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## Assignment - 1 [MAD]

1 Based on your understanding, identify a recent Business trend that has influenced the android platform. Explain how this trend impact Android app developers and Business in the mobile app industry.

→ One of the Business trends that was influencing the android platform and impacting the android app developers and Businesses in the mobile app industry was the emergence of progressive web App (PWA's).

- PWA combine the best feature of both web & mobile apps, providing user with fast loading times, offline functionality and the ability to install them on their device's home screen.
- Here how this trend impacts Android app developers & businesses:

(1) Cross-platform Compatibility : Developer can create a single PWA that fⁿ well on Both mobile & desktop device.

(2) Improve user-Experience :- Improve fast loading time & smooth performance.

(3) Lower Development costs :- cause they require single code base & can be updated more easily

(4) Offline functionality : PWA can work offline or in low-network condition

(5) Reduce app store-Dependency :- PWAs can be accessed directly through a web browser, reducing the dependency on app stores & their associated fees.

(6) App discoverability :- PWA can be discovered through search engines, making them potentially more accesible to users who might not actively search for new app on app store.

(3) Faster Iteration: this allows businesses to respond to user feedback & market change more rapidly
(4) Data privacy & security :- PWAs are served on HTTPS, which adds a layer of security to user data.

2 What is the purpose of an Inflator of layout in Android development, & how does it fit into the architecture of Android Layouts ?

→ In Android development, an 'Inflator' (short for 'Layout inflator') is a crucial component used to create instances of Android view object from XML layout resource files. it plays a significant roles in the architecture of Android layouts by facilitating the conversion of XML layout descriptions into Actual view objects that can be displayed on the screen., Here How it fits into the architecture of Android layouts:
(1) XML Layout files: In Android App development, UI layout are often design using XML files.
(2) Layout Inflater: this is where the layout inflator comes into play. its a service provide by the Android System that parses this xml layout file & creates the corrosponding view object at runtime. in other words, it "inflates" the xml layout into actual view objects.
(3) programmatic Manipulation: once the xml layout is inflated, developers can programmatically manipulate and customize these view objects.
(4) Adding to the View hierarchy: After customizing ation,

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developers typically add this inflated view objects to the view hierarchy of an Activity & Fragment. These hierarchy determine how the UI components are organized on the screen.

Q-3 Explain the concept of a CustomDialogBox in android Applications. Provide examples to illustrate its use.

→ A custom Dialog Box in Android applications is a user interface element that display a pop-up or overlay on the screen to provide information, gather user input, or prompt the user to make a decision.

- Custom Dialog are typically created by extending the 'Dialog' class or by inflating a custom layout.

Concept

- Custom Appearance - Custom functionality.

Example

Custom Layout XML file (eg. 'custom_dialog_layout.xml')

```
< linear layout xmls:android = "http://schemas.android.com/apk/res/android"
    android:layout_width = "match parent"
    android:layout_height = "wrap content"
    android:Orientation = "vertical"
    android:pading = "16 dp" >
```

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```
<TextView
    android:id="@+id/dialog_message"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="this is a custom Dialog box"
    android:textsize="18sp"
    android:layout_gravity="center" />

<Button
    android:id="@id/dialog_button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="OK"
    android:layout_gravity="center"
    android:padding="8dp" />

</LinearLayout>
```

## Kotlin Code

```
import android.app.AlertDialog
import android.os.Bundle
import kotlinx.android.synthetic.main.custom_dialog_layout.view
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
```

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```
val inflator = LayoutInflator
val customDialogView = inflator.inflate(R.layout.custom-
                                        dialog-layout, null)
val builder = AlertDialog.Builder(this).setView(customDialogview)

val customDialog = builder.create()

customDialogview.dialog-button.setonClickListener {
    customDialog.dismiss()
}
customDialog.show()
}
}
```

4. How do activities, services, and the android manifest file work together to make an android app? Can you describe their main roles & provide a basic example of how they cooperate to design a mobile app? in Kotlin.

→ This work together to provide the app functionality & Define its Behaviour

1. Activities:
   - An activity represent a single screen with a user interface. it serve as a UI layer of your App.
   - Activities handle user interaction, such as button click & input, & display the appropriate UI elements.
   - Activities are declared display in the Android manifest file to define their entry point & configuration.

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Q Service. :
- a service is a component that perform background tasks without a user interface.
- a service run in Background and are used for long-running operations, such as playing music, fetching data from a server, or peforming periodic tasks
- service are declared in the Android manifest file to specify their attributes & behaviours.

3. Android manifest file
- the android manifest file (AndroidManifest.xml) is an essential configuration file for your Android app.
- it contain metadata about the app, including its components (activities, service, Broadcast Recievers, etc), permission & other settings.
- the manifest file defines how different app components interact with the android system & with each other.

Example
(app with 2 activities & background service)

(1) creating a new Android project with Two activities (main Activity and Second Activity) and a service (MyService)

(2) Define activity in the Android manifest file (AndroidManifest.xml)

in manifest file, declaring the activity.

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```
<activity android:name = ".mainActivity">
  <intent-filter>
    <action android:name = "android.intent.action.MAIN" />
    <category android:name = "android.intent.category.LAUNCHER" />
  </intent-filter>
</activity>
<activity android:name = ".secondActivity" />
<service android:name = ".myservice" />
```

(3) Creating the Kotlin code for Activity & Services.

- "main activity" is set as the launcher activity, which means its the entry point of the app.
- "secondary activity" is another activity we can navigate to.
- "my service is our background service.

mainActivity.kt

```
class mainActivity : AppCompactActivity(){
    // Implementing main Activity logic.
}
```

SecondActivity.kt

```
Class SecondActivity : AppCompactActivity(){
    // Implement SecondActivity logic here
}
```

myservice.kt

```
Class myservice : Service(){
    override fun onBind (intent: Intent ?) : IBinder ? {
        // Implement background service logic here
        return null
    }
}
```

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(4) Intent Between Activities & start the Service :
- navigation Between activities using 'Intent' and start the Service using 'Startservice'.

navigating to mainActivity to secondActivity.

```
Val intent = Intent (this, secondActivity :: Class.java)
StartActivity(intent)
```

starting myservice

```
val serviceIntent = Intent (this, myservice :: class.java)
Startservice (serviceIntent)
```

Q-5 how does the android manifest file impact the development of an android application? provide an example to demonstrate its significance.

→ Here, are some key way in which the android manifest file impact the development of an Android app.

1. Component Declaration
2. Permission
3. App Metadata
4. Intent filter
5. Activity Launches Configuration.

Example →

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1. Compant declaration

2. permission:
- you specify permission like 'Send_SMS' to send_message, 'Recieve_sms' & 'Internet' to connect.

3. App metadata
↳ like app's name, version, & package name. for example:

```
<application
    android:label="MyMessenger"
    android:icon="@mipmap/ic_launher">
```

4. intent Filter
→ you can define intent filter to allow your app to open when a user click on an sms link like 'sms:' or 'mms:' URLs.

XML

```
<activity android:name=".composeMessageActivity">
  <intent-filter>
    <action android:name="android.intent.action.VIEW" />
    <category android:name="android.intent.category.DEFAULT" />
    <data android:scheme="sms" />
    <data android:scheme="mms" />
  </intent-filter>
</activity>
```

Q-6 What is the role of Resources in android development? ~~of an android application~~. Discuss the various type of resources & their significance. in creating well-structured application. Provide Example to clarify your point.

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→ they are used to provide various type of data to your app, enabling it to adapt to diff devices, screen sizes, languages, & configuration. Resource are essential for maintaining a clean separation of concern, improving maintainability, and ensuring your apps user interface & behaviour are consist across various device & configurations.

Here, are the various type of resources in Android development & their significance.

1. Layout Resource
   - (XML files) define the user interface of your app's screens, specifying how UI element like button, textview & images are organized.
   - they facilitate creating dynamic & responsive layout for diff screen size & orientations.

Ex `res/layout/activity_main.xml`

```
<linear layout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <Button
        android:id="@+id/myButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Click me" />

</linear layout>
```

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(2) Drawable Resource
- Include image, icon & other graphical Assets used in your app user interface.

ex "res/drawable/ic_launcher.png"

(3) String Resources
- store text & string literature used in your app. including UI lables, message & prompts
- Example 'res/values/strings.xml'.

<string name = "app_name" > MYAPP </string>.

(4) Color Resource.
- color value used in your app's UI, making it easy to maintain a consistent color scheme.

ex "res/values/colors.xml"

<color name = "primary_color" > #007acc </color>.

(5) Dimension Resources:
- specify size, margin, & padding values in a device independent manner

ex 'res/values/dimens.xml'

<dimen name = "margin_large" > 16dp </dimen>

(6) style Resources.
- define Reusable sets of attribute, such as textsize, text color & layout properties ex res/values/style.xml.

(7) layout variants (eg. Landscape/portrait):
- use to optimize the UI for each orientation.

ex 'res/layout-land/activity_main.xml'

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Q-7 How does an android Service contribute to the fun of a mobile app? Describe the process of developing an Android Service.

→ here, how an android service contribute to the functionality of an mobile app

(1) Background processing
(2) long-Running operations.
(3) Intercomponent communication
(4) Improving user experience.

here is a basic overview of the process of developing an Android Service.

1. create a service class.
   - extent a service class.
   - override oncreate(), onstartcommand() & onDestroy() methods to define service Behavior.

```
Class myservice : service (){
    Override fun oncreate(){
        super.oncreate()
    }
Override fun onstartcommand(intent: Intent?, flags: Int, startId: Int): Int {
    return START-STICKY
}
override fun onDestroy(){
    super.onDestroy()
}
overrid fun onBind (intent: Intent?): IBinder? {
    return null
}
}.
```

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2) To ~~Create~~ Declare the Service in the Android manifest.xml:

<service android:name=".MyService" />

3) Start or Bind to the service
- using startService(intent)
- bindService(intent, serviceConnection, flags)

4) implement the service logic:

5) Handle service lifecycle

(6) Communicate with other Component.

(7) Test & Debug.