

Field Service Opportunities

Heading into a new century, the field service business is thriving. Increasingly complex products and equipment, rising performance expectations and a growing realization of the value of customer satisfaction equate to a burgeoning demand for field service technicians. Despite attempts by manufacturers and resellers to make products amenable to user-based repair, companies and consumers have little desire or time to maintain and repair complex equipment, preferring to outsource these functions instead. Today, in the US alone, there are approximately 500,000 organizations providing some form of field service, staffed with roughly 2.3 million field service workers.¹

As they confront this swelling demand, field service organizations must also deal with mounting internal pressures. Like every other business, field service must find ways to decrease operating costs, increase customer satisfaction and enhance revenues. However, many field service organizations are hampered in their ability to meet these goals by a lack of automation, connectivity and integration in their processes and systems. Often viewed in the past as a low-visibility, back-office function, these organizations have not received the level of investment necessary to keep pace with changing and heightened service demands. Outdated processes, strained scheduling capabilities, spotty access to customer data, reliance on paper forms, and parts shortages plague many field service organizations, and lead to lower technician productivity, customer dissatisfaction and lost opportunities to capture follow-on business and revenues.

Field service organizations can surmount these obstacles through selective application of new technologies. From software systems to wireless applications, the leading field service organizations are already transforming their operations and seeing dramatic business results. Sophisticated workflow management, business intelligence, logistics and inventory tools are automating and streamlining the field service function. Breakthrough mobile and wireless applications now span the entire field service process. They empower field workers by giving them better access to information on-site including work orders, customer service history, promotions, product specifications and parts availability. They let technicians perform their work more effectively and cross-sell other solutions. Finally, tighter integration between field service applications and other company systems streamlines service delivery and enables more effective planning, forecasting, accounting and product design.

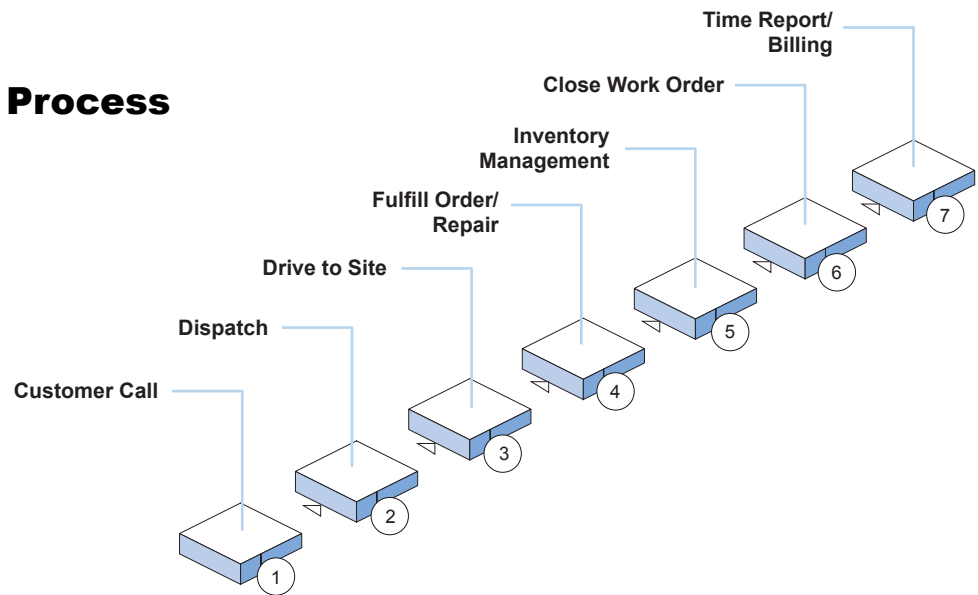
This paper makes the case for bringing field service organizations into the 21st century through the application of new technologies focused on the mobile worker. It starts by examining what is involved in field service, explores opportunities to enhance revenues, reduce costs and increase customer satisfaction through improved field service, and outlines strategic and technical considerations for bringing these goals to fruition in your field service organization.

What is Field Service?

There are millions of mobile workers performing a wide range of business functions. This field force is composed of sales representatives, service technicians, inspectors and doctors on rounds, among others. In this paper, we concentrate on one aspect of the field force - those organizations dedicated to delivering field service. Field service, for purposes of this paper, is defined as a technician performing repair or installation work at a customer site. It may also include regularly scheduled preventive maintenance work. Service is prioritized and priced according to the customer's warranty or service level agreement and the severity of the problem.

Field service organizations vary greatly in size, target industries and supported technologies. For large companies like AT&T and IBM, their field service units number in the tens of thousands whereas smaller companies may have only a few service crews. Although every industry relies on field service to some degree, for industries such as high technology, utilities, telecommunications, insurance and aerospace, field service is critical. Equipment from computers and peripherals to building systems, office equipment and medical equipment depend on field service. Sometimes, this equipment is the lifeblood of a company, and any downtime or service interruptions can significantly impair operations or even endanger human life and safety.

The Field Service Process



1. Customer Call. A customer call initiates the field service process. Customer information and problem description are logged, and customer entitlement is verified. If the problem cannot be resolved over the phone, a work order is created and an appointment is scheduled. The work order opened in this step is tracked and managed until closure.

Common issues include the time to answer a call; the ability to access customer service history; the accuracy of entitlement checks; the ability of the call taker to resolve and investigate problems; and the ability of the call taker to contact technicians directly.

Mobile enablement. By equipping technicians with mobile devices running field service applications, call takers can communicate directly with technicians in the field, if needed.

2. Dispatch. The dispatch step assigns pending work orders to technicians, taking into account the customer's entitlement, priority of the problem and technician expertise and route coverage. Dispatchers may also order and/or ship needed parts directly to the customer site for installation by a technician.

Common issues include the ability to assign resources and schedule appointments optimally; technician time involved in traveling to and from dispatch site; dispatcher's ability to track whereabouts of technicians; and the ability to re-adjust assignments in real-time to accommodate schedule changes.

Mobile enablement allows dispatchers to transmit schedule information directly to technicians, eliminating trips to the dispatch site to pick up assignments. It also allow dispatchers to adjust schedules in real time, convey adjustments to technicians in the field, track the technicians' location and vary assignments based on availability, expertise, and truck inventory. Using wireless applications to streamline these processes, a field service organization can improve technician productivity 15-25%.¹

The Field Service Process (continued)

3. Drive to site. Assignment or schedule in hand, the technician travels to each customer site.

Common issues include the technician's ability to locate the customer site; communication and coordination between technician, dispatcher and customer; ability to notify of delays, arrival times, etc.

Mobile enablement allows technicians to look up directions to a customer's site and communicate estimated arrival time to the customer and dispatch center while en route.

4. Fulfill order/repair. The technician performs the necessary work at the customer site, installing equipment or diagnosing and repairing problems. To perform the work, the technician may need to consult product manuals or a service center. If replacement parts are required, they may be waiting at the site, having been dispatched separately, or the technician obtains them from his vehicle stock or orders them.

Common issues include the technician's ability to access customer repair history; capturing labor and parts used during the repair/installation; access to product specifications; availability of replacement parts; and the ability to order part and update parts inventory in real-time.

Mobile enablement allows technicians to access needed information from the field including customer service history, equipment repair records and product diagrams, reducing calls to call centers or manufacturers. Mobile applications guide technicians through their work, automatically recording time and parts used during the service call. They also provide access to inventory data, including parts availability, and permit technicians to order parts and update stock records from the field.

5. Inventory management. This step coordinates the flow of good and bad parts between warehouses, stocking centers, technician vehicles and repair depots. It deals with parts numbering, cycle counting, bar coding, warranty returns and parts kits.

Common issues include the ability to properly track and locate inventory; investment in and control of assets; maintenance of proper stocking levels; ability to interact in real-time with requests from the field; and ability to forecast service parts demand.

Mobile enablement allows field service organizations to better manage their inventory, thereby reducing inventory costs 20-25%.¹ Giving technicians access to real time inventory information, and the ability to order parts from the field, reduces the tendency to stockpile parts in vehicles. Using a combination of wireless applications, bar coding and scanners, technicians can transmit parts information in real time, including parts used or parts returned for repair, allowing field service organizations to have an accurate, current view of asset stocking levels and location.

The Field Service Process (continued)

6. Close work order. After performing work on site, the technician will either close the work order, signifying that all work is complete, or schedule another appointment to finish any remaining work. In closing the work order, the technician captures data that feeds into customer history records, billing, performance measurement, product design and sales forecasting.

Common issues include the time to fill out paperwork; time to re-key the data; accuracy of data; obtaining customer sign-off and approval of work completed; and integration between systems.

Mobile enablement allows technicians to obtain customer signatures electronically, close work orders, and update all necessary data including service records and billing information. By using mobile devices to input data, a company can save \$5-50² in paper processing costs per transaction.

7. Time report/billing. In the final step of the process, the technician's time and materials information is submitted to the accounting department. An invoice is sent to the customer, consistent with the customer's entitlements and pricing schemes.

Common issues include the time lag between the technician's paper submission and re-keying of data; the length of the billing and collections cycle; the ability to access and integrate diverse data (customer entitlements, labor used, parts used, parts returned, etc.) to produce an accurate invoice.

Mobile enablement allows the technician to submit work order information in electronic format directly from the field to headquarters for processing, and, in some cases, to generate an invoice and accept payment while at the customer site. This can cut days or even weeks out of the billing cycle.³

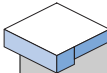
Pursuing Field Service Opportunities

The field service process is quite complicated, given the number of activities, dependencies, parties, functions, software systems and equipment involved. Managing this process is difficult, requiring careful coordination and timely access to information from disparate sources. Many existing field service processes evolved from necessity rather than planning, resulting in a mixture of manual and inadequately integrated automated processes. These processes work, but offer many opportunities for high return improvements. Moreover, even well designed field service processes can reap significant benefits from some of the latest advances in technology. For example, Sears, Roebuck and Co. was able to improve the efficiency and responsiveness of its field service unit by equipping its 12,000 technicians with mobile devices and wireless access to route information, schedule changes, inventory, pricing and other data.

Field Service Opportunities

Field service opportunities fall into three categories: **enhancing revenues, reducing costs** and **increasing customer satisfaction**. Field service can enhance revenues by capturing overlooked service revenues, cross-selling other products and services, and using superior service as a differentiator and selling point. Cost savings result when technology is applied to improve technician productivity, manage assets more tightly, increase the efficiency of the field service process and integrate field service data and functions with other corporate systems. A field service organization can increase customer satisfaction and repeat buyers by being more responsive to clients, pinpointing more accurate arrival times, delivering more predictable service and achieving a higher first-visit completion rate.

To start, field service organizations must decide which opportunities to pursue. While some improvements positively impact all three categories, generally the greatest benefits are gained through a more targeted approach. For example, a company that decides to focus on increasing customer satisfaction may need to invest in infrastructure upgrades, mobile technology and staff training. These investments may increase, rather than decrease, costs in the short term, although they should enhance revenues in the long term.



Field Service Opportunities

- Enhance Revenues
 - Capture overlooked service revenues
 - Cross-sell products/services
 - Use superior service as selling point
- Reduce Costs
 - Improve Technician Productivity
 - Control Assets
 - Increase Process Efficiency
 - Integrate
- Increase Customer Satisfaction
 - Improve Responseiveness
 - Ensure Predictability
 - Increase Single Visit Completion Rate

An organization may start with an improvement objective in mind, or may perform an analysis to identify the strategy with the highest potential return. Depending on the strategy, a mixture of technology implementation, process change and perhaps organizational re-alignment will be required. Technology, especially mobile and wireless technology, is the critical enabler for all of these opportunities, automating field service functions, connecting participants, providing access to information, and integrating field service functions with each other, and with other company functions.

Enhancing Revenues

Companies are increasingly modeling their field service organizations as profit centers. However, even field service organizations currently operating as cost centers stand to benefit by enlisting their staff in revenue-enhancing opportunities. Field service organizations can contribute to their company's revenue streams in three basic ways: by capturing more service revenues, by cross-selling other products and/or services, and by using superior service as a selling point to drive more sales.

Capturing overlooked service revenues

Field service organizations generate service revenues directly from labor and materials, replacement parts, service agreements, extended warranties and ancillary services. One way to grow these revenues is to ensure that no billable charges are lost or overlooked, and that invoices are as accurate as possible. By arming technicians with mobile devices, they can avoid the typical 20-30%² order rejection rate because they have a more precise record of work performed, time spent and parts used. They can capture this information in real time, and forward the data via a wireless connection to a central billing system. By integrating billing systems with customer entitlement records, field service organizations can ensure that customers are charged where appropriate for time and materials used.

Cross-selling products and/or services

Each customer contact point in the field service process represents an opportunity to cross-sell and up-sell accessories, upgrades, and additional products and services. By relying on field service employees such as call takers and technicians, field service organizations can use a "soft sell" approach with customers and capitalize on fortuitous sales opportunities. For example, Mesa Energy Systems, an HVAC and retrofit company, sent prompts to their technician's mobile devices as part of the standard job-closing process, resulting in 10-15 new leads every day, as opposed to 8-10 leads per week they were getting without the application. To have this

approach work, call takers and technicians must be trained in recognizing sales opportunities and must have access to integrated customer, product and sales data to make appropriate recommendations. Technicians will need mobile devices to access this information from the field. Business intelligence systems can alert employees of potential sales opportunities in an account (aging equipment, imminently expiring warranties, appropriate accessories, etc.).

Using service as a selling point

It is true that good products lead to happy customers and repeat sales. But even good products can require service. High quality service at an acceptable price also delights customers, giving them value that they can appreciate. The more responsive and consistent service is, and the higher the quality of repairs, the more satisfied customers will become. In this case, service becomes a marketing differentiator that can be used to drive in more sales. To reach this state, a field service organization must commit to improving the effectiveness of its field service delivery, and must be able to measure its performance and proactively adjust service levels. For example Niagara Mohawk, which will become the ninth largest electric utility company upon merging with National Grid Group, decided to focus on superior customer service as a means to strengthen relationships with current customers and attract new customers. The company implemented a wireless field mapping system, which enabled their technicians to react more quickly to power outages, thereby increasing customer satisfaction. Many of the techniques described in the subsequent sections of this paper are exactly the types of improvements that lead to higher quality service and compelling marketing propositions.

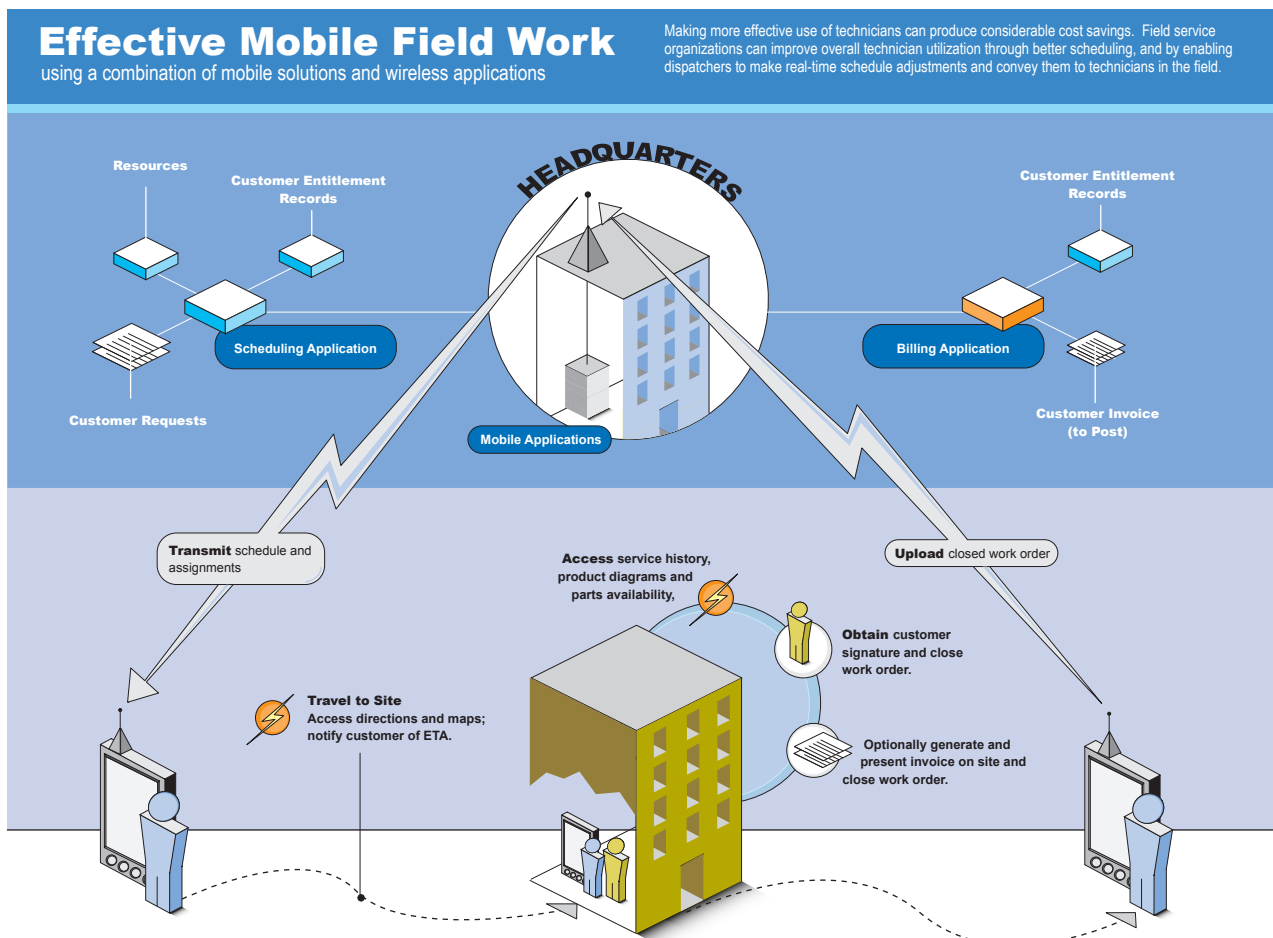
Reducing Costs

Cost savings result from improving the productivity and effectiveness of technicians, call takers and dispatchers. Moreover, by closely managing parts and equipment inventory, field service organizations can significantly decrease the amount of capital invested in these assets. Operational overhead can be reduced by automating and streamlining the process to improve its overall efficiency, and by integrating the various process components with each other and other company applications and functions.

Improving technician productivity

Making more effective use of technicians can produce considerable cost savings. Field service organizations can improve overall technician utilization through better scheduling, and by enabling dispatchers to make real-time schedule adjustments and convey them to technicians in the field. But an even more dramatic way to boost productivity is to empower technicians to perform their field work more effectively, as illustrated in figure 1, using a combination of mobile solutions and wireless applications.

Figure 1



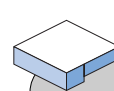
These advances give technicians access to the information they need while in the field, including customer service history, equipment repair records, product diagrams and schematics, inventory and parts availability, and even directions and maps to customer sites. Mobile applications automate technician tasks, reduce paperwork, track labor and parts used, and expedite diagnosis and repair. They also let technicians stay in close touch with dispatchers; they can receive schedules and adjustments, and transmit closed work orders without having to travel to the dispatch center to pick up and drop off paperwork.

For example, NovaMed, a medical equipment repair company, implemented a wireless solution for dispatching techs and enabling them to access back-end systems while in the field. In just over half a year, technician productivity increased by 35%.

Controlling Assets

Field service organizations normally invest significant capital in parts and equipment but find it difficult to account for these assets because they are distributed among stocking centers, repair depots and technician vehicles. Few service organizations have systems capable of managing parts logistics in real time. As a consequence, inefficiencies are rife. Poor logistics lead to uneven stocking levels. With approximately 70% of service calls requiring a part,¹ high parts unavailability destroys technician productivity as multiple visits are needed to complete work. But overstocking parts is detrimental too, tying up capital in non-income producing investments.

The way to improve control over these assets is through technology. Tightly integrated logistics, inventory management, and service parts planning systems provide better control over inventory and can lower total inventory costs by a minimum of 25 to 35%.¹ Wireless applications are instrumental in achieving these gains. With access to real time inventory information and the ability to order parts from the field, technicians are less likely to stockpile parts in their vehicles. Wireless applications, combined with bar coding, scanners and other tracking techniques, give companies an accurate perspective on inventory levels and asset locations. For example, the California Department of Water Resources implemented a bar-coding system to track inventory within and between plants, thereby eliminating keyboard input errors and enabling a complete, accurate view of their assets resulting in a significant reduction in costs.



Mobile Applications Empower Technicians to:

- Receive work orders while in the field
- Obtain maps, directions, traffic and weather reports
- Notify customers of estimated arrival time or delays
- Access customer information and service history
- Step through repair and installation tasks
- Access product specifications, diagrams and schematics
- Access parts inventories and order parts
- Track and transmit labor and parts used in real time
- Capture customer signatures electronically
- Close work orders in the field and upload data in real time
- Invoice customers and accept payment onsite
- Cross-sell other products and services
- Communicate with other technicians and dispatchers

Increasing Process Efficiency

Increasing the efficiency of the field service process not only lowers the administrative overhead of the service organization but also reduces the overall cost to deliver service. Software, especially mobile applications, can automate manual processes, eliminate paperwork and reduce the time lag between process steps. Technology improves the flow of information from step to step, giving workers more timely access to current data and streamlining the entire process. Mobile devices lead to faster, more efficient delivery of service by connecting technicians with dispatchers and giving technicians access to needed information in the field. For example, Con Edison, the electricity provider to most of New York City, was able to deploy its field workers more efficiently and effectively by giving them access to complete electrical grid information, including status and alarms, from handheld devices in the field. Wireless applications have also been used to shorten billing and collection cycles and improve cash flow by allowing technicians to complete work orders in the field, submit time and materials reports in real time, and even generate orders, obtain customer signatures and collect payments on site. Giving customers access to self-service and self-help features such as appointment scheduling and Web-based FAQs can reduce the burden on call takers and dispatchers.

Integration

Optimizing the field service process requires a high degree of coordination and timely access to data from a variety of sources. In many cases, however, companies have vast collections of valuable data scattered across "stovepipe" systems including front-end (order entry, customer care, billing) and back-end (scheduling, inventory management, supply chain management, accounting) applications. Finding and combining that data in creative ways transforms it into concise information that can be used to generate breakthrough improvements.

Integrating the systems, applications, components and data of the field service process enables the types of productivity and efficiency improvements outlined above. For example, integrating wireless field applications with billing systems closes the loop between service delivery and invoicing, and shortens the collection cycle. To receive even greater benefits, companies must integrate field service components with other company applications and functions. For example, sales people benefit from access to accurate customer service records and repair histories when contacting customers for renewals and add-on sales. Product design and quality assurance efforts benefit from access to defect information gathered in the field. Logistics, inventory management and service parts planning functions benefit from access to parts usage and repair statistics from the field.

Increasing Customer Satisfaction

Satisfied customers are valuable business assets. Loyal customers become repeat buyers; they refer others to the company's products and services; and the cost to maintain these customers is generally lower than the cost to acquire new ones. Customer satisfaction is influenced by two primary factors: the quality of the product purchased and the quality of the service rendered. Although field service organizations have little direct influence over the quality of the product sold, poor service can make even a good product look bad. Similarly, excellent service can help overcome the limitations of a mediocre product.

Field service organizations can do several things to improve customers' perception of service quality. Chief among these are improving the responsiveness of the field service unit, ensuring that services are delivered with a high degree of predictability and increasing the odds that work will be completed in a single visit.

Improving responsiveness

Customers generally want quick response to their demands. While responsiveness depends greatly on the capacity of the organization, more productive and efficient technicians increase throughput, allowing more customers to be serviced sooner. Mobile applications can deliver these benefits. They enable technicians to notify customers of estimated arrival times and delays, and allow dispatchers to adjust schedules in real time. Other technology-based improvements, such as flexible scheduling systems and customer self-service applications, can further speed service delivery and lower response time. For example, WINfirst, a broadband utilities company, implemented a wireless dispatch and management application, enabling them to provide their customers with a specific appointment for service installation and to call ahead and confirm the arrival.

Ensuring predictability

Customers want predictable service. They want call takers and technicians to have access to their service histories and work orders, and technicians to arrive at the appointed time equipped with the parts and tools needed to do the job. They expect reliable and error-free repairs and installations. Technology can help service organizations meet these expectations. Software applications give call takers and technicians access to repair histories; wireless access to maps and directions keep technicians on schedule; and mobile devices let technicians keep customers abreast of scheduling issues. Mobile applications can also guide technicians through repairs, and provide access to product manuals, thereby ensuring more consistent service.

Increasing single-visit completion rates

Related to responsiveness is the ability of the technician to complete all work in a single visit. Various factors influence this ability - the expertise of the technician, as well as access to repair histories, parts availability and product specifications. Technology can help in all of these areas. Scheduling systems can ensure that assigned technicians have the expertise needed to perform the work. Mobile applications give technicians access to customer service history, equipment repair records, product diagrams and manuals, parts data and other information needed to complete their work in a single visit.

In Conclusion

The good news is that the field service business is thriving. The even better news is that the profession has a real opportunity to provide significant contributions to the bottom line by improving its effectiveness at enhancing revenues, reducing costs and increasing customer satisfaction. These improvements are possible thanks to exciting new technologies, particularly in the area of mobile applications.

From initial customer call, to closing of work orders and customer invoicing, every step in the field service process stands to reap immeasurable benefits. Whether your field service organization already enjoys a high degree of automation and efficiency and is looking for incremental benefits, or whether you are looking for more substantial upgrades and rewards, there are a variety of high-payback technical solutions available now. Of these solutions, mobile applications are providing perhaps the most dramatic returns in field worker productivity, process efficiency and revenue enhancing efforts. Why not take advantage of these opportunities today?

Footnotes

1 Source: D.F. Blumberg Associates, Ft. Washington, PA.

2 Source: Mobilize.

3 Source: Frontline Solutions, "Field Service is Redefining the Boundaries of the Enterprise" October 2000.

About ArcStream

ArcStream Solutions is a wireless consulting and systems integration firm focused on delivering innovative solutions that improve the effectiveness of mobile workers. ArcStream specializes in providing B2E - business-to-employee - strategic consulting and implementation services for field service, pharmaceutical, insurance, and high tech manufacturing organizations. ArcStream's enterprise-wide, strategy approach focuses on evaluating the impact of wireless applications and ultimate return on investment for each client. For more information, please visit ArcStream Solutions' web site at <http://www.arcstreamsolutions.com>.

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