

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 enterprise applications that has made it possible for many employees to work productively anywhere, anytime. For the most part, they have not had to wait for the IT department to supply their ‘ubiquitous’ device. They are happily bringing their own.

According to a recent report from industry analyst, Gartner Inc., this trend is expected to increase: ‘By 2014, 90 percent of organisations will support corporate applications on personal devices by 2013, 80 percent of businesses will support a workforce using tablets.’¹ Consequently, IT is pressed to deliver security-rich applications and access across an ever-changing, multiplatform, multi-device 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, starting with a solid assessment through to management of this complex environment.

Assessing your objectives

To get started with developing a strategy, it is important to examine your business objectives and align your applications with those. You might consider:

- Application functionality, determining which applications help enhance productivity for your various user groups
- Technical considerations, including available skills
- Development and management costs, along with best return on investment (ROI).

At many organisations, email, contacts and calendars are still the primary mobile services offered, often because these applications are easiest to deploy and available out of the box. However, as the success of mobile application stores demonstrate, today’s mobile user is looking for more than just email. Delivering a range of mobile enterprise applications can help reduce the dependency on the traditional laptop and enable mobile users to be more productive. That said, it is important to understand the limits of smartphones and tablets (for example, small screen and small keyboard) and avoid replicating PC applications.

IBM® has been engaged in a ‘comprehensive enterprise mobility initiative’ for years, bringing some of its most talented developers, researchers, mobility experts and everyday users together to create not only a strategy, but also specific workplace-focused applications. Today, more than 50 percent of all IBM employees conduct work away from an IBM office. How do they stay connected to product information, client data and general IBM resources? IBM leverages mobile software solutions for email and collaboration, social software and portals, such as Lotus Notes Traveler, Lotus iNotes and Lotus Connections, many employees can access IBM’s internal address book, ‘BluePages,’ as easily on their smartphones as their laptops.

Evaluating options for developing applications

According to analyst IDC, application developers have churned out more than 300,000 mobile applications in just over three years and growth is expected to soar as these applications find themselves on more and more devices.²

In your organisation, application overload may set up a different scenario. It is probably not feasible to mobile-enable all of the applications your employees use today. You may end up combining some off-the-shelf (OTS) mobile applications with application development, either in house or working with an experienced developer.

Challenges range from user experience (mobile devices tend to have small screens and awkward input mechanisms) to connectivity issues, data consistency and synchronisation and of course, device management and versioning that might be required.

Native applications

A native application is installed, runs on the mobile device and is typically developed using the device's Software Development Kit (SDK). 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, like Apple's App Store, or an internal version. 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. Adobe® Flash Lite, Java™ MicroEdition, Symbian or BREW are examples of application environments that can run on multiple platforms.

The industry continues to discuss the 'death' of native mobile applications, given the sophistication and capabilities of many mobile web browsers. Some say that, as companies look to optimise cost efficiencies and reduce support costs, many enterprise applications will suffer. Others note that as a certain platform gains momentum, it encourages native application development, which can take better advantage of the increasing power of the devices.

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 hypertext markup language (HTML), JavaScript and CSS have certainly evolved, allowing the same application to be formatted for multiple device platforms. 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, JavaScript and CSS inside a native application wrapper. This application provides a rich experience, offline access, high performance, support for multiple platforms, and can leverage hardware features. When considering this application, users must realise 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 virtualisation. Virtualisation can allow users to connect remotely to your PC to access data on your

laptop or to give users the ability to run a native Microsoft® Windows® application that saves on custom development effort. Products like Citrix GoToMyPC or Citrix Receiver allow users access to virtual desktop and enterprise files or applications on any PC, Mac, netbook, tablet or smartphone. Although most Windows applications are formatted for larger screens, virtualisation 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	<ul style="list-style-type: none"> • Rich end-user experience • Offline access • Leverage hardware-specific features 	<ul style="list-style-type: none"> • Platform specific (for example, cost to build, deploy or update)
Web	<ul style="list-style-type: none"> • Support for multiple platforms • Standards based • Security (for example, no local data storage) • Ease of deployment 	<ul style="list-style-type: none"> • 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 • Server infrastructure (server, licences, administration or other)
Hybrid	<ul style="list-style-type: none"> • Rich end-user experience • Offline access (for example, HTML5) • High performance • Support for multiple platforms • Leverage hardware features 	<ul style="list-style-type: none"> • Platform specific (for example, cost to build, deploy or update) • Server infrastructure (server, licences, administration or other)
Virtual	<ul style="list-style-type: none"> • Leverage existing PC applications • Security (for example, no local data storage) 	<ul style="list-style-type: none"> • 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, licences, administration or other)

Wimbledon fans get courtside news on the go

For The All England Lawn Tennis and Croquet Club, best known as the home of Wimbledon championships, IBM created a hybrid application for fans with an iPhone or iPod Touch so they could get a near-real-time view from the courts, videos, news, scores, schedules and more. (As part of the project, IBM also developed additional mobile services, like a downloadable mobile Twitter application for ‘tweets’ from players, commentators and a team of IBM scouts at the event.) The hybrid browser architecture used XML to describe static application components, like screens or menus, with web content displayed in UIWebView components. Video quality was matched to the user’s connection type, such as a WiFi or Edge network.

Developing mobile applications

To develop mobile applications for the enterprise, you will need to consider application development platforms. There are a variety of choices, depending on the mobile platform selected from Objective-C, Java, .NET to Mobile Enterprise Application Platforms (MEAP). MEAPs allow development in a fourth-generation language and provide middleware integration to backend systems.

Once the application is developed, it will need to be tested prior to deployment. Although it is typical to perform testing on actual devices, an alternative solution, DeviceAnywhere, offers developers the ability to run tests across most major devices

using this highly fragmented marketplace to determine exactly what the end user will experience on each device. The tool is integrated with IBM software, allowing developers to test and detect issues with the delivery of mobile applications before users do and reduce downtime. IBM has a strategic-partner relationship with DeviceAnywhere.

Deploying 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 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.

In just six months, IBM teams created an enterprise mobile applications store, WhirlWind, built on web services, which helps optimise portability and enable greater productivity. Initially for the company’s large BlackBerry smartphone user population, now the store is expanding to offer support for other devices as security policies allow. Applications in WhirlWind are categorised, rated on their usefulness and tagged by users, who can also contribute applications and web applications to the store.

Recently, IBM and the Wholesale Applications Community (WAC), a global alliance of telecommunications companies committed to simplifying application development, announced the availability of a new cloud-based, 'white label mobile app store. The store, built on IBM WebSphere Commerce software, is designed to help mobile operators quickly build their own online application stores and offer subscribers innovative applications and widgets for consumer and business use.³ Mobile device management (MDM) typically has the capability to deploy and manage enterprise mobile applications. This enables administrators' visibility to what applications users have installed, the ability to "blacklist" applications that are prohibited and to suggest new and updated applications to users.

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¹ 'Gartner's Top Predictions for IT Organisations and Users, 2011 and Beyond: IT's Growing Transparency,' 23 November 2010. <http://www.gartner.com/resId=1476415>

² 'Worldwide and U.S. Mobile Applications, Storefronts and Developer 2010 - 2014 Forecasts and Year-End 2010 Vendor Market Shares: The 'Appification' of Everything,' (IDC #225668), 13 December 2010.

³ 'IBM and WAC To Streamline Creation of Mobile Application Stores,' 14 February 2011. <http://www-03.ibm.com/press/us/en/pressrelease/33682.wss>