What Makes UI Design a “Good” Design?

Slide Note

search

Search Box Design – Option 1

Enter Search Text

Search Box Design – Option 2

Intuitive Design

- Which search button looks more intuitive?

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Slide Note

Resemblance to Physical Objects

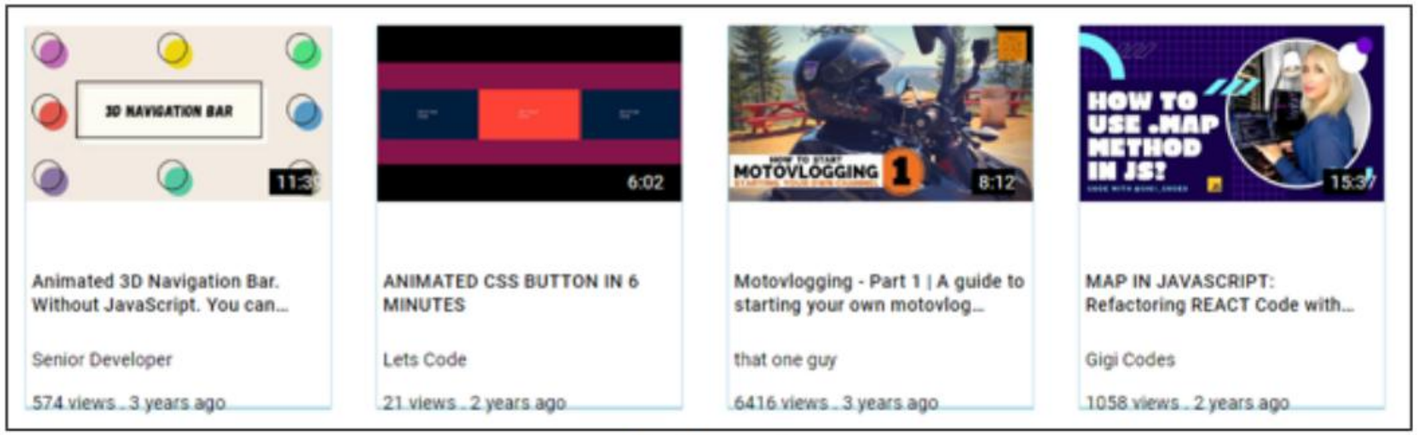
- Which navigation buttons are more meaningful and have more resemblance to real-world/physical objects?

Navigation Buttons: Option 1

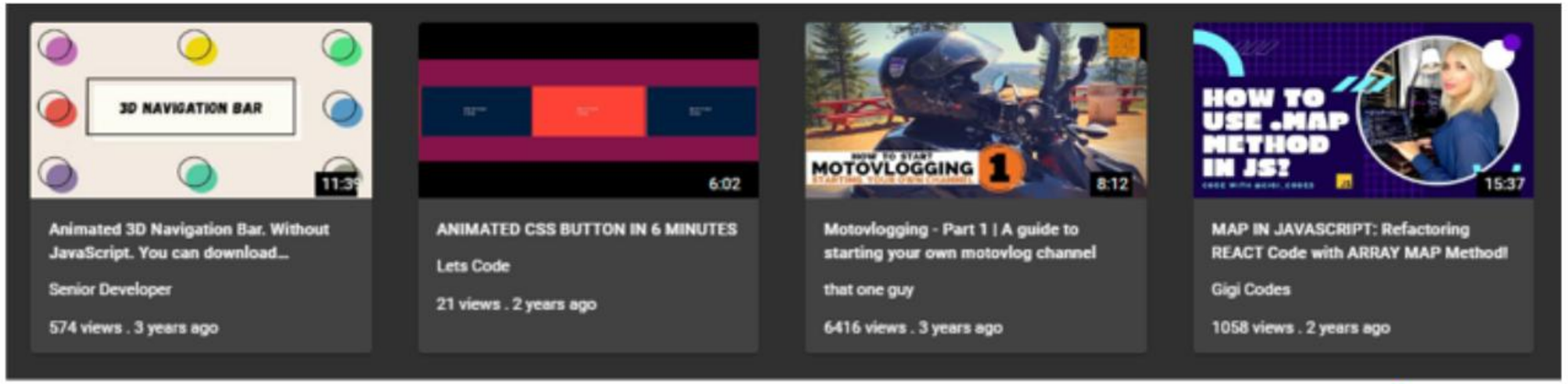
Navigation Buttons: Option 2

Slide Note

Which View Is More Appealing?



Option 1



Option 2

Slide Note

Customizable Design

- Can multiple theme options in an app's UI make it more accessible?

Slide Note

What Will You Do?

Imagine you have been asked to deliver an application with a great user experience.

You do not have much time to add additional CSS, styles, and effects.

You must deliver your application into the market quickly so the users can start using it right after getting the application.

Slide Note

Style a Single Page Application Using Angular Material

Slide Note

Learning Objectives

- Explain Material Design and its design principles
- Set up Angular Material in an Angular application
- Design an Angular application using Angular Material components
- Style an Angular application using an Angular Material pre-built theme
- Design an Angular application using an Angular Material schematics

Slide Note

What Is a Material Design?

- Material Design is a design language created by Google.
- It helps design high-quality user interfaces for web and mobile devices.
- The creation of Material Design was inspired by the real-world print medium designs that use paper and ink.
- A sheet of paper looks like a flat 2-dimensional surface. However, it:
  - creates shadow effects
  - can be rolled, cut, and folded.
- Similarly, UI designs created using Material Design have elements placed on a two-dimensional plane interface, giving them the feel of real-life paper and other objects.
  - This “feel” allows users to interact more naturally with the UI, just like real-world objects are touched and moved around.

Slide Note

In English, metaphor is a figure of speech in which a word is used in place of another word to indicate likeness or similarity.

For example: "It's been a real circus at home since Mom went on vacation."

Physical objects reflect light and cast shadows when put on any surface. Similarly, Material Design also uses these techniques to create a similar effect.

(e.g., card layout generates shadow and raised effect)

The print medium uses typography to create grids, arranges spaces, use colors and images. Material Design follows these methods to develop impactful rich UX, which could be bold, graphic-oriented, and purposeful. (e.g., grid system, icons, and color pallets are the areas where Material Design has a good role to play)

The third principle deals with the impact created by motion.

o The motion focuses attention.

o At the same time, it is expected to be fluid, and transitions should be coherent (smooth and not jerky and related).

o Material Design follows this principle to generate fluid experiences.

o (e.g., ripple effect)

Material Design – Design Principles

- The following principles guide the design:
- Material is the metaphor
  - The UI with Material Design resembles real-world objects, its textures, and shadow effects.
    - CSS properties such as border, border radius, and box-shadow help in the creation of these effects.
- Bold, Graphic, Intentional
  - The Material Design renders contents with typography (font-system), grid layouts, spacing, color, and visual descriptions (using icons) like a print medium design.
  - It helps create designs that have a hierarchical structure and are intuitive.
- Motion provides meaning
  - When the elements appear onscreen or users interact with them, they produce a motion effect.
  - This effect helps give subtle feedback to users.
    - For example, a ripple effect is generated when a user clicks a button.

Slide Note

The link navigates to web page that plays video showing how a simple web page gets transformed when Material Design is applied.

Click Here to Watch Material Design in Action

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https://kstatic.googleusercontent.com/files/2e8ce35f669a5b728e18297dbf7d1815cce5486fe51447b46a4e08864e93e0bc057eec6eab8cb9d5aed93e0983b705bcb165a0b70a40197f400c550281456934

Slide Note

How Does Material Design Enhance User Experience (UX)?

Slide Note

Nowadays, people do not stick with one application for their favorites; they have many choices. If they have a bad experience, they quickly switch to another application.

For example, if they do not get a good experience with the Ola app, they switch to the Uber app. If they do not get a good experience with the Swiggy app, they switch to the Zomato app.

So always ensure that a user experience (UX) is great, so one becomes engaged with the experience and does not leave the app. Therefore, we have to build great user experiences with less effort and time.

Angular Material can help us to a great extent. It has a set of components made up of all design philosophies. The components from Angular Material can be used to make the application with a great User Experience.

Features of a "Good" Component:

Ease of accessibility

Bidirectionality (LTR, RTL) with rendering

Theme and Color Palettes for styling

Unit testability of components

Material Design implementation helps in creating such "Good" components.

Can You Add Material Design to Angular Applications?

- Angular Material comes packed with a rich library of Angular Material components, themes, and schematics that help Angular master the creation of "good" components.
- Yes, you can add Material Design to Angular by installing Angular Material in the Angular project.
- The installation allows the developer to:
  - Design views using Angular Material components
  - Add Angular Material schematics for quick UI design
  - Style Angular application views using Angular Material pre-built themes

Slide Note

Note: Install Angular Material packages in the `Fruit-Fantasy` app solution code developed in the `Demo 4: Fruit Fantasy - Handle Error Response` of `Sprint 4: Build Reusable Application Logic using Angular Services` of `Angular Course: Building Single Page Applications Using Angular`.

Install Angular Material in the `Fruit-Fantasy` App

Material Design is included in the Angular project by using Angular Material packages.

The first step would be to install Angular Material packages to the existing `Fruit-Fantasy` app running the command

```
ng add @angular/material
```

Click here for the demo solution.

DEMO

Slide Note

Quick Check

While installing Angular Material in an Angular application, which module gets imported to enable Angular's animation system?

1. `AnimationsModule`
2. `NoopAnimationsModule`
3. `BrowserAnimationsModule`
4. `BrowserModule`

Slide Note

Quick Check: Solution

While installing Angular Material in an Angular application, which module gets imported to enable Angular's animation system?

1. `AnimationsModule`
2. `NoopAnimationsModule`
3. **`BrowserAnimationsModule`**
4. `BrowserModule`

Slide Note

Recalling the Installation Process - Questions

- Which command was used to install the Angular material?
- Which packages were installed?
- What were the questions prompted during the installation process?
- In addition to the installation of packages, what configurations were carried out?

Slide Note

Recalling the Installation Process - Answers

- Which command was used to install the Angular material?

```
ng add @angular/material
```

- Which packages were installed?
  - Angular Material, CDK, Angular Animations
- What were the questions prompted during the installation process?
  - Choose a pre-built theme or custom theme.
  - Whether to apply global typography styles.
  - Whether to set up browser animations.

Slide Note

Recalling the Installation Process – Answers (Cont'd.)

- In addition to the installation of packages, what configurations were carried out?
  - Add project dependencies to package.json.
  - Add the Roboto font to your index.html.
  - Add the Material Design icon font to your index.html.
  - Remove margins from the body
  - Set height: 100% on HTML and body
  - Set Roboto as the default application font

Slide Note

The page lists components by categories

For each selected component, the page displays the three tabs providing

- overview of component
- API for using the component
- examples on the selected component

Angular Material Components

- Based on the Material Design specification, Angular Material offers a variety of UI components.
- The components are well tested to ensure performance and reliability.
- The API for including these components in the app is consistent, which makes the task of including them easy for the developers.
- To explore the Angular Material components, visit the page available at

https://material.angular.io/components/categories

Slide Note

Style the `Fruit-Fantasy` App UI With Angular Material Components

Angular Material helps in adding Material Design to the Angular application.

Implement the steps required to include Angular Material components in the existing `Fruit-Fantasy` Angular application and style it's components.

Click here for the demo solution.

DEMO

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Slide Note

Quick Check

Which Angular material component provides an expandable detail-summary view?

1. Sidebar component
2. Expansion panel component
3. Toolbar component
4. Dialog component

Slide Note

Quick Check: Solution

Which Angular material component provides an expandable detail-summary view?

1. Sidebar component
2. **Expansion panel component**
3. Toolbar component
4. Dialog component

Slide Note

Sass is an extension to CSS.

It's a pre-processor for CSS that helps to reduce the repetition of CSS and saves time.

A palette is a collection of colors representing a portion of color space. Each value in this collection is called a hue.

In Material Design, each hue in a palette has an identifier number.

Angular Material pre-built Themes

- Angular Material's theming APIs are built with Sass (Syntactically Awesome StyleSheet).
- You can use Angular Material without Sass by using a pre-built theme.
- Angular Material includes four pre-built theme CSS files, each with a different palette.

Theme	Light or dark?	Palettes (primary, accent, warn)
deeppurple-amber.css	Light	deep-purple, amber, red
indigo-pink.css	Light	indigo, pink, red
pink-bluegrey.css	Dark	pink, blue grey, red
purple-green.css	Dark	purple, green, red

Slide Note

Angular Material Theming

- Angular Material's theming system lets you customize the color and typography styles for components in your application.
- Each theme includes three palettes that determine component colors:
  - A primary palette for the color that appears most frequently throughout your application.
  - An accent or secondary palette is used to highlight key parts of your UI selectively.
  - A warning or error palette is used for warnings and error states.

Slide Note

Enhance the `Fruit-Fantasy` App With the Angular Material Pre-built Theme

Angular Material comes with pre-built themes that help to quickly style Angular Material components with three different color palettes: primary, accent, and warn.

Style the `Fruit-Fantasy` app with the Angular Material pre-built theme.

Click here for the demo solution.

DEMO

Slide Note

Quick Check

In an Angular project, where would one find pre-built theme files post-installation in the Angular Material package?

1. @angular/prebuilt themes
2. @angular/material/themes/prebuilt themes
3. @angular/material/prebuilt themes
4. @angular/themes/prebuilt themes

Slide Note

Quick Check: Solution

In an Angular project, where would one find pre-built theme files post-installation in the Angular Material package?

1. @angular/prebuilt themes
2. @angular/material/themes/prebuilt themes
3. **@angular/material/prebuilt themes**
4. @angular/themes/prebuilt themes

Slide Note

How Can You Quickly Build UIs Using Angular Material?

Slide Note

Schematics are included with both @angular/cdk and @angular/material.

For example:

ng add @angular/material

Angular uses the `ng add` command here to add angular material library to the angular project

- ng update

Angular uses the `update` command here to update dependency of the workspace library.

Angular Material Schematics

- Angular Material comes packaged with Angular CLI schematics that makes creating applications with Material design easier.
  - A schematic is used to generate complex code based on a template.
  - It is a set of instructions for transforming a software project by generating or modifying code.
  - Example: `ng generate component <component-name>`
    - `Component` is the generation schematic here that is executed using the `ng generate` command to generate component code with `.html`, `.css`, `.ts` and `.spec.ts` files.
- In addition to the installation schematic, Angular Material comes with multiple schematics that can be used to generate Material Design components easily.
- Once you install the `npm` packages for Angular Material, they will be available through the Angular CLI.

Slide Note

The List of Angular Material Schematics

Name	Description
Address form	Component with a form group that uses Material Design form controls to prompt for a shipping address
Navigation	Component with a responsive Material Design side navbar and a toolbar for showing the app name
Dashboard	Component with multiple Material Design cards and menus that are aligned in a grid layout
Table	Component with a Material Design data table that supports sorting and pagination
Tree	Component that interactively visualizes a nested folder structure by using the `<mat-tree>` component
Drag and Drop	Component that uses the `@angular/cdk/drag-drop` directives for creating an interactive to-do list

Slide Note

Add a Navigation Schematic to the `Fruit-Fantasy` App

For a quick UI design using Angular Material components, add Angular Material schematics to the Angular project.

In the `Fruit-Fantasy` app, the collapsible side navigation bar can be quickly designed, added, and configured with the help of navigation schematics.

Add the navigation schematic to the `Fruit-Fantasy` app.

Click here for the demo solution.

DEMO

Slide Note

Quick Check

Select the correct option for adding the address schematic to the Angular project.

1. `ng generate @angular/material:address-form <component-name>`
2. `ng add @angular/material:address-form <component-name>`
3. `ng generate @angular/material:address <component-name>`
4. `ng add @angular/material:address <component-name>`

Slide Note

Quick Check: Solution

Select the correct option for adding the address schematic to the Angular project.

1. `ng generate @angular/material:address-form <component-name>`
2. `ng add @angular/material:address-form <component-name>`
3. `ng generate @angular/material:address <component-name>`
4. `ng add @angular/material:address <component-name>`

Slide Note

Angular Material Typography

- Typography is used to make a text legible and appealing when displayed.
- Angular Material's theming system supports customizing the typography settings for the library's components.
- Angular Material's typography APIs let you specify any font face.
- The default font-face value is configured to Google's `Roboto` font with the 300, 400, and 500 font-weight styles.
- To use `Roboto`, your application must load the font, which is not included with Angular Material.