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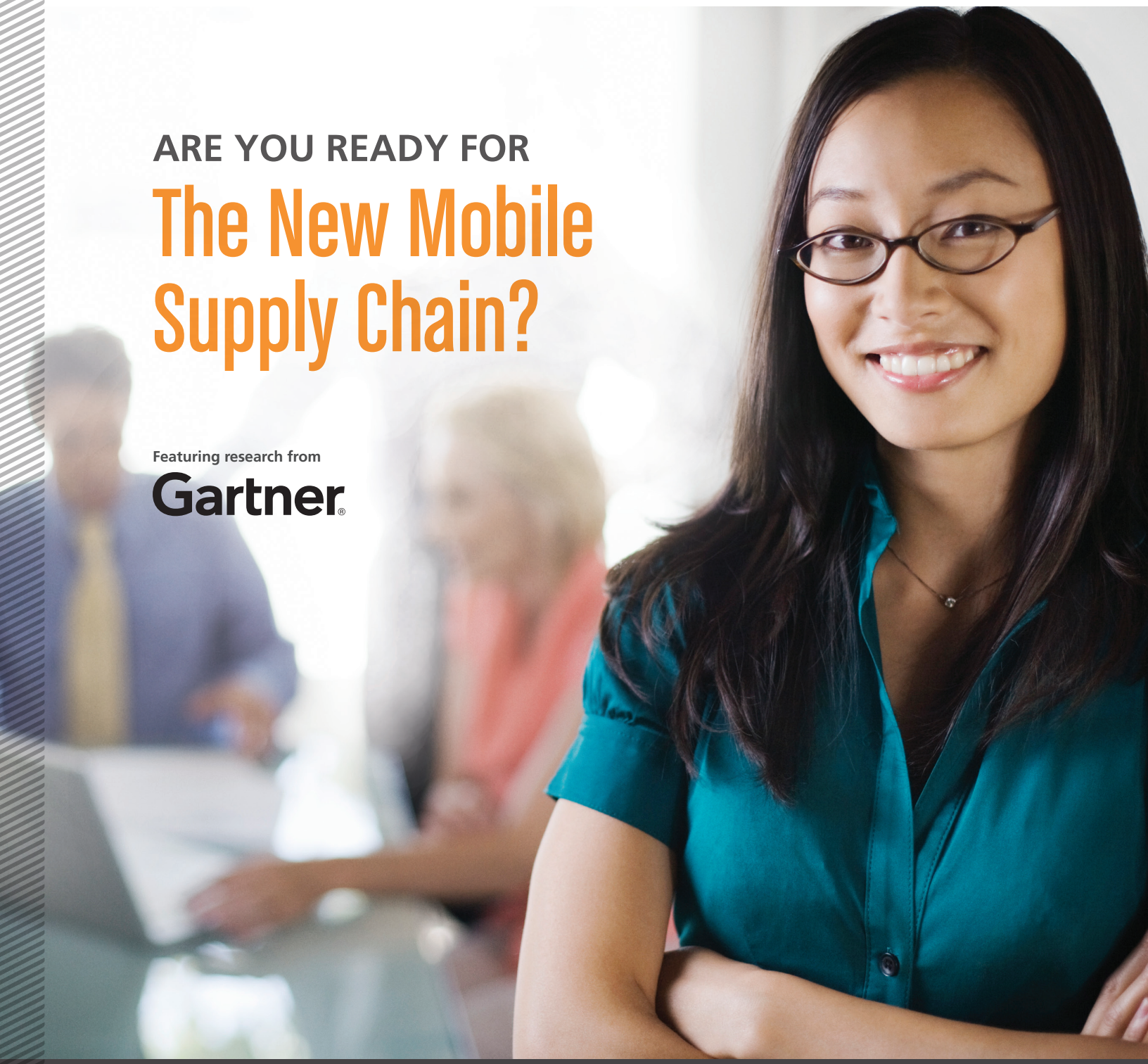
ARE YOU READY FOR

The New Mobile Supply Chain?

Featuring research from

Gartner®



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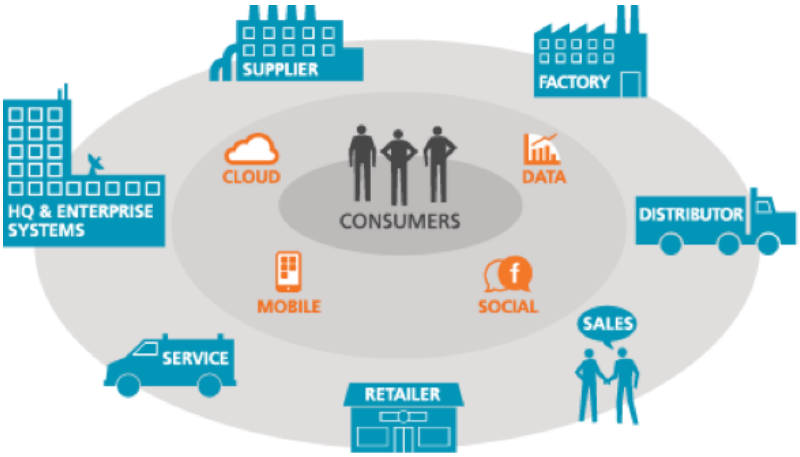
Mobility is ubiquitous. The question is no longer when to build a mobile strategy; it's how to most effectively become a mobile enterprise right now. The answer lies in mobilizing your supply chain.

Embracing mobility in every aspect of your business can lead to shortening the supply chain through increased visibility and responsiveness. The diagram below demonstrates how mobility can connect all entities in the supply chain and increase direct engagement with the end consumer.

Figure 1. The New Mobile Supply Chain



The applications and impact of such a mobile supply chain are wide-reaching. With optimally implemented mobile solutions, business process improvements ripple throughout the supply chain. For example, the increased accuracy of real-time inventory tracking benefits everyone from the information worker on the warehouse floor, to the customer browsing in the store.

Imagine a shopper able to find an item in the size and color she wants from her mobile device, even if it's not available on the shelf. With the connection afforded in the new mobile supply chain, the customer can find the item in the location nearest to her, or place an order online, immediately. Though the benefits of complete supply chain visibility are easy to see in the retail space, the same business value is similarly amplified in B2E and B2B applications.

People who interact with your supply chain — suppliers, manufacturers, distribution, retail, sales, service, and the back office — can and should benefit from mobile access. Mobility grants real-time access to data, transactions, and processes to all stakeholders within your supply chain, whether employees,

contractors, business partners, or end customers. The result: elevated visibility for all users.

A mobile supply chain depends on four key factors and a strong foundation of security and scalability. A Mobile Application Development Platform (MADP) that provides integrated, process driven, flexible, and omni-channel support can increase visibility and responsiveness to equip organizations to become active players in the new mobile supply chain.

Integrated apps increase visibility.

Increased visibility across the supply chain has the power to transform your business.

1 INTEGRATED: Access to enterprise data. Anywhere.

Integration is fundamental to equipping employees, business partners, and customers with real-time data from ERP systems. An effective enterprise solution should integrate seamlessly with these back-end systems. Even simple processes like PO approvals, service order creation, and inventory look-up apps can have an enhanced impact if they're interacting with your existing supply chain software. That's because with mobile integration, efficiencies gained in one line of business are amplified across the supply chain.

Additionally, in the mobile supply chain, integration goes beyond the back-end system and data — beyond traditional integration. The new mobile supply chain embraces machine to machine (M2M) integration. The number of connected devices and equipment is growing. In a mobile supply chain, it's important to think creatively about how this equipment can be leveraged to mobilize and optimize business processes.

Access to the enterprise system and data is the cornerstone of an effective supply chain. Talking to and interacting with the backend system gives every entity in the supply chain instant visibility. Ultimately, integration is about getting the most out of your investment in supply chain software, while expanding and simplifying user access. Implementing a MADP built to talk to your back-end system can have a significant impact on project costs by speeding integration and time to market.

The best mobile solutions are the simplest ones.

Quickly and easily accomplish your goals with process driven apps.

2 PROCESS DRIVEN: Users are process oriented; the supply chain should be, too.

A well-integrated mobile solution should also be process driven. Optimal mobile solutions are those designed with end-user interaction in mind. Businesses should consider what information would help their customers make decisions, increase their productivity, and allow them to interact with

your supply chain and back-end system in the most effective manner, regardless of their location. By starting with the most common interactions, businesses can improve existing processes.

Taking this value-driven approach, target areas of least efficiency in your supply chain, and then change the process through mobile automation. Process optimization means taking the opportunity to use mobility to increase efficiencies in your business processes.

However, ERP systems weren't built for the kind of interaction that optimizes business processes. Personalizing business processes is critical to providing a better user experience than simply mobilizing the back-end system. A process driven approach can personalize the experience of every person who touches your supply chain.

Flexibility enables self-sufficiency and business agility.

Make IT proactive, not reactive, and enable new business capabilities throughout the enterprise.

3 FLEXIBLE: Change quickly and easily.

In a technological world characterized by instant gratification and constant user feedback, mobility is always changing. When change is the new norm, business processes and mobile apps need to be iterative. A flexible MADP solution can quickly and easily adjust for a faster time to market, faster time to value, and better adoption and satisfaction rates.

The business analyst is an often overlooked agent of change and flexibility. Business analysts are close to business processes and have the familiarity to speed the pace of change. If equipped with the right tools, business analysts help your business react quickly to change. Businesses stand to improve customer satisfaction by embracing flexibility and responsiveness throughout the organization.

Central to flexibility in the mobile supply chain is reusability. Businesses can leverage reusability by developing processes and mobile applications as simple business actions, which can then be reused as needed. Common applications like inventory inquiry, PO approval, and work order updates can be extracted so that, with just a few clicks, users can launch from one process into another. The result of this flexibility is enhanced speed, equipping your business to deliver solutions as quickly as possible.

Think beyond the device.

MADPs that support omni-channel protect your investment and future proof your applications.

4 OMNI-CHANNEL: Connect to your users, no matter how they access your supply chain.

Embrace all possible constituents in the new mobile supply chain with omni-channel support. Design your mobile supply chain to support interactions

anywhere, by anyone. True omni-channel platforms will support any operating system, including Android, Windows, iOS, and Web. Beyond that, omni-channel should support any device, including smartphones, tablet devices, and ruggedized handheld devices — even equipment in M2M interactions.

Moreover, many workers perform tasks in a multi-screen environment, using more than one form-factor throughout the course of the day. Often, processes that start on a smartphone may continue on a tablet and wrap up on a laptop. Being able to provide personalized, quick access to any device and operating system in a seamless, integrated manner is a powerful benefit to employees and businesses in the mobile supply chain.

With an omni-channel MADP, the software takes care of the device — you don't have to think about compatibility. Instead, you can focus your efforts on designing solutions first and adding devices later. Doing so can drive efficiencies beyond expectations. To push those efficiencies further, common mobile device features can bring innovation to your solutions. Technologies such as GPS, camera, and NFC are now available in everyone's hands in real time, all the time. With an omni-channel MADP, these features provide immense possibilities.

Securely scaling a mobile solution is a complex task.

Is your MADP up for it?

5 SECURE AND SCALABLE: Safely support growth in any direction

With so much expansion into the mobile world and so many connected devices in the mobile supply chain, it's critical not to lose sight of a foundation of security and scalability. And, in the mobile world, organizations need to consider the security of data at rest and in transit.

Device technologies allow for encryption of the data store and the communication, but as you build out multiple applications in the supply chain, rebuilding those measures every time becomes cumbersome. Leveraging a MADP with a secure and scalable foundation streamlines that effort and results in faster time to value.

Additionally, authentication and authorization play a role in the new mobile supply chain. Using your existing authentication methods through mobile reduces clutter and streamlines the user experience. It gives users one less log-in to remember, leading to better adoption and productivity.

Lastly, providing the ability to scale your solution as the user and device community grows is critical to a deployment's success. With a properly designed mobile supply chain, users end up using mobile devices more than their old PCs. However, unpredictable adoption and connection make scaling a solution complex. Building an enterprise-grade mobile solution that can easily scale both horizontally and vertically can help mitigate those concerns, ultimately ensuring all users have an optimal experience wherever and whenever they choose.

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About DSI®

As the pioneer in enterprise mobility, DSI equips companies around the globe to be mobile enterprises.

With 30+ years of business and technical know-how, deep industry knowledge, and a proven track record for delivering predictable results, DSI provides an industry-leading mobile application development platform.

DSI's mobile platform features out-of-the-box integrations with leading enterprise software systems such as Oracle, JD Edwards, SAP, Microsoft, and Infor that are optimized for mobile deployment. Apps built using DSI's platform work on- or off-premise, connected or disconnected, and are integrated from end-to-end, tying together various software systems and data collection points — including machine-to-machine (M2M) — to mobilize the entire enterprise.

Customers leverage DSI's portfolio of pre-built, industry-specific mobile apps or build their own with a drag-and-drop toolset that eliminates the need for specialized mobile developers — enabling business analysts to quickly design apps or easily modify existing ones to support evolving business needs.

DSI has given more than 1,100 customers worldwide the freedom to be a mobile enterprise and create sustainable, optimized advantages for their businesses. For more information on how DSI can help you take control of your mobile future, visit dsiglobal.com or contact us using the numbers to the left.

As unprecedented numbers of enterprises build mobile applications, the mobile application development platform market continues to grow and evolve rapidly. We assess the major vendors that enable enterprise IT developers to create mobile applications for customers, partners and employees.

Market Definition/Description

The mobile application development platform (MADP) market remains largely distinct from the larger AD tool market, because developing mobile applications for enterprises presents unique challenges, including:

- Each mobile OS has a unique presentation style, interaction style and software stack.
- Devices have different screen sizes, input modes and hardware capabilities.
- New devices and OS versions are introduced multiple times per year.
- Network connectivity and power levels fluctuate widely in typical usage scenarios.
- New consumer applications regularly extend and revise the standards for good mobile applications.

MADPs are generally based on one of three technologies. Each technology requires different investments and skills:

- **Native toolkits**, such as Apple's iOS development toolkit, enable the development of native applications for a single mobile OS platform. Native toolkits generally provide the best performance and the most access to a specific OS platform, but are limited to only one OS platform.
- **Web toolkits**, such as jQuery Mobile, enable the development of Web-based applications that perform well in Web browsers for various mobile OSs and devices. Web toolkits are inherently multiplatform, and leverage standard Web skill sets, but can have performance and interaction style limitations, lack feature phone support and require a network connection.
- **Specialized platforms**, like the ones from Appcelerator and DSI, provide proprietary capabilities designed to protect the developer from the differences between OS platforms and limitations of browser-based applications. Specialized platforms take a more proprietary route, but generally provide more out-of-the-box enterprise capability than Web and native toolkits. They also often address more of the full software development life cycle — from application design, development and integration to testing, deployment and management. Some specialized platforms are optimized for high developer productivity, and others are optimized for high application performance and developer control.

Recognizing the popularity of native and Web toolkits, many MADP vendors have built or repackaged their platforms as a series of tools to complement, rather than compete with, them:

- **Wrapper tools**, such as Adobe PhoneGap, allow mobile Web applications to work like native applications. They compile mobile Web applications into OS-specific applications, often called hybrid applications, that can be downloaded to a mobile device, access device functions beyond those provided by the browser, and run without a network connection like a native application.
- **Mobile middleware**, such as IBM Worklight, enables native and hybrid applications to communicate securely with enterprise applications running on servers and cloud services, as well as providing application management functions.
- **Application generators**, like the one in KonyOne Studio, produce Web, hybrid and native applications from a single set of application specifications.

Because enterprise requirements are similar, but wide ranging, we expect vendors and open-source project teams to assemble a portfolio of tools that users can combine in different tool chains to meet the requirements of specific mobile application projects.

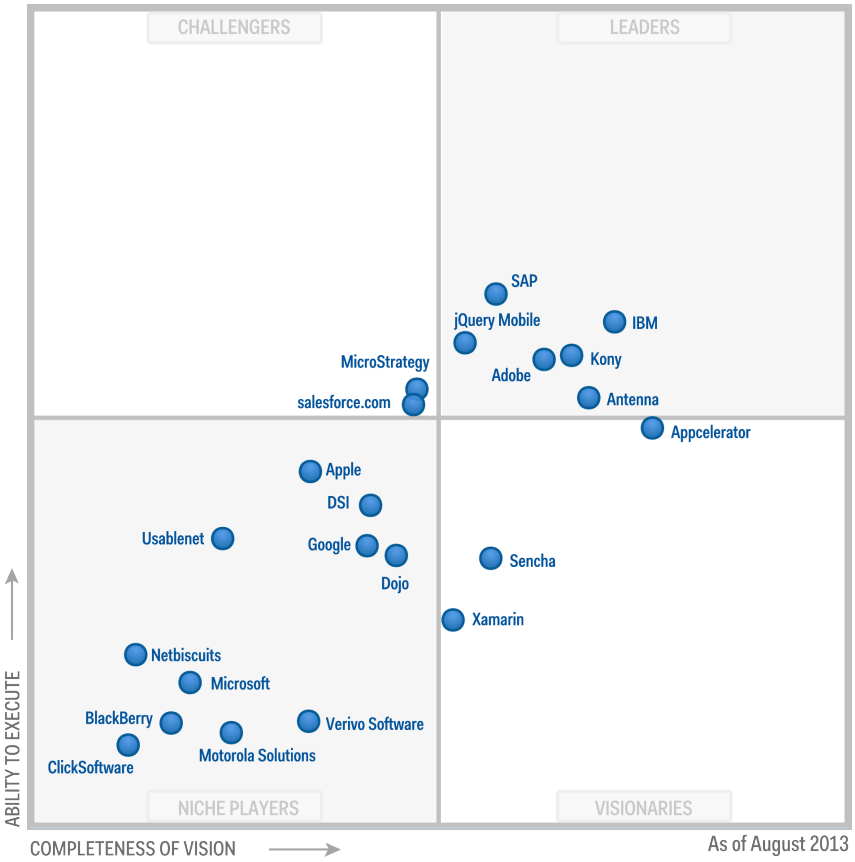
In addition to different technology approaches, MADP vendors have different business strategies:

- **Pure-play MADP vendors**, such as Antenna, primarily provide mobile AD tools, services, applications and templates. Some hope to become large public companies.
- **Enterprise software vendors**, such as SAP, have broad customer bases and product suites that extend well beyond mobile AD. For these vendors, MADPs represent a way to expand within their customer bases and open doors to new customers.
- **Mobile application vendors**, such as salesforce.com, primarily provide applications, but make the underlying platform available to customers. Their MADPs help them sell their applications.
- **OS platform and device vendors**, such as Apple, BlackBerry, Google, Microsoft and Motorola Solutions, use their MADPs to encourage developers to build new apps, because apps help drive the sale of their OS platforms and/or devices.
- **Open-source projects**, such as jQuery Mobile, provide focused frameworks augmented by proprietary products and support from their contributor community. The projects support the common interests of their contributors.

One of the most interesting aspects of the MADP market is that traditional enterprise software, low-cost disruptors and open-source sales models are simultaneously having an impact on the market. Given history, one might have expected the market to move from high-priced enterprise software to low-cost disruptors and to open source over a decade or more, but enterprise have all three choices today. This, plus the rapid evolution and fragmentation of mobile technology in general, means today's leaders can easily be tomorrow's laggards. Hence, we advise that enterprises avoid long-term commitments to any one vendor or technology and re-evaluate their mobile AD strategy often.

Magic Quadrant

Figure 1. Magic Quadrant for Mobile Application Development Platforms



Source: Gartner (August 2013)

Vendor Strengths and Cautions

Adobe

Adobe is engaged in a multiyear transition from a desktop-centric, Flash-oriented platform to a portfolio centered on HTML5, mobile and cloud computing. Adobe can now be considered the leading vendor of commercial HTML5 tools. Adobe Edge provides development and design tools for HTML5, Cascading Style Sheets (CSS) responsive Web design, and multi-form-factor testing. Key to Adobe's transition was its 2011 acquisition of Nitobi, the vendor behind the popular PhoneGap Web hybrid wrapper technology for cross-platform mobile apps. Adobe has managed this acquisition well, allowing PhoneGap to continue its high-growth trajectory. Adobe also regularly updates Apache Cordova, an open-source version of PhoneGap. PhoneGap/Cordova is integrated with other MADPs, including those of IBM, SAP and salesforce.com. Adobe AIR was enhanced and repositioned as a cross-platform mechanism for deploying code written in Flash ActionScript or C++ onto native apps for iOS, Kindle, Nook and other Android devices.

Appropriate Use: Adobe PhoneGap is appropriate for projects where cross-platform reach is more important than high performance, and where developers have solid HTML, CSS and JavaScript skills. Adobe AIR is for ActionScript/Flash developers who want to leverage their skills onto a range of mobile and desktop platforms.

Strengths

- Adobe's product portfolio covers a diverse range of scenarios, requirements, platforms, skill sets and deployment models centered on HTML5 and mobile.
- Adobe PhoneGap is simple in concept and compatible with a wide range of cross-platform Web technologies, including HTML5, CSS, JavaScript libraries and frameworks from other vendors.
- Adobe PhoneGap has a burgeoning ecosystem of plug-ins that address specialized scenarios, such as geofencing, image recognition, PDF viewing, power management and social network interoperability. Support and integration are available from a wide range of industry players and system integrators.

Cautions

- Adobe PhoneGap's wrapped hybrid architecture model means reduced performance, compared with native and some other MADPs. However, developers with native-code skills can extend PhoneGap with plug-ins to address specific areas of functionality or performance concerns.
- Cross-platform portability expectations of PhoneGap often fall short of expectations. While code reuse can be high between iOS and Android apps, portability to other platforms can dip to 70% or 80%.

- Adobe AIR has a limited appeal outside Adobe Flash and ActionScript developers.

Antenna

Antenna has been a longstanding leader in Gartner's mobile application platform Magic Quadrants. The company has expanded its offerings and customer base through a combination of organic growth and acquisitions. Antenna offers its combined technology as the AMPchroma platform, which enables enterprises to build, run and manage mobile applications through four components: AMP Studio, AMP Client, AMP Server and AMP Manager. The platform, which can be deployed on-site or in the cloud, delivers a hybrid container that runs across multiple devices and supports over-the-air app management and multiple Web apps per container. AMPchroma supports the deployment of Web, hybrid and native applications, and addresses multiple vertical markets, with emphasis on financial services, manufacturing, retail, consumer packaged goods, life sciences, and travel and transportation.

Appropriate Use: Antenna is likely to be used successfully in organizations that are managing a portfolio of mobile applications, and looking for reusability across multiple applications for multiple types of mobile devices.

Strengths

- Antenna sports one of the more powerful, flexible and easy-to-use AD studios among the MADP vendors. Antenna has opened up its platform to support HTML5/JavaScript mobile development frameworks, such as jQuery Mobile, Sencha and Dojo, to give developers additional flexibility in their choice of tools.
- The AMPchroma platform can be deployed behind the firewall or as a hosted solution. Antenna's middleware enables enterprises to connect multiple back-end systems and data sources via a range of connectors that it has built. If the enterprise has a back end that Antenna has not integrated, the company offers a well-documented framework for data integration connector development and deployment.
- While Antenna has historically excelled at business-to-employee (B2E) mobile development, its platform is well-suited for the full range of AD. The ability to integrate other frameworks and tools further enhances this capability.
- Customers like Antenna's breadth of capabilities, especially for B2E scenarios, and its product vision. This was reflected in Antenna's strong revenue growth in 2012.

Cautions

- The relatively limited pool of people trained on the Antenna platform can pose a hiring challenge for companies that need Antenna expertise. This can be partially addressed with the use of third-party tools.
- The Antenna platform is required to support the applications that were developed on that platform. Moving off the platform may require significant recoding of applications.
- Gartner observed a few customer support issues with organizations delivering their first applications using Antenna and its partners.
- Antenna's mobile software pricing is roughly comparable to other leading MADP providers and represents a significant investment for large application deployments.

Appcelerator

Appcelerator's Titanium offering is designed to enable developers to rapidly build native, hybrid or mobile Web applications. Developers code in JavaScript, which then exposes the native capabilities of each device. Unlike many platform providers, Appcelerator focused first on building a developer community and has created a large following. The resulting ecosystem includes a variety of public code, applications and capabilities that are significant enablers for rapid application development (RAD). This unique model enables Appcelerator to identify and promote ecosystem technologies that drive the most interest. In the past year, Appcelerator introduced Appcelerator Platform, including development tools, cloud mobile back-end services, an enterprise app store, application analytics and additional deployment options. The company has greatly increased its partner ecosystem by being an OEM for app testing and app performance monitoring technologies from Soasta and Crittercism. Appcelerator is ranked as the most visionary company in this year's MADP Magic Quadrant.

Appropriate Use: Appcelerator is appropriate for enterprises with requirements for multi-OS AD, app life cycle support and JavaScript skill sets.

Strengths

- Appcelerator has a large base of 450,000 developers who have deployed more than 50,000 apps on more than 130 million devices. The Titanium development environment is a free download that supports quick onboarding of mobile development skills.
- Significant prebuilt assets are available for use from Appcelerator's community, including code, apps and cloud services.
- Appcelerator has a clear vision, market understanding, focus and financial backing.

- Appcelerator's ecosystem of system integrators and independent software vendors (ISVs) provides enterprises with a wide variety of sourcing options and extensions.

Cautions

- While the company counts over 450,000 registered Titanium developers, a low volume of Gartner client inquiries suggests that relatively few midsize and large enterprises have evaluated the Appcelerator offering. This may be the result of the company's short history targeting enterprise buyers. As with any MADP vendor, ask for enterprise references similar to yours before investing.
- Outside of the developer tools, much of the enterprise life cycle capability that Appcelerator provides has come in recent releases, and some through integrations. Enterprise purchasers should understand the product's maturity.
- As with all developer ecosystems, code and apps provided through the developer community must be tested fully before use in applications.

Apple

During the past year, Apple successfully launched iOS 6, the iPhone 5, and a next generation of the iPad and the iPad mini. The demand for Apple products continues to rise significantly. Although Apple provides development platforms focused on its own products, its support for the enterprise requirements of those products continues to improve. The iPad has become the de facto tablet for many enterprises, driving tablet AD and deployments in enterprises worldwide. Apple's AD tools for iOS devices include the iOS Software Development Kit (SDK) and the Xcode integrated development environment (IDE). Apple released a configuration utility that enterprises can use to install iOS device profiles, which can be distributed via email or over the air using a mobile device management (MDM) server. Apple does not provide packaged enterprise mobile applications, although it does support general-purpose enterprise application integration. Enterprises developing in the iOS SDK can leverage application investments across the iPhone, iPad and iPod based on shared OS code and tool bases. For enterprises targeting the consumer segment or wishing to leverage the distribution capabilities of Apple's App Store, Apple has strong subcategories (such as business and productivity) that can enable the easy discovery of applications.

Appropriate Use: Apple is an appropriate choice for enterprises that have standardized on iOS devices for their employees or whose app strategy includes building iOS-only apps, in addition to apps for other platforms.

Strengths

- Apple's toolkit provides strong support for iOS devices, which is sometimes more important than cross-platform support. For customer-facing apps, the improved performance, capability and usability of some native apps can make a competitive difference, justifying building those apps with Apple's iOS-only MADP.
- The iOS devices are making inroads into the realm of ruggedized devices, as their consumer price points and effective case technologies make them appealing in all but the harshest environments. Many enterprises are implementing an iOS-only device strategy, which makes an iOS-only development platform a reasonable option.
- The iOS SDK remains solid, with significant enhancements and loosening of restrictions in the 4.6 release of the Xcode IDE and SDK v.6.1. The iOS SDK continues to be one of the most popular MADPs with developers.

Cautions

- Few organizations and developers have the luxury of focusing solely on iOS support. Apple's singular focus on iOS devices limits the development environment and the applications created with it.
- Apple's MADP requires skills in Objective-C, Xcode IDE and the iOS SDK. Typical IT organizations don't employ developers with these skills.

BlackBerry

In the past year, BlackBerry (formerly known as Research In Motion) worked to recreate its platform to be more competitive with the leading smartphone platforms, such as those from Apple and Google, to halt its decline in the market. The company recently launched the BlackBerry Z10 and BlackBerry Enterprise Server 10, and has worked to attract developers to the new BlackBerry 10 OS, a derivative of QNX. This effort has been helped by the ability to easily port Android applications to BlackBerry 10 OS via the BlackBerry Runtime for Android Apps offering. Native application developers can use the BlackBerry Native SDK and the Cascades UI framework. Web developers can utilize the BlackBerry 10 WebWorks SDK to create applications that use HTML5, CSS and JavaScript. The company provides the BlackBerry SDK for Adobe AIR for developers who need a runtime for AIR applications. BlackBerry is supporting and/or partnering with a number of MADP vendors to provide support in the BlackBerry 10 platform, including IBM, SAP, Adobe, Appcelerator, jQuery, Sencha and Dojo. With the number of development and porting options available, mobile application developers will be able to reuse their skill sets when developing for the BlackBerry 10 platform.

Appropriate Use: The BlackBerry development tools are good for developers who want to target the new BlackBerry 10 devices.

Strengths

- BlackBerry's development platform is very open, accommodating use of many other tools and platforms at the discretion of the developer.
- BlackBerry provides native and HTML5 development tools in its SDK, giving developers flexibility in app development.
- BlackBerry Enterprise Server 10 enables developers to distribute apps securely to BlackBerry devices, and enables IT departments to deploy apps to an enterprise workspace that is secure and separate from the personal space.

Cautions

- Today's highly consumer-oriented enterprise landscape is driving enterprises toward bring your own device (BYOD) programs that support the use of employee-owned devices. This makes single-platform AD increasingly unrealistic and will continue to force many BlackBerry-only enterprises toward other options.
- The change in the BlackBerry OS requires developers to use different tools from earlier versions of the native SDK. The impact on WebWorks is not as significant.

ClickSoftware

ClickSoftware is a vendor of mobile workforce management and service optimization software with a full MADP offering. Presently, the company focuses on apps for workers who spend most of their time in the field. Industries include communications, utilities, oil and gas, office equipment, medical and capital equipment, insurance and home healthcare services. ClickSoftware has deployments worldwide, and is the largest ISV worldwide for field service management and mobile workforce optimization. Using its MADP, the company has developed products covering the full service chain cycle. ClickSoftware was one of the first field service management vendors to adopt HTML5 for mobile applications. Its development platform includes a full development studio with a visual forms editor and an enterprise-focused mobile application framework, which features compositions of apps from building blocks (built from scratch or downloaded from the company's ClickAppStore), context-aware guidance and notifications, back-end integration, data synchronization; and role-based security. The platform has been proven in the field through years of enterprise deployments, and its applications can also run on top of the mobility infrastructure services offered by IBM, SAP and salesforce.com. ClickButler, an engine based on artificial intelligence, enables the development of mobile

intelligent personal assistants that anticipate user needs and acts on them proactively.

Appropriate Use: The company's focus on mobile workers, along with its position as the largest ISV worldwide for mobile workforce management and optimization, lends ClickSoftware credibility and appeal for organizations with resource and service optimization and productivity application requirements.

Strengths

- ClickSoftware's combination of development tools and framework, scheduling platform and packaged mobile applications gives it a number of entry points with enterprise customers.
- The company has strong geographic coverage and a growing set of partners, including a successful strategic partnership with SAP and IBM.
- It has a strong focus on the energy, oil and gas, utilities and telecommunications sectors, while home services, computer and office equipment, insurance and government agencies are other areas of industry knowledge.
- The vendor boasts a wide range of GIS and application partners, as well as the ClickAppStore, where hundreds of add-on widgets and functional applications are available.

Cautions

- Enterprises that are not using ClickSoftware's packaged field workforce optimization solutions should look for proof points for its use as an independent MADP supporting broader resource optimization uses.

Dojo

The Dojo Toolkit (or Dojo for short) is a set of related open-source projects supported by the Dojo Foundation. Dojo makes it possible to use standard Web technologies — including HTML, JavaScript and CSS — to build interactive mobile Web pages for desktop devices and WebKit-enabled mobile devices, such as the iPhone, iPod touch, iPad, Android, and BlackBerry smartphones and tablets. Developers can also use Cordova or PhoneGap with Dojo to create hybrid mobile applications. Dojo Mobile is a mobile JavaScript framework. Coupled with Dojo's Dijit (an extensive collection of UI widgets) and GFX (a native cross-browser, 2D graphics framework), Dojo provides an extensive collection of UI components for mobile devices. Maqetta, a drag-and-drop UI design tool supported by the Dojo Foundation, works with Dojo and Dojo Mobile. Dojo is available as an open-source offering and via commercial distribution within several vendors' offerings. Several organizations, including SitePen, offer commercial support, training and development services. The

open-source community provides all code, documentation, enhancements, bug fixes and support. Project sponsors include IBM, BlackBerry and Orange.

Appropriate Use: Dojo is best-suited for development organizations looking for a lightweight, open-source mobile Web framework, especially those with experience using Dojo to build desktop rich Internet applications (RIAs).

Strengths

- The Dojo Toolkit is an open framework; it is an independent, open-source project based on HTML, JavaScript and CSS standards.
- Because Dojo Mobile extends the popular Dojo Toolkit for desktop applications, many developers will find it easy to learn and use.
- When Dojo is used with Cordova, it is possible to build hybrid mobile applications without any licensing costs.

Cautions

- By itself, Dojo doesn't provide support for native or hybrid applications, application management, legacy system integration, disconnected mode and other features that contribute to application sophistication.
- Use of Dojo aligns best with sophisticated Web developers who are comfortable with self-support.

DSI

While not as well-known as other MADP vendors, DSI has built a solid MADP business over the past 10 years by focusing on the needs of manufacturing and supply chain companies. DSI provides a platform that supports the rapid development of custom transactional applications that can be deployed across a wide range of smartphones, tablets, PCs and ruggedized devices without recoding or recompilation. Native clients are provided for Windows Phone/Windows CE/Windows 8, iOS, Android and BlackBerry, as well as a mobile Web option. The design tool offers solid support for multichannel development, with an advanced approach to managing design layouts for multiple device form factors. DSI also offers a set of prebuilt business process flows for common applications, such as mobile inventory, field service, field sales, procurement and delivery. DSI's ERP integration focuses on Oracle products (Oracle JD Edwards EnterpriseOne, Oracle E-Business Suite [EBS], Oracle PeopleSoft and Oracle JD Edwards World) with additional support for SAP, Microsoft, Infor and others. Many DSI deployments also feature machine-to-machine (M2M) integration, incorporating industrial equipment such as automated scales and conveyor belts.

Appropriate Use: DSI is well-suited for building and operating custom mobile applications for B2E scenarios — particularly those in manufacturing and supply chains — including those with significant M2M requirements.

Strengths

- DSI has extensive experience building mobile applications for manufacturing and supply chain scenarios, as well as prebuilt templates and built-in platform features that accelerate their development.
- DSI has more than 1,000 customers in more than 50 countries, and direct operations and partners around the world.
- Reference customers liked that DSI delivered projects on time and within budget, and felt that the platform was solid in production.

Cautions

- DSI's enterprise-focused platform is not as appropriate for building business-to-consumer (B2C) applications.
- While the DSI platform has the potential for use in other verticals, the company's domain expertise is focused on manufacturing and supply chain solutions.
- The bulk of DSI's implementations is based on Oracle ERP systems. Enterprises with other ERP systems should validate whether DSI can meet their integration requirements.

Google

Google Android's success as an alternative to Apple iOS for smartphone devices has led to the creation of more than 750,000 Android applications, many built using Google's MADP. The Google MADP consists of SDKs for each version of Android; tools for developing Android applications in Java; and an Eclipse wrapper to simplify application coding, compilation and testing. The Android SDK, toolset and Eclipse wrapper are available free of charge.

Appropriate Use: The Android development platform is an appropriate choice for enterprises that have standardized on Android devices for their employees or whose app strategy includes building Android-only apps, in addition to apps for other platforms.

Strengths

- The Google Android MADP provides a robust development environment for Java developers.
- It provides full access to all Android on-device capabilities.
- It provides immediate access to new Android features, enabling developers to quickly take advantage of the considerable hardware and ecosystem innovation fueled by Android's global market share for smartphones.

Cautions

- The Google MADP is not multiplatform; it is only suitable for Android application development.
- There are multiple versions of the Android SDK, and applications developed with one version have limited portability to newer versions of the Android OS, and no portability to older ones. However, there are ways to develop apps that dynamically assess the availability of APIs and adjust the features to the available APIs. Because some APIs perform differently from one version to the next, multiple versions of an app may be required to support the multiple versions of Android popular in today's market.
- The Android Eclipse plug-in is oriented to individual developers. Teams doing Android development often use other tools in conjunction with Google's MADP to manage collaboration, source control and build management, for example.

IBM

IBM's mobile platform product, Worklight, underwent a significant overhaul last year. IBM acquired Worklight in February 2012, and integrated the product into IBM products to produce a life cycle management solution. The new portfolio is branded MobileFirst. These products include Rational for testing, Cast Iron for integration, Tealeaf for analytics and Endpoint Manager for device management. Worklight provides an Eclipse-based, stand-alone IDE, platform-specific APIs, and runtime components to help developers build, deploy and manage multichannel Web, hybrid and native mobile applications. The Worklight Server is a mobile middleware system providing integration, authentication, security and management capabilities. Worklight provides an API for developers who want to use other IDEs and frameworks to build apps leveraging the Worklight server and life cycle capabilities. Worklight native, hybrid and Web applications are optimized for the particular device to which they are automatically deployed. The product utilizes Apache Cordova for native packaging and access to device resources. The Worklight IDE download and use are free of charge. As apps are deployed into production, charges apply. Developer resources include free online training and a developer community.

Appropriate Use: Worklight is best-suited for development organizations focused on multiple-device platforms, and employing or utilizing a company's skill base in open technologies, such as Eclipse, HTML5 and JavaScript.

Strengths

- The Worklight platform was designed to enable organizations to use Web skills with automation of many mobile requirements.
- Worklight is complemented by IBM's overall portfolio of Web, cloud and connectivity capabilities.

- IBM has contributed substantially to World Wide Web Consortium (W3C) standards work (including co-chairing the HTML5 Working Group), PhoneGap and Dojo, all frameworks that are accommodated by Worklight. IBM is one of the largest system integrators for enterprise mobility, with service revenue that, by Gartner's estimate, exceeds $1 billion; however, little of that is related to Worklight today. Gartner expects that Worklight will play a central role going forward.

Cautions

- While extensive work has been done to integrate Worklight into other IBM products, there are still some gaps for full integration.
- Significant effort is going into IBM's partner ecosystem, but there are limited numbers of experienced developers on Worklight for the time being.
- While Worklight is flexible, using its support for third-party mobile frameworks for Web, hybrid and native applications creates a more difficult set of assets to maintain than when utilizing the frameworks built into the Worklight IDE.

jQuery Mobile

jQuery Mobile's popularity continued to grow among enterprise developers this past year. The jQuery JavaScript framework library has mainstream desktop Web roots, and jQuery Mobile has leveraged JQuery's large ecosystem to become a common shortlist choice. This occurred despite some problems with performance and fidelity in the first version (some of which still linger) and the fact that a UI-focused library, like jQuery, is only one part of a complete mobile development platform. jQuery's success is largely because it is lightweight and narrow in scope. As a result it is unlikely to conflict with an enterprise's other development tools. A popular combination is jQuery with PhoneGap/Apache Cordova — two narrow-scope offerings that combined can meet a wide range of low-to-midrange application requirements. There is no single vendor behind jQuery, but this works to its advantage. jQuery is supported to varying degrees by many other vendors, including IBM, Microsoft, Adobe, Google and Oracle.

Appropriate Use: jQuery is appropriate for cross-platform projects that are Web-centric and content-centric, rather than those that require high performance or complex user interactions.

Strengths

- jQuery's market presence in the Web sector is pervasive. It is used in roughly 80% of the top 1,000 websites, and can be used with some other JavaScript libraries and frameworks.
- Among JavaScript libraries and frameworks, jQuery has the largest ecosystem in terms of developer knowledge, add-ons, plug-ins, training, books and support from system integrators. In many of these areas, jQuery enjoys a 10-to-1 or more advantage in share and visibility over competing alternatives.

- The mobile version of jQuery has a good complement of touch-centric widgets and controls.

Cautions

- jQuery Mobile is less suitable for application-centric projects that require high performance, smooth interactivity, or a native look and feel. For higher-end projects, JavaScript developers often choose Appcelerator or Sencha Touch.
- Although jQuery is relatively lightweight for desktop Web development, jQuery Mobile is less so for mobile, leading some to choose even lighter-weight alternatives, such as Zepto (a jQuery-compatible microframework).
- jQuery doesn't support the Model-View-Controller (MVC) architectural pattern. Leading-edge developers often select a JavaScript framework that supports client-side MVC, such as Backbone, Ember, Angular, Meteor, Derby or Polymer.

Kony

Kony made some significant product changes in the past year, releasing an updated KonyOne platform and adding several capabilities. The company traditionally focused on consumer applications, but released key enhancements to create a platform that can deliver complex enterprise apps, as well as consumer apps. The development environment is focused on building multichannel, multiplatform applications using JavaScript. Kony continues to build out its integration capabilities. Kony's recent acquisition of Sky Technologies provides tighter integration within SAP implementations, and Kony has added other new adapters. The addition of life cycle capabilities, including mobile application management, an enterprise app store and analytics, support the deployment and security capabilities needed for enterprise applications. Within the IDE, a developer may use external code through the foreign function interface to implement requirements such as integration for external devices. With support for older HTML4 devices and messaging, along with the most up-to-date devices with HTML5 and native apps, Kony has one of the most diverse platforms for device support.

Appropriate Use: Kony is well-suited for projects in which large, diverse device populations must be supported, and development needs to be outsourced. It has a strong integration method for SAP back ends. Other integrations include Oracle back ends, such as JD Edwards, Siebel and PeopleSoft.

Strengths

- Kony has been growing rapidly and invests a great deal in product development.
- With a focus on full enterprise life cycle and multichannel enablement, Kony continues to mature as a strong enterprise player.

- Kony is committed to keeping up with the high rate of evolution in the mobile space, and provides SLAs guaranteeing support for new device and mobile OS releases within a specified period.

Cautions

- While Kony has invested greatly in building out an enterprise capability, the majority of its business has been consumer-focused to this point.
- As Kony grows rapidly, Gartner has noted that some of the vendor's original customers have moved off its platform.
- Kony is beginning to enable enterprise developers to use the platform to build applications; but, to date, few clients build apps on their own. Building a partner and developer ecosystem is important to outpace competitors. Kony is working to build the ecosystem and has trained approximately 2,000 developer partners, a relatively small number compared with many of the MADP leaders.

Microsoft

Having fallen behind in the mobile phone and tablet markets, Microsoft has made significant investments in an attempt to return to a leadership position. Windows 8 is at the center of Microsoft's strategy, with a unique touch-optimized UI across desktops, notebooks and tablets. (While Microsoft's smartphone offerings are similar, they don't share the same OS and APIs today.) Despite the commonality in the UI, however, Microsoft's platform strategy is complex, resulting in adoption challenges in enterprise and consumer scenarios. Most enterprise development organizations are carefully considering when and how to support Windows 8 in their B2E and B2C mobile AD efforts. As a result, interest in Microsoft's mobile AD platform remains tepid. In 2012, Microsoft launched Windows Azure Mobile Services: cloud mobile back-end services that support iOS, Android and cross-platform mobile HTML/JavaScript hybrid app development, and Windows 8 and Windows Store apps, as well as provides secure communication to on-premises enterprise systems. This is significant, as Microsoft is the first device OS platform vendor to provide a cross-platform cloud back-end service offering. On the tool front, Microsoft released Visual Studio 2012, which supports Windows 8 and Azure cloud development, as well as the use of JavaScript and HTML5 in Windows 8 applications.

Appropriate Use: Microsoft is a solid choice for enterprises with a wide number of legacy desktop applications on Windows-based devices, and for those that have a significant investment in the Microsoft ecosystem, where they can benefit in markets where Microsoft is able to gain traction for Windows 8.

Strengths

- Microsoft has long-standing relationships with enterprise IT departments, and a huge base of desktops and notebooks. Many IT departments want to support Microsoft.

- Microsoft has begun to place additional emphasis on openness in mobile AD by supporting iOS and Android applications in Windows Azure Mobile Services, as well as supporting JavaScript/HTML5 in Windows 8 applications.

Cautions

- Microsoft's strategies for smartphone, tablet/desktop and cloud platforms remain fragmented, leading to complexity, confusion and slow adoption. This makes selection of a Microsoft-focused development approach less attractive than cross-platform alternatives.
- Windows 8's unique approach to UI and application design introduces new challenges to a write-once, run-anywhere strategy that spans Windows and non-Windows devices.

MicroStrategy

Widely known as a business intelligence vendor, MicroStrategy offers a comprehensive MADP supporting the creation, deployment and measurement of transactional, as well as information-centric, applications. Cross-platform development is performed using a visual tool to compose and configure UI and functional elements, and to tune the layout for the necessary screen sizes and form factors. Client-side functionality is delivered through a MicroStrategy-developed container, leveraging native widgets on each of the supported platforms. The result is a cross-platform application that has a native user experience. In addition to MicroStrategy's analytics server, a mobility server is provided to support user management, security, data storage, back-end integration and dynamic provisioning of applications to the client devices. Somewhat unusual for a vendor at the enterprise end of the MADP landscape, MicroStrategy offers a hands-on approach to platform evaluation through a downloadable free trial, as well as a free perpetual license for up to 10 users. It also offers a paid two-week QuickStrike program that includes strategic guidance, professional graphics design, development support and user testing.

Appropriate Use: MicroStrategy is a good choice for mobile scenarios that span the life cycle of data creation, capture and analysis, or where the desire for reduced time to benefit or to support rapidly evolving business requirements outweighs the need for standards-based development.

Strengths

- MicroStrategy's platform and customer engagement model emphasizes the creation of polished UIs, resulting in business applications that have visual appeal in customer-facing business scenarios, such as side-by-side selling.
- The platform's tooling and metadata-driven architecture lend themselves to RAD and iteration, while supporting enterprise requirements for security and reliability.

- MicroStrategy's advanced data analytics and mobile dashboard capabilities can be used to monitor and measure application usage patterns, and to mine and analyze business data.
- As with other platforms based on a managed-client/server architecture, data synchronization is provided to support offline functionality.

Cautions

- While MicroStrategy's mobility platform is suitable for transactional applications, the inclusion of MicroStrategy's analytics server makes the platform primarily desirable for scenarios that also require data analytics.
- The toolset's visual approach to AD is not, as of yet, suited to scenarios that require significant customization.

Motorola Solutions

Motorola Solutions' product portfolio consists of mobile computing devices and software, bar code scanners, network infrastructure and services. Their MADP is from RhoMobile, a software vendor acquired in July 2011. The centerpiece of the RhoMobile Suite is RhoElements, an HTML5 framework and container for native and hybrid mobile apps. RhoElements supports the MVC architectural design pattern, and an object/relational mapper for persisting objects to storage. It offers broad OS support, and is the only HTML-based framework to support Windows Mobile and Windows CE. RhoMobile Suite also includes RhoConnect, an integration server for mobile applications that connects front-end systems to back-end enterprise business applications, and provides data synchronization for offline data usage. Developers can use RhoConnect with apps written in Objective-C, Java, Ruby or other languages. RhoConnect includes adapters for enterprise applications such as those from salesforce.com, Oracle, Microsoft Dynamics and SugarCRM. Also included is a push notification service that fills the gap for OSs that do not offer push messaging.

RhoHub enables developers to build and deploy in the cloud, in partnership with salesforce.com (Heroku). It provides mobile app management with RhoGallery Mobile App Management services. RhoStudio is an Eclipse-based plug-in that enables developers to write, test and debug cross-platform applications for iOS, Android, Windows Phone and BlackBerry from a single computer. The RhoMobile Suite also includes Rhodes — a free open-source subset of RhoElements that provides necessary components for consumer apps.

Appropriate Use: Motorola Solutions' RhoMobile Suite is suited for organizations that need strong data handling, back-end connectivity and support for the MVC architectural pattern.

Strengths

- RhoMobile Suite's strength is in data management and data integration for more informational apps.
- It offers a strong back-end integration capability.
- It supports a diverse set of mobile platforms, not just iOS and Android.
- Motorola Solutions has strong enterprise presence, especially in retail and ruggedized sectors.

Cautions

- Motorola Solutions' history, name and brand are confusing to those who have not followed the acquisition history, which has led to reduced visibility.
- The Rhodes brand is strongly associated with Ruby, which is a strength among the Ruby community, but can be perceived as an obstacle among non-Ruby developers.

Netbiscuits

Founded in 2000, Netbiscuits continues to extend its development platform and cloud service for B2C mobile websites and apps. In 2012, the company embraced HTML5 with its Tactile multitouch framework for smartphones and tablets. It added new testing options, stronger integration with content delivery networks, and a device context service that enables developers to tailor apps to a user's device. Long a favorite for presmartphone B2C mobile websites, Netbiscuits has not set the pace in smartphone and tablet app development. The company raised $27 million in October 2012 to invest in sales, marketing and development.

Appropriate Use: Netbiscuits is a good fit for mobile media, commerce, advertising and marketing applications, ranging from fully interactive and transactional mobile Web presence to one-off campaigns targeting a wide range of platforms. It is well-suited for projects that target feature phones, smartphones and tablets.

Strengths

- Netbiscuits' strong suit is B2C. Its platform provides multidevice, mobile Web AD and operation, device management, rich content applications and rich media ads.
- Netbiscuits integrates with a range of popular IDEs, including NetBeans, Eclipse and Microsoft Visual Studio.
- Overall customer satisfaction remains strong.

Cautions

- Because Netbiscuits' focus is on customer-facing mobile websites and Web applications, consider other MADPs for B2E and native AD.
- Although the company is over 12 years old, Netbiscuits' HTML5 framework Tactile is relatively new, and clients have reported some quality issues. BiscuitML, Netbiscuits' extension to HTML, is still part of the new HTML5 framework.

salesforce.com

Salesforce.com is primarily known for its cloud/SaaS applications and capabilities, but also supports mobile AD through its platform and tools. Developers can use the company's Force.com application platform as a service (aPaaS) and Force.com APIs. During the past year, salesforce.com significantly expanded its mobile capabilities, and formalized its mobile offerings under the name Salesforce Touch. These include Salesforce Touch apps and the Salesforce Touch Platform, which is part of Force.com. Customers can extend these apps and create Web, native and hybrid applications for smartphones and tablets using the Salesforce Touch Platform, which includes Apache Cordova and its capabilities. Customers can also use Force.com APIs in applications built with other MADPs. For example, salesforce.com offers native mobile clients for its sales, service and social networking SaaS applications. With the latest release, the company added Salesforce Platform Mobile Services — a cloud mobile back-end as a service with services for data, code and identity. Server-side code execution can run on Force.com or Heroku, using Ruby, Node.js, Java, Python, Clojure or Scala. The Salesforce Touch Platform and Mobile Services can be used to build any type of mobile application, not only for extending salesforce.com applications.

Appropriate Use: This vendor is suited for customers looking to extend their salesforce.com or Force.com applications to mobile users.

Strengths

- Touch-enabled mobile applications and the Force.com aPaaS and APIs are no-cost options for salesforce.com SaaS customers.
- Force.com provides a high-productivity development/deployment environment with visual design tools, built-in integration with salesforce.com applications and a solid aPaaS.
- Customers can use jQuery, Sencha and Apache Cordova as complementary tools to integrate with the salesforce.com platform.

Cautions

- Many of salesforce.com's mobile offerings are new, having been built on the Salesforce Touch Platform. Some maturation is to be expected.
- While salesforce.com continues to make progress in the mobile area, its mobile application suite and AD platform are not quite as functional as its desktop Web offerings.

SAP

In 2012, SAP continued to expand its portfolio of mobile software products and services. SAP acquired Syclo, an MADP competitor, for an undisclosed amount in June 2012. Syclo provides SAP with successful mobile applications for enterprise asset, field service and inventory management, and another MADP, Syclo Agentry. SAP has continued to build out its SAP Mobile Banking Platform to support additional vertical industries, such as consumer packaged goods, retail, telco and utilities. SAP delivered SAPUI5, a new HTML5/JavaScript UI framework for desktop and mobile applications, and continued enhancements to the mobile capabilities of Business Objects. Early in 2013, SAP announced it was consolidating some MADP assets, merging the Syclo Agentry, Sybase Mobiliser and Sybase Unwired Platform (SUP) into a single platform, branding it as SAP Mobile Platform, and offering it in enterprise and consumer editions. SAP's mobile business unit reported €222 million in net new software license revenue for 2012. While this number includes non-MADP revenue, we believe SAP grew its MADP license revenue dramatically over its strong sales performance in 2011, making it the largest MADP provider in terms of license revenue.

Appropriate Use: Regardless of whether your enterprise is an SAP ERP customer, consider the SAP Mobile Platform if your enterprise is looking for a single vendor that offers a broad portfolio of mobile technology alternatives.

Strengths

- SAP's early bet on mobility and substantial continued investment in mobile computing has enabled the company to build out a broad portfolio of solutions and the beginnings of a strong partner ecosystem.
- SAP's broad customer base means its products have been tested in a broad range of mobile applications across a diverse set of industries.
- Customers report high levels of satisfaction with SAP mobile solutions, and that SAP's MADP offerings are stable and secure. SAP's banking and messaging solutions have demonstrated the ability to scale to support demanding consumer scenarios, and SAP offers some of the broadest device support among all the multichannel vendors.

Cautions

- SAP's product portfolio is complex. Enterprises looking for a lightweight infrastructure to support quick-win mobile initiatives often find the SAP product set daunting.
- Because many of SAP's mobile offerings are evolving rapidly, enterprises should examine each offering's heritage and ask for integration road maps and guarantees of support.
- Compared with some alternatives, SAP's mobile software pricing can be high, so be prepared to negotiate.

Sencha

Sencha is a leading example of a vendor with a Web-centric approach to mobile AD. Sencha is a champion of HTML5, evidenced by its aggressive defense of HTML5 as an appropriate development environment for Facebook-style applications. In contrast with native code cross-compilers, such as Kony and Appcelerator, Sencha's offering is a mix of commercial and open-source tooling for HTML5 development. The offering consists of Sencha Architect, a commercially licensed tool, which enables developers to design, develop and deploy mobile and desktop applications. Sencha Touch, a mobile Web app framework available under open source or commercial license, provides access to native device features exposed by HTML5, and is separate from Sencha Ext JS, a cross-browser framework for desktop Web AD. Sencha Charts allows for touch-driven accelerated graphics and charting. Sencha Mobile Packager facilitates native wrapping of applications, as well as bridging to native APIs. Sencha.io, a cloud-hosted back-end as a service is in beta. The company also offers an Eclipse plug-in.

Appropriate Use: Sencha will be attractive to IT organizations and ISVs that have Web application and JavaScript development expertise. Its programming model should be familiar to developers with backgrounds in Adobe Flex, Microsoft Windows Presentation Foundation (WPF), Java Swing or other object-oriented, component-based development platforms.

Strengths

- Sencha fits best with developers whose predominant mobile application needs are for mobile Web and hybrid architectures, as opposed to native apps or applications that need more complex integration with the OS or system libraries.
- Application deployments leveraging Sencha have grown significantly over the last year.
- Sencha is one of the few HTML5 development frameworks that provides support in contrast to the open-source alternatives.

Cautions

- Sencha's fortunes are tied tightly to the adoption and maturation of HTML5. If an enterprise needs native AD, then it will need to look to other tools and frameworks for support.
- Sencha does not provide for ancillary life cycle services, such as code repositories, bug tracking, support desk, usage analytics, performance analytics or version management, but may be integrated with third-party providers in these areas.
- Like other HTML5 solutions, Sencha apps can suffer from long initial load times on slow network connections, because they have to load JavaScript code to the device. However, Sencha provides delta-caching for low-latency repeat visits.

Usablenet

Founded in 2000, Usablenet's focus is to allow organizations to utilize existing content and website assets in new mobile Web experiences. Usablenet's APIs are available for integration with third-party native clients, or with native clients developed by Usablenet's professional services organization using native toolkits. Usablenet's platform is cloud-based and supports several content inputs, including HTML4, HTML5, JavaScript, Ajax and Dojo websites; Web services (SOAP, REST and JavaScript Object Notation [JSON]); APIs; and XML. Output from the Usablenet cloud development platform includes mobile websites and mobile Web applications. The company provides Web application frameworks for Facebook, kiosks, tablets and smartphones.

Appropriate Use: Usablenet is strongest for predominantly mobile Web B2C applications, and for organizations that prefer outsourcing to a cloud-based platform.

Strengths

- Usablenet has a strong professional services organization. Usablenet customers can do their own development on the Usablenet Development Cloud; have Usablenet develop applications for them via its professional services; and/or do both.
- The company has a strong client base in the retail and travel industries, and strong revenue growth.
- Usablenet has partner arrangements with companies such as PayPal and Google.

Cautions

- The company focuses primarily on mobile Web applications. Its platform does not generate native mobile applications automatically.

- Usablenet caters more to situations where developers are attempting to leverage existing Web content, Web services, APIs and XML feeds, rather than building new mobile business logic.
- Usablenet's business model is based on pages served, even for native mobile application support, and will require an ongoing operating budget.

Verivo Software

Verivo Software provides a comprehensive MADP for the enterprise market. Historically, Verivo's platform employed a proprietary visual drag-and-drop development approach. This has changed with its recently released Akula platform. This new platform was designed to embrace third-party tools and frameworks, while continuing to allow enterprises to develop, deploy and manage cross-platform applications. Supported architectures include Web, native and hybrid applications. Verivo offers security and integration capabilities, including connectors to frequently deployed enterprise solutions via its new Java Platform, Enterprise Edition (JEE)-based Akula Server middleware.

Appropriate Use: Verivo's Akula platform will be attractive to development organizations with cross-platform projects that need to connect to enterprise systems.

Strengths

- Developers will find that Verivo's new platform, Akula, is flexible, allowing for incorporation of third-party tools and frameworks.
- Verivo's Akula platform provides enterprise security and enables users to leverage a suite of back-end connectors to support mobile enterprise application scenarios.
- Verivo's new Try Before You Buy program allows developers to assess the platform capabilities for 30 days without purchasing a license.

Cautions

- The recent shift from the company's closed platform to the Akula platform will ultimately require customers to migrate their applications to the new platform at their expense.
- As with all new platforms, Akula may experience some early issues that will need to be addressed.

Xamarin

Xamarin provides tools and platforms that allow C# developers to build cross-platform applications that run on iOS and Android, as well as Windows and Mac OS X. Xamarin's unique offering has led to rapid growth due to pent-up demand from .NET and C# developers for mobile tools. Founded in May 2011, Xamarin has a history that dates back more than a decade. The principals had key roles on the Mono project, a free-of-charge and open-source initiative launched in 2001 that implemented the C# language, .NET framework and runtime environment on multiple platforms.

In February 2013, Xamarin introduced Xamarin 2.0, which includes Visual Studio integration for developing Android and iOS applications, plus a cross-platform IDE called Xamarin Studio, the Xamarin Component Store (a catalog of third-party and Xamarin-built components) and visual design tools. In addition, Xamarin offers Test Cloud, a service for mobile apps that enables developers to test across hundreds of mobile devices, including any mobile application, not just Xamarin-compiled code. Xamarin's architectural approach provides completely native UIs with better performance than other cross-platform techniques, as well as access to the native capabilities of each device. The approach also allows Xamarin to support updates to native APIs on the same day they are released, as it did with iOS 6. The trade-off is that developers must code the UI to each target platform — while sharing common back-end code across them — and they typically must understand platform-specific programming concepts.

Appropriate Use: Xamarin is appropriate for developers that want to leverage C# and .NET skills to develop native apps that target some combination of iOS, Android and Windows platforms.

Strengths

- Xamarin addresses an untapped market need (C# developers wanting to leverage their skills on mobile).
- Xamarin offers compatibility with a broad swath of Microsoft .NET tools and technologies.
- Apps built with Xamarin have fully native UIs and performance.
- Xamarin uses multifaceted technology built by a cohesive team with solid long-term track record.

Cautions

- The system is cross-platform within a limited scope, because developers code in a cross-platform language and toolset, but craft the UI using APIs native to each platform.

- The company is small with limited resources, competing against well-established mobile vendors with large ecosystems, as well as other innovative small companies.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor appearing in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.

Added

We added four vendors:

- ClickSoftware
- MicroStrategy
- Motorola Solutions
- Xamarin

Dropped

Four vendors that appeared in our 2012 Magic Quadrant were not included this year:

- Andanza Technologies did not meet our criteria for market impact.
- FileMaker still offers an MADP, but it is no longer targeted at enterprise IT developers.
- Spring Wireless changed focus during 2012.
- Syclo was acquired by SAP during 2012.

Inclusion and Exclusion Criteria

Vendors in this year's Magic Quadrant met the following criteria:

- Significant market impact. This is demonstrated either by:
- MADP software revenue in 2012 of more than $15 million.
- Over 1,000 new enterprise implementations in 2012.
- A high volume of inquiry from Gartner end-user clients.

- A global presence. Vendors must have had at least 10 new enterprise implementations in each of at least two of the following geographic regions: North America, Latin America, EMEA or Asia/Pacific.
- Intellectual property. Firms must own the intellectual property rights to their MADPs.
- Enterprise use. Only MADPs used by enterprise IT customers for custom development are included. Platforms used solely by consulting or packaged application vendor employees are excluded.
- General-purpose MADP. The platform supports a wide range of application types, not just the extension of a packaged application, mobile business intelligence, content management or streaming application.

We updated our evaluation metrics to reflect the growth, convergence and consolidation of the market. New criteria include:

- Openness. Many enterprises use different tools depending on the business requirements of the application, often from a mix of vendors. We surveyed more than 100 enterprises for this Magic Quadrant, and found they used tools from an average of 2.5 MADP vendors. As a result, this year, we began evaluating vendors on how well their products supported standards and integrated with other MADP vendors' products.
- Web technologies. Enterprises increasingly are looking for solutions based on Web technologies, such as HTML5 and JavaScript, to increase application reach, reduce vendor lock-in, extend application life and leverage skills and technology investments. We updated our evaluation criteria to reflect the growing importance of Web technologies in enterprise mobile strategies. We were not alone in recognizing this trend: Today, most vendors embrace Web technologies at least to some degree.

Evaluation Criteria

Ability to Execute

Product/Service: How well does the vendor's platform meet the buying requirements of enterprises? Does it support the full software development life cycle? How well does the vendor support consumer-oriented and enterprise-oriented mobile applications? Can the platform be used to build native, hybrid and Web applications? Is the platform open? Does it integrate well with other vendors' platforms? Does it require only standard IT skills and tools? How labor-efficient is the offering? Does the vendor supply application templates or frameworks to accelerate development? Does the vendor have a strong partner ecosystem that extends the value of its products/services?

Overall Viability: For commercial vendors, we looked for continued commitment from upper management and overall company financial well-being. For open-source projects, we considered the strength of the community responsible for developing and supporting the project, the project sponsor relationships, and the number of enterprises and developers using the software.

Sales Execution/Pricing: Is the company growing at, or faster than, the market rate? Does the vendor have the scope and sales model to participate in all enterprise evaluations, or is it constrained? Does the pricing model create a sales barrier?

Market Responsiveness and Track Record: How rapidly has the company responded to changes in the market?

Marketing Execution: What is the level of market awareness of the company's mobile enterprise offering? How does the company work with its partners to create a healthy ecosystem?

Customer Experience: Along with the product offering and sales execution criteria, this criterion carries the highest weight and is based on customer and partner references, as well as Gartner client inquiries.

Operations: How well does the vendor support customers? Does it provide cost-effective and competent consulting services? Can it provide a cloud-based deployment model or hosting services? (See Table 1.)

Table 1. Ability to Execute Evaluation Criteria

Criteria	Weight
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	High
Market Responsiveness/Record	Medium
Marketing Execution	Low
Customer Experience	High
Operations	Low
Source: Gartner (August 2013)	

Completeness of Vision

Market Understanding: Does the vendor understand the needs of marketing, IT, product engineering and system integrator users? How does it stay on top of those needs and translate them into useful products? To what degree has the market validated the vendor's vision?

Marketing Strategy: Does the vendor have a reasonable strategy to create broad awareness and differentiation for its offerings?

Sales Strategy: Will the strategy enable the vendor to compete in the majority of enterprise selections, or will it constrain the vendor's success? For open-source projects, we consider whether the project ecosystem will position it for success in the majority of enterprise selections.

Offering (Product) Strategy: Does the road map for the product reflect the market's direction and the likely requirements of buyers within 18 to 24 months? Has the company built or acquired the pieces necessary to maintain product relevance and leadership?

Business Model: Does the vendor's business model yield the kind of profitable growth that will allow the company to lead the market? For open-source projects, is the project's ecosystem likely to drive it to market leadership?

Vertical/Industry Strategy: Does the vendor offer packaged mobile applications or templates for specific vertical industries? Is the vendor able to articulate a strategy for vertical differentiation, and can it maintain that position?

Innovation: Does the vendor lead the market with innovative technology, sales models or business models?

Geographic Strategy: Does the company have a strong plan for supporting customers and growing business worldwide? For open-source projects, we evaluate the international distribution of project users (see Table 2).

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Low
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	Medium
Vertical/Industry Strategy	Low
Innovation	High
Geographic Strategy	Low
Source: Gartner (August 2013)	

Quadrant Descriptions

Leaders

As this market reaches early mainstream status, Gartner expects Leaders to be profitable, and to present lower risk and consistently high project results as the market begins to consolidate and competition grows. Leaders must not only be good at cross-platform development and deployment, but also have a good vision of the multichannel enterprise, support for standards, a solid understanding of IT requirements, and scalable channels and partnerships to market. Leaders must provide platforms that are easy to purchase, program,

deploy and upgrade. Leaders can focus primarily on either B2C or B2E, but vision and execution scores are higher for vendors that can cover both use cases today.

Challengers

Challengers in this market must have high numbers of enterprise clients; a large, growing base of seats in deployment; and the ability to meet the needs of all departments in global rollouts. Challengers offer a complete software suite that has all the required functionality and is scalable for large numbers of users. They are vendors with a history of execution in the market. Challengers may lack marketing skills, or a strong technical or business vision — especially in the areas of diversity, future convergence with Web technologies and multichannel support — or may have lingering gaps or confusing overlaps in products or channels to market.

Visionaries

Visionaries in this market have a compelling vision of their products' and the market's future, as well as the technical direction to take them there. However, they have not backed up that vision in one or more of the following areas: history of execution, revenue, size of client base or strong financial results.

Niche Players

Niche Players in this market are not as strong in one or more of the following criteria: product breadth/completeness or focus, geography, or number of customers. Although they may be a good choice for a particular project, they are not well-suited as a broad platform for all types of projects. Gartner suggests pairing some Niche Players (such as single-platform-focused vendors) with hybrid or Web-oriented approaches to assemble a more complete solution. Enterprises need to ask Niche Players in this market to show them how they will remedy their shortcomings through partnering or integration.

Context

The market for MADPs is complex. A team of six analysts conducted this year's evaluation. Beginning with a pool of more than 120 vendors, we found 22 that met the Magic Quadrant inclusion criteria. We opted to include vendors supporting different mobile AD approaches, because Gartner client inquiries show that enterprise buyers consider them as alternatives.

Given the wide range of vendor technologies, business models and histories, it is not surprising that vendors have widely differing strengths, cautions and visions for this market. Our evaluation was based on the converging enterprise requirements for a single platform capable of supporting B2C, B2B and B2E scenarios.

When using this research, there are a number of important points to keep in mind:

- As with all Magic Quadrants, vendors in the Leaders quadrant are not necessarily the best for all projects or enterprises. Depending on your needs, a vendor in any quadrant could be the best for your enterprise. For example, if you only need to build applications for the Apple iPad, a Niche Player, such as Apple, may be your best choice. Our evaluations are based upon a specific set of criteria, and may not match those of your organization. For a view into how well some of the leading MADPs support either a B2C or B2E scenario, see "Critical Capabilities for Mobile Application Development Platforms."

- There are many vendors that have mobile AD offerings but did not meet our inclusion requirements. This does not mean they shouldn't be selected. Other vendors that you might consider include 3CInteractive, AppPoint, Catavolt, Convertigo, Embarcadero, FeedHenry, Formotus, Globo, HP, Intel, Magic Software Enterprises, Mendix, Modo Labs, moTwin, Moovweb, Openstream, PocketMobile Communications, Prolifiq Software, Retriever Communications, Runtime Revolution, Service2Media, Sita, Synactive and Telerik. For more on selecting vendors, see "Selecting a Mobile App Development Vendor."

- Some platforms may be a better fit with your organization's skill sets. Consider the match between the skills you have and those required by each MADP you evaluate. Enterprise customers typically have the following skills in good supply:

  - Traditional developers familiar with Java or .NET programming languages

  - Technical business analysts who prefer high-level fourth-generation languages (4GLs) and form builders

  - Web developers and designers who are proficient with JavaScript, HTML and CSS

- Despite market consolidation, the MADP market continues to evolve rapidly. In addition, the developing nature of mobile applications and infrastructure makes it difficult for an enterprise to select a single, strategic MADP vendor. Concentrate on finding a small set of platforms that will satisfy your short-term to midterm needs, and be prepared to re-examine your choices every few years.

- Many enterprises need more than one MADP to meet all their requirements, so look for platforms that work together. For more on lowering IT cost and complexity, see "Minimizing the Number of Supported Mobile Application Architectures."

Market Overview

Selecting MADPs has become an urgent issue for many CIOs. Less than seven years after the introduction of Apple's iPhone, the worldwide installed base of smartphones and tablets will surpass that of PCs in 2013.[1] As a result, mobile technologies ranked as a top technology priority in Gartner's last three annual CIO surveys. Building mobile applications is an important component of an enterprise's mobile strategy, because applications provide much of the potential business ROI in the mobile infrastructure. Enterprises build mobile websites and apps to engage customers wherever they are. Similarly, they build mobile applications to improve employee efficiency and effectiveness. However, selecting an MADP is not easy:

- The debate over Web, native and hybrid approaches continues. While HTML5 promises to satisfy typical enterprise needs, most enterprises find it is only a partial solution today.
- While many IT organizations would like to standardize on a single MADP, no single vendor can provide a cost-effective solution for the wide variety of mobile applications a typical enterprise needs to build.
- The vendor landscape continues to rapidly grow and evolve, with new vendors and new products entering the market every month.
- The market continues to converge around common enterprise requirements, making it more difficult to differentiate between the products offered by different vendors and increasing the number of vendors.

Evidence

[1] "Forecast: Devices by Operating System and User Type, Worldwide, 2010-2016, 4Q12 Update"

Evaluation Criteria Definitions

Ability to Execute

Product/Service: Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/ partnerships as defined in the market definition and detailed in the subcriteria.

Overall Viability: Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

Sales Execution/Pricing: The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

Market Responsiveness/Record: Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

Marketing Execution: The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

Customer Experience: Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

Operations: The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

Completeness of Vision

Market Understanding: Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

Marketing Strategy: A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

Sales Strategy: The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

Offering (Product) Strategy: The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

Business Model: The soundness and logic of the vendor's underlying business proposition.

Vertical/Industry Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

Innovation: Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

Geographic Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.

Source: Gartner Research Note G00248487, I. Finley, V. Baker, K. Parmelee, D. Mitchell Smith, R. Valdes, G. Van Huizen, 07 August 2013