

How to make Android Application

Android

“Android is a Linux-based operating system for mobile devices such as smartphones and tablet computers. It is developed by the Open Handset Alliance, led by Google, and other companies.”

Android Success Story

Released at September 20, 2008



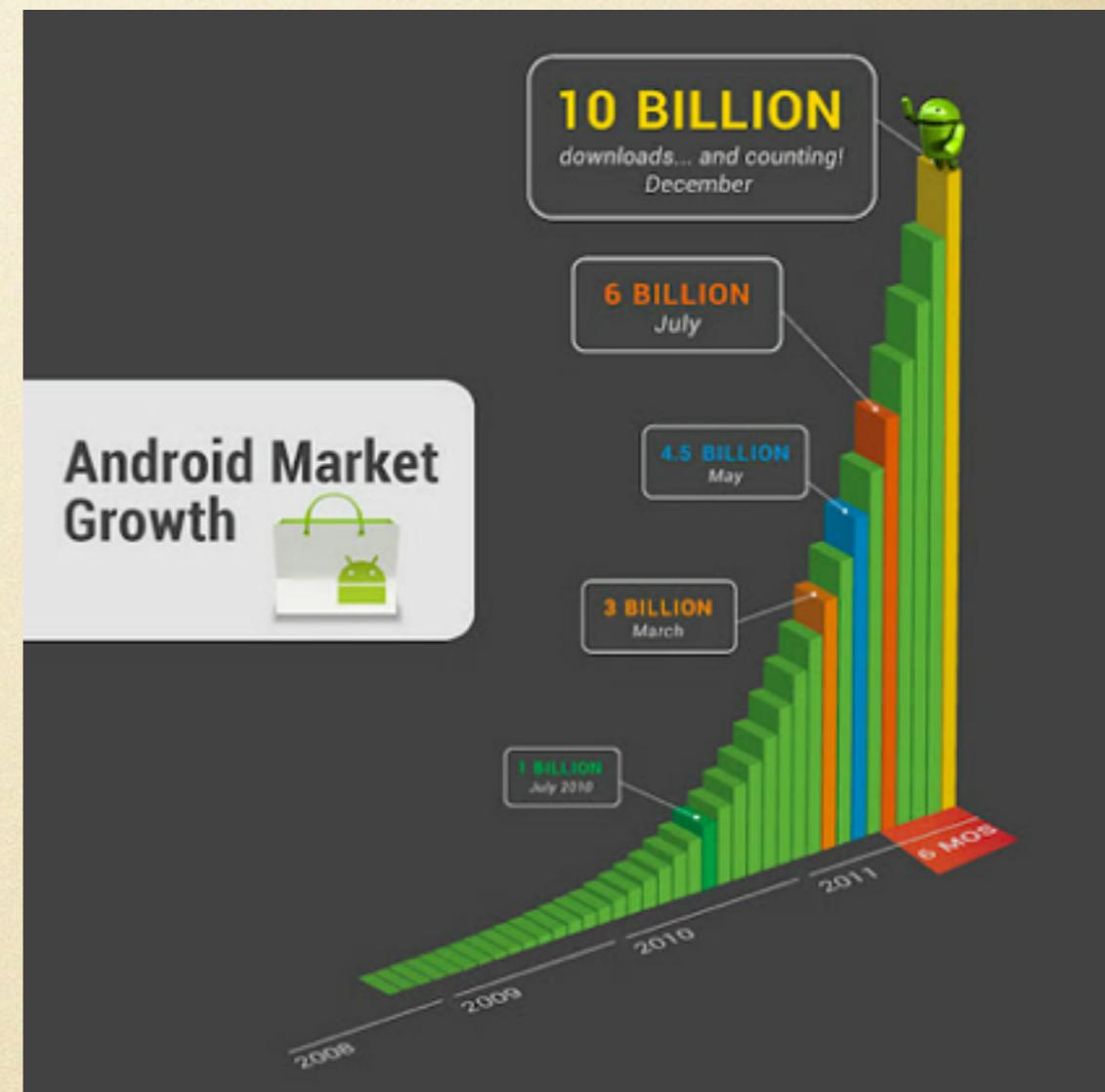
Now 60% of market share.

[http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))

Google Play

Over
500,000 apps

Over
1,000,000,000 downloads



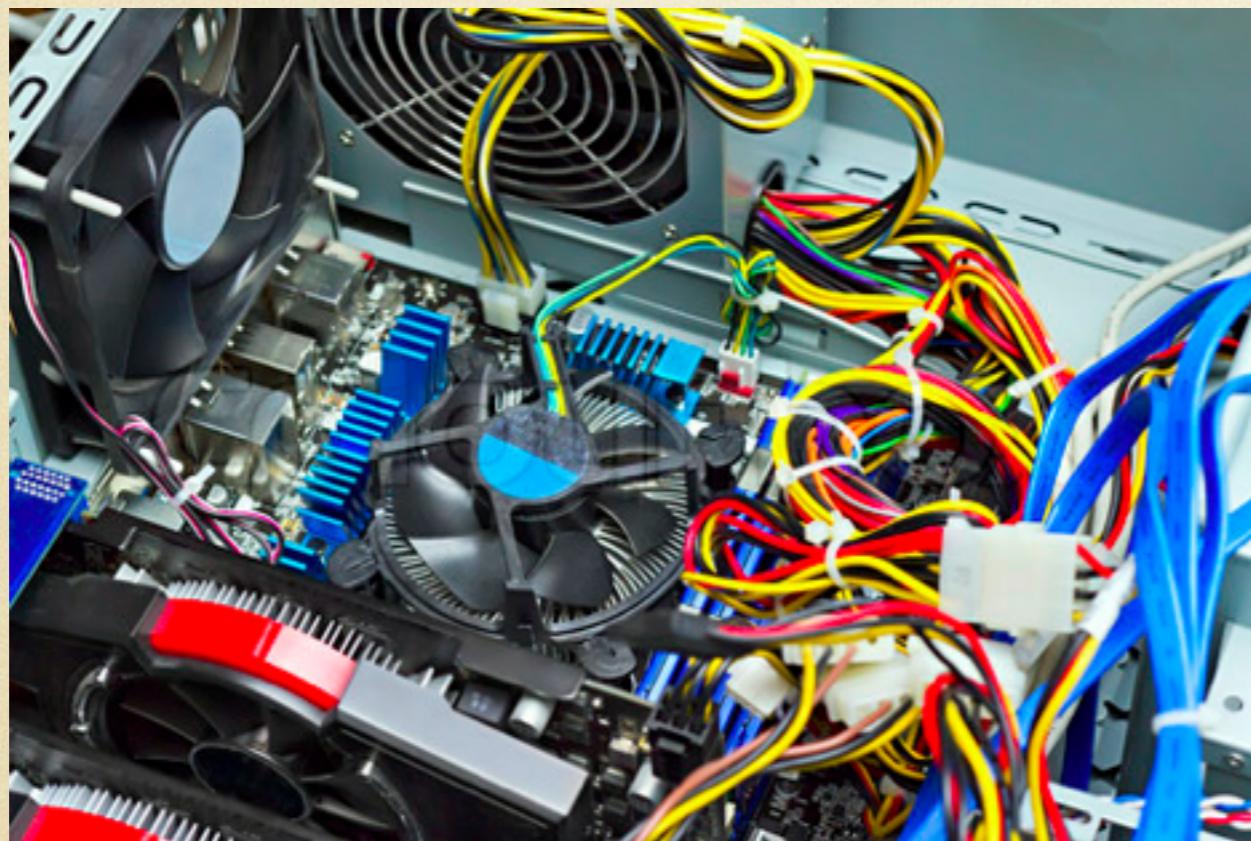
But...

“Why iOS Apps Look Better Than Android Apps?”

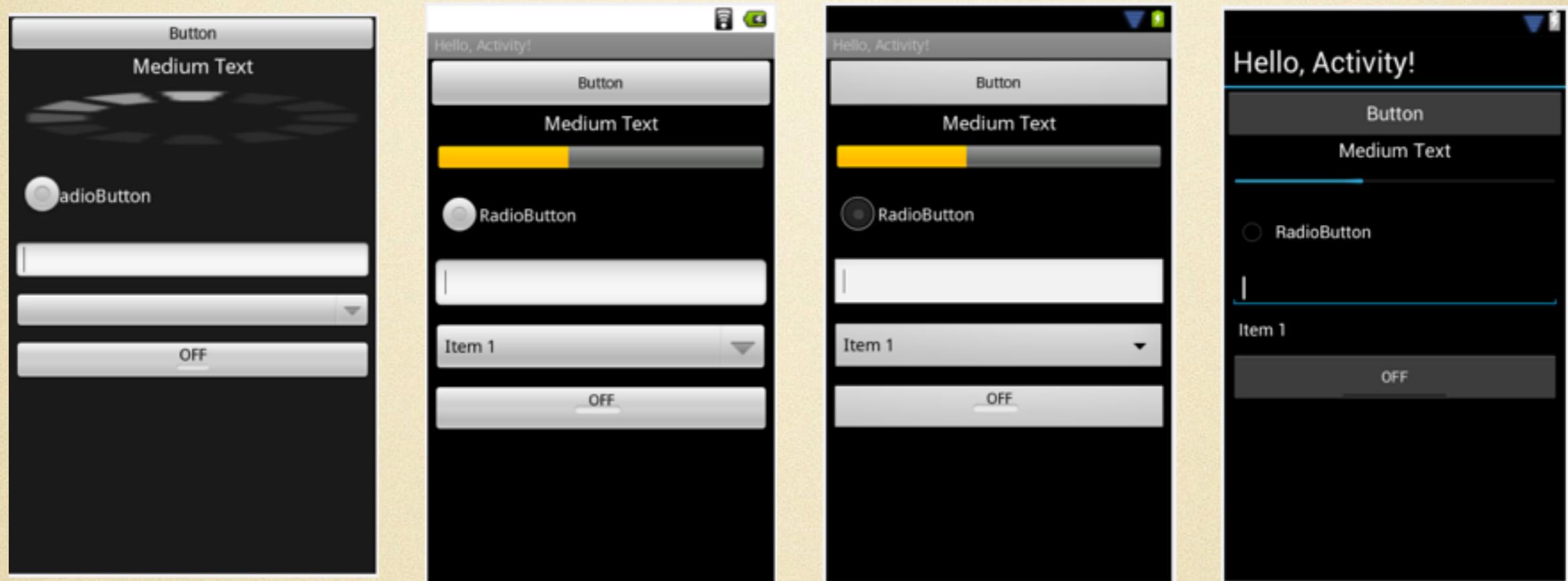
<http://www.wired.com/gadgetlab/2012/04/easier-design-apps-ios/>

Why?

Nature of Android

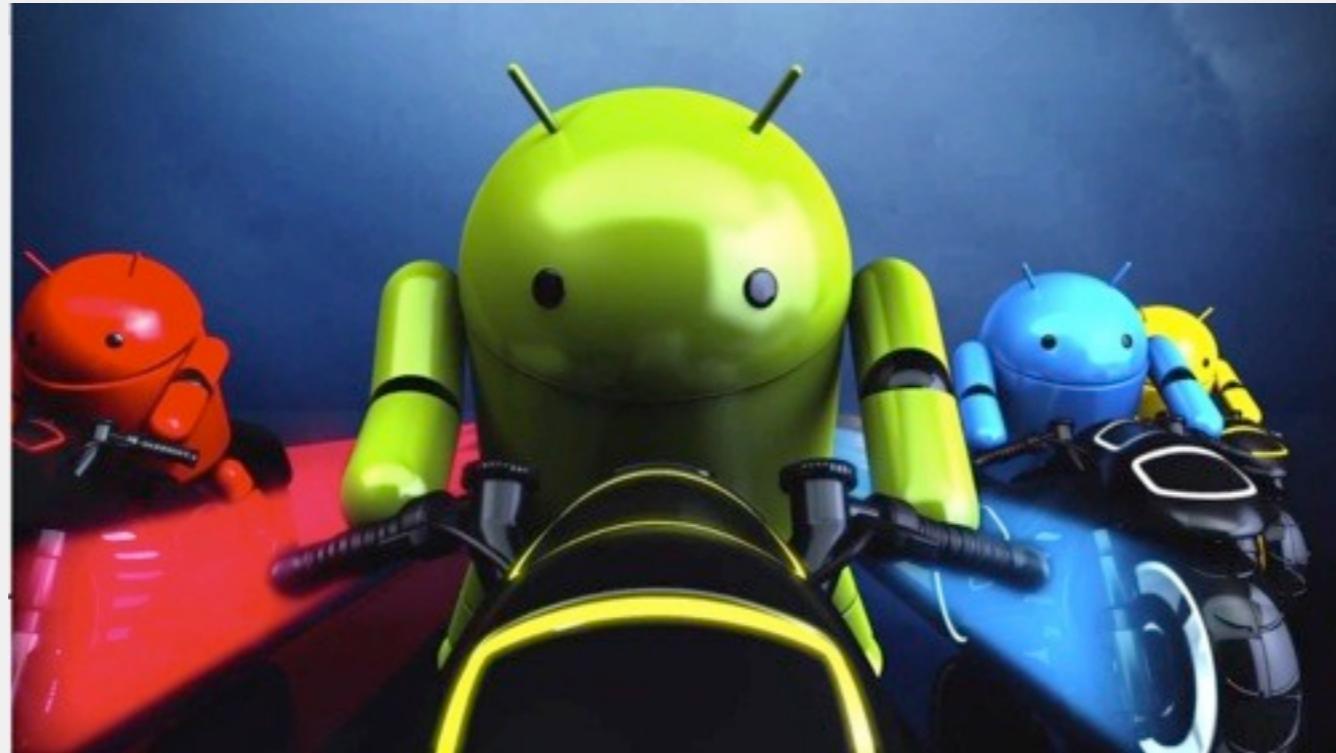


no·con·sist·ency



worse: each manufacture has their own theme.

Time to Change



http://youtu.be/-F_ke3rxopc

Android Design

Style Guide for Android OS



Enchant Me

Simplify My Life

Make Me Amazing

Android Design

Concept, Principles, Patterns, Font,
Color, Useful Resources...

Must READ!!!

<http://developer.android.com/design/index.html>

<http://klutzy.github.com/android-design-ko/> (한국어 버전)

Pure Android

How to make Pure Android Application

Contents

Android Design Pattern

Action Bar

Multi Pane Layout

Navigation

Compatibility

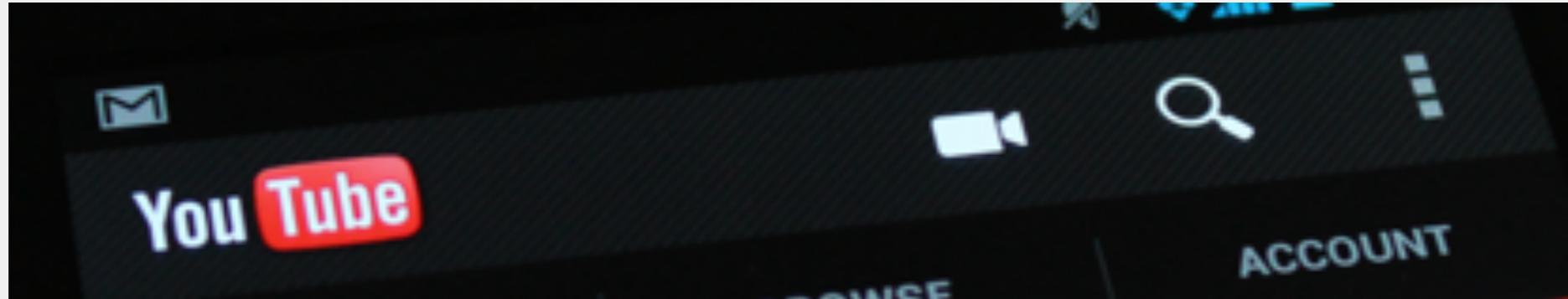
Backward Compatibility

Support Multiple Platform

Support Multiple Screen

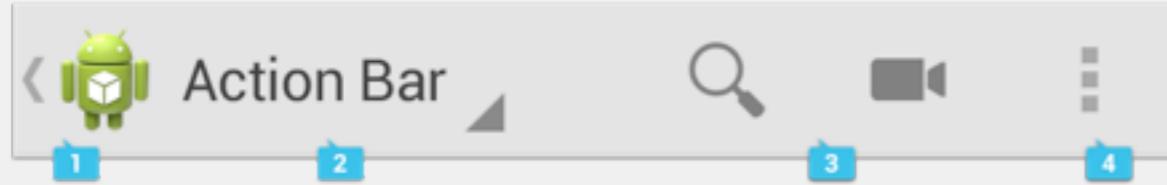
Action Bar

Action Bar - Identity of Android



“The action bar is arguably the most important structural element of an Android app. It's a dedicated piece of real estate at the top of each screen that is generally persistent throughout the app.”

Basic Action Bar

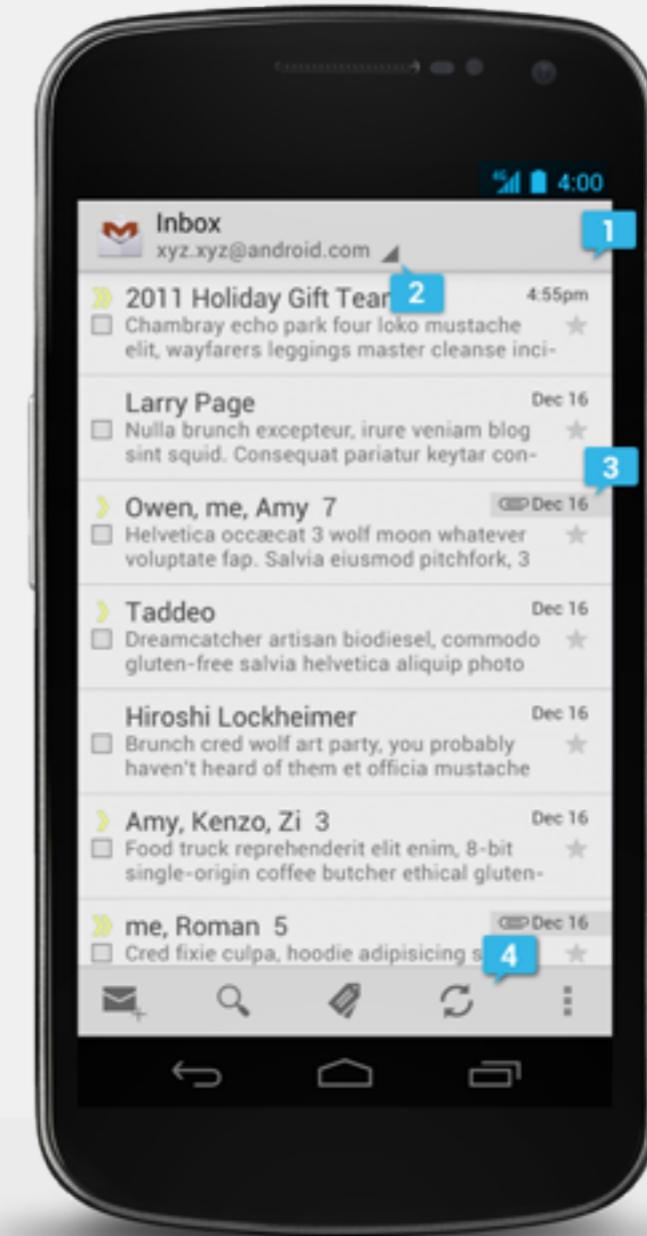


1. App icon

2. View control

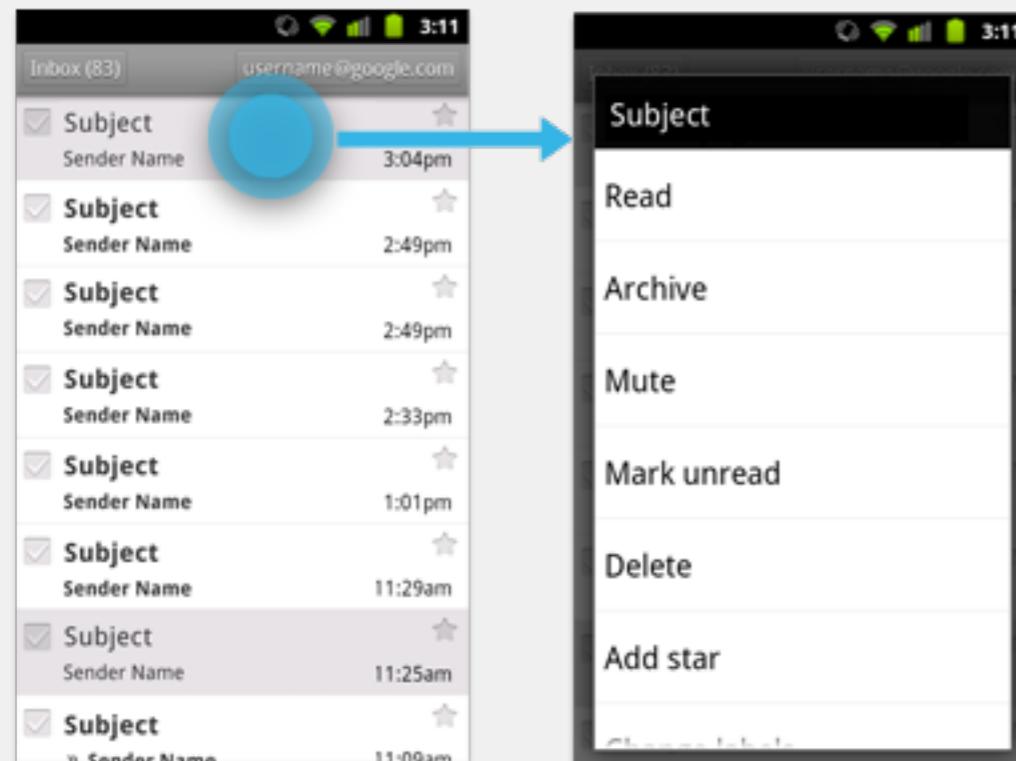
3. Action Buttons

4. Action overflow

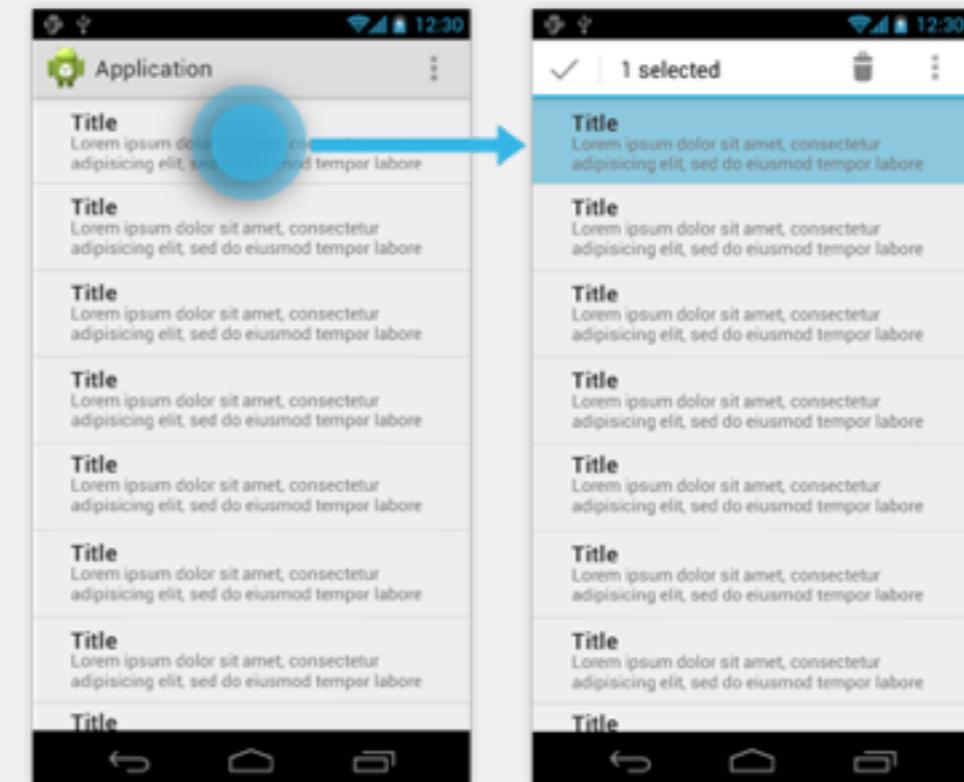


Contextual Action Bar

Before Honeycomb

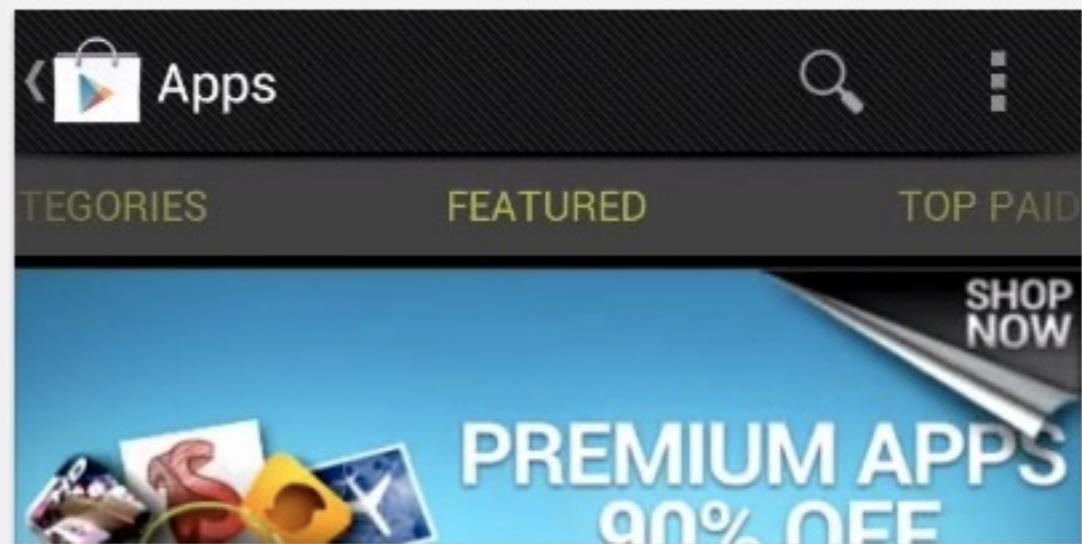
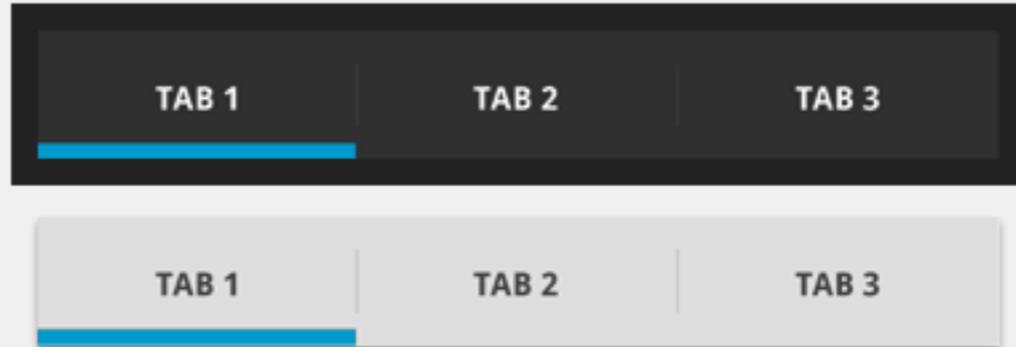
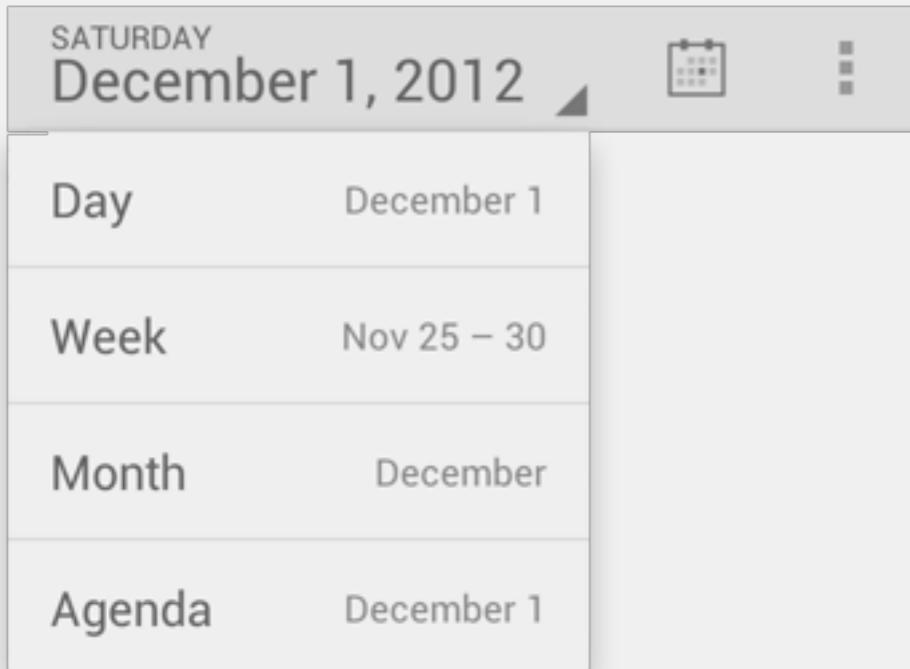


After Honeycomb



<http://developer.android.com/guide/topics/ui/menus.html#CAB>

Action Bar Navigation



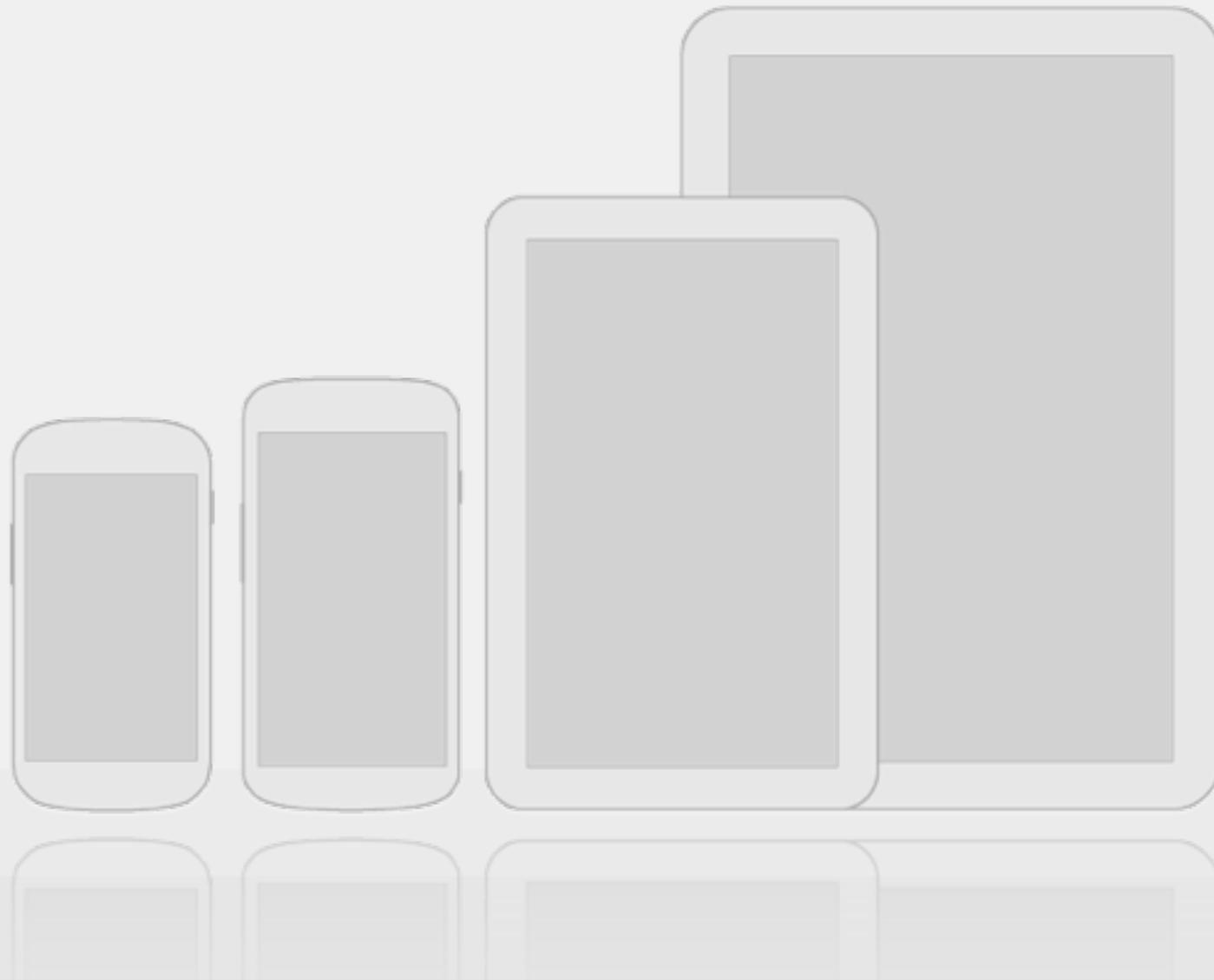
Action Bar Complexity

- Too many things to do
may display the activity title, navigation modes, and other interactive items.
- Read carefully
<http://developer.android.com/guide/topics/ui/actionbar.html>
- Think about style
<http://android-developers.blogspot.kr/2011/04/customizing-action-bar.html>

Multi Pane Layout

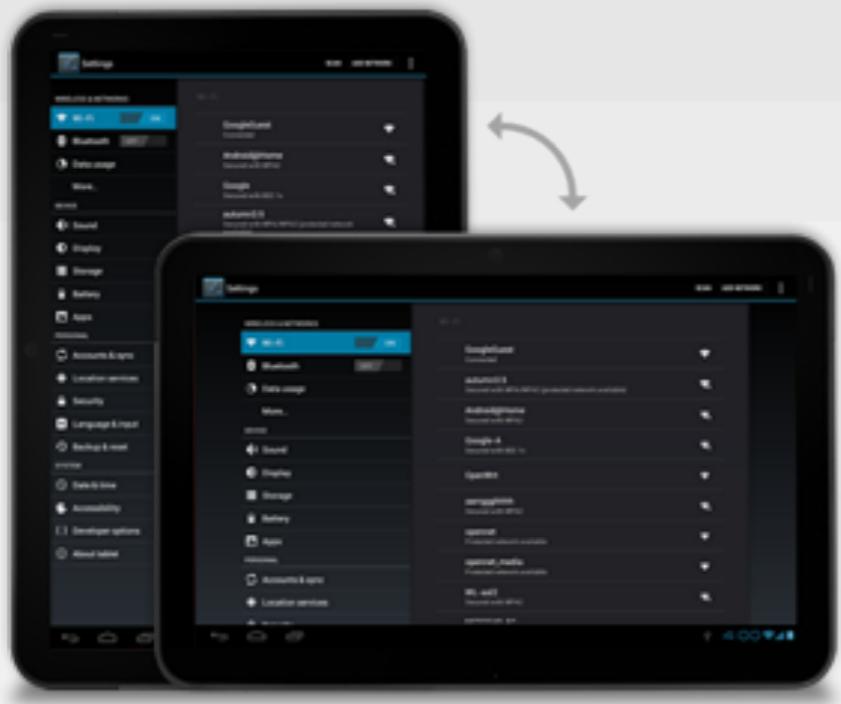
Multi Pane Layout

From phone to tablets

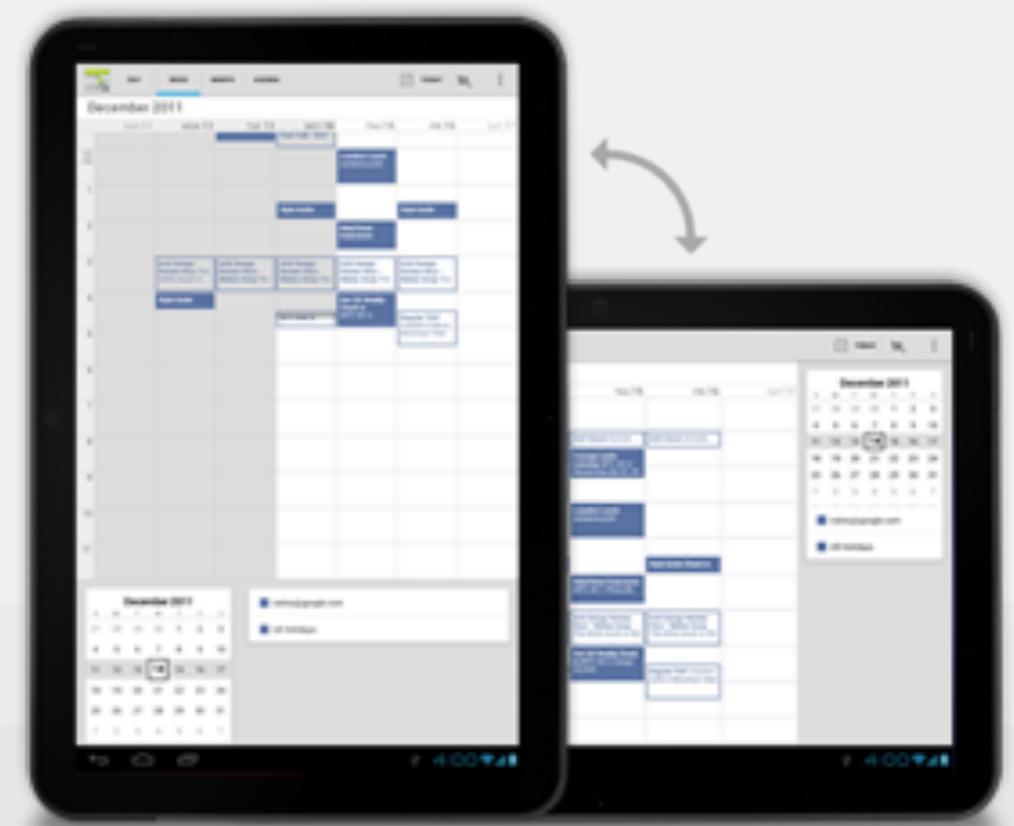


Multi Pane Layout

- Stretch / Compress
- Stack
- Expand / Collapse
- Show / Hide

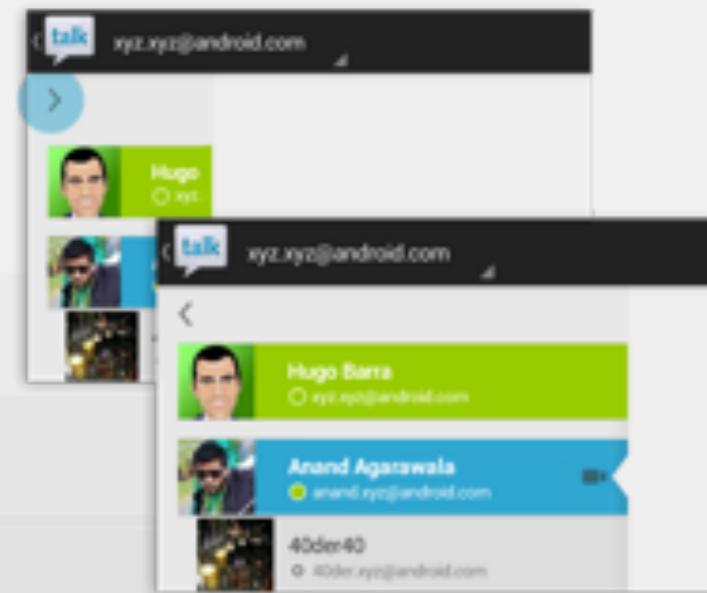


Stretch / Compress

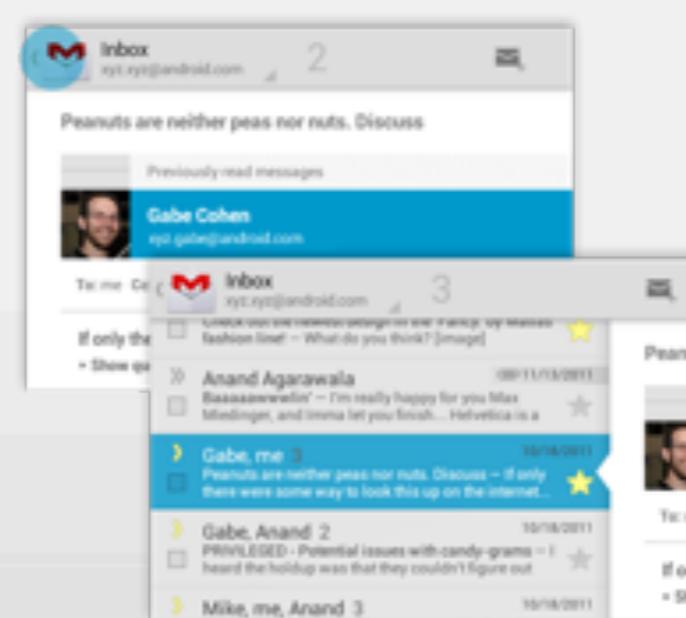
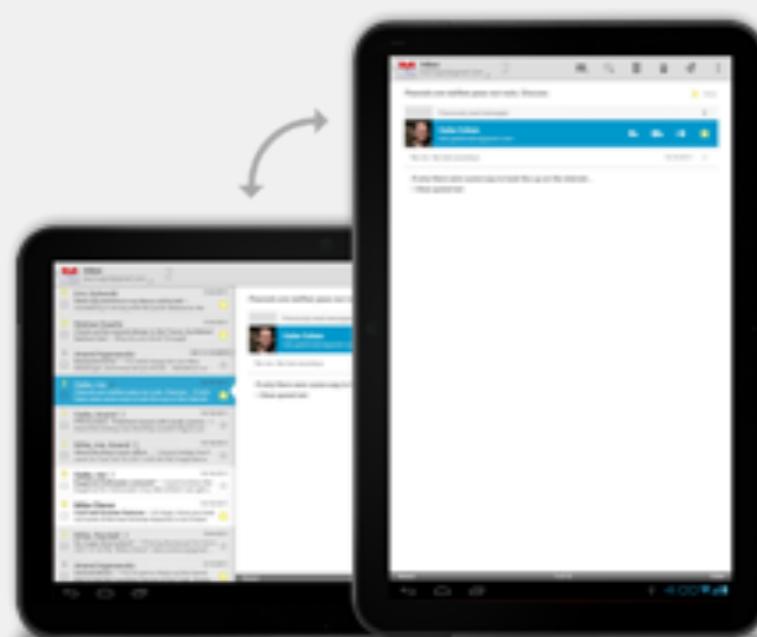


Stack

Expand / Collapse



Show / Hide



Wait...
What is a Pane?

Pane is a Fragment

Layout

+

some independent function module

+

Lifecycle Management

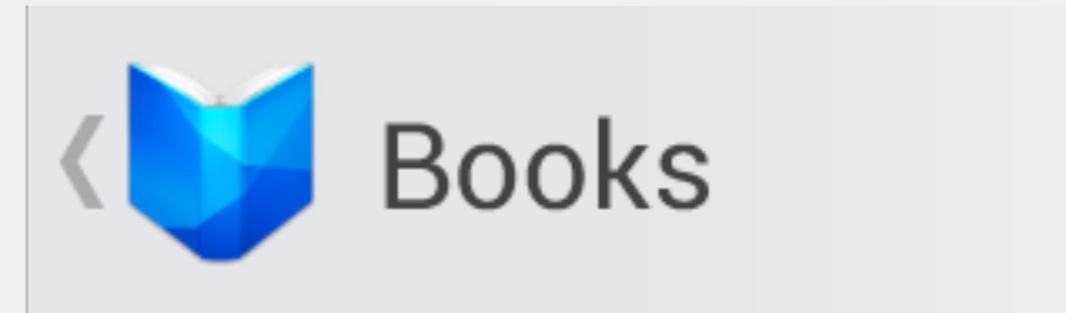
Fragment is not new one.

You can do it by yourself, using custom view.

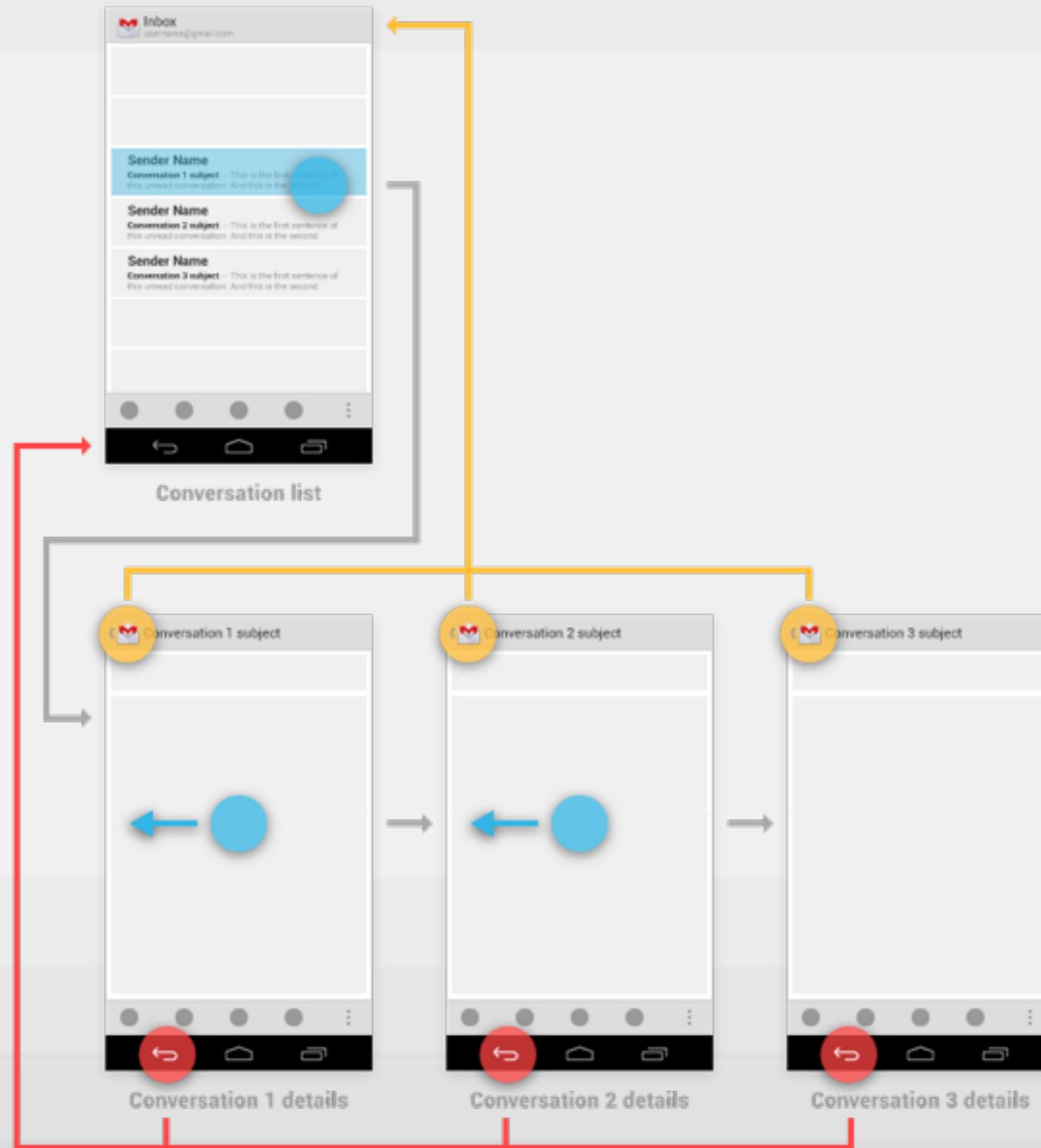
<http://developer.android.com/guide/topics/fundamentals/fragments.html>

Navigation

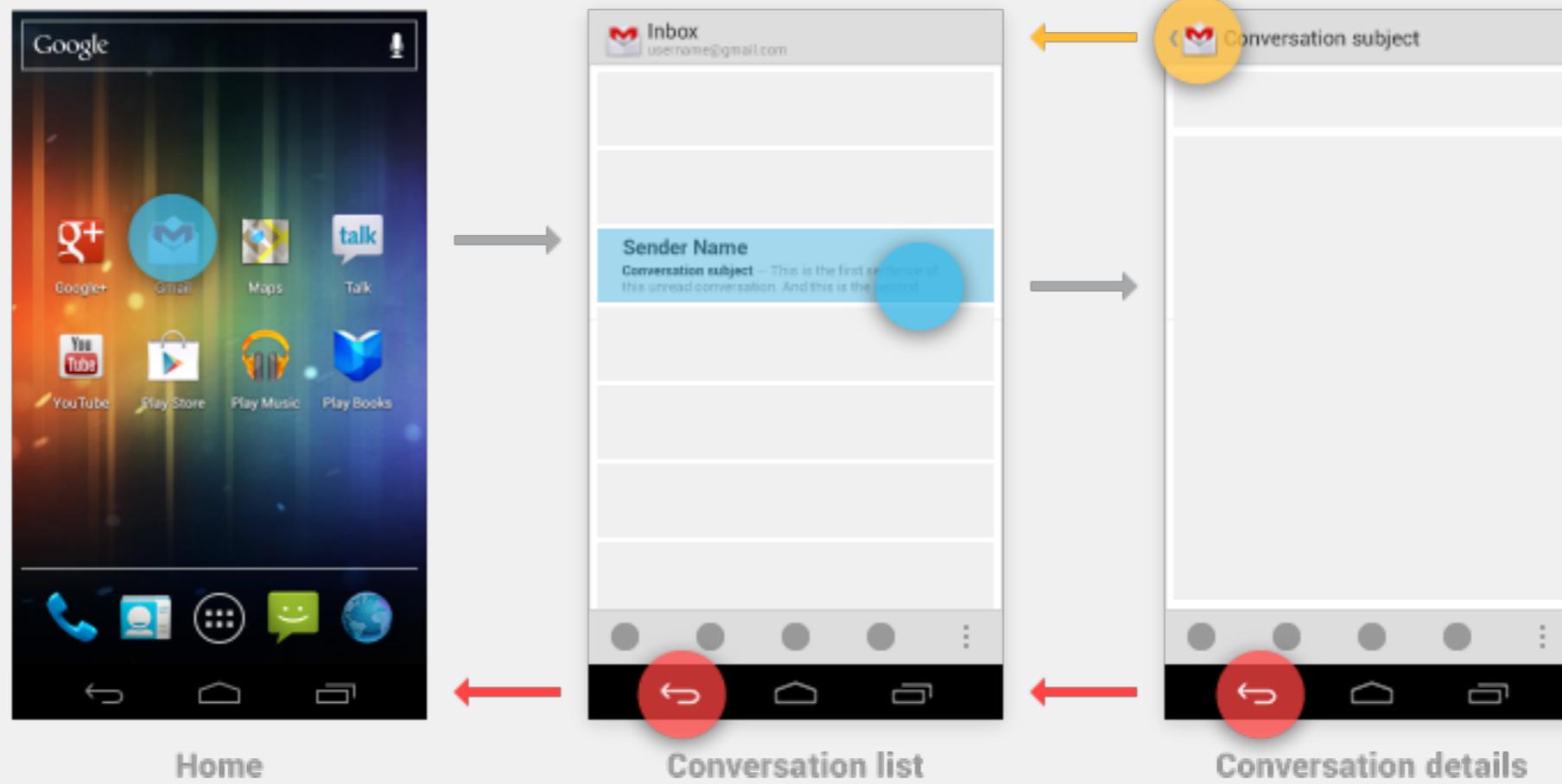
Navigation



Navigation Up & Back



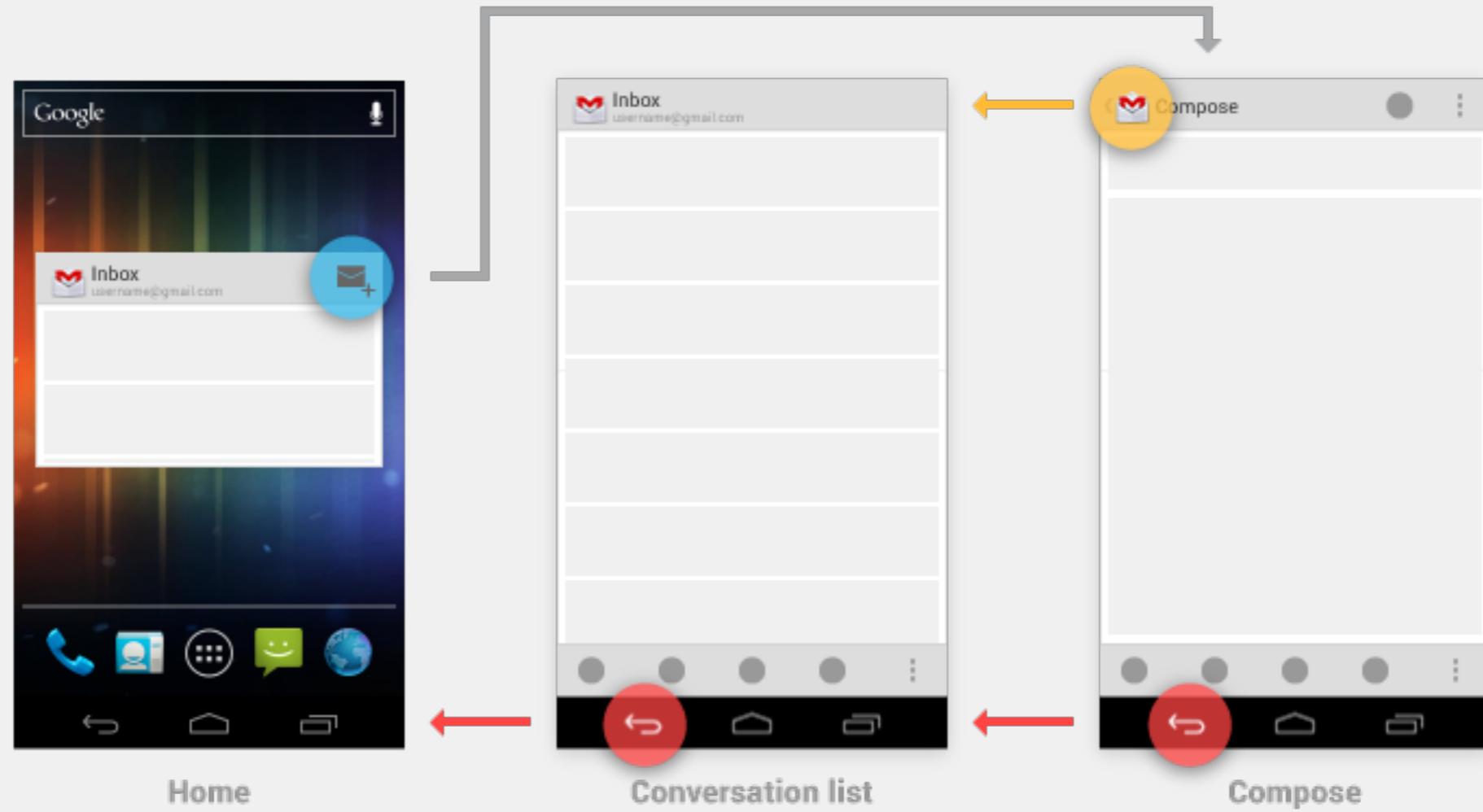
Navigation



'up' never close a current app

<http://developer.android.com/training/design-navigation/ancestral-temporal.html>

Navigation can be very tricky



```
public void startActivities (Intent[] intents)
```

Don't Do This.

- Don't mimic UI elements from other platforms
- Don't carry over platform-specific icons
- Don't use bottom tab bars
- Don't hardcode links to other apps
- Don't use labeled back buttons on action bars
- Don't use right-pointing carets on line items

<http://developer.android.com/design/patterns/pure-android.html>

Happy End?

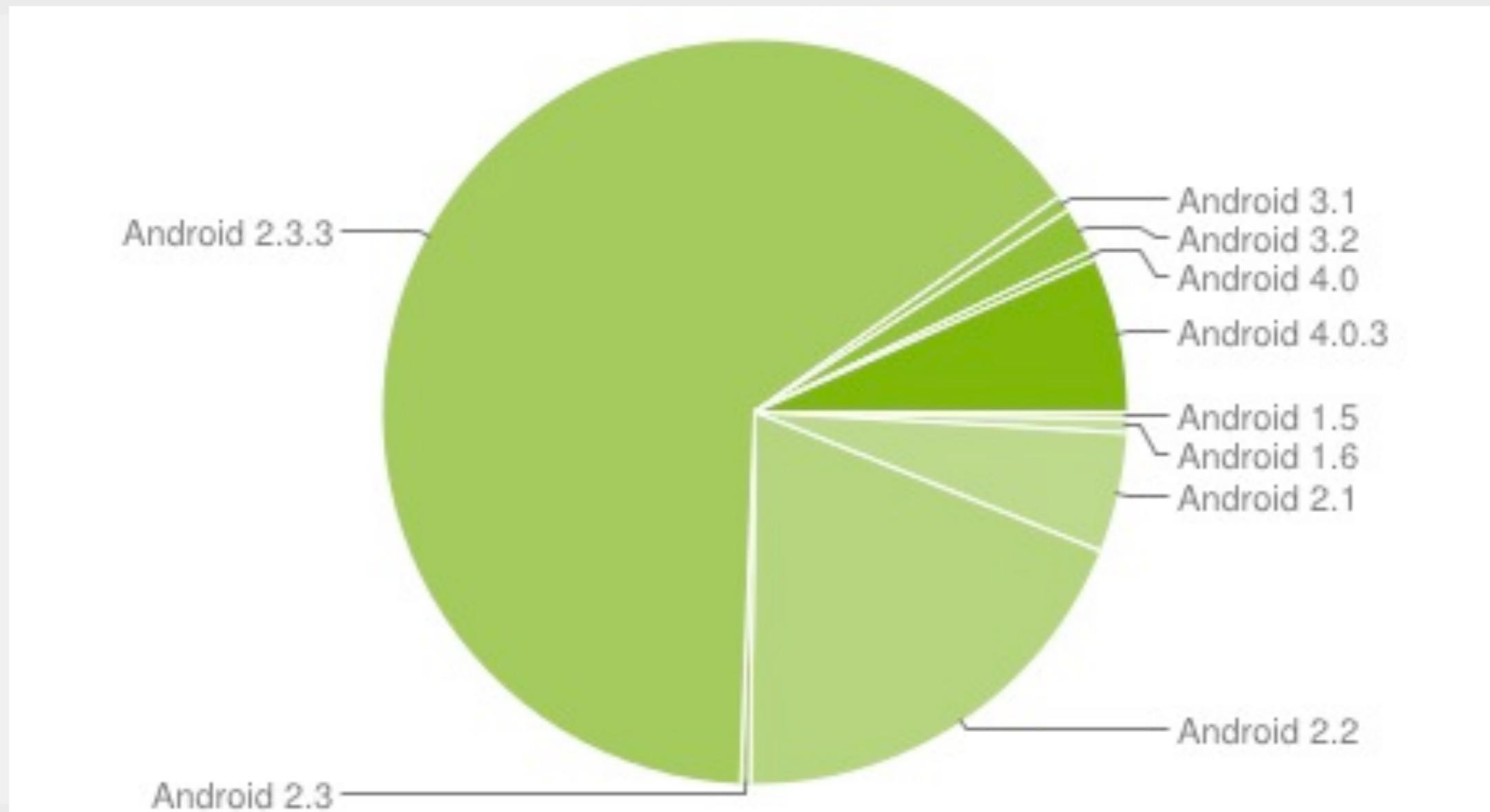
Fantasy



Reality



Look at this



<http://developer.android.com/resources/dashboard/platform-versions.html>

Compatibility

Compatibility

- It's real problem & no silver bullets..
- Need to be smart, need some strategy.
 - Old API-Centric or New API-Centric
- The Truth
 - The portion of old API isn't getting any bigger
- Backward Compatibility
- Support Multiple Platform
- Support Multiple Screen

Backward compatibility

- minSdkVersion / targetSdkVersion
- Using newest SDK version
- Lint API Check
 - <http://tools.android.com/recent/lintapicheck>
- Runtime Version Check & Using Reflection

Using Latest SDK



<http://devmaze.wordpress.com/2011/01/18/using-com-android-internal-part-1-introduction/>

Version Check & Reflection

```
int version = Build.VERSION.SDK_INT;

private static void initCompatibility() {
    try {
        mDebug_dumpHprofData = Debug.class.getMethod(
            "dumpHprofData", new Class[] { String.class } );
        /* success, this is a newer device */
    } catch (NoSuchMethodException nsme) {
        /* failure, must be older device */
    }
}
```

<http://developer.android.com/resources/articles/backward-compatibility.html>

Lint API Checker

The screenshot shows an IDE interface with a code editor and a tool bar below it.

Code Editor:

```
18 ⊕    @Override
19     protected void onResume() {
20         super.onResume();
21         ActionBar actionBar = getSupportActionBar();
22     }
23 } //end of class
```

Tool Bar:

Problems X Console Lint Warnings Call Hierarchy Error Log LogCat

Lint Warnings Table:

Description	Resource	Path	Location	Type
Call requires API level 11 (current min is 7): android.app.Activity#getActionBar	BeLaunc...	/com.huewu.sampl...	line 21	Android Lint...
Class requires API level 11 (current min is 7): android.app.ActionBar	BeLaunc...	/com.huewu.sampl...	line 21	Android Lint...
The project was not built due to "Could not delete '/DikiServer/bin/.git'.". Fi...	DikiServer		Unknown	Java Problem
The project was not built since its build path is incomplete. Cannot find the...	Test		Unknown	Java Problem
The type java.lang.Object cannot be resolved. It is indirectly referenced from...	TestActi...	/Test/src/net/ving...	line 1	Java Problem

<http://android-developers.blogspot.kr/2012/03/updated-sdk-tools-and-adt-revision-17.html>

Support Multiple Platform

1. Find official solution
2. Find open-source library
3. Check AOSP sources
4. Develop your own library

Official Android Support Package

- Fragment for all!!!
 - Loader
 - ViewPager
-
- ...and many other useful utils.

<http://developer.android.com/sdk/compatibility-library.html>

Many Library are Out There

- Android UI Pattern App
 - <https://play.google.com/store/apps/details?id=com.groidify.uipatterns>
- ActionbarSherlock
 - <http://actionbarsherlock.com/>
- Android-ViewPagerIndicator
 - <https://github.com/JakeWharton/Android-ViewPagerIndicator>
- NineOldAndroids
 - <http://nineoldandroids.com/>
- Greendroid
 - <http://greendroid.cyrilmottier.com/>
-

Android UI Pattern App

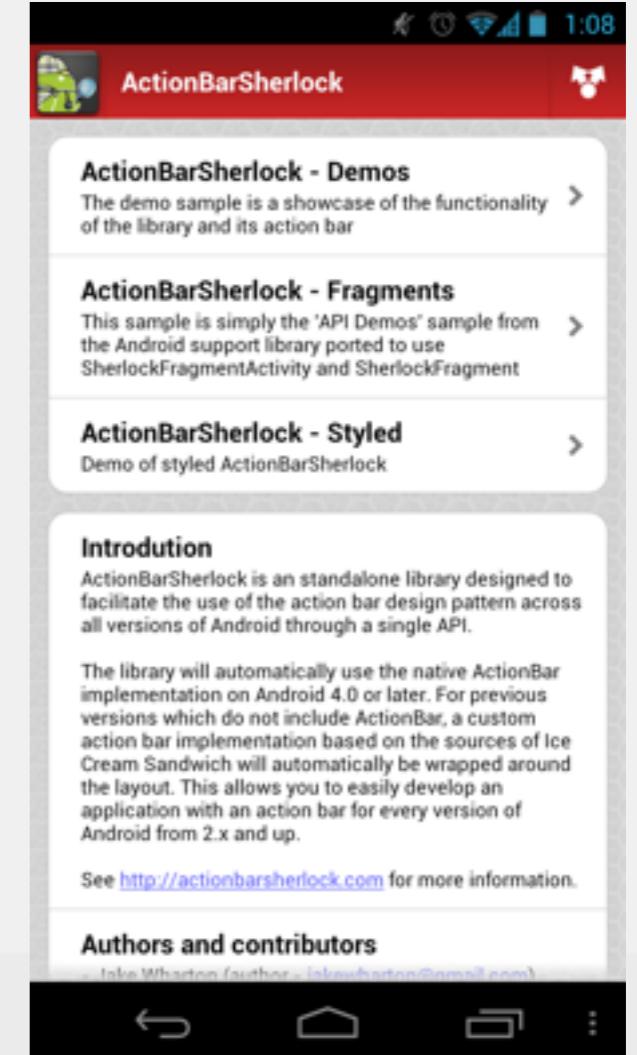
All about open-source android UI library

brief explain
author
popularity
API Level

...

Download it Now!

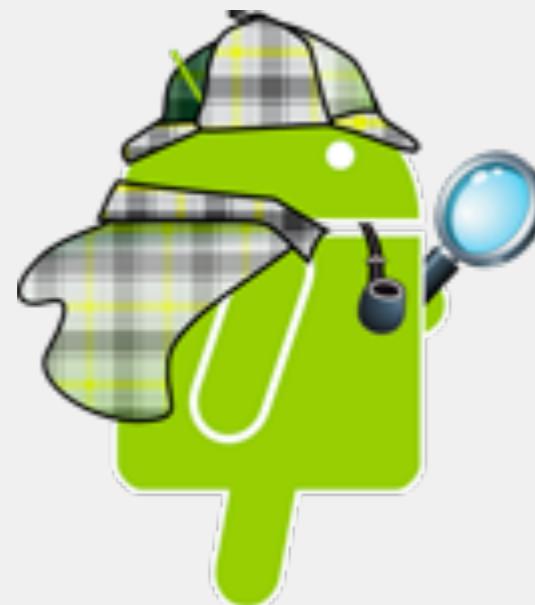
<https://play.google.com/store/apps/details?id=com.groidify.uipatterns&hl=ko>



ActionbarSherlock

Actionbar API for Android 2.x

Based on Support Package & ICS source code.

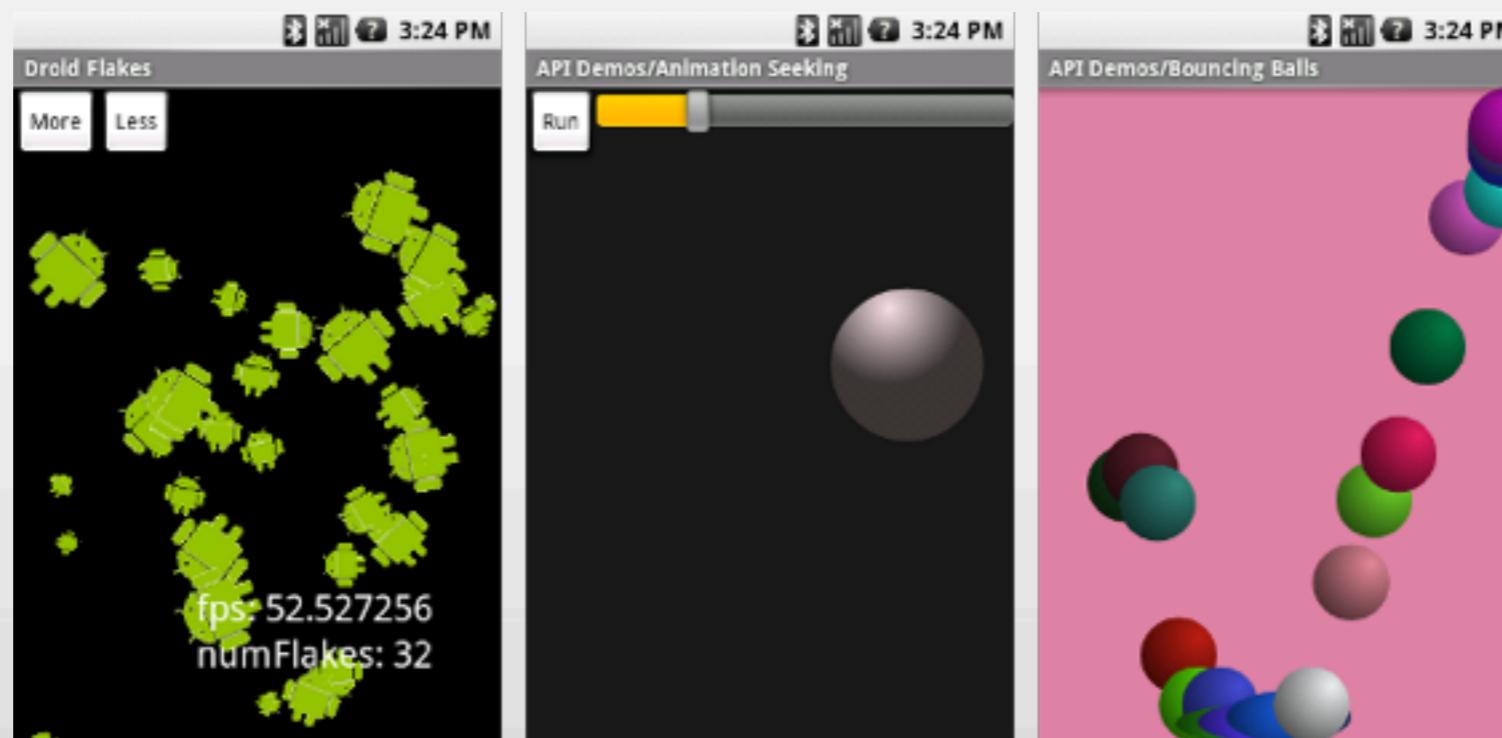


<http://actionbarsherlock.com/>

ActionbarSherlock Demo

NineOldAndroids

- Property Animation in Honeycomb
 - <http://developer.android.com/guide/topics/graphics/prop-animation.html>
- Provide almost same api for All Android Version
 - <http://nineoldandroids.com/>



Remember this name
JakeWharton

<https://github.com/JakeWharton>

ActionBarSherlock

Android library for implementing the action bar design pattern using the native ActionBar on 3.0+ and a custom implementation on pre-3.0 through a single API and theme.

ViewPagerIndicator

Paging indicator widgets compatible with the ViewPager from the Android Support Library and ActionBarSherlock.

NineOldAndroids

Android library for using the Honeycomb animation API on all versions of the platform back to 1.0!

mkvdts2ac3

Bash script to convert DTS audio to AC3 within a matroska file.

HanselAndGretel

Android library providing bread crumbs to the support library fragments.

DirectionalViewPager

Implementation of the compatibility library ViewPager class that supports paging both vertically and horizontally.

DiskLruCache

Java implementation of a Disk-based LRU cache which specifically targets Android compatibility.

GridLayout

This library provides a version of GridLayout that works across all versions of Android 1.5+. As a side effect, this library also includes the lightweight Space view.

trakt-java

A Java wrapper around the Trakt RESTful API and a simple DSL for easy interaction.

MapForgeFragment

Port of the MapsForge library to provide a self-contained MapFragment for both the native type and compatibility library.

uglify-js-middleware

Connect middleware which will automatically uglify your JS files.

SMSMorse

An Android service that vibrates incoming SMS messages in Morse code.

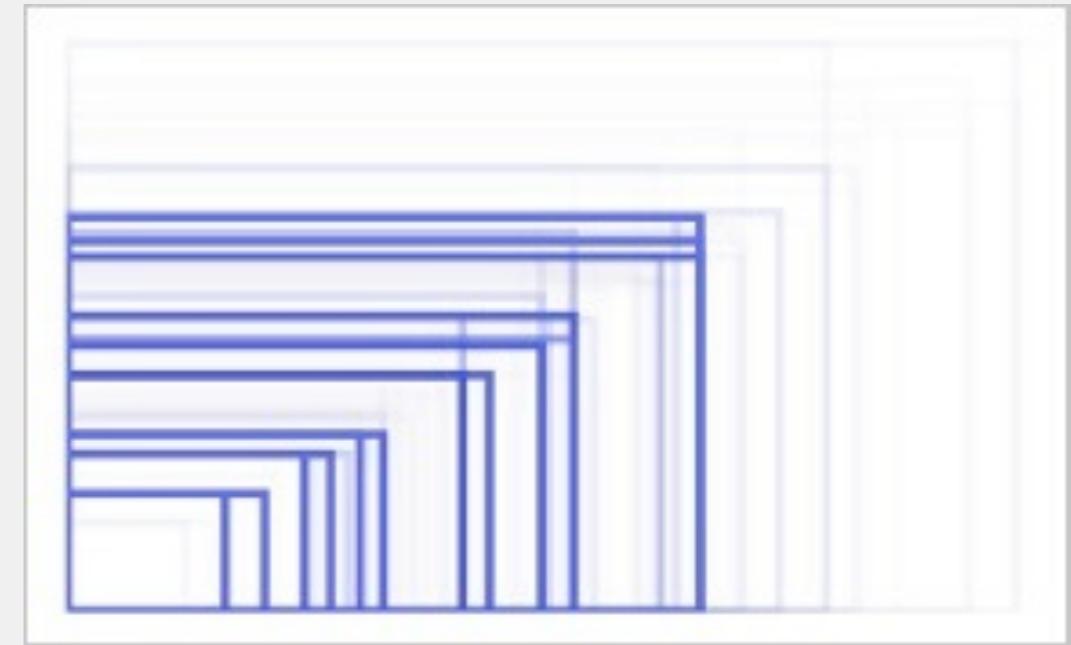
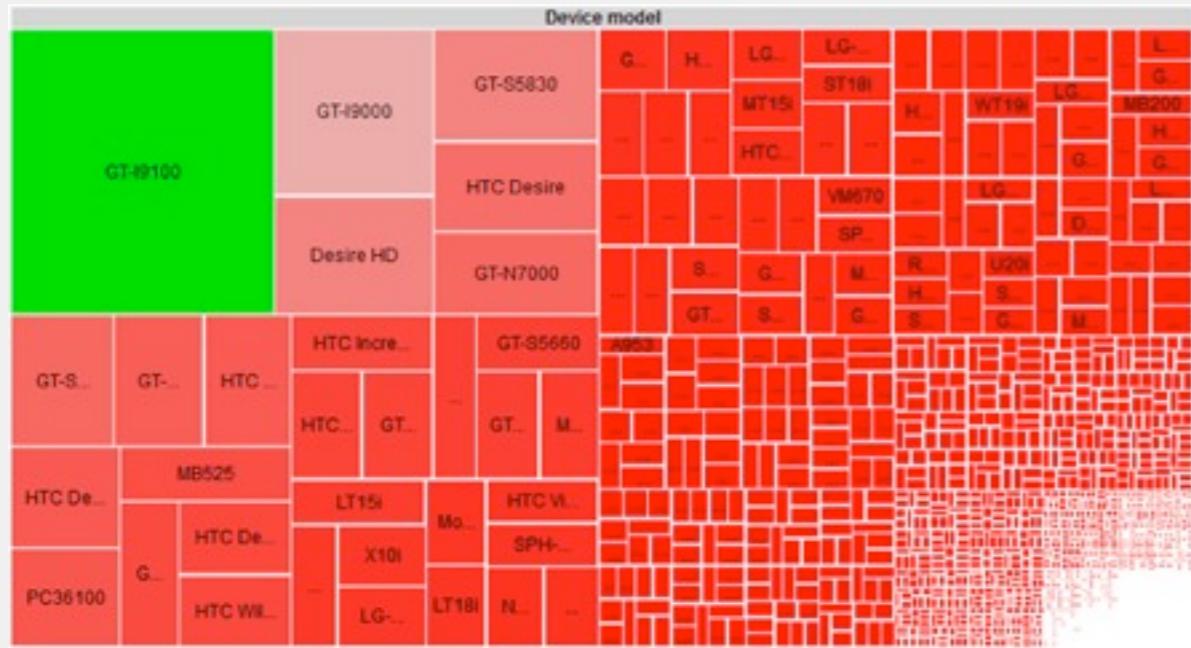
AOSP

- Android Open Source Project
 - <http://source.android.com/>
- Three Steps
 - Check ICS source code / resources / etc...
 - Grab some codes
 - Wrapping it nicely
- Many libraries already do this.

Develop your own library

Don't do this

Support Multiple Screen



[http://opensignalmaps.com/reports/
fragmentation.php](http://opensignalmaps.com/reports/fragmentation.php)

Support Multiple Screen

1. Resources Abstraction

2. Style and Theme

3. Timesaving Tools

Never use Actual Number

- DP instead of Pixel
- Relative Layout instead of Absolute Layout
- Dimension Reference
- Color Reference
- ...

Resource Type

- Animation
- Color State
- Drawable
- Layout
- Menu
- String
- Style
- Bool
- Color
- Dimension
- ID
- Integer
- IntegerArray
- TypedArray

Many Types!!!

Resource Qualifier

MCC and MNC
Language and region
smallestWidth
Available width
Available height
Screen size
Screen aspect
Screen orientation
Dock mode
Night mode
Screen pixel density (dpi)
Touchscreen type
Keyboard availability
Primary text input method
Navigation key availability
Primary non-touch navigation method
Platform Version (API level)

"Provide Default"

values/

"Can be combined"

values-xlarge-port-v10/

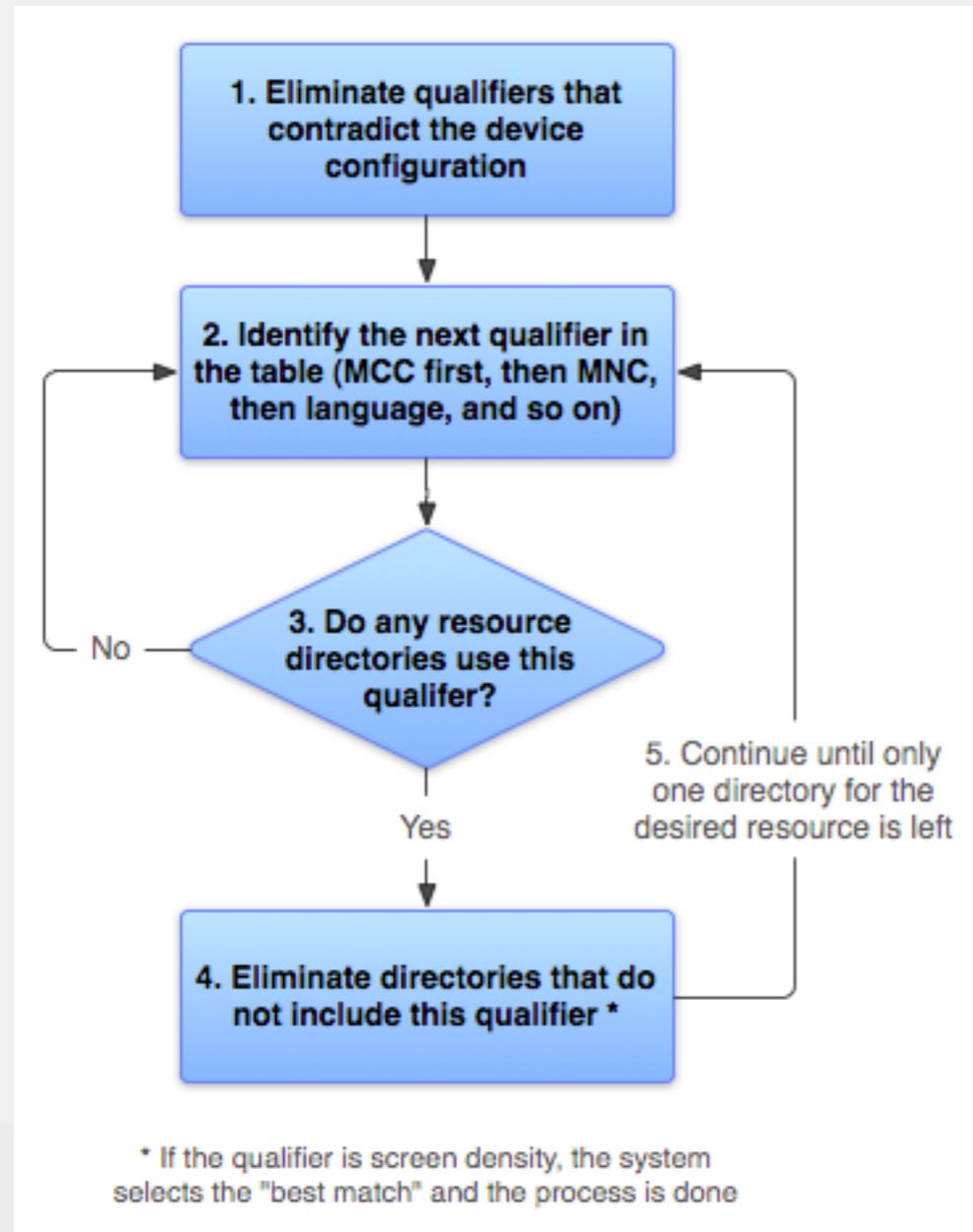
"Order is Matter!!!"

drawable-en-port/ o

drawable-port-en/ x

<http://developer.android.com/guide/topics/resources/providing-resources.html>

Resource Qualifier Matching

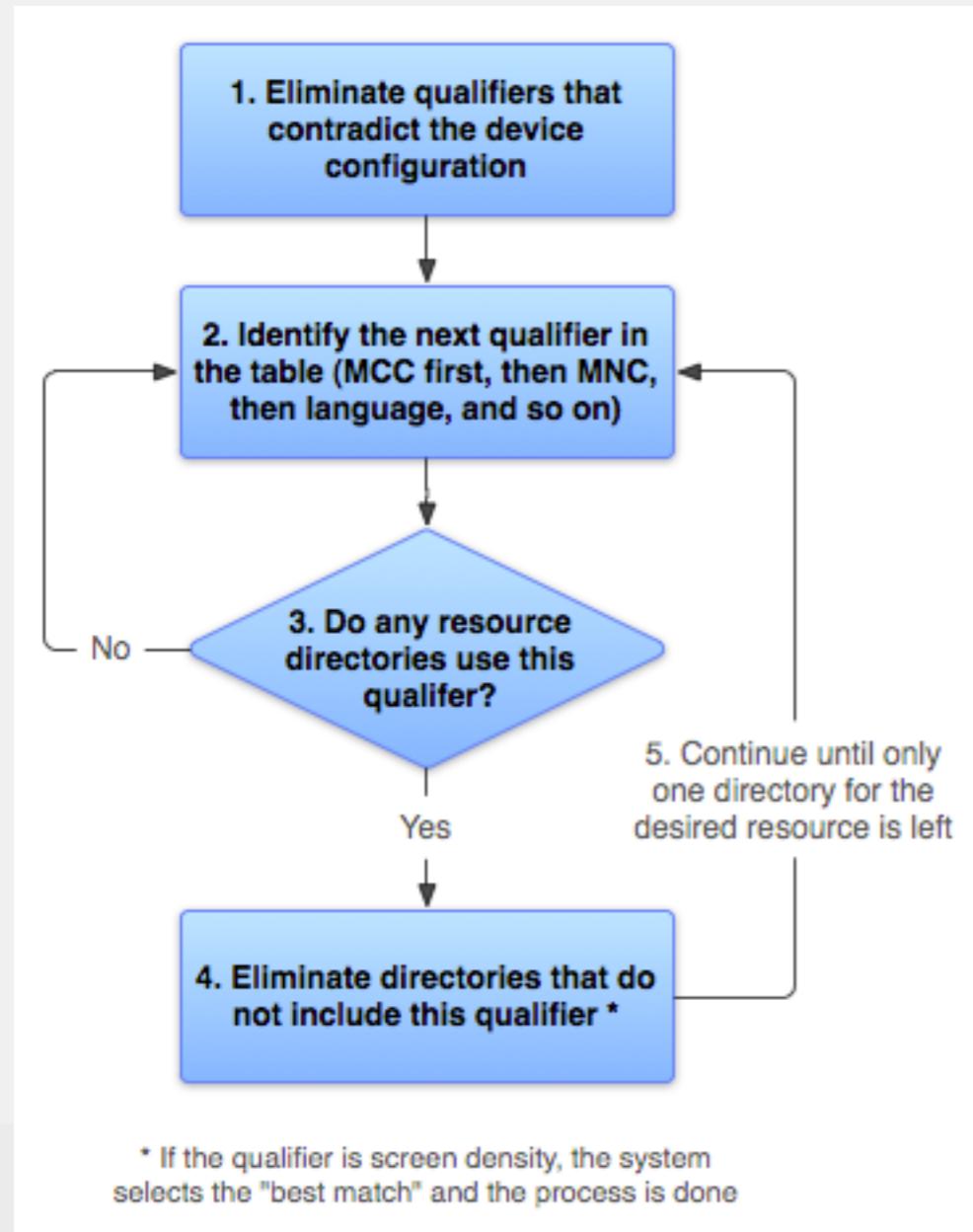


Locale = **en-GB**
Screen orientation = **port**
Screen pixel density = **hdpi**
Touchscreen type = **notouch**
Primary text input method = **12key**

drawable/
drawable-en/
drawable-fr-rCA/
drawable-en-port/
drawable-en-notouch-12key/
drawable-port-ldpi/
drawable-port-notouch-12key/

<http://developer.android.com/guide/topics/resources/providing-resources.html>

Resource Qualifier Matching

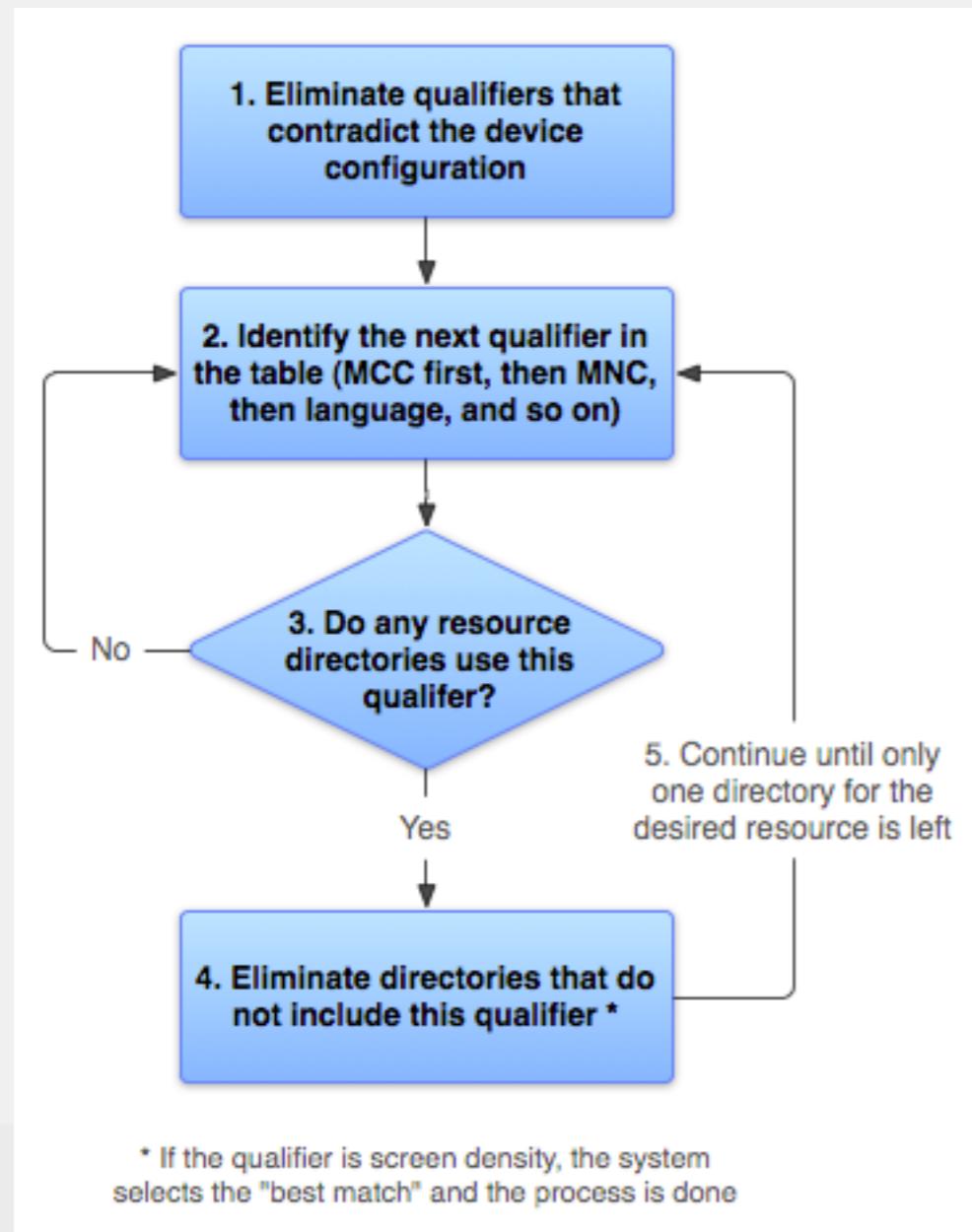


Locale = **en-GB**
Screen orientation = **port**
Screen pixel density = **hdpi**
Touchscreen type = **notouch**
Primary text input method = **12key**

drawable/
drawable-en/
~~**drawable-fr-rCA/**~~
drawable-en-port/
drawable-en-notouch-12key/
drawable-port-ldpi/
drawable-port-notouch-12key/

<http://developer.android.com/guide/topics/resources/providing-resources.html>

Resource Qualifier Matching



Locale = ~~en-GB~~

Screen orientation = ~~port~~

Screen pixel density = ~~hdpi~~

Touchscreen type = ~~notouch~~

Primary text input method = ~~12key~~

~~drawable/~~

~~drawable-en/~~

~~drawable-fr-rCA/~~

~~drawable-en-port/~~

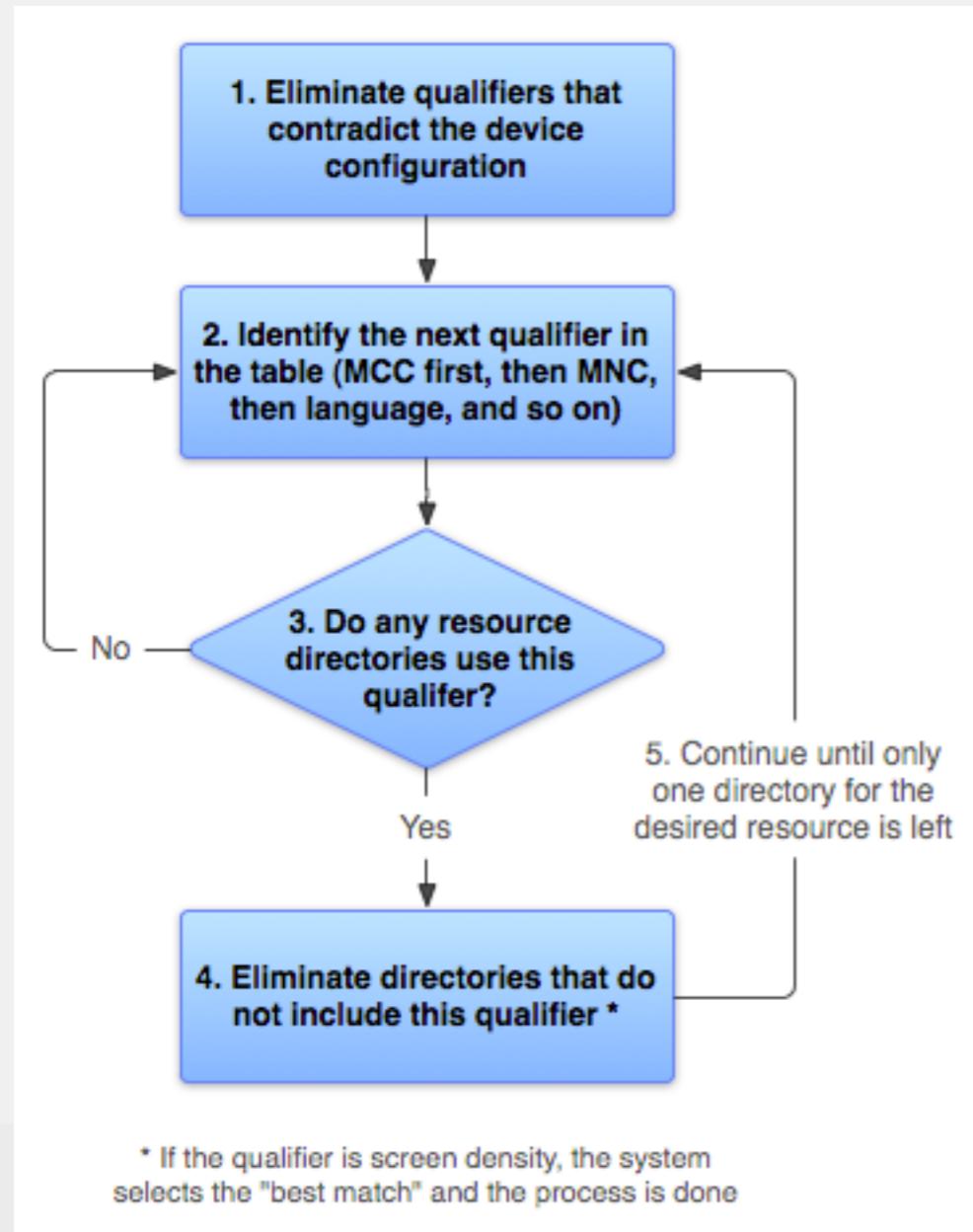
~~drawable-en-notouch-12key/~~

~~drawable-port-ldpi/~~

~~drawable-port-notouch-12key/~~

<http://developer.android.com/guide/topics/resources/providing-resources.html>

Resource Qualifier Matching



Locale = ~~en-GB~~
Screen orientation = ~~port~~
Screen pixel density = ~~hdpi~~
Touchscreen type = ~~notouch~~
Primary text input method = ~~12key~~

~~drawable/~~
~~drawable-en/~~
~~drawable-fr-rCA/~~
~~drawable-en-port/~~
~~drawable-en-notouch-12key/~~
~~drawable-port-ldpi/~~
~~drawable-port-notouch-12key/~~

<http://developer.android.com/guide/topics/resources/providing-resources.html>

Theme & Style

- Only for designer's Stuff?
- Very similar to CSS
- 3 Step
 - First, check default theme and attributes
 - Need to change anything?
 - Override an existing attribute

All about Attributes

- Why my TextView looks like this?

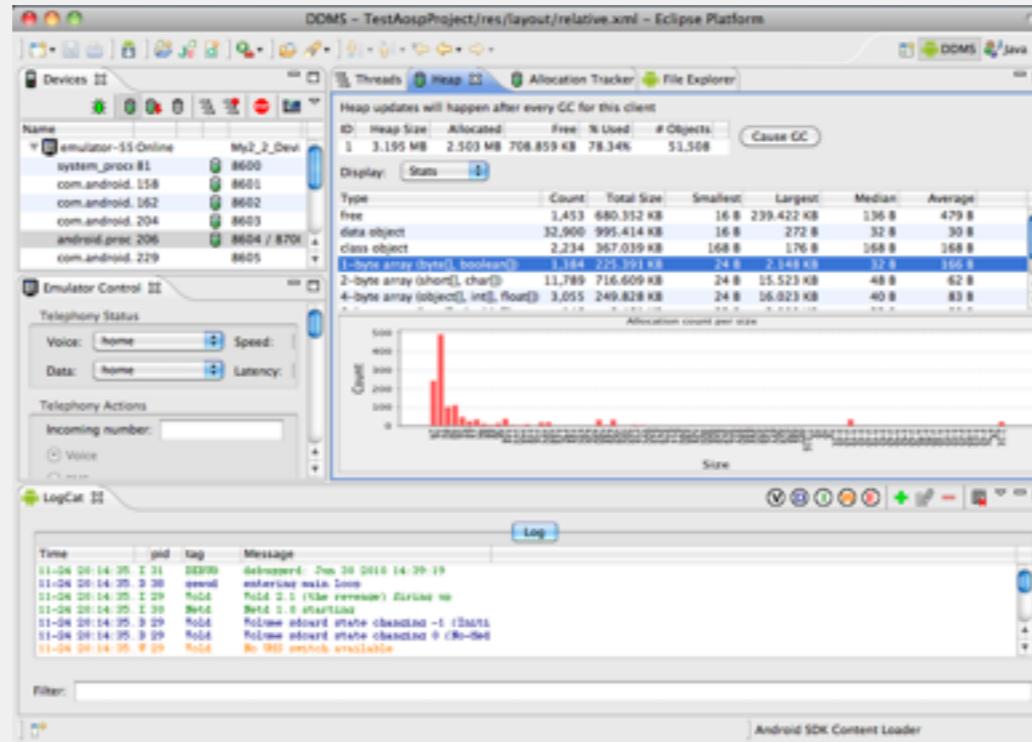
<http://developer.android.com/reference/android/widget/TextView.html>

android:autoLink, android:autoText, android:bufferType, android:capitalize, android:cursorVisible,
 android:digits, android:drawableBottom, android:drawableLeft, android:drawablePadding,
 android:drawableRight, android:drawableTop, android:editable, android:editorExtras, android:ellipsize,
 android:ems, android:freezesText, android:gravity, android:height ,android:hint, android:imeActionId,
 android:imeActionLabel, android:imeOptions, android:includeFontPadding, android:inputMethod,
 android:inputType, android:lineSpacingExtra, android:lineSpacingMultiplier, android:lines,
 android:linksClickable, android:marqueeRepeatLimit, android:maxEms, android:maxHeight,
 android:maxLength, android:maxLines, android: maxWidth, android:minEms,
 android:minHeight ,android:minLines, android:minWidth, android:numeric, android:password,
 android:phoneNumber, android:privateImeOptions, android:scrollHorizontally, android:selectAllOnFocus,
 android:shadowColor, android:shadowDx, android:shadowDy, android:shadowRadius,
 android:singleLine, android:text, android:textAllCaps, android:textAppearance, android:textColor,
 android:textColorHighlight, android:textColorHint, android:textColorLink, android:textIsSelectable,
 android:textScaleX, android:textSize, android:textStyle, android:typeface, android:width

<http://developer.android.com/guide/topics/ui/themes.html>

Android Develop Tool

Thank you to ADT team's hard working!!
Current version is '18.0.0'

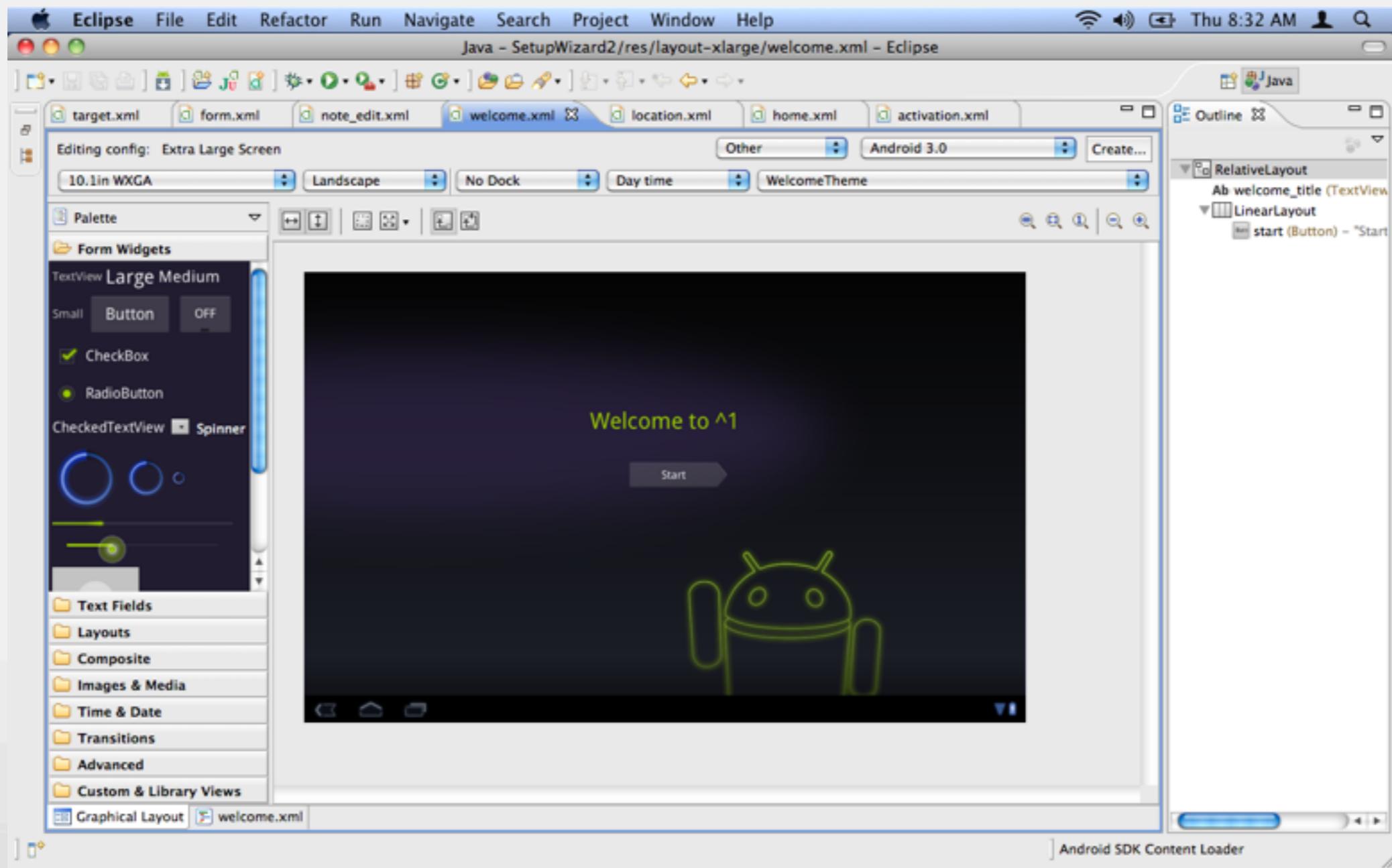


Android Development Tools in Google I/O 2011

<http://developer.android.com/videos/index.html?v=0q05KqjXTvs>

Graphical Layout Editor Demo

It's not shame to use a tool!!



Emulator

- Yes, it's slow... but not dammed slow.
- Snap-shop.
- Don't forget turn on H/W accel.

Impossible is something

- Alternative
 - Multiple APKs in as a single package name
 - <http://developer.android.com/guide/market/publishing/multiple-apks.html>

애플리케이션 수정

제작 취소 저작

상품 세부정보 APK 파일 단순 모드로 전환 »

활성 APK
'저작'을 클릭하면 해당 APK가 Android 마켓에 게재됩니다.

 버전 코드: 5 버전 이름: 1.4 더보기 »	API 수준: 7-12+ 지원되는 화면: xlarge OpenGL 빙스처: 전체 비활성화
 버전 코드: 4 버전 이름: 1.3 더보기 »	API 수준: 7-12+ 지원되는 화면: small-xlarge OpenGL 빙스처: 전체 비활성화

경고: 여러 개의 활성 APK가 일부 동일한 기기를 지원합니다. 기기에 하나 이상의 API가 지원되는 경우 기기는 더 높은 버전의 APK를 받게 됩니다.

Summary

- Android Design
- Action Bar!!!
- ActionbarSherlock!!!
- Resource Abstractions!!
- Graphical Layout Editor

Useful External Links

- Android Developer Site
 - <http://developer.android.com>
 - Check resources tab!
- Android Design
 - <http://developer.android.com/design/index.html>
- Facebook Android 개발자 그룹
 - <http://www.facebook.com/groups/kr.android/>
- Android Design Pattern Blog
 - <http://www.androiduipatterns.com>
- JakeWharton's Homepage
 - <http://jakewharton.com/>
- GitHub Gaug.es
 - <https://github.com/GitHub/gauges-android>
 - <http://huewu.blog.me>

Thank You

huewu.yang@gmail.com

<http://huewu.blog.me>

<https://github.com/huewu>