User Interaction: Intro to Android

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A brief history of Android

• Rumors of the “gPhone” started about the time the iPhone launched
• Google dropped the bomb on 11/5/2007
  • It wasn’t working on a handset
  • It was working on an operating system
  • to compete with Microsoft, Symbian, telephone companies. Who else ?
A brief history of Android

- Why would Google do this?
  - It doesn’t want to be locked out of mobile advertising
  - It’s the same reason they supported Firefox
  - It’s the same reason they built Chrome
  - It’s the same reason they bought YouTube
  - It’s about maintaining access to advertising channels today, and having access to tomorrow’s innovations
- Competitors don’t need to let Google advertise
A brief history of Android

• Actually it wasn’t just Google
• It was the Open Handset Alliance (OHA)
  • including HTC, LG, Samsung, T-Mobile and more
  • pushing
• Based on Linux
  • optimized for mobile devices
A brief history of Android

- The architecture is highly modular
  - “Location” can come from many places
  - Text messaging handling can be done by any software component
- It is predominantly open-source
- It is predominantly Java-based
A brief history of Android

What would it take to build a better mobile phone?

A commitment to openness, a shared vision for the future, and concrete plans to make the vision a reality.

Welcome to the Open Handset Alliance™, a group of 47 technology and mobile companies who have come together to accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience. Together we have developed Android™, the first complete, open, and free mobile platform.

We are committed to commercially deploy handsets and services using the Android Platform.

- Develop Android applications: Get the SDK
- Contribute to the Android Open Source Project: Get the source code

http://www.openhandsetalliance.com

- http://www.youtube.com/watch?v=7Y4thikv-OM
A brief history of Android

- First SDK was released on 11/12/2007
- Main conceptual competitor is LiMO
  - Linux for Mobile
    - Verizon and Mozilla key initial players
    - Many partners in both projects
    - Outside Asia, no one cared
A brief history of Android

- 6/24/2008 Nokia announces purchase of Symbian from Sony Ericsson in response
  - starts the Symbian Foundation to open-source their main platform, gets released in 2011 as “shared-source”
- 10/21/2008, Google puts all of Android into open source using the Apache License
- 12/9/2008 Sony Ericsson joins the OHA
  - Google denies rumors of the gPhone at the same time

http://www.engadget.com/2008/06/24/nokia-buys-symbian/
A brief history of Android

- 8/12/2010 Oracle sues Google over intellectual property in Java
- 2/11/2011 Nokia announces it is abandoning Symbian for Windows 7
- 10/5/2011 Steve Jobs dies
- From 2011 - 2013 Nokia fell from the #1 smart phone maker to #10
- 5/2012 Google is initially freed from infringement claims
- 9/2/2013 Microsoft begins purchase of Nokia’s phone business
- 5/2014 Google judgement on API is partially reversed case continues

Overview of Android

- Platforms running Android
  - in 2009
    - T-Mobile G1 phone
    - HTC developer phone
  - in 2011
    - Hundreds
  - in 2014
    - Silly
Overview of Android

- Various code revisions are named after pastries (sort of)
  - Cupcake (released on 4/30/2009) v1.5
  - Donut (released on 9/15/2009) v1.6
  - Eclair (released on 10/26/2009) v2.1
  - Froyo (released on 5/20/2010) v2.2
  - Gingerbread (?) v2.3 (SIP, NFC)
  - Honeycomb (5/2011) v3.0 (tablet)
  - Ice Cream Sandwich (11/14/2011) v4.0 (face recognition)
  - Jelly Bean (11/13/2012) v4.2 (Google Now)
  - KitKat (9/3/13) v4.4 (experimental runtime “ART”)
Overview of Android

- Various code revisions are named after pastries (sort of)
  - Lollipop v5.0 released (11/12/2014) 64 bit CPUs, ART, battery
Overview of Android

- Google play (née Android Marketplace)
- Place to get 3rd-party android apps
- Utilizes Google Checkout for payment
- Not exclusive source for applications
- Applications are not “blessed” at all by Google
- It is merely a convenience for developers

https://play.google.com/store?hl=en
Overview of Android

Intro to Android

Easy Tie
base sign

Description

Don’t know how to tie a tie?
Learn it with Easy Tie!
Easy Tie is an app that shows you step-by-step how to tie a necktie.
Knots included:
- Simple Knot
- Double K.
- Small K.
- Half Windsor K.
- Windsor K.

Visit Developer’s Website

App Screenshots

User Reviews

5 star 71
4 star 49
Overview of Android

Intro to Android

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- Saint Andrew K.

Visit Developer's Website  Email Developer

App Screenshots

User Reviews  Write a Review

5 star 79
Average rating

ABOUT THIS APP
RATING:
(106)
UPDATED:
June 21, 2010
CURRENT VERSION:
1.6
REQUIRES ANDROID:
1.5 and up
CATEGORY:
Lifestyle
INSTALLS:
5,000 - 10,000
SIZE:
1.0M
PRICE:
$1.99
CONTENT RATING:
Everyone
Easy Tie
basesign - June 20, 2010
Lifestyle

$1.99 Buy  Add to Wishlist

This app is compatible with your device.

Description
Easy Tie is an app that shows you step-by-step how to tie a necktie.
Knots included:
- Simple Knot
Intro to Android

Android Features (hardware dependent)

- Application Framework
  - enabling reuse and replacement of components
- Dalvik virtual machine (now ART)
  - optimized for mobile devices
- Integrated browser
  - based on the open source WebKit engine
- Optimized graphics
  - powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification

Android Features (hardware dependent)

- SQLite
  - for structured data storage
- Media support
  - (MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)
- GSM Telephony
- Bluetooth, EDGE, 3G, and WiFi
- Camera, GPS, compass, and accelerometer

- Some more advanced context in Lollipop

Intro to Android

Android Features (hardware dependent)

• Multi-touch
  • brief concern about patent infringement with Apple
• Multi-tasking support
• Tethering
  • What is this?
• NFC / Android Beam

Intro to Android

Android Features (hardware dependent)

• Rich development environment
  • a device emulator
  • tools for debugging
  • tools for memory profiling
  • tools for performance profiling
• Special version of Eclipse IDE
  • New Android Studio in Beta

Application Fundamentals

• By default:
  • Each application is run in its own process
  • Each process has its own virtual machine
  • Each process has its own user that runs it

Application Fundamentals

- Code reuse is central to Android
- Applications can be started from several points
  - not just “main()”
- Four components that can be run:
  - Activities
  - Services
  - Broadcast receivers
  - Content providers

Application Fundamentals

- Activities
  - a user interface for doing a task
  - e.g., a photo browser, a “send-mail” interface
  - subclass of “Activity” base class
  - an application is a collection of activities that call each other (or activities in other applications)

Application Fundamentals

- Services
  - a task that is typically run in the background
  - e.g., a music player
  - subclass of “Service” base class

Application Fundamentals

- Broadcast receivers
  - receives broadcast announcements
  - signals from the os and other applications
  - e.g., “user has entered a new location”
  - “user has taken a photo”
- subclass from “BroadcastReceiver”

Application Fundamentals

- Content provider
- provides data
- extends the “ContentProvider” class
