

Rapid Prototyping

ITIS 4350/5350

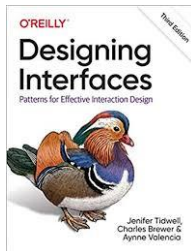
Design Systems

<https://uxdesign.cc/everything-you-need-to-know-about-design-systems-54b109851969>
<https://www.nngroup.com/articles/design-systems-101/>

Design Patterns & Design Systems

Design Patterns

- More general presentation of interface design elements
- Based on the way that people perceive and use software
 - Human senses and psychology don't change, so patterns remain relevant
- Foundational building blocks for UI / UX design



Design Systems

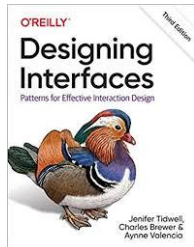
- More specific development of design patterns
- Often within a specific organization or ecosystem
- Provides design reference and guidance specific to that organization / ecosystem

Material Design



<https://m3.material.io/>

DI Ch. 11 - User Interface Systems & Atomic Design



Atomic Design: A Way of Designing Systems

“Design and design methodologies have been evolving directly alongside UI design systems, as described previously.

UI design now includes the idea that we are designing a system of flexible, reusable components for assembling interfaces for almost any screen or device.”

UI Systems

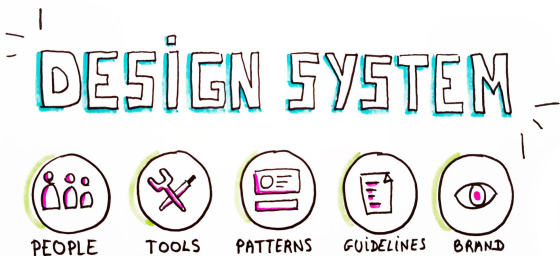
UI systems, or UI design systems, are UI styles and standards systems that help a company's designers, developers, and partners maintain quality and consistency in the look and feel of their software products. They use a components-based approach. They focus on standardizing the functionality and look and feel as much as possible while still staying in line with different operating system (OS) standards. They do not specify implementation technologies, such as what programming language to use.

The main point for you as an interaction designer is that a components-based approach to interfaces and design is the standard approach now (at least for the nuts-and-bolts functionality like filling out forms, picking dates and times, and so on.) Let's look at this briefly.

Technology companies such as Microsoft, Apple, Google, and many others have UI systems that cover multiple operating systems and multiple devices and screens:

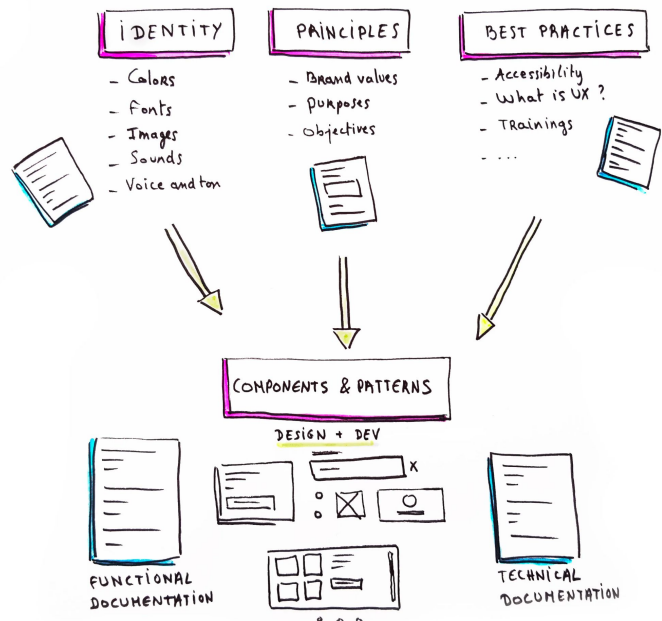
- Microsoft's Fluent Design System offers a standardized library of styles and code modules for Windows OS, web, iOS, and Android.
- Apple's User Interface Guidelines cover macOS and iOS apps, watchOS (for Apple Watch) and tvOS (for Apple TV).
- Google's Material Design System covers web, Android, iOS, and now native desktop OS applications through its Flutter UI framework.

Everything you need to know about Design Systems



“A Design System is the single source of truth which groups all the elements that will allow the teams to design, realize and develop a product.”

“The fundamental purpose of a Design System is to facilitate the work of the teams.”



@audreyhacq

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- Audrey Hacq

Design Principles

“Design principles are the guiding sentences that helps the teams to reach the purpose of the product thanks to the design.”

“They will help the teams to make meaningful Design decisions.”



Direction over choice

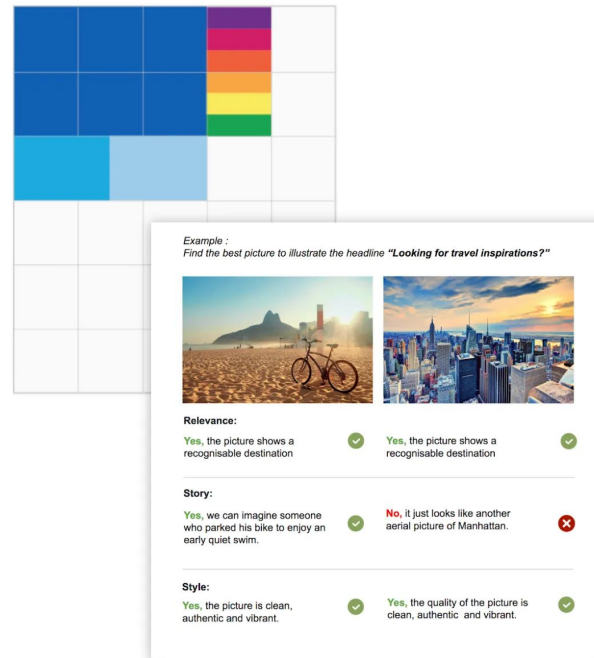
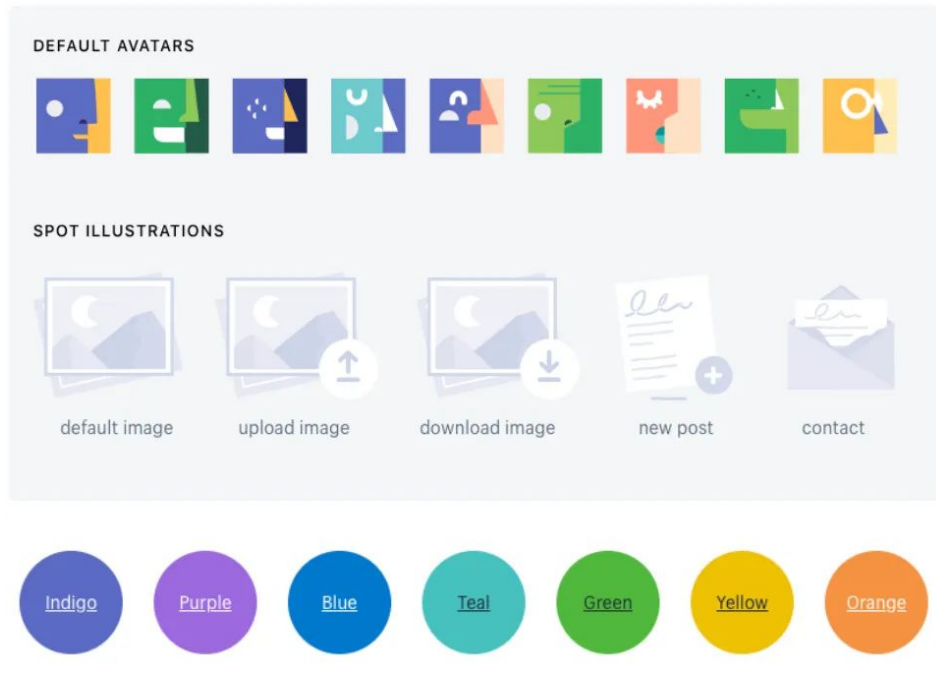


share these **components** and make s
vorks with the same raw material, wl

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- Audrey Hacq

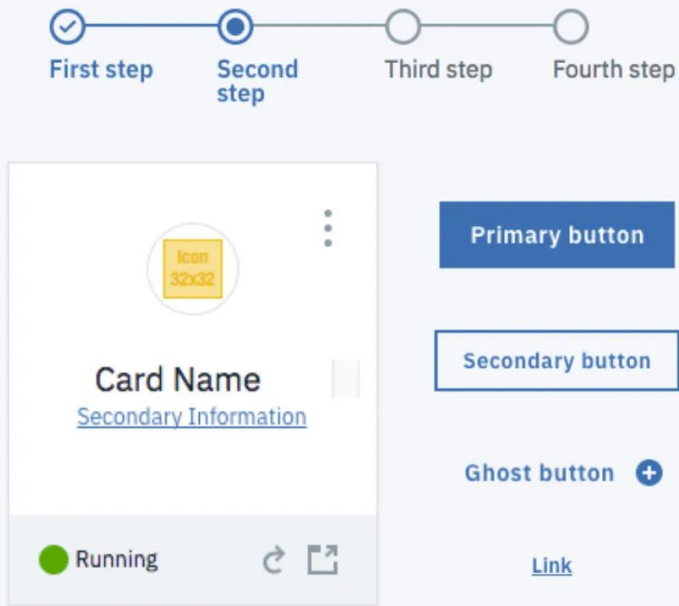
Brand identity & language



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- Audrey Hacq

Components & patterns




Yahoo Design Pattern

Accordion

Note: Last modified October 5, 2009

An accordion (or expansion menu) is a group of set of collapsible panels that provide access to a large number of items or other accessible items in a constrained space.

Each individual panel may be individually expanded, leaving the rest collapsed, generally by hovering or by clicking the title or an expand/collapse element on the specific panel, to display a single subset of the options.



What Problem Does This Solve?

When there are many items to fit into a single area or when the number of items, if displayed all at once, would overwhelm the user, then the accordion is best to give the user access to all of the items in a logical fashion.

The accordion is designed to be used to collapse the content from the content or a panel that they may display.

When To Use This Pattern

Use when the number of options is large, the space is constrained, and the set of items may be logically grouped into separate, reusable and repeatable chunks.

What's the Solution?

Present a hierarchy of options.

- The user is able to collapse or expand.
- The secondary level is a list of options that link into each group.

Accordions are typically styled as a stack of collapsible panels and not with the look of hierarchical trees with the top-level categories listed on the side. The category labels function as full-width labels and may be presented with a consistent expand/collapse icon.

An accordion may have one panel open by default or initial display.

RECOMMENDATIONS

- Have the most important panel open by default, both to expose the important choices and to demonstrate the look and feel each category can be used individually.
- Highlight the current panel as the user can collapse or expand panels from closed panels.
- Avoid nested accordion levels other than one. If you need a third level of detail, consider whether a new section or other element better suited to multiple level hierarchies would be more appropriate.

OPTIONS

Accordion may be configured to require that there is always a single panel open or to allow for multiple possibilities (all panels open) as the user can collapse or expand. Some applications consider it a best practice to permit only one panel to be open at a time, but others disagree.

An accordion may be configured so that only one panel may be open at a time, but many examples of accordions allow for multiple panels to be open at once.

List
 ul
 li
 ul
 li

Why Use This Pattern?

The primary reason to use an accordion element is to compress a large amount of options into a limited space.

Special Cases

Most accordions are stacked vertically, but they may also be laid out horizontally.

Accessibility

For best practices users an accordion usually works off balancing either a screen reader or a tab key. It may be possible to add keyboard navigation to the accordion with linking between labels and showing arrows pointing between the panels.

An accordion should always be something useful or a source of fun, or perhaps something of value.

Display more should not be used as this might hide the content from a screen reader. Instead consider setting a target of 1.

Bootstrap Component

Accordion example

Extend the default collapse behavior to create an accordion with the panel container,

EXAMPLE 1

Collapsible Group Item #1

An accordion (or expansion menu) is a group of set of collapsible panels that provide access to a large number of items or other accessible items in a constrained space.

Each individual panel may be individually expanded, leaving the rest collapsed, generally by hovering or by clicking the title or an expand/collapse element on the specific panel, to display a single subset of the options.

Collapsible Group Item #2

Collapsible Group Item #3

```

<div class="panel">
  <div class="panel-heading">
    <h4>Collapsible Group Item #1</h4>
  </div>
  <div class="panel-body">
    <p>An accordion (or expansion menu) is a group of set of collapsible panels that provide access to a large number of items or other accessible items in a constrained space. Each individual panel may be individually expanded, leaving the rest collapsed, generally by hovering or by clicking the title or an expand/collapse element on the specific panel, to display a single subset of the options.</p>
  </div>
</div>
<div class="panel">
  <div class="panel-heading">
    <h4>Collapsible Group Item #2</h4>
  </div>
  <div class="panel-body">
    <p>An accordion (or expansion menu) is a group of set of collapsible panels that provide access to a large number of items or other accessible items in a constrained space. Each individual panel may be individually expanded, leaving the rest collapsed, generally by hovering or by clicking the title or an expand/collapse element on the specific panel, to display a single subset of the options.</p>
  </div>
</div>
<div class="panel">
  <div class="panel-heading">
    <h4>Collapsible Group Item #3</h4>
  </div>
  <div class="panel-body">
    <p>An accordion (or expansion menu) is a group of set of collapsible panels that provide access to a large number of items or other accessible items in a constrained space. Each individual panel may be individually expanded, leaving the rest collapsed, generally by hovering or by clicking the title or an expand/collapse element on the specific panel, to display a single subset of the options.</p>
  </div>
</div>

```

Main expand/collapse controls accessible

To make a panel expandable, use the `data-toggle="collapse"` attribute. The attribute requires the href of the element to be expanded. The href is the href of the element to be expanded. The href is the href of the element to be expanded. The href is the href of the element to be expanded.

Additionally, a panel can be expanded by using the `data-target="#collapseExample"` attribute. The href is the href of the element to be expanded. The href is the href of the element to be expanded. The href is the href of the element to be expanded.

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Usage

The collapse plugin allows a few classes to handle the heavy lifting.

Three classes

Options

Three classes

Via data

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- Audrey Hacq

Design Systems 101 - Design System Tradeoffs

Why Use a Design System?

- Design (& development) work can be created & replicated quickly and at scale.
- Alleviates strain on design resources to focus on larger, more complex problems.
- Creates a unified language within and between cross-functional teams.
- Creates visual consistency across products, channels, and departments.
- Can serve as an educational tool and reference.

Why Not Use a Design System?

- Creating and maintaining a design system is a time-intensive activity which requires a dedicated team.
- It takes time to teach others how to use the design system.
- There may be a perception that projects are static, one-off creations, which generally don't require reusable components.

Material Design

Material 3 is the latest version of Google's open-source design system. Design and build beautiful, usable products with Material 3.

Get started

<https://m3.material.io/>

Final Exam Class Period

Thu Dec 14 @ 5:00pm - 7:30pm

Final Exam Period - Thu Dec 14

- **Attendance required for everyone** - all sections - undergraduate and graduate
- Exam period time different than regular class time - 5:00 - 7:30
- Graduate students will present project work
- Everyone (graduate and undergraduate) will have an in-class activity to submit - takeaways from the presentations

Graduate Level Presentations on Individual Project Work

Presentation Setup

- Presentation in final exam class period (Dec 14)
- Shared Screen Presentation
 - Have link to your video demonstration ready in case of issues
- Focus on 2 Things
 - Showing your application demo in the tool you have adopted
 - Brief discussion of pros/cons of the tool you used vs. Balsamiq / Figma / Axure
- 15 Minutes
 - ~5 Minutes on the Tool - Highlight Prototyping Capabilities
 - ~5 Minute Demonstration
 - ~2.5 Minute Discussion on Tradeoffs
 - ~2.5 Minute Questions