

The Evolution of Enterprise Mobility

Bringing agility and flexibility to mobile application development

EXECUTIVE SUMMARY

- Driven by explosive growth in smartphone and tablet sales, enterprise mobility has become an essential part of business. Organizations across industries are developing internal- and external-facing mobile applications that drive revenue, build brand loyalty, strengthen communication with partners, and enhance employee productivity. Companies that have aggressively embraced enterprise mobility are seeing an impressive return on their investment.
- The rapid and ongoing rollout of new smartphone and tablet devices is driving new customers into the market, but also forces developers to build mobile applications for multiple platforms and device types. Keeping pace in this market requires an agile, flexible, and iterative approach to application development.
- In-house development is a complex, expensive, and time consuming process that requires coding in multiple languages, extensive testing on different platforms, and dedicated resources for ongoing updates and maintenance. Mobile web isn't a viable option for addressing these challenges: security is weak, user interface suboptimal, and functionality limited.
- Increasingly, organizations are turning to Mobile Enterprise Application Platforms (MEAPs) to address the challenges inherent to application development. MEAPs allow organizations to rapidly develop and deploy rich mobile applications across platforms, with no coding required.
- All MEAP vendors should offer core functionality in the areas of development environment, data integration, security, native client, and analytics. MEAPs that don't provide these capabilities should be ruled out during the evaluation process.
- The most forward-thinking and innovative MEAP vendors are differentiating themselves with best-of-breed platforms that provide truly code-free cross-platform development, simultaneous integration with any internal or external data source, enhanced security features, and a CPU-based pricing model.
- Of all the solutions on the market today, only Verivo Software's platform currently offers a completely code-free development environment, simultaneous integration of all internal and external data sources, enhanced security features, and CPU pricing that allows organizations to cost effectively scale their applications.

ENTERPRISE MOBILITY IS HERE TO STAY

Since the inception of Apple's App Store in 2008, the concept of enterprise mobility has evolved from a nice-to-have novelty into an essential part of doing business. Increasingly, organizations in a broad cross section of markets – financial services, pharmaceuticals and life sciences, consumer products, education, automotive, and manufacturing among them – are seeing the value of mobilizing enterprise information and making it available to customers, employees, and partners. These organizations are making smartphones and tablet devices an important part of their sales, marketing, operations, and human resource strategies by developing customer-

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facing mobile applications that drive revenue growth, build customer loyalty, and strengthen brand awareness. They're also creating internally focused applications that aim to improve employee and partner efficiency, communication, and productivity. These initiatives have taken many different forms and met with varying degrees of success, but they illustrate that organizations are taking enterprise mobility seriously. With application downloads expected to top 44 billion by 2016¹, they're wise to do so.

Those companies that have implemented well-planned mobility strategies are seeing an impressive return on their investment. Starbucks estimates that in the first three months of 2011 nearly three million customers used its mobile app to make purchases², while Premier Inn, a British hotel chain, saw its mobile application generate \$1.6 million in revenue during its first three months of release³. In 2010 eBay launched a suite of mobile applications with the goal of generating \$1.5 billion in annual mobile sales,⁴ and announced in April that 2011 mobile sales would likely reach \$4 billion.⁵ A study by InMobi, a mobile advertising firm, predicts that consumer sales via mobile devices will reach \$9 billion in 2011, and reports that consumers prefer mobile devices over PCs and laptops for online shopping.⁶

Enterprises are also leveraging mobility to improve internal operations, strengthen partner ties, and boost employee productivity. Transportation supplier CSX Corporation has developed enterprise mobile applications focused on improving engineering, sales and marketing, and technology processes. "The engineering app is set to replace CSX's current paper-based system and to leverage capabilities such as taking a picture and ... GPS information from the smartphone," said Jon Yuan, solutions architect for the company. Other apps enable distribution through business partners, as well as workflow processing.⁷

Financial markets giant Allianz Global Investors Distributors (AGID) has also developed applications that drive internal efficiency and revenue growth. The company's sales organization relies on an app that integrates CRM data and data from SharePoint Server 2007 to cut down the time associated with looking for corporate and customer information. By making information more accessible at the point of interaction, AGID has gained a competitive advantage in the marketplace.⁸

A survey conducted during Oracle OpenWorld 2010, a conference for Oracle technologists, customers, and partners, found that many organizations – led by those in technology, consumer goods and financial services – increasingly see the value in mobilizing employees.⁹ And a separate report found that businesses already leveraging mobile applications for time tracking, recruiting, talent management, and e-learning are now contemplating mobile applications that allow employees to purchase and manage insurance and other benefits.¹⁰

Driving the rapid and sometimes frantic efforts of companies to go mobile is the continued growth in device sales, with smartphones constituting an ever-larger slice of this expanding pie. Of the 1.6 billion mobile devices sold to consumers worldwide in 2010, 297 million of them were smartphones, up 72 percent from 2009.¹¹ In the US alone, smartphone sales are projected to reach 95 million units in 2011, versus 67 million units in 2010,¹² and worldwide sales will reach 619 million units in 2015.¹³ Smartphones are expected to eclipse standard feature mobile phones as the dominant mobile device by the end of 2011,¹⁴ and in the fourth quarter of 2010, overall mobile sales exceeded those of PCs for the first time.¹⁵

User Group: Consumers

- m-commerce
- Location based search, promotions, deals and discounts
- Product availability
- Social networking
- Real-time news and updates
- Restaurant and travel reservations
- Financial account balances and information
- Games

User Group: Employees

- Job tracking
- CRM
- Address book and contact information
- Calendar and scheduling
- GPS
- Business intelligence and reporting
- Content management
- Time and expense submission and approval
- Payroll and benefits tracking
- Cloud-based services

User Group: Vendors and Partners

- Inventory management
- Supply chain tracking
- Real-time reporting
- Service/product ordering
- Appointment scheduling
- Trouble ticket submission and review
- Price quotes

Growth in the tablet market has been even more staggering. The NPD group estimates that tablet sales will grow to 55.7 million units worldwide in 2011, a year-over-year increase of nearly 200 percent,¹⁶ and IHS/iSuppli sees global tablet shipments exceeding 200 million units by 2015, a 12-fold increase.¹⁷ Gartner is even more bullish, projecting sales of 208 million units in 2014.¹⁸ The company recently lowered its PC sales forecast, citing competition from the iPad and other tablets.¹⁹

The tablet market is crowded and will only become more so, with models from BlackBerry, Dell, Samsung, Toshiba, Motorola and others now fighting Apple for a slice of the market. With 69 different tablet devices introduced during the 2011 Consumer Electronics Show,²⁰ it's clear that there will be little convergence around a single operating system or family of devices in the near future. For organizations considering a mobility strategy, the ramifications of this market fragmentation are enormous.

"We expect growing consumer enthusiasm for mobile PC alternatives, such as the iPad and other media tablets, to dramatically slow home PC sales, especially in mature markets."
– George Shiffler, Gartner Research²¹

MOBILE APPLICATIONS GROW UP

This proliferation of different mobile devices is both a blessing and a curse: new models will create buzz that drives additional users into the market, but will also force developers to constantly update and redesign their mobile applications. While an iPhone-only app able to draw information from a single database might have sufficed two years ago, today, users demand richer applications that leverage the wide-ranging features native to the different devices pouring into the market. Seemingly overnight, smartphone users are seeking out applications that provide localized deal updates, integration with cloud-based services like Dropbox, and a range of other new features, and Gartner predicts that nascent capabilities like mobile payment, health monitoring, contactless payment using near field communication services, money transfer, and object recognition will be among 2012's most popular.²²

This underscores the need for a mobility strategy that is fluid and dynamic. Applications that change and evolve in tandem with the devices on which they run are the ones that will succeed in the marketplace, and organizations that commit to a development process that is iterative, agile, and flexible will find themselves at a competitive advantage.

"A twice-a-year update may be fine in slow-moving industries, but it doesn't work so well if your competition is introducing ... snazzy new iPad apps every time you turn around." – Jeffrey S. Hammond, Forrester Research²³

CHOOSING A DEVELOPMENT METHOD

Mobile application development can take several different forms. Some organizations choose to hand the process over to an in-house programming team, assuming they will build a native and truly custom application, while also giving them complete control over cost, schedule, and management. Organizations that go this route underestimate the complexity and cost of mobile application development.

Traditional software development – which sees programmers design, build, test, release, and upgrade products – is amplified in the mobile space. The development lifecycle is similar, but must be repeated for each mobile device platform on the market. Application modifications of any kind – whether adding new features and workflows, integrating additional data sources, modifying security protocols, or changing look and feel – require additional coding. That's three new sets of code, written in three different languages (Java, Objective C, and J2ME) for even the smallest change to application features or functionality. Testing must be conducted on three different platforms, and updated applications submitted to three different vendors for approval. In addition, code must sometimes be further tweaked in order to optimize applications for the myriad of different smartphone and tablet devices on the market.

In even the most well resourced organization this process is likely to take weeks, and will more often stretch on for months. In-house development is an expensive, slow, difficult-to-manage, and ongoing process – one that drains resources from more mission-critical corporate initiatives. And businesses that attempt to work around these challenges by limiting their development efforts to a single platform risk falling behind as multiple mobile operating systems gain traction in the market.

MOBILE WEB: A POOR SUBSTITUTE

Some organizations attempt to sidestep the challenges inherent to application development by building their mobility strategy around the mobile web. A browser-based solution does offer several advantages: device compatibility is assured and changes can be made quickly without a dedicated development team, ensuring a relatively low total cost of ownership (TCO). But the drawbacks of a browser-based strategy far outweigh its benefits. Security is typically weak. Mobile web solutions can't leverage the native device features that are key to a positive user experience. There's no option for offline functionality, and applications are unable to handle complex workflows. While a well-optimized mobile website might meet the basic needs of a small group of users, most expect the functionality and rich features that can only be delivered via a native mobile application.

Some organizations see HTML5 as a way to address these problems, but for all the hype, this emerging technology just isn't ready for prime time. HTML5 does nothing to address the lack of an app store-type discovery and distribution channel for web apps, or the fact that UI is still constrained to the HTML model. Specification development has been glacially slow, and even the World Wide Web Consortium, citing interoperability issues, argues against deployment.²⁴ While HTML5 may hold promise for the future, it's not an ideal strategy for mobile application delivery today.

MEAPS MAKE MORE SENSE

For most organizations, a Mobile Enterprise Application Platform, or MEAP, is a better solution. MEAPs are development frameworks that allow organizations to rapidly develop, deploy, and modify rich, native, fully-customized, branded enterprise-grade mobile applications across multiple platforms using a code-free architecture. They are typically built around three main components: a development environment that facilitates rapid application design, build, testing, and updating; a mobile server that manages data integration, security, and authentication; and a client that allows applications to run natively on different smartphone and tablet devices. By providing a rich set of tools that make application development faster, simpler, more predictable, MEAPs have proven themselves a superior alternative to both browser-based mobility solutions and internally built applications.

MEAP vendors bring a variety of different capabilities and features to their platforms, but most offer core functionality in the following six areas:

- Integrated development environment – Software that allows users to design, configure, and manage complex cross-platform applications without the need for custom coding.
- Data integration – The ability to draw information from multiple back-end, legacy, and external sources, and integrate it seamlessly to create rich composite applications.
- Robust security – A range of security features and protections, including single sign on and NTLM authentication, encryption, encrypted cache, authorization, audit trail, anti-theft protections, and role-based administration.

- Client – Functionality for creating rich applications that leverage the features native to each device on which they run.
- Analytics – Browser-based reporting tools that track activity, identify back-end performance issues, and improve application utilization.

These capabilities are essential to mobile application development, and only platforms that deliver in all six areas should be considered as part of an enterprise mobility strategy. Use the MEAP-evaluation checklist at the back of this paper to ensure that the MEAP you're considering has what it takes to serve as the foundation of a successful mobile application strategy.

HELP WANTED

According to the Wall Street Journal,²⁵ companies are struggling to find the engineers, developers, and programmers required to build high-quality mobile applications, with qualified candidates often fielding multiple offers, and organizations providing sign on bonuses or on-the-job training to attract workers. It's another compelling argument for choosing a MEAP that allows organizations to design, deploy, and manage mobile applications without coding.

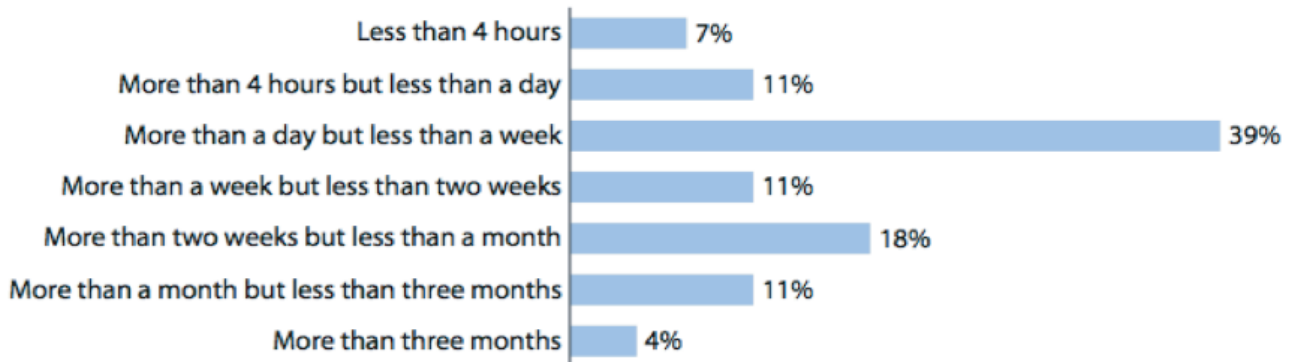
LOOK FOR BEST-OF-BREED

There are many vendors competing in the MEAP space, and the best of them are providing sophisticated features and capabilities that address the increasing complexities of mobile application development and management. These best-of-breed platforms give organizations complete control over every aspect of application design and management, facilitate rapid development and real-time updates, and deliver low TCO with pricing that supports affordable scalability.

CODE-FREE, CROSS-PLATFORM DEVELOPMENT

While many of the MEAP vendors on the market today promise code-free cross- platform development, few are able to deliver. Though most do provide a configuration-based architecture for building out basic application features, custom coding or scripting is required for more complex functions – whether integrating with additional data sources, plotting complex workflows, or creating screens and navigation. This code must be written separately for each mobile operating system, retested on each platform, and updated applications must be resubmitted to each application store prior to deployment. The majority of respondents to a recent Forrester survey say that changing just one line of code can stretch projects out by weeks if not months.²⁶ It’s a process that’s anything but agile, and it runs counter to the very benefits a MEAP is designed to deliver.

“If you were to change one line of code on your project, how long would it typically take your organization to push the resulting change into production?”



Base: 101 IT professionals involved in or aware of their company’s release management processes (percentages do not total 100 because of rounding)

Source: Q4 2010 Global Release Management Online Survey

A platform that offers a true configuration-based architecture not only allows for rapid development across multiple platforms and device types, but facilitates real-time, code-free updates to application design, data integration, security settings, and native features.

Best-of-breed platforms simplify application development with an integrated development environment and intuitive, WYSIWYG control panel that utilizes drag and drop functionality, pulldown menus, and check boxes to make application modifications and updates. Because all changes are code free, they can be implemented by administrators with minimal technical skills and pushed to users in real time without redeployment or downloads. Only MEAPs that provide this level of cross-platform, truly code-free development allow organizations to deliver rich mobile applications that keep pace with today’s fast-changing market.

ENHANCED SECURITY

Whether it's the programming flaw that saw Citibank's iPhone app cache account information on 117,000 smartphones or the data breach that compromised email addresses and ICC IDs of 120,000 iPad customers,²⁷ mobile security has never been a more pressing concern. While nearly all MEAPs offer baseline security features, the best of them go further by providing out-of-the-box, easy to implement services that bring greater flexibility and control to mobile application security.

Many MEAPs take a monolithic approach to data access, providing the option of making data cacheable or available in real-time only mode. But some platforms now offer customizable caching that allows administrators to drill down and establish discrete protocols for different data sets. For example, applications can be configured to allow device caching of client contact records, while more sensitive account information is available in real-time only mode. Administrators can innumerate how many records to be stored on the device at any given time, simplifying disclosure and compliance, and protecting corporate intelligence and customer privacy.

Organizations with sensitive corporate data must constantly balance accessibility with security, and many have committed years to developing and implementing enterprise-wide authentication schemes. The best mobile platforms work seamlessly with existing corporate infrastructure and enhance the user experience by brokering data requests to multiple systems without requiring repeated authentication. Platforms with these enhanced security features ensure that users have immediate access to the information that they need, and that organizations have complete control over their sensitive data and business intelligence.

A PRICING MODEL THAT DELIVERS VALUE AND A LOWER TCO

The most innovative MEAP vendors are helping organizations address budgetary restraints by offering CPU-based pricing schemes that charge users based on server throughput. This is a radical departure for an industry that typically prices platforms by device types supported, data sources integrated, number of users, complexity of systems, or even application page counts. With CPU pricing, organizations with small or simple mobile applications can utilize a base server, while those running richer, more complex applications pay for additional server capacity as needed. Organizations can create new applications, integrate additional features and data sources into their existing applications, and add users and device types without incurring additional charges. Platforms that provide this type of CPU pricing deliver affordable scalability and lower TCO, and serve as a foundation that supports long-term enterprise mobility.

INTEGRATION WITH EVERY DATA SOURCE

The best mobile enterprise applications integrate seamlessly with any internal or external data source.

Enterprise systems

- Blackboard
- BMC Remedy
- Charles River
- Concur
- EZData
- Microsoft CRM
- Morningstar
- MQ Series
- Onyx
- Oracle CRM on Demand
- PeopleSoft
- Pivotal
- Salesforce.com
- SalesLogix
- SalesPage
- SAP
- Saratoga
- SharePoint
- Siebel
- Sungard Banner
- Thomson Reuters

Commercial services

- BigCharts
- craigslist
- Facebook
- Google
- Netflix
- PayPal
- Twitter
- Xignite
- Yahoo!

Integration interfaces

- EJB
- JSON
- REST
- RSS
- SOAP
- SQL-92
- SQL Stored Procedures
- WSDL
- XML over HTTP

Databases

- DB2
- Informix
- Microsoft SQL Server
- Oracle
- PostgreSQL
- SQL-92
- Sybase

COMPREHENSIVE, SIMULTANEOUS DATA INTEGRATION

Integration capabilities vary widely from vendor to vendor. All have mobile servers for connecting with the most widely used data sources, but delivering a user experience that simultaneously integrates data from multiple sources often requires additional coding. The best MEAPs offer comprehensive integration capabilities that are easy to configure and available out-of-the-box. They come packaged with a wide-range of pre-built plugins that allow for simultaneous integration with any internal or external data source, whether enterprise systems like Oracle and SAP; commercial services like Facebook and Twitter; SOAP, RSS and other integration interfaces; or database platforms such as Microsoft SQL server. They make connecting to new systems as simple as using a mobile plug-in toolkit that leverages standard coding language and can be rapidly applied via an integrated development environment.

THE VERIVO SOFTWARE SOLUTION

Verivo's enterprise platform is a suite of mobility software and services that helps your organization meet all of its mobile development needs -- from early build stage through administrative tasks surrounding deployment and on-going management. The platform empowers users to translate ideas into design within days and update and manage apps in seconds -- over the air across multiple mobile devices -- from Apple iOS offerings to Blackberry and Android smartphones and tablets.

The following is an overview of Verivo's powerful enterprise mobility platform:

- **Build.** With Verivo's drag-and-drop integrated development environment, users can build apps five times faster -- no writing code for each device, no need to recompile or redeploy code with every change. The platform also supports the development of native applications, providing a much better user experience than Web-based apps, leveraging device functionality like camera and GPS, while offering extensive offline capabilities.
- **Deploy.** The platform's configuration-based architecture allows you to build an app once and deliver it in seconds to multiple mobile devices as a native, fully integrated application. The software's proprietary technology enables iterative updates of apps with new content and functionality and the ability to push changes out to mobile devices without code recompilation or redeployment.

- **Manage.** Adding users, disabling users, wiping devices -- all of these daily chores can be a real burden for already strapped development departments. Verivo's product handles all of these core management functions, including generating usage profiles. It's powerful security architecture includes encryption, authentication, and audit trail capabilities while integrating with Good Dynamics' secure container technology.

Only Verivo helps businesses harness the power of mobile technology and empower users to build, deploy, update and manage their mobile initiatives themselves.

ABOUT VERIVO SOFTWARE

A leading provider of enterprise mobility software, Verivo helps companies accelerate their business results. Its unique technology empowers teams to centrally build, deploy, manage and update their mobile apps -- rapidly, securely and across multiple devices. Hundreds of companies in numerous industries around the world rely on Verivo's platform to drive their mobility initiatives. To learn more, visit www.verivo.com.

VENDOR CHECKLIST: WHAT TO LOOK FOR IN A MOBILE ENTERPRISE APPLICATION PLATFORM

When evaluating solutions and providers, be sure they deliver in these key areas:

Application development

- Build native apps with drag-and-drop WYSIWYG design tool
- Deploy and update apps with no coding or code generation
- No mobile device API expertise required
- Applications fully upgradable with each product release
- Ability to build and manage applications in-house with no external professional services required

Deployment

- Application can be deployed:
 - via all major third party application stores
 - over-the-air directly to end-user devices
 - via third party MDM solutions
- Applications can be updated over-the-air with no code compilation or redistribution of software

Back-end data sources

- Back end connectivity via standard plug-ins
- Web services (SOAP, REST, XML over HTTP)
- Relational databases (Oracle, SQL Server, Sybase, DB2, SQL92)
- Supports read, write/update, delete
- Proprietary, home-grown enterprise data systems and data warehouses
- Inventory of pre-built plug-ins for commercial systems, (SAP, Siebel, Oracle CRM On Demand, Salesforce.com, Remedy, Microsoft Dynamics CRM, HP ServiceCenter, etc.)
- Ability to connect to multiple data sources, both internal and external, within one application or screen

Security

- Enterprise-grade encryption of all data, both in transit and on device
- Client-side security features to protect locally-stored data on all platforms
- Built-in support for multi-factor authentication and ability to tie users to specific handhelds
- Single sign on, including integration with LDAP, Active Directory, Siteminder, and proprietary schemes

General platform features

- Manage all cross-platform applications in one central configuration
- Hosted or on-premises deployment
- Server manages security, authentication, authorization, user management

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