



# Mobile Application Development Made Simple

From web-based development tools to over-the-air deployment and updates, extending applications to Palm webOS phones is fast and easy.

By Sandra Gittlen

One of the largest construction companies in the United States was in a quandary. The firm's leaders knew that extending core applications to mobile devices would significantly increase productivity for its 3,500 employees. However, the resource pool of 10 developers would be drained trying to learn new coding languages as well as deploying and maintaining applications for diverse and complex platforms such as Apple's iPhone and Microsoft Windows Mobile.

To avoid this strain, the Texas-based company deployed the Palm webOS development platform. With the webOS Software Development Kit (SDK), developers use common skills such as JavaScript, CSS and HTML to quickly create, convert and distribute sophisticated mobile device applications. They also can use the same developer tool sets to extend their current web-enabled applications to the webOS platform.

These applications can be deployed across a host of popular devices such as the Palm Pre and Palm Pixi smartphones. Automatic over-the-air installations and updates allow enterprise users and customers to have the most current version of the application without needing to tether or sync their devices.

In just six months, developers at the construction company have created several applications for use on employees' webOS phones, including a mobile version of the main construction management program. The mobile application, which extends its web-based counterpart, uses web services to access back-end data. As a result, information is always up to date when employees input or search for it.

The construction company's mobile management application enables a work-site manager to update, in real time, a punch list of tasks that have been completed, such as the pouring of the foundation or the installation of plumbing, according to Stephen Smith, the company's software development manager.

This capability alleviates the need for the person in the field to boot up a laptop or head back to the office to process paperwork. Because the data is fed directly into back-end systems, the company also can automatically send out invoices to vendors, speeding payments.

Being able to extend the use of the web-based application, which was already funded and had resources allocated to it, also saved the company from the expense and staffing needed for an entirely new application.

"If we had to develop the same application on a different platform, it would have taken two to three times as long. We've definitely been able to leverage the web development knowledge we have in-house," Smith says.

## Complexity crisis

Most enterprises today want to develop mobile applications for use internally by employees and externally by business partners and customers. Yet they struggle because developing for certain platforms can be costly in terms of in-house developer time, outside consultants and licensing fees. Companies either have to accept that it will take months for developers to build a test environment and get up to speed on new languages, which can jeopardize other critical projects, or they have to hire and manage a team of consultants. In addition, software development kits can be cumbersome and expensive.

"Coding for individual platforms like Windows Mobile is a chore. There's a lot that goes into it, such as compiling code for different types of devices under the same operating system," says Jeff Frick, the construction company's lead mobile developer.

Some developers opt to simply create mobile web sites. But Frick finds this approach too limiting and says it can slow performance and have a negative impact on user adoption. "You miss out on the opportunity to create a rich environment for your users' specific needs and device," he says.

Conversely, the Palm webOS platform enables in-house developers to rapidly create and deploy internal and customer-facing applications for numerous devices

that are easy to use and highly functional. The webOS platform makes it easy and quick to extend mission-critical business applications to mobile devices so companies can experience advantages similar to those created by mobile enterprise e-mail.

At its most basic, webOS is a mobile operating system built on a Linux platform. The user interface is designed for touchscreen devices and supports multitasking via a “card” system. Cards line up after a user launches an application. Users can flick through the cards by swiping their finger right or left. They also can close an application by flicking a card off the screen. Applications for webOS allow other common multitouch gestures as well.

Palm webOS devices feature a unique technology called “Synergy” that connects to Microsoft Outlook via Exchange ActiveSync so users can aggregate calendars, contacts and mail from multiple Exchange accounts in one place. Synergy also gathers information from popular messaging and social network applications, including Facebook, Gmail, Yahoo!, and LinkedIn. The technology enables users to combine instant messages and text messages in a single window, which streamlines their communication.

Security and disaster recovery are key issues for enterprises, so webOS devices include Palm services that allow for over-the-air backup and recovery. With these services, organizations can also push updates and patch device firmware and software without having to tether the device.

Onscreen notifications alert users to the availability of such updates. Notifications, which also can be used to announce a new message in the inbox, display at the bottom of the screen no matter which applications the user has open. Users can customize the parameters for each application’s notifications.

Unlike some devices, webOS devices support background applications. Users can keep critical programs running while they check their mail or do other work. That way, they don’t have to waste time relaunching a program or worry about missing important updates. They can stay focused on the task at hand.

All of these features make webOS devices like the Palm Pre and Palm Pixi incredibly useful for mobile enterprise workers. It’s even more useful when developers can build their own webOS applications to make users far more productive.

## Developing for webOS

The construction firm’s Frick says that he was introduced to the webOS platform six months ago and within a few weeks, he had a prototype that was ready to be beta-tested by his employees. “That includes the webOS coding and the coding for web services to interact with our back-end systems,” he says.

He attributes this ease of use to the fact that the platform taps the JavaScript, HTML and CSS skills he and other developers in the company already had. In his book “Palm webOS” (O’Reilly Media, 2009), author Mitch Allen notes that “the exact same methods and tools you use to create any normal web page can be applied to the webOS device.”

In addition, Palm has developed a robust and effective framework that Frick says gives him the ability to focus on what he wants a program to do instead of how to make the program do it. He adds that the framework is built to take the difficulty out of compiling code and designing it to look like other webOS applications. “I didn’t have to do a lot of extra styling myself. The menus, buttons and the way things move around the screen were already built in,” he says.

The UI System Manager, or UI SysMgr, is responsible for almost everything in the system that is visible to the user. The Application Manager provides the application runtime. It also loads the individual applications and hosts the built-in framework as well as some special system applications, the status bar and the Launcher, according to Allen.

The Application Manager runs in a single process, schedules and manages each of the running applications, and handles all rendering through interfaces to the graphics subsystem and on-device storage through interfaces to SQLite. Applications rely on the framework for their UI features set and for services access. The UI features are built into the

framework and the Application Manager handles them directly, but the service requests are routed over the Palm Bus to the appropriate service handler, Allen adds.

“The WebKit browser engine, which is also used to power Apple’s Safari and Google Chrome, renders what should be displayed. Finally, Google’s V8, which is one of the fastest and most sophisticated JavaScript engines, compiles and runs programs,” Allen writes.

As you start to develop mobile applications, you’ll work with a series of application components, including stages, scenes, storage, events, widgets and services. Each plays a critical role in how your application will function. For instance, you can think of a stage as a window or tab in a browser and each scene as a different web page. Events are actions applied to scene elements. Tapping on a button, for example, generates an event. HTML5’s local storage functionality handles local storage for webOS applications. Widgets provide standard UI elements such as text fields, buttons and lists. Palm webOS supports numerous services, including application, system, cloud and hardware services.

If you have legacy applications, programs written for other mobile platforms, or want to use C and C++ alongside these web technologies, you can use the Plug-in Development Kit (PDK). Components built with the PDK plug into the webOS apps using the same mechanism that supports desktop browser plug-ins. The PDK brings new functionality to webOS, including immersive 3D graphics, and gives developers who have built games for other platforms an easy way to bring their titles to the webOS platform.

Developers can write a webOS application using only a text editor or web development tool and the JavaScript-based Mojo Framework, which supports common application-level functions, UI widgets, access to built-in applications and their data, and native services. For instance, using the Eclipse™ integrated development environment (IDE) with the Palm plug-in simplifies debugging, packaging, installing and running webOS applications.

## Keeping testing simple

For organizations that do not want to build a complex test environment, Palm has created the Project Ares IDE. Project Ares is the first mobile development environment hosted entirely in a browser. Ben Galbraith, who spearheads the developer initiative at Palm, says this lightweight tool will lower the barrier of entry for enterprises to create mobile applications.

The tool, which is currently in beta, speeds workflow by enabling developers to move quickly and seamlessly from editing in a browser to debugging on a device and then selling applications in Palm’s App Catalog or on the web.

In addition to the construction management application, Frick and his team have developed an application for external use that helps customers find nearby homes and construction sites. Using the device’s GPS, customers can see what’s close to them as well as its stage of construction; for instance, still dirt, framed or completed.

Steve Butsch, director of systems engineering at Palm, says he’s seen tremendous creativity among the developer community. For example, a drug company developed a drug-coaching application that gives customers reminders of when they should take their dose. It also prompts users for feedback on their condition. “This application allows the company to test the efficacy of a drug regimen by getting real-time updates from their user base,” he says.



Enterprise developers can also create mobile dashboard applications to provide executives with real-time updates on the company’s health. Those updates could include sales numbers, inventory status, product pipeline and receivables. Executives could set their devices to receive notifications if critical numbers pass a certain threshold.

Retail companies can use the webOS SDK to develop end-cap management applications that ensure quality control. Store managers would be reminded to snap a picture of their displays and send them to headquarters. If the displays are incorrect, the manager could be sent the original layout and other details.

## Distribution point

Traditionally, once a developer created an application, it was difficult to distribute it to mobile devices. Mobile workers would have to come back to the office or connect with their laptops to sync their devices and have programs installed or updated.

Palm webOS has obviated the need for syncing and tethering with its over-the-air distribution. Developers have three options for getting applications into employee and customer hands.

One option is to submit your application for inclusion in the App Catalog, which ships on every webOS device, for a one-time fee of \$50. Your users can search specifically for your application and then quickly download it to their handheld. They can also be notified of its availability via an RSS feed. Palm reviews all App Catalog applications within a reasonable time period.

Web distribution is another option. This leverages Palm’s cloud services to alert users to a new business application without having to use the public catalog. This method also enables almost immediate publication as applications do not have to be reviewed. Instead, you receive a specific URL that you can send to your users. All they have to do is tap the URL to download the program. These apps also appear in the RSS feed, but you can request that they be excluded.

A third option is for beta release of your application. You can submit your application to Palm as a beta

and receive a special URL to send to users who want to be part of your test. Again, when the user taps on the URL, it’s downloaded to the device. You can also request that beta versions be excluded from the RSS feed.

## Distribution summary

All of these methods allow developers to gain feedback, automatically push updates to users and even pull the application back if the need arises.

Frick uses the beta version to test-drive applications and gather suggestions for improvements. “We can make tweaks or enhancements based on that input and then quickly redistribute the application,” he says.

Distribution Method	Fees	Review	Web URL	Paid Apps
App Catalog	\$50/app <sup>1</sup>	Palm	Yes	Yes
Web distribution	Free	Self-review	Yes	Yes
Beta distribution <sup>2</sup>	Free	Self-review	Yes	No

1. Free for open source developers.  
2. Software clearly marked as beta.

## Support center

As you delve into the world of developing webOS applications, you can find best practices and support from your fellow developers on the Palm Development Center. This portal hosts the latest versions of the SDK, reference material, innovative development tools and fresh content to educate you about building great mobile applications. For instance, there are entertaining and instructive video webcasts and podcasts from webOS pioneers. The Palm Development Center is also the place to access Project Ares, the web-based IDE.

You can become part of the webOS developer community by registering free at [developer.palm.com](http://developer.palm.com).

## Conclusion

There is no doubt that mobile applications will become standard fare in the enterprise. To ensure that you don't overburden your developers or rack up incredible consultant costs, develop your mobile applications with webOS. This simple, intuitive platform mobilizes your mission-critical web-enabled applications using existing resources and in-house expertise. So you're sure to gain a return on your investment similar to what organizations experienced when e-mail was extended to mobile platforms.

Like the Texas-based construction firm, you can enjoy the innovation that comes with Palm's rapid and sophisticated mobile application development environment. Frick says, "With webOS, I'm able to quickly and cost-effectively develop mobile applications that are sleek, simple and functional."

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