Design patterns
in HCI

Design

A design is a plan or specification for the construction of an object or system or for the implementation of an activity or process, or the result of that plan or specification in the form of a prototype, product or process. The verb to design expresses the process of developing a design. Wikipedia

अभिकल्प या डिजाइन शब्द का उपयोग प्रयुक्त कलाओं, अभियांत्रिकी, वास्तुशिल्प एवं इसी तरह के अन्य सृजनात्मक कार्यों एवं क्षेत्रों में किया जाता है। इसे क्रिया के रूप में एवं संज्ञा के रूप में प्रयोग किया जाता है। विकिपीडिया

Design process

- **Design process is a way of figuring out what you need to do, then doing it.** Along the way you might solve one or more problems, try to achieve a goal, and/or create something specific.

- The first critical step to understanding the design process is that it's not about working the "right way" or "wrong way". The design process is a method you use to be more creative, productive, and accurate. The process should conform to you, rather than the other way around. It's not a rigid list of steps to follow, but a tool you use to do better work.

Design Process Simplified

What do you need to do?

Do It!

Design patterns

- Patterns are good solutions to common problems
- What is pattern?
  - **Decorative Design**
- There are several kinds of patterns
  - Structural
  - Navigation
  - Widgets

Structural

- Wizard
  - sequence of dialog boxes with Next and Previous buttons
- Center stage
  - word processor, drawing programs
- High-density information display
  - mail and google maps

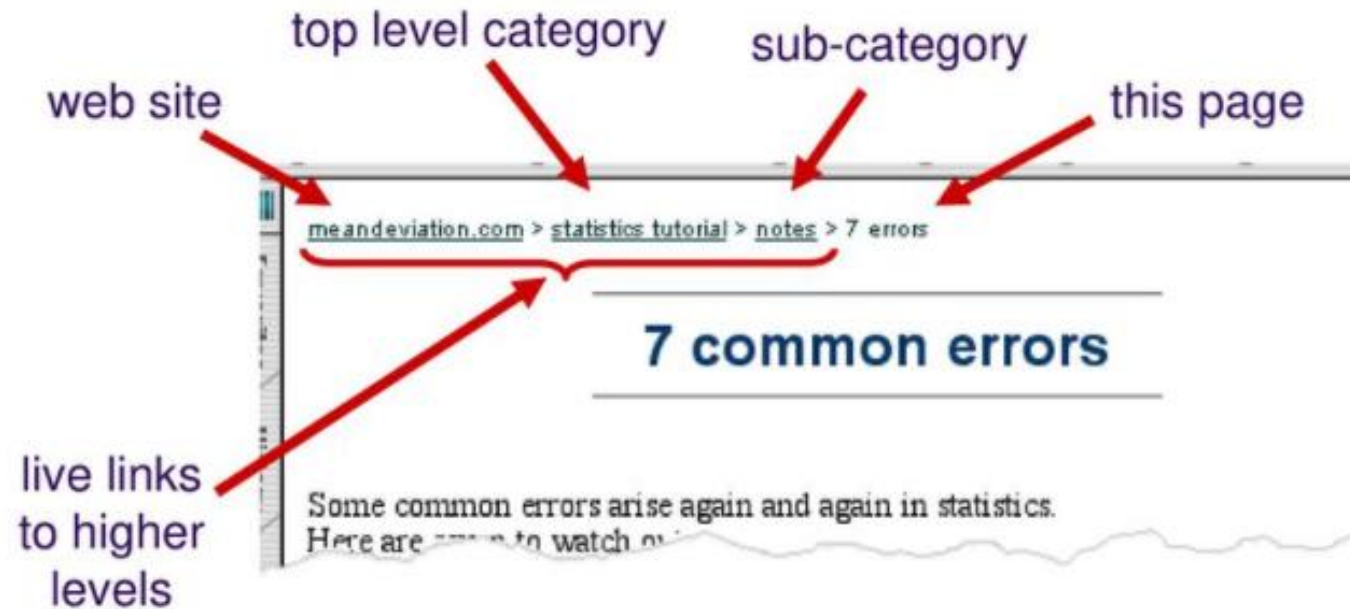# Navigation

- Pagination
- Breadcrumbs (where you are)

Pagination

- **Pagination** divides up a long list of data into pages, with a control showing the page numbers (e.g. 1 2 3 4 ... 103) as hyperlinks.

pagination
Results Page:
1 2 3 4 5 6 7 8 9 10 ▶ **Next**

Breadcrumbs (where you are)

shows path through web site hierarchy
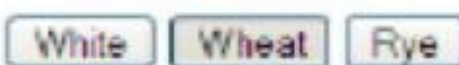
Widgets for 1-of-N Choices

Radio Buttons **for 1-of-N Choices**

- Radio buttons are the conventional idiom for making 1-of-N selections.

- They are fast

- All the choices are visible

- It uses a lot of screen real estate as N gets large

Toggle Buttons for 1-of-N Choices

□ Toggle buttons can offer larger targets than radio buttons (faster hit)

□ Toggle buttons are often used for mode switches, or for 1-of-N choices in toolbars.

Drop-down menu for 1-of-N Choices

- A **single-selection listbox** is a static version of the same thing, where the list of N choices is always visible, and the chosen item is indicated by a highlight.

- Drop-down menus are very compact, but require two pointing operations (point and click to open the list, then point to the new choice)

- All these widgets are useful for 1-of-N choices,

In design Issues:

- Avoid using N checkboxes for 1-of-N choices.
- Radio buttons are a visually distinct widget that communicates the affordance that the choices are exclusive (i.e., that you can only select one at a time).
- Checkboxes fail to convey this.

Widgets for 1-of-2 Choices

□ For the special case where N=2, you can also use a single **checkbox** or **toggle button**.

Widgets for 1-of-2 Choices
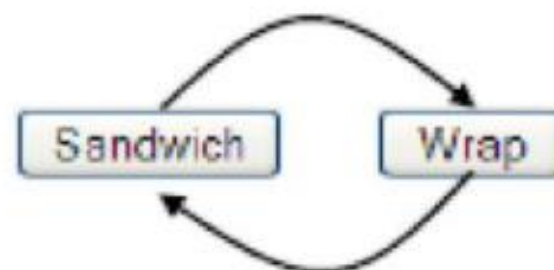
- Widgets for 1-of-N choices (with N=2), plus:

  Checkbox   ☑ Toasted

  Toggle button   [Toasted]

- Avoid:

  ☐ Sort in ascending order

  ☐ Insert vs. overstrike

  [Sandwich] ⇄ [Wrap]

Widgets for K-of-N Choices

N checkboxes

- ☑ Lettuce
- ☐ Tomato
- ☑ Onion
- ☐ Pickle

Multiple-selection listbox

Two listboxes

Widgets for K-of-N Choices

- **Checkboxes** are a natural way to do this.
- **A multiple-selection listbox** is another way to do it.
  - Lack of learnability- multiple selections are not visible to users
  - Errors(the selection is very fragile) - one accidental click can clear a carefully-created selection
- **Two listboxes** are still another way
  - 'K' choices you have made clearly visible
  - Less fragile
  - It uses wider screen

Widgets for K-of-N Choices

- **Here's a design question: when the user moves an item over to the 'K' list, should it disappear from the N list?**

- Maybe not disappear, since that would remove visual search landmarks from the N list

- But some indication in the N list of which items have already been selected would improve the visibility of system status and reduce errors (like selecting the same item again).

levels

- widget choice
  - menus, buttons etc.
- screen design
- navigation design
- environment
  - other apps, O/S

Website...

- widget choice
- screen design
- navigation design
- environment

- elements and tags and links- `<a href="...">`
- page design
- site structure
- the web, browser, external links

Physical devices

- widget choice
- screen design
- navigation design
- environment

- controls
  - buttons, knobs, dials
- physical layout
- Main modes of device
- the real world

Poor interface design

- Increased mistakes in
  - Data entry
  - System operation
- Inaccessible functionality
- User frustration
  - Low productivity and/or
  - Under-utilization
- System failure because of user rejection