Establishing an effective application strategy for your mobile enterprise

How to enable, develop and deploy mobile-based applications in an end user environment

IBM.

It has been more than 20 years since the term "ubiquitous computing" first entered the popular lexicon, but it has never seemed truer than in today's workplace, as smaller and more mobile devices become strategic alternatives to the traditional desktop. But it is really the explosion of mobile enterprise applications that has made it possible for many employees to work productively anywhere, anytime. And, for the most part, they have not had to wait for the IT department to supply their "ubiquitous" device.

Today, end users are bringing their mobile devices to work in increasing numbers. IDC believes that by 2016, employee-owned smartphones, tablets and PCs in the workplace will grow from 2 billion to more than 5.25 billion. These users expect IT to support them in accessing corporate databases and applications seamlessly and securely.[1] Consequently, IT is pressed to deliver security-rich applications and access across an ever-changing, multiplatform, multidevice universe—and then keep them updated and provisioned to the right users.

This white paper provides an overview to help you establish an effective mobile application strategy for your employees, starting with a solid assessment through to management of this complex environment.

Developing your mobile application strategy

There are clear reasons why companies should make developing a mobile strategy the first order of business. Companies that have already established and are implementing a mobile strategy are most likely to be leaders in their industries. In one study conducted by IDC and IBM, these mobile technology leaders were twice as likely to have experienced both revenue growth and IT budget increases of at least 10%.[2] And in a survey conducted by the IBM Institute for Business Value in conjunction with Oxford Economics, 73 percent of mobile leaders said they have realized measurable ROI from their mobile initiatives, compared to only 34 percent of all other companies in the study.[3]

Yet that same study found that less than half of the companies surveyed have comprehensive mobile strategies in place.[4] To get started with developing a strategy for how your employees will leverage mobile applications to do their jobs, it is important to examine your business objectives and align your applications with those. You might consider:

- Who are my users?
- What devices will they be using? Are those devices personally owned, corporate owned or both?
- Which applications will help enhance productivity for my various user groups?
- What data will my applications be accessing? Is it sensitive? Will it be stored locally on the mobile device? What is the security policy for this data?
- Is there an off-the-shelf application available that will meet my needs? If not, how will I develop a custom application: in-house, or outsourced?
- Are mobile versions of my current enterprise applications available off the shelf?
- How will I make my application available to users, deploy updates to the app and track usage?

At many organizations, email, contacts and calendars are the primary mobile services offered, often because these applications are easiest to deploy and available out of the box. They also deliver rapid productivity benefits for users who conduct work outside of the office—which is a growing population of employees.[5] Today, more than 50 percent of all IBM employees conduct work away from an IBM office, and we have connected more than 200,000 IBMers to internal networks using mobile devices. IBM leverages mobile software for email and collaboration, social software and portals—such as IBM® Lotus Notes® Traveler, Lotus iNotes®, and Lotus® Connections software—to keep employees connected to their clients, each other and general IBM resources.

That said, today's mobile business user is looking for more than just email. There are many opportunities for using mobile to both increase employee productivity and enhance the customer experience by improving response time and communications. Depending on your industry, examples of mobile applications that can help employees improve customer service include:

- Giving sales staff access to up-to-date product inventories
- Providing repair technicians or engineers with access to diagrams and subject matter experts
- Extending customer relationship management systems to field personnel for easy access to proposals, contracts, contacts and other project information
- Gathering data such as insurance claims—with photos to document damage—for direct transfer to back-office processing applications

Evaluating options for mobile applications

Whether you are starting with email and calendars or planning a complex, custom field service application, a key element of your mobile strategy will be determining what type or types of applications you will make available to your employees.

As you evaluate the four major categories of mobile applications, the factors to consider will range from user experience to connectivity issues, data consistency and synchronization, and the device support decisions you have made.

Native applications

A native application is installed, runs on the mobile device and is typically developed using the software development kit (SDK) for the device's operating system. Native applications are advantageous in that they can use device features such as the camera, global positioning service (GPS) and accelerometer to their full potential while providing a rich user experience (such as with games). Native applications also typically provide for offline or disconnected access and offer a straightforward path to distribution through an application store. A key disadvantage is that native applications usually run on only one platform. So, if you are planning to support your application across multiple platforms, additional effort is required. Organizations typically find themselves supporting two if not three mobile application platforms, including Google Android, Apple iOS and BlackBerry.

Web browser applications

Today's web browser applications have the potential to "write once, run many" on various platforms and screen resolutions. Powerful tools like HTML5, JavaScript and CSS allow the same application to be formatted for multiple device platforms. Gartner predicts: "By 2017, the browser on mobile endpoint devices will be used as a sophisticated application delivery platform, with 50 percent of new web apps involving complex client-side JavaScript."[6]

Because web applications do not store data on the mobile device, the risk of losing corporate data is reduced if the mobile device is misplaced or stolen. However, with modern browsers supporting web storage and Document Object Model (DOM) storage, data can be stored locally on the mobile devices for offline or disconnected access, which may discount the security advantage.

Compared to native applications, however, web browser applications have a number of disadvantages. Web applications typically cannot access device features such as the camera, GPS or accelerometer. In addition, web browser applications may deliver lower performance and a user experience that is less rich than native applications, although this is likely to change. Unlike native applications that can run when disconnected from the network, most web browser applications require persistent network connectivity.

Hybrid applications

As the name implies, hybrid applications combine the best features of web and native applications and are common in many mobile applications available today. In this model, the web browser engine delivers content using standard HTML, HTML5, JavaScript and CSS inside a native application wrapper. This application provides a rich experience, offline access, high performance, and support for multiple platforms, and can leverage hardware features. When considering this approach, organizations must realize that like native applications, the hybrid is platform specific and will involve costs to build, deploy and update.

Virtual applications

For applications that cannot easily be made to run natively or in a web browser, there is virtualization. Virtualization can allow users to connect remotely to their PCs to access data or to use a native Microsoft Windows application, saving on custom development effort. Products like Citrix GoToMyPC allow users access to desktop and enterprise files or applications on any PC or Mac, from virtually any tablet or smartphone. Although most Windows applications are formatted for larger screens, virtualization technology formats the application for the particular device and screen size. Like web applications, a key advantage of virtual applications is security. No data is stored on the mobile device and only keyboard input and screen updates are sent across the network. A disadvantage is that users must have persistent network connectivity.

	Pros	Cons
Native	• Rich end user experience • Offline access • Leverage hardware-specific	• Platform specific (for example, cost to build, deploy or update)
Web	• Support for multiple platforms • Standards based • Security (for example, no local data storage) • Ease of deployment	• May not support offline or disconnected access • May not offer as rich a user experience as native • May not offer the ability to leverage hardware-specific features
Hybrid	• Rich end user experience • Offline access (for example, HTML5) • High performance • Support for multiple platforms • Leverage hardware features	• Platform specific (for example, cost to build, deploy or update) • Server infrastructure (server, licenses, administration or other)
Virtual	• Leverage existing PC applications • Security (for example, no local data storage)	• May not support offline/disconnected access • A user interface designed for a PC may not translate well to a smartphone or tablet • Server infrastructure (server, licenses, administration or other)

Developing and securing mobile applications

The types of mobile application that you plan to deploy—native, web, hybrid or a combination of types—will in turn drive your selection of an application development platform. If your mobile strategy focuses on supporting a single device type or mobile OS, using the provider's development toolkit is the obvious choice. Or you can use programming languages such as HTML5, JavaScript, CSS, .NET, C++ and Objective C and the like to develop either native or web applications for mobile users. Both of these approaches do require that you have the appropriate programming skills to develop apps in-house.

It is much more likely, however, that organizations will be using a multiplatform approach to enterprise mobile applications. An increasingly popular alternative for enterprises is mobile application development platform software. These software packages bundle fourth-generation programming languages—which eliminate the need for deeper programming skills—with other tools such as debuggers, emulators and installers to deliver an integrated development environment. A significant advantage is that most of these tools support cross-platform deployment, which means you "develop once, deploy many."

The selection of a mobile application development platform is not a simple task. According to Gartner, "The market for

tools to create consumer and enterprise facing apps is complex, with well over 100 potential tools vendors. For the next few years no single tool will be optimal for all types of mobile application, so expect to employ several."[7] The tool vendors range from open-source projects to enterprise software vendors such as SAP and major software companies such as IBM and Adobe. Others include pure-play mobile application development platform vendors and software as a service providers such as salesforce.com.

Once the application is developed, it will need to be tested prior to deployment. Selecting a mobile application development platform that includes testing software can simplify this process. Testing should address both functionality and application security, a factor that is frequently overlooked—resulting in significant risk to enterprise data. Gartner predicts that through 2017, 75 percent of mobile security breaches will be the result of misconfiguration and misuse on an application level, rather than the outcome of deeply technical attacks on mobile devices.[8]

Deploying and managing mobile applications

Once the mobile applications are written, they need to be deployed to end users. Application stores are familiar in the consumer marketplace, and they are growing in popularity inside many enterprises as a way to allow workers to acquire approved applications without desk-side assistance—and with enhanced security.

Creating an internal enterprise application store for web applications can help eliminate the need to type long URLs into the browser on mobile devices with small keyboards. You might also allow end users to submit applications that may include web links to public websites as well as applications in public application stores (like Apple's App Store) with business purposes—although security policies should also be developed to ensure that any outside-sourced applications are tested and proven to meet your internal security requirements.

Software for developing and deploying an enterprise application store is often integrated with a mobile application development platform or with mobile device management software. Integration in the former is part of the growing trend on the part of enterprises toward focusing more on mobile application management than mobile device management.

IDC recognizes IBM expertise in mobile application development

Industry analyst IDC named IBM a leader in the new IDC MarketScape Worldwide Mobile Application Development, Testing, Management, and Infrastructure Services 2014 Vendor Assessment.[9] Following an evaluation of 14 companies against 117 criteria, IBM was recognized in the "leaders" category in part for its "training and knowledge sharing, range of service capabilities, innovation/research and development pace and productivity, employee management, and customer satisfaction."

The report highlighted customers' praise for IBM's technical expertise in mobile, consulting and its global technology services, as well as its flexibility to coach clients through the application development cycle, regardless of the design process already in place. IBM's professionalism, punctuality, customer service, and overall project management capabilities were also noted.

How IBM can help

Through our IBM MobileFirst initiative, IBM offers an end-to-end portfolio of services and software designed to help enterprises streamline and accelerate mobile adoption. IBM MobileFirst combines deep industry expertise with mobile, big data and analytics, cloud and social technologies to help organizations increase workforce productivity and deepen relationships with customers.

Our enterprise mobility services include:

IBM MobileFirst Infrastructure Consulting. IBM mobility experts help you develop the right strategic plan for your organization.

IBM MobileFirst Application Platform Services. Speed and simplify application development with a hosted, fully managed IBM Worklight® platform, an industry-leading, open mobile application platform for smartphones and tablets that helps you efficiently develop, test, deploy, run and manage HTML5, hybrid, and native applications.

IBM MobileFirst Managed Mobility Services. Let IBM handle your mobility implementation with an end-to-end, fully managed solution that encompasses device management (employee- and organization-owned), application management, security, messaging and collaboration, and user support—delivered either via the cloud or on your premises. IBM currently manages more than 430,000 devices for large and midsized organizations around the globe.

IBM MobileFirst Network Services. Keep your employees connected with a secure and reliable infrastructure optimized for mobile.

IBM MobileFirst Collaboration Services. Support your collaboration, cost and productivity objectives with a cloud-based Unified Communications and Collaboration model.

For more information

To learn more about IBM MobileFirst Services, contact your IBM marketing representative, IBM Business Partner, or visit the following website: **ibm.com**/services/mobility

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