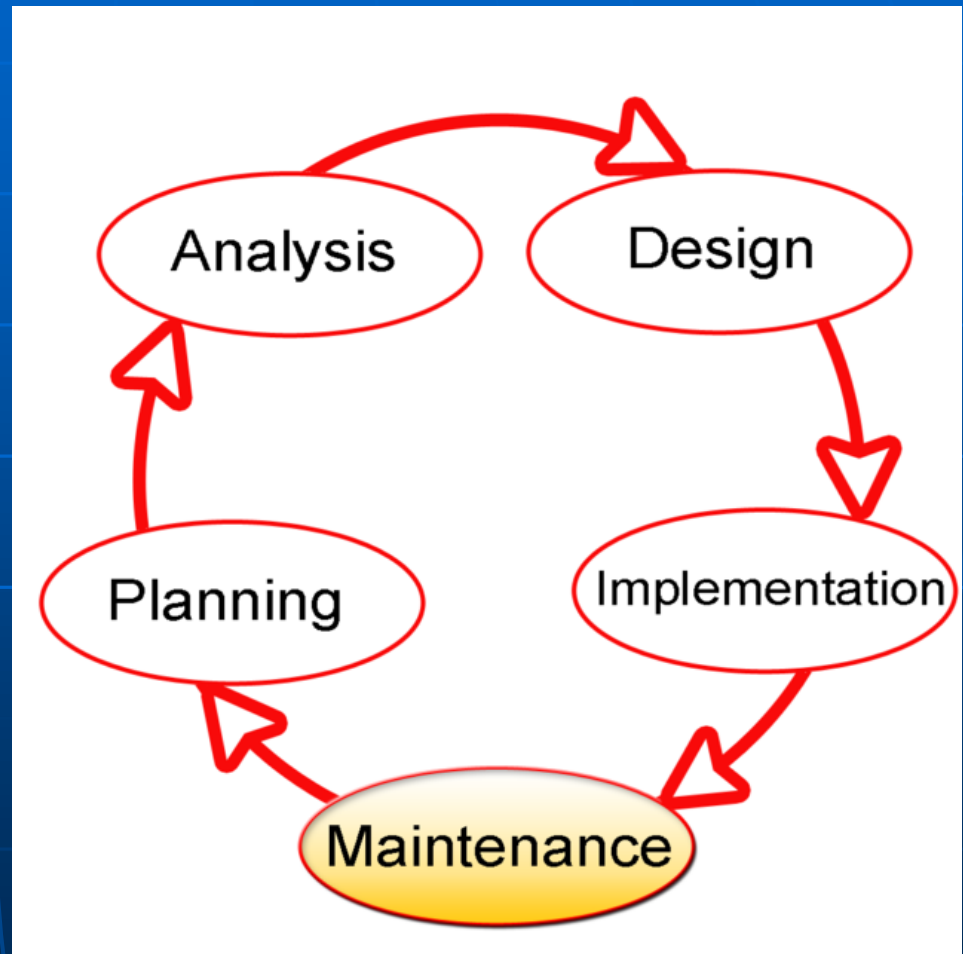


Design and Material Design

Dr. Christelle Scharff

Software Engineering Process

Software (apps)
cannot be
developed
without process!



Requirements First!

- Requirements are crucial in software development!
- Good design begins with writing good requirements!
- In mobile app development, requirements are preferably written as **User Stories** in the Agile way
- Template of a User Story:

As a <user type>, I want to <function> so that <benefit> .



Examples of User Stories

Feature /
Function

- Functional requirement:
 - As a **pupil** I want to be able to **access my quiz scores** so that **I can see how well or bad I am doing**

Constraint of
Time

- Non-functional requirement:
 - As a **pupil** I want to **get my scores in less than 2 seconds** such that **I do not get frustrated.**

Design

- Design is NOT only UI/UX
- It is so much more than what you hear about Design Thinking too!
- Design includes:
 - Database design
 - Architectural design
 - Object-oriented analysis and design
 - Modelling (e.g., use of UML – Unified Modeling Language)
 - UI/UX design

UI / UX

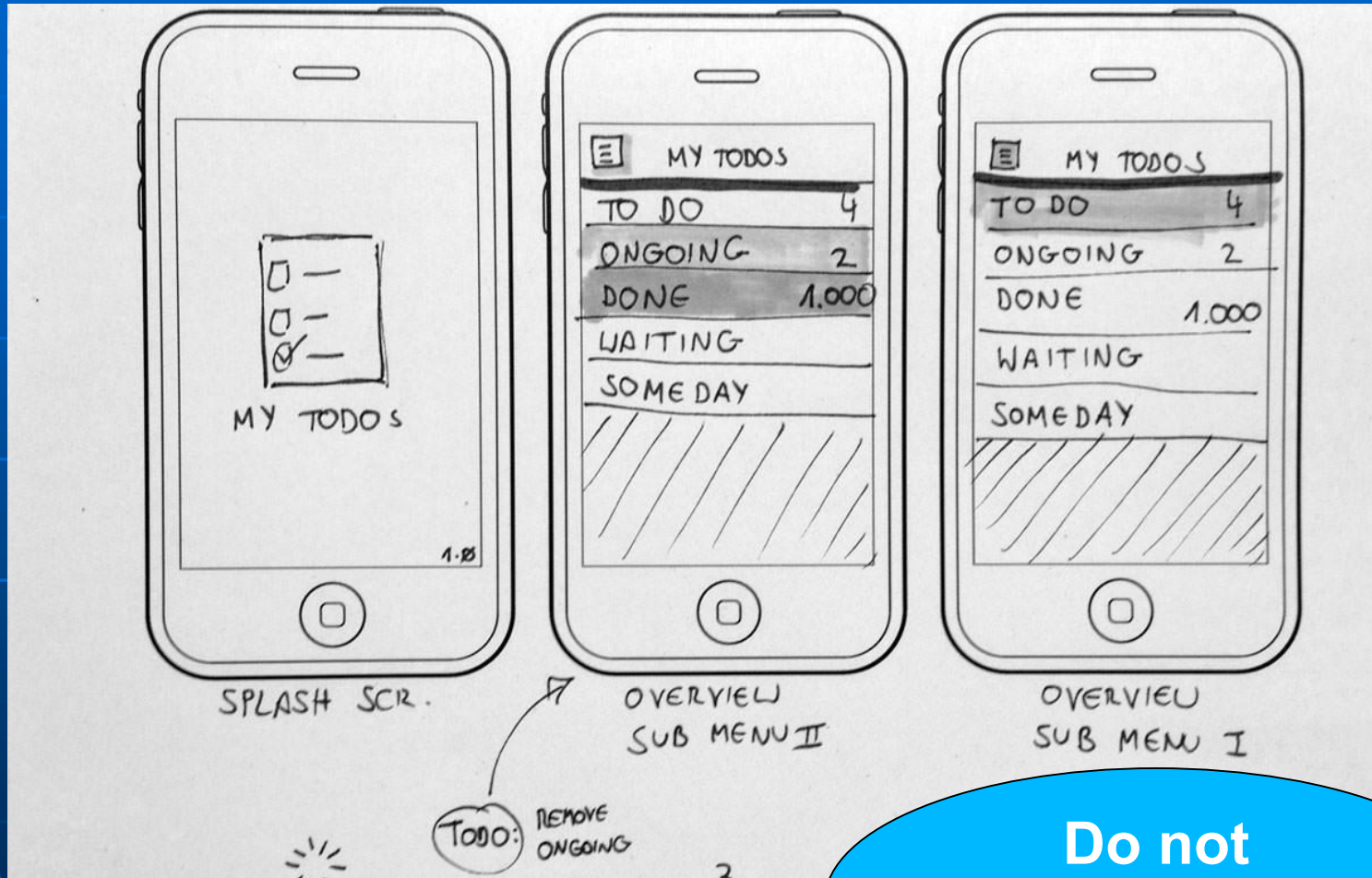
- UI – User interface
- UX – User experience
- The time to convince users to use an app is very short!
 - There are lots of good free apps!
 - Check out Flurry (now Yahoo!) numbers
 - <https://developer.yahoo.com/flurry/docs/overview/>
- Think about the user FIRST



UI/UX Design Process

- Sketch the UI on paper
- Use a tool to produce wireframes
- Refer to the Android standard
- Use the Android Studio UI Designer to design the layout
- Add the logic of your program in Java

Paper Sketches



**Do not
underestimate
paper sketches**

Prototyping Tools

- Cacao <https://cacao.com/>
- Proto.io <https://proto.io/>
- POP <https://popapp.in/>
- NinjaMock <https://ninjamock.com>
- Andromo <http://www.andromo.com>
- FluidUI <https://www.fluidui.com>
-

Material Design

- Appeared with Lollipop (5.0 API level 21)
- “Material is a metaphor for a system of motion; surfaces and edge of material provide visual cues. [...] Movement is important for providing understanding that leads to instinctive interactions.” Trish and Richard Cornez
- Material design can be applied across platforms
- Material design is based on best practices that Google and other organizations have discovered



Material Design

- Material design focuses on: specific UI elements (e.g., floating button), animations, transitions, lists, cards, and view shadows.
- Applying material design to an application requires the `android:theme` to be set to the material theme in `AndroidManifest.xml`

- `AndroidManifest.xml`

```
android:theme="@style/AppTheme">
```

- `Styles.xml`

```
<style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
    <!-- Customize your theme here. -->
    <item name="colorPrimary">@color/colorPrimary</item>
    <item name="colorPrimaryDark">@color/colorPrimaryDark</item>
    <item name="colorAccent">@color/colorAccent</item>
</style>
```

Material Design

- Two interesting animations provided by Material Design are Circular Reveal and Curved Motion
- Code for Circular Reveal:
- <https://github.com/paceuniversity/cs6392016/tree/master/CS639MaterialDesign>
- References:
- <https://developer.android.com/training/material/animations.html>

Lab

Write code to test curved motion

Material Design Colors

- <https://material.google.com/style/color.html>

Red			Pink			Purple		
500		#F44336	500		#E91E63	500		#9C27B0
50		#FFECEE	50		#FCE4EC	50		#F3E5F5
100		#FFCDD2	100		#F8BBD0	100		#E1BEE7
200		#EF9A9A	200		#F48FB1	200		#CE93D8
300		#E57373	300		#F06292	300		#BA68C8
400		#EF5350	400		#EC407A	400		#AB47BC

Material Design Typography

- <https://material.google.com/style/typography.html>
- Roboto and Noto are the standard typefaces on Android



Material Design Writing

- <https://material.google.com/style/writing.html>

Avoid the pronoun “we”

Focus on the user and what they can do with your app, rather than what you or your app is doing for the user.

Get started with these popular posts on Google+.

Do.

To get you started, we're showing you popular posts on Google+.

Don't.

Material Design

Material Design Support Library:

```
compile 'com.android.support:design:27.0.0'
```


Material Design Components

The support libraries provide a number of classes for implementing Material Design user interface recommendations. Many of these classes are provided in the [android.support.design](#) package.

- [AppBarLayout](#) - Provides an implementation of many of the scrolling features of Material Design's [app bar concept](#).
- [FloatingActionButton](#) - Creates floating button for displaying a special type of promoted action. This Material Design user interface element is shown as a circled icon floating above the app user interface. For more information, see [Add a Floating Action Button](#).
- [TabLayout](#) - Provides a layout for displaying tabbed pages. This widget is designed for use with the [ViewPager](#) class.
- [Snackbar](#) - Provides a widget for displaying lightweight feedback about an operation using the [snackbar pop-up](#)

<https://developer.android.com/topic/libraries/support-library/features>

Material Design Icons

- <https://material.google.com/style/icons.html>

