

# Code Of The Road

Web 2.0 technologies, including Google Gears, are making it easier than ever to mobilize your business apps



By Peter Rysavy



our employees and customers hold in their hands devices with computing power and storage that dwarf the desktops of just a decade ago. If you're not developing applications beyond e-mail and calendar synchronization for these smartphones, your company is bound to miss out.

Handheld device prices have fallen from \$500 at the high end a couple of years ago to \$100 for a Research In Motion BlackBerry Pearl or Samsung BlackJack II running Windows Mobile today. Meanwhile, technologies to port complex business apps to mobile devices are developing nicely, though complexity and fragmentation continue to be a problem.

Mobile platform choices aren't as clear cut as for desktop systems, and cutthroat competition rages among the leading smartphone platforms, including RIM BlackBerry, Symbian, Windows Mobile, Mac OS X, and now mobile Linux. In addition, there are higher-level application frameworks such as Java and Qualcomm Binary Runtime for Wireless (Brew). Anybody developing mobile applications must make hard choices as to which platforms and devices to target, as well as what application architecture to use.

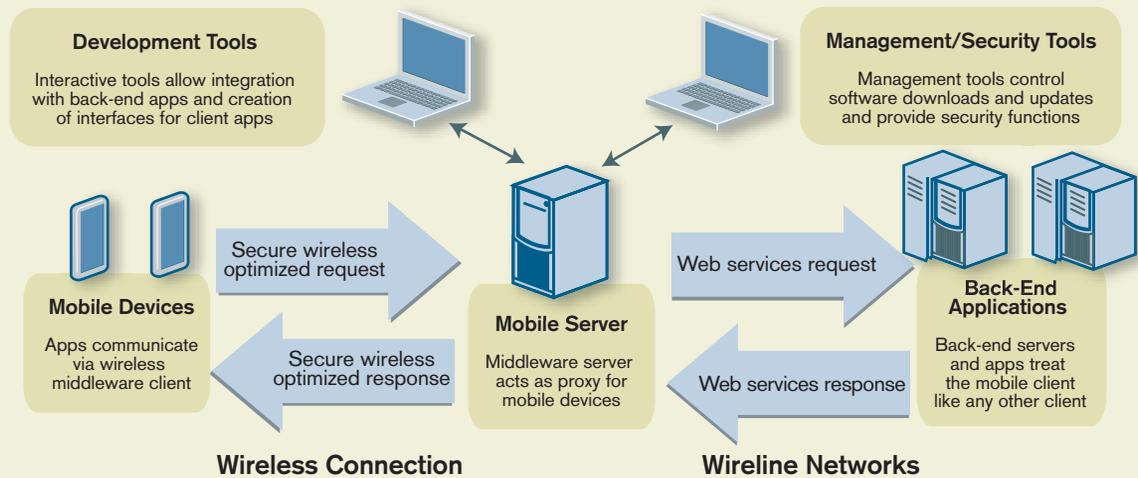


Fragmentation contributes to the complexity, as do other issues, including variable screen sizes and user input mechanisms, the vagaries of wireless connections, limited battery power, the need for management systems to facilitate software deployments and updates, and security requirements.

Fortunately, vendors are focused on solving the complexity problem with architectures that facilitate the creation of apps that can easily access enterprise back-end systems and operate over a large number of devices. These include Web 2.0 developments and rich Internet application environments, new Java and synchronization technologies, and advances in mobile middleware platforms. Each has gotchas, but together they represent a powerful toolset for mobile application development.

And judging by our poll, IT pros are taking notice. Of the nearly 400 surveyed, 33% have isolated projects under way, 37% have business units deploying mobile apps, and 30% have company-wide deployments. That's serious adoption. RIM dominates among the devices, with 57% of organizations developing for the BlackBerry, 44% for Windows Mobile, 25% Palm OS, 5% (al-

## Stuck In The Middleware



A mobile middleware system comprises a client on the mobile device, a mobile server, development tools, and management and security utilities. The middleware client provides a level of abstraction on top of the native OS, so mobile enterprise apps can run on multiple device types; the mobile middleware client handles connection management, file system, and user interface details.

ready) iPhone, and only 4% Symbian. And in-house mobile development expertise is strong, with 30% of respondents keeping work close to home.

### GOING NATIVE

Developing apps in native environments using languages such as C, C++, and Objective C isn't new, but it remains the way to make the most powerful and responsive mobile apps. Companies such as Microsoft, Apple, and Symbian have rich development environments with debuggers and emulation environments.

BlackBerry apps are built using Java with a combination of standardized Java and RIM-specific interfaces. RIM also provides complete toolsets. Microsoft shops can develop natively in C/C++ or use the .Net Compact Framework, which provides a simplified, managed development environment that has powerful capabilities.

The learning curve is steep using languages such as C/C++ along with platform-specific APIs, and your application will run only on that particular platform. This approach is often beyond what an average IT group can do, making the new application architectures attractive. Nevertheless, our poll showed 43% of respondents doing in-house mobile app development with Microsoft tools, followed by 27% using Java, and 26% mobile middleware.

When it comes to Web 2.0 and rich Internet applications, there's a lot happening that applies to mobility. We define Web 2.0 to mean highly compelling and interactive applications that often let users participate in content generation. Opera, a leading third-party mobile browser provider, says its Opera Mini browser

is displaying 2.5 billion pages per month across its user base, showing that the mobile Web is going mainstream. Forty-nine percent of respondents to our poll favor a Web-based model for mobile applications.

A Web-based application or service is fundamentally different from a local app. With mobile devices, the biggest complicating factor is that users aren't always connected. They may have driven out of the coverage area or be on a plane. In the past, mobile Web applications were sluggish because of slow wireless network speeds and high latency. But today's 3G networks are much faster, frequently providing throughput around 1 Mbps, and latency is heading south to 100 milliseconds and lower. Enhancements to 3G and new networks such as WiMax will further improve Web app performance.

Reasons to consider a Web application include simpler app development compared with a native app, the ability to target content across a range of devices, no need to install and maintain apps on mobile devices, and simpler security through options such as SSL VPNs that readily support HTTP traffic.

Other recent developments provide further impetus to a Web approach. These include technologies—such as Ajax, Web widgets, Adobe Flash, Microsoft Silverlight, and Google Gears—that were developed for desktop environments but are becoming available for mobile platforms and provide important benefits.

Take Ajax. Being able to selectively update a page without having to refresh the whole screen is extremely attractive on mobile devices that may be bandwidth-challenged, as is the ability to allow for limited interac-

IN DEPTH / MOBILE APPS

tion with downloaded data. Most smartphone browsers support Ajax, making Web applications more responsive to users and more bandwidth efficient. Moreover, technologies such as Adobe Flash, Microsoft Silverlight, and Scalable Vector Graphics, available on Java-based systems, support animated content. While hugely popular for consumer applications—think YouTube—this richer content can also enhance enterprise apps, letting service technicians or medical professionals remotely view work procedures, for example.

Finally, technologies that provide automatic synchronization with a local data store, such as Google Gears, help browser-based applications work when connectivity is lost—a fundamental problem with the mobile Web.

Should you develop content specifically for mobile browsers? The Apple iPhone Safari and Opera Micro and Mini browsers have demonstrated that almost any page can be rendered reasonably well on a mobile device. However, the most effective format still requires that you design content for the smaller display and minimize the number of objects the browser must retrieve.

While many of these Web technologies are in their infancies, they point to a rich mobile future. A Web-based application will never outperform a native one,

but it can be a much faster way of making data available to mobile workers, with less management overhead. And unlike native apps, developing Web-based ones is well within the reach of most IT organizations.

DIG DEEPER

**MOBILE APPS** Find out the facts and figures from our study on how businesses are using smartphones for much more than e-mail. Download this *InformationWeek* Report at: [informationweek.com/1198/report\\_mobileapp.htm](http://informationweek.com/1198/report_mobileapp.htm)

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JAVA EVOLUTION

While most mobile phones have Java Virtual Machines installed, these are best suited for games—with the exception of the RIM BlackBerry, mobile

JVMs haven't generally been powerful enough for enterprise apps. This is about to change with new mobile Java developments.

First, some background: Mobile Java architecture consists of the Java Platform Micro Edition; configurations that are either the Connected Limited Device Configuration or the more powerful Connected Device Configuration; and profiles which for most phones consist of the Mobile Information Device Profile (MIDP). Specific JME capabilities and programming interfaces are defined in Java Specification Requests (JSRs).

The first major development is a new mobile Java platform, being supported by IBM, Sprint Nextel, and Nokia, that's based on a management framework defined by the OSGi Alliance and enabled by a runtime platform from the Eclipse Foundation, called the Em-

Impact Assessment: Emerging Mobile Application Architectures

● Benefit

● Risk

IT organization

IT gets new tools with which to more easily build mobile applications.



Multiple approaches and architectures combined with multiple toolsets require considerable evaluation to determine the best fit.

Business organization

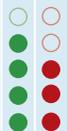
New architectures and tools facilitate development of mobile applications that facilitate more productive interaction among employees.



Given the required development effort, IT must carefully choose which approaches, devices, and applications to support.

Business competitiveness

Companies leveraging mobile and wireless technologies in a strategic and methodical fashion can gain significant competitive advantage.



Strategic deployments require not only considerable development effort but also must address security and management issues.



Bottom Line

More powerful ways to build mobile applications are a positive development, though organizations must develop new competencies to take advantage of them.

bedded Rich Client Platform, or eRCP. IBM's J9 JVM for Windows Mobile implements OSGi/eRCP. This combo results in a powerful Java environment with multitasking and a rich user interface capable of running many enterprise applications, though currently only on high-end smartphones. Nokia also is making OSGi/eRCP available on its more powerful Symbian OS phones, though not many that are available in the United States. Still, given the many programmers conversant with Java development, this could be an attractive option.

## Truly Mobile CRM

**S**ATELLITE TV PROVIDER DIRECTV WORKS with more than 6,000 independent dealers who resell its service to residential customers. Directly serving those distributors is a team of nearly 700 area sales managers, who need critical information, such as financial data, active service requests, and activation and cancellation rates, while in the field.

DirecTV has been for several years a satisfied user of Siebel's CRM On Demand system, but it didn't work for field sales managers who couldn't carry around a laptop, says Erik Walters, a program manager for DirecTV's sales and operations arm. "For our guys, that's not mobile enough."

Walters' team faced an increasingly common problem in companies with mobile sales and field employees: how to mobilize an existing enterprise application.

DirecTV coupled the back-end CRM application with mobile middleware from Antenna Software. Antenna creates front-end systems that tap into popular enterprise mobility platforms like BlackBerry and Windows Mobile, providing data to mobile users from various databases via a single integrated interface.

DirecTV has 675 employees using Antenna, vastly increasing the productivity of sales managers, Walters says. In the past, an industrious area sales manager would be lucky to see three or four customers a day; now it's closer to 10 or 12.

Sales managers use BlackBerry 8700s and Curve 8300s, and all will move to the Curves in the next 90 days. Users prefer that model's light weight, flexibility, and GPS, which DirecTV plans to make more use of in upgrades to the On Demand app.

The move to a mobilized CRM platform is part of a broader shift in the way DirecTV sales managers interact with dealers. The company's changing how it handles calls and requests from dealers, Walters says. "Everybody is looking for that 360-degree view of the dealer customer."

To get that view, DirecTV will implement the hosted Call Center On Demand product from Siebel parent Oracle for incoming phone queries from dealers. The success of the mobilized CRM On Demand has given the company confidence to move to a more hosted model for its overall relationship with this critical group of resellers. —RICHARD MARTIN (rmartin@techweb.com)

An alternative that largely matches the OSGi approach in capability is based on the forthcoming MIDP 3.0 profile, likely to be available on some devices in the next 12 months. MIDP 3.0 can be combined with JSR 320, a management framework similar to OSGi that allows installation/uninstallation and control of services.

Sprint Nextel appears to be going the OSGi route via a program it calls Titan. AT&T is supporting MIDP 3.0. Verizon hasn't gone with Java, preferring Brew, though you can always install Java capabilities on Verizon phones.

Meanwhile, Sun Microsystems is working on a new Java version, called JavaFX, that will span a variety of devices from phones to desktops. JavaFX's runtime leverages Java Standard Edition and is a more powerful environment than Java ME. It also adds scripting and Flash-like animation capabilities to support rich Internet applications. There are few technical details, and we wonder whether the mobile industry can support yet another Java approach, especially since the Google Android programming environment is also based on Java, albeit with its own APIs.

We were surprised by how many respondents expressed enthusiasm for Java, with 89% saying it can provide an effective handheld platform that can support multiple device types, echoing our sentiments exactly. Bottom line, mobile Java is growing up, and legions of Java programmers can start applying their skills to much more powerful mobile platforms for business apps.

### MOBILE'S MIDDLEWARE

Mobile middleware has been a building block for mobile applications since wireless data networks became available over a decade ago, though the functions today emphasize application integration, and not the data transport functions of the past. Mobile middleware requires the addition of client software and server platforms, but it addresses many aspects of mobile application development, including integration with back-end services and applications, efficient wireless communications protocols, management functions, and security. Nearly 80% of respondents to our survey considered a mobile middleware approach to be effective.

Key innovations in new middleware products include use of Web services to integrate with back-end applications, composite apps where the same client application can simultaneously interact with multiple back-end apps (e.g., user interface displaying both Oracle and SAP data), development environments that don't require software coding, interactive tools for creating user interfaces, and the ability for the same mobile middleware application to operate across multiple mobile device types. This last is particularly attractive because most organizations have to support multiple mobile devices.

Mobile middleware consists of a component on the mobile client, a mobile server, development tools, and management and security tools (see diagram, p. 40). The client is specific to each mobile platform, with the middleware vendor providing different clients for each mobile OS. The client provides a platform that interacts with the user and runs the program created with the development tools. Since the middleware client provides a higher level of abstraction than the native OS, the enterprise-created program can run on multiple device types, with the mobile middleware client handling low-level details of connection management, file systems, and user interfaces.

**IN SYNC**

The concept of synchronization is to automatically coordinate select data between two systems, in our case, mobile devices and servers. One can think of wireless e-mail systems such as RIM BlackBerry as a form of synchronization. Microsoft's wireless e-mail system uses its ActiveSync protocols. Various vendors are enhancing their synchronization abilities; one that we looked at is Microsoft Sync Framework, currently in a preview stage.

Microsoft intends MSF to be a comprehensive sync platform for applications, services, and devices, working across flexible network topologies. For instance, it syncs up ADO.Net-enabled databases, as well as files and folders. Enterprises will need some level of programming expertise since programs must be written in C++ or within Microsoft's .Net Compact Framework.

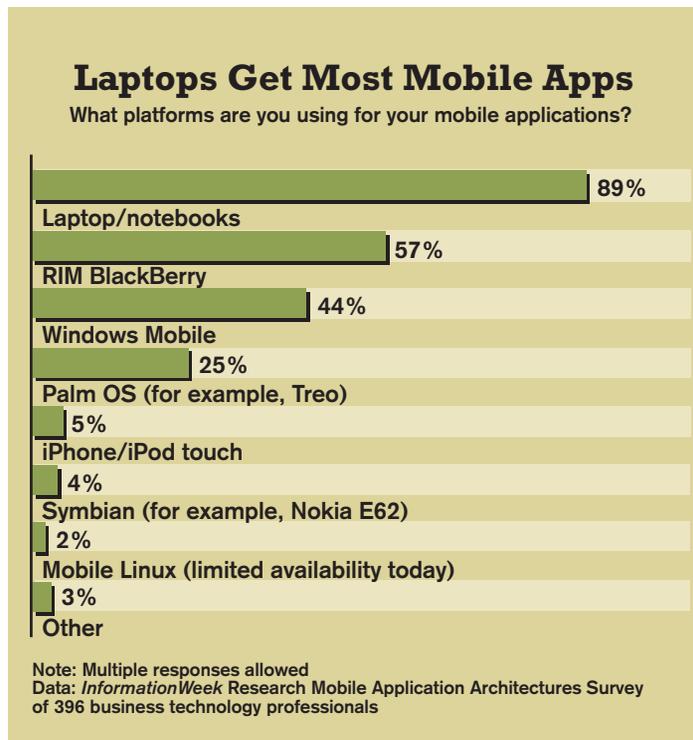
Database vendors also have sync solutions that extend to mobile devices (e.g., Sybase One Bridge, Sybase iAnywhere, Oracle Mobile Collaboration 10g). Third-party sync solutions such as Nokia Intellisync also are popular.

Bottom line, tools for developing mobile apps are becoming sophisticated, and many are suitable for enterprises and address the challenges of developing for multiple device types. The hardest problem is figuring out which one makes sense for you—a good problem to have.

**Peter Rysavy is the president of Rysavy Research ([www.rysav.com](http://www.rysav.com)), a consulting firm specializing in wireless technology assessment and integration.**

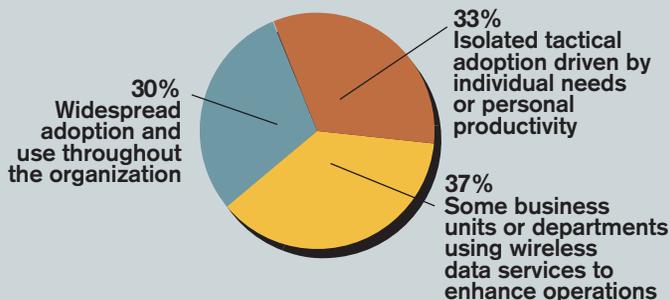
Write to us at [iweekletters@techweb.com](mailto:iweekletters@techweb.com).

**Appendix**



### Scope Of Wireless Data Services Varies

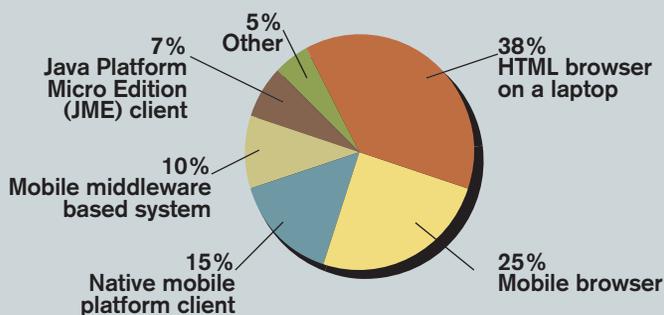
Within your organization, which of the following best characterizes the deployment of mobile applications using wireless networks for communications to access information?



Data: *InformationWeek* Research Mobile Application Architectures Survey of 396 business technology professionals

### HTML Browsers: Top Way To Access Data Wirelessly

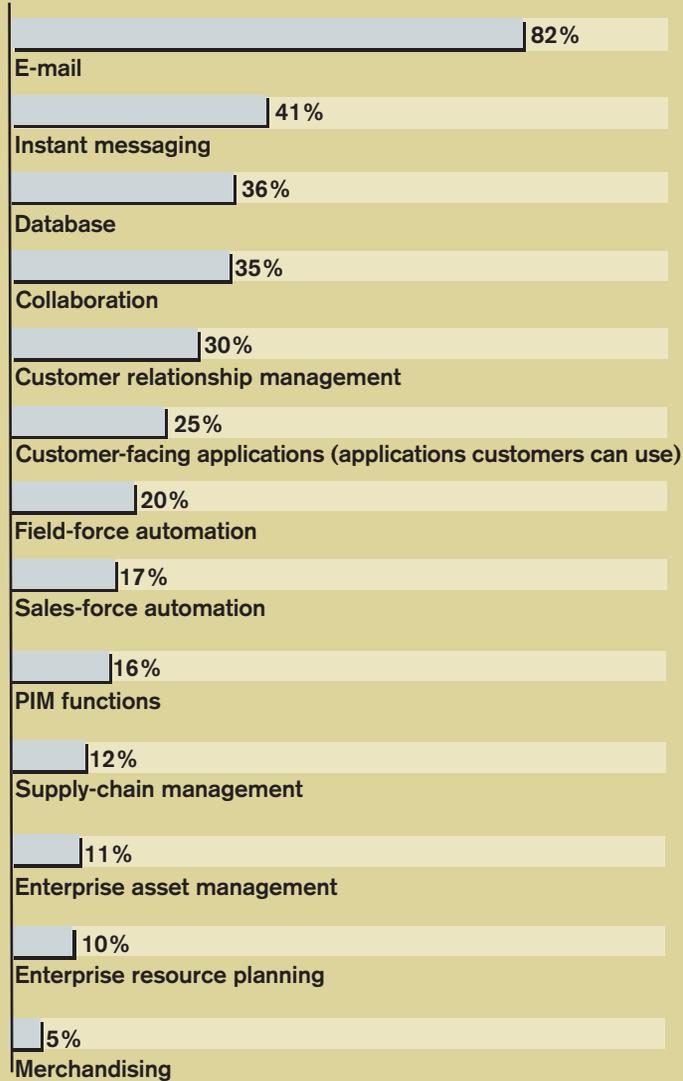
Which mobile/wireless application architecture are you using to access your organization's data over a wireless network?



Data: *InformationWeek* Research Mobile Application Architectures Survey of 396 business technology professionals

### E-Mail: No. 1 Mobile App

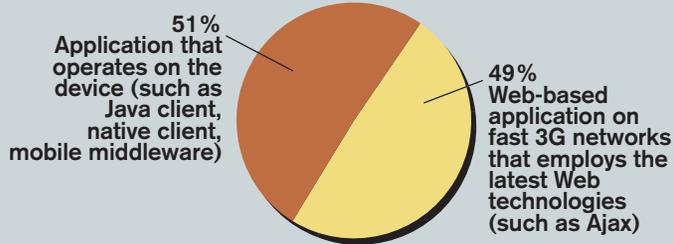
Which of the following applications is your organization using or deploying in the next 12 months for mobile devices?



Note: Multiple responses allowed  
Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals

### Architectural Approach: No Clear Preference

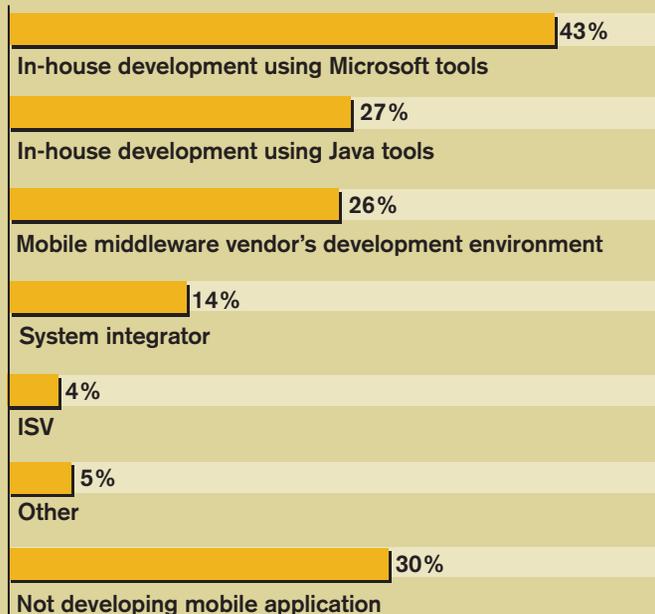
Which mobile application architectural approach do you think is most effective?



Data: *InformationWeek* Research Mobile Application Architectures Survey of 396 business technology professionals

### Microsoft Tools Most Used

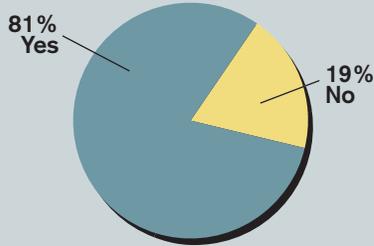
What method(s)/approach(es) are you using to design, build, deploy, and manage mobile applications?



Note: Multiple responses allowed  
Data: *InformationWeek* Research Mobile Application Architectures Survey of 396 business technology professionals

### Java's On Target

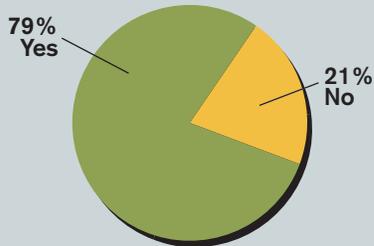
Do you believe that Java can provide an effective handheld platform that can span multiple device types?



Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals

### Mobile Middleware Wins The Vote

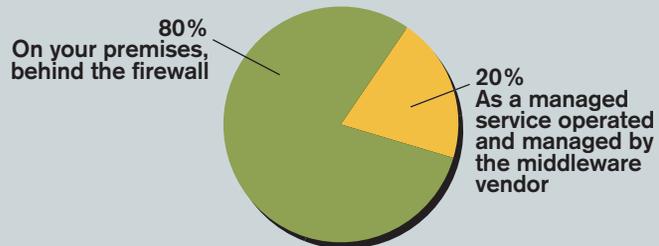
Do you believe that mobile middleware provides an effective/desirable approach to address a combination of application, device, management, and security functions?



Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals

### On-Site Servers Preferred For Mobile Middleware

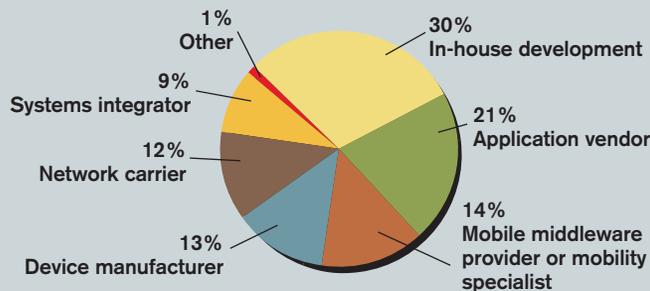
When considering a mobile middleware approach, where would you like the server component to reside?



Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals

### In-House Development Gets The Nod

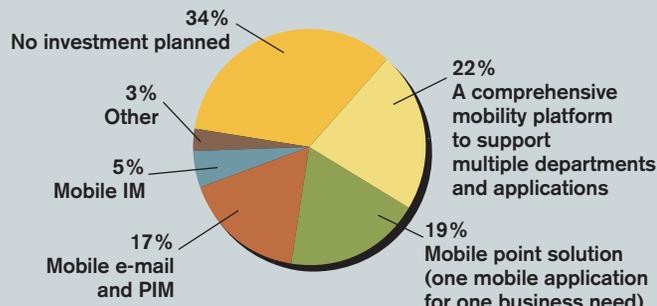
Which solution provider are you most likely to turn to for implementing mobility?



Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals

### Varied Investment Plans

What will be your next investment around mobile applications?



Data: InformationWeek Research Mobile Application Architectures Survey of 396 business technology professionals