Mobile Application Development (2161611)

Unit : 01

Chapter 01 – Introduction to Android, Mobile App Development

What is Android?

- An Android is an open source & Linux based operating system for mobile devices such as smartphones, etc.
- An Android was developed by open Handset Alliance led by google and other companies.

Why Android?

1. Open Source
2. Larger Developer and Increased Marketing
3. Community Reach
4. Inter App Integration
5. Reduced cost of development
6. Higher Sucess Ratio
7. Rich Development Environment

OLIRRH

Featureas of Android – B C S M M W M M R

- Beautiful UI
- Connectivity
- Storage
- Media Support
- Messaging
- Web browser
- Multi touch
- Multi tasking
- Resizable Widgets
- Multi Language
- GCM
- Wifi Direct
- Andriod Beam

History of Android

- Cupcake Android 1.5
- Donut Android 1.6
- Eclair Android 2.0/2.1
- Froyo Android 2.2x
- Gingerbread Android 2.3x
- Honeycomb Android 3.x
- Icecream Sandwich 4.0.x
- Jelly Bean Android 4.1x
- KitKat Android 4.4x
- Lollipop Android 5.0x

What is API level?
An API level is an integer value that uniquely identifies the Framework API version offered by a version of the Android platform.

Android IDEs - Android Studio, Eclipse IDE.

Important Factors contributing to the cost of Mobile App

1. UI/UX design hours
2. Platform wise app development hours
3. Backend Sever hours
4. Hourly rate of development.

What are the Biggest Challenges Faced by Mobile App Developers

1. Development Approach
2. Device compatibility & Screen Size
3. Attention
4. Funding
5. Customer Review & Experience

06 Myths of App Development

1. You need to Know everything in Prior.
2. Developing an app is not time consuming.
3. Mobile Development does not cost much.
4. Building an app brings an end to your efforts.
5. Apps are for smartphones only.
6. Mobile App markets on its own when it's built.

Third Party Framework

Third party apps and Services are created by companies or developer that aren't google.

03 categories of Mobile Application Framework.

1. Native Apps - It is an application that is specifically designed for particular platform or device.
   Ex: Pokeman app
2. Web Apps - It concerns with the application that is designed to deliver web pages on different web platforms for any Device.
   Ex:
3. Hybrid Apps - It is a combination of both native & web application
   - It can be developed for any platform from single code base.
   Ex:

Native Framework -

It refers to building a mobile app exclusively for a single platform.

Ex: You can develop a native android App with Java or Kotlin and Swift.

Mobile Web App -

* They are web apps optimised for a good phone experience.
* They are not mobile applications, but websites written in HTML/CSS & run by a browser.

Hybrid Mobile App Development -

* It allows you to create your application once & then deploy it across different platforms including iOS, Android or Windows

* It saves time for developers working on multiple project designed specifically for each platform.
* A Hybrid app is created using a single coding language & works on many platforms.
* It is about Striking the right blend of native and web development technologies to bring your app to life.

Chapter 1.2 : Mobility Landscape, Mobile Platforms

Mobility Landscape -
"Mobility" refers to the manner in which app/users are engaging with those devices.

Mobile Application Development Platform (MADP) -
It is a type of software that allows a business to rapidly build, test & perhaps deploy mobile apps for smartphones or tablets.

Ex of Mobile platform - Palm, Blackberry, iPhone, Android
Ex of Mobile OS - Palm OS, Symbian, Windows, Mobile, Mac OS X & Android.

Symbian OS

* It is a dropped mobile OS & digital platform developed for smartphones.
* Developed in 1988 by Symbian Ltd.
* It used by - Samsung, Sony, Nokia etc.
* OS component - Micro Kernel & Uses interface
* Symbian OS written in - C++ lang.
* Versions -
EPOC32, Symbian OS 6.0 & 6.1, OS 6.2, OS 7.0 etc

* Features - Messaging, Multimedia, communication protocol, data synchronisation, Security, application environment. Multi tasking, robustness, Flexible
* Advantages - It provides open platform to enable independent techno.
  - It vendors to develop third party app.
  - It allowed Impressive battery life.
  - It requires lower hardware requirement.
* Disadvantages - It is dependent on Nokia.
  - It provide late response as compared to iOS.
  - Touch of Symbian devices are not smooth.

Android O.S

* It is mobile OS which developed by Google.
* Android is based on Linux OS & open source OS which is specially developed for touch screen mobile devices - tablet etc.
* Android OS written in - Java Lang.
* Features - Hardware based Feature -
  Audio, bluetooth, GSM, Microphone, NFC, Sensors.
  Software based Feature -
  Widgets, home screen, input method, wallpapers, callin
* Versions - Android 1.0, 1.1 (Petit 4), 1.5 (cupcake), 9 (Pie
* Advantage - It can be built by anyone.
  - Android phones are multi-tasking.
  - It provides app marked called Play Store.
  - It provides widget & notification facility.
* Disadvantage - Most of apps requires active internet connection.
  - Wastage of battery is more due to the background processing.
  - Android System is not safe as iOS.

iOS

* iOS (iphone OS) is mobile OS which is successfully designed & developed by the Apple Inc.
* iOS interface depends upon the direct manipulation by using touch gestures.
* Version - iOS 1, 2, 3, 4, ... 11.
* Features - Home screen, touch ID, icloud drive, Health, Safari, multitasking, message, camera, Face recog
* Advantage - Performance is magnificent & smooth.
  - It genrate less Heat
  - Best for gaming & business purposes.
  - It provides jailbreaking for customisation & good face recognition security.
* Disadvantage - Depends upon iOS devices.
  - Not an open Source.
  - Price of iOS devices & cost of apps is high.

	Windows	Android
1.	Developed by Microsoft Inc.	1. Developed by Greegle LLC.
2.	Lamched in 1985.	2. Lamched in 2008
3.	Designed for all PC & comp.	3. Designed for mobile devices.
4.	Current stable version - Window 11.	4. Current stable version - Android 13
5.	Kernel type is Hybrid.	5. Kernel type is Linux.
6.	Prefered License is propriarty & Source available.	6. Prefered License is Apache 2.0 & GNU GPL v2.
7.	It charges for orignal version.	7. It is free of cost.
8.	It is for workstation, personal computers, media centre etc.	8. It is for smartphone & tablet computers.

	IOS	Android
1.	Developed by Apple corp.	1. Developed by Google LLC.
2.	Released on 29 July 2007.	2. Released on 23 Sept 2008.
3.	Lanched in 2007.	3. Lanched in 2008.
4.	It is specially designed for Apple iphones & ipads.	4. Designed for smartphones.
5.	Kernel type is Hybrid.	5. Kernel type is Linux.
6.	Main written in - C, C++, assembly Lang.	6. Main written in - C, C++, Java.
7.	Swift is mainly used for iOS app development.	7. Java & Kotlin are majorly used for Android app developm.
8.	It has Siri as voice assistant.	8. It has google has google assitance.
9.	It available in 34 lang.	9. It available in 100+ lang.
10.	File Transfer in android is easier than in IOS.	10. File transfer in IOS is more difficult than in android.

Introduction to Setting up the mobile apps development environment with emulator Telephony -

Step1- Setup Java Development Kit (JDK).

Step2- Configure Android SDK, after you have successfully installed the Android SDK, it is time to configure it. After installing the Android SDK, you will get a window.

Step3- Setup Eclipse IDE
Install the latest version of Eclipse, after successful installation it should display a window.

Step4- Setup Android Development Tools (ADT) Plugin.

Step5- Create Android Virtual Device.

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Chapter 1.3: App User Interface, Designing, Layout User Interface elements, Drawable, Menu

Layout – are specific types of view group.
are subclasses of view group.
contain child views.
can be in a raw, column, grid, table

layout defines the visual structure for user interface, such as UI for an activity or app widget

Common Layout classes –
1. ConstrainLayout : connect views with constraints.
2. LinearLayout: horizontal or vertical raw.
3. RelativeLayout: child views
4. TableLayout: raws & columns
5. FrameLayout: Shows one child of stack of children.
6. GridView: 2D Scrollable grid.

Event handlers – A method, called an event handler is triggered by a specific event & does something in response to the event.
Syntax: android:onClick = "ShowToast"

Measurement –
- Device Independent Pixels (dp) – for views
- Scale Independent Pixels (sp) – for text

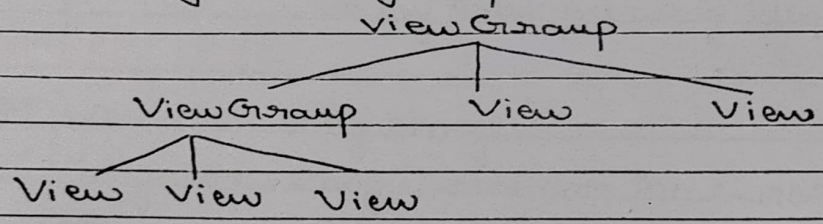
View – If you look at your mobile device, every user interface element that you see is a View.
– Views are Android's basic user interface building blocks.
– Views have properties –
1. have properties (color, dimensions, positioning)

II. May have focus.
III. May be interactive.
IV. May be visible or not.
V. Have relationship to other.
- Example of views: Button, EditText, SeekBar

Content - It is an interface to global information about an application environment.

ViewGroup Views -
A ViewGroup (parent) is a type of view that can contain other view (children).
viewgroup is the base class for layout & views containers.
- ScrollView - Scrollable view that contains one child view.
- LinearLayout - arrange views in horizontal/vertical row.
- Recycler view - scrollable "list" of view or view group.

Hierarchy of view groups & views -



Activity - An Activity is an application component.
- Represents one window, one hierarchy of views.
- Java class, typically one activity in one file.

What does an Activity Do?
(I) Represent an activity such as ordering groceries, sending email
(II) Handles user interaction such as button click, text entry
(III) Can start other activities in the same or other apps.
(IV) Activity has life cycle -
Created, started, runs, is paused, resumed, stopped & Destroyed.

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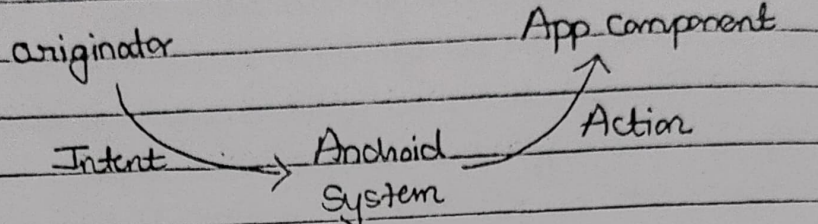
Intent

- It is description of an operation to be performed.
- It is an object used to request an action from another app component via Android System.



- Intent can do - Start Activities, Start Services, Delivers broadcasts.
- 2 Types - I. Explicit Intent - Starts a specific activity
  II. Implicit Intent - Asks system to find an acti that can handle this request
- 2 Types of sending data with Intents -
  I. Data - One piece of infor. whose data location can rep. UR
  II. Extras - one or more pieces of information as a collection of key value pairs in a bundle.

When does config change?

Configuration changes invalidate the current Layout or other resources in your activity when the user -

I. rotates the device
II. choose diffirent system Language, so relocale changes
III. enters multi window mode.

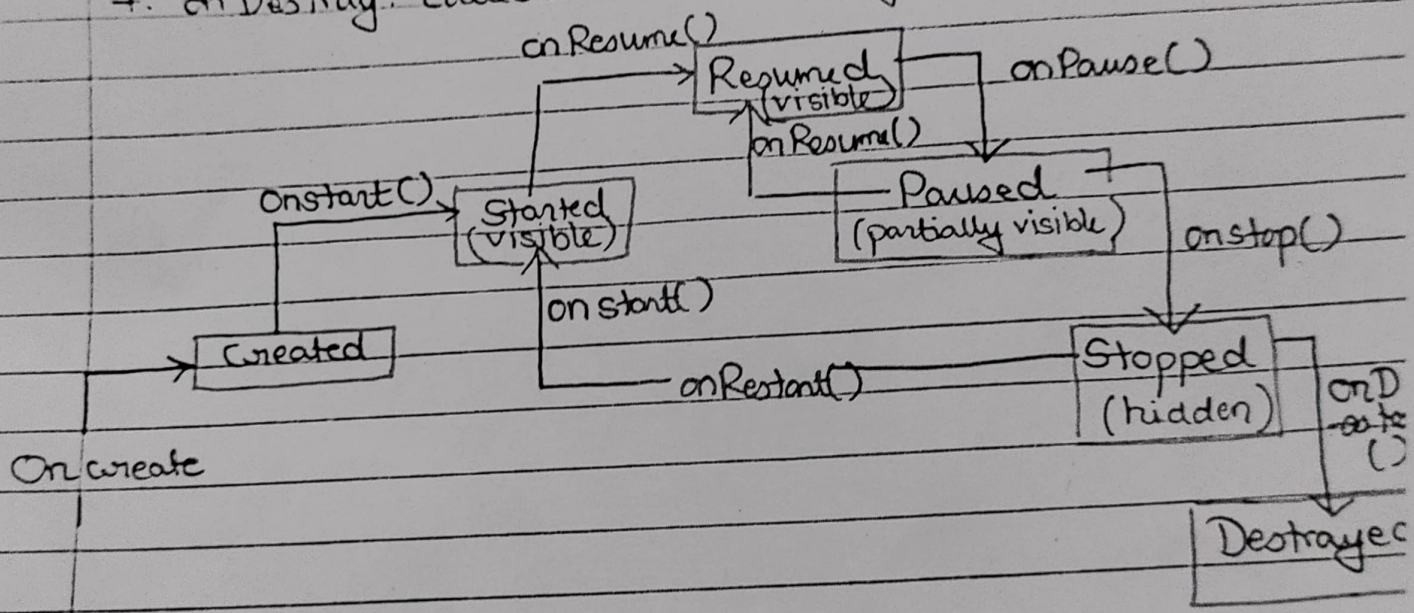
What happens on configure change?

1. Shut down activity by calling
   - onPause()
   - onStop()
   - onDestroy()
2. then starts it over by calling
   - onCreate()
   - onStart()
   - onResume()

Android Activity Life cycle -

The 7 method of Activity Life cycle are-

1. onCreate: called when activity is first created.
2. onStart: called when activity is becoming visible to the user.
3. onResume: called when activity will start interacting with user
4. onPause: called when activity is not visible to the user
5. onStop: called when activity is no longer visible to the user
6. onRestart: called after your activity is stop, prior to start
7. onDestroy: called before the activity is destroyed.



list out the steps to setting up mobile app development with emulator telephony

Install Android Studio
Create a New Project:
Create an Emulator:
Configure Telephony Settings:
Start the Emulator:
Test Telephony Features:
Debugging and Troubleshooting:

how you can link activities using intents in Android:

Starting an Activity:
Passing Data between Activities:
Receiving Data in the Target Activity:
Explicit vs. Implicit Intents:
Handling Activity Results: