CHAPTER 1 – INTRODUCTION TO MOBILE APPLICATION DEVELOPMENT

Before Getting Started

- Discussion about your Mobile Phone
- Which type of cell phone do you have
- Why are we use particular cell phone
- Why we go for particular company's cell phone
- Statistics in the hall
- Google search

Agenda

- **Why** We are Here?
- Get Basic Idea of **Mobile and Smartphone Applications**
- Get Basic Idea of **Mobile, Smartphone & Tablet Platforms**
- Identify the **Position of particular Platform over all platforms**
- **Background** and **History** of mobile applications
- **Why** Should We Learn mobile app development
- **which platform is on the top.**
- **Why should we learn that platform**
- how to create an application on android platform

Why we are here?

- To Get Introduced to the **Latest Mobile Application Development Trends**
- To Get **Hands-on Experience and Expertise** to Develop Android Applications.
- To get Basic Idea and to Prepare ourselves about **How to Adopt Upcoming Mobile Technologies** (in the emerging field of Android, iOS)

Why we are here?

- To Identify the **Prospects and Features** of One Platform compare to others (iPhone, BlackBerry, Android, Windows 8 etc.)
- To **Create and Deploy Applications/Software** for Users or Business Clients.
- And Definitely to start a career as a **Mobile Application Developer.**

Mobile and Smartphone Applications

1) Mobile Phones :-

A **mobile phone** (also called **mobile**, **cellular telephone**, **cell phone**, or **hand phone** is an **electronic device** used to make

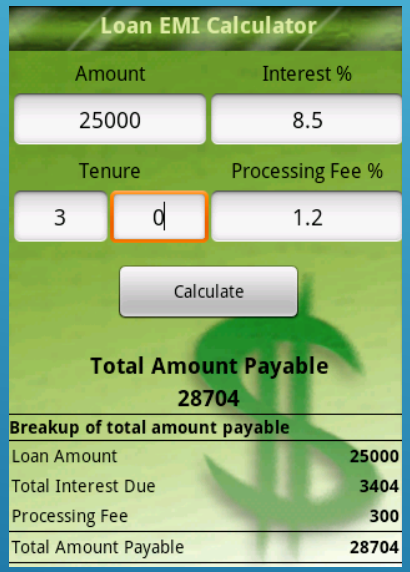
1. **Calls across a wide geographic area.**
2. **Send Text SMS**
3. Can see call records
4. Can capture image
5. Can run music
6. Can browse web etc.

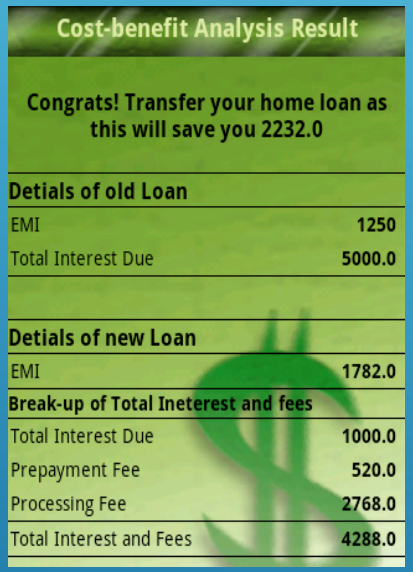
To learn about mobile phones in details:
http://en.wikipedia.org/wiki/Mobile_phone

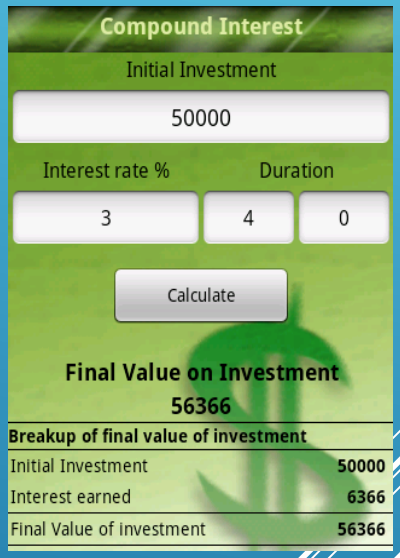
You'll get detailed history about how this technology evolved over the years

Mobile and Smartphone Applications

Category: Utility Tools







Another example can be: **Daily Planner Application**

Possible Features:

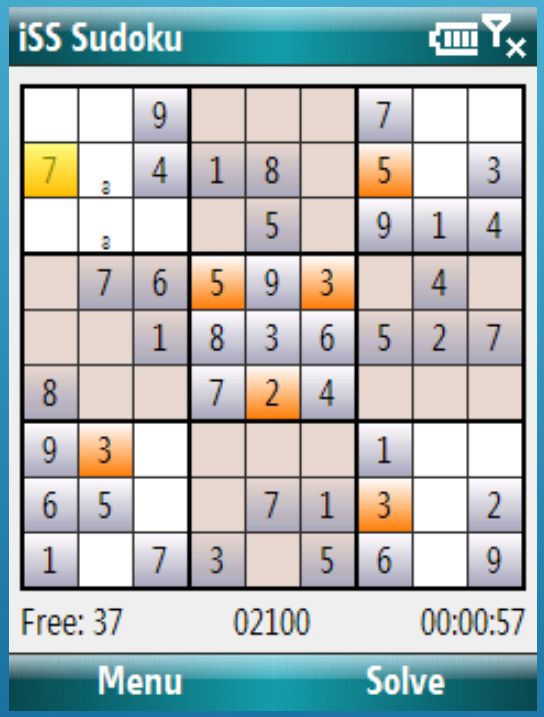
1. Task List
2. Reminder
3. Appointment etc.

Mobile and Smartphone Applications

Mobile and Smartphone Applications: Some Examples (Contd.)

Category: Games

Sudoku



Tetris

Snak

Mobile and Smartphone Applications

Mobile Phone Applications: Development

1. Different Mobile phone vendor companies use different p
   for developing applications for their own platform.
2. We'll discuss about a open **"Legacy"** platform as an exam
   is **J2ME**

Java Platform, Micro Edition, or **Java ME:**

1. It is a **Java platform** designed for embedded systems (mo
   Devices are one kind of such systems) .
2. Target devices range from industrial controls to mobile p
   with Java (KVM support).
   Formerly known as **Java 2 Platform, Micro Edition** (**J2ME**).
   For details:
   http://en.wikipedia.org/wiki/Java_Platform,_Micro_Editi

Nokia, **Samsung**, **Sony Ericsson** and many other vendors supports J2ME
applications and games development

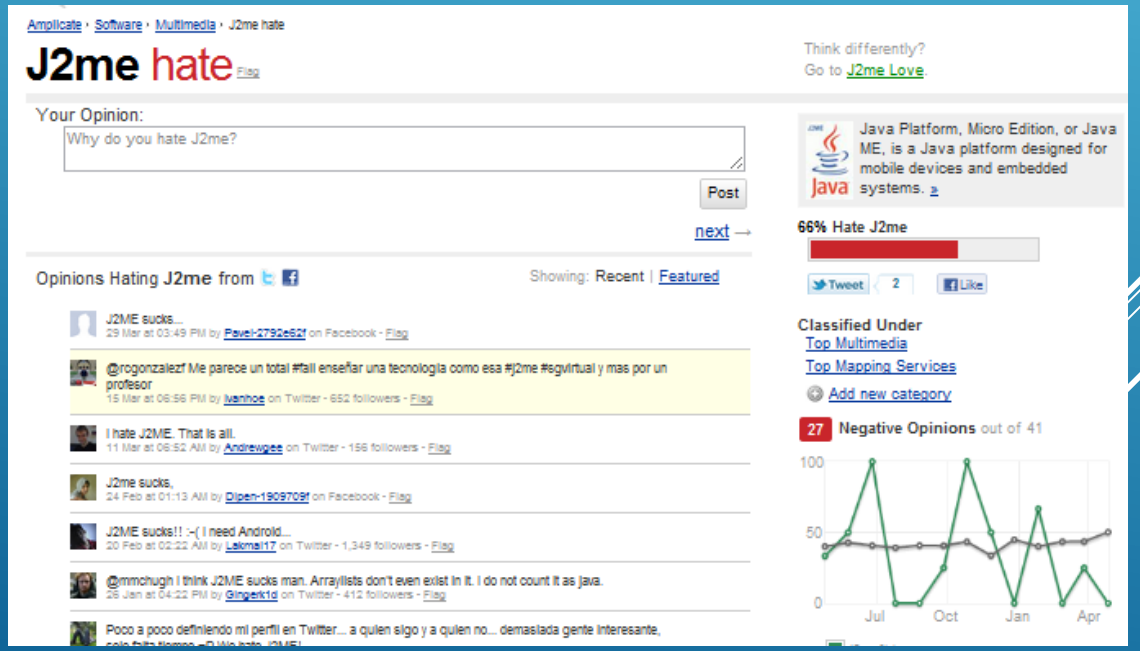
Mobile and Smartphone Applications

Mobile Phone Applications: Development With J2ME

Limitations

1. Memory Issues
    1. Vendor Specific Implementation
    2. Insufficient Memory
    3. Inefficient Memory Management
2. Device Compatibility Issues
3. **Not enough Access** to Core System of the Phone
4. Vendor Specific Implementation of **KVM**

That is why…
We see sites like this:



Mobile and Smartphone Applications

Smart Phones

1. A **smartphone** is a mobile phone that offers **more advanced computing ability, Features and connectivity** than a contemporary mobile phones.
2. Smartphone's may be thought of as **handheld computers integrated with a mobile telephone.**
3. They also provide their own Operating System with Application Development Framework

To learn about smart phones in details:
http://en.wikipedia.org/wiki/Smartphone

You'll get detailed history about how this technology evolved over the years

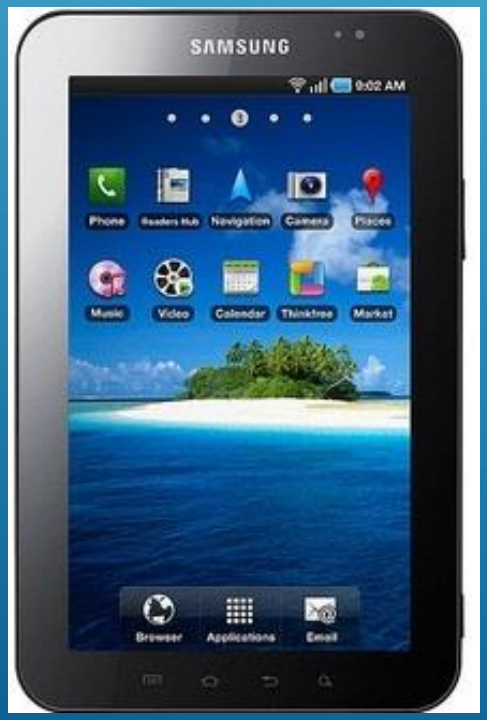
Mobile and Smartphone Applications

Android iPhone BlackBerry Palm Pre

Mobile and Smartphone Applications

Tablet Platforms

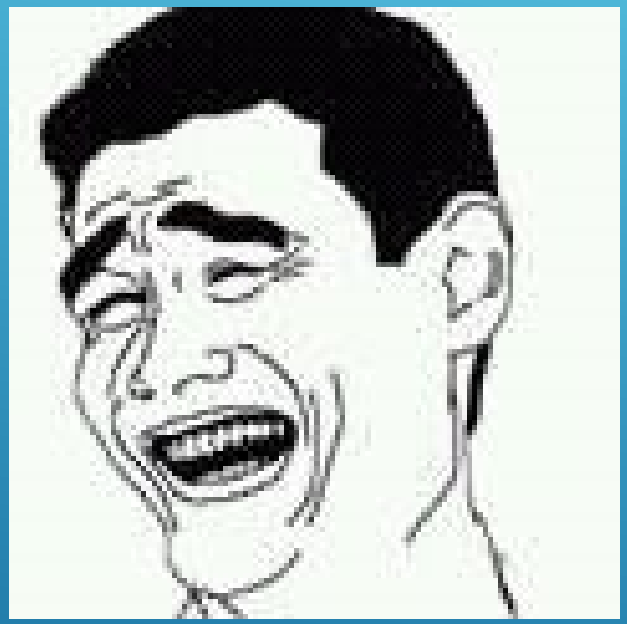
Android: Galaxy Tab



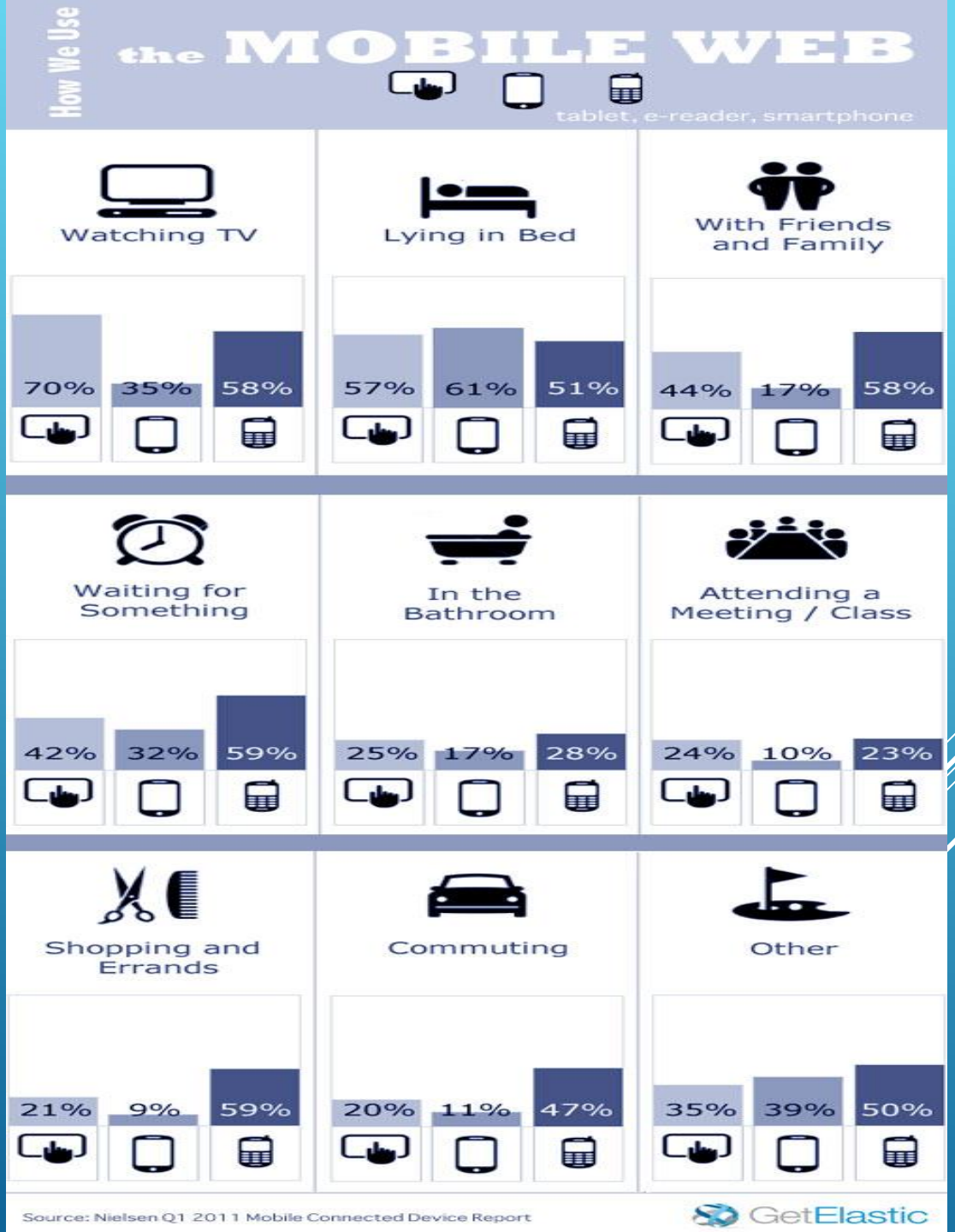
Apple: iPad

Acer Iconia Tab W500

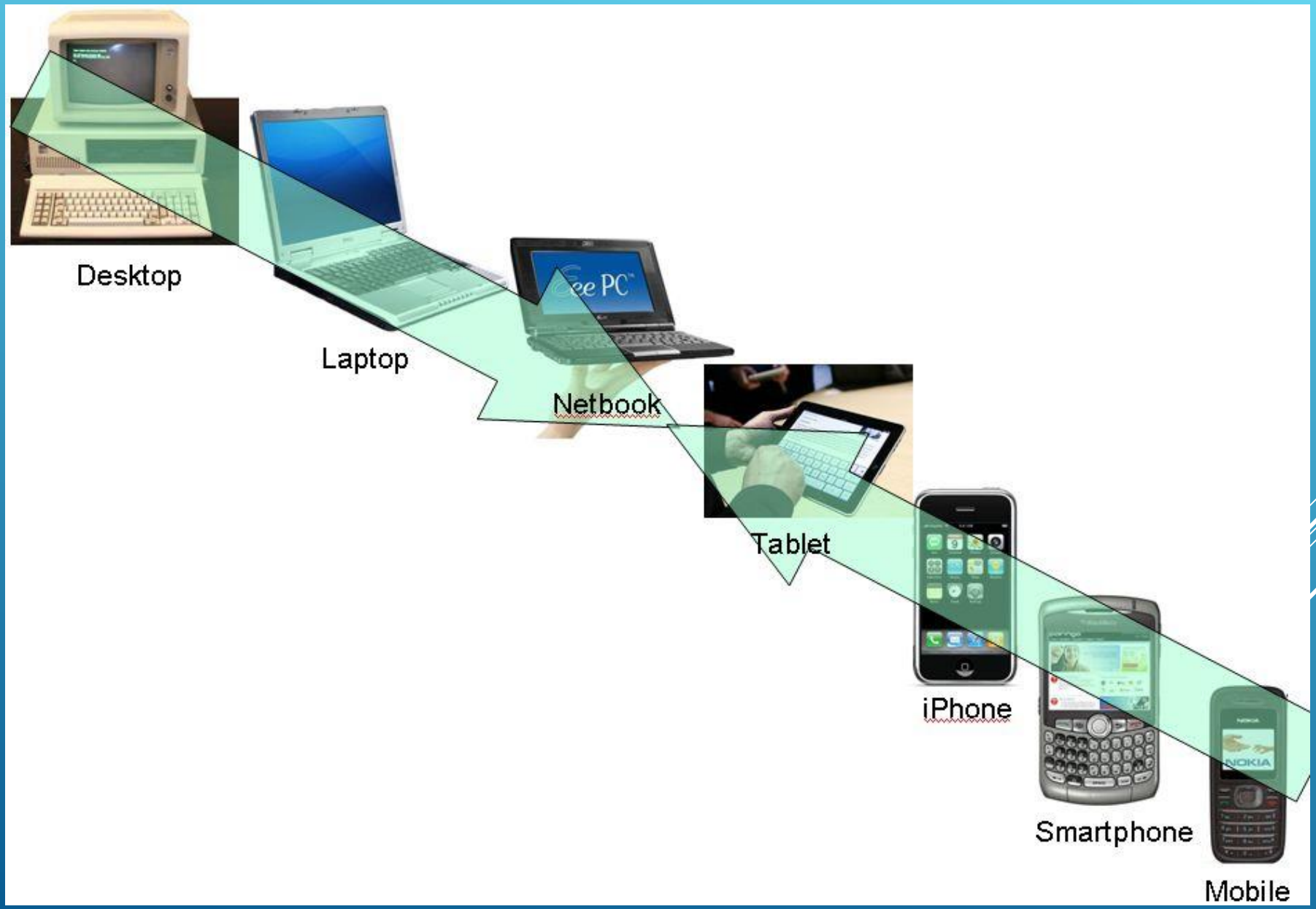
How we think of others



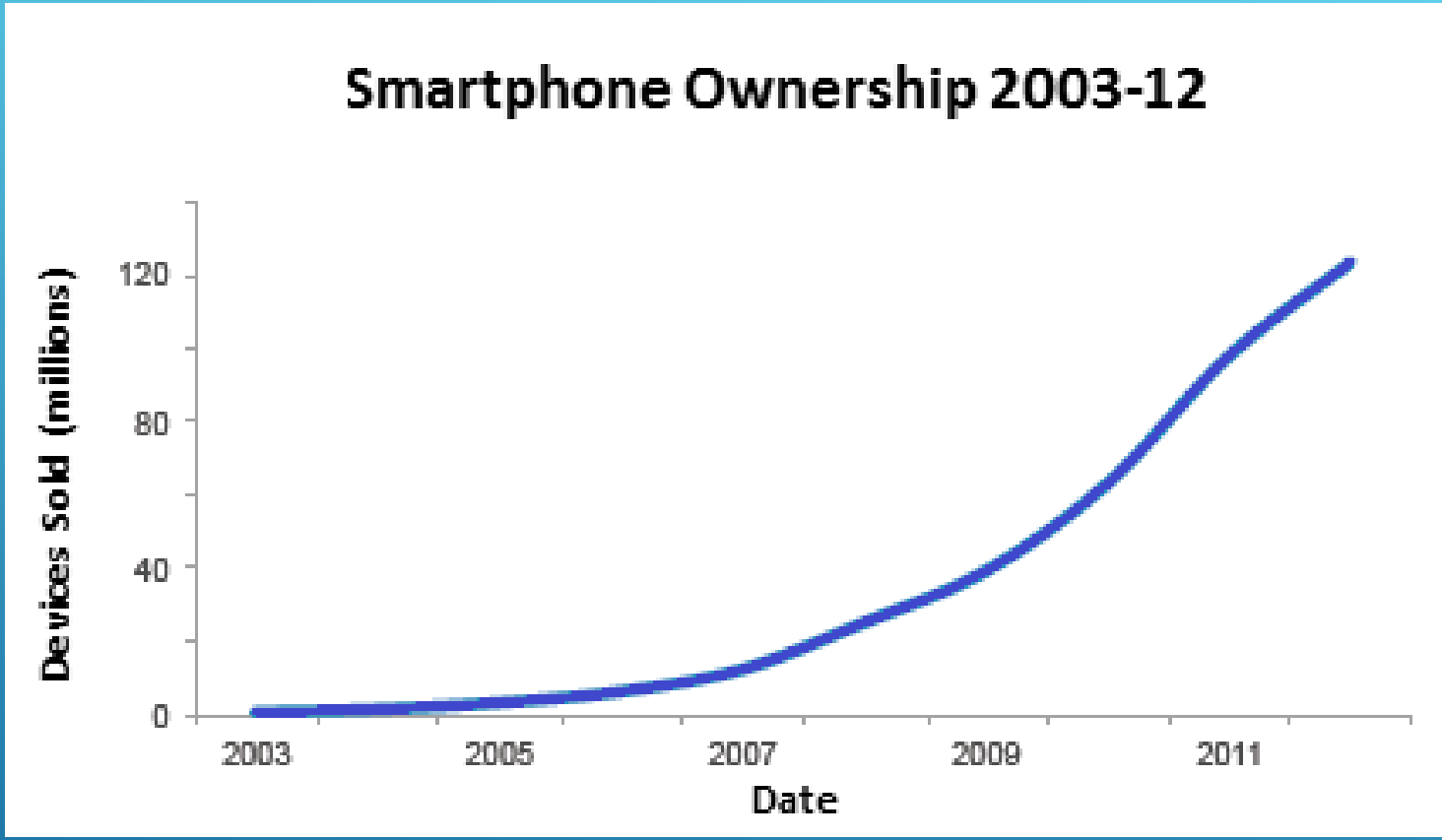
How we are addicted to smartphones, tabs, mobiles :-



Evolution of Mobile and Computer



Growth of mobile domain



Smartphone sales have grown exponentially since their introduction 10 years ago reshaping the way consumers connect and experience media.

Why Mobile App Development

- Market for mobile software surges from $4.1 billion in 2009 to $17.5 billion by 2012
- Students are naturally interested.
- mobile developer jobs posted on the site -- an increase of 101% over the number of similar job postings in 2012 -Elance.com reports
- The total number of job listings on the site expanded at a rate of 52% in that same time frame -Elance.com reports
- that job postings for Android developers soared 302%

ads for iPhone-related positions rose 220% - IT job siteDice.com

http://www.computerworld.com/s/article/9217885/Your_next_job_Mobile_app_developer

http://www.businessweek.com/technology/content/oct2010/tc20101020_6396

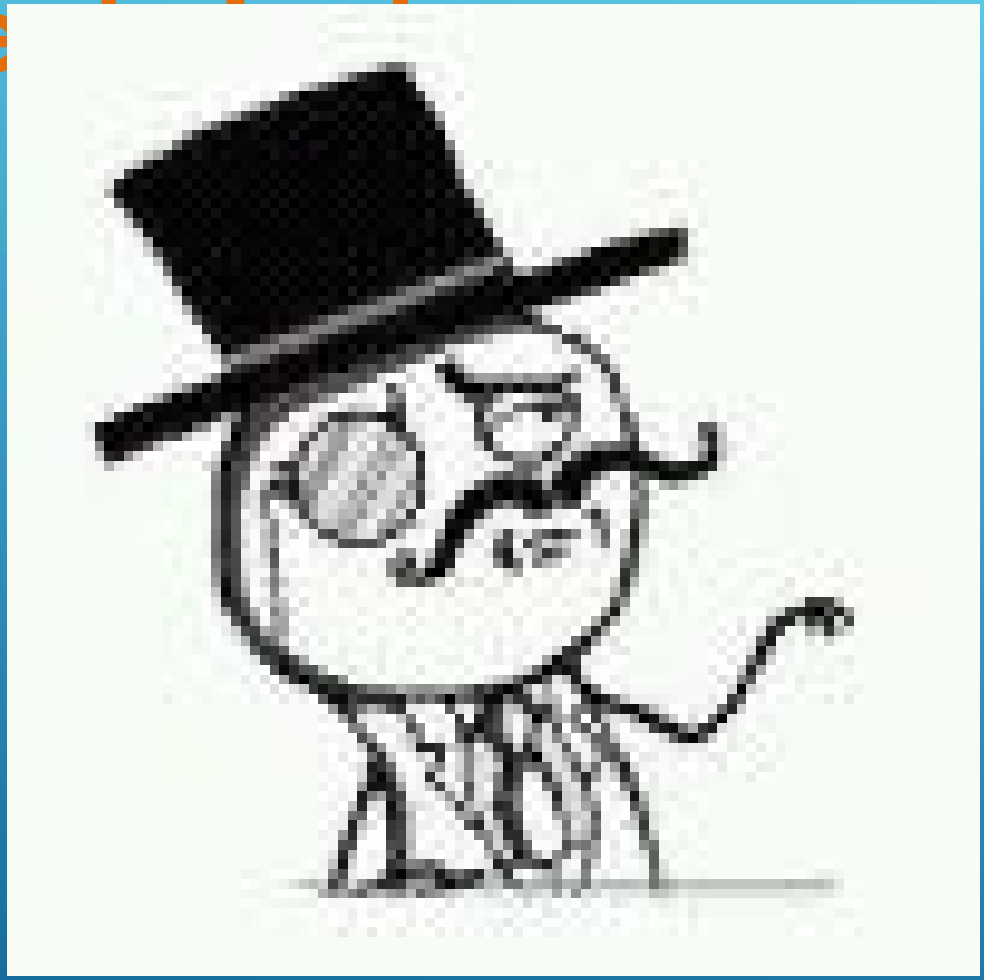
“There is more demand than supply because there aren't enough great mobile developers out there.”

Ellen Pack, VP Of Marketing, Elance.Com

steve jobs

- Master mind or smart phone creator –steve jobs .
- best known as the co-founder, chairman, and CEO of Apple Inc. Through Apple, he was widely recognized as a charismatic pioneer of thepersonal computer revolution[
- applications development for phones which has great user interface and user friendly.
- Giving chance to individual developer to make applications. And earn money agenda.

Now some more te



What is application?

- A mobile application is a software application designed to run on smartphones, tablet computers and other mobile devices
- usually available through application distribution platforms, which are typically operated by the owner of the mobile operating system
- public demand and the availability of developer tools drove rapid expansion into other categories, such as mobile games, factory automation, GPS and location-based services, banking, order-tracking, and ticket purchases

What is OS?

- A **mobile operating system**, also referred to as **mobile OS**, is the operating system that operates a smartphone, tablet, PDA, or other digital mobile devices

- Its a combine features of a personal computer operating system with mobile Features such

a touchscreen, cellular, Bluetooth, WiFi, GPS mobile navigation, camera, video camera, speech recognition, voice recorder, music player

Operating Systems

Android from Google Inc
BlackBerry 10 from BlackBerry
iOS from Apple Inc
Windows Phone from Microsoft
bada from Samsung Electronics (closed)
S60(Series60) from Nokia (closed)

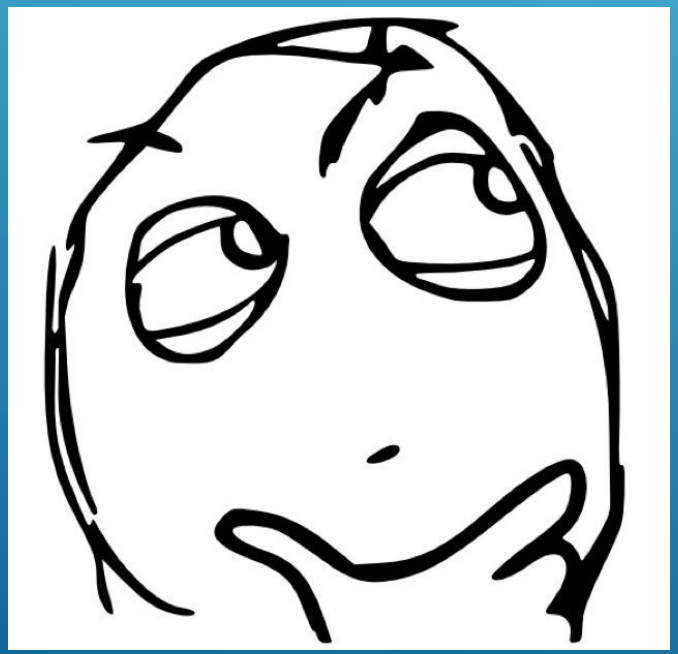
Tizen from non-profit organization The Linux Foundation
Upc Aliyun OS from Alibaba/oming software platforms
Firefox OS
Sailfish OS

Operating systems used In

- small devices with 512 RAM and 1.5 GHz single processor.
- Microwave
- smart TV
- PlayStations.
- mobile devices

Application File systems

- What about install applications ?
- Same Application file install on all platforms?



File format-

- iPhone - .ipa
- Android - .apk
- Windows 8 - .xap
- Symbian - .sis
- J2me - .jad , .jar

OS platforms and their supporting language

Platforms	Programming language
Android	Java
Blackberry	Java
iPhone	Objective-C
Java ME	Java
Symbian	C++
Windows Phones	C#, Visual Basic

What should we do to create applications?

- Target any platform.
- Understand Differences in Platforms
- learn Languages according to platform.
- Practice with tutorials and make hands-on on programming

First Step towards developing applic

- Make a basic flow of applications
- Make flow chart and paper work(it clears the idea).
- make UI for application (POC)
- Collect information and research of any particular feature.
- Make a habit of prepare estimation for project.

Where to write a code to develop a

SDK -Software Development Kit
IDE – Integrated Development Environment

OS	**IDE**
iOS	xcode
Android	Eclipse
Windows	Visual studio
Blackberry	eclipse

http://en.wikipedia.org/wiki/Software_development_kit

MVC pattern

- Model–view–controller (MVC) is a software architecture pattern which separates the representation of information from the user's interaction with it.
- A **model** notifies its associated views and controllers when there has been a change in its state.
- A **view** requests from the model the information that it needs to generate an output representation to the user
- A **controller** can send commands to its

Types of application

Native Apps – Install on the device and dose not need any data transfer to server.
Data store in device itself

Client-Server Apps- App install on device but without connection it can not be launched.
commercial Apps like banking Apps.

Mobile Web Apps-Mobile browser Apps, These are not installed in the devices.
Depend on quality of browser.

http://softwaretestinggarbage.blogspot.in/2012/10/types-of-mobile-application.html

Mobile Application Categories

- Utility
- Games
- Private Apps
- Banking Apps
- Entertainment Apps

Game-requires game engine

- Cocos2d
- Box2d
- Moai SDK
- Sparrow Framework
- iSGL 3d

http://en.wikipedia.org/wiki/List_of_game_engines

Advantages of Native Mobile Applications over Cross-Platform apps

- **Optimized User Experience** - Mobile application users expect better performance, better usability, higher quality design and more functionality.
- **Ease of Authentication** - Authentication is one of those features that helps deliver a personalized experience to your users. A native app can remove the authentication hurdle from your user's path
- **Personalization** :Setting preferences based on past usage trends helps make the experience more relevant upon the next visit while showing value to the user.
- **Higher Quality Images and Photo Galleries** - Since users are downloading the app, and expect app

what is cross platform

- **PhoneGap** is a mobile development It enables software programmers to build applications for mobile devices using **JavaScript, HTML5 and CSS3**, instead of device-specific languages such as **Objective-C**, **java**.

- Application created by phoneGap can run on platforms like Android, iPhone, Windows phones, Blackberry.

- The core of PhoneGap applications use HTML5 and CSS3 for their rendering,and JavaScript for their logic.

What is Native App

- specifically designed to run on a device's operating system and machine firmware, and typically needs to be adapted for different devices.
- It is an application program that has been developed for use on a particular platform or device.

- they can interact with and take advantage of operating system features and other software that is typically installed on that platform.

- It has the ability to use device-specific hardware and software, meaning that native apps can take advantage of the latest technology available on

Advantages and disadvantages for cross platforms

Advantages

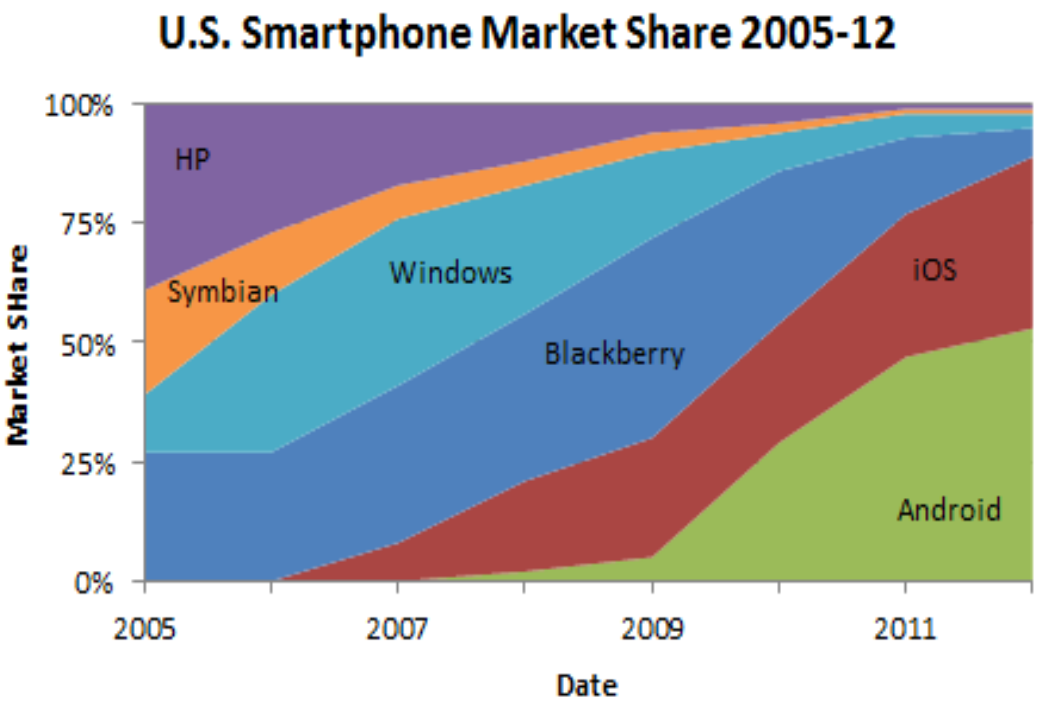
Development takes less time and less investment
Access to plugins that can be used in other projects
Web developers can easily use the code
Desired support for cloud services

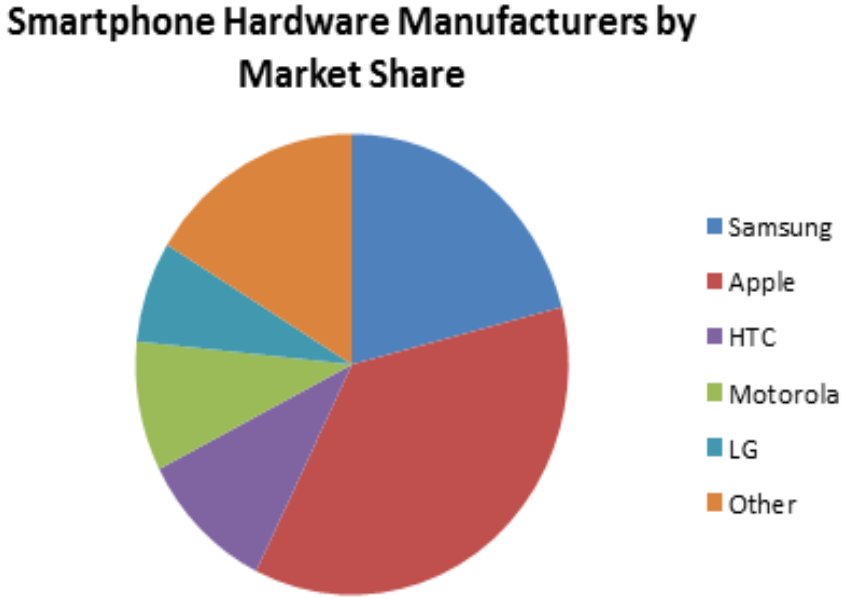
Disadvantages

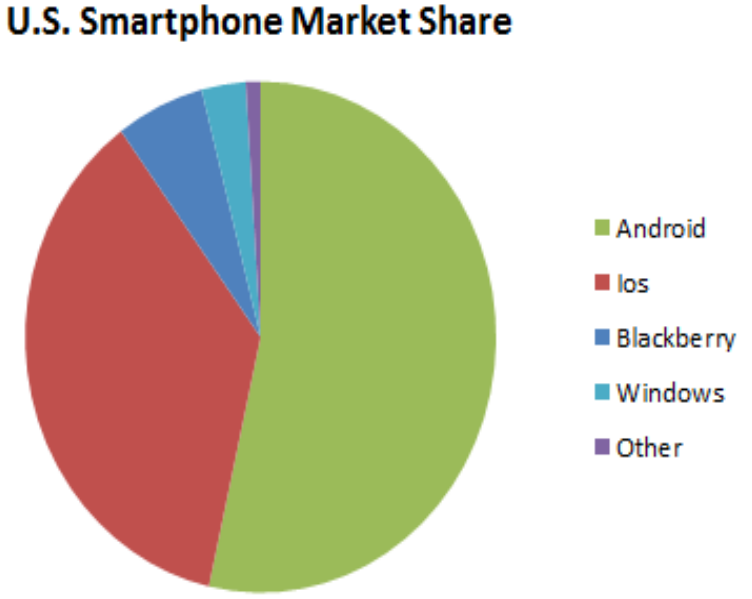
Update cannot include all supporting features
Restrictive tools cannot enough freedom
Slower code increases the rendering time

http://goarticles.com/article/The-Advantages-and-Disadvantages-of-Cross-Platform-Mobile-Application-Development/7529057/

Market research







why android

Technical Advantages

Android is built upon an **open-source platform**, and most of the Android code is released under the free software/open source Apache License.

Rich and easy to integrate feature sets.

Android applications are written in **the Java programming language**, which is a powerful, mature and very widely adopted language.

Easy to learn than Apple's Objective-C

Inter-Application communication is easier.

Business Advantages

Android Market — is much more of an open marketplace than Apple's iTunes App Store.

No delay for approval of submitted application. So you can reach your users fast.

Brief History of Android

Google acquires startup Android Inc. to start Android platform

- 2005– Work on Dalvik VM begins
- 2007– Open Handset Alliance announced – Early look at SDK
- 2008– Google sponsors 1st Android Developer Challenge – T-Mobile G1 announced – SDK 1.0 released – Android released open source (Apache License) – Android Dev Phone 1 released

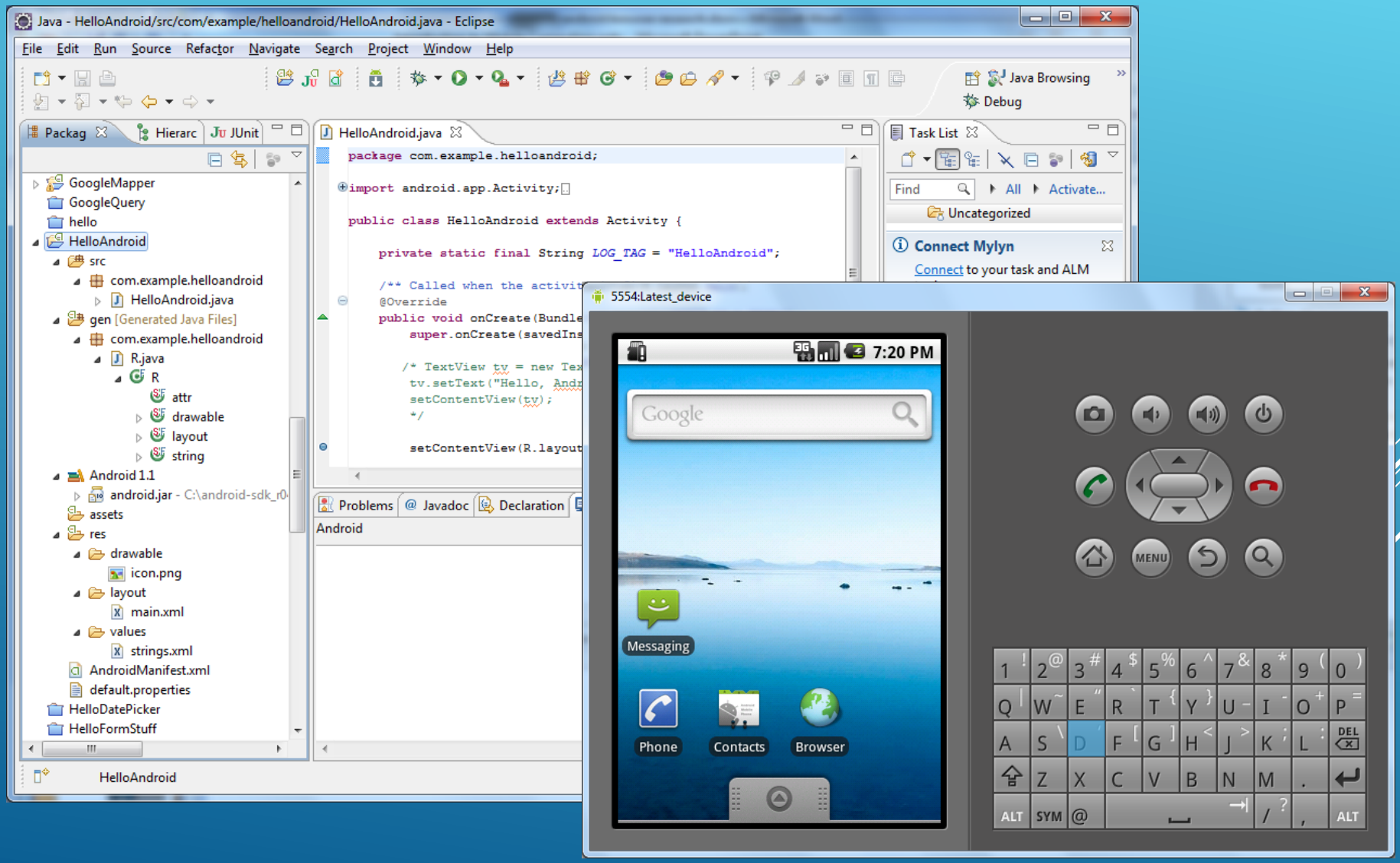
Brief History cont. – SDK 1.5 (Cupcake)

- 2009 – SDK 1.6 (Donut) – SDK 2.0/2.0.1/2.1 (Eclair)
- 2010– Nexus One released to the public

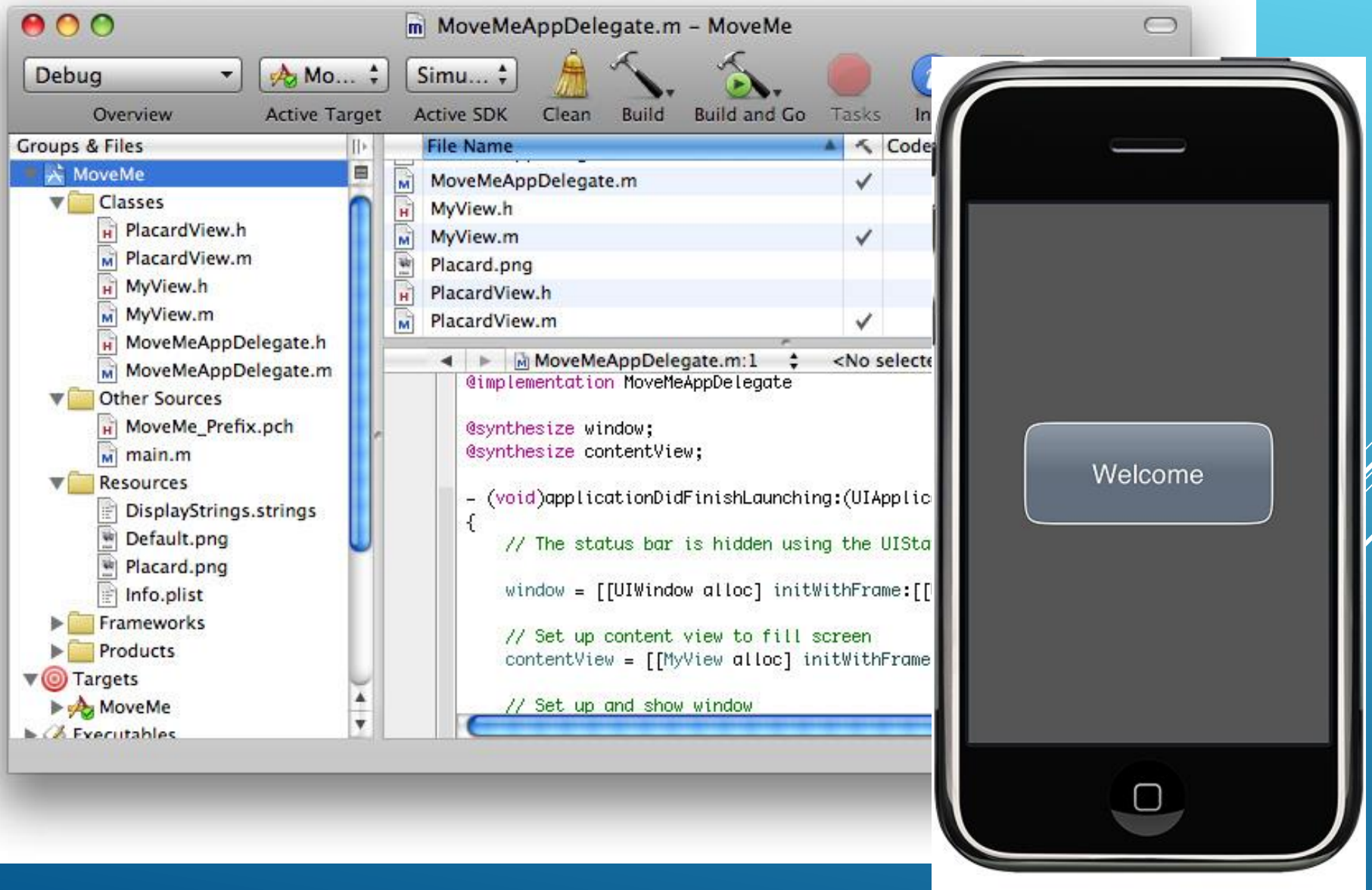
– SDK 2.2 (Froyo) – SDK 2.3 (Gingerbread)

- 2011– SDK 3.0 (Honeycomb) for tablets only

Eclipse and Android Emulator



xcode IDE & iPhone Emulator



Emulator Limitations

- No support for placing or receiving actual phone calls – Simulate phone calls (placed and received) through the emulator console
- No support for USB connections
- No support for camera/video capture (input)
- No support for device-attached headphones
- No support for determining connected state
- No support for determining battery charge level and AC charging state
- No support for determining SD card insert/eject
- No support for Bluetooth
- No support for simulating the accelerometer – Use OpenIntents's Sensor Simulator

Get start with your first application in and

Before we start-

- Clear the definition of IDE
- Emulator
- Languages for development
- Cross platform App and native App

Setting up Development Environment

System Requirements

Supported OS

- Windows XP (32-bit), Vista (32- or 64-bit), or Windows 7 (32- or 64-bit)
- Mac OS X 10.5.8 or later (x86 only)
- Linux (tested on Ubuntu Linux, Lucid Lynx)

Supported Development Environment (Eclipse IDE based)

- Eclipse 3.4 (Ganymede) or greater/Eclipse Classic (versions 3.5.1 and higher)
- JDK 1.5 or 1.6
- ADT Plugin

Setting up Development Environment(Contd.)

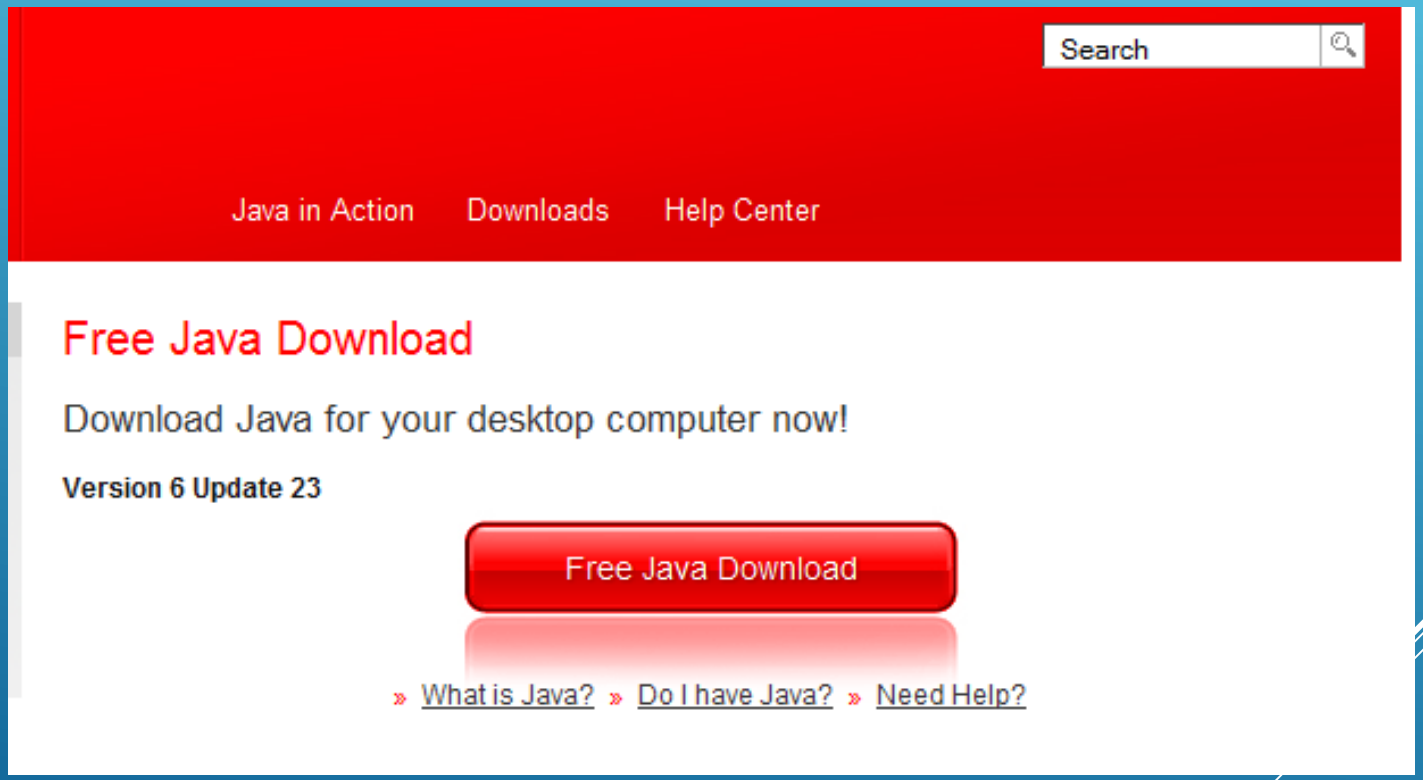
To set up the development environment, we need:

- Java Development Kit (JDK 1.5+, 1.6 is preferable)
- Eclipse IDE
- Android SDK

Setting up Development Environment (Contd.)

Java Development Kit (JDK)

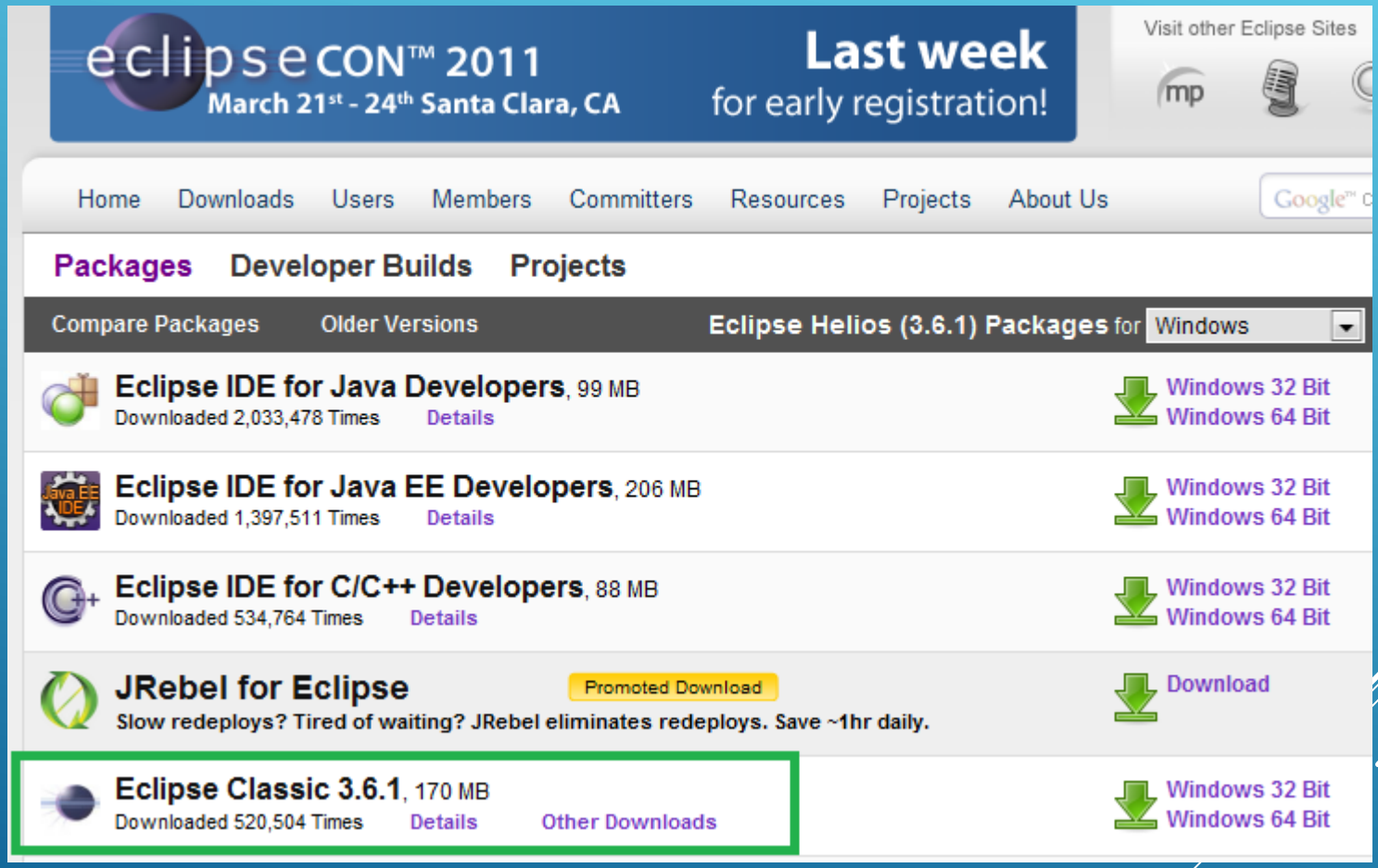
Download Link: http://www.java.com/en/download/index.jsp



Download JDK from here and Install JDK

Setting up Development Environment (Contd.)

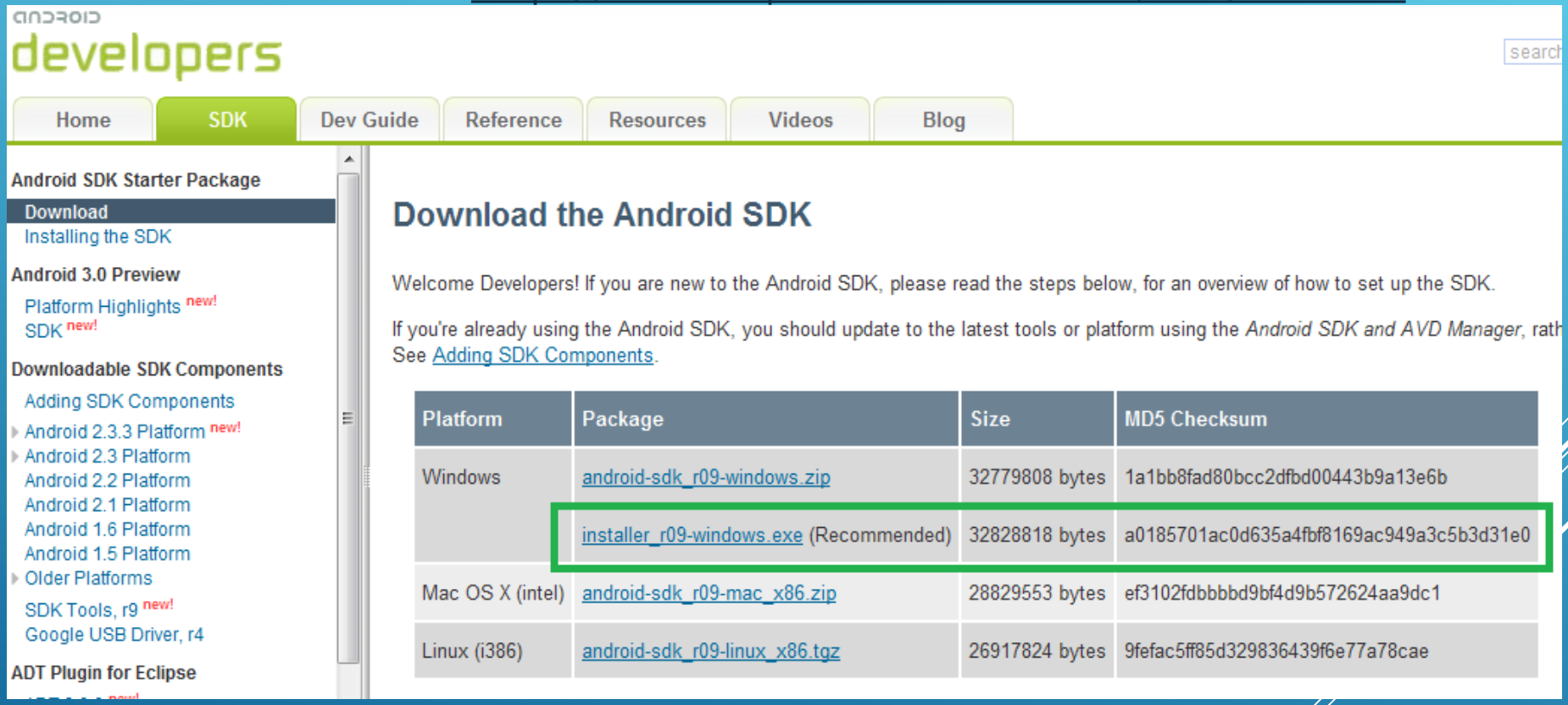
Eclipse IDE Download Link:
http://eclipse.org/downloads/



Download the highlighted version of Eclipse IDE

Setting up Development Environment (Contd.)

Android SDK Link:
http://developer.android.com/sdk/index.h



Download and Install the SDK starter package from the table above (Highlighted)

Or Get the Android SDK

Developers | Design | Develop | Distribute

Training | API Guides | Reference | Tools | Google Services

- Developer Tools
- Download
  - Setting Up the ADT Bundle
  - Setting Up an Existing IDE
  - Exploring the SDK
  - Download the NDK
- Workflow
- Tools Help
- Revisions
- Extras
- Samples
- ADK

Get the Android SDK

The Android SDK provides you the API libraries and developer tools necessary to build, test, and debug apps for Android.

If you're a new Android developer, we recommend you download the ADT Bundle to quickly start developing apps. It includes the essential Android SDK components and a version of the Eclipse IDE with built-in **ADT (Android Developer Tools)** to streamline your Android app development.

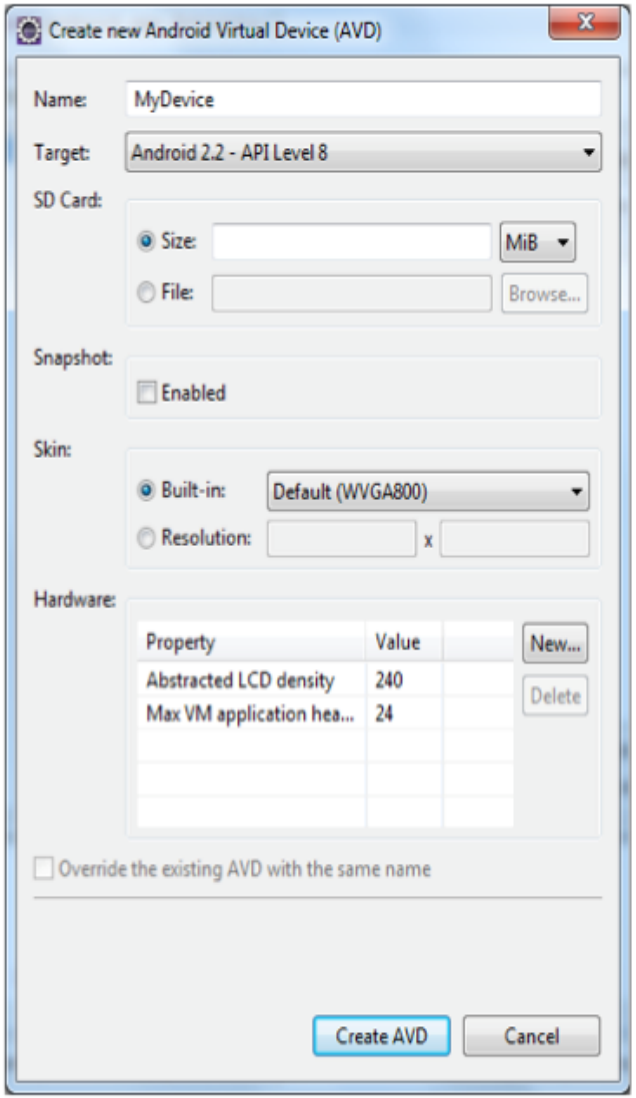
With a single download, the ADT Bundle includes everything you need to begin developing apps:

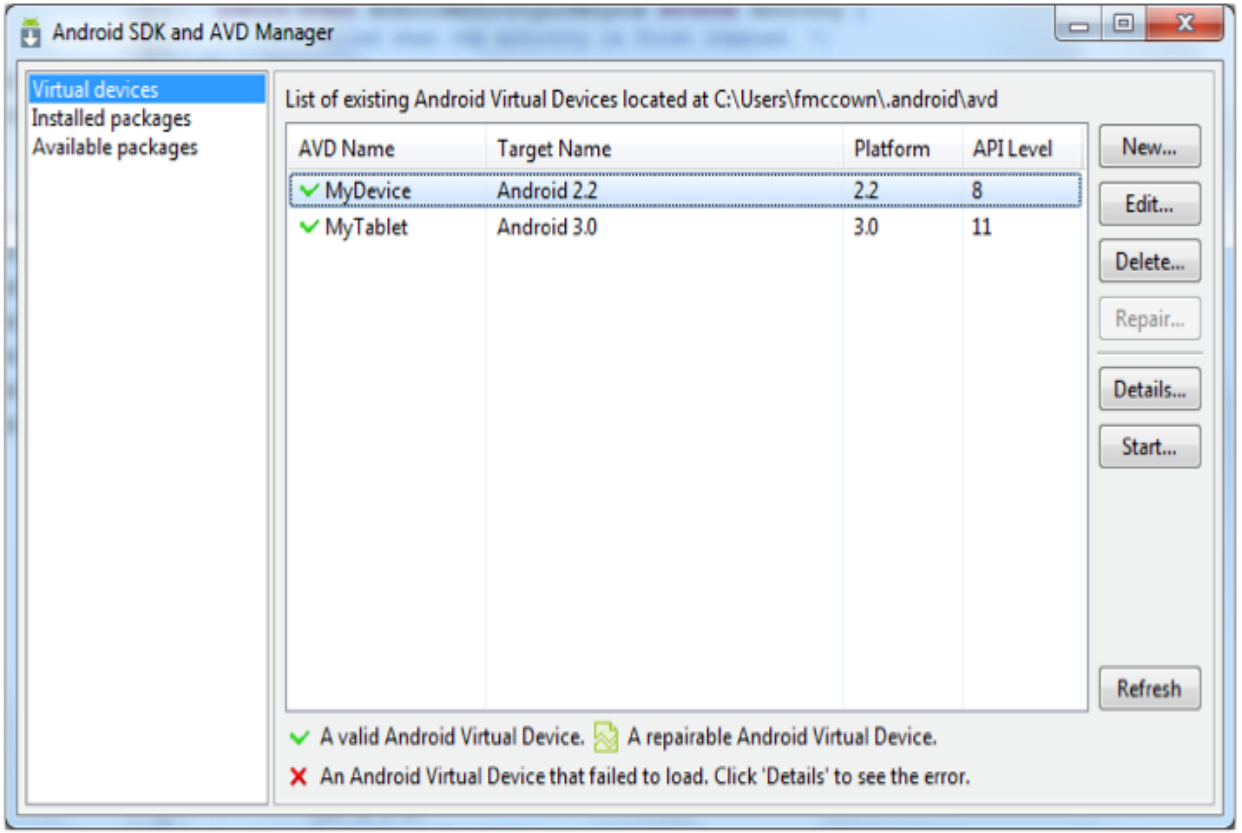
- Eclipse + ADT plugin
- Android SDK Tools
- Android Platform-tools
- The latest Android platform
- The latest Android system image for the emulator

Download the SDK
ADT Bundle for Mac

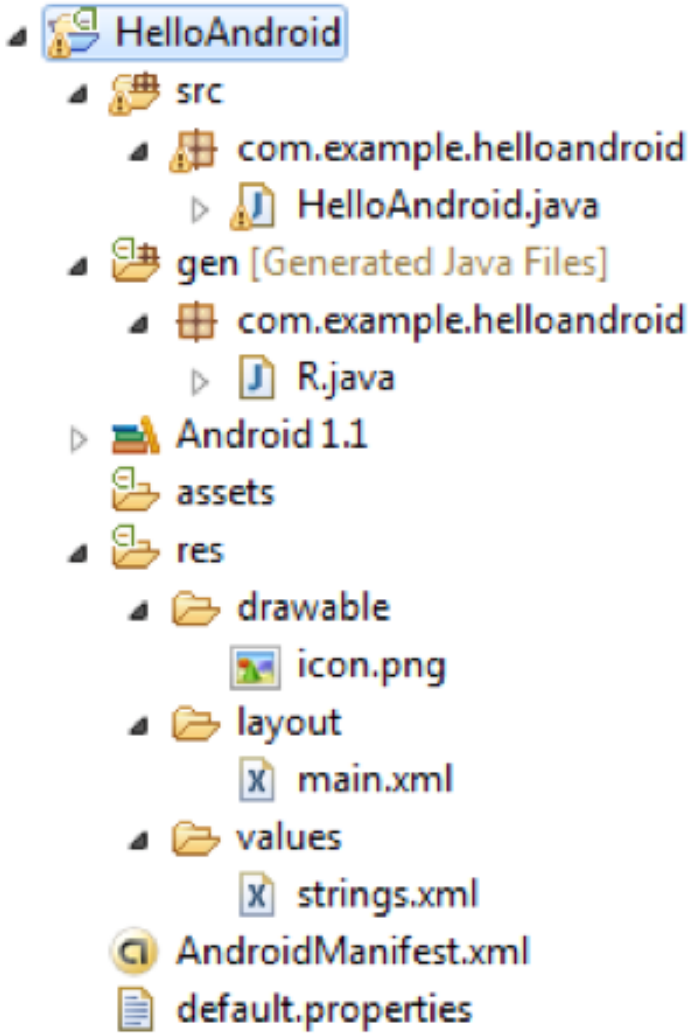
http://developer.android.com/sdk/index.html

Create an AVD using Android SDK and AVD Manager





Hello Android Tutorial

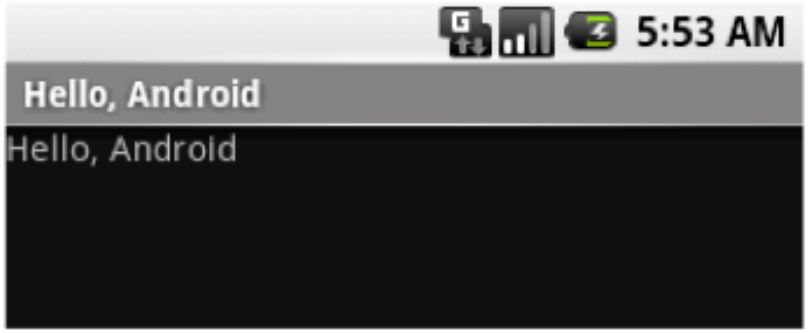



```
package com.example.helloandroid;

import android.app.Activity;
import android.os.Bundle;

public class HelloAndroid extends Activity {

    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
    }
}
```



http://developer.android.com/resources/tutorials/hello-world.html

Important Files

src/HelloAndroid.java
– Activity which is started when app executes
• res/layout/main.xml
– Defines & lays out widgets for the activity
• res/values/strings.xml
– String constants used by app
• gen/R.java (Don't touch!)
– Auto-generated file with identifiers from main.xml, strings.xml, and elsewhere
• AndroidManifest.xml
– Declares all the app's components
– Names libraries app needs to be linked against
– Identifies permissions the app expects to be granted

application test on the iPhone

- Apple is strict about application development.
- We have to follow some apple rules in development
- Eg. Image size and naming conventions
- To deploy on device developer requires
- apple certificate.
- Device ID on which application is to be test
- Provision profile
- Deploy on device
- Test on device
- Distribution certificate
- Distribute on the iTunes

My Work on projects

Native iOS Apps-
Mathnut-education
tellmama-utility
audit app-utility
prognocis-medical

Now on cross platform prognocis

Where do I get study material

- **Sites which are popular for tutorials**
  Developer. site
  Raywenderlitch
  Lynda
  W3school
  Stack overflow.

- **Books**
  Head first
  Sams Teach Yourself Android/ios Application Development in 24 Hours

"The smartphone in your pocket has more computing power than all of NASA did when it put a man on the moon in 1969.
And yet all you do is play angry birds."

- Malcolm Frank , Cognizant EVP, Strategy & Marketing

Questions?