiting from your most costly customer interactions

Face to face service can be both cost-efficient and revenue producing

Handheld solutions enable companies to meet customer expectations for more responsive, personalized service while making field operations highly profitable (Figure 3). By decreasing per-call costs while increasing the direct or indirect effect of field service on the revenue stream, handheld computing often produces rapid return on investment.

Here are some examples of results companies are getting with handheld computing today:

- Goodrich Aerospace (formerly BFGoodrich) is a leading supplier of aerospace components, systems and services. The company's Aviation Technical Services division is utilizing a mobile field service application from Perceptive Solutions, Inc., which lets Goodrich inspectors write non-routine aircraft maintenance tasks electronically. The application, running on Palm Powered Symbol SPT 1746s handhelds, interfaces with the company's backend enterprise systems. "The benefits of using Perceptive's Palm Powered solution

"If done correctly, wireless can certainly have a huge immediate return to the bottom line. [It can pay for itself] in a few weeks..."

**—Giga Information Group,
quoted in eWeek 8/7/00**

have been immediate relative to improved, more efficient paperwork processes. This correlates to shortened turn times of aircraft heavy maintenance and modification visits,” says Jim Gahagan, Senior Director of Information and Technology Services.

“The immediate and measurable return to the enterprise for mobile field service handheld solutions is compelling, both in financial terms and in organizational efficiency, effectiveness, and competitive advantage. Most solutions paid for themselves in less than six months.”

—Aberdeen Group, June 2001

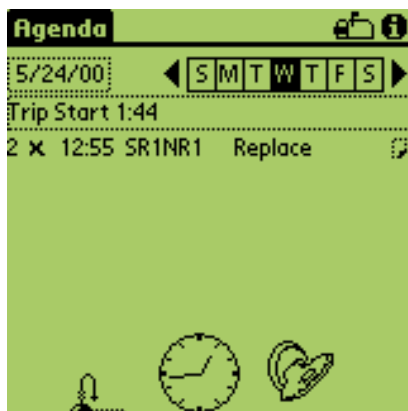
“For field service, adoption is easily justified.”

—The Yankee Group, 2001 study on use of mobile technologies for vertical applications

- Whirlpool Corporation, the world’s leading manufacturer of major home appliances, continually looks to provide products and solutions that assure customer success. Whirlpool’s Commercial Laundry Division developed a mobile service solution which runs on Palm handhelds. Commercial laundry customers, such as laundromat owners and route operators, can simply point their Palm handhelds at the electronic display on a machine to perform a variety of functions—collect operational data, perform machine software upgrades, or adjust settings such as vending price, cycle time, or water temperature. Data is transmitted via the infrared beam on the handheld, enabling efficient and accurate information exchange and data collection. “We chose to deploy our service solution on the Palm platform because of its low cost and open architecture. Palm handhelds make it easy, efficient, and economical to manage the operational data on our commercial laundry equipment,” said Ron Li, Brand Manager, Whirlpool Commercial Laundry Division.
- A major plumbing company achieved an approximately \$8400 net incremental profit per worker by increasing billable hours while cutting mileage and fuel costs using etrace™ software from Gearworks™ on a Palm OS® platform device.
- Alpha Microsystems, an IT service company, developed FieldConnect™ to improve the productivity of its 100 or so field technicians. The software, which provides knowledge base access and real-time service reporting and customer signature capture, has boosted productivity by 25%. At the same time it has reduced the company’s communication costs by 60% and its call center staffing requirements by 40%. FieldConnect is now commercially available for Palm Powered handhelds.
- NovaMed, a company that services medical equipment, has boosted the productivity of field technicians by 30%. Technicians use Palm III and Palm V handhelds with wireless modems to complete the large amount of required legal documentation while still at the customer site, so they’re free sooner to respond to the next service request. In addition, the company’s average time for submission of a completed work order has gone from 2-3 weeks to 2-3 hours, eliminating opportunities for error that result from lag time, reducing compliance risk, and accelerating billing and cash flow.

- Pure-Chem is a small residential pool inspection company whose business “depends on being quick and efficient.” They use Palm V handhelds to help their field service people inspect some 660 pools a year while responding to phone inquiries from customers all day long. “Instead of searching through 15 route books to find the right route card with information specific to the customer’s pool,” says one technician, “I just type the first three letters of the last name, and all of the customer’s records appear on my Palm; I can give the customer test results in about two seconds. As a result, I can handle more service calls.”

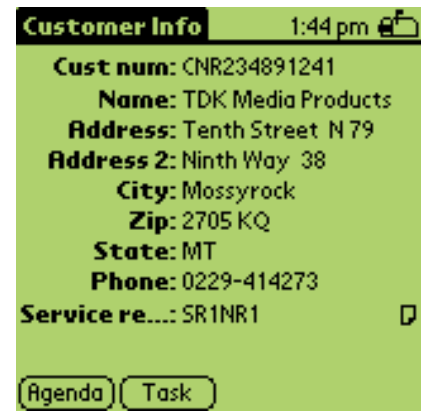
Using Oracle Mobile Field Service on a Palm Powered™ handheld...



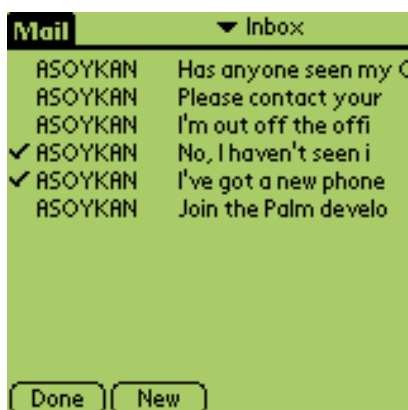
...the field service engineer accesses the day's agenda, and any changes to it while on the road...



...receives detailed information about the job...



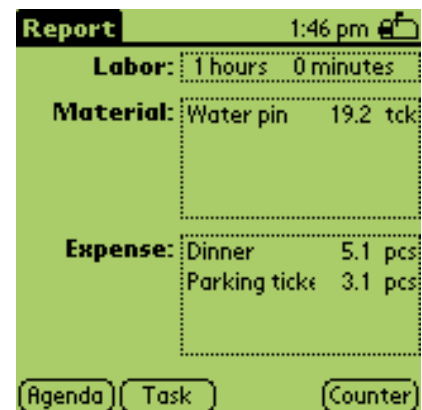
...and the customer...



...checks email...



...enters task- or test-related data...



...quickly captures labor, materials and expense details.

Figure 3. Continuous Contact Throughout the Work Day

Three basic principles for mobile field service success

Successful field service solutions share these key characteristics

There are many ways to put together mobile solutions, and a wide range of new handheld computers, peripherals, and services in the market. No matter what your company's requirements and choices, however, following some simple guidelines can steer you to a profitable outcome. In our customers' experience, a successful mobile solution does three things:

1. Goes where the work is

Good field service solutions go where the work is and never interrupt work processes or get in the way of interactions with customers. Laptops, which are heavy to lug around and take time to boot up, don't always fit the bill. Handhelds, in comparison, are far more portable. They're light and small enough to tuck into a pocket or bag. They travel easily to the point of service, whether it be down in a basement to check a wiring hub, up on a roof to perform maintenance on a generator, or under a desk to replace a faulty hard drive. And most handhelds have always-on or instant boot features, so there's no delay when information is needed.

Several handhelds are also ergonomically designed for ease of use, including use by technicians wearing gloves. They're ruggedized so they can withstand extreme working environments or just being tossed on a truck dashboard day in and day out. They're equipped with hands-free features, such as holsters or neck straps, that enable users to access information while handling other tools. They incorporate backup power sources in case batteries die where there's no access to electrical adapters or rechargers.

Handhelds and the applications that run on them need to support rapid computing on small screens while enabling field service personnel to remain engaged in conversations and service procedures. Handhelds should offer a variety of easy input modes (touch screen, stylus, snap-on or fold-out keyboard, etc.) and a display that is large enough to accommodate buttons, checklists, icons, and even small diagrams. The handheld operating system should hide menus not relevant to the task at hand. Applications should deliver just top-level content initially, while providing clear drill-down paths for more detail.

2. Provides real-time and off-line access

Field service staff may need to go where real-time wireless connection to corporate databases is unavailable—rural areas, shielded buildings, elevators, tunnels, basements, etc. It's important, therefore, to select a handheld platform with a complete operating system capable of storing content and running native applications locally. For example, a field technician repairing a fan 20 ft. inside a ventilation duct will get the job done faster if he doesn't have to stop and climb out of the duct every time he needs to access a maintenance manual or diagnostic aid over a wireless network.

In addition, even where network coverage is available, relying 100% on real-time access isn't efficient from the point of view of bandwidth utilization or worker productivity. Wireless connections (which today max out at speeds of under 30 Kbps) are ideal for small pieces of data that change frequently and whose value depends on timeliness—trouble tickets, for example. Sending alerts warning technicians when schedules change is another good use of wireless networks. (A rule of thumb is to restrict wireless use to queries less than 100K to databases of less than 32MB.)

Larger amounts of data that change infrequently can be tedious to receive over wireless links. It's easier, for example, to download a parts inventory database or customer information from home over a broadband connection or over an office LAN before leaving for the day. Such material could also be carried on a Secure Digital Card or MultiMediaCard, both of which store large volumes of data on a chip the size of a postage stamp that can be quickly popped into the handheld's expansion slot.

Native applications running locally on handhelds can make intelligent decisions about when and how to use networks. They can save bandwidth and user time by performing calculations and other processes locally where that makes sense and, when it's necessary to access corporate servers, by updating only those fields of information that change rather than refreshing entire screens. They can also select the best type of network connection available at any given moment for the type of content to be transmitted—using infrared, for example, to transmit a small piece of data from a handheld to a nearby PC or infrared port, rather than going out to a wireless service provider's network.

Similarly, in the field, when a real-time connection is not available, the handheld application can decide to store the information input

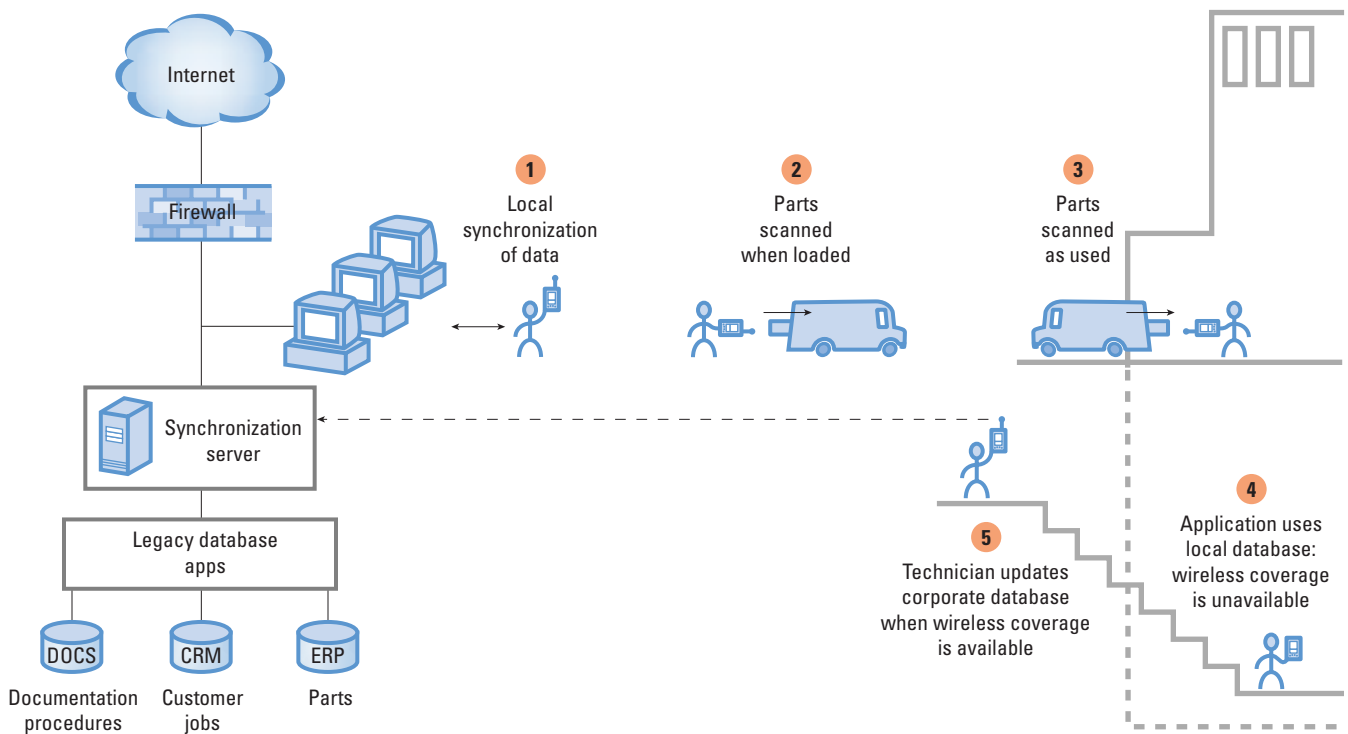


Figure 4. Field service connectivity

by the technician—a work order with a customer signature, for example. When the technician moves back into network range, the handheld automatically uploads the stored data and completes the transaction with the company’s central servers (Figure 4). At the same time, any data the handheld application has requested—such as an order confirmation—is automatically downloaded to it.

3. Gets the job done on the spot

When all information is at hand and computing can be performed regardless of network coverage, field service staff have a much better chance of accomplishing the entire job done at the customer’s site on the first call. They can check inventory, for example, order and reserve parts, confirm delivery dates, and capture customer signatures on service contracts and purchase orders. Customers are happier, and companies cut costs by minimizing return visits, follow up phone calls, redundant data entry, and other clerical work back at headquarters.

In addition, because field technicians use handhelds while doing work, not just afterward to report on it, the information captured

tends to be more accurate. Customers aren't annoyed by billing errors, and companies don't waste time going back to try to research and fix problems. Contract, warranty, and regulatory compliance improves, reducing risk exposure.

Quick guide to mobile field service applications and their benefits

A survey of the ways companies are using handhelds for field service

Applications

Get to the customer sooner

Rapid dispatch. Immediate transmission of work orders to technicians in the field; communicate changes to schedule or work orders in real-time.

Logistics management. Ability to stay in continuous contact with mobile workforce improves service management visibility into availability and location of employees and contractors; automatically match up customer service level agreements (SLAs) and schedules with resources.

Automatic scheduling and routing. Technicians can download schedules and routes with work orders. Wirelessly enabled handhelds can receive route updates throughout the day in response to changing priorities or traffic and weather conditions. Technicians can also pop an expansion card containing interactive roadmaps into handhelds and connect to global positioning system (GPS) modules to help with navigation in unfamiliar regions.

Better preparedness. Field service personnel arrive at the customer site fully prepared to solve the problem (Figure 5). Handheld carries everything company knows about the customer, the product, and the problem. Can drill down from electronic trouble tickets to details on customer order and service histories, work in progress status, SLA terms, and warranty status and repair policies on every piece of customer-owned equipment.

Solve most problems in the first visit

Mobile knowledge base. Handhelds bring the expertise of the whole organization to bear on every service call. Technicians can access company, partner, and external information sources from a single working environment. Perform full-text searches of repair and maintenance manuals. Provide diagnostics and troubleshooting tips. Step through suggested procedures, while inputting results, measurements, and device readings (from snap-on instruments such as meters and water probes). Companies can improve performance and enforce policies by "baking into" handheld applications corporate standards and best practices.

Cost Savings

Improves resource utilization; reduces scheduling errors and misunderstandings

Improves resource utilization and accuracy when making service commitments to customers

Eliminates need for technicians to produce own schedules and routes; reduces time wasted in traffic and searching for customer locations

Speeds time to resolution

Improves service consistency and quality

Revenue Generation

Increases number of service calls that can be completed in given period of time

Improves punctuality and allows narrower scheduling windows, boosting customer satisfaction

Enables technicians to provide more personalized, knowledgeable service;

Increases first-call problem resolution, improving customer satisfaction

Quick guide to mobile field service applications and their benefits, continued

Applications

Access to help from colleagues back at the home base. Field workers who get stumped can use email or instant messaging to get real-time help. Expertise in specific areas can be shared efficiently with the entire mobile workforce.

Dynamic provisioning. Immediate field access to parts information such as price, availability for shipping, tracking number, and repair and warranty policies. Mobile workers can reserve in-stock parts, generate purchase orders and access online supplier catalogs for those that aren't. While still with customer, technician can commit to delivery dates, open new work orders, and schedule return visits.

Parts tracking. Parts can be scanned by barcode readers when moved from service depot to truck, truck to customer, or truck to truck. If a technician locates a needed part on another truck just a few miles away, he can send a wireless message to his colleague and arrange to get the part quickly.

Ensure a positive end-to-end customer experience

Electronic tracking of the entire service process. From issue of work request through completion of job, track everything that goes into and comes out of the service process: labor, travel, parts, amounts and types of materials consumed. Mobile applications make data easy to capture, as an integral part of service delivery.

Contract and warranty management. Incorporating guidelines into mobile applications helps field service personnel abide by service level agreements and warranty terms. Mobile solutions allow immediate escalation of service requests at risk of not meeting contractual terms.

Improved regulatory compliance. Incorporating regulatory guidelines into electronic forms and step-by-step processes makes compliance effortless mostly transparent to workers. As data is uploaded from handhelds, compliance applications at the central office can automatically pull the fields necessary for generating reports.

Streamlined reporting and billing. Technicians input service call data while at customer sites, eliminating clerical work. Time and billing data automatically captured by handhelds can be transmitted to accounts receivable in real time over a wireless network or synchronized at the end of the day. Some mobile applications even incorporate automatic invoicing based on contract terms with on-the-spot printing.

Turn every service call into a sales opportunity

Appropriate buying opportunities. Mobile applications can prompt technicians to make customers aware of complementary products and services and offer them specials, discounts, and deals. They can provide detailed information about products, pricing, and availability. They can automatically select the right offers for particular customers based on their profile and purchase history.

Cost Savings

Reduces mistakes; eliminates calls from technicians into service center; supports "just-in-time training" for rarely performed tasks; decreases amount of training required for new hires

Improves inventory management, reducing carrying and depreciation costs

Improves parts management; reduced property loss and theft

Improves productivity and management visibility into technician activities

Reduces risk of contract breach

Reduces compliance costs and exposure to risk of penalties and litigation

Eliminates manual data entry; reduces billing mistakes and costly manual reconciliation

Increases revenues per customer at very low cost of sales

Revenue Generation

Increases first-call problem resolution, improving customer satisfaction

Improves satisfaction by letting customers know exactly what the next step will be and when it will take place.

Speeds problem resolution

Expands data available for continuous quality improvement

Improves customer satisfaction

Improves reporting and billing accuracy; accelerates billing cycles and improves cash flow

Quick guide to mobile field service applications and their benefits, continued

Applications

On-the-spot closing. Technicians can close deals—capturing customer signatures on purchase orders and confirming delivery dates—on the spot.

Customer information capture. Handhelds can prompt technicians to input information on potential future sales opportunities. Data can be automatically forwarded to sales or direct marketing departments for later action.

Cost Savings

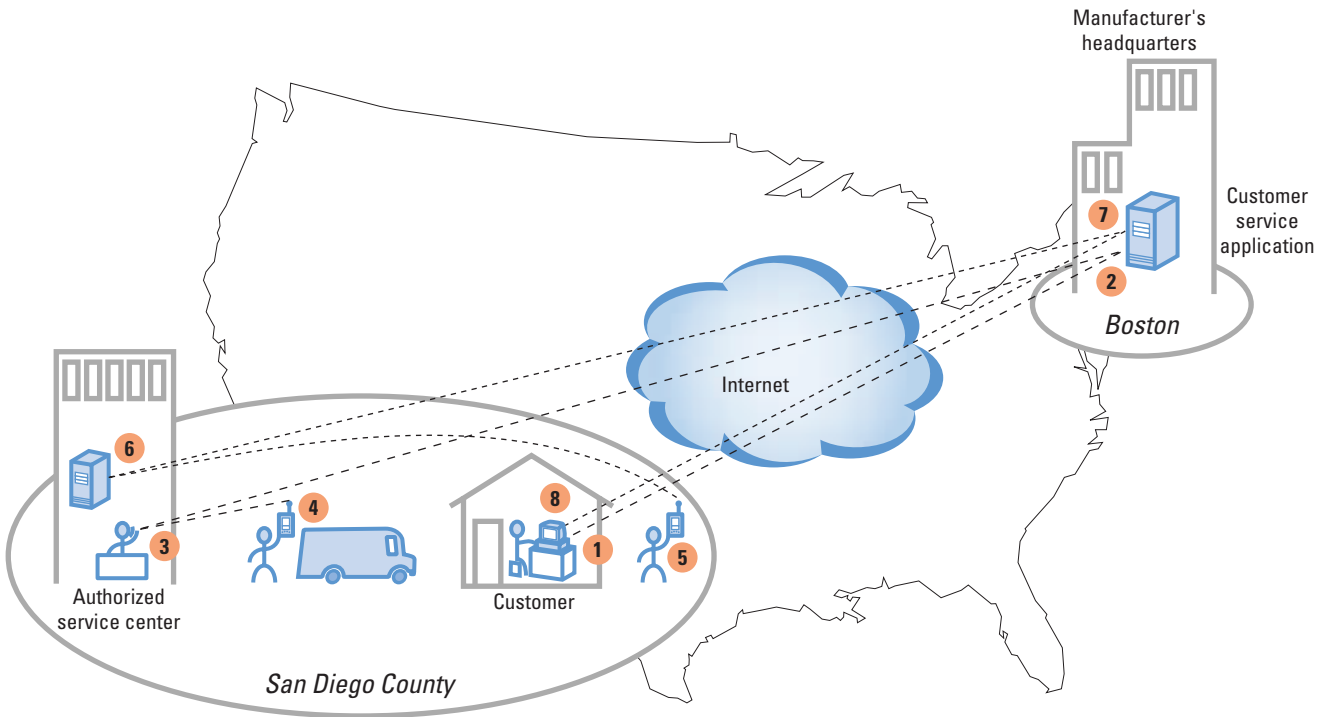
Reduces cost of sales

Reduces need for customer interviews, focus groups, and other forms of market research

Revenue Generation

Shortens sales cycles

Increases visibility into customer requirements; improves targeting of offers to individuals



- 1 Customer enters a service request at manufacturer's Web site.
- 2 Manufacturer's customer service application receives request and forwards it automatically to the authorized service representative in the customer's area.
- 3 The authorized service center receives the request, opens a work order, and transmits it over a wireless network to a technician in the field.
- 4 The technician receives the work order and telephones or emails the customer to make an appointment for later in the day.
- 5 The technician makes the service call and, when completed, transmits time, labor and parts billing information back to the service center.
- 6 The service center sends a message letting the manufacturer know the problem has been resolved.
- 7 The manufacturer sends an email message to the customer, asking if she was satisfied with the service.
- 8 The customer replies by email.

Figure 5. Accelerating Time to Resolution

The Palm advantage for mobile field service

We can help you make providing personalized service more profitable

Palm and its partners have the solutions you need today to deploy handheld computing throughout your mobile field service workforce. Nobody offers you a wider range of products with proven performance and reliability in the field.

Advantages of Palm Powered™ solutions—some highlights

- The wide range of products in the market running the Palm OS® platform lets you deploy field service applications flexibly across your choice of handhelds and meet the specific needs of workers. Choose from Palm-branded handhelds as well as products from Symbol (including the ruggedized Symbol SPT 1700), Sony, Kyocera, Handspring, IBM, and TRG. (Future products are also on their way from Nokia and Samsung). See “Enterprise Requirements for Handheld Computing” at <http://www.palm.com/enterprise/tools>.
- Your workforce will feel comfortable immediately and gain productivity rapidly using Palm Powered handhelds, known for their easy to use, intuitive design and operation. See “Choosing the Right Handheld” at <http://www.palm.com/enterprise/tools>.
- Palm and its partners incorporate a variety of standards-based extension capabilities into Palm Powered handhelds, providing you with a wide choice of add-on devices, such as barcode scanners, modems, printers, and GPS receivers. New Palm-branded handhelds, for example, incorporate a universal connector and an expansion slot that accommodates both Secure Digital Cards and MultiMediaCards. See “Expansion Solutions for Palm Handhelds” and “Building on Success—Palm’s Expansion Strategy” at www.palm.com/enterprise/tools.
- All Palm-branded handhelds support multiple means of connectivity, including wireless networking, wireline synchronization with network servers via dial-up or LAN connections, and wireline synchronization with PCs. Plus we build in compatibility with a wide range of networking protocols (Mobitex, CDMA, CDPD, GSM, etc.), so you don’t have to worry about compatibility. See “Wireless Enterprise Applications for Mobile Information Management” at <http://www.palm.com/enterprise/tools>.

- Palm and its partners provide integrated support for your corporate email and groupware applications, including Microsoft Exchange/Outlook, Qualcomm Eudora, Lotus ccMail, LotusDomino/Notes, Novell GroupWise, and IMAP4 and POP3 mail solutions. And, of course, Palm mobile email solutions will continue to evolve to incorporate the latest technologies and capabilities, including push email with notification which will be available by the end of 2001. See “*Mobile Access to Enterprise Email*” at <http://www.palm.com/enterprise/tools>.
- Whatever your security requirements, you can address them with the wide range of security features built into the Palm OS and available from Palm partners. The Palm OS platform includes out-of-the-box support for password authentication and encryption as well as challenge-response security protocols such as Microsoft Challenge Handshake Authentication Protocol (CHAP). It also incorporates Elliptic Curve Cryptography from Certicom Corp, which provides a high-level of security over low bandwidth wireless links. Products from other partners include strong security measures such as secure tokens and digital certificates; encryption of the entire handheld workspace or specific data such as PIN numbers, URLs, and the Palm MemoPad; plus locks and latches for securing handhelds onto belts or neck straps. See “*Securing the Handheld Environment—An Enterprise Perspective*” at <http://www.palm.com/enterprise/tools>.
- You can manage Palm OS handhelds centrally, along with all your other computing resources. Tivoli’s Smart Handheld Device manager, for example, enables administrators to centrally discover existing handheld devices, install and remove applications, receive real-time inventory information and perform remote configuration. CA’s Unicenter TNG enterprise management solution now has mobile extensions for its Software Delivery Option (SDO), ShipIT™, and its Asset Management Option (AMO) and AimIT™. See “*Managing Mobility: IT Management Solutions for Handhelds in the Enterprise*” at <http://www.palm.com/enterprise/tools>.
- Your enterprise help desk can support handheld users just as they do desktop and notebook PC users. The Palm Escalation Support program includes specialized training, knowledge base access, and consultation with Palm experts via e-mail, chat ,or phone, with 7x24 or 5x12 options. The program also offers next-business-day replacement of handhelds, parts, and peripherals or automated replenishment of on-site stock. Read more about the program at <http://www.palm.com/support/enterprise/escalation>.

- Palm customers are enjoying very rapid payback periods, with their handheld computing investments paying for themselves in as little as a few days or weeks. In addition, many customers are enjoying tremendous total cost of ownership (TCO) savings. Palm's superior ease of use means lower training and support costs as well as faster adoption rates, improved productivity, and time savings for mobile workers. These benefits, in concert with a broad choice of management tools for easier administration, mean a lower TCO for Palm Powered handheld computers than for laptops or Pocket PC devices. In May, 2001, Gartner Group found that Palm handhelds have one fourth the TCO of laptops. *Read about ROI and TCO savings of Palm customers at <http://www.palm.com/enterprise/studies/#customer-relationship>.*
- To accelerate development and deployment of handheld applications, you may need to augment your internal resources with outside experts. Palm has built significant relationships with leading worldwide systems integrators such as IBM Global Services, EDS, PriceWaterhouseCoopers, KPMG, and Accenture. Palm's Enterprise Alliance Program comprises select systems integrators, professional services, and consulting firms focused on providing high-level solutions for the enterprise. *For a complete listing of Palm's Enterprise Alliance Partners, visit <http://www.palm.com/enterprise/>.*

A sample of Palm Powered field service solutions

Over 75% of handhelds worldwide are based on the Palm OS® platform, an installed base that attracts continued investment by companies all over the world (IDC, 2000), resulting in expanding choice and value for Palm handheld users. Already there are more than 10,000 applications available for Palm OS handhelds and 157,000 registered Palm OS software developers working on new Palm Powered solutions—the majority focusing on enterprise applications.

Sample of Palm Powered™ software for field service organizations

FieldAccess

From Alpha Microsystems

Provides field personnel with handheld access to central databases, including ability to view all calls in their dispatch queue; accept a call and submit an estimated time of arrival; update job status; submit and track parts orders; close calls and provide itemized labor, travel, and parts for the job; open new calls; capture customer signatures; send and receive job-related notes and email; and search and locate other personnel in the field.

Communiport Mobile Productivity Center

From Delphi Automotive Systems

Improves field service safety by giving drivers hands-free, eyes-free access to Palm functions and content. The Communiport MPCpro uses special electronics inside the cradle that converts data from Palm V/Vx handheld into speech. It also uses advanced speech recognition technology to let users navigate the stored data by voice, find numbers, and make calls.

etrace™

From Gearworks

A versatile mobile communication solution that enables field service companies to optimize utilization of mobile assets and speed service delivery. Features include electronic work orders, time and material tracking, real-time invoices with signature capture, and GPS fleet mapping.

GoldMine® Service and Support

From FrontRange Solutions Inc.

Provides complete call center management, including call logging and tracking, first-level call distribution and support via diagnostic knowledge base and other tools, automated trouble ticket generator with email integration, monitor alerts, business process automation, and reporting.

iAnywhere Tracker for SAP R/3

From iAnywhereSolutions (a Sybase company)

Extends the widely used Cross-Application Time Sheet (CATS) to Palm Powered devices. Enables mobile field service professionals to directly enter their own time management information into the SAP system via wireless connections from wherever they are, or to record

information on their handheld device offline and synchronize later when a network connection is available.

Oracle Mobile Field Service

From Oracle Corporation

Enables central service management to send service requests to field engineers over wireless or wireline connections. Mobile engineers can accept assignments in real-time, access job-specific information and installed base data, and submit service reports after completing tasks.

ServQuest

From Prism Visual Software.

A Web-based, wireless solution for field services. It enables end-customers to report problems via the Internet, and companies to dispatch work orders to mobile field technicians via a Palm Powered handheld. The application enables mobile technicians to check work order status and inventory, track equipment and its history, close jobs, and generate invoices or charge parts and labor to a service contract or warranty.

MySAP.com

From SAP

MySAP.com™ includes mobile field service and dispatch applications that enable companies to rapidly allocate service engineers and materials to meet incoming service requests, deliver and track customer and account information for field service personnel, and perform service planning, forecasting, scheduling, and dispatching. The solution is tightly integrated with fulfillment systems and includes support for both mobile wireline and wireless devices.

Service Hub for Wireless Workforce Management

From ViryaNet

Service Hub is an application platform that unites the entire service community—customers, operation managers, field engineers, and subcontractors—to conduct work and share information. The Wireless Workforce Management solution streamlines service request logging and dispatching, monitors field staff to ensure compliance with service entitlements and deadlines, provides inventory visibility, and dynamically measures performance.

Sample of Palm Powered software for internal service organizations

ServiceCenter Mobilize.It!

AssetCenter Mobilize.It!

FacilityCenter Mobilize.It!

Mobilize.It! for Transportation

From Peregrine Systems

These powerful software solutions help companies improve the reliability, productivity, and cost-effectiveness of their organizational infrastructures. ServiceCenter Mobilize.It! enables mobile IT staff to update, open, and close incidents from Palm Powered handhelds. AssetCenter Mobilize.It! lets Palm users handle work orders, perform receiving functions, audit inventory, and manage move, add, and change operations. FacilityCenter Mobilize.It! provides facilities staff with

an automated tool for managing work orders and performing inspections. Mobilize.It! for Transportation extends Peregrine's FleetAnywhere and RailAnywhere software to mobile users.

Remedy Link for Palm Powered Handhelds

From Remedy® Corporation

Provides mobile access to the Remedy Action Request® System-based Customer Relationship Management and Information Technology Services Management applications. Enables field technicians to view and enter trouble ticket information and access inventory status from the problem site.

Sample of Palm Powered handhelds for field service

Palm-branded handhelds

From Palm, Inc.

Handhelds from Palm, Inc. are the world's most popular, acclaimed by users for their compact size, ultra-light weight, long running batteries, and simple, intuitive operation. A wide range of hardware choices, including built-in wireless capability, snap-on modems, color screens, memory expansion cards, and add-on devices, flexibly meet field service requirements. All Palm handhelds support a variety of methods for synchronizing with corporate databases, email, and messaging systems to put essential data in the hands of workers on the go.

Symbol SPT 1700

From Symbol Technologies, Inc.

The SPT 1700 series of ruggedized, mobile Palm Powered computers capture and manage data in even the most challenging environments while supporting both wireless and wireline connectivity.

Choices from other leading vendors

To ensure customers the broadest possible range of choices, Palm licenses the Palm OS platform to other vendors. Palm licensees include mobile computing industry leader such as Sony, Kyocera, Handspring, TRG, and IBM.

Sample of systems integrators offering Palm Powered solutions for field service

ArcStream Solutions

ArcStream Solutions can bring field service organizations in the 21st century through the use of Palm Powered handhelds and custom solutions designed to enhance revenues, reduce costs and improve customer satisfaction.

Breakaway Solutions

Breakaway Solutions has unique capabilities, coupled with expertise in vertical markets, to provide integrated CRM solutions with Palm's best-of-class handhelds that improve the way mobile business users access and share data.

Golden-Gate Technologies

Golden-Gate Technologies provides mobile solutions using Palm Powered handhelds to give enterprises wireless or wireline access to their CRM databases in real time or in a disconnected mode. The field worker can selectively store service, support, and sales information from that system to the Palm. This information can then be modified locally and synchronized back to the central CRM database. Golden-Gate provides these mobile services in either a licensed or hosted model. The solution can be customized to each company's business model.

Inforte Corporation

Inforte eBusiness Relationship Management solutions integrate traditional employee-centric Customer Relationship Management applications with customer-centric eCommerce Solutions providing enterprise organizations with a 360-degree view of the customer relationship. These solutions streamline information, improve efficiencies, increase revenues and improve customer satisfaction.

KPMG Consulting

KPMG Consulting's Enterprise Mobile Enablement solutions provide mobile access to key enterprise applications and information via mobile devices (such as smart phones, PDAs, and two-way pagers). Enterprise Mobile Enablement solutions use a methodology allowing rapid deployment of third party Independent Software Vendor (ISV) solutions.

Questa Corporation

Questa Appliance-to-Business (A2B™) software and consulting solutions enable companies to improve operational efficiency by leveraging the power of the Internet and wireless connectivity to link enterprise systems and remote devices. The company offers an A2B Service that enables intelligent equipment to anticipate its own maintenance needs, automatically requesting service and sharing information about itself. The service also includes a mobile service portal, which enables field service personnel to access information about enterprise equipment and initiate diagnostics from a wireless enabled Palm Powered handheld.

ZAMBA Solutions

ZAMBA consulting services provide Palm Powered solutions that enable greater mobile and wireless access to applications, sharing critical enterprise data with workers in the field. These solutions integrate mobile and wireless channels with overall CRM solutions, producing faster and more accurate delivery of service from field workers to end customers.

Palm also holds significant relationships with leading worldwide systems integrators, such as IBM Global Services, EDS, PriceWaterhouseCoopers and Accenture.

Conclusion

Companies looking for opportunities to deploy mobile technologies in ways that produce rapid return on investment probably couldn't do better than to start with field service. Field technicians account for the largest segment of mobile workers, and their need for timely information and communications make them ideal users.

Mobile solutions can be applied to just about the entire process of service delivery—from dispatch to billing—producing dramatic cumulative cost savings. In addition, because field technicians interact directly with customers, empowering them with mobile solutions that support more personalized and efficient service is one of the quickest ways to make a positive impact on customer satisfaction, retention, and future purchases. In fact today, mobile solutions are even being used to turn service visits into sales opportunities. Field service, long regarded as a cost center, is being transformed into a revenue generator.

Palm branded and Palm Powered handhelds—which, according to a recent Winn Technology Group survey, are on 84% of the handheld standard lists of Fortune 1000 companies with handheld standards—are leading the way into this new era of profitable field service. These handhelds provide all of the capabilities needed for serious enterprise computing, yet are renowned for their simplicity and ease of use. And they're supported by a vast choice of complementary products and services from thousands of software and hardware vendors. Choosing Palm is a good first step toward a successful mobile field service deployment—and profitable results.

Appendix: More information on mobile field service

Here are some online resources you may find helpful as you explore mobile field service opportunities.

On the Palm Web site

- Palm Handheld Business Justification Quiz for IT Professionals, offering a quick way to assess your current level of mobility and mobile technology readiness and see whether your business environment can benefit from the deployment of handhelds. Use it for free at <http://www.palm.com/enterprise/bjq/index.html>
- Aberdeen Group white paper: “The Benefits of Mobilizing Enterprise Applications With Handheld Devices” at www.palm.com/enterprise/tools
- Palm white papers, also at www.palm.com/enterprise/tools, include:
 - “Wireless Enterprise Applications for Mobile Information Management”
 - “Mobile Access to Enterprise Email”

- “Handheld Computing Optimizes Customer Relationship Management”
- “Securing the Handheld Environment—An Enterprise Perspective”

From other online sources

- www.anywhereyougo.com and www.thinkmobile.com are both portals/online communities offering business news and articles on mobile solutions.
- destinationCRM (www.destinationcrm.com) does the same for customer relationship management, and publishes a free print magazine called Field Force Automation.
- www.wirelessweek.com is an online magazine from Cahners Publishing.
- www.supportgate.com is a comprehensive resource on technical support, calls centers, and CRM.
- The Customer Support Consortium (<http://www.customersupport.org>) has a very good library of recommended and reviewed publications.
- The Association for Services Management International (<http://www.afsmi.org>) offers journals, web seminars, and a bookstore.



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