

Android Development in an Imperfect World



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Even if you know what you're doing...



... not everyone does.



Themes

- How to work around and fix imperfection.
- Miscellaneous Android development tips.



Some Causes of Imperfection

- No documentation



- Code written by fired people



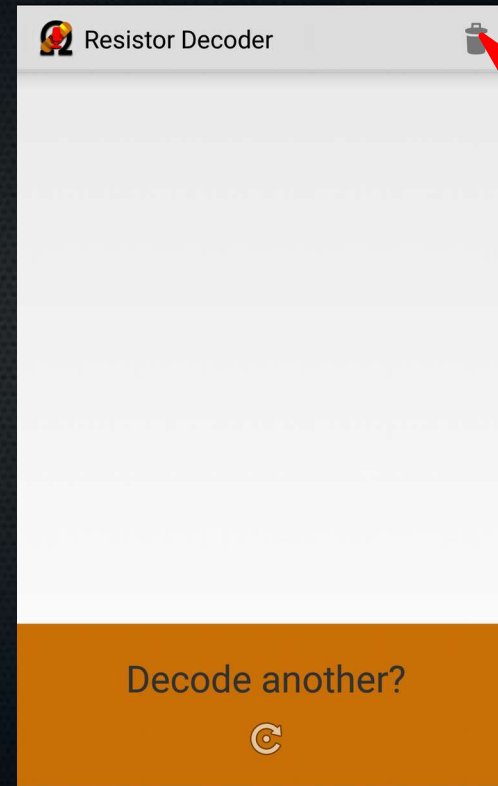
- Evolving project



Scenario 1: No Documentation



- You've just started working on a legacy Android project, and you've just been assigned an issue.
- There's no documentation.
- How do you get started?



Move this into the overflow menu.

'git grep' to the Rescue



- `git grep ">Decode another?<"`

```
src/main/res/values/translatable_strings.xml:  
  <string name="decode_another">Decode  
another?</string>
```



- `git grep decode_another \-- *.xml | grep -v values`
 - `app/src/main/res/layout/results.xml:`
`android:id="@+id/decode_another"`
 - `app/src/main/res/layout/results.xml:`
`android:text="@string/decode_another"`
 - `app/src/main/res/layout/results.xml:`
`android:contentDescription="@string/decode_another"`



- `git grep layout.results`
 - `app/src/main/java/com/digitalarcsystems/resistordecodermobile/MyActivity.java:`
`setContentView(R.layout.results);`
- Now you know that `MyActivity` is behind the screenshot.

Variation 1: Fired Developers

- What if the fired developers didn't use string resources?
 - `git grep "\"Decode another?\""`



Variation 2: Fired Developers

- Can't find the string anywhere?
 - Probably someone changed its case in code
 - e.g. `toUpperCase()`
 - add `-i` to your `grep`



Variation 2A: Evolving Project



- Found too many string resources?
 - It was "LOG IN" in 2013, then "Log In" in 2014, and now "log in" in 2015.
 - The old string resources were never removed.
 - Opportunity
 - Prune out any obsolete string tokens.



Scenario 2: Thwarted by Fired Developers



- You're asked to change layout. It looks right in the editor but wrong in the app.
- Could be some code messing with layout.

```
someView.rightMargin = 0;  
getLayoutParams().width = 200;  
someView.setPadding(0, 10, 0, 10);  
RelativeLayout.LayoutParams lp = new  
RelativeLayout.LayoutParams(RelativeLayout.LayoutParams.MAT  
CH_PARENT, RelativeLayout.LayoutParams.MATCH_PARENT);  
someView.setLayoutParams(lp);
```

Questions So Far?

- Coming up: Tips





Gradle and Time Travel

- Gradle repos work great when you're moving forward in time.
- Gradle repos sometimes fail when you're moving backward in time.
 - Google is notorious for discontinuing older versions of their repos.
 - ***Do not expect to be able to build your app from a year ago without upgrading dependencies.***

String Thing 1: \n

- Fired people put newlines\n into your string resources. To get\n line wrap, change\n the\n layout.
- Translators will screw this up.
- Users changing their font sizes will screw this up.



String Thing 1: \n

- Remedy:
 - Remove the newlines in English, fix the layout that used the original string, and then remove newlines in all the target languages.



String Thing 2: Layout and Translations

- When changing a layout, ensure that it looks right for all your translations.
 - Layout → Design tab → Globe → Preview All Locales



More Causes of Imperfection



- Google in your way



- Vendors in your way



- Art vs science



- Unfamiliarity with platform tools

Scenario 3: AndroidTV Support

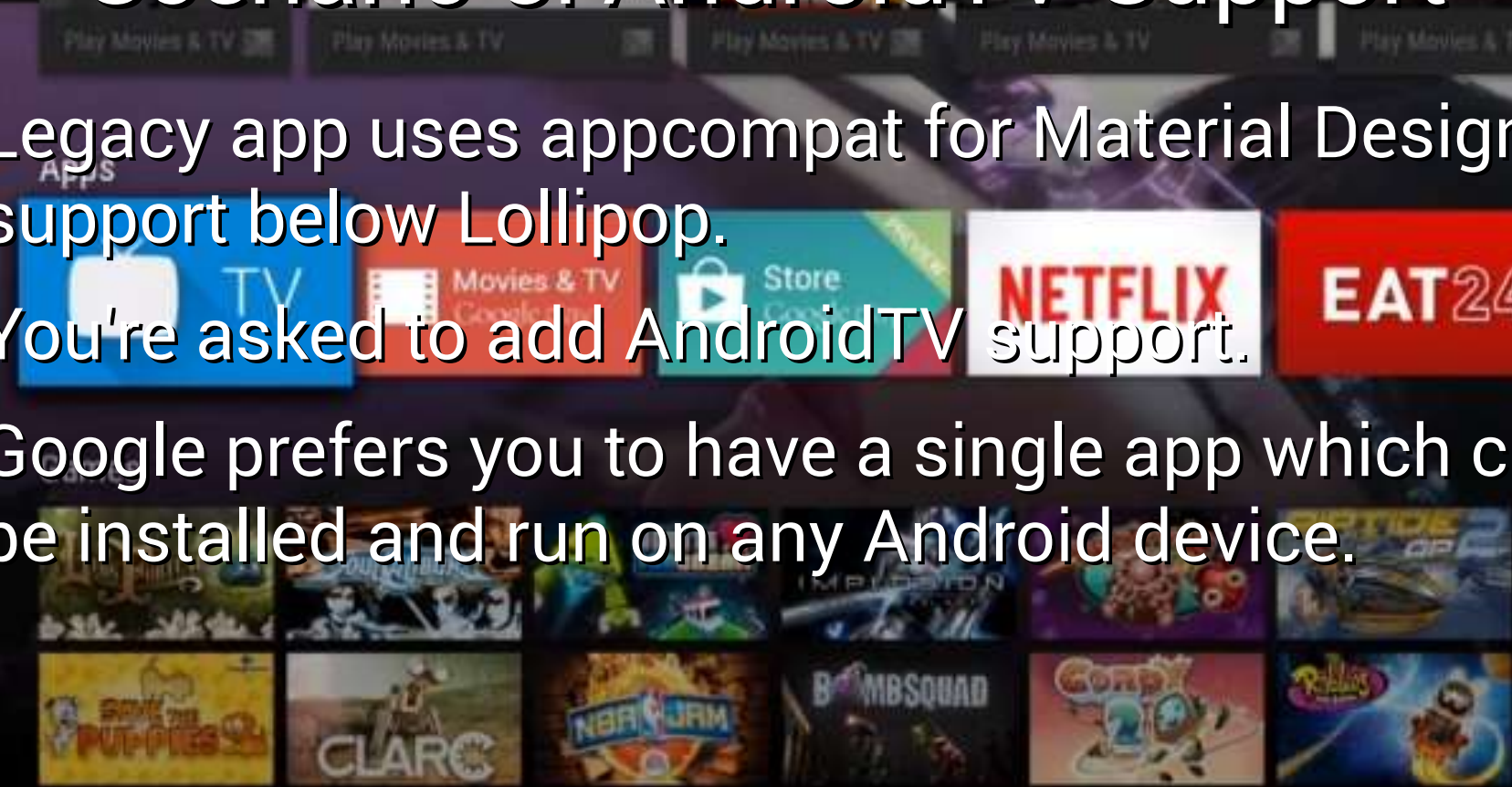
- Sometimes Google's Android libs are elegant and integrate well.
- Sometimes not.



Scenario 3: AndroidTV Support



- Legacy app uses appcompat for Material Design support below Lollipop.
- You're asked to add AndroidTV support.
- Google prefers you to have a single app which can be installed and run on any Android device.

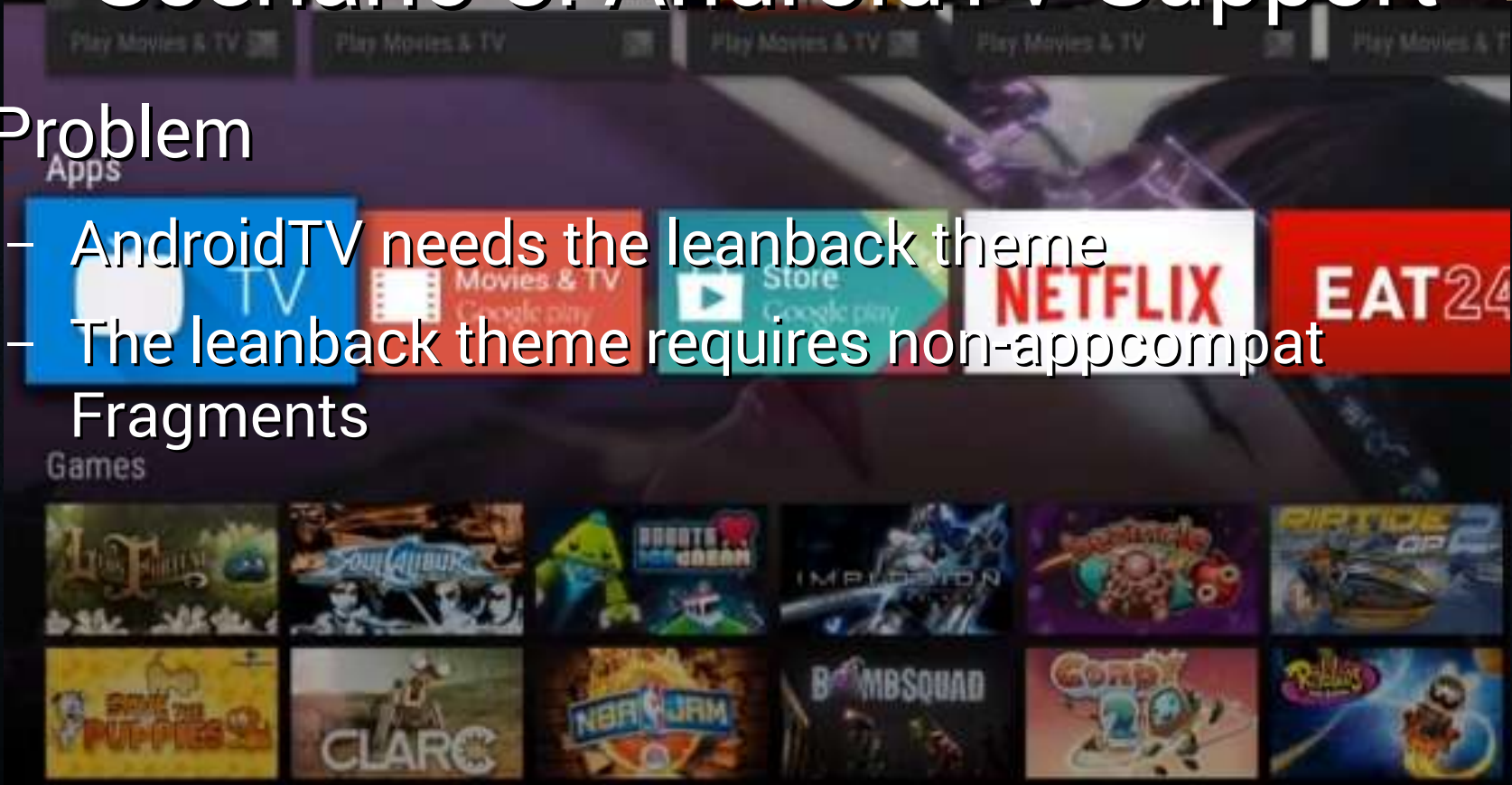


Scenario 3: AndroidTV Support



- Problem

- AndroidTV needs the leanback theme
- The leanback theme requires non-appcompat Fragments



Scenario 3: AndroidTV Support

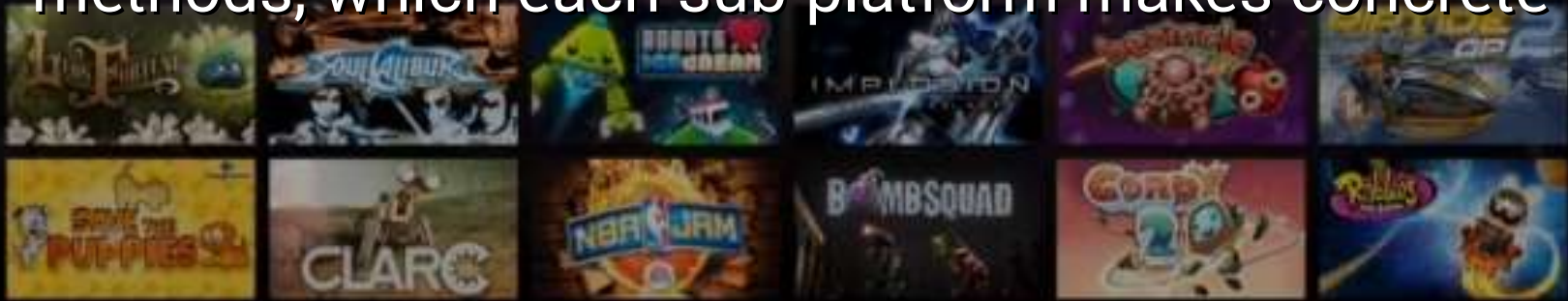


- Solution

- put common code into utility classes that take View and Activity as parameters

- put anything involving Fragments into abstract methods, which each sub-platform makes concrete

Games



Scenario 4: Doesn't Work on Samsung

- There are *many* examples of this
 - Different default landscape and portrait orientations
 - Bugs handling transparency
 - Bugs in Java
 - Incompatibility with appcompat
 - *These and many more hits from your favorite vendor with the purchase of any Samsung device.*
- Workaround general format
 - String manufacturer = Build.MANUFACTURER;
 - String release = Build.VERSION.RELEASE;



Questions So Far?

- Coming up: More Tips



String Thing 3: Grammar



- Don't put grammar into code.
 - Symptom: Non-English users complain about ungrammatical sentences.
 - Causes:
 - Layout
 - `android:text="@string/or"`
 - Code
 - `getString(R.string.do_this) + getString(R.string.or) + getString(R.string.do_that)`
 - `getString(R.string.delete) + "?"`



Tip: Batch Refactoring

- "We don't want to use `OurTextView` anymore. Let's just use `TextView`."
- The quick and dirty way:
 - Just change `OurTextView` to trivially extend `TextView`
- The slow and thorough way:
 - Delete `OurTextView` and let the build process yell where the problems are.
- The quick and thorough way:
 - Rely on the shell.

Tip: Batch Refactoring



- Start by deleting `OurTextView.java`

- Then:

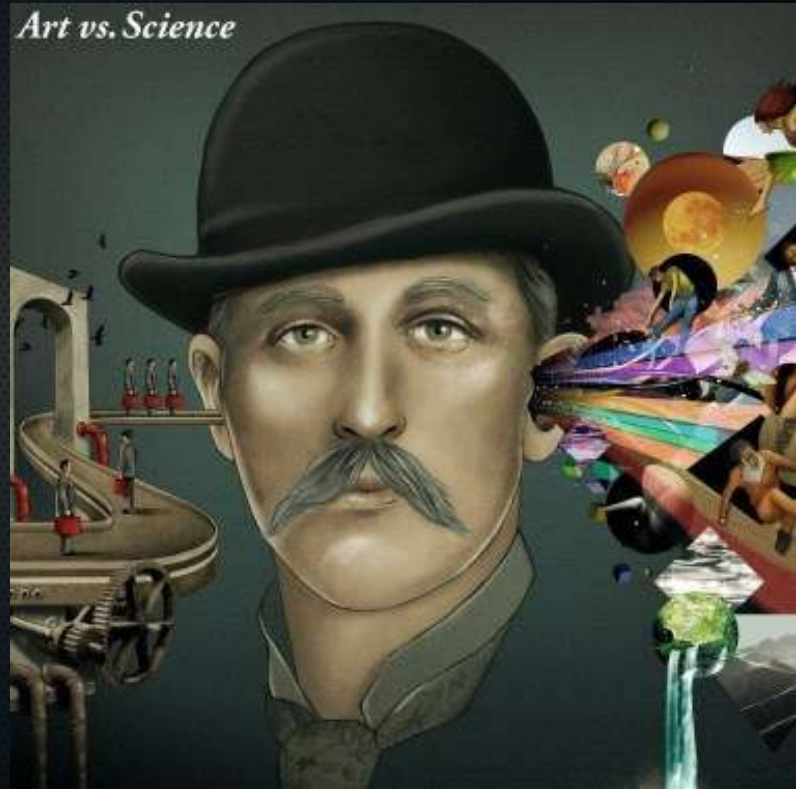
```
git grep com.biz.OurTextView | awk -F':' '{print $1}' | uniq | xargs sed -i  
"s/com.biz.OurTextView/android.widget.TextView/g"
```

```
git grep OurTextView | awk -F':' '{print $1}' |  
uniq | xargs sed -i "s/OurTextView/TextView/g"
```

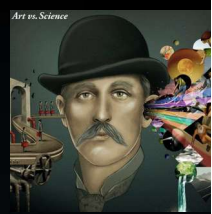
- Now do any minor manual cleanup needed.

Working with Designers

- Not coders (generally)
- Design guideline familiarity?
- Platform familiarity?
- UX background?



Working with Designers



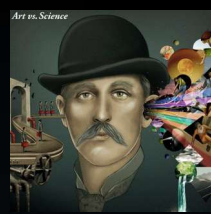
- Not coders
 - Some designs might be unrealistic
 - They don't know what support libraries like appcompat can and can't do

Working with Designers



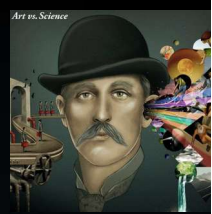
- Design guideline familiarity
 - Some designs might not be "the Android way" do to things.
 - A designer accustomed to iOS may need to provide
 - more mockups in different aspect ratios and sizes.
 - more graphics assets
 - See something odd in a mockup? Ask for a design guideline reference.

Working with Designers



- Platform familiarity
 - A designer who doesn't use an Android device might not fully grasp nuances not shown in design guideline screenshots.

Working with Designers



- UX background
 - Designers who don't emphasize UX might design a beautiful confirmation screen that should just be a Toast.

Questions So Far?

- Coming up: More Tips



Tip 1



- When Studio pops up the dialog asking which device to run on, you can select more than one by control- or shift-clicking.

Tip 2



- Not sure which layout maps to which "stuff" on the screen?
 - *Zaphod Beeblebrox: It's the weird colour scheme that freaks me. Every time you try to operate one of these weird black controls, which are labeled in black on a black background, a small black light lights up black to let you know you've done it.*
 - Use terrible colors. Change the backgrounds of a few ViewGroups or Views to red, yellow, green, blue, and see where the colors appear in the app or Studio.



Tip 3

- How to see a <merge> layout in Studio:
 - <merge
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
tools:showIn="@layout/simple_framelayout">



Tip 4

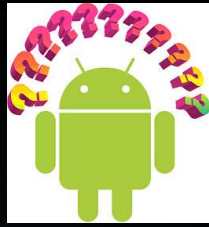
- Check the dates on tutorials, writeups, and questions
 - avoid employing a workaround that has been fixed
 - avoid trying to implement a feature that was dropped
 - some of the animation effects demonstrated in the Material Design announcement did not make it into the support library

QA: Error Logs

- QA wants to help you fix crashes, but there are two kinds of problems with the logs they send:
 - Logs not capturing the crash.
 - Logs capturing the crash and several minutes of activity before and after the crash.



QA: Error Logs



- Why do the logs not capture the crash?
 - The QA team isn't familiar with how rapidly the logs cycle on Android.
 - "It crashed, then I hooked it up to a USB cable and grabbed logs."
 - The QA team isn't aware that they can run 'adb' on more than one device simultaneously.
- Teach them to run this while they test:
 - `adb -s DEVICEID logcat -v time`

QA: Error Logs



- Encourage clean boundaries in logging.
 - Train them to start logging right before performing a repeatable crash test.
 - Train them to stop logging as soon as they see a crash.

Thank You!



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