



ANDROID APP DEVELOPMENT



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Under the Guidance of

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What is Android?

- Android is an open source Linux-based **Operating System** for mobile devices such as smart-phones and tablet computers.
- Like other computer operating systems Android offers unified approach to application development (but in mobile devices). That means developers need to develop applications for Android, and it should run on different devices powered by Android.
- Powers smart-phones, smart-watches, Smart-tv's and even cars too.



THE ANDROID ARCHITECTURE

Applications

Native Android Apps

Third Party Apps

Application Framework

Activity Manager

Window Manager

Notification Manager

View System

XMPP Service

Location Manager

Package Manager

Resource Manager

Content Providers

Telephony Manager

Libraries

SQLite

WebKit

OpenGL ES

FreeType

Surface Manager

Media Framework

SSL

SGL

libc

Android Runtime

Core Libraries

Dalvik Virtual Machine

Linux Kernel

Display Driver

WiFi Driver

Audio Drivers

Binder (IPC) Drivers

Bluetooth Driver

Camera Driver

Power Management

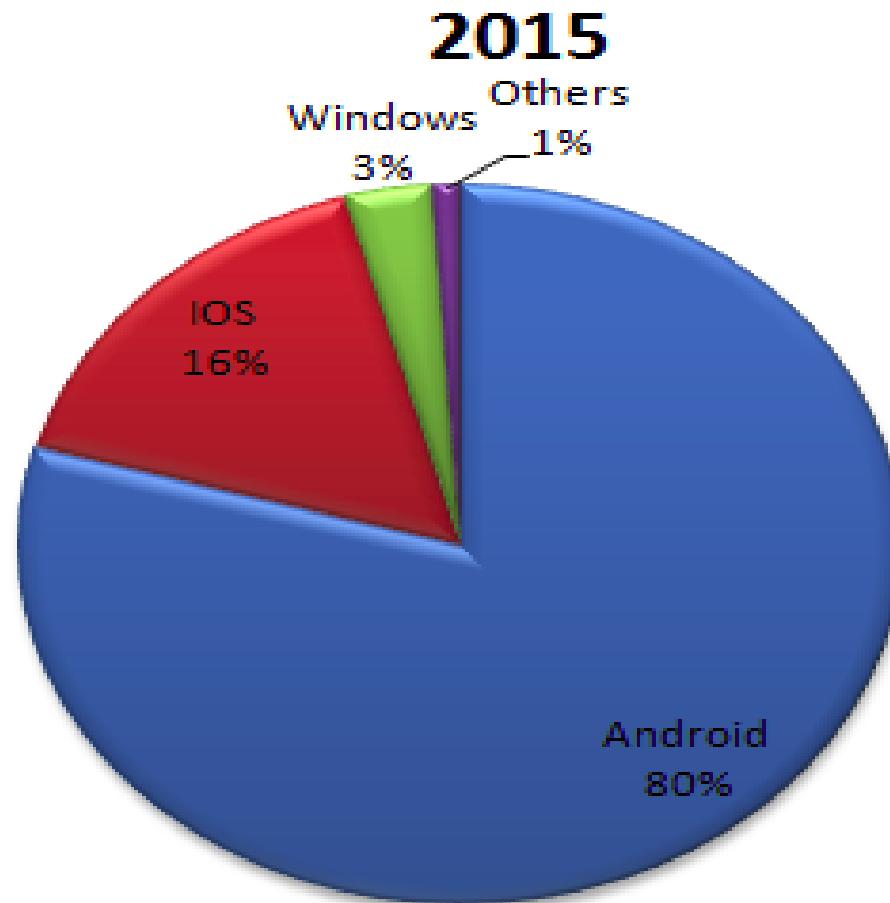
Process Management

Memory Management

Flash Memory Driver

Why Android App Development is worth it?

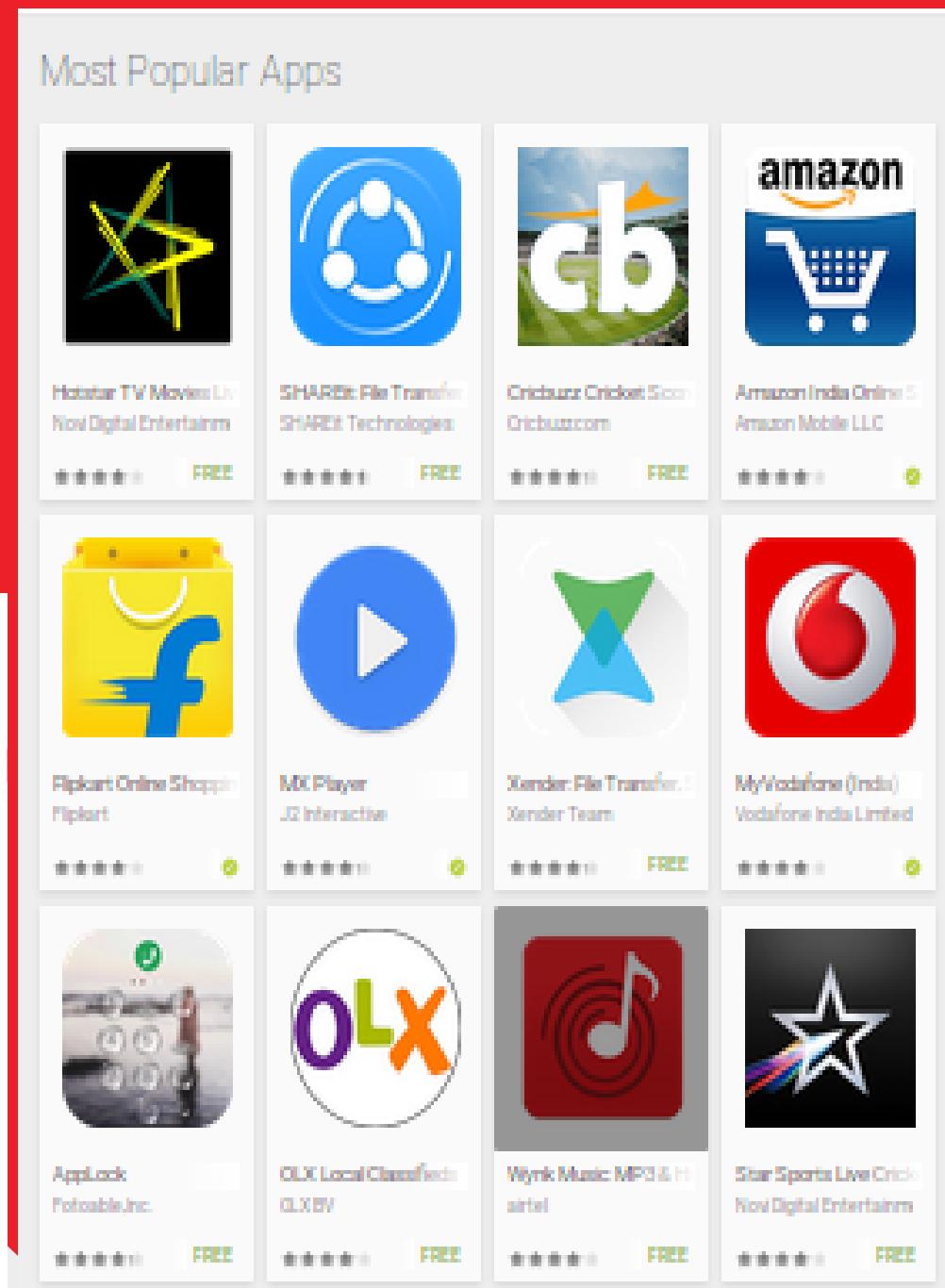
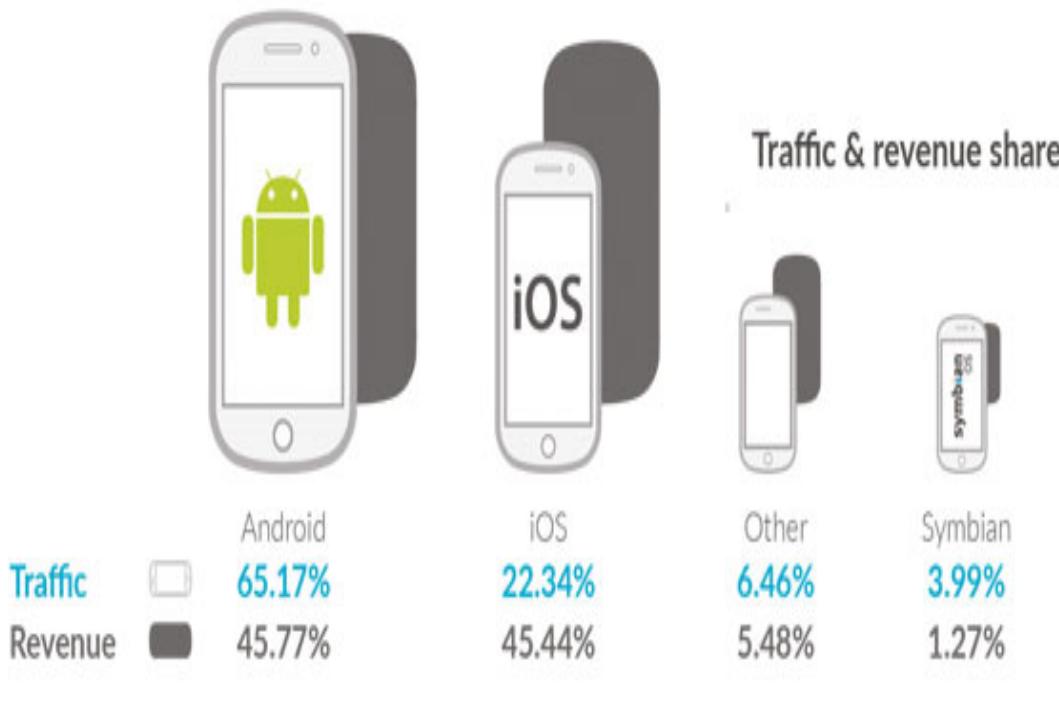
Global Operating System Market Share



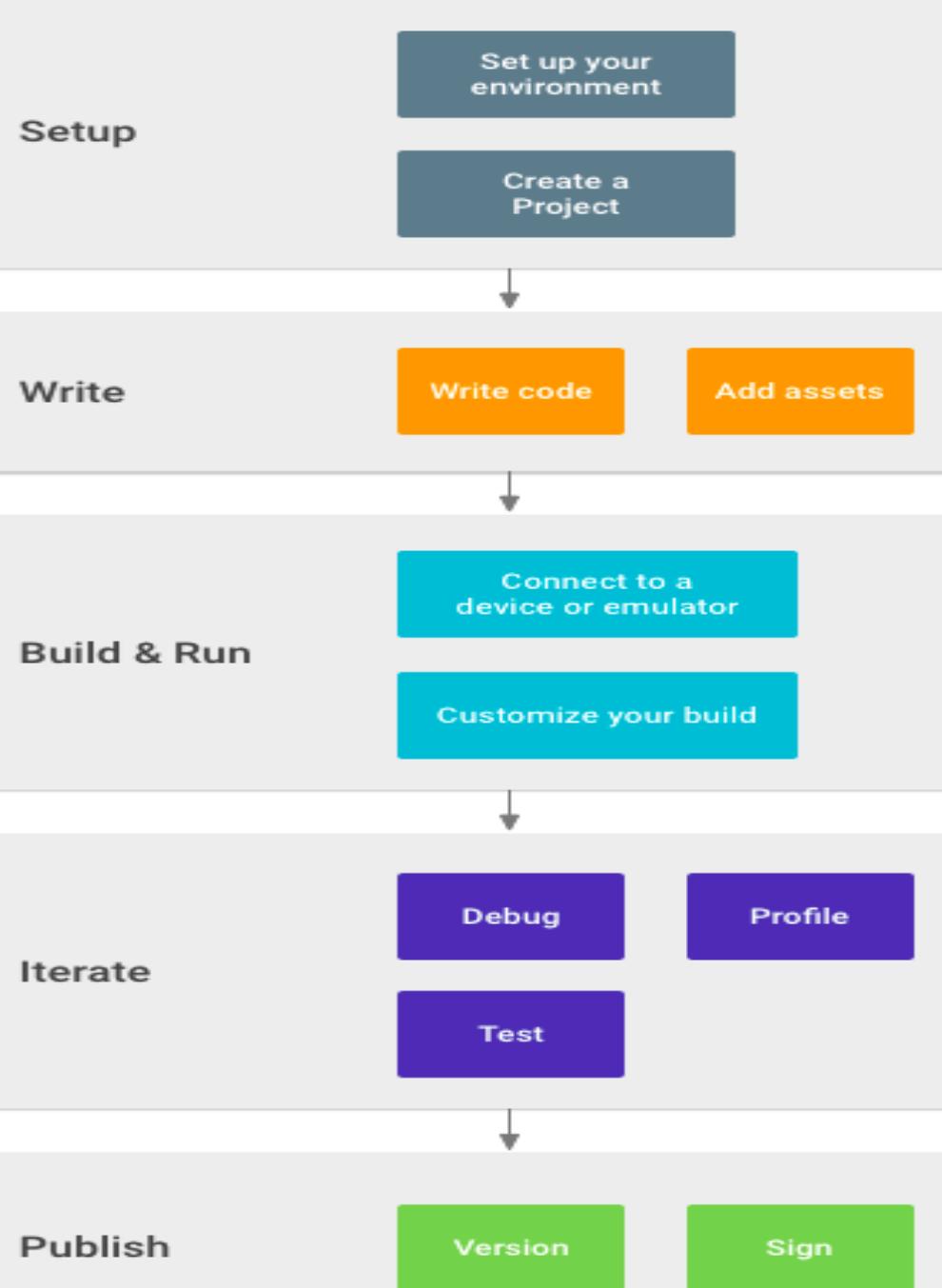
Android continues to lead the Global market share, having reach on over 80% of mobile users

What are Android Applications or ‘Apps’?

- An Android app is a software application running on the Android platform. Because the Android platform is built for mobile devices, a typical Android app is designed for a smartphone or a tablet PC running on the Android OS.



Workflow



- > Install Android Studio(IDE) and create a project.
- > Write quality code, design a UI and create resources for different device types.
- > Build the project into a debuggable APK package, that can be installed and run on Android-powered devices or an emulator.
- > Create tests to eliminate bugs and optimize app's performance.
- > Publish when the app is ready to be released to the users. Versioning and signing it with a key is to be considered.

Tools and Softwares to get started with Android App Development



Powered by IntelliJ Platform

Android Application Anatomy



Activities

1. Provides **User Interface**
2. Usually represents a **Single Screen**
3. Can contain one/more **Views**
4. Extends the **Activity** Base class

Services

1. **No User Interface**
2. Runs in **Background**
3. Extends the **Service** Base Class

Application= Set of Android Components

Intent/Broadcast Receiver

1. Receives and Reacts to broadcast **Intents**
2. No UI but **can start** an Activity
3. Extends the **BroadcastReceiver** Base Class

Content Provider

1. Makes application data available to other apps
2. Data stored in **SQLite database**
3. Extends the **ContentProvider** Base class

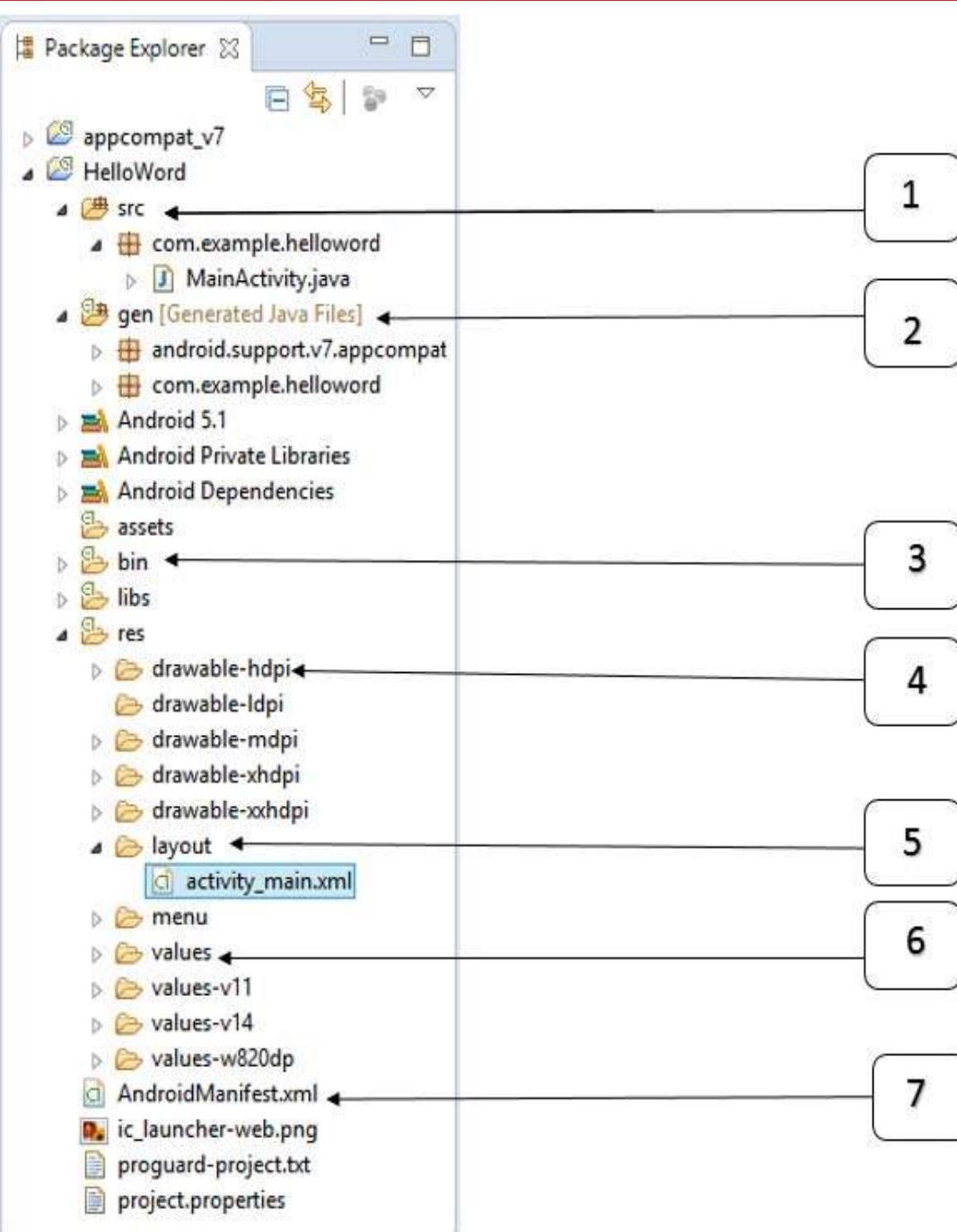
Components that **MUST** be present in an app

- > Activity
- > Intent
- > Interface

Components that **CAN** be present in an app

- > Services
- > Broadcast Receivers

Anatomy of an Android Application



1

Src : This contains the.java source files

2

Gen : This contains the compiler-generated .R file

3

Bin : This folder contains the .apk files

4

res/drawable-hdpi : drawable objects,
For High Density screens

5

res/layout : contains app's user interface files

6

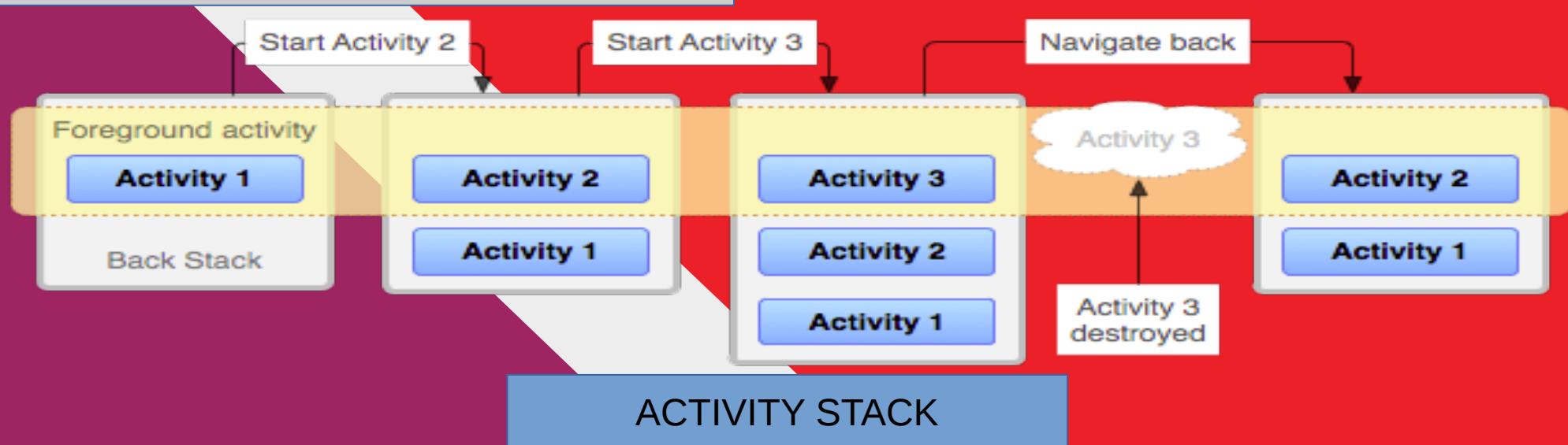
res/values : contains xml files for resources,
ex strings

7

AndroidManifest.xml : describes the
Fundamental characteristics of the app

Activity

- > Activity provides the user a screen/interface to interact with the application.
- > An application typically has multiple activities. Each screen of an application is a different activity. You can understand this using the following image: The first Activity (screen) has a button, which when clicked leads the user to a second screen, which is the second activity.

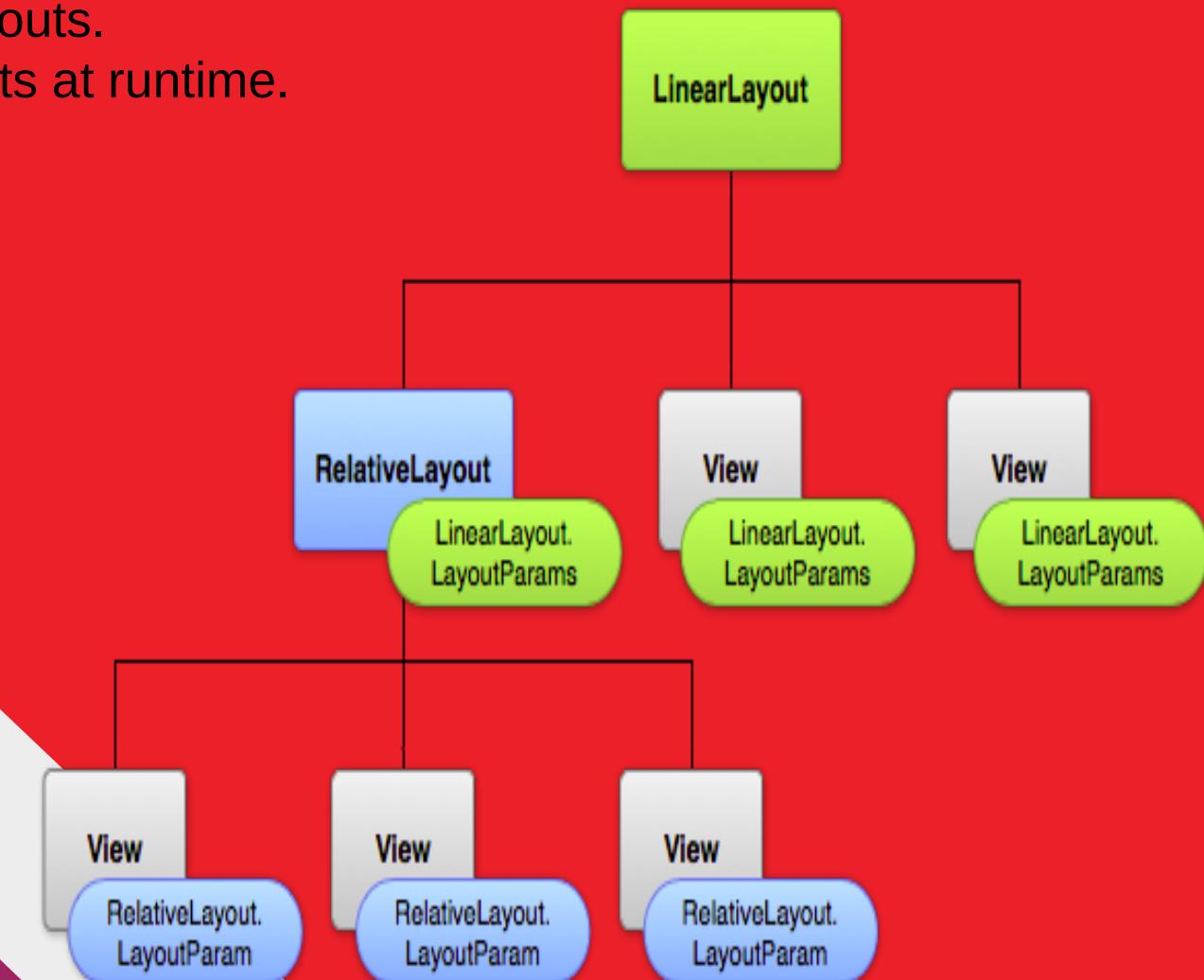


Layouts

- A layout defines the visual structure for a user interface, such as the UI for an activity or app widget.
- You can declare a layout in two ways:
 - Declare UI elements in XML. Android provides a straightforward XML vocabulary that corresponds to the View classes and subclasses, such as those for widgets and layouts.
 - Instantiate layout elements at runtime.

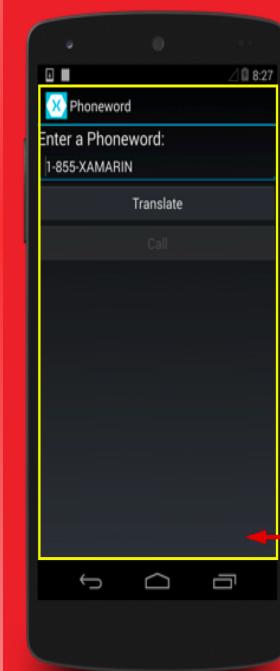
Layout options

1. Linear Layout
2. Relative Layout
3. Table Layout
4. Absolute Layout
5. Frame Layout
6. List View
7. Grid View

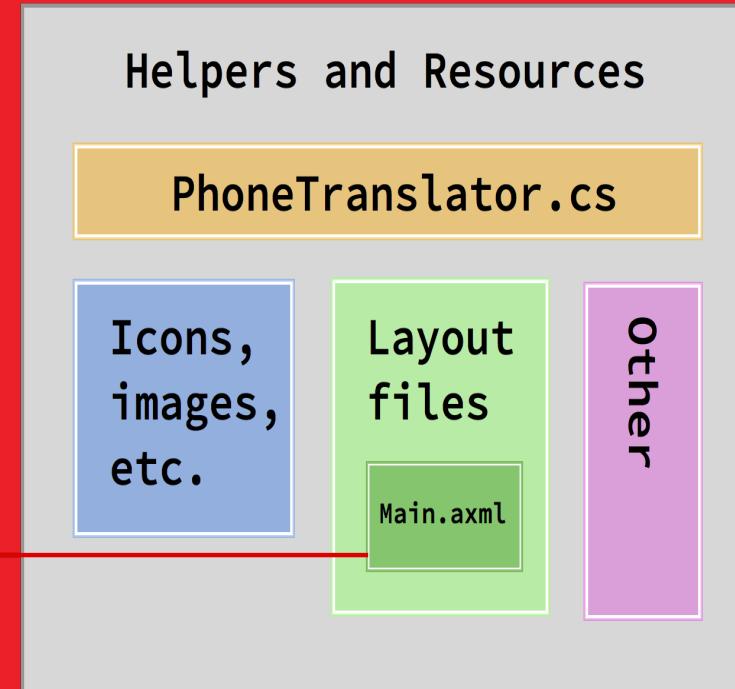


App Manifest

- Every application must have an `AndroidManifest.xml` file (with precisely that name) in its root directory. The manifest file provides essential information about your app to the Android system, which the system must have before it can run any of the app's code.
- It declares the permissions that the application must have in order to access protected parts of the API and interact with other applications. It also declares the permissions that others are required to have in order to interact with the application's components.

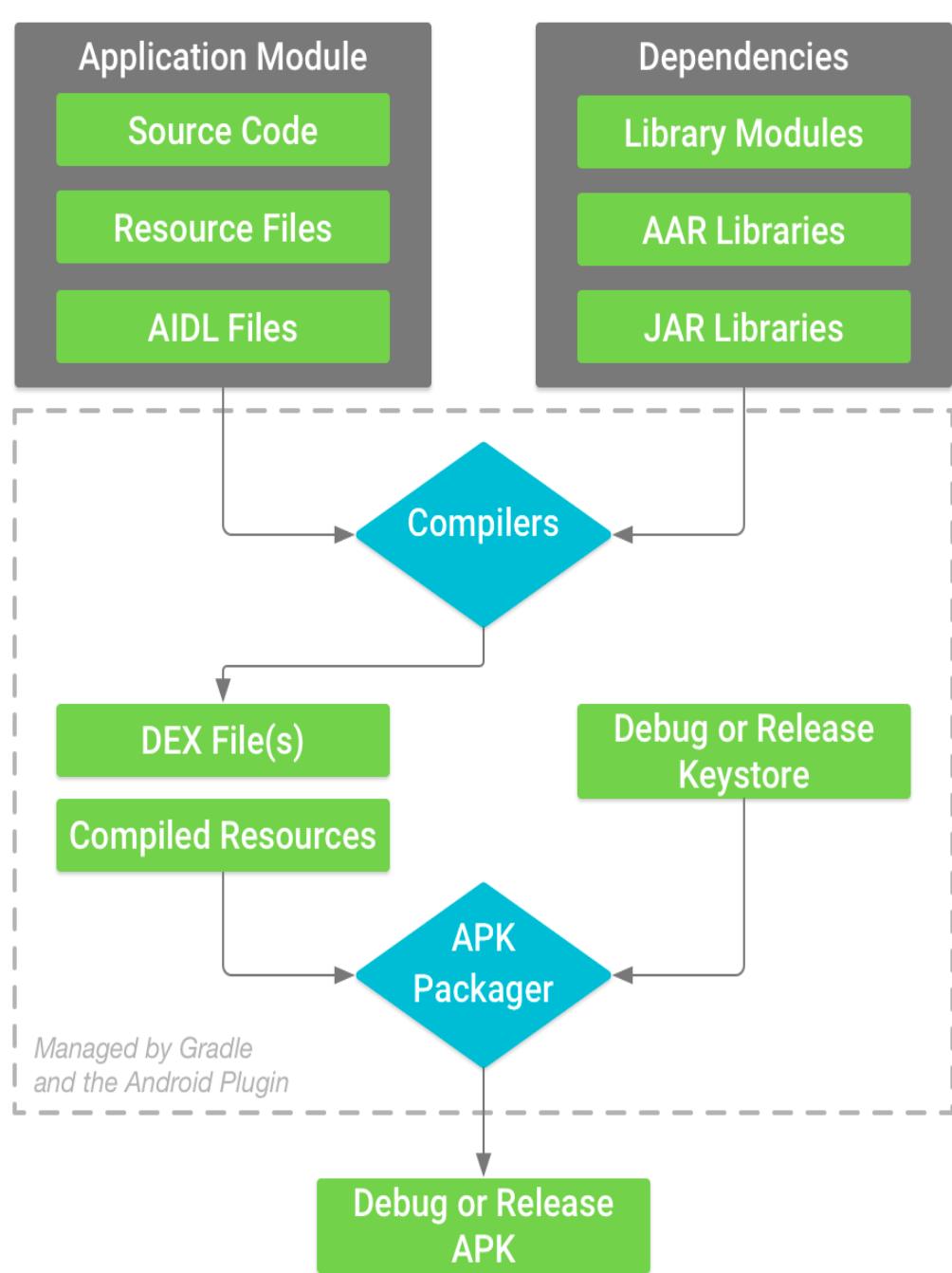


Activity (Screen)



Android Manifest

Generating the debug/release .apk file



1. Compiler converts the source code into DEX files, including the bytecode.
2. The APK Packager combines DEX files and compiled resources into single APK. APK must be signed before deployment.
3. The APK packager signs the APK using either the debug or release keystore.
4. At the end of the build process, you have either a debug APK or release APK of your app that you can use to deploy, test, or release to external users.

Publishing the app to Google Playstore

Google Play Developer Console - Mozilla Firefox

Google Play Dev... [+ New Tab](#)

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Sign-in with your Google account **Accept Developer Agreement** Pay Registration Fee Complete your Account details

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This is the Google account that will be associated with your Developer Console. If you would like to use a different account, you can choose from the following options below. If you are an organization, consider registering a new Google account rather than using a personal account.

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BEFORE YOU CONTINUE...

 Read and agree to the [Google Play Developer distribution agreement](#).

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 Review the distribution countries where you can distribute and sell applications.

If you are planning to sell apps or in-app products, check if you can have a merchant account in your country.

 \$25 Make sure you have your credit card handy to pay the \$25 registration fee in the next step.

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**Thank you for your Time and
Attention!**

