



Mobile Applications Development: Leveraging Experience to Maximize Gain

A MapleWorks White Paper

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INTRODUCTION

Think back to the weekend, or even to your commute to work this morning. How many people did you see intently interacting with their Smartphones? Youth, professionals, soccer moms, grandparents? The combination of Smartphones and mobile applications is revolutionizing the way we interact—and demand for engaging mobile applications is on the rise.

In July 2009, the Apple App Store turned 1 year old. In just 12 months, more than 1.5 billion mobile applications were downloaded of the 65,000 mobile applications that were available (source: http://www.appleinsider.com/articles/09/07/14/apples_app_store_more_than_1_5_billion_served.html). Market research firm Frost & Sullivan, predicts that in the USA downloads from all app stores will reach 6.67 billion by 2014, up from 2 billion in 2009 (source: <http://www.frost.com/prod/servlet/presentation.pag?docid=176853195>). And a 2009 study by comScore reveals a 63% increase in Smartphone use over a 12 month period (source: <http://www.unwiredview.com/2009/11/04/study-shows-touchscreen-adoption-growing-at-exponential-rate-in-usa/>).

Today, users want everything at their fingertips and they want them all on one device. Companies that understand this will retain valuable customers. Take TomTom as a case in point. TomTom is a dedicated mobile global positioning system (GPS) device. But, smartphones can run GPS mobile applications, so why would you buy a TomTom? And that's why the TomTom mobile application is now available from the Apple App Store. While this is just one example of a company's strategy to remain relevant via a mobile application, you can probably think of many more. In fact, if you're reading this white paper, it's highly likely that you have an idea for a mobile application.

With skyrocketing adoption, one can quickly see why companies are looking to develop mobile applications. If application development is not your core expertise and, even if it is but you need help getting to market faster, this white paper suggests the credentials that you should be looking for in an outsourced partner, as well as talking points to see how providers handle the many challenges that the myriad of Smartphones pose when designing mobile applications.

While there is no shortage of software development providers, you can quickly whittle down the list when you take the following development experience into consideration: voice communications, data communications, graphical user interfaces (GUI), and video applications. Of course, you're also looking for these same developers to have experience developing mobile applications for the iPhone, BlackBerry, Windows, Android, and Symbian operating systems (OS).

There's much to consider if you're developing a mobile application. This white paper provides valuable insight if you are considering outsourcing the development of mobile applications to a software development provider.

WHAT CONSTITUTES A POSITIVE USER EXPERIENCE?

A well-developed mobile application delivers a positive user experience (UX). But how does one define "positive UX?" Rather than one thing, a positive UX is a combination of load time, response time, graphical presentation, navigation, intuitiveness, and interaction. Create an engaging mobile experience and users will spread the word.

A WALK DOWN MEMORY LANE

The mobile devices of the 80s were dedicated to voice communications. Software developers only needed experience with voice communications, network management, infrastructure and frameworks.

Today's mobile devices not only provide voice communications, they provide data communications, access to the Internet, enable remote access, run mobile applications, and much more. You can understand why software development providers holding skill sets in voice communications, network management, infrastructure, frameworks, unified communications, video applications, GUI design, and OSs (iPhone, BlackBerry, Windows, Android, and Symbian OSs) are sought after to develop mobile applications.

WHAT LESSONS HAVE THE EXPERIENCED MOBILE APPLICATIONS SOFTWARE DEVELOPERS LEARNED?

The iPhone Touch, launched in 2007, raised the bar in terms of the user's experience (UX). The iPhone currently has one of the slickest, most intuitive user interfaces (UI) in the market. According to a study by comScore, there are 24 million touchscreen devices in use within the USA, representing a 159% growth year-over-year from 2008. Of the 24 million, 32.9% are iPhones. (If you're interested in the full breakdown, visit <http://www.unwiredview.com/2009/11/04/study-shows-touchscreen-adoption-growing-at-exponential-rate-in-usa/>.)

To develop a brand-defining UX, an experienced software developer must consider a number of technical challenges thereby reducing the risk associated with launching an engaging mobile application to the market.

1. Small screens/small key pads. One of the first challenges to consider is screen real estate. One must understand the limitations and capacities of the target device's screen size, resolution, keypad, and whether or not there is a touchscreen. Screen real estate affects the UI in terms of data, actions, and flow of screens. How much data can appear on the screen? What size can the data be? Where will the data be placed? How will screen size restrict navigation? An experienced UI designer understands all this and is knowledgeable in design best practices.

2. Limited CPU performance. The physical limitation of central processing unit (CPU) power affects the functionality and the UX. Each layer of the application architecture must be thought out and prioritized to maximize constraints of the target device.

3. Limited memory and storage space. Memory capacity ranges from device to device—another physical limitation of Smartphones. Therefore, each layer of the application architecture must be thought out and prioritized to maximize memory constraints of the target device.

WHAT YEAR WAS THE FIRST MOBILE PHONE LAUNCHED?

The Motorola DynaTAC was the first FCC-approved mobile phone in 1983.

4. Caching. Access to data is constrained by unreliable network connections and the resource-constrained device itself. Caching improves the performance and responsiveness of mobile applications, so consider the resource constraints of the target device when determining what data to cache. Consider how intermittent connectivity and low bandwidth affects the design of the mobile application. Experienced software developers design mobile applications with a minimum memory footprint; in other words, they cache only the data that is essential to meet their minimum performance objectives.

5. Operating system (OS) behaviour. There are numerous OS behaviours to understand: iPhone, BlackBerry, Windows Mobile, Google Android, Symbian. For example, the iPhone Touch can only run one mobile application at a time, whereas, BlackBerry and Android don't have this limitation. Consider the affect receiving a phone call will have during the interaction with the mobile application. Experienced developers always keep the UX front and center in their design considerations.

6. Battery life. Every design decision should take into account the physical limitations of screen real estate, CPU, memory, storage, and caching, and it must include battery life. In fact, battery life is one of the most constraining factors in designing mobile applications. Backlighting, reading and writing to memory, wireless connections—and more—impact power usage. Consider how much power the mobile application will consume, and determine how to optimize the mobile application to preserve battery life. Examples include ensuring the code is efficient, computations are decreased, and communications are in batched bursts and then shut down when not required.

7. Bandwidth. Mobile applications may need to intermittently connect to the Internet, but the network connection speed (bandwidth) is slower than a desktop or laptop. The target device is constrained by latency and round-trip time (the time between the request and the reply). Experienced developers understand how bandwidth affects performance of the mobile application, thereby impacting the UX. Consider how to manage this for the user. Will the user be notified if a connection has failed? Will data be stored or lost? How does storage affect the performance of the mobile application. An experienced developer will consider software protocols based on speed and power consumption and design caching, data access, etc., keeping bandwidth limitations in mind.

8. Security. Financial institutions and other security based companies are now providing mobile applications to their customers. If a software developer is designing a mobile application for use over a network, the developer must consider security implications and how to protect sensitive data.

9. Portability. Smartphone screens come in all sizes and orientations. Smartphones vary in CPU, memory, storage, battery life, and more. If the plan is to port the mobile application to other target devices, consider a layered architecture to enable reuse and maintenance. Experienced developers design for a subset of functionality that exists on all of the target devices and will then customize the code to each.

10. Usability testing. Experienced software developers understand the criticality of designing mobile applications for novice and expert users. Usability testing is important to ensure the original defined UX is delivered in terms of each of the constraints mentioned: screen real estate, keypad size, CPU, memory, storage, caching, OS behaviour, battery life, bandwidth, and security.

That's 10 considerations and we've only touched the surface here. We haven't even talked about authentication and authorization, configuration management, data access, exception management, logging, synchronization, validation, and deployment. Experienced software developers will have considered these technical challenges—and much more.

If you are looking for an outsourced partner to develop a mobile application, use these 10 technical challenges as talking points to understand if the provider has the experience to minimize the risk of developing an engaging mobile application.

CONCLUSION

According to Frost & Sullivan, 2 billion mobile applications were downloaded across all app stores in the USA in 2009. And they predict that by 2014, 6.67 billion mobile applications will have been downloaded across all app stores in the USA. Today, the pricey iPhone rules. But Android is free and both it and Palm look like they could be contenders. One thing is certain: mobile applications are in a growth mode for all operating systems.

If you are looking to develop mobile applications and require an outsourced partner, make sure the software development provider has the credentials to handle the challenges that Smartphones present. Look for a background in voice communications, data communications, GUIs, and video applications software development. Also, ascertain if these same developers have experience developing mobile applications for the iPhone, BlackBerry, Windows, Android, and Symbian operating systems.

If the buzz from this year's Consumer Electronics Show (CES 2010) is accurate, we're going to start seeing more and more people intently interacting with their Tablets. As mobile devices offering varying functionality continue to address diverse market needs, user demand for mobile applications will continue to surge. Working with an experienced software development provider increases (1) the likelihood of delivering an engaging mobile application and exceptional UX to your target consumers, and (2) your technology is transferrable, no matter the mobile device of the future.

2009 STATS (USA)

- 2 billion mobile apps were downloaded across all app stores in the USA in 2009 (Frost & Sullivan)
- 1.5 billion mobile apps downloaded from Apple App Store from July 2008 to July 2009 (Apple)
- 65,000 mobile apps available from the Apple App Store in a 12-month period (Apple)
- 63% increase in Smartphone use from 2008 to 2009 (comScore)
- 24 million touchscreen devices in use in 2009, representing a 159% growth from 2008 (comScore)
- Of the 24 million touchscreen devices, 32.9% are iPhones (comScore)
- By 2014, 6.67 billion apps will have been downloaded across all app stores in the USA (Frost & Sullivan)

THE AUTHOR OF THIS WHITE PAPER

The author of this white paper, MapleWorks Technology, is an experienced source of **software development services** for developers of **networking and communication products** for both the service provider and enterprise markets.

MapleWorks offers clients the following value:

- Rich communications DNA
 - o Average of 15 years experience in the network communications domain
 - o Located in Silicon Valley North, their staff has experience from Nortel, Mitel, Siemens, RIM, etc.
 - o Staff is technology focused and invest in staying on top of emerging technologies
- Factors contributing to MapleWorks' proven track record of bringing products to market on time and on budget are the company's expert engineers and a proprietary **fluid, hybrid development processes called MapleWorks OnTrack™ and Agile OnTrack™**
- Business practices
 - o IP protection is respected and is the same as in the USA
 - o Onshore service provider; therefore, visas are not required
 - o Face-to-face knowledge transfer at client's site
 - o Management philosophy is one of minimal handholding, operating in a fluid environment, and successfully adapting to each client's development processes
- Business environment
 - o Development culture is the same as the USA
 - o English is the primary language
 - o Close proximity to the Ottawa International Airport enables day trips or single overnight stays
 - o Similar time zone
 - o Geopolitical stability means no risk to client projects
- Variable development cost is 30-40% less than in the USA

MapleWorks holds membership with each of the following industry associations:

- Massachusetts Technology Leadership Council (MTLC) – www.masstlc.org
- Massachusetts Network Communications Council (MassNetComms) – www.massnetcomms.org
- Canadian Advanced Technology Alliance (CATA) – www.cata.ca
- Ottawa Centre for Research and Innovation (OCRI) – www.ocri.ca

If you have questions about your outsourcing project, we invite you to contact us by phone at 781.897.1727 or send email to info@mapleworks.com



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