Topics in This Section

• Motivation
  – Web Apps vs. Mobile Apps
  – iPhone Apps vs. Android Apps
• Books and references
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  - Content comes from server, so is never out of date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.

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
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
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
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

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

*The real reason Android runs Java*

From Randall Munroe and xkcd.com
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.

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
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

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

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

- Caveat: based on survey, not sales data


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
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

Wrap-Up
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* (Komateni 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

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.
Questions?

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.