# Top Trends in Smartphones

And How Rhomobile Helps You Write Apps to Take Advantage of Them


**WHITE PAPER**
**MAY 2011**

**Rhomobile** - **Mobilize Your Enterprise**

rhomobile

# Overview

Mobile devices have been infiltrating the enterprise steadily for the last two decades. Until now, businesses have mostly used these devices for mobile voice and email. Players in the legacy enterprise mobility space offer app development and device management mostly to niche portions of the enterprise, but they have seen little success in a nascent market. The mobility landscape for businesses is changing rapidly, and most enterprises want some way of taking advantage of these changes to make their workers more productive and compete more effectively. Rhomobile offers a modern and complete approach to app development and integration that will allow businesses to evolve with new mobile trends.

This document describes several of the major technology and market shifts that will occur over the next two years and the way Rhomobile will help enterprises benefit from them.

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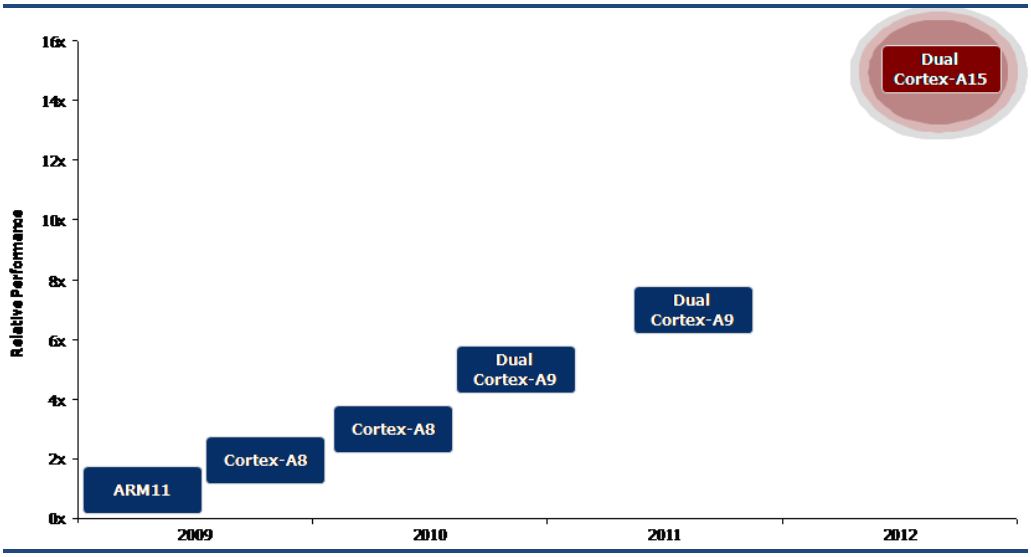
# More Powerful Smartphones

Smartphones are becoming far more powerful than the desktops of just a few years ago. Dual core 1-gigahertz processors are already shipping. Dual core 2-gigahertz processors are on the horizon. Even quad-core devices are planned for early next year. Just as with what happened with the shift to more powerful personal computers, more powerful processors have allowed for a more productive programming environment. In the early days of the personal computer, applications were primarily developed in Assembler and C. As more powerful processors appeared in the early 1990s, more productive programming environments emerged, such as Visual Basic for Windows application programming and PowerBuilder for client server applications.

**Figure 1: Evolution of Mobile Processors Performance**




Source: Wall Street Research, March 2011

Mobile application development has always used primitive and unproductive development tools and approaches. Three years ago Feature Phone develop-

ment on the dominant operating systems for smartphones (Symbian, Windows Mobile, and Palm) was primarily in C. This was despite the fact that web development used highly productive approaches of HTML for interfaces and backend applications done in scripting languages such as Python, Ruby, and PHP with an order of magnitude or better productivity. For iPhone development, developers have been asked to use Objective C, a programming language created over thirty years ago, which was widely derided as obsolete two decades ago.

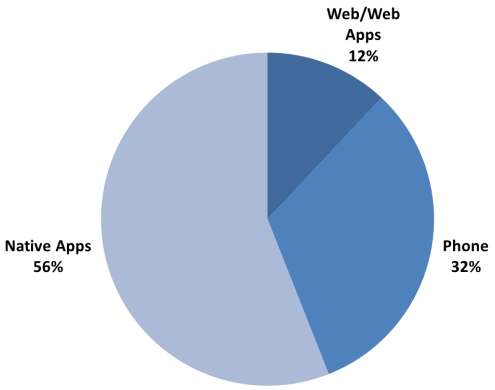
Such primitive approaches were necessary due to the limited processing power and space available on mobile devices. Recent developments in the speed and capabilities of smartphones make such primitive approaches no longer necessary. **Rhomobile's Rhodes Framework** takes advantages of these huge leaps in the power and capabilities of the modern smartphone, and provides for the first time all the best of modern app development to mobile devices.

## "The App Internet" and Native Apps

Some might say, "Well can't you just write mobile web apps to get apps quickly onto all smartphones?" This ideology is really just a quick fix, as new powerful mobile devices and tablets have caused people to shift away from the web as we know it and migrate to the "App Internet" (as discussed here by Forrester). According to the Forrester article:

> *Two ways of computing have dominated over the past 20 years. The first I'll call the "Microsoft model" -- where local personal computers do most of the work. The second model is the Web/Cloud model, in which most of the work happens on remote servers. Both are outmoded. The Microsoft model fails to leverage the economies of scale in the Cloud; Web/Cloud fail to leverage the exponential growth in the power of local storage and processors.*
>
> *So what comes next? Something I call the "App Internet." In this model, powerful local devices (PCs, smartphones, tablets) run applications that simultaneously and seamlessly take advantage of resources in the Web/Cloud. If you want to see this model in action, check out iPhone and Android applications.*

**Figure 2: Comparison of Native Apps and Mobile Web Percentage Usage per Day**




Source: Appsfire, SAS, & Apple Inc., December 2010

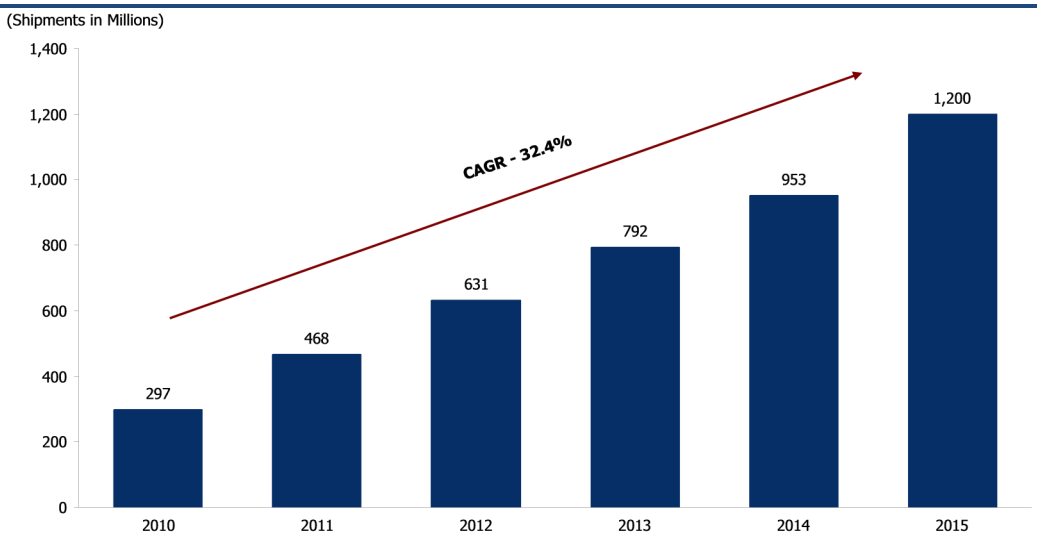
Mobile web applications are the older paradigm. And they are clearly not getting the traction that native apps get. Rhodes, however, leverages the web development capabilities (writing app interfaces in HTML5) but still allows for true leverage of powerful local devices. RhoSync provides easy connectivity to the resources in the Web/Cloud. Frameworks like Rhodes, which use web skills but provide native local apps, will be key for the App Internet. Note that frameworks that use proprietary interface development libraries (such as Appcelerator or legacy first generation providers such as Pyxis or Antenna) do not reflect the benefits of the App Internet.

# Massive Growth in Smartphone Shipments

Smartphone device manufacturers are predicted to ship almost half a billion devices in 2011. In the fourth quarter of 2010 smartphones already outpaced shipments of PCs. This huge growth in smartphone usage and availability will change the industry in several fundamental ways. The biggest of these is the rapidly emerging reality that all corporate workers will already have a smartphone of their own and that it will become the primary way that those employees access remote information. Just as the emergence of a personal computer on every desktop created a whole new generation of software companies to take advantage of that phenomenon (for example, Microsoft, Apple, and Dell), the recent ubiquity of smartphones will create a whole new generation of software companies completely focused on this new reality.

In the space of enabling software to create *modern* smartphone apps for the enterprise, it is difficult to find direct competitors to Rhomobile. The previous generation of enterprise mobility focused on the realities of far less powerful phones, resulting in a far less productive toolset. Competitors in the "smartphone framework" space (one which Rhomobile created two and a half years ago with the Rhodes framework) are all focused on consumer applications. There is room for a category dominator in the enterprise smartphone space. Rhomobile is now the best positioned in this new space. We have not seen any company truly target this new sector.

**Figure 3: Projected Growth in Smartphone Shipments**




Source: Gartner and Berg Insight

# "Bring Your Own Device"

The most immediate trend in mobile device usage is companies encouraging employees to use their own smartphone. This provides cost savings to companies by not purchasing devices and not having to manage them. It also makes employees more productive by allowing them to use their own personal phone that they are generally very adept at using.

Existing mobile device management solutions work against this trend. They insist on managing the entire device, which negates much of the cost advantages for companies. Additionally, employees do not want their full devices managed. However, companies still need to manage their own apps and data, as well as which employees have access to them and when.

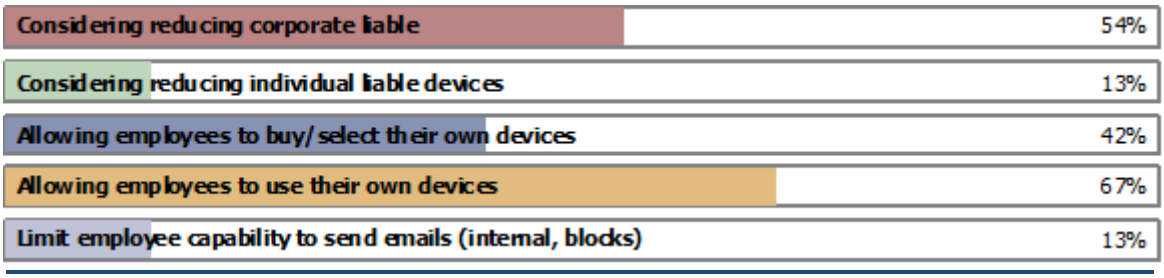
There is an opportunity to address this new market with a new breed of "smartphone app and data management" capability focused on just managing the apps and data that the user needs. As pointed out in this article by searchCIO.com, traditional approaches to IT service management, and more specifically mobile device management, require a new approach to managing critical corporate apps and data.

Rhomobile's RhoGallery product addresses this need by providing "galleries" of apps to which enterprise users are invited. Instead of managing the entire device, administrators just manage collections of apps. In effect, this provides an "enterprise sandbox." It is also available in hosted form so it can be used immediately.

**Figure 4: Survey of "Bring Your Own Device" vs. Company-Supplied Device Percentages**

**Which of the following changes is your company considering in how it manages mobile services/devices?**

Poll Results




Source: Telecom Expense Management Industry Association, 2011

# The Smartphone as the Primary Computing Device

Mobile devices are changing from being an adjunct for occasional remote usage to being the primary way that a broad swath of workers handle information. This creates new challenges in creating usable interfaces for those workers.

A new breed of mobile applications now needs to be created that assumes the app is the primary way of creating and consuming information. How does this affect mobile app creation? It means that companies need to create apps that can handle all of the information needed for an application or function, and not just writing apps that are oriented primarily to reading information on the device or exposing a subset of the information. It is actually a good practice to not try to stuff all objects into a single app. Rather it is important to make sure that there are apps that cover all business objects in a backend application. You

need to assume that a given worker wants the ability to do all of his work on the device.

In order for developers to quickly write powerful, functional apps that enable workers to use their devices as their primary information tool, developers require several development capabilities.

**Data Synchronization** - One important capability is data synchronization. If you are going to use your smartphone as your primary device you need to be able to create and edit data on it. This does not happen without data synchronization. If the only connection to the backend is via live synchronous connection (as with a web browser), users do not have enough confidence to use their devices for work. Just as users adopted email on devices once synchronized email became commonplace, enterprise app usage will not become bidirectional until a solution for offline data and synchronization is in place. RhoSync makes data synchronization from smartphone apps easy, regardless of whether the Rhodes framework or an underlying SDK is used.

**Cross Platform Portability** - Another challenge to building highly functional mobile enterprise apps that are an employee's primary computing tool is handling various form factors. Single apps with one codebase need to work across smartphones and tablets of various sizes. Because the Rhodes framework has a browser component for display (yet still builds true native apps), the browser component handles much of that diversity. For more extreme differences of interface, Rhodes separation of interface from business logic with Model View Controller pattern allows for drastically different interfaces (Views) where required but still allows for sharing common business logic in controllers. Previous approaches to mobile interface development required extensive redevelopment for minor changes in screen resolution, which says nothing of the effort required to target a new device.

**Faster and Easier Development** - Finally, smartphone app development needs to be easier if all enterprise applications are going to be moved to the smartphone in a timely way. Rhodes makes it faster to develop those apps by allowing developers to use their web skills and write apps up to 25x faster. Those apps then immediately work across all popular smartphones. RhoSync makes it easier to integrate apps to backend enterprise applications by providing out of the box "source adapters" for many popular enterprise applications. It also simplifies the development process if a new source adapter needs to be written.

Wikipedia wrote an app using Rhodes and the resulting code base was 5x smaller than their original Objective-C App. Visit **rhomobile.com/apps** to see other apps that saved time and effort using the Rhodes Framework.

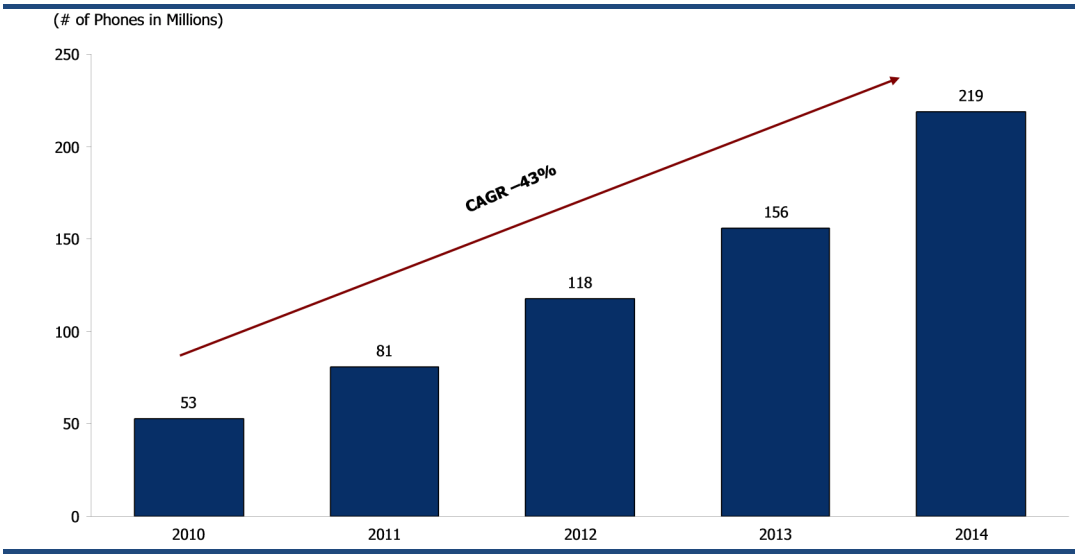
# Smartphones at the "Point of Service"

Providing your employees with smartphones allows for information capture and retrieval at the location and time that a product or service is purchased or delivered. If you walk into an Apple Store, the employee's iPhone (albeit with a hardware accessory) lets that employee sell you the product right when you are looking at it. There is no "cash register" obstructing the front of the store and flow of customers to the merchandise.

For service delivery, this is even more useful. Whether the service provider is your contractor, gardener, auto mechanic, or waiter, if you can be billed and charged at the exact location and time when the service is delivered, the transaction is more efficient and satisfying for everyone concerned. Most restaurants in Europe charge credit cards right at the table with dedicated mobile card reading devices. The ability to charge at the point of service with smartphones will allow that convenience to be provided in the United States. For mobile service providers delivering a service outside of their normal venue, the efficiencies are even more dramatic.

Smartphones that are appearing now with Near Field Communications (NFC) chips or Bluetooth capability to credit card reading accessories enable this shift in the way commerce (in both products and services) will take place. With the introduction of full read-write NFC support in Android 3.0, NFC is about to experience huge growth. Even popular consumer games like Angry Birds are taking advantage of NFC today.

**Figure 5: Projected Growth in NFC-Equipped Smartphone Shipments**




Source: iSuppli Research, 2010

However, there is a huge diversity of standards in the way to interface with various NFC chips and external accessories. It is a multiplicative nightmare. There are at least ten smartphone operating systems that will be available in the next two years (iPhone, Android, BlackBerry, Windows Mobile, Windows Phone 7, Symbian, Meego, Samsung Bada, WebOS, and BB Playbook QNX). There are many ways of accessing accessories and purchasing objects: RFID, NFC ECMA 340, NFC ECMA 342, and devices such as the Square credit card reader. There are hundreds of ways to program to what is essentially the same logical process.

Frameworks like Rhodes that expose common ways of doing the same logical tasks are a better approach to writing apps that work across differing smartphones and differing accessories to enable this change to "devices at the point of service." As ReadWriteWeb notes here, this long predicted "Internet of Things" is finally becoming a reality. NFC tags embedded in everyday objects allow consumers to interact with all objects from smartphones (the most likely device with which this would happen). But the diversity of smartphone SDKs and the various standards are obstacles in quickly making this trend a reality. The Rhodes framework with unified API supporting NFC and other external devices addresses this problem in a way that individual device SDKs cannot.

## Smartphone as your Digital Identity

Smartphones can recognize every sense: sight, hearing, touch, location-awareness, and even chemical sensors. Smartphones will take everything that you see, hear, feel, say, and do. They are also getting as powerful as servers and have just as much processing power and space. This will allow them to not just see, hear, and feel what you do, but also be able to record it and record your responses to those stimuli as well. Smartphones have in effect become the embodiment of people's lives and identities. Researchers are already beginning to take advantage of this phenomenon.

For many to most service professionals, the smartphone will effectively become the "universal, perpetual log" of everything that they do—or at least all of the services that those people perform. Initially, these will be early adopters who want to spend less of their own efforts selectively tracking their activities. Very quickly this will become the sensible efficient way of recording activities both for billing and legal protection purposes. And of course not too long after, it will become required for compliance purposes. When it is cheap and easy to record everything, it will be difficult to justify not doing it. The "universal log" starts as just video and audio recording. However, it will be enhanced with position information and tagging of individuals with contact and biometric data. The substance of "universal log" apps and just what they record will be moving targets that vary based on the industry.

# Conclusion

Rhomobile is the only modern product for enterprise mobility that allows the productivity of web development skills in writing apps and the power of the cloud and hosted services for ease of adoption. There are several meta trends emerging over the next couple of years that Rhomobile's Rhodes framework and RhoSync App Integration Server address. These include:

- More powerful smartphones
- The "App Internet" and growth of native apps
- Massive growth in smartphone shipments
- Smartphones as users' primary computing device
- Devices at the "point of service"
- Mobile devices as each user's "digital identity"

Rhomobile's tool suite will let you take maximum advantage of all of this momentum in smartphone usage and build better apps for your users.

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## About Rhomobile

Rhomobile's free and open source mobile application framework, Rhodes, lets you quickly build native mobile applications for all smartphones: iPhone, BlackBerry, Windows Mobile, Symbian and Android. These are true native device applications (not mobile web apps) which work with synchronized local data and take advantage of device capabilities such as GPS, PIM contacts, camera, native mapping, push, alerts and calendar. Rhodes invented the smartphone app framework (including that term) two years ago and has had over 50,000 open source downloads since then. Rhodes is the only smartphone framework with support for all smartphones, a Model View Controller pattern, and, most importantly, support for synchronized offline data. Because of these features, which are all critical for enterprise needs, several large Fortune 500 companies have standardized on Rhodes for mobile development.