

2009

Mobilizing Enterprise Applications



With a peek into
Lotus Notes mobilization

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Why Go Mobile Today?

It has been more than a decade since businesses began the race to web-enable corporate applications and data. This effort was driven by the need to make applications and the critical information they contain more accessible to users, and to keep pace with the ever-increasing speed of business operations. Today, with the advent of truly mobile computing, history is repeating itself with an even more condensed timetable and a focus on creating a more mobile workforce. For enterprises, the challenges of mobilizing their workforces are readily apparent.

“A content-browsing technology cannot provide the user experience or local processing capability that sophisticated mobile customer and business applications will require... Over the next five years, the deficiencies of WAP combined with the functional and usability requirements of future mobile applications and games will make client-side Java the implementation technology of choice for nontrivial mobile applications.”

Architecting Mobile Applications
Microsoft White Paper

The ubiquity of electronic communications and digitized data has increased the pace of business and the expectation of response to near instantaneous. At the same time, a rapidly growing percentage of the workforce is increasingly mobile, spending less and less time at their desks each day. This mobility isn't just limited to the stereotypical “road warriors”. The research firm IDC estimates that the number of “mobile professionals” - classic white-collar employees who spend 20% or more of their time away from their desks - is growing by approximately 15% annually. Since the vast majority of critical business data is only available through a PC connected to the corporate LAN, these two trends are creating a digital divide where a company's most valuable employees are increasingly separated from the critical applications and information they need to drive the growth and success of the business.

Enterprises that recognize this growing divide will find an enormous opportunity to increase efficiency, productivity, and even competitive differentiation. By leveraging wireless and mobile devices and software, companies can give mobile employees direct access to mission critical applications and data wherever and whenever needed; keeping workers connected to enterprise applications, regardless of their physical locations, and in the process shorten decision cycles, reduce unproductive down-time, and respond more quickly to customers.

However, the challenges enterprises encounter in the attempt to build wireless access to mission-critical data are significant. Disparate wireless networks, a constantly shifting landscape of mobile standards and technologies, and the natural display and navigation limitations of mobile devices are just a few of the obstacles companies face in building out secure, user-friendly mobile applications to solve business problems. Furthermore, to avoid creating administrative headaches and unnecessary costs, these mobile business applications must also effectively leverage the enterprise's existing IT infrastructure, as well as its existing technical and support expertise.

“...mobile applications should be designed not to rely on a network connection to provide functionality. Connectivity can be the best-case scenario for an application but should not be required for using the application...”

Nick Jones
Analyst, Gartner Group

The solution to these challenges needs to be integrated, complete, and cost effective. Its delivery should be supported by, and based upon, services that tailor it to meet specific enterprise needs. And fundamentally, the right solution must enhance employee productivity, reduce costs, and increase competitive advantage. In other words, effective mobile applications must be flexible enough to accommodate a vast and evolving array of mobile network and device technologies, while at the same time being tightly integrated with the enterprise’s existing infrastructure. The mobile application should leverage best-of-breed technology to deliver complete, and cost effective, business solutions.

Business Opportunities

The goal of introducing mobility solutions into the workforce is to make employees and essential business processes more efficient, which yields direct productivity gains and cost savings. These productivity gains and cost savings, along with the improved speed of customer communication and response, help create competitive advantage, increased customer satisfaction, and increased job satisfaction. In addition, mobility solutions can also provide enormous returns that go well beyond these macro benefits to improve effectiveness of specific personnel and operations. Specifically, the following three types of personnel often benefit most significantly: Mobile Executives, Sales People, and Field Service.

Mobile Executives

Mobile Requirements	Productivity Gains	Reduced Costs
<ul style="list-style-type: none"> ▪ Have secure, optimal connection to corporate email, messaging, and PIM functionality. ▪ Access critical business performance metrics and reports. ▪ Access workflow, time reporting, and expense tracking applications ▪ Have easy access to client history and reports on client visits. ▪ Have access to relevant enterprise applications. 	<ul style="list-style-type: none"> ▪ Ability to email while sitting in a taxi, waiting at airports, etc. ▪ Ability to act on business performance data while on the go without having to wait for network availability and browser to refresh. ▪ Ability to input time and billing information while in transit without having to boot up their laptop. ▪ Ability to access critical information, whenever it’s needed, reduces decision cycle time. 	<ul style="list-style-type: none"> ▪ Reduced need for executive assistants to provide support while traveling because the executive can directly access critical business metrics and performance data. ▪ Faster decision cycles, and constant access to performance data, means that executives can detect and solve problems faster, reducing the financial impact of manufacturing, product, financial, sales, or other business incidents.

Field Sales

Mobile Requirements	Productivity Gains	Reduced Costs
<ul style="list-style-type: none"> ▪ Check on status of an order ▪ Access detailed product information ▪ Access competitive information ▪ Provide an up-to-the-minute price quote ▪ Access customer information ▪ Place an order ▪ Dispatch a field service technician ▪ Enter call notes, and update account records 	<ul style="list-style-type: none"> ▪ Direct access to inventory, order, and customer data, helps maximize the value of meetings and shorten the selling cycles ▪ Ability to update call notes from the field, rather than going back to the office, results in more sales calls every week. Sales teams spend more time selling and less time catching up on paper work. ▪ Updating call notes from the field results in better, more accurate data, giving the company more control over the sales process and the customer relationship. 	<ul style="list-style-type: none"> ▪ Because of increased productivity, fewer sale personnel are needed to cover the same potential customer base. ▪ Travel and administrative costs can be reduced ▪ Overall processing necessary to close the sales cycle is reduced as orders are placed directly in to the database and invoices are generated immediately and electronically.

Field Service

Mobile Requirements	Productivity Gains	Reduced Costs
<ul style="list-style-type: none"> ▪ Increase department's support capacity, without adding additional head count. ▪ Open new tickets in field, to eliminate "free" support jobs. ▪ Receive a service dispatch. ▪ Gain easy real-time access to technical support documentation. ▪ Have easy real-time access to inventory for parts ordering. ▪ Have easy real-time access to customer history. ▪ Electronically update the status of a service call and close a trouble ticket. 	<ul style="list-style-type: none"> ▪ With dynamic dispatching that updates their schedules real-time, field service personnel can make more service calls. ▪ Direct access to customer history means less travel time and more service engagements for each field service representative. ▪ Ability to log new tickets from the field eliminates "free" tickets, and improves performance, metrics, and quality and accuracy of support data. ▪ Real-time dispatch of service tickets enables field service personnel to respond to scheduling changes, cancellations. 	<ul style="list-style-type: none"> ▪ Reduced processing errors and rework time due to automation of service process ▪ Reduced travel costs due to more efficient use of service personnel ▪ Reduced billing cycle as the order is processed immediately. ▪ Fewer dispatchers needed to adequately serve the needs of the field service personnel. ▪ Enables organizations to become more nimble and agile as they are able to fill time gaps in field service personnel; calendars in real-time.

Choosing the Right Platform for your Business

An optimal approach to the mobilization of enterprise applications can be achieved by choosing a mobile platform that delivers the five (5) key features: mobile application acceleration, security, developer tools support, application delivery, and administration.

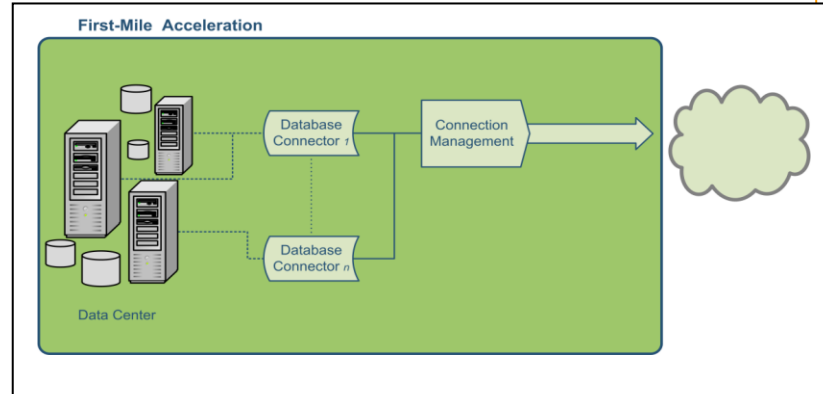
Mobile Application Acceleration

Mobile application acceleration addresses the requirement for highly responsive applications that access and interact with the appropriate corporate data.

Mobile networks sit in the middle of the mobile application landscape and developers have little control over the latency and bandwidth restrictions they impose. Therefore, the acceleration techniques concentrate on "first-mile" improvements (on the server side) and "last-mile" improvements (on the mobile device). The first-mile and last-mile techniques are then implemented in conjunction with additional acceleration techniques that work across the server and device boundaries. When combined, significant performance gains are extracted from existing mobile networks and devices.

First Mile Accelerator Features (server side)

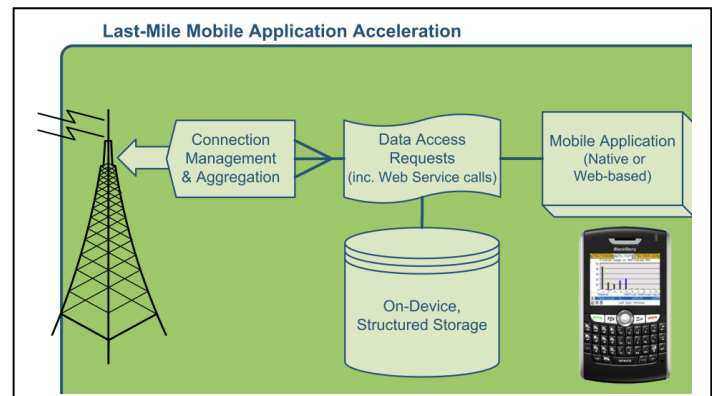
Mobile enterprise applications are often targeted to provide particular corporate data to specific users. For example, mobile sales dashboards can provide role-based, regional datasets customized for individual district managers to use as they travel and meet with sales people in their district. Mobile enterprise applications need to provide access to these datasets such that numerous customized data extracts can be performed as needed without interfering with the other concurrent uses of the corporate databases.



- Data Connectors:** Manage the mobile infrastructure's ability to extract the necessary data from the appropriate data sources and transform it into the format required by the on-device structured storage. Therefore, the connectors must be able to address the need for a variety of customized data extracts using the source database's APIs or query languages.
- Connection Management:** Communicates with the on-device connection manager to process and control the data transfers between the enterprise data center and its mobile applications. Therefore, when necessary, the server-side connection manager may initiate a data update to one or more devices using a shared protocol.
- Data Compression:** Maximizing the efficiency of the limited bandwidth that is available to mobile devices requires data compression over the air. Mobile platforms perform this data compression automatically between the server-side source of the data and the application client. The platform infrastructure provides mechanisms on both ends of the data stream to make this compression transparent such that the end user does not have to take any additional steps to access the compressed data.
- Background synchronization:** If you chose to have data residing locally on your device then you need a platform that will handle background over the air synchronization. The result is a mobile application where the user interacts with the local data while, in the background and when the device can connect to the mobile network, the application is automatically and consistently synchronizing the local data to the current state of the data on the server. In addition to providing a more responsive user interface, an additional feature of this approach is that most uses of the application remain viable even when the mobile device is offline.

Last Mile Acceleration Features (mobile side)

An application that exhibits poor performance on a mobile device won't be successful even if the server-side aspects of the system perform extremely well. Experience has shown that the most successful mobile applications – whether they are native or web-based applications are those that are most responsive to the user's interaction. Mobile applications platforms that can address this issue provide **on-device structured storage** and **connection management**.



- **On-device structured storage:** This choice allows the application logic and interaction to be working with data that is stored on the device. Maintaining the local data in a structured manner (rather than a browser-like cache) enables the application to perform more common data interactions (e.g., sorting and filtering queries) without requiring any network traffic back to the data center. Offloading these more common sources of network traffic improves overall application responsiveness and frees up the mobile device's network connections for application functions that require interaction with the server (e.g., transactions that change the data).
- **Connection Management and Aggregation:** Mobile devices offer a limited set of resources to their applications. For example, mobile browsers are often limited to having two simultaneous HTTP connections open. When possible, mobile platforms provide an on-device mechanism that acts as a network access proxy to minimize the effect of these kinds of restrictions. The proxy component is deployed to the mobile device and intercepts the outgoing connection requests from the application(s) and aggregates multiple connection requests into a single message sent using an over-the-air protocol. In practice, this reduces the processor and network workloads since there are fewer real network connections that need to be maintained. This results in optimized use of the bandwidth provided by the mobile network.

Security

The number of mobile applications that access sensitive or private data (i.e., data to which access should be limited to a known user, a known enterprise, etc.) is increasing quickly. Therefore, every mobile platform must address the **security** of data throughout the mobile infrastructure – especially for enterprise applications.

As today's mobile platforms store application data on the user's mobile device to provide mobile application acceleration, it is mandatory that the application data be secured throughout the application infrastructure and throughout the data's lifecycle. Any data that is delivered from the data center to the device must be sent in a format that is encrypted. The application must have a mechanism to decrypt the data when it is accessed by the user. If the data sent to the device is kept on the device (for mobile acceleration or caching purposes), it must also be stored on the device in a secure, encrypted format that is accessible to the authorized mobile application and user.

The importance of on-device data security cannot be overemphasized. Experience has shown that smaller, mobile devices are lost or stolen more frequently than desktop systems. The use of a mobile platform that stores its on-device data without any form of encryption gives every lost or misplaced smartphone the potential to become a security breach. The goal of these platforms is the same: any sensitive data stored on the device can be accessed only by applications and users that are authorized to access the data.

Developer Tools Support

Modern mobile platform providers understand the need to provide their developer community with the flexibility to develop their mobile applications using tools with which they are already familiar and/or tools that provide superior productivity and ease of use. Mobile platform providers can make a number of choices to best meet the needs of their developers.

Some mobile platforms provide tools that allow developers and IT staff without mobile application development expertise to develop applications using a 4GL-like approach. These application development studios allow the developer to design a mobile application with user interface and data access abstractions. Typically, these abstractions

are used to generate native applications that implement the platform's mobile application acceleration and security features.

For developers who want more control or who have experience, mobile platform providers can offer plug-ins to popular development environments such as Eclipse or Visual Studio. These components expose APIs and provide access to libraries or assemblies that implement the platform's features. These APIs often include facilities to incorporate the use of the platform's components – such as access to the platform's on-device storage, data connectors, connection managers, compression, security, etc. – inside the developer's code.

Application Delivery

The Application Delivery component uses the information and relationships modeled in the Administration component to determine which application(s) are appropriate for a specific user/device and to deploy those applications on the user's device.

An application delivery can be authorized by a number of events including, but not limited to, the following: associating a new device with a user, changing a user's role, or associating a new application implementation to an application for which the user is authorized.

The simplest delivery can be initiated by having the Administration component send an SMS message to the device for which the delivery has been authorized. This SMS message can contain a link to the appropriate application installer such that the device owner can perform the installation by clicking on the link. Though not quite as simple, a link to the appropriate installer could be sent in an email to the user. Other alternatives would include the development of an enterprise mobile application delivery web site where the user could log in from the device's browser and the login credentials are used to direct the user to the appropriate installer(s).

Administration

The Administration aspect of a mobile platform controls which users (and users' devices) are authorized to access which applications and data. The Administration component enables reporting capabilities such that an enterprise knows which users/devices/applications/data are in use (or had been in use – assuming the proper logging is in place). It also supplies the information necessary for the Application Delivery component to determine which application(s) and which data should be delivered to a particular user/device.

The Administration component provides tools and/or APIs that manage the relationships between users, devices, applications, and application data. Conceptually, this can be viewed in terms of the management of user authentication, mapping users to devices, mapping users to roles, mapping roles to applications, and mapping applications to application data source(s).

Conclusion

The 5 features listed above should be a guideline in determining what will work best for your organization. What is clear is that with the proliferation of mobile computing, organizations need a carefully thought-out mobile strategy and plan. Once that is done you will be able to decide on the features and functions you will need in your chosen platform. At a bare minimum you will need to address security and application delivery. The other features will be required based on the type and usage of the application. In summary the key features you need to consider in your mobile deployment are:

The **mobile application acceleration** aspect of the platform will implement “first-mile” enhancements on the server side in conjunction with “last-mile” enhancements on the mobile device.

The “first-mile” enhancements include data connectors and connection management mechanisms through which mobile applications can access enterprise data. The “last-mile” enhancements will include on-device, structured data storage and connection management mechanisms that optimize application responsiveness while minimizing the user-visible impact of the mobile network latency and bandwidth limitations.

The **security** aspect of the platform will ensure that sensitive enterprise data is encrypted throughout the mobile infrastructure. It will also enforce strong policies that limit access only to properly authorized mobile users.

The **developer tools support** aspect of the platform provides developers and IT staff the tools they need to create mobile applications that incorporate the platform’s acceleration and security features as easily and readily as possible.

The **application delivery** and **administration** aspects of the platform enable the enterprise to effectively and efficiently deploy mobile applications. These components ensure that the user and his/her device are given access to the applications and data that are best suited to his/her role in the organization.

A mobile platform with strong support for all of these key features is ideally suited for developing and deploying mobile applications that are dynamic, responsive, fast, and secure on existing mobile devices and today’s mobile networks.

Lotus Notes Mobilization

Mobile applications can deliver new economies of scale across all your Lotus Notes application investments. Relavis Mobile lets you drive a lot more ROI from your existing systems by extending the necessary information to mobile devices. It allows you to exponentially increase access by making your data accessible anytime, anywhere, and across different BlackBerry device types - not just on your desktop.

Relavis Mobile provides the premiere mobile product for companies using Lotus Notes; the secret is in our Lotus Notes Connector. The versatility of the Connector allows you to take simple or complex applications and data relationships and easily deploy them to your mobile devices. Combined with our expertise in mobile application development in Lotus Domino, Relavis Mobile ensures your success. No other mobile technology for Lotus Notes on the market can deliver this richness and ease of deployment. Some key features of the tool are:

- **Domino Connector:** Delivers the application connectivity, and essential ancillary functionality, which would otherwise have to be custom built by developers on an application-by-application basis. As a result, Relavis Mobile developers are able to focus their time on building core applications, rather writing code that allows for secure access to a specific database. In addition to embedded connectivity, the Domino Connector manages all of the synchronization functionality for the mobile application. Therefore, no custom APIs or Web Services are required to address all of the **data integrity, conflict resolution, encryption, authentication, transmission and local security** challenges presented by users pushing and pulling information over multiple networks with varying states of connectivity.
- **On-Device Compression:** The unique data compression technology included in Relavis Mobilizer allows applications and, in most cases, all of the application data to reside on the user’s device, giving the user instant access to his or her information regardless of wireless coverage or signal strength.

- **Security:** In addition to providing best-of-breed authentication and encryption for data communications, Relavis Mobile includes a unique technology that fully secures the application and all of the data through the use of an application Lease Key — even if the device is taken off the network and can't be wiped or killed remotely. This Lease Key is used to fully secure the application data throughout its lifespan.
- **Relavis Mobile Studio:** Relavis Mobile Studio is an easy-to-use, drag-and-drop design tool that can reduce or even eliminate dependence on outside consultants. With the studio, IT departments have the ability to customize and change their existing mobile applications, and even create new mobile applications and connectors, all without writing a single line of code.
- **Centralized Device/ User Management:** Administrators can manage a variety of devices from a single administrative console and push out standardized deployment configurations for updating remote devices. By leveraging user and grouping information from existing enterprise directories, administrators can easily monitor and control user access to mobile applications, levels of security, and levels of data access.
- **Relavis Management Console:** The Relavis Management Console is an intuitive, web-based Graphical User Interface (GUI) that allows IT administrators to manage all aspects of all mobile applications with their existing resources. It is an enterprise-grade management and administration portal.

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