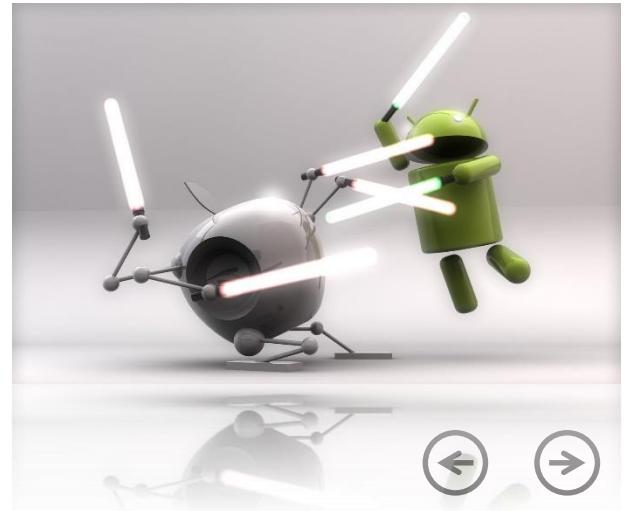

The Great Mobile Debate: Native vs. Hybrid App Dev

Nick Landry, MVP

Senior Technical Evangelist – Microsoft
Nokia Developer Ambassador & Champion
ext-nick.landry@nokia.com
@ActiveNick – www.AgeofMobility.com



Who is ActiveNick?

- Senior Technical Evangelist – Microsoft
- Nokia Developer Ambassador & Champion
- Former Microsoft MVP 2005-2014: Windows Phone Development
 - Mobile Publisher – Big Bald Apps: <http://www.bigbaldapps.com>
- Speaker. Blogger. Author. Tweeter. Father. Gamer
- 20+ Years of Professional Experience
- Specialties:
 - Mobile Development
 - Location Intelligence & Geospatial Systems
 - Data Visualization, HPC, Cloud
 - Mobile Game Development
- Blog: www.AgeofMobility.com
- Twitter: [@ActiveNick](https://twitter.com/ActiveNick)



2005-2014



Agenda

- Review of Modern Mobile Platforms
- Different Approaches for Multi/Cross-Platform Development
 - Native Mobile Development
 - Mobile “Hybrid” Development
 - Other Cross-Platform Options
- Fight! Pros & Cons of Each
- Recommendations & Guidelines
- Join in & Participate



Why Mobile Development Matters

- Humans are lazy & reactive
- Users are more mobile than ever
- Miniaturization and the all-in-one device
- Smartphones & tablets: From luxury to commodity
- From a “Connected World” to a “Social World”
- Smartphones and tablets overtaking PCs & laptops
- The Enterprise and BYOD
- New monetization platforms
- Reaching millions of users & expanding your audience to developing markets
- Mobile apps are the new resume



What is a Mobile Developer?

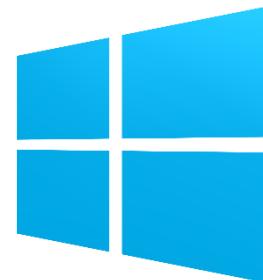
Really?





Mobile Development: The Reality

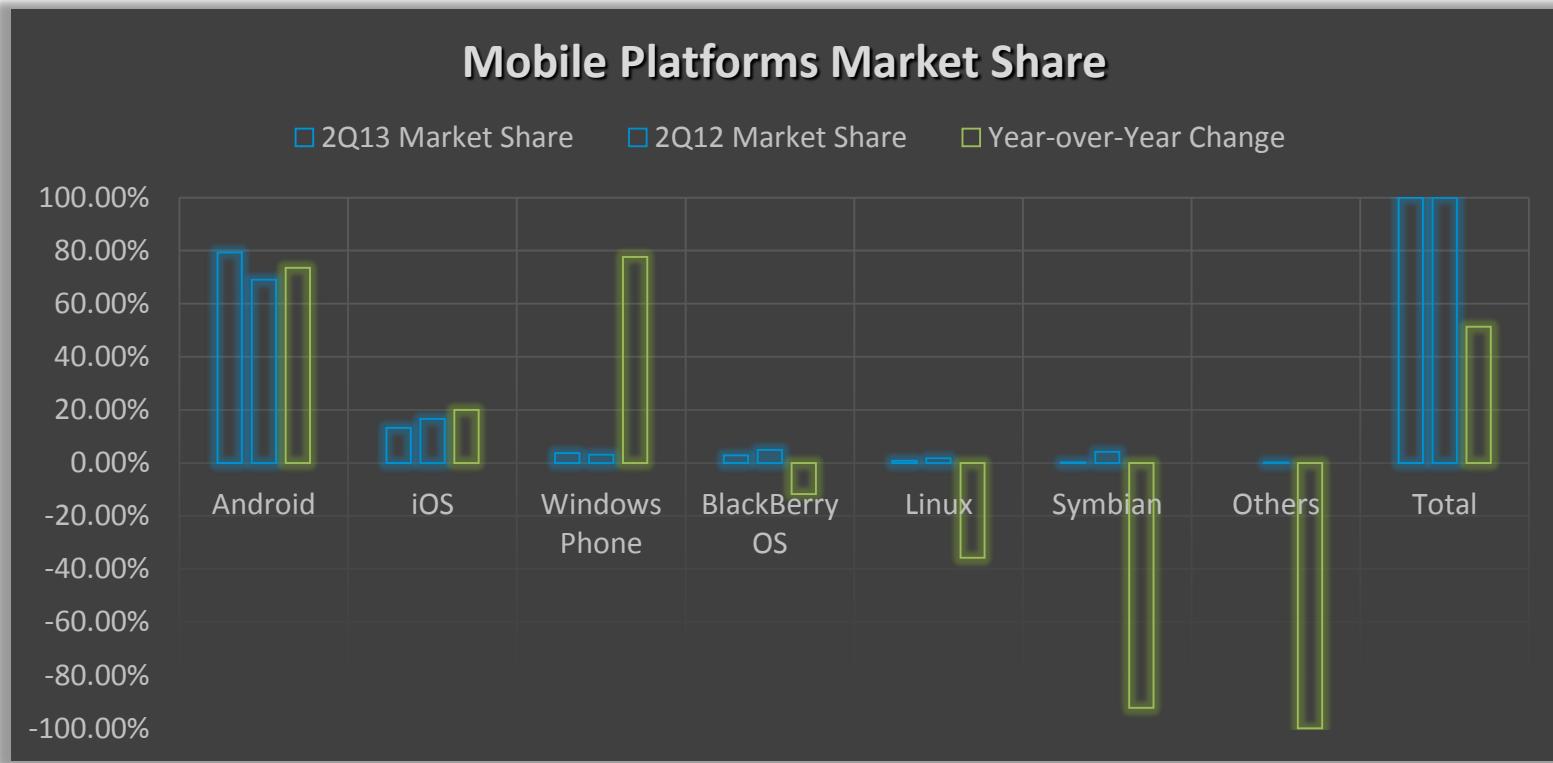
Mobile Platform Options



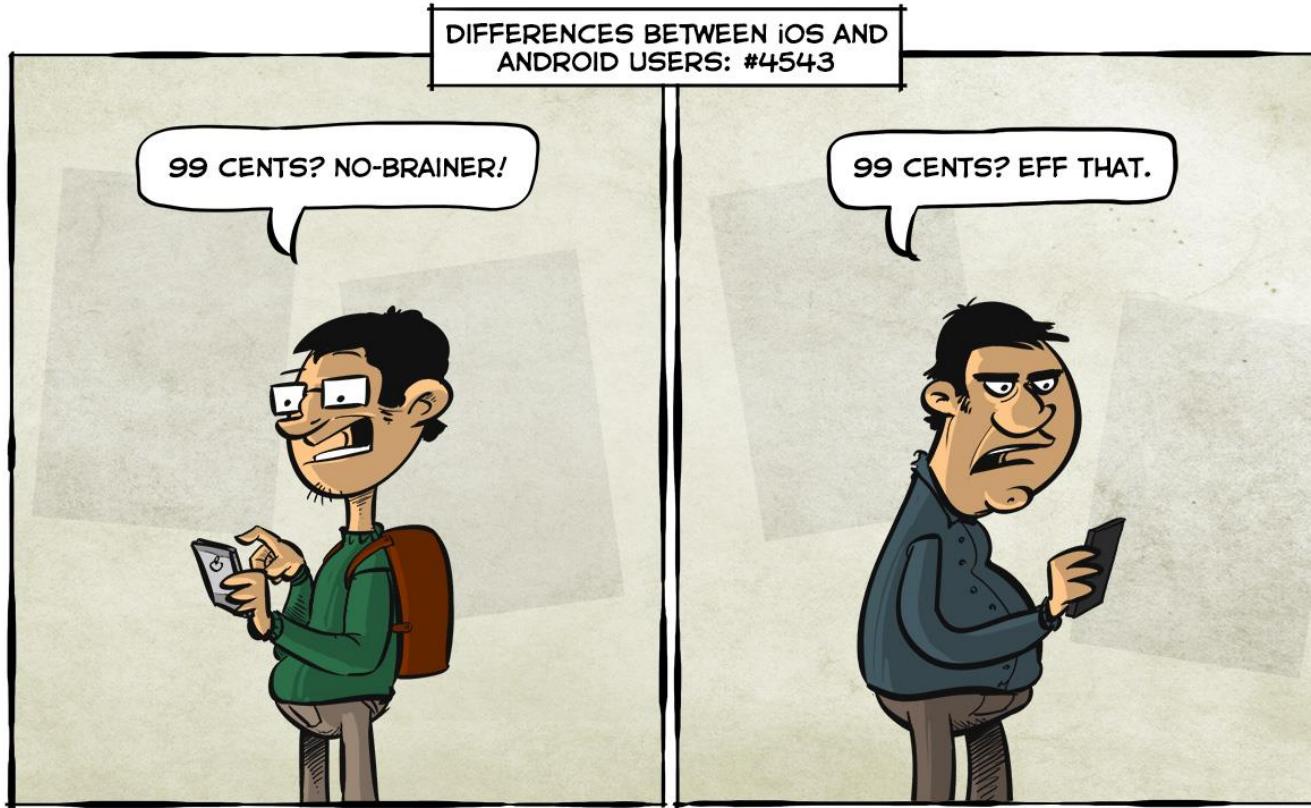
HTML5



Mobile Platforms Market Share

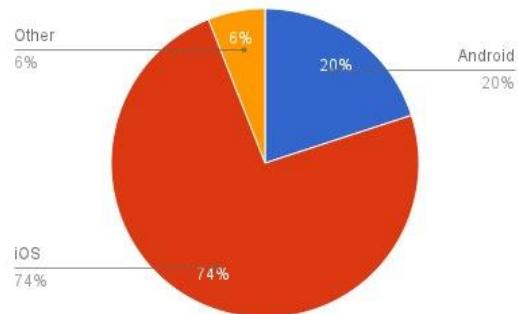


Is Market Share the Whole Story?

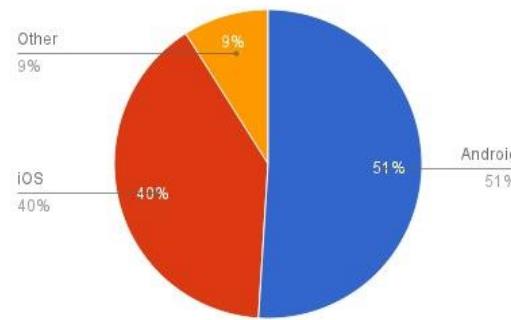


Is Market Share the Whole Story?

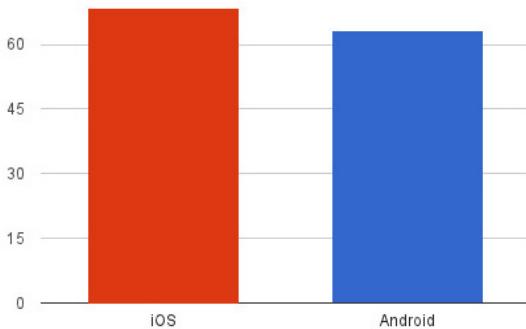
Canalys Download Revenue, Q1 2013



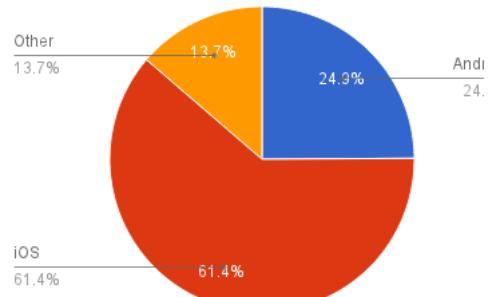
Canalys App Downloads, Q1 2013



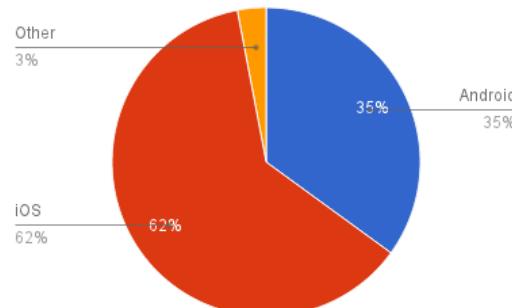
uTest app quality, 1/13



NetMarketShare mobile OS usage, 3/13



Citrix enterprise use of mobile platforms, Q4 2012



iOS Development for iPhone & iPad



i.e. How to compete with 1,000,000 apps



iOS Average Revenue: \$5,200 / month / app

Your first app



400,000 iOS apps were never downloaded (~57%)

Getting Started with Native iOS Development



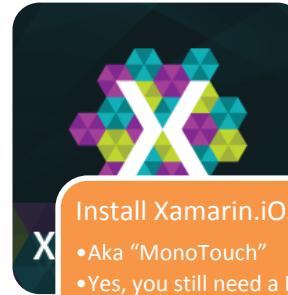
Get a Mac. iOS device recommended too

- 2.5GHz Intel Core i5 Mac mini from \$599 (new)
- 11-inch Intel Core i5 64GB MacBook Air from \$999 (new)
- Look for eBay Deals



Install Xcode

- Free download in the Mac App Store
- Register an account at developer.apple.com
- \$99 / year to deploy to actual devices & publish to the App Store



Install Xamarin.iOS

- Aka “MonoTouch”
- Yes, you still need a Mac to build iOS apps
- Free Starter Edition at Xamarin.com
- \$299 for Indie Edition: no size limit + components



Install Other Tools

- UI Controls
 - SDKs & Frameworks
 - Dev Tools & IDEs
 - Prototyping Tools
 - Deployment Tools
- Start Learning!



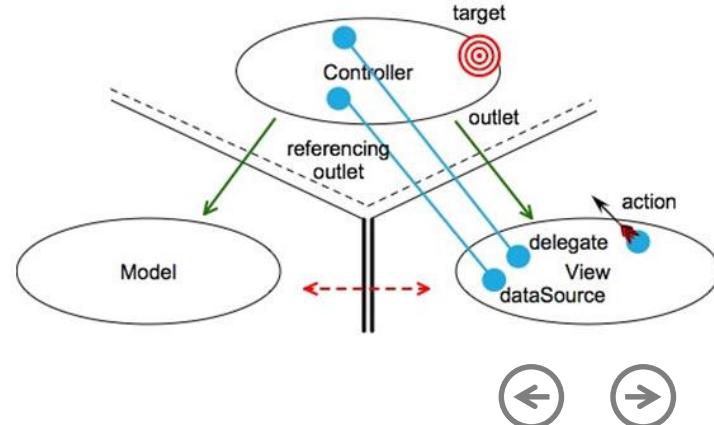
Getting Started: .NET → iOS

	MICROSOFT .NET DEVELOPER	APPLE IOS DEVELOPER
Computer	Any Windows PC/laptop	Mac
Dev Operating System	Windows 7 / 8.x	Mac OS X
Official Resources	MSDN	Apple Developer Center
Development IDE	Visual Studio	Xcode
Development Languages	C#, VB.NET, F#, etc.	Objective-C
Primary SDK	.NET Framework + WP SDK WinRT	iOS SDK
Code Compilation	Managed Code	Native Code
Runtime	CLR	No*
SDK Libraries	Assemblies	Frameworks
User Interface	XAML Controls	Cocoa Touch Controls
Operating System Targets	Windows 8, Windows Phone	iOS
Developer Program	\$19 per year	\$99 per year
Target Devices	Lots of Diversity	Few Options



iOS and the Model View Controller

- Using the MVC pattern is mandatory in Xcode for iOS projects based on UIKit
 - No code behind. All code goes in Controller
 - Apple decided for you. Don't fight it
- Facilitates the development of Universal iOS apps for iPhone and iPad
- UIKit provides a system for navigating between Views and Controllers
 - Includes Visual Transition
- Xcode provides drag & drop interactions to connect Views and Controllers
 - Actions and Outlets



Android Development

i.e. How to build apps for 12,000+ device models



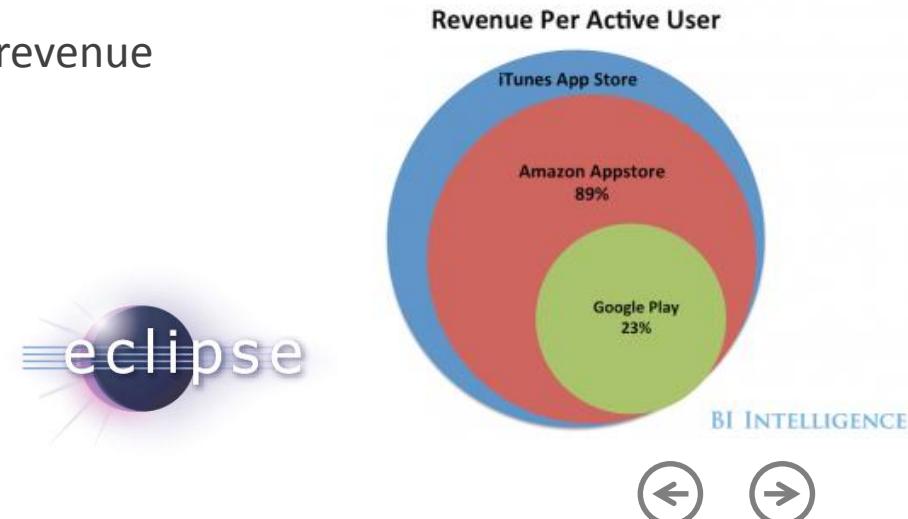
“I was looking to pick the most common Android devices, and then discovered that the top 100 only covered about a third of our users.”

Mike Shaver
Engineering Director, Facebook



Development for the Android Ecosystem

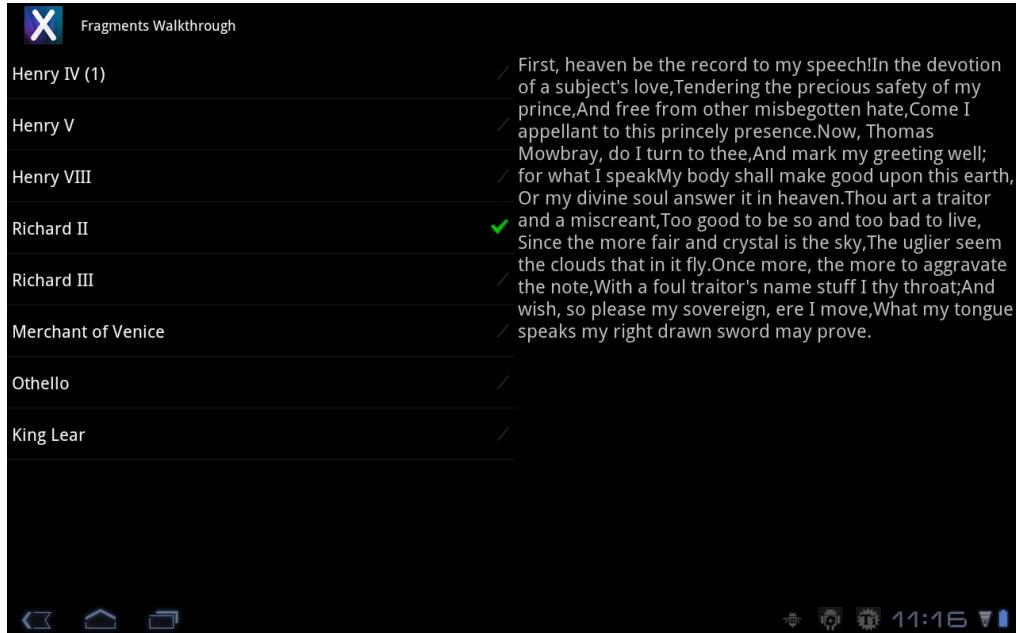
- Over 12,000 Android devices catalogued to date: smartphones, tablets, e-readers, netbooks, smart watches, car computers, game consoles, other devices
- **Free** Open-Source Operating System “created” and maintained by Google
- Most Android users got their phone for **free**
- Most Android developers build their apps with **free** tools
- Higher market share than iOS, but lower revenue
- Suffers from Fragmentation Hell
- Programming Language: Java
- IDE: Eclipse, Android Studio, IntelliJ



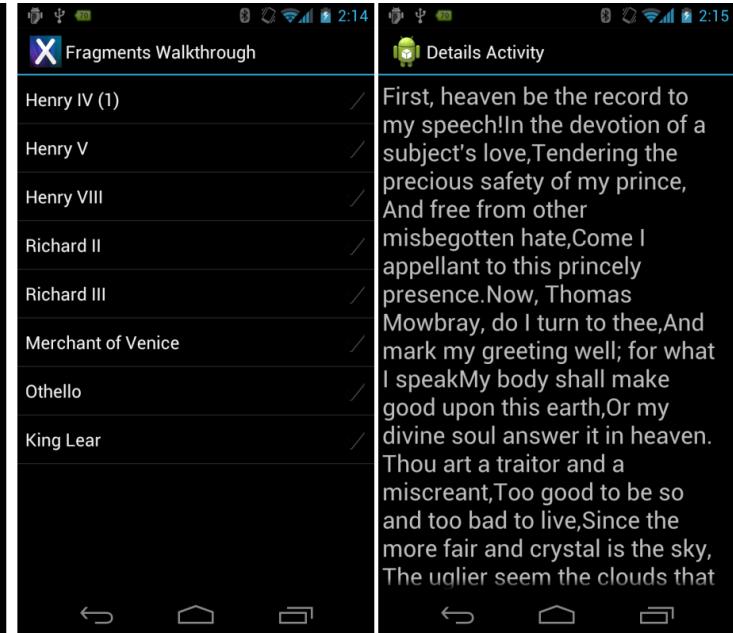
Android UI Design

Dealing with Countless Screen Sizes & Resolutions

Android UI Fragments

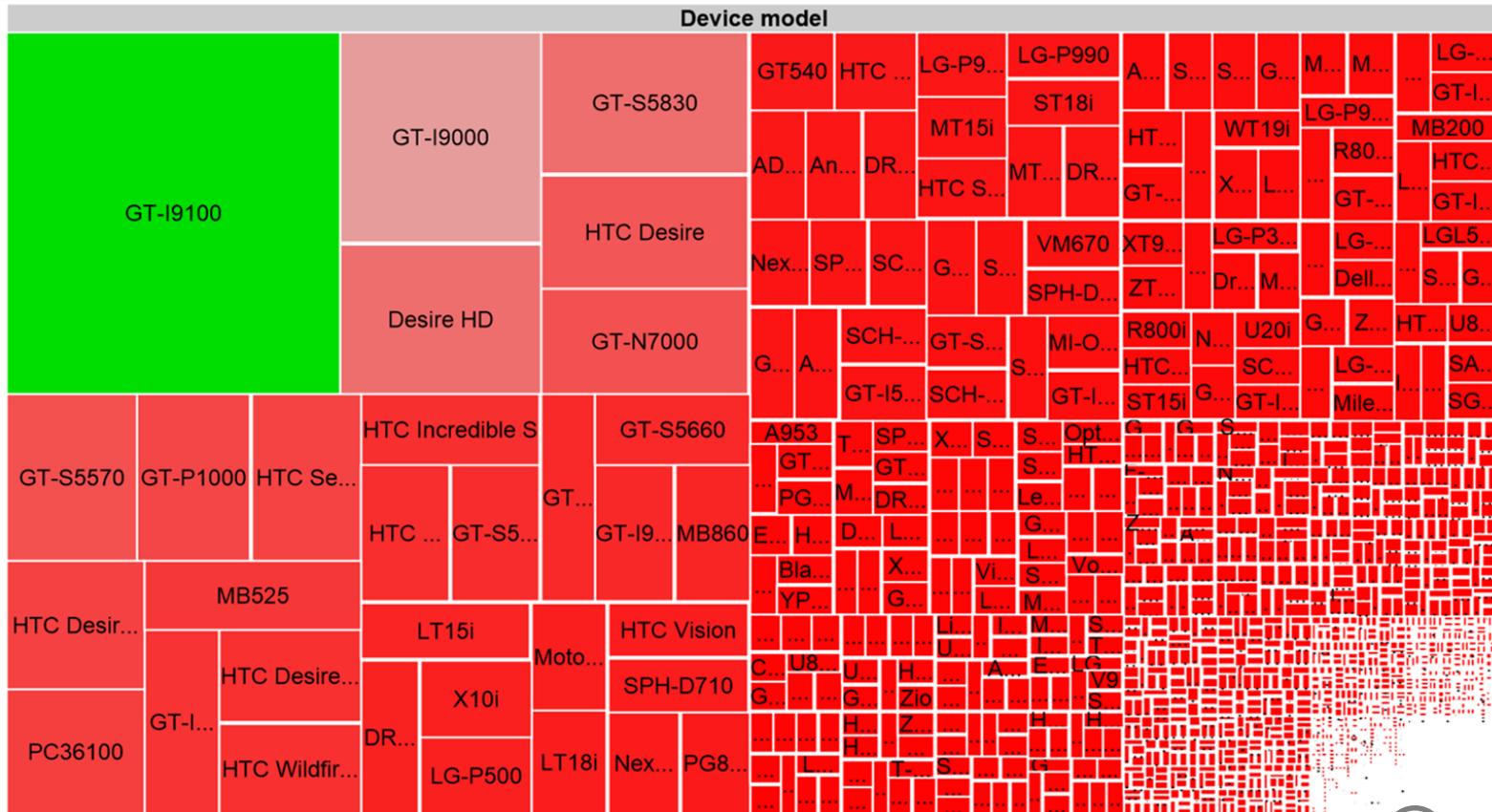


Tablet

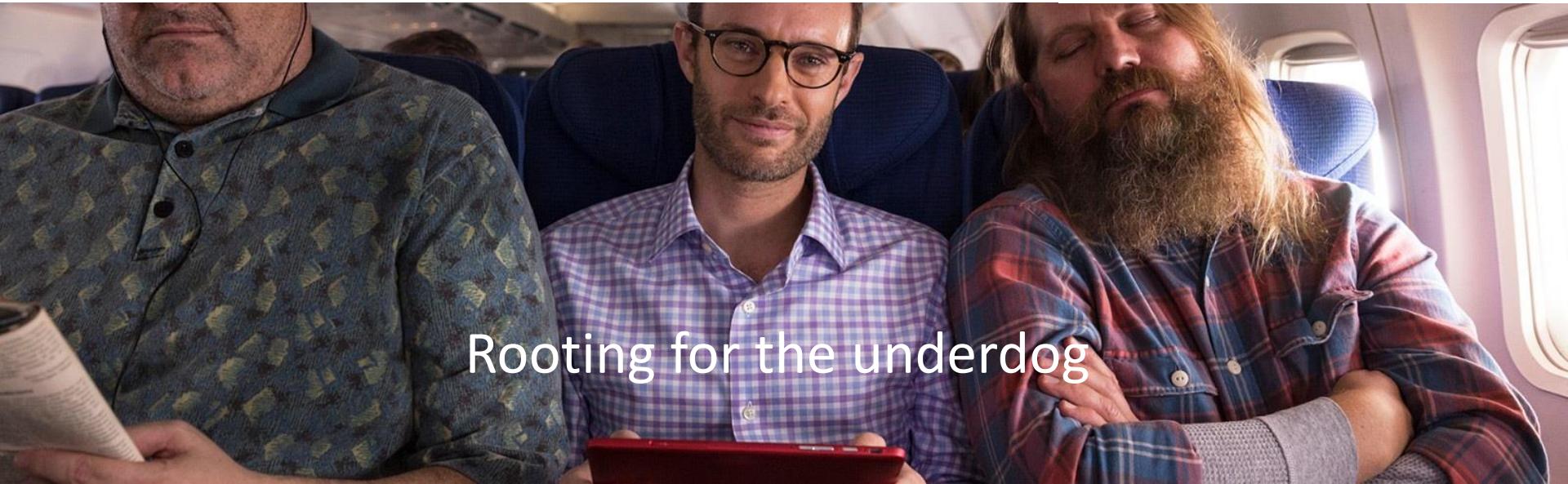


Phone

Android Platform Fragmentation



Windows & Windows Phone Development



Rooting for the underdog



What Makes Windows Phone Unique?

- The Start Screen & Live Tiles: Content
- Panorama & Pivot Experience
- People-first Integration & Quick Features
- Xbox Live Integration & Games
- Microsoft Office Apps
- Consistency + Choice
- Personal Preferences
- Developer Experience



Windows Phone in Numbers

240K

91%

10%

24

13



Windows: Some Key Differences

It's important to design for the platform differences as well as similarities



Produce

Fresh fruit
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Vegetables
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

14 Fresh fruit
2 Vegetables
5 Organic

Platform

Windows Phone

WinRT-XAML + C#, VB, C++
Silverlight Legacy API

Windows

WinRT Core:

- XAML + C#, VB, C++
- HTML + JavaScript (WinJS)

Both run C++ & D3D games

Screen Size

Windows Phone

800x480, 1280x720, 1280x768
Portrait, Landscape

Windows

1366x768, 1920x1080, etc.
Portrait, Landscape, Snapped

Controls

Windows Phone

Panorama, Pivot, ListPicker
LongListSelector

Windows

GridView, ListView, Semantic
Zoom, FlipView

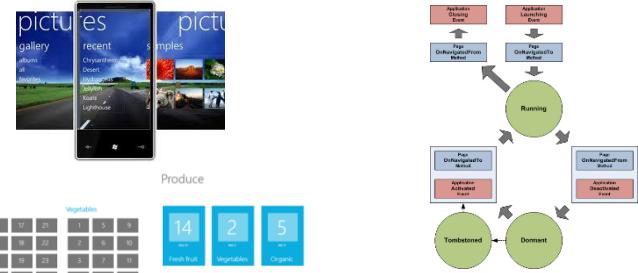
Lifecycle

Windows Phone

Launched from start/apps list.
Tombstones apps

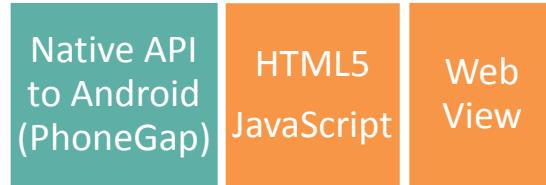
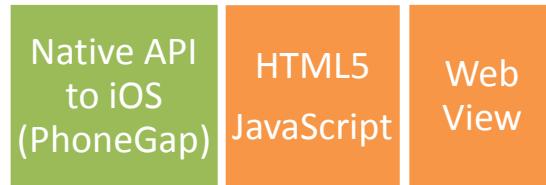
Windows

Resumes existing apps
No tombstoning



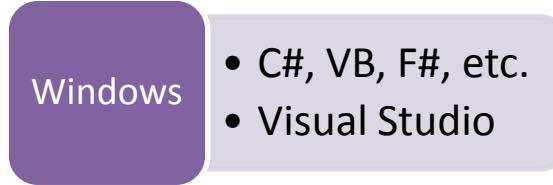
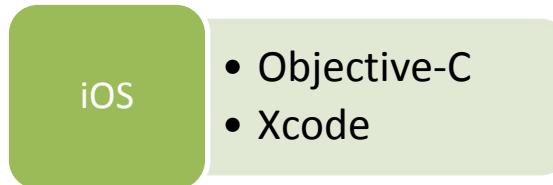
What is a Mobile Developer?

Mobile Web / Hybrid Dev

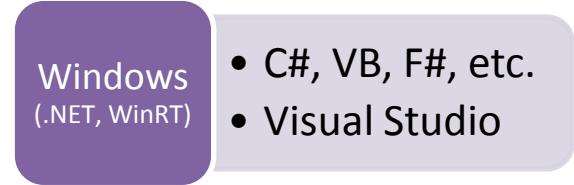
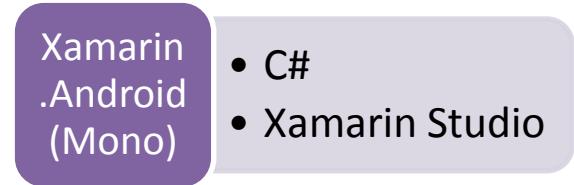
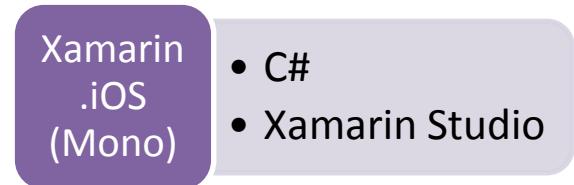


Phone**Gap**

Native Mobile Platforms



Native Cross-Platform Dev



Mobile Web / Hybrid Web Apps

PhoneGap and its Derivatives

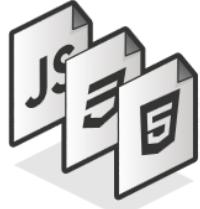


Phone**Gap**



Cross-Platform Mobile Apps

- Design & build the mobile app using HTML5, CSS3, & JavaScript
- Wrap it with Adobe PhoneGap
 - Free Cordova open source framework or PhoneGap build
 - Get access to native APIs (camera, compass, file, accelerometer, contacts, geolocation, etc.)
- Deploy to multiple platforms
 - iOS, Android, Windows Phone, Blackberry, WebOS, Symbian, etc.
- Multiple Cordova Variants Available
 - Telerik AppBuilder, Red Gate Nomad, IBM Worklight, HP Anywhere, etc.



Wrap your app with
PhoneGap



Deploy to **mobile**
platforms!



PhoneGap, by any other name...

- PhoneGap was originally developed by Nitobi
- In 2011, Adobe acquired Nitobi
- PhoneGap was donated to the Apache Software Foundation (ASF) under the name Apache Cordova
- Through the ASF, PhoneGap remains free and open source under the Apache License, Version 2.0
- PhoneGap is an open source distribution of Cordova
- Other commercial distributions of Cordova available
 - Telerik AppBuilder, Red Gate VS Nomad, IBM Worklight, HP Anywhere, etc.



PhoneGap Project Structure

- config.xml
 - Application attributes for PhoneGap Build
- index.html
 - Web app entry point
 - Included tags for phonegap.js, CSS, etc.
- index.css (in css folder)
 - Basic CSS styles
- index.js (in js folder)
 - With deviceReady handler



Cordova, PhoneGap, AppBuilder, Nomad...

Pros

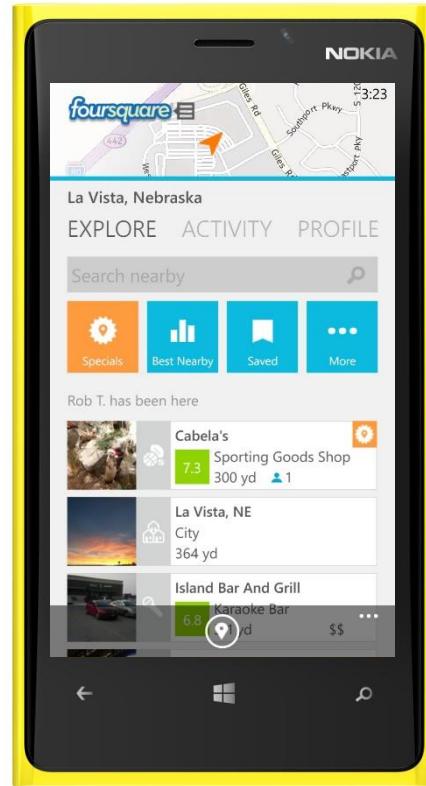
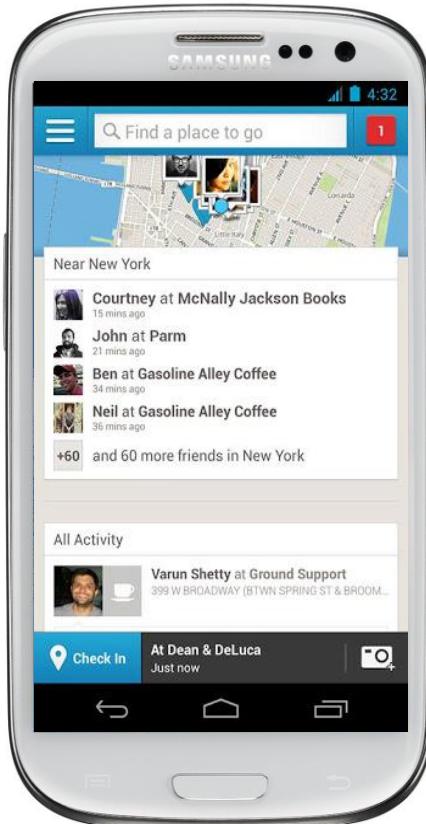
- Write once in HTML5 & JavaScript, deploy to multiple device platforms
- Code reuse
- Reuse existing Web expertise
- Lower development costs when targeting 2+ platforms
- Faster time to market on 2+ platforms
- Simplified deployment with cloud builds
- Modular architecture with plugins
- JQM adaptive rendering to emulate the device's native UI
- Telerik AppBuilder and Red Gate Nomad brings Cordova to Visual Studio + build in the cloud

Cons

- Single UI = Generic design that doesn't feel at home on multiple device platforms
- Browser discrepancies
- Inferior tooling
- Learn new JavaScript frameworks: jQuery UI, JQM, Knockout, Twitter Bootstrap, etc.
- Performance considerations
- Limited to device APIs exposed by PhoneGap vs. native platform APIs
- Reactionary to native platform changes
- High-end & 3D graphics limited / impossible
- Vendor lock-in



Cross-Platform Design?



Cross-Platform App Dev with Xamarin

10 years later, Mono is alive & kickin'!



What are Xamarin Tools?

- Xamarin 2.0
 - Xamarin.iOS (formerly known as MonoTouch)
 - Xamarin.Android (formerly known as Mono for Android)
 - Xamarin.Mac
 - Xamarin.Mobile
- Xamarin Studio
- Visual Studio Integration
- Component Bindings
- Component Store



Xamarin Studio



Visual Studio



Xamarin.iOS



Xamarin.Android



Xamarin.Mac



Bindings



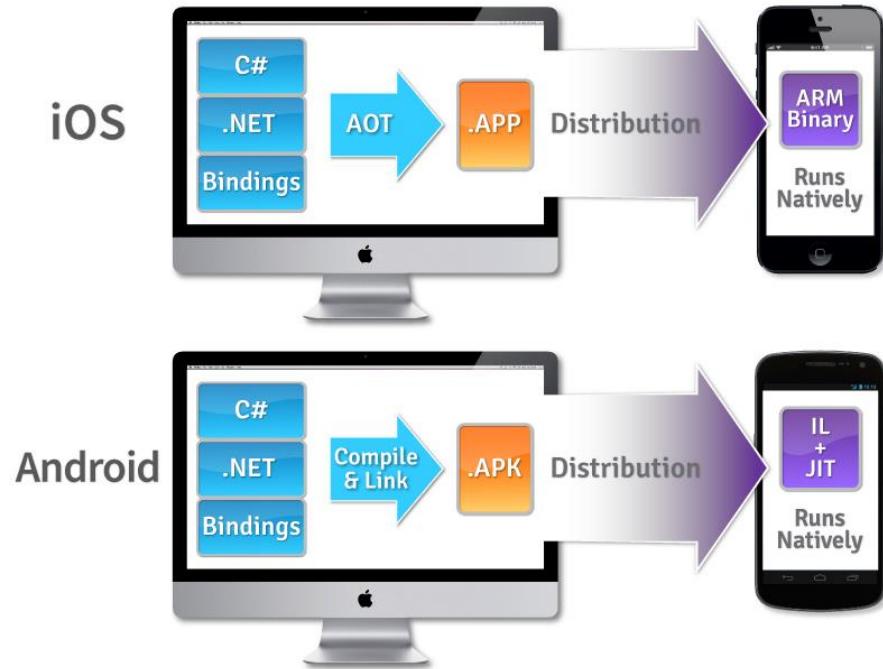
.NET



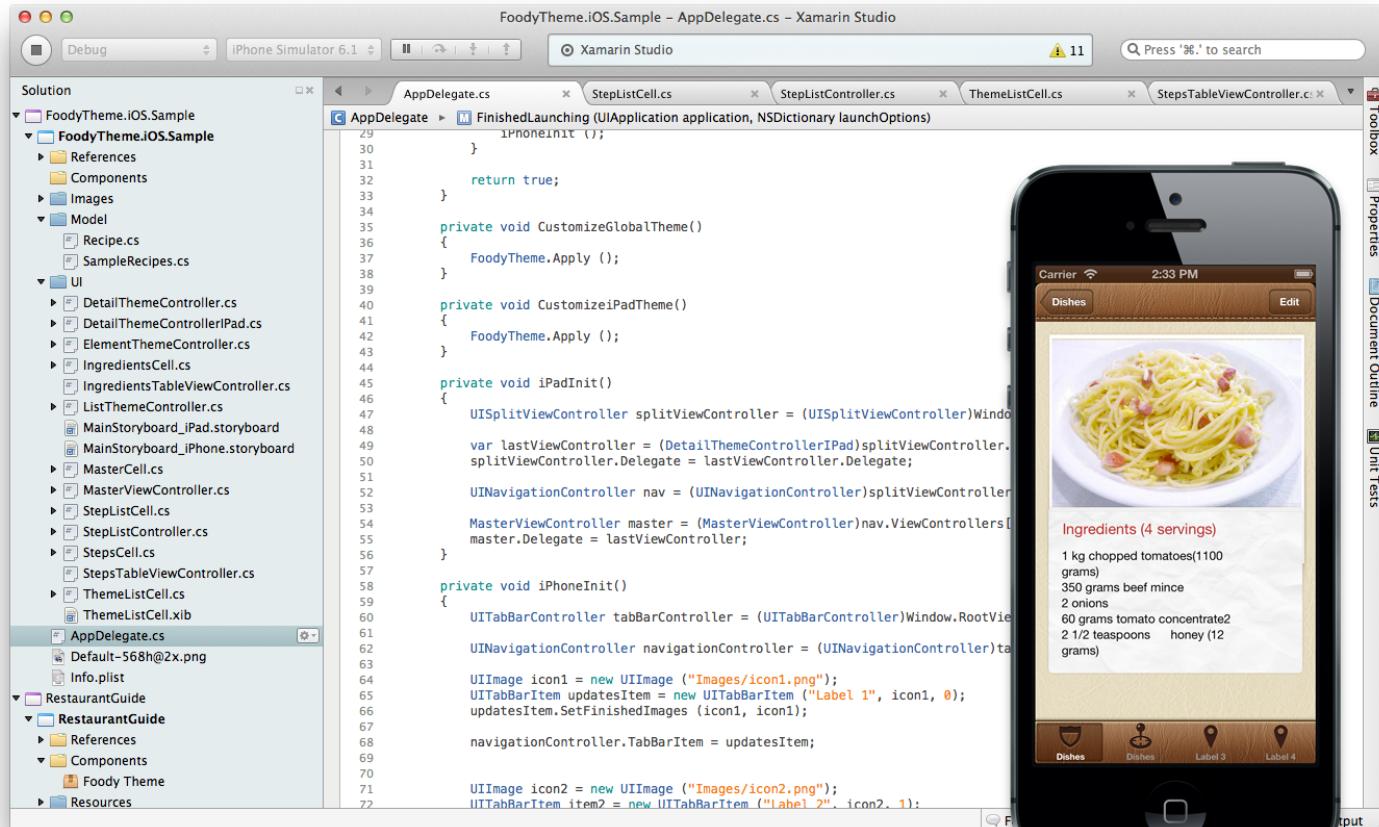
mono



Xamarin: How It Works



Xamarin Studio



Starter Edition
(free)

Indie Edition
(\$299)

Business
Edition (\$999)

Enterprise
Edition (\$1899)

Integration with Visual Studio in Business Edition & above



Native Dev: Platform Tools or Xamarin?

Platform Tools (Windows, iOS, Android)

- Default native method to build apps
- Free development tools & SDKs
- Requires learning at least one language & SDK per platform (C#, Java, Objective-C)
- Design, develop & maintain completely separate apps for each platform
- More learning resources available
 - Books, web sites, blogs, training, StackOverflow, videos, larger community, etc.
- iOS: Only option (yet) for GUI design with Interface Builder

Xamarin / Mono

- Reuse existing C# skills & source code (but you have to know C#)
- Need to buy an additional tool: extra cost
- Need to learn new tools & techniques
- Still need to learn the specifics of each platform SDK, app architecture & lifecycle
- Fewer third-party libraries available
- No built-in GUI designer for iOS (yet, in beta): Use IB in Xcode or code it!
- Offers a better Android designer than provided by Google for Eclipse
- Vendor lock-in / dependency



Which Mobile Approach is the Right One?

Is There a Silver Bullet?



Go Native or Go Home



If you want to chase that “Angry Birds” money...

Mobile Strategy Considerations

Audience	Objectives	Other Considerations
<ul style="list-style-type: none">• General Consumer Market• Niche Consumer Market• Enterprise Users• BYOD	<ul style="list-style-type: none">• Marketing “Checklist” Apps• Brand “Reach” Apps• Weekend Warrior Apps• Apps for Profit• Mobile Revolution Apps	<ul style="list-style-type: none">• Mobile Population Coverage Target & Desired Reach• Expertise• Resources• Timeframe



Summary



- There is no silver bullet, no “one size fits all”, when choosing a cross-platform mobile strategy
- Native Apps and Hybrid Apps both have their place
- Each mobile project should be evaluated separately
 - Audience, Goals, Reach, Expertise, Resources
- Always create a unique UI specific to the platform

iOS Technical Resources

- **Age of Mobility Blog**
 - www.AgeofMobility.com
- **Official Getting Started Videos**
 - developer.apple.com/videos/ios
- **WWDC Videos**
 - developer.apple.com/wwdc/videos
- **Pluralsight iOS Training**
 - www.pluralsight.com/training/Courses#ios
- **Subscribe to Dave Verwer's iOS Dev Weekly Newsletter**
 - <http://iosdevweekly.com>
- **Code by SteveZ**
 - www.infragistics.com/community/blogs/stevez
- **Torrey's Blog**
 - www.infragistics.com/community/blogs/torrey-betts
- **Twitter List**
 - twitter.com/ActiveNick/ios-dev-bloggers



Recommended iOS Learning References

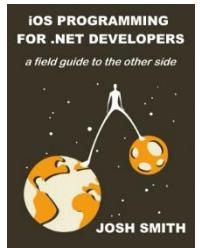


iOS Programming: The Big Nerd Ranch Guide
Edition 3 (Conway, Hillegass)

<http://amzn.to/PO0BI2>

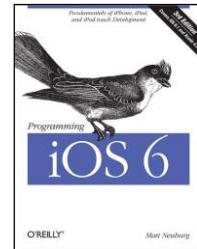
Objective-C Programming: The Big Nerd Ranch Guide
Edition 3 (Conway, Hillegass)

<http://amzn.to/PO0BI2>



iOS Programming for .NET Developers
(Josh Smith)

<http://iosfordotnetdevs.com>



Programming iOS 6, Third Edition
(Neuburg, O'Reilly)

<http://amzn.to/ZREPRO>





Free iBooks

Additional iOS Programming books are available for free from Apple via the iBooks Store on your iOS device, including Objective C, Cocoa Fundamentals, iOS, OS X, Deployment & more.



Available on iPad and iPhone

These iBooks are not very recent, dating back to 2010 and iOS version 4

But free is free!

Use them as a starting point but make sure to stay current with references on programming for iOS 5 and 6



Windows Phone Resources

- Windows Phone Developer Portal: dev.windowsphone.com
- Windows Phone 8 Jump Start Training: <http://bit.ly/wp8jump>
- Windows Phone 8 Dev for Absolute Beginners: <http://bit.ly/wp8devAB>
- Windows Phone Developer Blog: blogs.windows.com/windows_phone/b/wpdev
- Windows Phone Consumer Blog: blogs.windows.com/windows_phone/b/windowsphone
- Nokia Developer Portal: <http://developer.nokia.com>
- Nokia Dvlup Challenges & Rewards: <http://bit.ly/godvlup>
- Nokia Conversations Blog: <http://conversations.nokia.com>
- Microsoft App Studio: <http://apps.windowsstore.com>
- Nick Landry's Blog: www.AgeofMobility.com
- Windows Phone Developer Magazine (online): <http://flip.it/95YFG>
- GeekChamp (WP & Win8 dev): www.geekchamp.com
- Windows Phone Central (News): www.wpcentral.com



Technical Resources: PhoneGap & Web

- Official PhoneGap Site
 - <http://phonegap.com>
 - You will also need NodeJS: <http://nodejs.org>
- Official jQuery Mobile Resources
 - <http://jquerymobile.com/resources>
- Pluralsight Online Training
 - www.pluralsight.com/training/Courses/Find?searchTerm=phonegap
- Mobile Web Development IDEs
 - Sublime: www.sublimetext.com
 - JSFIDDLE: <http://jsFiddle.net>
 - JSBin: <http://JSBin.com>
 - Codiqa: <http://codiqa.com>
 - JetBrains WebStorm: www.jetbrains.com/webstorm

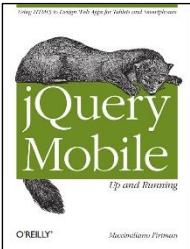


PhoneGap Articles and Posts

- PhoneGap 3.0 – Stuff You Should Know
 - <http://devgirl.org/2013/09/05/phonegap-3-0-stuff-you-should-know>
- PhoneGap 3 for Dummies, Part 1: Setup & a first example
 - <http://neophob.com/2013/08/phonegap-3-for-dummies-part-1-setup-and-a-first-example>
- PhoneGap and Cordova with iOS 7
 - <http://coenraets.org/blog/2013/09/phonegap-and-cordova-with-ios-7>



Recommended JQM & PhoneGap Books

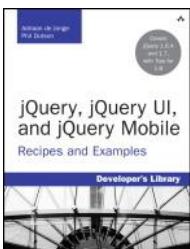
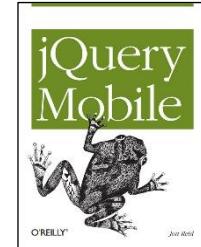


jQuery Mobile: Up and Running
(Firtman, O'Reilly)

<http://amzn.to/15Olkce>

jQuery Mobile
(Reid, O'Reilly)

<http://amzn.to/1aAcd6K>

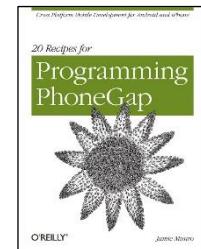


jQuery, jQuery UI, and jQuery Mobile: Recipes and Examples
(de Jonge, Addison-Wesley)

<http://amzn.to/1eB5KHE>

20 Recipes for Programming PhoneGap: Cross-Platform
Mobile Development for Android and iPhone (Munro, O'Reilly)

<http://amzn.to/18SohJC>



Thank You!

Slides will be posted on SlideShare

Let me know how you liked this session. Your feedback is important and appreciated.



Blog: www.AgeofMobility.com

Twitter: [@Activenick](https://twitter.com/Activenick)

Email: ext-nick.landry@nokia.com

Mobile Apps: www.bigbaldapps.com

LinkedIn: www.linkedin.com/in/activenick

Website: www.mobility42.com

Slideshare: www.slideshare.net/Activenick

