

WHITE PAPER

Solving the Wireless Puzzle: A Framework for Evaluating Wireless Enterprise Platforms

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IN THIS WHITE PAPER

Wireless business enablement for enterprises in 2008 is building on a wave of momentum and is demonstrating an important value proposition among businesses related to cost savings, increased productivity, improved business processes, and realized return on investment (ROI). As users and IT decision makers continue to grasp the business value tied to mobility and learn to leverage an enhanced ecosystem of wireless technology, the wireless enablement of corporate resources will become an ever increasing priority within the enterprise. This white paper discusses the enterprise wireless market, the significance and differentiation among mobile users, the business case for wireless enterprise applications, and the critical criteria for establishing an end-to-end wireless solution.

Introduction

There is a lure to mobilizing corporate applications that enterprises will find increasingly hard to resist. On the surface of awareness is the understanding that mobile devices are platforms on which business users can leverage a range of personal and corporate data with greater flexibility than that offered by desktop and notebook computers. However, it is the insightful organization that will recognize the returns that come from putting the most up-to-date data into the hands of those in the field who can do the most with it. Whether it is interacting with customers, working with suppliers, or allowing employees to make the most of time spent away from their desks, access to live data saves time through increased efficiencies, instills confidence through demonstrable competency, and ignites ideas for building a new freedom and flexibility for corporate operations.

Mobile and wireless fit into a variety of useful business scenarios, many of which will evolve and expand over time as companies come to better understand the benefits of the instant access to and dissemination of knowledge. The momentum in mobile initiative has been strong in industries such as retail, manufacturing, education, healthcare, and the public sector, where employees tend to spend more time out and about than sitting at a desk. There also has been considerable success within financial and legal services, where there is value in receiving data now rather than later.

Every industry, however, has workers who have some degree of mobility in their work life and can potentially benefit from a mobile solution.

Sales Force Automation

There are few positions where the efficiency with which an employee can access and move knowledge from one place to another can affect a company's revenue more than a salesperson. Increasing the efficiency of information exchange at the client point of contact can directly translate to increased sales, shorter sales cycles, a more satisfied customer base, and a greater return on a sales force automation (SFA) investment.

Mobile and wireless technologies give sales forces the ability to access information from the field more quickly and communicate more proficiently with clients and the home office. And because information is more accessible, a sales force can better maximize the time spent in front of the client and be more responsive to questions on inventory, product information, and price changes. These technologies can streamline processes by reducing data entry tasks and improving information accuracy by sending data from the point of activity. They can also bring additional value to an SFA system by allowing sales to access information while in the field.

Field Service Automation

Field service professionals are another natural fit for mobile and wireless because they are in time-conscious jobs where efficient scheduling, dispatching, and communication can make the difference in whether a technician shows up in the right location, on time, and with the correct part.

The use of mobile handheld and wireless technology can help alleviate many of the challenges firms face in managing a field force, such as tracking the movements of technicians and updating customer data on home office servers as quickly as it's updated on the road. It can also ensure that each technician starts the day with a detailed schedule that includes customers' services agreements, past history, and warranty information and special instructions such as what must occur in conjunction with the completion of a service call.

Wireless and Mobile Users

To address the role of mobility within the enterprise, it is important to understand the terms *mobile* and *wireless* and the differences between the various levels of mobility across multiple types of connectivity modes. First, mobility refers to the action of working away from your primary workplace regardless of the connectivity. Connectivity could be through various high-speed wired connections or through a variety of wireless connections. Wireless connectivity includes cellular and WiFi access, with WiMAX being discussed as a potential alternative. WiFi access offers shorter-range coverage with higher throughput. It is possible to enable VoIP over a corporate WLAN (VoWLAN) with additional infrastructure build, systems integration, and capable mobile devices. Cellular connectivity offers near pervasive geographic coverage for stable voice communications as well as data communications, but WiFi offers significantly higher data throughput speeds.

Connectivity varies across a number of parameters, including device types, enterprise needs, corporate policies, and mobile user requirements. Typically, connectivity includes the following modes:

- ☒ **Hybrid online/offline** is a wireless offering that also includes access to data offline when a network connection is not available. The device is capable of local access, and synchronization occurs across a variety of devices — converged mobile devices, ruggedized mobile devices. This form of connectivity leverages onboard applications that can be accessed and used when wireless connectivity is not readily available.
- ☒ **Real-time wireless-only access** refers to a connectivity scenario where the device relies on wireless access to perform the functions at hand. Converged mobile devices, mobile phones, ultramobile PCs, and laptops with cellular connectivity are the means for access. In this scenario, access is available only through the device's browser over a purpose-built application that is dependent on the wireless connection for access to a hosted application.

WiFi or 802.1x connectivity refers to more of a fixed mobility environment, but with an opportunity to access a much higher connectivity rate at what is most likely a lower cost. This type of connectivity can be found in private environments, such as across a multiple-building campus environment, be it a higher education institution, private business, or government environment, as well as in public environments, such as airports, convention centers, hotels, and restaurants. In both environments, the use of real-time access and synchronization over this fast connection is typical. In both cases, the working environment consists of a fixed amount of time at the site rather than a continuous usage environment — whether it is a campus roamer or a visiting employee from the West Coast leveraging the WLAN for the day or for 20 minutes at an airport gate.

In off-campus environments, a more nomadic work profile is typical, where mobile workers are constantly leveraging a wireless network to get access to corporate email, PIM, Internet/intranets, customer relationship management (CRM), and a variety of other vertical and horizontal applications. In this environment, workers are not typically fixed within one area for long periods of time but rather are mobile across large areas, where a WAN is most efficient. Although wireless coverage has improved, in rural areas (particularly in North America) and inside certain buildings or other shielded structures, cellular connectivity is not available.

The Business Case for Wireless Enterprise Applications

The momentum in enterprise mobility originates, in most cases, with email. This is in part because its utility is obvious and users welcome it with open hands. Another reason is that wireless email is the battle-tested "best practice" for enterprise mobile and wireless implementations. It serves as a launching point for businesses to deploy further applications specific to the job functions of mobile workers. Lessons learned in the course of mobile email deployments and through end-user support provide IT departments with the knowledge for forming best practices that can be applied to the rollout and support of other applications to be mobilized. Furthermore, productivity gains and testimonials from mobile users combined with an existing mobile platform with supported devices can serve to build a strong case for mobilizing further applications.

Working in a time where discretionary spending is retreating to conservatism, projects with formless returns are often challenged to receive their due. While mobile email undoubtedly offers productivity gains and reduces business lag time, it is difficult to quantify ROI. Hard dollar returns can more readily be obtained from mobile applications that could, for example, reduce a sales cycle or help an organization to optimize business processes and transactions that involve mobile workers.

As companies continue to look to deploy applications beyond email, the returns become more intriguing when one considers what can come from a system that provides simple, secure connectivity to corporate data regardless of worker location. In environments where moving knowledge from one worker to another is central to operations, mobile and wireless technologies can be the instruments of higher efficiencies. However, because enterprises are looking to mobilize the applications that run their businesses, which are not always standard programs and frequently designed to build competitive advantages, rarely is there a blueprint to follow. Enterprises entering the realm of "what's next" need to follow some general principles as they move forward:

- Implementation should be driven by business requirements, not technology.** Although mobile and wireless technology is fascinating, if its implementation is more about keeping pace with technology rather than how it benefits business processes, it won't be nearly as useful as much as it is interesting.

Mobility should also be thought of not as a means for creating new applications and processes but, instead, as a way to improve an enterprise's current ways of doing business. Processes should be examined in the context of how they can be improved through the ability to disseminate or receive data sooner rather than later and evaluated with an outcome approach that cuts through the hype of "the next big thing" to the technologies appropriate for the task. When it comes to enterprise applications, mobile does not always mean wireless and wireless does not always mean mobile. It will, however, signal a change in the way business will be conducted. Where wireless email simply broadened the bounds from where messages could be sent and received, mobilizing corporate applications can force a retooling of the workflows they are intrinsically tied to and require employees to adapt their jobs to the faster pace of data.

- The benefits of mobilizing enterprise applications can have a measurable impact.** The benefits of mobilizing enterprise applications exceed those of horizontal applications such as wireless email, and they are often quantifiable in hard dollars because the mobile extensions intend to improve the processes that are tied to either revenue or customer satisfaction. Think of these following examples:

- What is the impact of alerting a manufacturing line instantly when large orders hit?
- What are the benefits of processing transactions while customers are waiting in line?
- What is the cost of allowing field workers to exist as silos of knowledge on paper-based systems?
- If service is your business, what is the cost of showing up late with the wrong part?

- ❑ What is the impact of closing the sale sooner rather than later — because the salesperson had the most up-to-date inventory data and customer information in hand with a real-time connection to the billing and order fulfillment system?

Where you often need to trust that the productivity gains from wireless applications will translate to benefits for the company, mobilizing the applications that steer a company can result in increased profits, reduced costs, heightened customer satisfaction, and more customer renewals because wireless and mobile technologies speed up the processes that drive revenue by bringing efficiencies to actions that could not be handled immediately.

- ☒ **Simplification can be achieved for business users, despite yet another mode of communication.** For all of the potential productivity gains of mobility, the addition of another mode of communication and another phone number unavoidably complicates the issue through the proliferation of additional, as well as separate, phone numbers and voicemail systems. Ironically, business lag time could be increased by the addition of mobile communications. However, an organization can unify its corporate telecom system and its users' mobile devices to make mobile and remote workers available to customers, partners, and colleagues via a single corporate phone number with a single voicemail. Productivity gains inherently come from enabling technologies that serve to simplify business processes.

- ☒ **Benefits need to be assessed in terms of the total cost of ownership (TCO) of the wireless extensions.** Benefits are seldom built without associated costs — not all of which are in monetary form. Any benefit that a mobile solution can bring should be weighed against its short-term and long-term costs.

Up-front costs of mobilizing enterprise applications will include an investment in self-analysis to discover where mobile technologies have the most impact. Include application development, systems integration costs, and an investment in mobile devices because setting and enforcing IT policies on devices is more easily done when the company owns the devices outright. Ongoing costs will include systems and application maintenance and monthly operator costs if there is a wide-area wireless component. Then you need to add in technical support and training. In essence, the line items for adding mobility to corporate data are similar to those for any IT project and, therefore, need to be balanced against the alternative ways and costs of getting the job done.

The total cost of ownership of mobilizing data to handheld devices, ideally, would be competitive with the next best substitute, such as accessing the data with a laptop through a secure remote access connection. As the costs of the alternatives diverge, benefits and outlays of the solutions should be scrutinized in a context that considers the accelerating trend that enterprises be responsive, connected, and collaboratively informed. What is the cost of catching up? What is the cost of regaining a competitive advantage?

- ☒ **The critical concerns of enterprises need to be addressed.** Enterprises face a variety of hurdles in their pursuit of mobile connectivity, hurdles that many companies will be forced to contend with as more workers are mobilized.

Security

As workers are able to access corporate systems through a variety of devices and networks, the chance of a security breach intensifies. A mobile workforce means companies must leverage new security technologies and procedures that will stand up to the challenges created from mobile enterprise applications. Companies have already invested significant resources toward building secure corporate infrastructures, which cannot be compromised by the wireless extensions added to applications.

Security needs to be addressed at a device level to protect local data and to minimize the threat of releasing a virus within corporate systems. It also needs to be inherent to the transport layer of the solution because there is no guarantee that IS will be able to keep pace with the proliferation of devices that workers try to connect with.

Ease of Management

IS departments have gone from managing a single computer per user to managing potentially an endless number of machines and devices. They will be charged with managing the authentication of not only who is gaining access to the network but also from what device, which is critical to managing access policies as well as the look and feel of applications on the variety of available mobile devices. Employing server-based mobile technologies allows centralized control and thwarts many of the problems stemming from IT support, asset management, authentication, and other device noncompliance issues.

As with any system accessing corporate data, enforcing IT policies is more easily accomplished when the company holds ownership of the devices. Companies that purchase, distribute, and support mobile devices are able to exercise the same control that they already exercise over corporate PCs.

Scalability

Mobility in the enterprise will roll as a self-perpetuating force that builds off each small win that companies gain from data being more accessible than it was before. At its broadest level, mobility will give workers secure access from any device, whether in the office or out, to any piece of information they need, and they will do it as easily as they check their email today.

With that vision, the key attribute for success of initial wireless deployments is the ability to deploy a scalable solution, as an expectation of larger user deployment in additional phases. Scale should refer to not only addressing an increasing number of users leveraging a wireless solution but, perhaps more important, the ability to scale beyond the initial application or project scope. As many customers are focused on an initial project and specific problem being solved, scaling the initial offering across a broader portion of the organization is a significant criterion to consider.

End-to-End Components of a Wireless Platform

Building an enterprise mobile strategy eventually requires a decision regarding the mobile devices that will be supported. The choices in device form factors, OS platforms, input methods, exterior styling, durability, connectivity options, and features and functionality have increased exponentially in recent years. From voice-centric smart phones to data communication-centric, Web-centric, and application-oriented devices, enterprises have choices to evaluate.

Mobile Devices

Evaluating devices should be done in the context of the business tasks to be mobilized and with an understanding of the devices' unique mobility constraints. Key attributes to assess include the following:

- ☒ **Battery life.** The length of charge among various devices can be a few hours, a few days, or even a couple of weeks, depending on the size of battery, a device's capability set, and its built-in power management features. An understanding of the mobility patterns of a company's mobile workforce will help determine the span that a charge needs to last. Also, because advanced capabilities such as WiFi, Bluetooth, multiband cellular radios, GPS, high-resolution screens, and multimedia further tax battery life, enterprises sensitive to power should invest in devices that offer appropriate, not excessive, capabilities for the tasks at hand.
- ☒ **Screen size and resolution.** The type of data to be displayed on mobile devices will help determine the screen size that will deliver the best experience. Although finite amounts of data or data that can be displayed as a list is appropriate for small form factor devices with limited screen size, richer applications benefit from a greater amount of screen real estate with richer color display and higher resolution.
- ☒ **Input.** Understanding how workers will need to interact with mobile data will help determine what kind of data input technologies should be inherent to the device. If email and other forms of content creation are integral parts of the mobile applications, QWERTY keyboards can be more versatile and accurate than numeric keypads or touchscreen keypads. In other instances, embedded, or wireless pen-based, handwriting recognition input remains important for specific usage models that require signatures or graphical representations.
- ☒ **Size and weight.** Optimally the mobile device should be as small and light as possible while still meeting the usage requirements for battery life, screen size, durability, and the ideal method for input. This becomes even more acute as additional wireless radios, components, and feature sets are added, thus requiring more space and a larger battery. An explicable trade-off exists between optimization of form factor and robust capabilities.
- ☒ **Durability.** The requirements for the durability of a device are dictated by the environment in which it is to be used. Certain environments require extra protection against being dropped on hard surfaces; others require protection against extreme temperatures, moisture, vibration, dust, and so forth. The extra cost of highly durable devices must be weighed against the longevity of the device as this relates directly to return on investment.

- ☒ **Connectivity options.** Beyond cellular connectivity, many options exist that can enhance capabilities. WiFi provides high-speed data transfer in a campus environment, where cost, security, and management of the wireless session can be controlled by the enterprise. GPS provides location-based services for navigation and tracking. Bluetooth offers near-field data transfer capabilities. Multiple cellular radios can provide greater geographic coverage over different wireless platforms such as CDMA, GSM, or iDEN.
- ☒ **Storage.** The amount of onboard memory determines the amount of data that can be carried and accessed on the device when a user is away from wireless coverage. Expandable memory cards can greatly enhance the onboard memory of the device, but enforceable policies pertaining to file types that can be stored on these memory cards must be considered to ensure corporate security. Applications requiring a mix of online and offline work will require sufficient storage so that data can be saved between network or system connections. As part of a core end-to-end wireless platform, there are many attributes that constitute the main ingredients for such a server-based environment. The following sections highlight these key attributes.

Enterprise Integration

As wireless deployment continues to permeate enterprise customers, it is critical for such solutions to seamlessly integrate within core enterprise systems to offer a fluid wireless offering that not only hides the complexities of such a deployment but also supports existing environments. Enterprise integration provides the key link from existing systems out to the wireless environment and must provide a transparent environment between the two. Characteristics of enterprise integration include the need for open APIs or connectors to existing applications, the support of multiple wired and wireless networks (as discussed in the Introduction), strong synchronization in wired and wireless environments, and the ability to manage and secure the wireless environment and application through a console that is integrated with existing management systems.

Push

Push architecture, which immediately routes data from the server to the user's mobile device, is critical in wireless deployments whether they are email, PIM, or other CRM or field service applications. This push architecture provides mobile workers with always-on and always-connected access to the data they require, delivering real-time access to key applications and increasing productivity and enhancing the value of the wireless implementation.

Security

As wireless solutions continue to build momentum and the subsequent number of devices infiltrates the enterprise, the impetus to manage and secure these solutions grows stronger. Wireless security is important because it provides optimized solutions specifically addressing the needs of mobile devices and wireless connectivity. In particular, wireless security addresses the needs of securing the transmission through encryption, authentication, authorization, access control, and firewall protection down to the device level, delivering the need to lock down and provide backup and recovery of critical corporate data. Other considerations may also include the need to address mobile viruses and intrusion detection within wireless environments.

Standards-Based Solutions

One of the fundamental enhancements of wireless enablement today is the ability to build solutions based on standards that provide a flexible architecture to develop applications and extend existing systems without a proprietary environment. As wireless solutions continue to emerge, it is critical to include platforms that embrace standards such as Java and XML within the development environment, open API, and tools support and multiplatform support from both a server environment and a client environment. Open server environments are the more pressing requirement due to the vocal market demand for single server environments that can provide push services to devices from many different OEMs.

Global Solutions

Developing a wireless platform that has the extensibility to address multiple regions is imperative to delivering a global solution. Although addressing language and universal issues is important, understanding the nature of wireless solutions across multiple regions and countries demonstrates the true global reach of a wireless project. As an example, in Europe and Asia a mobile operator may have a much more significant role in mobile deployments today than it will in North America. The ability to provide an adaptable architecture to address multiple infrastructure requirements drives the global nature of the solution offering.

Support Services

Technology is a critical aspect in the rollout of any wireless deployment; however, understanding the importance of supporting the IT organization as well as the end user is paramount. Convenient, comprehensive, and flexible support services are necessary to assist new technology rollouts as well as address considerations in future product deployments.

"Extensibility-Ready" Components

Extensibility-ready components are additional entities that should be inherent within a successful wireless solution. Some of these components are detailed below:

- ☒ **Transport mechanism for multiple forms of wireless data.** The need for customers to work with vendors that can deliver an extensible platform that provides for multiple wireless data applications should be a requirement for enterprise deployments today. Although email/PIM is important in enterprise mobility, increasingly mobile deployment projects are more heavily concentrated on applications beyond email. Consideration must be given to those vendors that not only have the scale to deliver on the needs today but also can provide a much broader offering to address multiple applications and enterprisewide utilization.

- ☒ **Wireless data connectors.** Common back-end systems such as Oracle and SAP offer standard development frameworks that can easily be extended wirelessly. This includes utilizing standard Web-based client design, specific APIs, and other development tools to rapidly provide wireless access. In addition, the support of other data sources and objects, including XML and Web services,

provides adaptability of a broad level of existing data sets into wireless environments. Lastly, support of common software development kits allows organizations to leverage existing resources and familiar development environments and use tools to build compelling applications for their mobile population base.

- ☒ **Professional services.** Beyond product sets, vendors providing professional services, consulting, and implementation or other support services deliver additional solution-level value to customers seeking customized implementations. This can be achieved through a vendor's in-house services organization or through a third-party partner.
- ☒ **Application support.** As wireless deployment projects continue to infiltrate enterprises, technology for IT is no longer the driving factor. An application that begins to solve a problem and addresses the need of a line-of-business manager resonates much more strongly than a platform play. Partnerships with popular enterprise application providers and development of solutions that lead with an industry-specific application both deliver key extensibility-ready components.

Conclusion

- ☒ Mobilizing enterprise applications should not be done for mobility's sake. Although there will be growing pressure to keep pace with the mobility efforts of competitors, mobile solutions should always be centered in a business case that weighs its benefits and costs against the alternative methods for getting the job done.
- ☒ Enterprise mobile strategies should focus on extending standing investments and unleashing the value of existing applications. The most powerful applications are those being used every day by workers. The ability to provide access to these applications to mobile workers is the true value of a mobile deployment project. Providing mobile workers with key sets of application access within a mobile environment delivers significant business advantages and addresses the strategic needs of the organization.
- ☒ To deploy successful wireless solutions, it is critical that companies not rebuild but rather leverage existing deployments and look for a vendor that can deliver on a scalable solution. Key attributes include a global, standards-based offering that is integrated with existing enterprise systems and one that includes a push-based architecture, management and security components, and a support structure in place. In addition, an extensibility-ready architecture must be inherent in any wireless offering providing offline access to wireless applications, API connectors to access common enterprise applications and legacy systems, a professional services organization within the vendor or strong partnership, and a framework for deploying applications.
- ☒ Let the business goals, worker mobility patterns, and attributes of the data to be mobilized determine a solution's wireless platform. The degree to which workers need to access the most up-to-date data, the requirement for voice communication to be part of the solutions, and the location from which data will be exchanged — from the field, on a campus, or within a building — will determine which connectivity methods are most appropriate.

Appendix

Table 1 contains a checklist of criteria for evaluating wireless enterprise platforms.

TABLE 1

Criteria for Evaluating Wireless Enterprise Platforms

| Key Attributes | Evaluation Criteria | Included |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Mobile devices | | |
| Battery life | Does the length of battery charge meet the mobility patterns of my company's mobile workforce? Does it support the power requirements stemming from connectivity needs, applications, display, etc.? | |
| Screen size | Is the screen size and screen orientation appropriate for the data to be displayed? Does it deliver the best user experience? | |
| Data input requirements | Does the data input technology (e.g., keyboard, keypad, touchscreen) meet the needs of my company's mobile workforce? | |
| Size and weight | Does the form factor of the mobile device fit the mobility patterns and preferences of my company's mobile workforce? | |
| Storage | Is there sufficient onboard memory to allow the mobile device to store and access data when out of wireless coverage? Is the use of expandable memory on mobile devices considered secure enough to be used within the organization? | |
| Enterprise integration | Does the mobile solution seamlessly integrate with my company's existing IT systems? | |
| Unified communications | Does the mobile solution leverage the organization's existing telecom infrastructure for simplified communications with unified access and messaging for mobile workers? | |
| IT management | Does the mobile solution allow for easy management of mobile assets or help enforce compliance with my company's access policies? | |
| Push | Does the mobile solution allow always-on and always-connected, real-time access to the required data? | |
| Security | Does the wireless solution include security measures such as mobile device lockdown, encryption, authentication, authorization, access control, firewall protection, intrusion detection, backup and recovery, and antivirus capabilities? | |
| Standards-based solutions | Does the wireless solution comply with industry standards and leverage nonproprietary technologies such as XML, Java, etc.? | |

TABLE 1**Criteria for Evaluating Wireless Enterprise Platforms**

| Key Attributes | Evaluation Criteria | Included |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Connectivity | Does the wireless solution meet the advanced connectivity needs of the mobile worker with options such as high-speed cellular data links, global voice and data coverage, near-field communications? | |
| Global reach | Does the wireless solution provide an adaptable architecture to address the different infrastructures of multiple regions and countries? | |
| Scalability | Can the wireless solution accommodate the expected increase in the number of users across the organization? | |
| Support services | Does the wireless solution include a comprehensive suite of support services to help with new technology rollouts as well as migration to new product deployments? | |
| Extensibility-ready components | | |
| Transport mechanism for multiple mobile applications | Does the mobile solution leverage the organization's existing IT infrastructure for critical business applications? | |
| Wireless data connectors | Does the wireless solution include a complete set of tools (API or browser based) to allow rapid deployment of an application? | |
| Professional services | Does the wireless solution include a comprehensive set of professional services such as consulting and integration to allow a customized solution to meet the company's specific requirements? | |
| Application support | Does the wireless solution provider have the strategic alliance with key enterprise application providers that provide key extensibility-ready components? | |

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