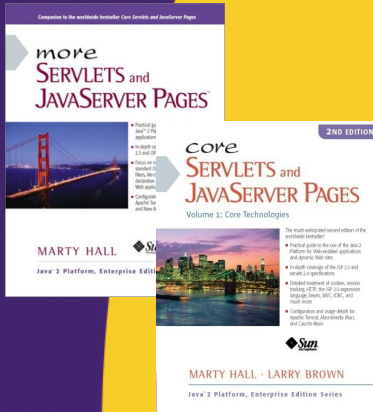




Android Programming: Overview

Originals of Slides and Source Code for Examples:
<http://www.coreservlets.com/android-tutorial/>

Customized Java EE Training: <http://courses.coreservlets.com/>
Java, JSF 2, PrimeFaces, Servlets, JSP, Ajax, jQuery, Spring, Hibernate, RESTful Web Services, Hadoop, Android.
Developed and taught by well-known author and developer. At public venues or onsite at *your* location.



**For live Android training, please see courses
at <http://courses.coreservlets.com/>.**

Taught by the author of *Core Servlets and JSP*, *More Servlets and JSP*, and this Android tutorial. Available at public venues, or customized versions can be held on-site at your organization.



- Courses developed and taught by Marty Hall
 - JSF 2, PrimeFaces, servlets/JSP, Ajax, jQuery, Android development, Java 6 or 7 programming, custom mix of topics
 - Ajax courses can concentrate on 1 library (jQuery, Prototype/Scriptaculous, Ext-JS, Dojo, etc.) or survey several
 - Courses developed and taught by coreservlets.com experts (edited by Marty)
 - Spring, Hibernate/JPA, EJB3, GWT, Hadoop, SOAP-based and RESTful Web Services
- Contact hall@coreservlets.com for details

Topics in This Section

- **Motivation**
 - Web Apps vs. Mobile Apps
 - iPhone Apps vs. Android Apps
- **Books and references**

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Web Apps vs. Android Apps

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Advantages of Web Apps

- **Universal access**
 - Browsers are everywhere
 - Any device on the network can access content
 - PCs, Macs, Linux, Android, iPhone, Blackberry, etc.
- **Automatic “updates”**
 - Content comes from server, so is never out of date
- **Well-established tools and methodologies**
 - In multiple languages
 - Java, PHP, .NET, Ruby/Rails, CGI, etc.



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Disadvantages of Web Apps

- **Few and weak GUI controls**
 - Textfield, text area, button, checkbox, radio, list box, combo box. That's it! No direct drawing (except for HTML5 Canvas)
- **Cannot interact with local resources**
 - Cannot read files, call programs, or access devices on the user's machine
- **Inefficient communication**
 - HTTP is weak protocol
- **Hard to write**
 - Requires knowledge of many technologies
 - Java, HTML, HTTP, CSS, JavaScript, jQuery, XML
- **Designed for large displays with mouse**
 - So harder to use on small phone displays with touch screen

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Advantages of Mobile Apps

- **Many GUI controls**
 - Textfield, text area, button, checkbox, radio, list box, combo box, clock, calendar, date picker, dialog box, image gallery, etc.
 - Comparable to options in desktop programming
 - Supports direct drawing
 - So animated games ala Angry Birds possible
- **Can interact with local resources**
 - Can read files (e.g., contacts list), have local database, access GPS, initiate phone calls, get input from microphone, create voice output, read screen orientation, etc.

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Advantages of Mobile Apps (Continued)

- **Efficient communication**
 - Can use any networking protocols you want
- **Easier (?) to write**
 - Requires knowledge of one language only
 - Java for Android
 - Objective C for iPhone
- **Designed for small displays with touch screen**
 - So, many apps and GUI controls are optimized for this environment

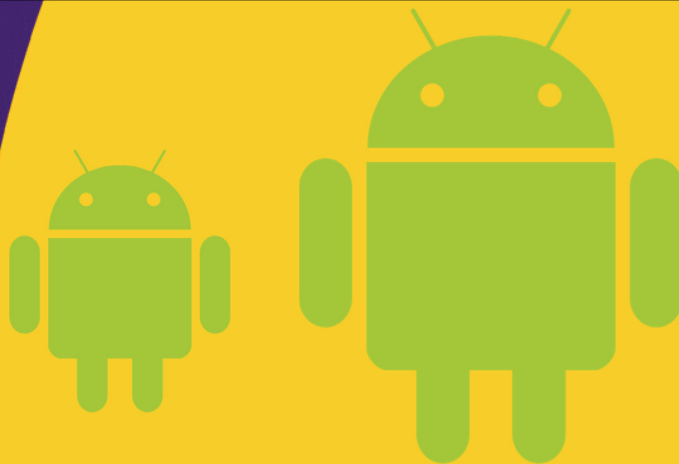
9

Disadvantages of Mobile Apps

- **No universal access**
 - Apps must be installed one at a time on each phone
 - An Android app cannot run on iPhone, Blackberry, PC, Mac, or Linux box
- **Difficult to manage updates**
 - User must intervene to get latest versions
- **Newer (esp. Android)**
 - So, fewer established tools and methodologies
 - On the other hand, Android programming is similar to desktop Java programming, and there are plenty of established approaches there

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 iPhone

Android Apps vs. iPhone Apps

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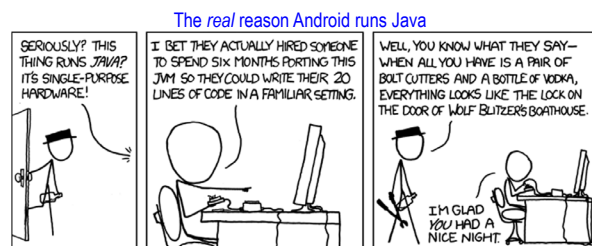
Installing Apps

- **General apps**
 - iPhone has larger selection
 - Android trying to catch up
- **In-house-developed corporate apps**
 - iPhone apps can only be installed via the App Store
 - iPhone requires you to submit app to the Apple App Store and get approval, even for apps from your own company
 - Unless you jailbreak your phone
 - Android apps can be installed through
 - Google App Store
 - Amazon App Store
 - **USB connection from PC**
 - **Email**
 - **Corporate Web site**

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Languages for Apps

- **iPhone**
 - Objective-C
 - Similar to, but not exactly the same as, C++
 - Virtually no corporate presence for Objective-C, other than for mobile apps
- **Android**
 - Java
 - The single most widely used language inside corporations
 - C/C++
 - Can call native apps (with some difficulty) via an approach similar to JNI for desktop Java



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Operating Systems for Developing Apps

- **iPhone**

- Macs

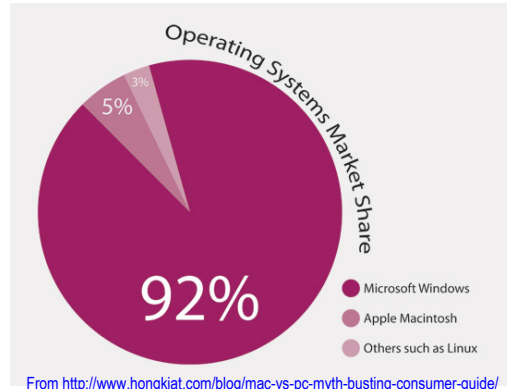
- **Android**

- Anything with Java and Eclipse

- Macs
- PCs
- Linux
- Solaris

- **Issue**

- Not so much which is cooler and which you personally prefer, but rather which is *already* installed in corporate environments



From <http://www.hongkiat.com/blog/mac-vs-pc-myth-busting-consumer-guide/>

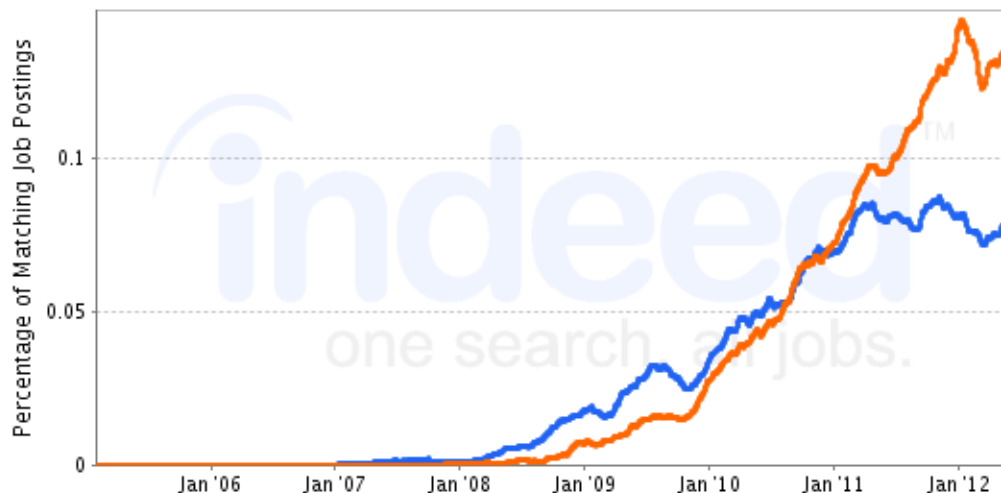


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Programming Jobs: Android vs. iPhone

Job Trends from Indeed.com

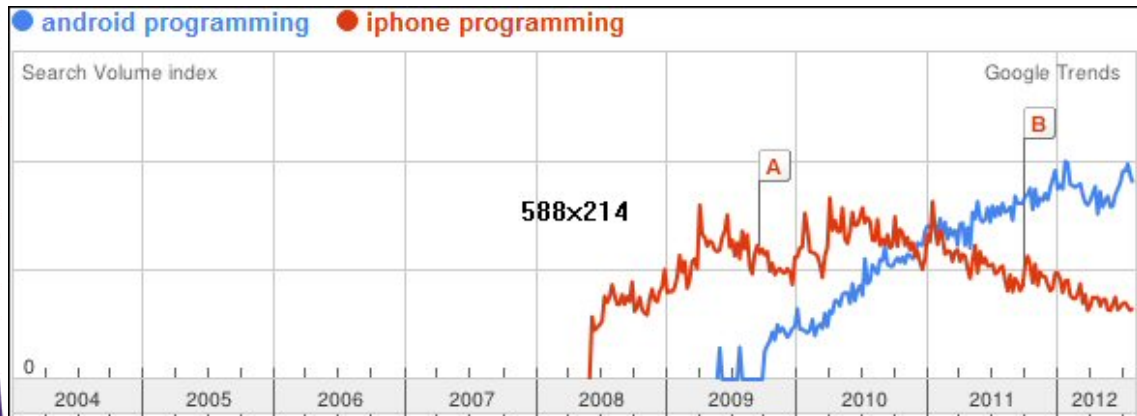
— android programming — iphone programming



- Caveat: Indeed.com shows rough trends only
 - Job postings with both words anywhere in posting
 - Biased by the job sites it samples

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Google Search Trends: Android vs. iPhone Programming

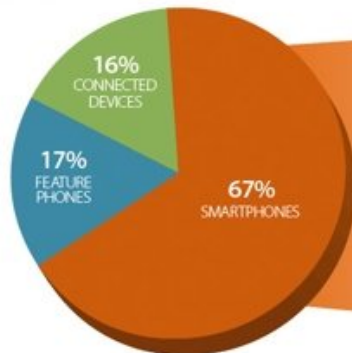


- Caveat: search volume shows rough trends only
 - For example, one of Android or iPhone might have clearer documentation, and require less searching

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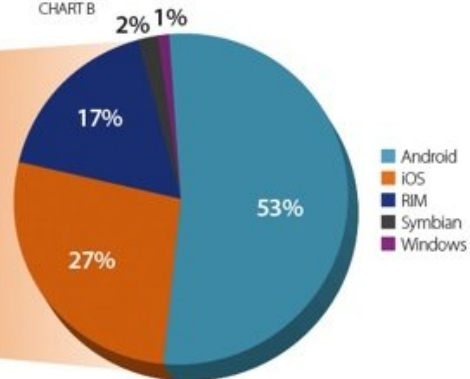
Advertising Revenue: Android (53%) vs. iPhone (27%)

Smartphone, Feature Phone & Connected Device Impression Share
CHART A



Source: Millennial Media, 5/11.
Smartphone data does not include what could be considered Smartphones running proprietary Operating Systems, e.g. Samsung Instinct, LG-Vu. Millennial Media defines a Connected Device as a handheld device that can access the mobile web, but is not a mobile phone. Examples include Apple iPod Touch, Sony PSP, Nintendo DS, iPad, etc.

Smartphone OS Mix
Ranked by Impressions
CHART B



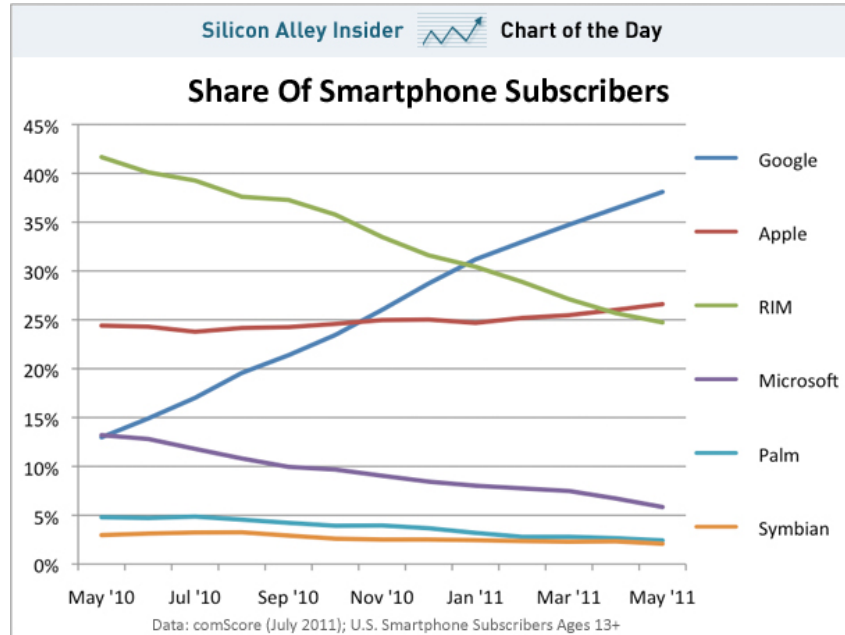
Source: Millennial Media, 5/11.
Other includes webOS, Danger, Nokia OS, Palm OS.

millennial media
mobilemix
THE MOBILE DEVICE INDEX

- Caveats: advertising does not equate to market volume, biased by who Millennial Media works with

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Market Presence



– Caveat: based on survey, not sales data

Raw data at http://www.comscore.com/Press_Events/Press_Releases/2011/7/comScore_Reports_May_2011_U.S._Mobile_Subscriber_Market_Share

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Other Issues

- **Market presence based on sales data**
 - Blackberry & iPhone used to dominate smart phone market
 - 2nd quarter 2010 smart phone sales (source: Nielsen)
 - Blackberry: 33%
 - Android: 27%
 - Caveats: these are sum of all Android devices. And, many Android phones given away for free with carrier subscriptions. Also, these numbers partially contradict graph on previous slide.
 - iPhone: 23%

- **Phone features, quality of apps, and coolness factors**

– Matter of opinion, but iPhone very strong here



From Randall Munroe and xkcd.com

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Bottom Line: iPhone vs. Android

- **Which to use personally**
 - iPhone has large market share, bigger app store, cooler interface (?), and more loyal users
 - Android more open and growing more rapidly
 - Bottom line: no clear winner, personal preferences prevail, but iPhone has edge
- **Which to use for in-house corporate apps**
 - iPhone apps very hard to install, Android simple
 - iPhone uses Objective C, Android uses Java
 - Bottom line: Android is clear winner

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Wrap-Up

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Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

References

- **Books (in rough order of preference)**
 - *Professional Android 4 Application Development* (Meier)
 - *Busy Coder's Guide to Android Development* (Murphy)
 - Online only: <http://commonsware.com/Android/>
 - *Android Cookbook* (Darwin)
 - *Pro Android 3* (Komatani et al)
 - *Android Developer's Cookbook* (Steele & To)
 - *Android in Action, 2nd Edition* (Ableson, Sen, & King)
 - *Android Application Development for Dummies* (Felker)
- **Online references**
 - <http://developer.android.com/>
 - By far the most important single reference.
 - Android forum on StackOverflow
 - <http://stackoverflow.com/questions/tagged/android>
 - Android widget gallery
 - <http://www.droiddraw.org/widgetguide.html>

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Summary

- **Web apps vs. Android apps**
 - Web apps can run on Android, iPhone, Blackberry and regular computers. But, they have weaker GUIs, cannot use local resources (files, databases, GPS, camera), and are often ill-suited to small screens
 - Android apps can local resources, are optimized for small screens, have richer GUIs, but cannot be accessed on other phone types or on regular computers
- **iPhone vs. Android**
 - For personal use, situation is unclear, but edge to iPhone
 - For building corporate apps, Android is clear winner

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Questions?

JSF 2, PrimeFaces, Java 7, Ajax, jQuery, Hadoop, RESTful Web Services, Android, Spring, Hibernate, Servlets, JSP, GWT, and other Java EE training.

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