



LUT
University

User Interfaces and Usability

Design patterns

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PRODUCE design solutions

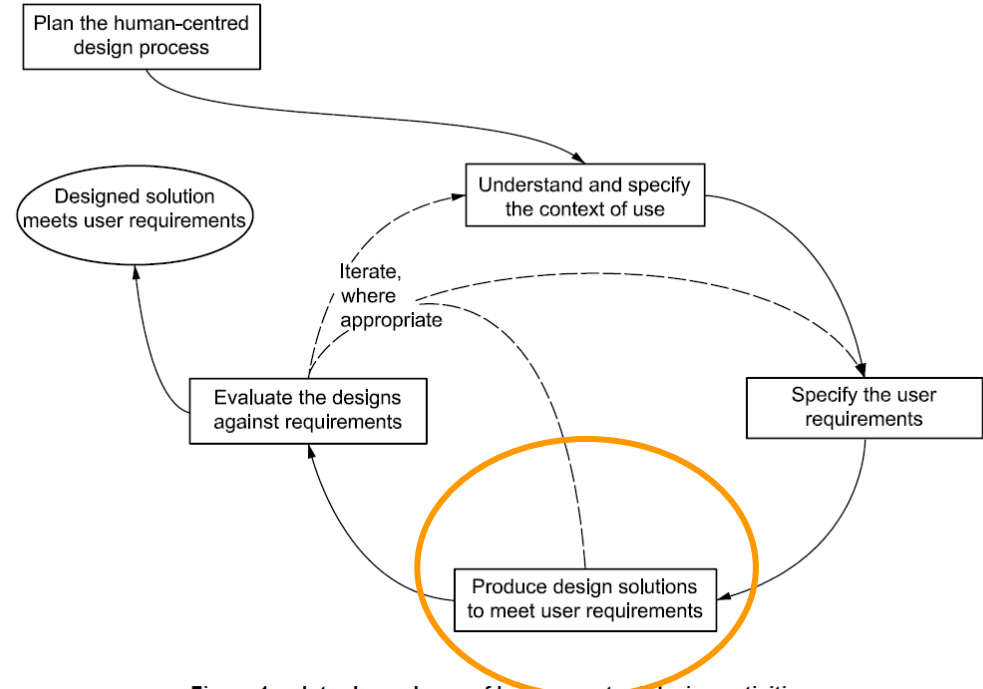


Figure 1 — Interdependence of human-centred design activities



Introduction to design patterns

- Originally patterns were architectural concepts that captured recurring design problems in urban architecture
- When designing common solutions, it is not always necessary to reinvent the wheel (remember the material.io library)

“Each patterns describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, allowing the designer to re-use this solution a million times over.”

- Christopher Alexander



Benefits of design patterns

- Patterns can
 - describe best practices
 - explain good designs
 - capture experience

Design patterns are often used elsewhere in software engineering, such as object-oriented design patterns.



Types of design patterns

- Visual pattern
 - Color, aesthetic principles, elements of design
- Layout pattern
 - How to arrange content
- Architectural pattern
 - Information architecture and interactions with that information
- **Interaction pattern**
 - Communicate how on-screen elements can be manipulated to achieve a particular task or result
- Conceptual pattern
 - Helps the user to build a mental model of an interface and its functionality



Interaction design pattern

<https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/interaction-design-patterns>

- Interaction design pattern
 - General repeatable solution to a commonly-occurring usability problem
 - Advantage: Users might be familiar with these (familiarity heuristic!)

User interface design patterns are recurring solutions that solve common design patterns.



Elements that often describe a pattern

<https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/interaction-design-patterns>

- Problems
 - Problems are related to the usage of the system
- Use when
 - the situation
- Principles
 - what ideas and theories support the pattern
- Solution
 - a proven solution to the problem, but still many ways to implement
- Why
 - argument for the beneficial impact on usability
- Examples and implementation details



Some considerations in pattern use

- Do not forget what is needed in any interface design
 - Research => requirements
 - Goal and task analysis => what are you trying to do with it
 - Design models => personas, scenarios, prototypes
 - Usability testing
 - Iterations

Design patterns can be used as a guide, but not as an only tool.



Pattern Collections

- Tidwell, J. 2011. Designing interfaces.
 - “*Designing Interfaces: Patterns for Effective Interaction Design* is a book about interface and interaction design, structured as a pattern language.”
 - <http://designinginterfaces.com/patterns/> & <http://designinginterfaces.com/about-the-book/>

User interface design patterns are recurring solutions that solve common design patterns.

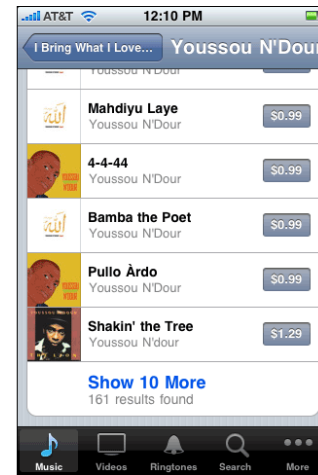
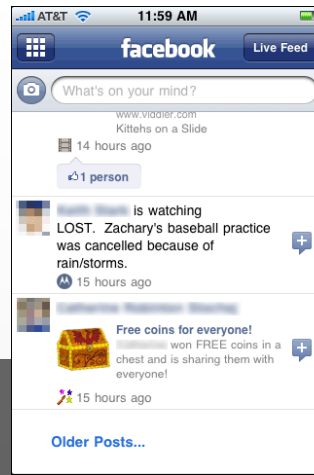


Selection of examples



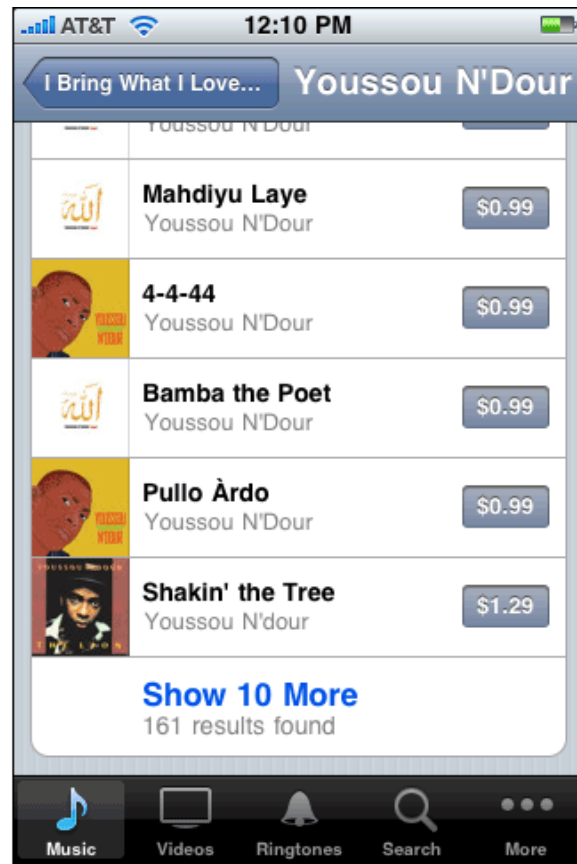
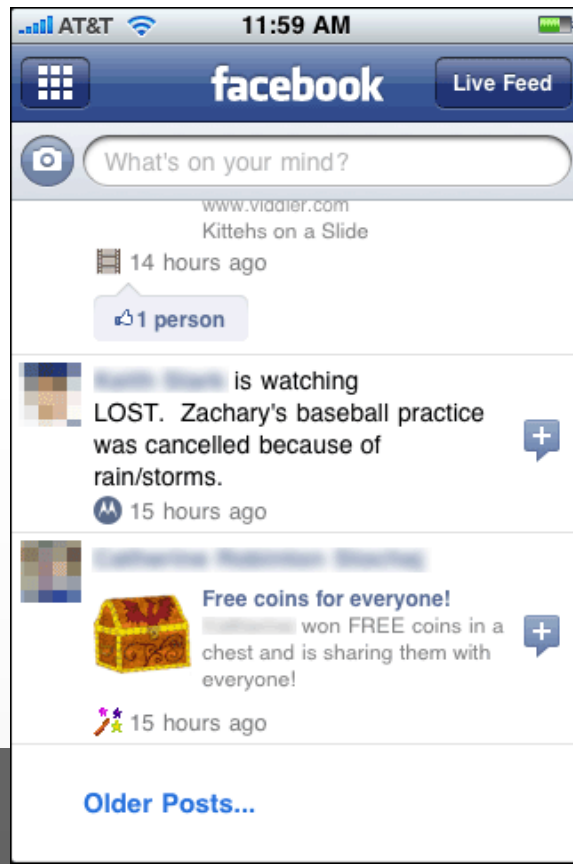
Infinite list

- **What:** At the bottom of a long list, put a button that loads and appends more items to the list.
- **Use when:** Showing long lists, e.g. email messages
- **Why:** User isn't stuck loading the full list
- **How:** When the page or list is initially sent to the mobile device, truncate the list at a reasonable length. That length will vary greatly with item size, download time, and the user's goal—is she reading everything (as with Facebook), or just scanning a large number of items to find the one she wants (as with search results)? At the bottom of the scrolled page, put a button that lets the user load and show more items. Let the user know how many more will be loaded.





Infinite list, example





Wizard

- **What:** Lead the user through the interface step by step to do tasks in a prescribed order.
- **Use when:** Designing a UI for a task that is long or complicated
- **Why:** Divide and conquer. By splitting the task into a sequence of chunks, each can be dealt with in a discrete “mental space” by the user.
- **How:** See <http://designinginterfaces.com/patterns/wizard/>



Wizard, example

1 Tell us your Location... 2 Choose your Interests... 3 That's it! Go to My Yahoo!

Tell us your Location

Enter a city or U.S. zip code

Arlington, MA 02474

☒ Make this my default Yahoo! location.

We'll use this to bring you local news, traffic, weather, and more.

« Back Next »

1 Tell us your Location... 2 Choose your Interests... 3 That's it! Go to My Yahoo!

Choose your Interests

Tell us what you want.

<input checked="" type="checkbox"/> Arlington, MA Content*	<input type="checkbox"/> Politics/government news*
<input checked="" type="checkbox"/> News*	<input checked="" type="checkbox"/> Reference/Facts and terms*
<input checked="" type="checkbox"/> Science*	<input type="checkbox"/> Arts*
<input checked="" type="checkbox"/> Photography*	<input checked="" type="checkbox"/> Books*

* Suggestions from Yahoo! What's this?

« Back Next »



Some pattern collections

- Designing Interfaces book
- Martijn van Welie, <http://welie.com/>
- UI Patterns, <https://ui-patterns.com/>
- Material.io, responsive patterns (applied) <https://material.io/design/layout/component-behavior.html#responsive-patterns>
- Materialize components (applied), <https://materializecss.com/badges.html>
- Data visualization patterns, <https://datavizcatalogue.com/search/patterns.html>



Summary and thoughts

- Design patterns can inspire you and demonstrate common solutions
- Good way of communicating knowledge and *why* this kind of UI design exists
- Helpful for novices to get started
- Does not replace user research, entire design process or applied design knowledge