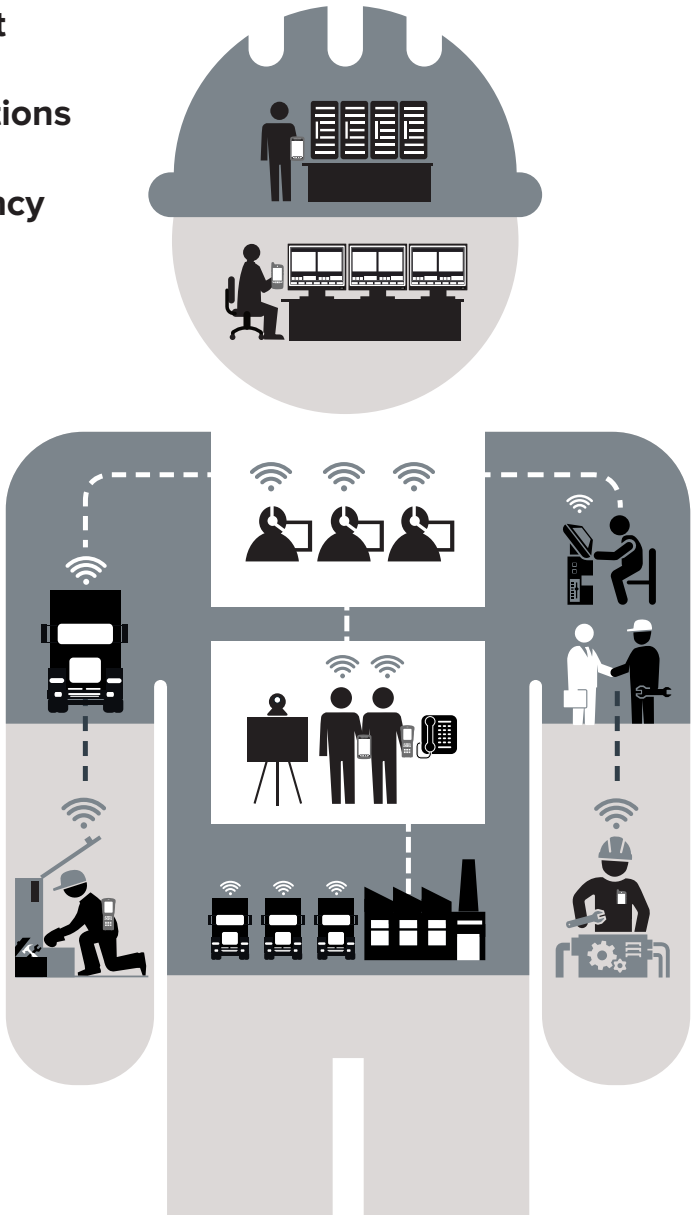
WHITE PAPER PART 3 OF 4

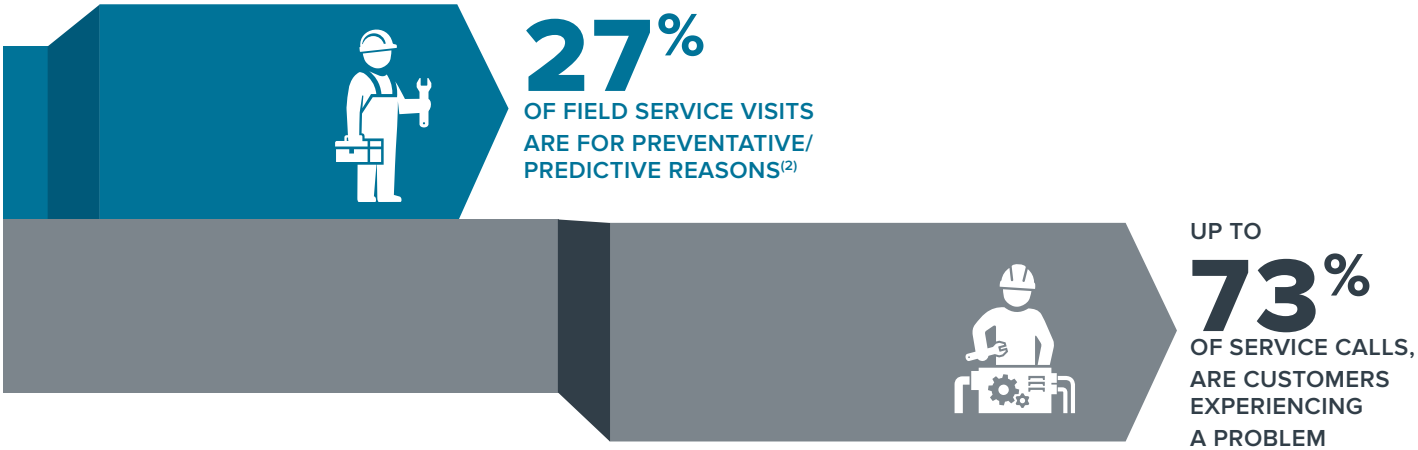
ANATOMY OF A MOBILE FIELD SERVICE SOLUTION

A guide to making the right technology decisions for devices, networks, applications and management tools to increase speed and efficiency at the point-of-service.



There are an estimated five million field service professionals[1] in the United States who are tasked with the all important responsibilities of installation, maintenance and repair of everything ranging from household appliances in homes; beverage coolers at convenience stores; computers and business equipment in offices; cell phone networks in major cities and rural areas; industrial robotic assembly systems in manufacturing plants and much, much more. The list is virtually endless.

Not surprisingly, only 27 percent of those visits are for preventative or predictive maintenance. That means that the greatest numbers of field service visits are to customers who have a problem. Something isn't working right. From the moment the customer calls and trouble tickets are logged into your system, the field service mechanism goes to work. From first triaging the call to scheduling, dispatching, route planning, inventory management, service delivery and ultimately payment, your field service teams play a critical role in building trust, enhancing customer satisfaction and increasing brand loyalty. A recent study by WBR found that 35 percent of company revenues come from services, up from the previous year.



No matter the task, field service teams need three important tools to do their jobs efficiently and effectively: the right mobile device, connectivity when and where it matters most, and access to applications that help them work smarter. Any breakdown of devices, accessories or application impacts your return on investment (ROI) and total cost of ownership (TCO).

Back at headquarters, you need a well thought out, holistic mobility strategy that includes device management, service support strategy, and application and device security. Relying on the local retail store for ongoing support of your devices makes for a risky strategy for the day-to-day operations of your service organization.

CIO's should lead their organizations through an exercise to answer five essential questions:

1. **What can we do better because of an investment in mobility?**
2. **What can we do that is new that will drive incremental revenue and profit?**
3. **What can we do to reduce costs while accommodating inputs from items #1 and #2?**
4. **How can we make our employees more productive?**
5. **How can we eliminate all possible manual forms and redundant data capture with our mobility investments?**

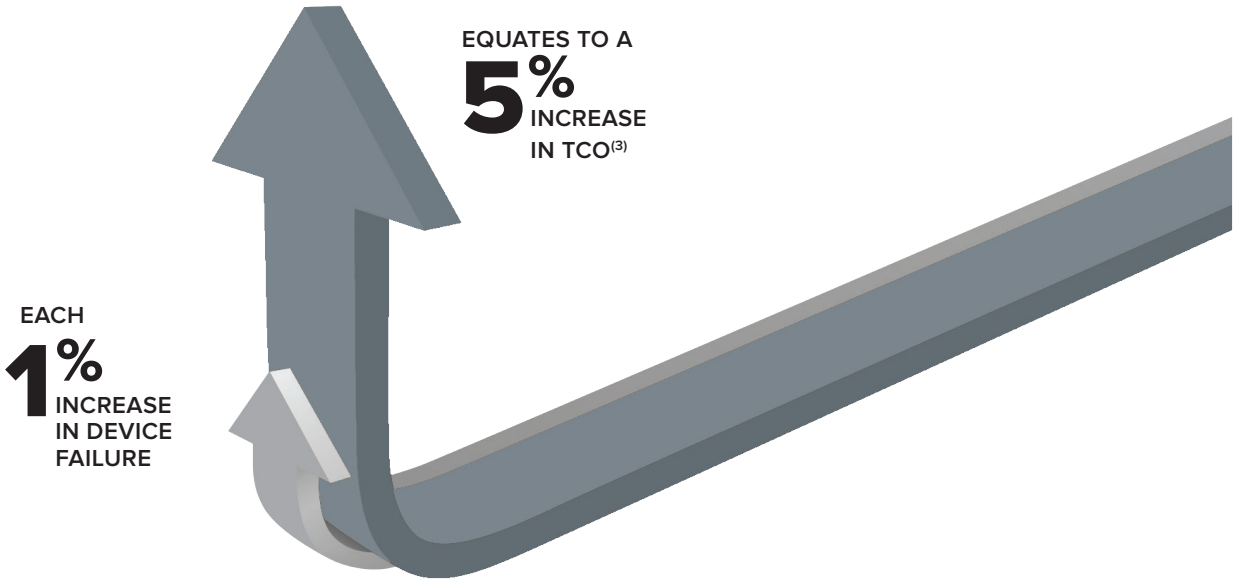
If you're a business designing a field service solution, there are a great many choices. This guide helps weigh those considerations so that you can effectively transform your field service operations into a vital and engaging organization empowered with the tools, information and resources to minimize disruptions in your customers' lives.

Increasing productivity with mobile devices

Mobile devices come in all shapes and sizes with a dizzying array of capabilities, from portable scanners to multifunctional, fully integrated handheld computers. Some organizations may want to deploy multiple devices for different types of service representatives while others may find that deploying just one is more efficient.

Many organizations are challenged with smaller IT budgets and may be tempted to select a less expensive, less durable device. Research shows, however, that over time these downgraded devices increase TCO and end up costing more in operational support costs and reduced productivity.

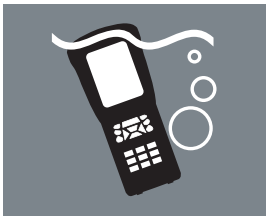
In field service, the productivity hit is even higher. It's important to consider both the time it takes for IT to repair a device as well as the time a field technician is unproductive while the device is out of service. Even in a "hot swap" service arrangement, time out of the field for that technician can be as much as four to five times more than the time it takes to actually service the device. With fully loaded service technician time at $100 per hour or more in North America, this lost productivity and opportunity cost far exceeds the repair of procurement cost of the device. According to VDC Research, mobile device failure results in 140 minutes a day in lost productivity. That is a great deal of time in a field service professional's already busy day.



When picking a mobile device for your field service organization, keep in mind these important factors.

DURABILITY

Mobile devices take a beating in the field. Drops to concrete, accidental spills, exposure to the elements and submergence under water are very real scenarios in some field service environments. Be sure to check the specifications for the devices you are considering and look for these critical characteristics.



Environmental Sealing and Construction. Some devices are rated to ensure reliable operation even when exposed to dirt, dust, humidity, rain and other degrading elements outdoors. Look for IP67 ratings for submersion in three meters of water for 30 minutes. This is far beyond what an aftermarket case can offer. In fact, many times the cases are discarded because end users find them bulky and difficult to keep in their pocket or they disguise the smartphone's sleek design.

Drop Specification. Manufacturers test their devices to withstand a drop to the floor from a specified height. Look for MIL-STD-810D ratings for drop and tumble specifications. Check the details of the manufacturer's testing. A device that can survive a three-foot drop to a grass lawn can't necessarily survive a three-foot drop to a concrete floor or a parking lot. Some tests are performed at room temperature, which won't cause as much damage as a similar drop outdoors in the cold.

Battery Life. It is critical that a mobile device last the entire shift. You can have the most robust application, utilizing 4G LTE connections for real time updates, barcode scanning and navigation, but if the battery does not last a full shift, those features and all the hard work that goes into deploying a strong field application are useless. While cigarette lighter adapters are inexpensive, they aren't always effective. In many cases the cigarette lighter adapter never fully charges the mobile devices especially if it is tied to the ignition switch needing to be on to supply current. Plus, constant partial charging reduces the lifespan of the battery.

Enterprise grade devices often offer twice the battery capacity of consumer smartphones, designed for long duty cycles and full shift operations. Some offer field swappable batteries for multiple shift operations. Field replaceable or hot swappable batteries ensure you always have power when you need it.

Ports. One of the most overlooked durability factors is around protection for the device's ports. If your service personnel use their mobile devices in dusty or wet environments, check to see if the device's ports are protected to prevent dirt or moisture from entering the ports and damaging the device.

Safety. If your workers visit sites that have flammable or explosive materials, their devices should draw electrical power that is below the level that could cause those materials to explode.

Security. One of the most imperative aspects of any mobility solution is security. Careful evaluation of the security protocols supported by your wireless devices is essential to ensuring maximum protection for your data. For example, you should be able to execute certain commands remotely. Make sure your administrators can remotely enable and disable Wi-Fi and cellular radios. Your administrators may also want to check call logs and examine how much data is being used per application.

DATA CAPTURE CAPABILITIES

Juggling multiple devices on a service call can be tricky. Some field service workers are asked to carry a smartphone for calling customers and dispatch, a separate Bluetooth scanner, a camera to capture barcodes and pictures, and a separate GPS device. Not only does that become difficult for workers to manage, supporting many devices drives up TCO and becomes a support nightmare. This is one of the significant hidden costs in a BYOD strategy that is overlooked.

Today's multifunction devices can meet all of your needs, including scanning 1D or 2D bar codes, Direct Part Marking (DPM), and RFID tags as well as enabling image capture. Some of the newest mobile computers also include Near Field Communications functionality that can be used to easily pair with mobile printers and card readers.

Deploying a multifunction device that can support a variety of data capture techniques simplifies IT support and reduces operational and capital costs. Multifunction devices can also provide a platform for future growth, allowing the addition of new data capture types without requiring the purchase of new devices.

USABILITY

If your field service representatives primarily work outside, make sure the device you choose has a screen that's readable in direct sunlight. Conversely, if your workers do their jobs in low-light conditions a backlit display might work better.

Hardware keys are also an important consideration. If your workers wear gloves, think about whether buttons are big enough for them to push without the hassle of removing their gloves. If they have touch screens, can they support use of styluses and tolerate wet screens? If the device is a shared device, can it support multiple user login as well as silent installed updates without user intervention?

While some studies have shown that users type faster and more accurately on virtual keyboards, some users may prefer the ability to type "blind" that comes with a physical keyboard.

Newer models support these much needed field service capabilities, plus the multi-touch pinch and zoom interaction modalities popular today. Dedicated keys for the most commonly used functions, like push-to-talk, can make workers much more efficient. Some devices offer programmable keys so you can enable certain buttons to quickly connect users to the function they use most often.

The devices should be intuitive to use. If they aren't, field service workers won't use them, leading to the failure of the mobile implementation. Intuitive devices also require less training, which can reduce the overall cost of the implementation.

PRINTING

Your service workers may need to print invoices or other documents on site. Mobile devices often come with Bluetooth for a wireless connection or a USB port for a wired connection to a printer. For road warriors, devices that are IP54 rated for harsh environments with long-lasting batteries, vehicle mounts and credit card readers for mobile payment may be required.

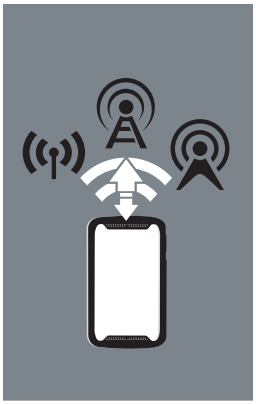
Always connected

Always being connected is driven by user experience and is now the new baseline. Mobile, big data and analytics combine to create right-time experiences. Right-time experiences add context to the business process. Information such as location, device presence and social graph data, motion and environmental conditions, and Internet accessible real-time data sources require a full time connected device.

Mobile device management (MDM) tools ensure that service representatives connect securely only to approved networks. Also, such tools can allow IT to specify what type of network is used to deliver large updates and when. IT can push out updates at odd hours and over Wi-Fi, instead of at the busiest times when a technician is trying to use the device to get work done.

In a recent Aberdeen Group survey report of manufacturing and service organizations, the top customer complaint reported was a technician's inability to resolve an issue once on site. While many factors may contribute to these failings, clearly increasing collaboration and communication can help representatives reach resolution faster. Access to wireless networks directly from an enterprise-class device is an important factor in helping to advance the speed and efficiency of service delivery.

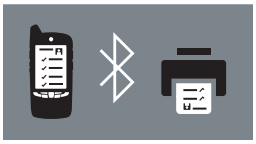
As you evaluate the types of communications networks required to help your field service team work more effectively, carefully examine your connectivity options.



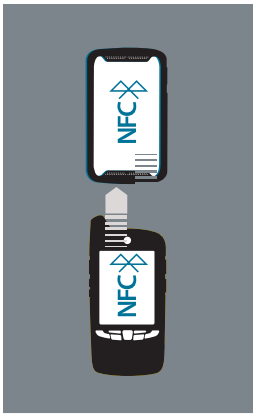
Cellular Networks: Mobile phone networks offer increasingly ubiquitous coverage so that field workers can use their mobile devices almost anywhere for voice communications and data transmission. However, not all networks offer equal coverage or equal services. If your field service team works nationwide or just in one region, think about which service provider offers the best coverage in your operating area. Consider devices that can run on multiple networks, through software-based selection or swappable hardware modules.

One element that is sometimes ignored in device selection within field service deployments is whether a wireless carrier will offer a Machine-to-Machine (M2M) data plan on the device, which is often much more cost effective than a voice and data plan available on popular consumer models. For a large fleet of devices, the cost savings for an M2M plan can be as much as 75 percent less than a comparable voice and data plan required for consumer smartphones. Selecting a device that can support an M2M plan can add up to significant savings.

Wireless Local Area Network (WLAN): Where available, WLANs serve as a cost-effective alternative to cellular networks. Administrators can configure most wireless devices to automatically connect to approved WLANs when available. However, not all devices are created equal in terms of connecting to Wi-Fi. Some enterprise-centric phones support seamless roaming, transferring your connection to the strongest access point as you move through a facility, before the signal degrades. Such systems may also ensure that kind of seamless roaming across access points even when they're made by different manufacturers.

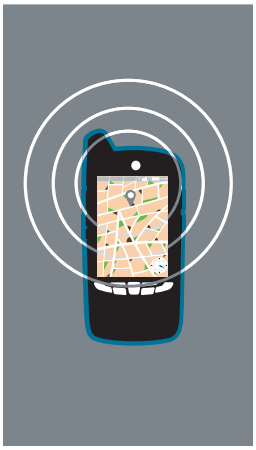


Bluetooth: Bluetooth lets workers wirelessly connect their mobile devices to other gear like headsets, printers and barcode scanners. With Bluetooth, workers don't have to keep track of cables and IT departments can reduce costs associated with supplying replacement cables.



Near Field Communications (NFC): NFC is a short-range, low-power wireless link that can transfer small amounts of data between two devices just a few centimeters away from each other. This capability is increasingly being built into handheld devices. It has some advantages over other technologies. For instance, it doesn't need pairing like Bluetooth and the device being read doesn't require a battery. Common use cases include setting up mobile printers, scanning ID Cards and payment processing. In addition, field service workers can read passive NFC tags on equipment to access that asset's history files, service record and catalog.

In fact, new technology combines Bluetooth and Near Field Communication, supporting much quicker Bluetooth connections. Users can instantly set up a connection by tapping the mobile device to the device the user wants to pair with. The time savings can be significant, particularly for technicians that require printing during many stops each day.



GPS: Including GPS in a mobile device can be particularly useful for field service operations management. For instance, businesses can improve customer satisfaction by using GPS to enable dynamic routing so that representatives can reach customer sites faster. Routing applications can also cut down on miles driven, leading to fuel and fleet maintenance cost savings. Location based triggers can be set up to automatically text the customer in advance of the service person's arrival so that the driver doesn't have to take their eyes off the road. All of which can impact first time fix KPIs and scheduling hits, allowing for dynamic scheduling flexibility. Technicians aren't stuck idling for the customer or for dispatch to call the customer or route them to their next call, potentially delaying the rest of the day's schedule.

Navigation comes in different flavors. Some devices require a good cellular connection at all times in order to deliver turn by turn directions. However, others store the maps locally on the device so that it's reliable even when users are out of range. Such platforms also often return route calculations quicker.

TOP PRESSURES DRIVING MOBILITY FOCUS[4]

- Accurately track products installed in the field.
- Provide field workers with necessary information to complete service tasks.
- Complete a service task on a first-visit.
- Monitor technician or asset status in the field.
- Provide field workers with necessary parts to complete service tasks.
- Enable technicians to contact customers while in the field.
- Integerate captured information with back-end systems and applications.
- Provide information to technicians as and when needed.

The application revolution

The application revolution has been largely driven by the consumer market phenomena that began during the past decade. This same model is now being applied to the enterprise market where mobile application developers are fast at work helping organizations optimize their field service teams. Innovative applications are helping field representatives eliminate paperwork, find information they need to do their jobs better and feed critical information back to the business. Already, Google reports over one million Android applications in their ecosystem and growing.

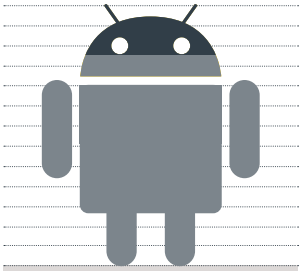
The type of applications your field teams use should depend on the tasks they need to accomplish, the type of device they have and the reliability of Internet connectivity. For instance, some applications won't work across devices and others struggle when users are out of range of a wireless network. Some devices don't allow users to do simple functions, like attach a photo to an email.

Applications can scale quite differently, sometimes requiring a major investment to add just a few new users. Depending on your security requirements, some applications might not appease your chief security officer. Finally, not all applications will integrate easily into backend legacy systems.

The application in concert with your mobility strategy must:

- Extend enterprise data to the field.
- Offer the field service tech useable information to best service the customer.
- Transform your business processes to achieve excellent new customer services solutions, leading to better profitability.

Check out the different types of applications available to help your field service teams.



1,239,772

NUMBER OF
ANDROID APPLICATIONS
June 2014

Software-As-A-Service (SaaS)

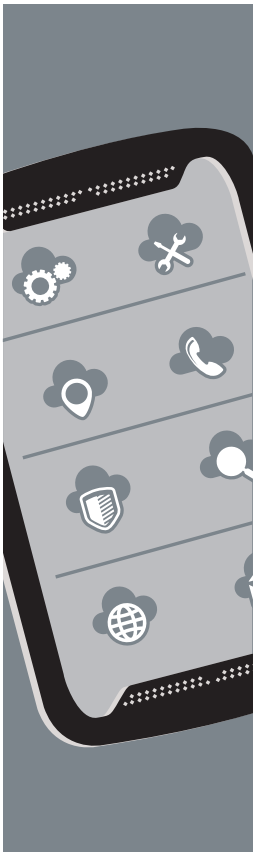
SaaS products make use of a hosted model that leaves management of the application up to the service provider. No longer do IT administrators have to manage software updates or backend server hardware. Since the SaaS service providers aren't tied to a cycle of regular software upgrades, they push out product updates continuously, so customers can benefit from updates right away.

SaaS also lets a business spread out the cost of the application over time since providers use a subscription model, charging monthly based on number of users. That eliminates the typical costly upfront investment in software that's run on-premises. It can also make it easy to add new users.

Off-The-Shelf Applications

These applications come pre-packaged but often let users tailor them to their specific needs. For field service, that capability is critical. While work order management has similarities no matter where applied, every environment is unique and requires some customization to get the most out of an application.

To use the software, businesses typically pay a license, based on number of users. The business user is responsible for running and maintaining the application, either internally or in a hosted environment. Sometimes adding new users can get costly.



Custom Applications

With a host of new technologies at their fingertips, businesses are increasingly building their own mobile field service applications. The development languages and tools you choose will depend on the devices you have in the field. Some third-party tools are also available to enable developers to write an application once and relatively easily port it across multiple device operating systems.

- HTML5: Using HTML5 to build an application means that it can more easily run across different devices. If you have multiple deployed devices, building an HTML5 application might make sense for your organization in part because having just one application to develop and maintain can keep costs down. Not only can HTML5 help in organizations that use devices with different operating systems, it renders applications nicely across different form factors and screen sizes. However, HTML5 applications may not deliver the same variety of capabilities that native applications can offer.
- Native code: Using native code lets developers build custom applications that take full advantage of all the features of a specific device. Conversely, if you have multiple teams of field service workers each using different devices, using native code will require you to build and maintain multiple applications, one for each device.
- Cloud: New kinds of cloud platforms are now available aimed at making it easier for enterprise developers to build mobile applications that run from public or private clouds. Some of the biggest cloud providers offer such services, as do standalone companies delivering mobile backend as service offerings.
- Hybrid: Some developers are now building apps that combine the best of HTML5 and native code in a single app. Certain functions of the application, typically utilities, are built in HTML5, making it easy to reuse that code across operating systems and builds. Other elements of the app are built using native code, taking advantage of the added capabilities available on the individual platform.

Managing your mobile workforce

Growing revenue through mobility is a key business transformation opportunity. However, it's a fine balance between capitalizing on the new revenue opportunities brought by mobility while maintaining cost control.

Ongoing, day-to-day management of a mobile field service solution, including devices, applications and networks, plays a large part in determining whether a deployment is successful. A well-managed deployment will maximize device uptime and support field service representative productivity.

When remote administrators can see exactly what's going on when a representative has a problem, they can quickly correct the problem, allowing field workers to continue doing their jobs. Remote diagnosis and repair are critical particularly for workers who would otherwise have to send a device in for diagnosis and repair, a waste of valuable time.

There are a myriad of tools available that can help IT administrators efficiently and effectively deploy, monitor and troubleshoot a field service solution. Full-service suppliers can also help with ongoing management, freeing up valuable time for your IT administrators.

Management tools can help administrators:

- **Stage devices for initial use by implementing the right device settings, operating system and applications**
- **Enable and disable Wi-Fi and cellular networks**
- **Remotely power off and wake up devices**
- **Install enterprise applications without user intervention**
- **Selectively wipe devices**
- **Manage devices natively via mobility device management services**
- **Connect devices to Lightweight Directory Access Protocol (LDAP) servers and others**
- **Receive SIM card change, insert and removal alerts**
- **Track and manage data usage thresholds**
- **Manage kiosk mode and restricted website policies**
- **Remotely update devices**
- **Set security parameters to prevent connections to insecure WLANs**
- **Remotely diagnose problems and do some remote repairs**

The power of mobility

Making the most of every contact with a customer is critical; and a frequently overlooked opportunity is the service call. With the ideal mobile field service solution, representatives arrive on time with all the information and tools required to perform the job right — leading to decreased costs, increased revenues and improved customer satisfaction, loyalty, retention and referrals. Back at headquarters, you can achieve a real-time picture of the workforce, leading to improved productivity and asset utilization.

Mobility has the power to extend, enhance and transform your field service offerings. Mobility properly executed will present new service offerings leading to better profitability and margin performance. Turn your field service organization into a competitive differentiator using the power of purpose-built mobility.

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