InformationWeek
:: analytics
Analytics.InformationWeek.com

January 2011
$99

Analytics Report

Application Mobilization:
A Rapidly Changing Landscape

Once a niche area, mobile applications are becoming strategic tools for companies trying to make employees more efficient, better service customers and become more competitive in today's global markets. Getting to a high level of mobilization, however, is surprisingly difficult. In this report, we'll showcase some trends and discuss ongoing challenges, such as accommodating multiple mobile platforms, dealing with security and accessing disparate back-end data sources.

By Peter Rysavy

Report ID: R1600111

TABLE OF CONTENTS

TABLE OF CONTENTS

Peter Rysavy
Rysavy Research

Peter Rysavy has worked since 1993 as a consultant with numerous clients on projects involving wireless technology. Clients include cellular operators, mobile-device companies, communications-software companies, infrastructure vendors, research organizations, government agencies and universities. He also teaches seminars, leads interoperability efforts and writes articles on wireless communications.

Peter graduated with BSEE and MSEE degrees from Stanford University in 1979, where he was involved in university/industry collaborations involving statistical and digital signal processing. Peter is currently a wireless technology consultant and president of Rysavy Research (www.rysavy.com).

Executive Summary

The mobile world changed in some profound ways in 2010, and mostly for the better. Development tools are richer. There are more off-the-shelf mobile applications. Networks are faster. Web-based applications, thanks to emerging technologies such as HTML5, are more practical for a wider range of applications. Mobile platforms themselves are far more powerful, with beautiful displays, fast processors, huge amounts of storage and sophisticated multitasking operating systems. Meanwhile, entirely new categories of platforms, such as tablets, have entered the scene. In this report, we'll help you make sense of all these developments for your business while examining the results of our *InformationWeek Analytics* Application Mobilization Survey of 693 business technology professionals, with exclusive trending from 2009. This data provides a good view of what other companies are doing and how IT managers view deployment of mobile applications.

Matching the increase in mobile device and network capability, adoption of mobile applications has also progressed rapidly. Some results did show consistency. For example, most deployments consist of isolated business units or departments using wireless data services to enhance operations. But we also saw impressive growth: The percentage of respondents reporting widespread adoption throughout their organizations increased from 21% to 27%, a tidy annualized 38% increase. In 2009, 42% of poll respondents said their organizations were currently deploying, or planning to deploy, mobile applications on smartphones. In 2010, it was 52%—a 30% increase. The biggest reason for not deploying mobile applications, cited by 42% of respondents, is that these apps present no benefit to their businesses.

"As a brick-and-mortar retailer, we have little scope or need for mobile applications, beyond mass-market applications already generally available," says one respondent. From another: "Our management is afraid of new technology and change."

Whether change is welcome or not, it's coming. Smart companies of all types are starting to take mobile applications seriously. Here's what you need to know to be ready for the new mobility landscape.

Research Synopsis

Survey Name: *InformationWeek Analytics* Application Mobilization Survey
Survey Date: September 2010
Region: North America
Number of Respondents: 693

Purpose:
To determine the state of application mobilization in enterprises.

Methodology:
InformationWeek Analytics surveyed business technology decision-makers at North American companies. The survey was conducted online, and respondents were recruited via an e-mail invitation containing an embedded link to the survey. The e-mail invitation was sent to qualified *InformationWeek* subscribers.

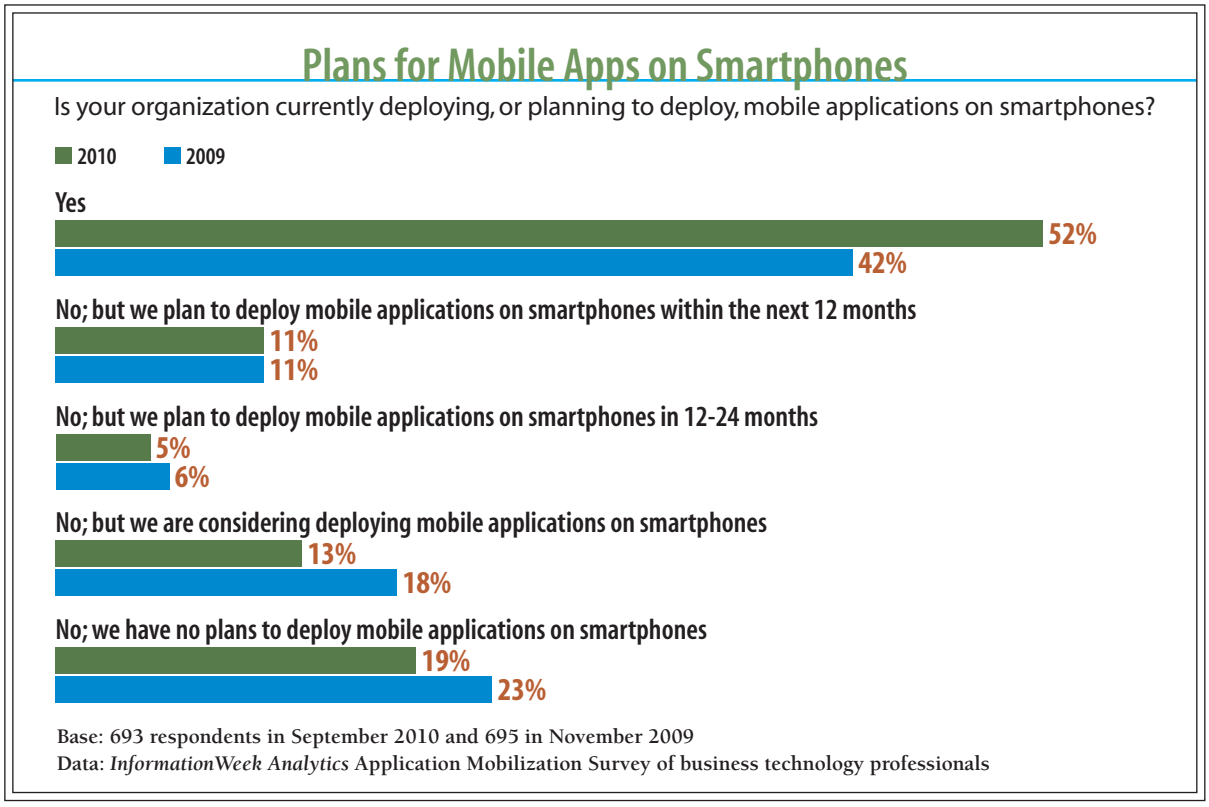
Application Variables and Approaches

It's an exciting time to be involved in application mobilization: Today's smartphones are powerful computers with significant processing power and storage, and tablets are the new must-have gadget. All these devices are pushing the boundaries of innovation, and IT must keep up.

How? First, identify the most important variables for your environment, since these usually dictate the optimal development approaches. There are four key areas to consider.

- **How many different mobile platforms do you need to support?** If it's just Windows Mobile devices or just iPhones, your approach is likely to be different than if you need to support two or more mobile platforms. Needless to say, supporting multiple platforms can

Figure 1



quickly become quite challenging. "The single biggest issue we face is the desire to be device/network agnostic," says one respondent. We understand and appreciate the sentiment, but we're just not there yet.

- **Do you plan to use only "off-the-shelf" applications, or is customization in your future?** If you're just supporting e-mail and calendar synchronization, you won't need to do custom development. Similarly, most major enterprise app vendors, including Microsoft, Oracle and SAP, have mobilized some of their applications, meaning no coding for you. But if your business is predicated on specialized software, the process is more complex.

- How many applications do you have to support? Accessing e-mail or even information from just one database is relatively simple. Integrating information on the same screen from Oracle and SAP databases is much more complicated. In our e-poll, 17% of respondents indicated that, beyond

Impact Assessment: Mobilized Applications

Impact to…	Benefit	Risk
IT Organization	○○●●● Mobile application development architectures and specifications enable IT to move beyond e-mail and calendar synchronization, securely. You purchase and support powerful smartphones—why not empower employees to take full advantage?	○○●●● Hard choices remain: Brutal competition rages among platforms, and there are a number of higher-level frameworks. Do you go Web or native? Middleware? IT can't reasonably support all the platforms and devices to which users have grown attached.
Business Organization	○●●●● New smartphones sport power that dwarfs older desktops, and finally applications are taking advantage of that might. Employees can have the access to enterprise data that they need to do their jobs, no matter where they are.	○●●●● Porting enterprise apps to small-form-factor devices demands platform selectivity: If business users expect IT to support a vast array of smartphones, they could be in for a rude awakening.
Business Competitiveness	○●●●● For most companies, mobile e-mail is table stakes—handing out BlackBerrys just keeps you on par. To gain real competitive advantage, you need to develop mobile versions of the applications that provide your business edge.	○○●●● There are security risks any time you let end users out the door with sensitive data literally in their pockets. Smartphones and laptops go missing every day, and nothing kills customer, investor and partner confidence like revelations of lost information.

Bottom Line: ○●●●● ○○●●●

More powerful ways to build mobile applications are a positive development for organizations with the competencies and finances to take advantage of them. However, it's not clear sailing: Platforms are still fragmented, data plans are costly, browser implementations are far from uniform, middleware is still with us, and management and security worries are not going away. Do we sound negative? Not on purpose—we believe in the power of mobilized business apps. We just want you to be prepared.

e-mail, calendar and contacts, they had no other data sources they wanted to access; 33% indicated a single data source; 20% said two data sources; and a plucky 30% said more than two data sources. In other words, most of you want access to corporate data beyond e-mail.

- **Finally, do you buy or build your applications?** Half of our respondents want an off-the-shelf application, and this is clearly the quickest way to deploy. Fortunately, application selection and options for supporting mobile devices are rapidly improving. For example, SAP recently acquired Sybase and its mobile middleware Unwired Platform. SAP and Sybase have released mobile CRM and workflow apps on this platform and plan to mobilize the entire SAP Business Suite set of applications this way.

We're frankly surprised that fully 50% of respondents are willing to develop their own applications. In fact, 25% are ready to develop mobile software that executes on the device itself—in other words, a client that uses the device's native language. This tells us that, whereas writing software for mobile devices used to be a highly specialized task, an increasing number of developers are familiar with software development for today's popular smartphone platforms.

Figure 2

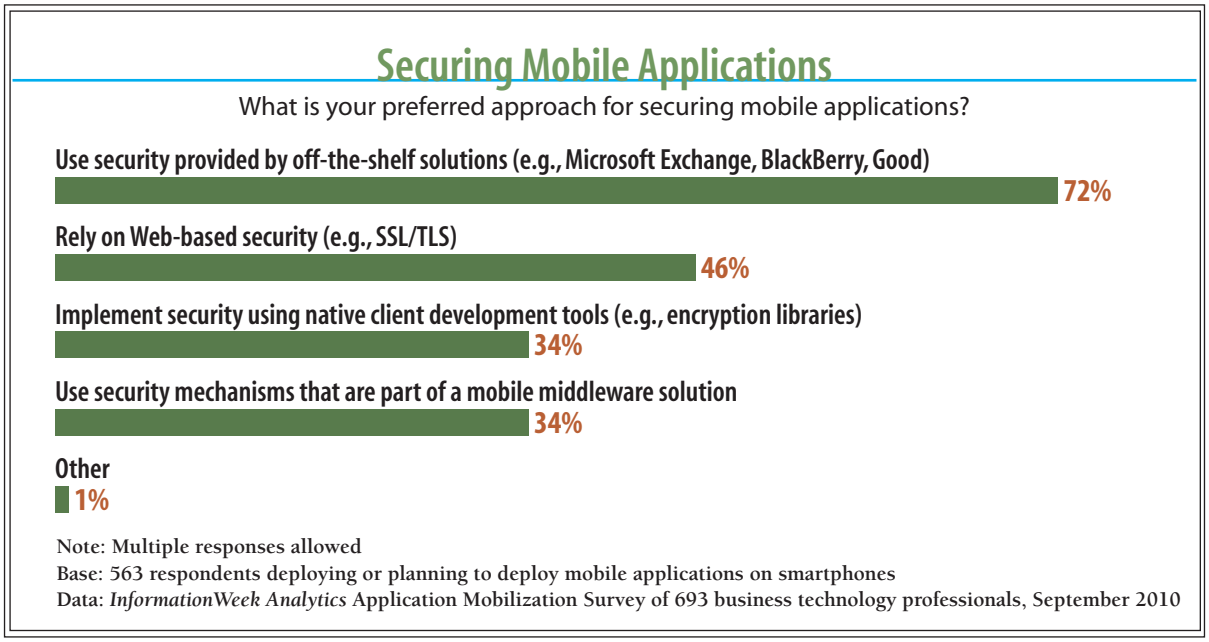
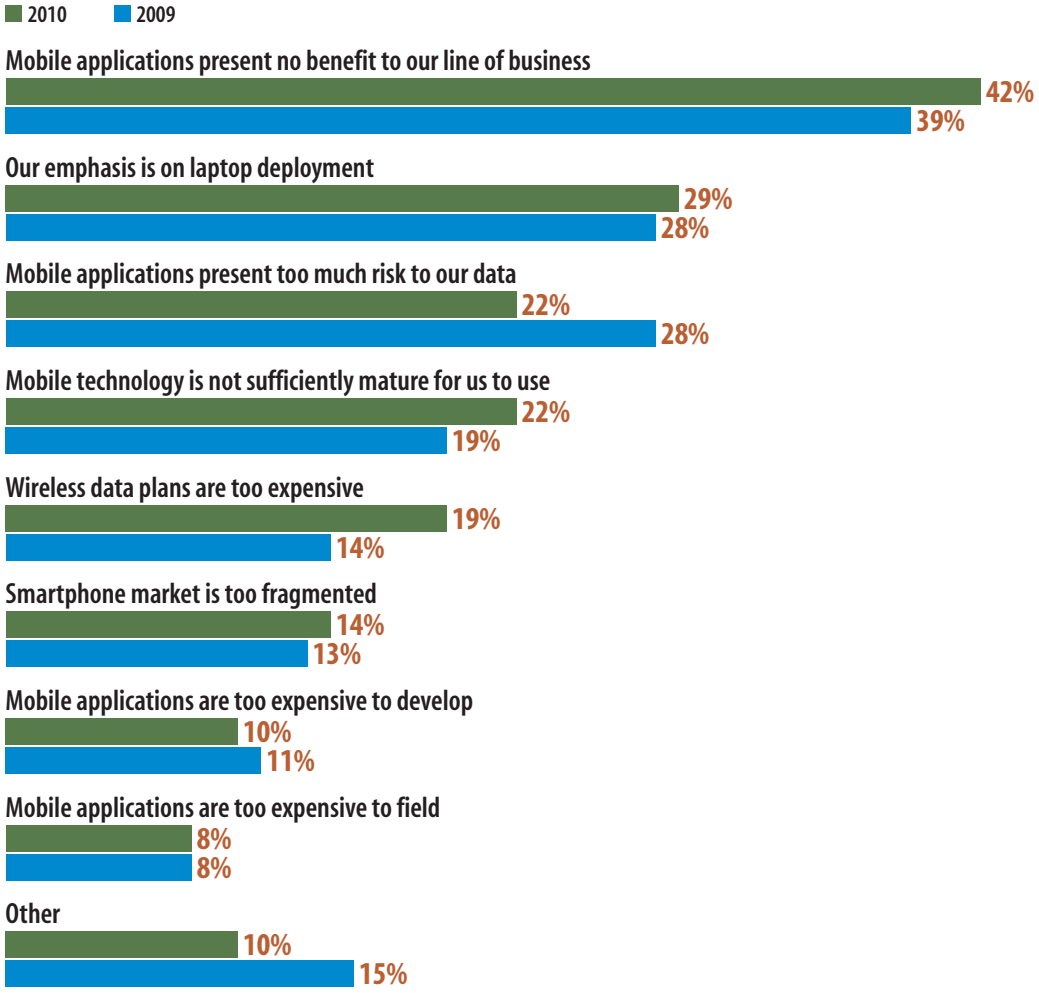


Figure 3

Reasons for Not Deploying Mobile Apps on Smartphones

Why doesn't your organization plan to deploy mobile applications on smartphones?



Note: Multiple responses allowed
Base: 130 respondents in September 2010 and 160 in November 2009 not planning to deploy mobile applications on smartphones
Data: *InformationWeek Analytics* Application Mobilization Survey of business technology professionals

Rise of the Mobile Web

The major alternative to a native client is a Web-based approach, which was supported by 10% of respondents. Eight percent favor a hybrid native/Web approach, 4% a Java client, and 2% plan on using mobile middleware tools from companies such as Antenna Software and Sybase. "For smaller devices with limited screen size, native apps currently provide a much richer experience," says one poll respondent, who adds that for devices with larger screens, such as tablets, browser-based apps are more feasible.

Although only 10% of respondents say they plan to adopt Web-based application approaches, we expect this percentage to increase rapidly over the next several years for a number of reasons. First, as networks get faster—both in higher throughput and in reduced latency—browsers will become more responsive. Another factor is adoption of HTML 5, which intro-

Figure 4

Summary of Mobile Web vs. Native Client Approaches

	WEB	NATIVE CLIENT
Performance/responsiveness	Good and improving	Excellent
User interface	Good but limited by browser	Excellent
Offline operation	Becoming available with HTML 5	Inherently available
Cross-platform support	Same code (with some validation/testing) can support all target devices	Separate client needed for each platform
Deployment	Simple	Complex
IT Organization	Simple	Complex
Hardware/network integration	Limited but improving	Best though platform-specific

duces capabilities that are especially valuable for mobile operation. One example is the local storage object, which permits a large amount of data to be stored locally. With this, a Web-based application like e-mail, for example, can store messages on the device. Combined with an application cache and rich JavaScript, the program can let users respond to and compose e-mails even when disconnected.

In other words, HTML 5 begins to blur the distinction between a Web app and an application operating locally.

The real advantages of a Web application, however, are cross-platform compatibility and ease of deployment and support. The same app, with maybe some tweaking, can operate on multiple device types. This assumes that you don't use a major feature of one mobile browser—say, HTML 5 offline storage—that is not supported in another mobile browser. And, deployment is as easy as loading the app on your Web server; no more figuring out how thousands of users are going to install it. As you make updates, they are available instantly.

Beyond this, initiatives by organizations such as the Wholesale Applications Community (www.wholesaleappcommunity.com/default.aspx), GSMA OneAPI

Figure 5

Key Development Considerations

	BlackBerry	iPhone	Android	Windows Phone 7
Underlying software architecture	BlackBerry	Mac OS X, Cocoa Touch	Linux	Windows
Development language	Java	Objective-C	Java, C++	C#, VB.NET (Silverlight, XAML)
Multivendor device implementation	Single vendor, highly consistent	Single vendor, highly consistent	Multivendor, greatest variability in implementation	Multivendor but very tightly controlled implementations

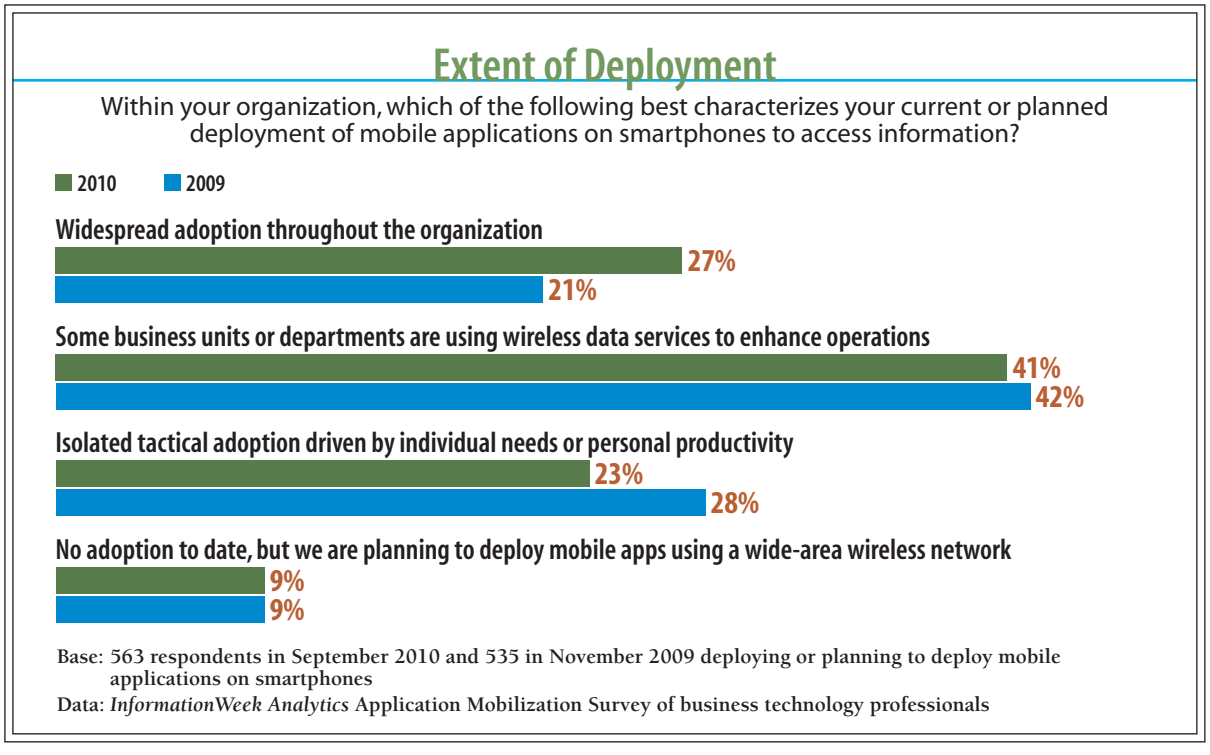
(www.gsmworld.com/oneapi/) and W3C (www.w3.org/2009/dap/) will provide a way for Web technologies to access more hardware functions and network operator APIs. It's an exciting area that IT should watch closely.

Native Application Development

Compared with Web applications, native apps have advantages, notably richer user interfaces, inherently faster application operation and tighter integration with hardware features. What is especially significant about native client applications today, however, is how rich and well supported the development environments are becoming.

Since mobile platforms vary in their development approaches, we have to look at them individually, and we'll do that in order of what adoption levels were reported in our survey: 57%

Figure 6



reported adoption of BlackBerry, 35% iPhone, 27% Google Android, 22% Windows Mobile, 6% Palm Pre and 6% Symbian. Consider that iPhone and Android weren't even on this list several years ago, and you see how quickly the market has changed.

One important trend in smartphones is that users increasingly have strong preferences in terms of which devices they use. You may want to develop your application for Android, but if you have a bunch of iPhone devotees, you may have an uprising on your hands. The table, previous page, summarizes the key development aspects of the main smartphone platforms. We'll dive into more detail in the next section.

Figure 7

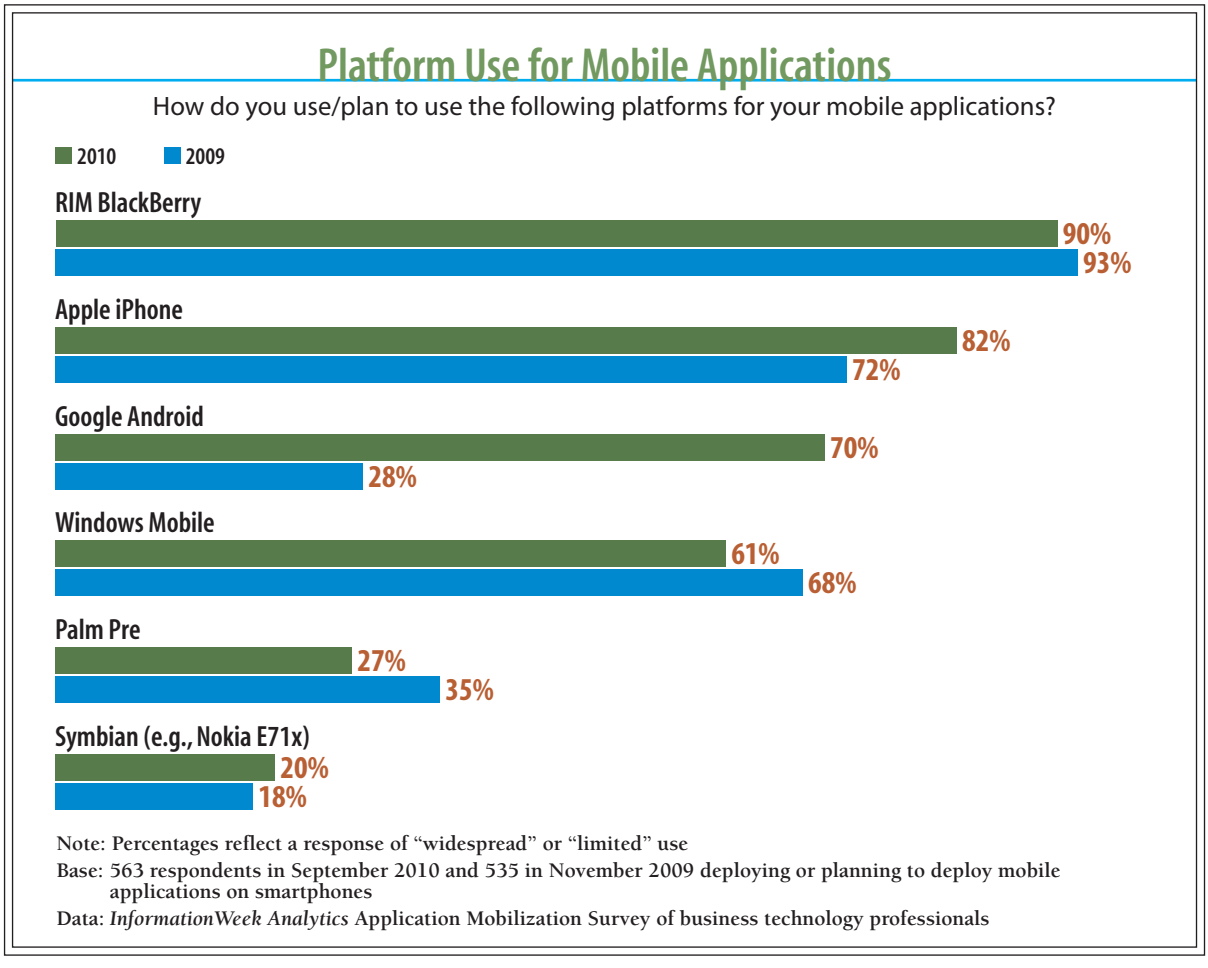
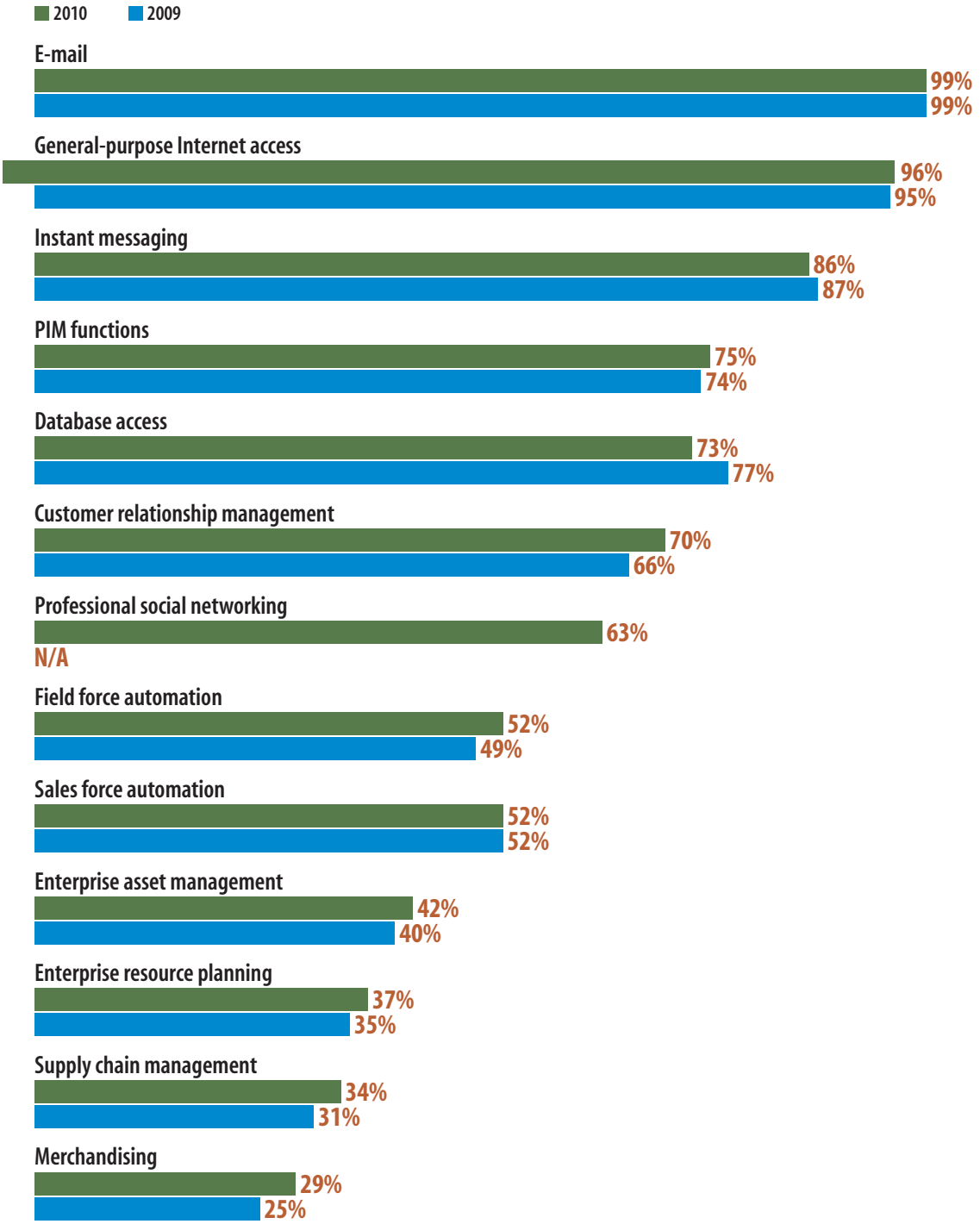


Figure 8

Mobile Application Deployment Plans

How will the following applications be used or deployed by your organization on a mobile basis in the next 12 months?



Note: Percentages reflect a response of "widespread" or "limited" use

Base: 563 respondents in September 2010 and 535 in November 2009 deploying or planning to deploy mobile applications on smartphones

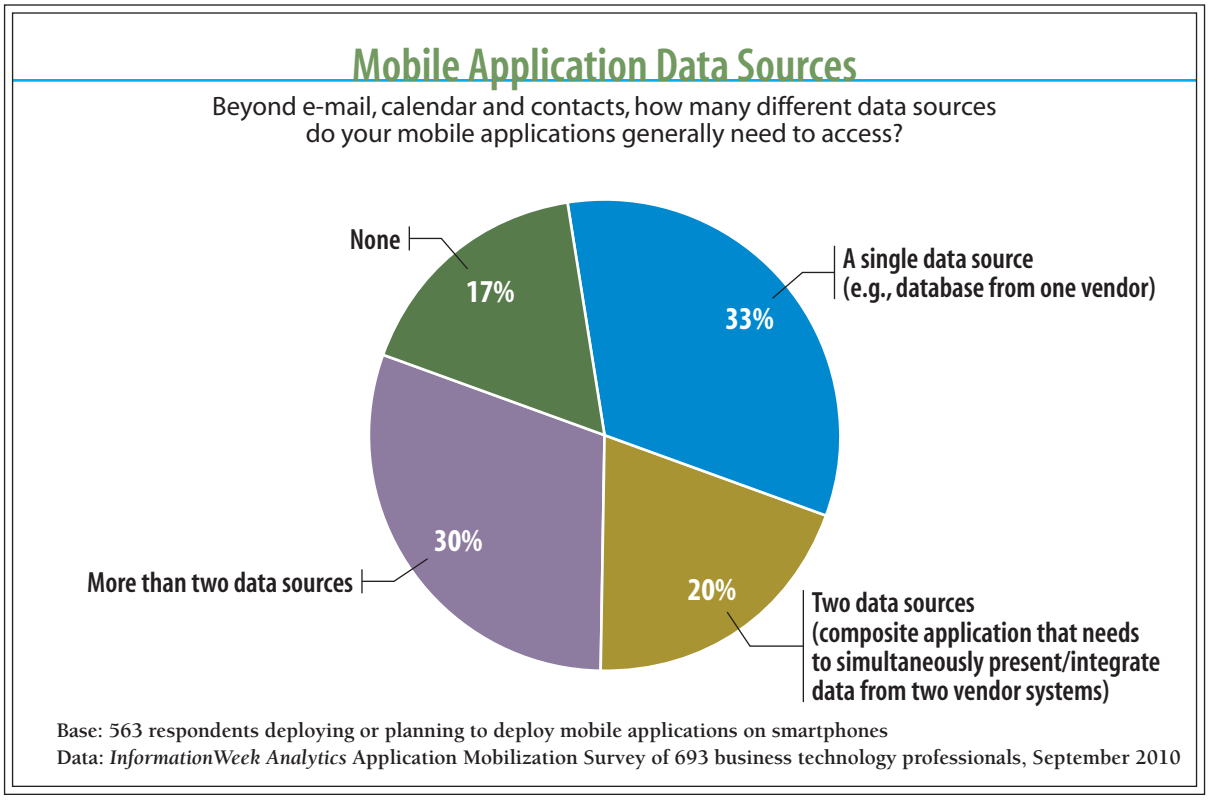
Data: *InformationWeek Analytics* Application Mobilization Survey of business technology professionals

Focus: BlackBerry

For companies wanting to develop custom applications for BlackBerry, RIM provides the BlackBerry Java SDK 6.0 environment for Java-based applications that work in conjunction with a comprehensive set of BlackBerry APIs. Developers can push data, steam media, access GPS functions, integrate applications with the BlackBerry browser, access messaging and calendar, use Bluetooth, use the camera, leverage GPS capabilities via a standardized location API (Java JSR 179), control Wi-Fi connectivity, use comprehensive cryptography and security APIs, and extend enterprise services. Developers can use either the Eclipse environment or the legacy BlackBerry Java Development Environment (BlackBerry JDE).

RIM also emphasizes Web development using tools such as Eclipse and Microsoft Visual Studio. Web applications can be server based or implemented through RIM's BlackBerry

Figure 9



Widget SDK. Widgets are standalone Web applications that use HTML, Cascading Style Sheets (CSS) and JavaScript, and to the user appear just like native applications.

Focus: iPhone

Though originally introduced with a heavy consumer emphasis, Apple has methodically improved its enterprise support and now provides a considerable number of resources to support business applications. For basic e-mail/contacts/calendar functions, the iPhone supports the Microsoft ActiveSync protocol, allowing push-based connectivity with Microsoft Exchange Servers.

Development for iPhones is accomplished with a version of C, called Objective C, and Apple's

Figure 10

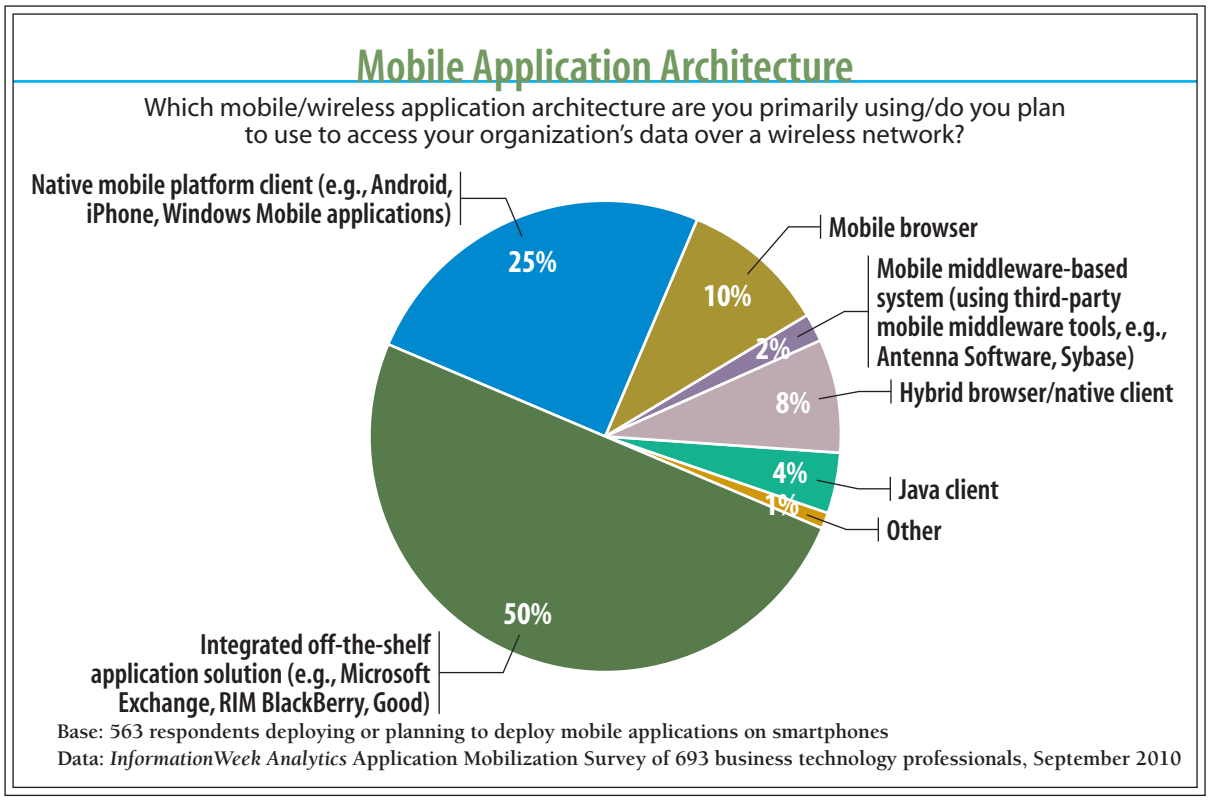
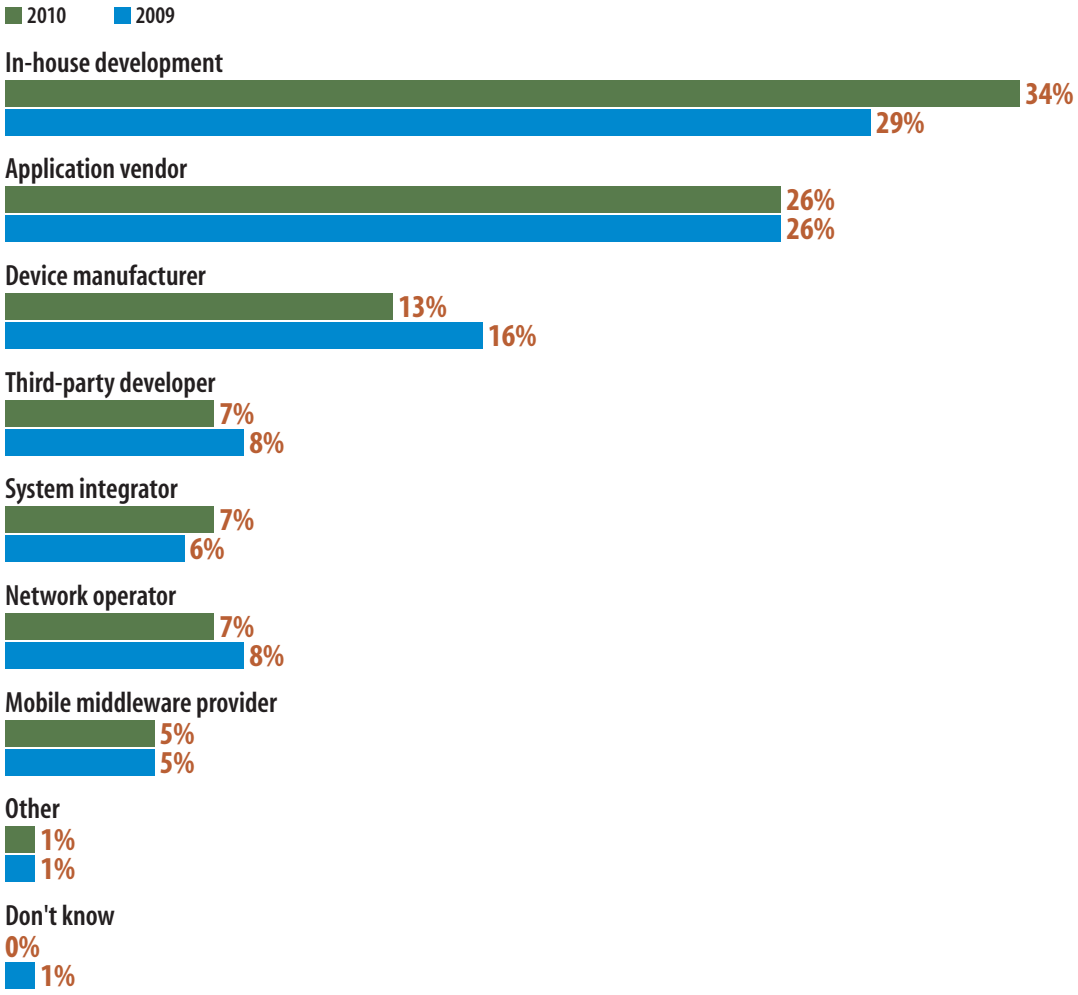


Figure 11

Mobility Provider

Which provider are you most likely to turn to for implementing mobility?



Base: 563 respondents in September 2010 and 535 in November 2009 deploying or planning to deploy mobile applications on smartphones

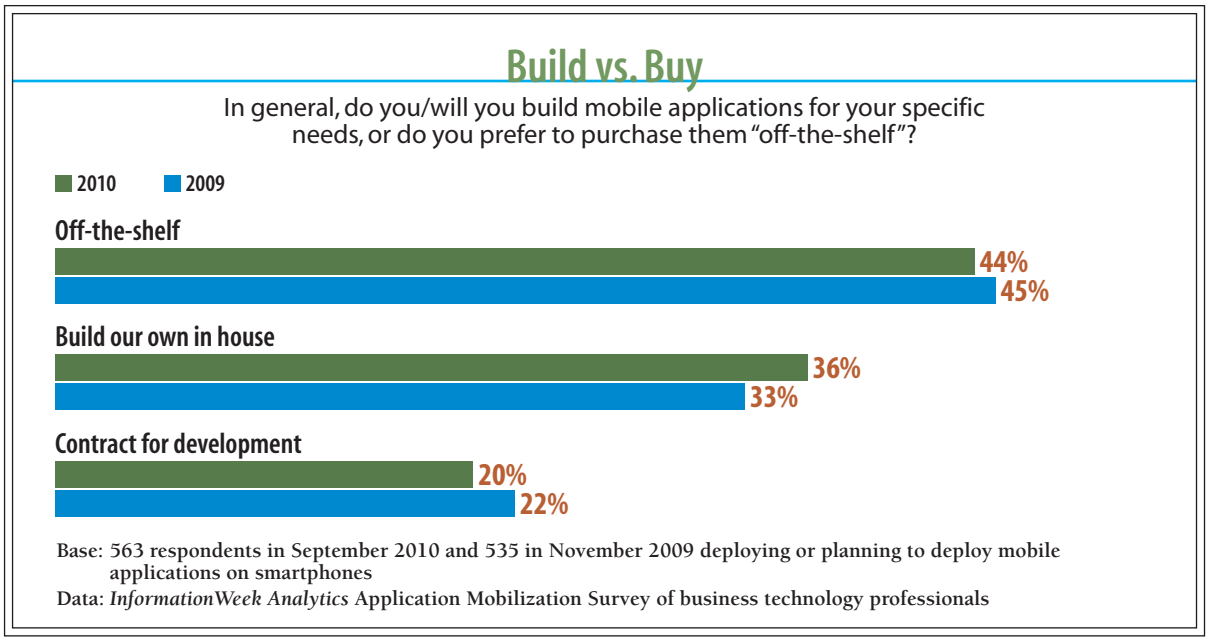
Data: *InformationWeek Analytics* Application Mobilization Survey of business technology professionals

iOS SDK 4, which provides tools for developing apps for the iPhone, iPad and iPod Touch. The latest version of Apple's iPhone operating system, iOS4, significantly improves application distribution capabilities allowing over-the-air distribution. Management APIs in general are improved, simplifying integration with mobile management systems from companies like Good. Similar to BlackBerry, the native API provides access to functions on the phone, including security and network functions, the camera, GPS hardware, and battery state.

While most consumer applications are distributed via the iTunes Web site, for businesses, Apple offers the Enterprise Developer's License that permits companies to develop and deploy applications in-house and bypass Apple's normal approval process for applications distributed via iTunes.

We didn't include tablets in this e-poll, but other surveys we've done suggest—and we believe—they'll be quite a disruptive factor in mobile application deployments. This is because larger screens and better data entry capabilities make these devices suitable for many applications that previously required notebook or netbook computers, especially for form-oriented applications. That iPhone applications immediately run on iPads is also significant since it

Figure 12

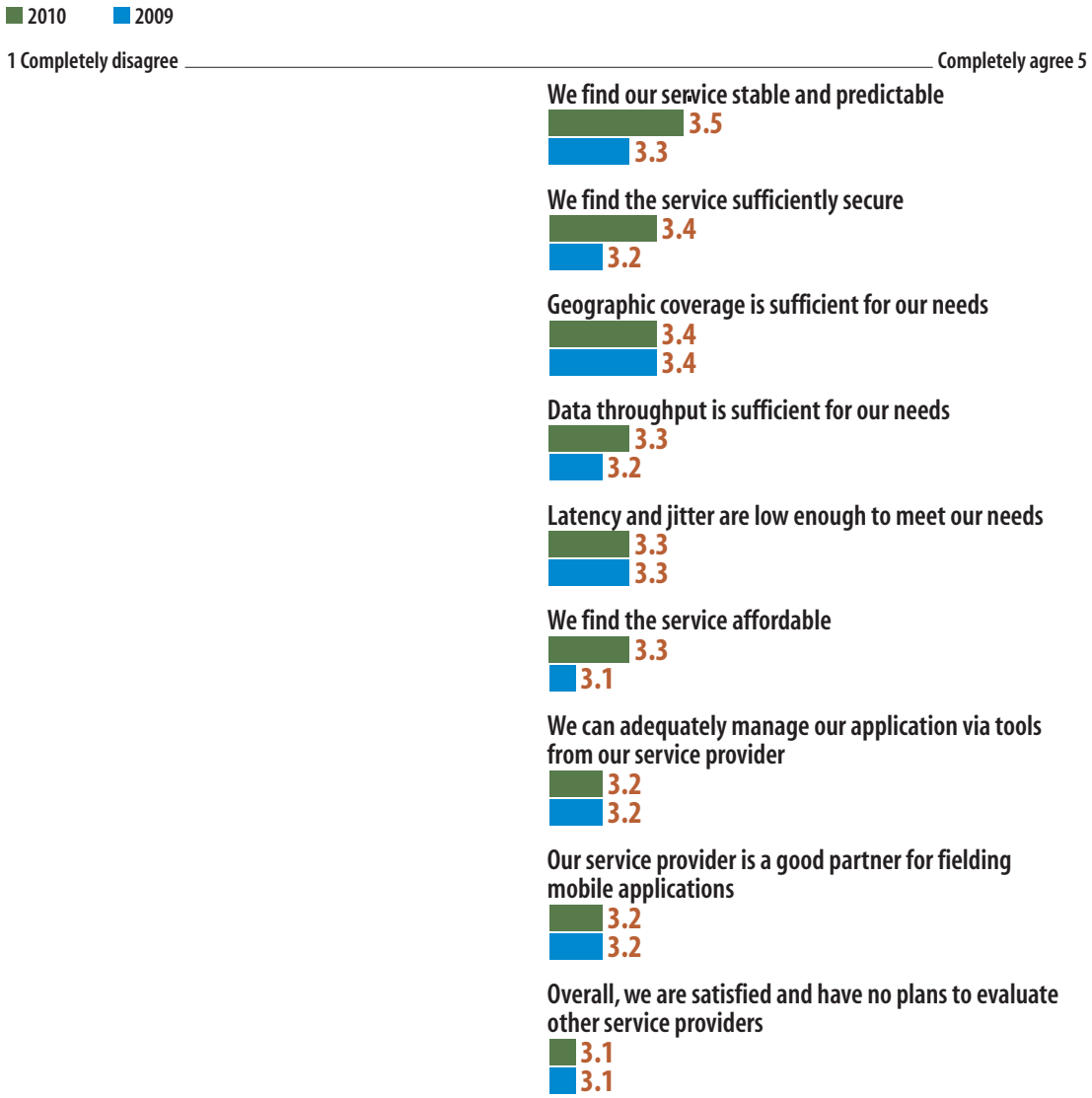


Base: 563 respondents in September 2010 and 535 in November 2009 deploying or planning to deploy mobile applications on smartphones
Data: *InformationWeek Analytics* Application Mobilization Survey of business technology professionals

Figure 13

Wireless Data Systems

Please indicate whether you agree or disagree with the following statements as they apply to your current or planned wireless-data system(s). Please use a scale of 1 to 5, where 1 is "completely disagree" and 5 is "completely agree."



Note: Mean average ratings

Base: 563 respondents in September 2010 and 535 in November 2009 deploying or planning to deploy mobile applications on smartphones

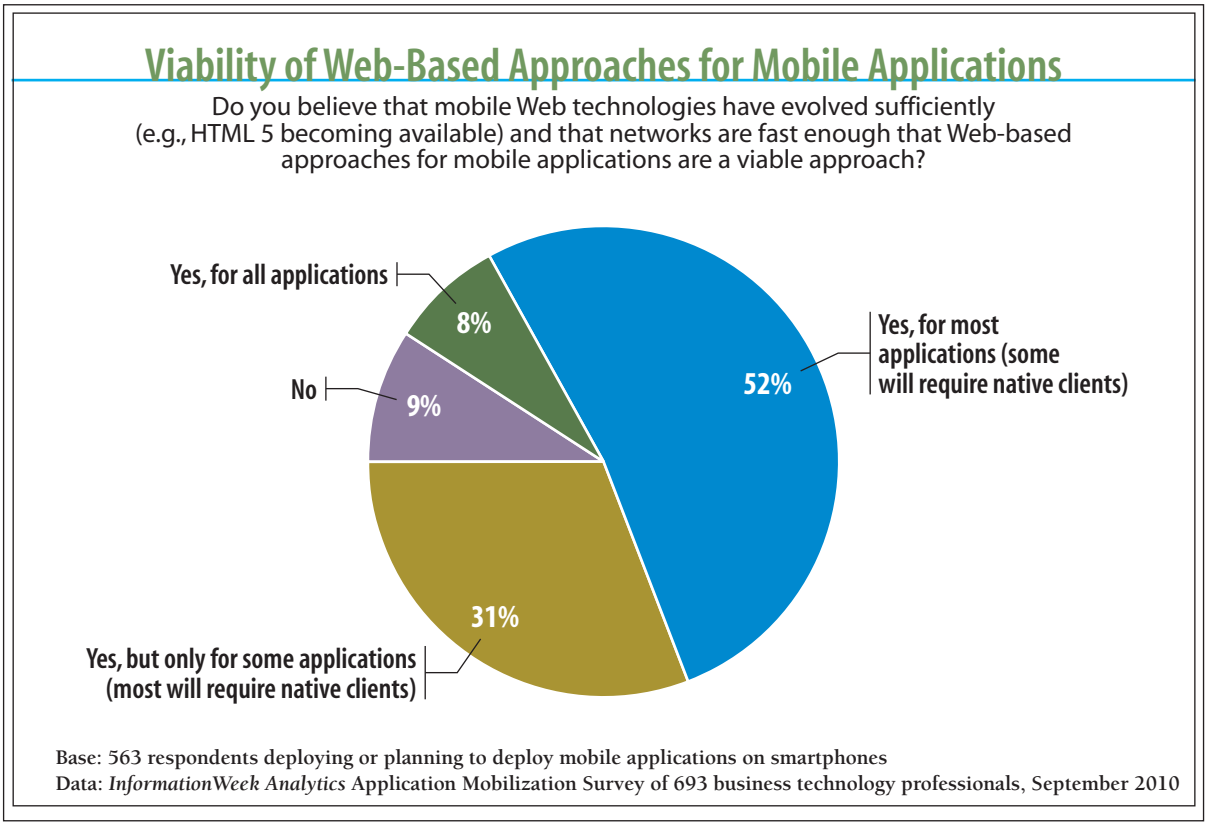
Data: *InformationWeek Analytics* Application Mobilization Survey of business technology professionals

means that companies may already have applications that will be easier to use on these devices. It also means there are a lot of Apple developers with the right skills to take on tablet application development.

Focus: Android

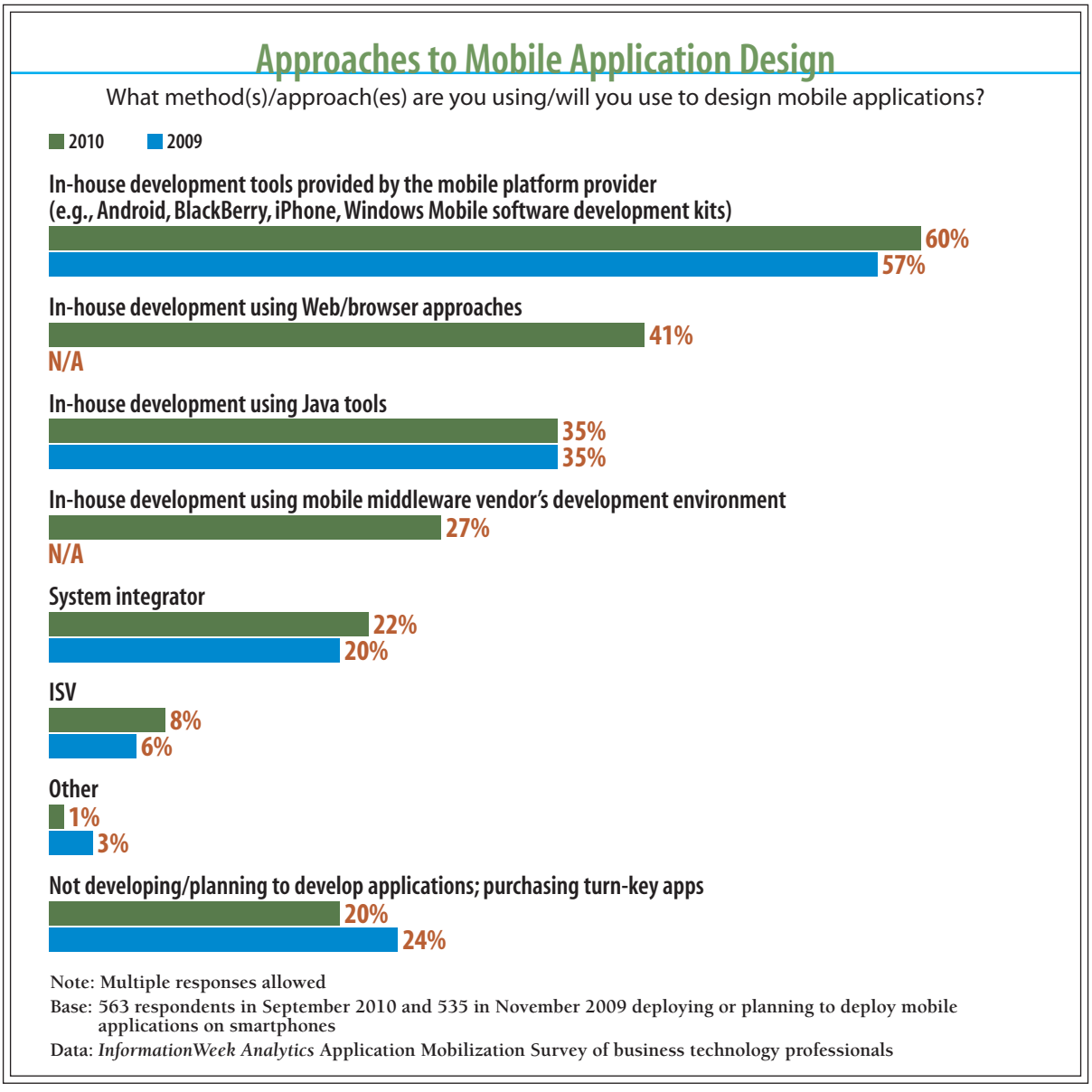
Development for Android is done in Java, but what makes Android different from normal Java development is that it comes with its own well-defined APIs. Android applications run on what is called the Dalvik virtual machine, which relies on an underlying Linux kernel for functions such as threading and low-level memory management. The reason Android has taken off, in contrast to a large number of other mobile Linux attempts over the last several years, is that it does provide a comprehensive and consistent framework for all application functions, whether

Figure 14



memory management, hardware control or network connection management. Like iPhone, Android also supports the Microsoft Exchange ActiveSync protocol, providing easy access to Exchange functions. And like iPhone and BlackBerry, Android APIs provide access to all the

Figure 15



device hardware functions.Developers who need to squeeze out additional speed in performance-critical portions of their applications can develop in native-code languages such as C and C++. This is done using the Android Native Development Kit. The NDK also provides a means for developers to reuse existing C and C++ code. Keep in mind, however, that the NDK introduces hardware dependencies, so code won't necessarily work on all devices.

Compared with the other platforms we're discussing, Android is more fragmented in its implementation across devices and manufacturers. In particular, the user interface shells can vary significantly. For instance, HTC provides its "Sense" user interface, whereas Motorola has used "MotoBLUR" on some devices. Hardware implementations can vary also. Consequently, you can't assume your application will "just work." Especially for mission-critical functions, budget time and resources to test your application on all Android devices of interest.

Figure 16

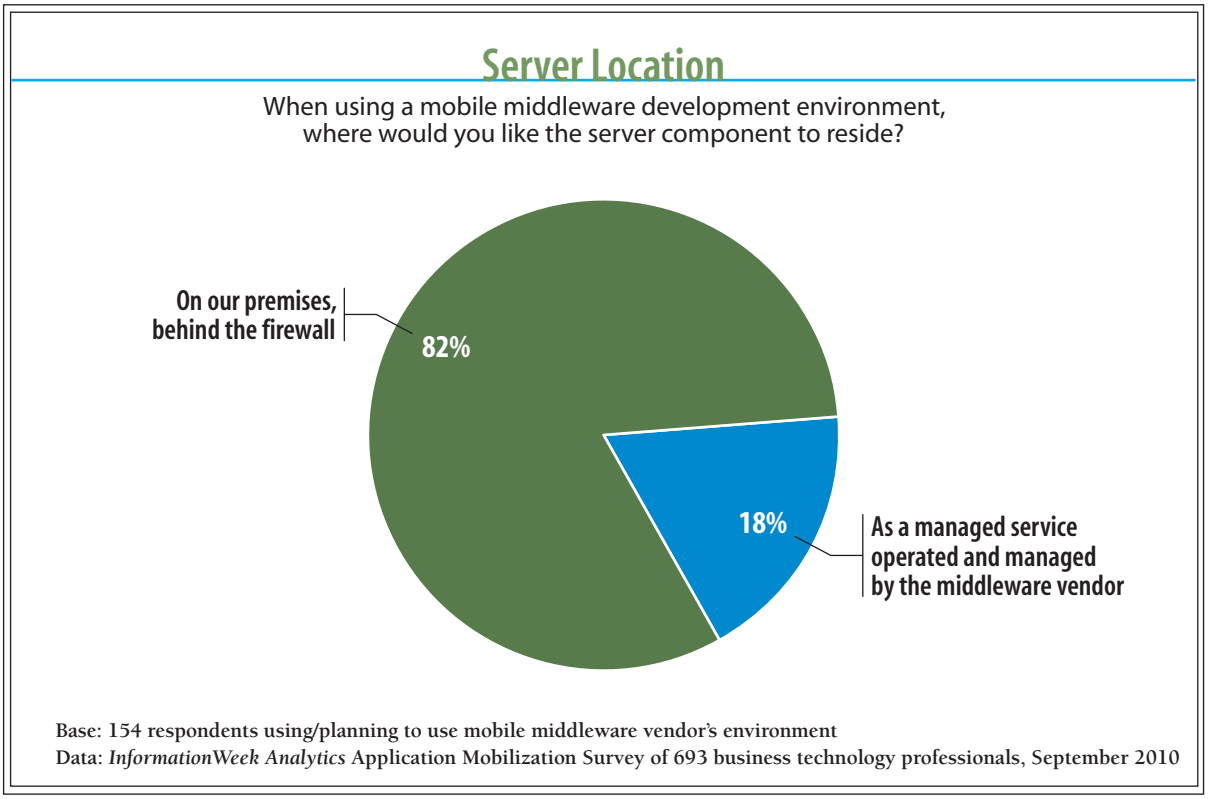


Figure 17

Summary of Developer Resources

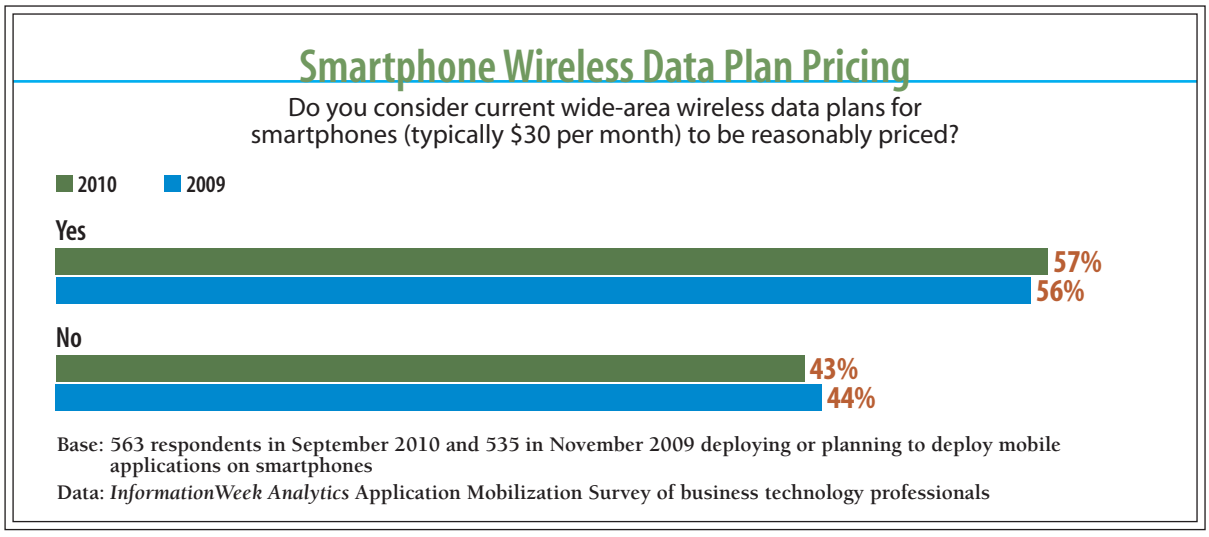
Android Developer Resources	
Developing in Eclipse with Android Development Tools	http://developer.android.com/guide/developing/eclipse-adt.html
Developing in other IDEs	http://developer.android.com/guide/developing/other-ide.html
Android Native Development Kit	http://developer.android.com/sdk/ndk/index.htm
BlackBerry Developer Resources	
Java Development Overview	http://na.blackberry.com/eng/developers/javaappdev/
Java Advanced Features	http://na.blackberry.com/eng/developers/javaappdev/advancedfeatures.jsp
BlackBerry Web Development Overview	http://na.blackberry.com/eng/developers/browserdev/
BlackBerry Widget SDK	http://na.blackberry.com/eng/developers/browserdev/widgetsdk.jsp
iPhone Developer Resources	
iOS Dev Center	http://developer.apple.com/devcenter/ios/index.action
iOS Application Design	http://developer.apple.com/library/ios/#documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/Introduction/Introduction.html
iPhone Business Deployment Scenarios	http://images.apple.com/iphone/business/docs/iPhone_Business.pdf
Windows Phone Developer	
Application Hub	http://create.msdn.com/en-US/
Windows 7 Developer Tools	http://create.msdn.com/en-us/home/getting_started
Silverlight for Windows Phone	http://www.silverlight.net/getstarted/devices/windows-phone/
XAML Overview	http://msdn.microsoft.com/en-us/library/ms752059.aspx

Focus: Microsoft Windows Phone

The biggest news with Microsoft Windows phone is Windows Phone 7. Though Windows Mobile had reasonable penetration in enterprise applications through release 6.5, this version of the operating system was beginning to look dated compared with newer alternatives. For Windows Phone 7, Microsoft redesigned the system from the ground up, producing an attractive platform that has garnered a lot of positive initial reviews. However, Phone 7 is not compatible with previous versions, so the large number of existing enterprise applications will not necessarily work on this new platform.

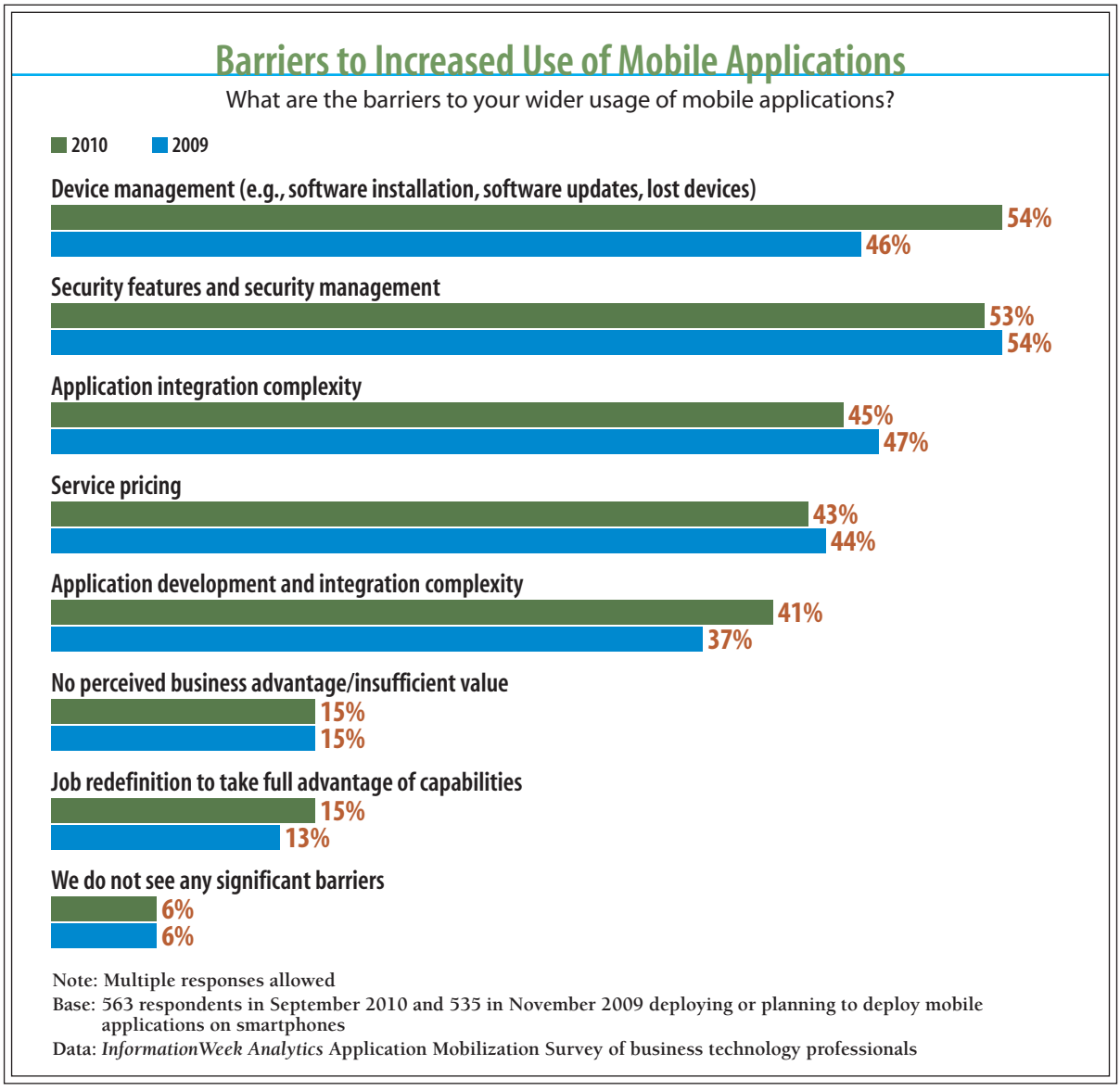
One significant change is that the application development platform for Windows Phone 7 is Silverlight, Microsoft's rich multimedia-oriented presentation environment. Actual coding is with Microsoft's .NET in combination with Extensible Application Markup Language (XAML). Silverlight provides access to phone features such as the accelerometer, camera, location information and other native functions. The development environment is the same as for desktop .NET and Silverlight applications, namely Visual Studio 2010. In the enterprise space, there are many proficient .NET programmers, thus the learning curve should be relatively manageable. Though Microsoft has taken a major risk breaking from the previous Windows Mobile software architecture, we believe its approach is solid, and if it gathers sufficient momentum rapidly enough, Windows Phone will be a serious contender.

Figure 18



The other thing to consider with Windows Phone is that if you are using a lot of Microsoft-hosted services in your enterprise (such as databases, e-mail, Web) you are likely to achieve tighter integration using Windows Phone than would be possible with other mobile platforms.

Figure 19



And, though a lot of vendors will be building Windows Phone 7 devices, Microsoft is imposing strict rules on how these are implemented, which will strongly factor in software running consistently across multiple device types.

Bottom line, each of the major smartphone platforms offers a rich programming environment. We would be hard pressed to choose a platform based simply on the tools. Rather when choosing which platform or platforms to support for custom applications, consider:

- In-house expertise, for example, .NET vs. Java;
- Ease of integration with your server data; and
- Security and management features.

Mobile Middleware Platforms

Though only 2% of our e-poll respondents say they are using mobile middleware approaches such as Antenna Software, Pyxis Mobile, Spring Wireless, Sybase (now owned by SAP) and Syclo, these do remain an important option. They offer development environments that don't require coding skills; ease integration of data from multiple back-end sources; allow the same code base to support multiple mobile platforms; provide centralized management capabilities; and support extensive security functions. Some of these systems include prepackaged applications. For example, Antenna Software provides prepackaged field service, mobile CRM, and IT support applications.

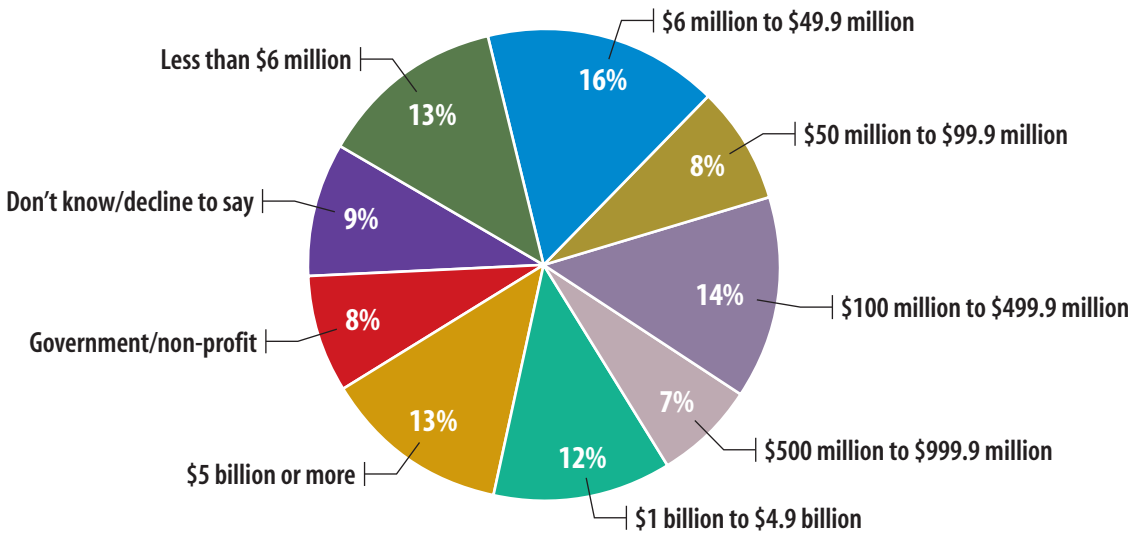
The price you pay for mobile middleware is an additional component in your overall architecture, as is the learning curve that is specific to the middleware platform. If you have a complex environment of multiple device types and/or multiple data sources, however, you are likely to come out ahead.

Appendix

Figure 20

Company Revenue

Which of the following dollar ranges includes the annual revenue of your entire organization?

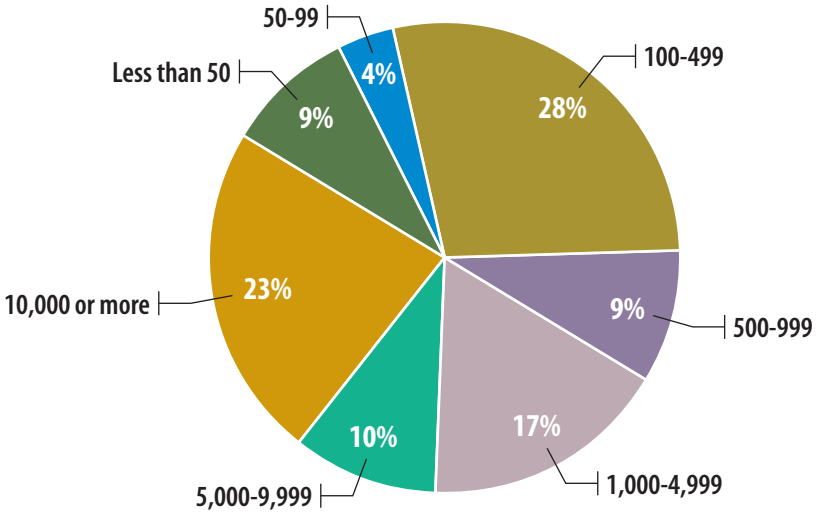


Data: *InformationWeek Analytics* Application Mobilization Survey of 693 business technology professionals, September 2010

Figure 21

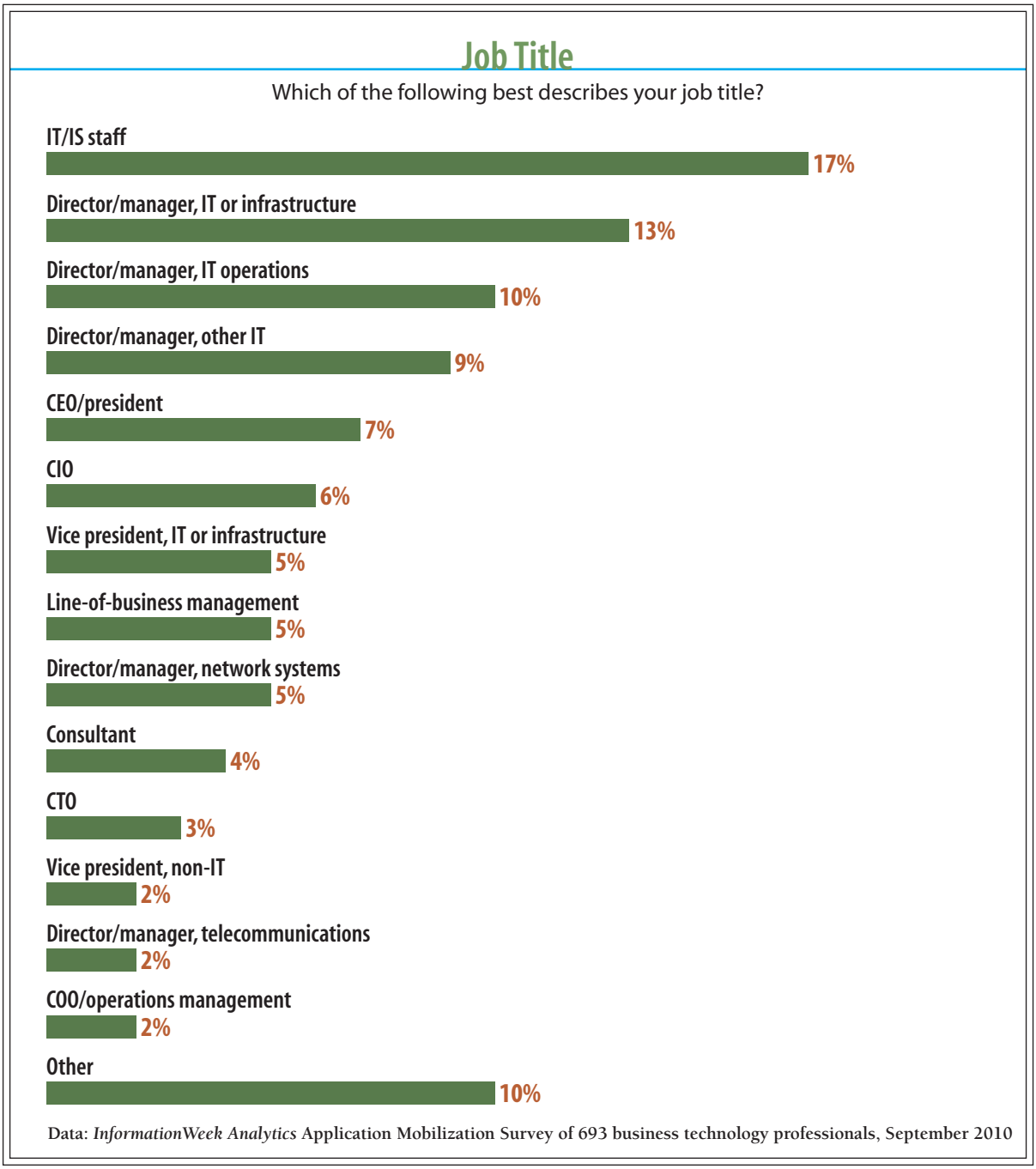
Company Size

Approximately how many employees are in your organization?



Data: *InformationWeek Analytics* Application Mobilization Survey of 693 business technology professionals, September 2010

Figure 22



Data: *InformationWeek Analytics* Application Mobilization Survey of 693 business technology professionals, September 2010

Figure 23