Design

- **Design** is the planning (process, decisions) that lays the basis for the making of every object or system.
Design

- How are the designs of these examples made?
- Process?
- Who are involved?
- Methods?
- Techniques?
- Tools?
- How many design decisions?
- How long does it take?
Design

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Design rules

- Heuristics, based on research, experience and common sense
  - Perception, cognition, HCI, engineering
- Advice for different kind of design problems
  - Low level: general advice
  - High level: mandatory and very specific
- Support for evaluation
How does one learn design?

- Can you read a book about it?
- Can this course teach you design?

In groups of 2:
  - Discuss for 2 minutes
Different types of rules

- General principles, guidelines
  - “Strive for consistency” (J. Nielsen, B. Shneiderman)

- International standards
  - “Direct manipulation of output: if appropriate for the task the result of a direct manipulation should be displayed in such a way that it can be further modified by direct manipulation.” ISO/DIS 9241-16:1996(E)

- Styleguide for a product or company
  - “A standard window should have a close box. When the user clicks the close box, the window goes away.” The Windows Interface Guidelines for Software Design

- Domain specific styleguide
  - Windows Vista, Mac OS X, Volvo cars, company web, ATM, etc.
General advice - simplicity

- Don’t waste space on headers, unless really needed. For experienced users the content and position is enough.
- Don’t emphasize the importance of details that are important for the first-time user. Most things are there to support experienced users.
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<th>UU-IT-S</th>
<th>Temp</th>
<th>Percentage</th>
<th>Date</th>
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<td>018 - 18 28 81 work</td>
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</tbody>
</table>
General advice - color

- Use dark colors on bright background
- Bright colors on dark background
  - Red and yellow visible
  - Green and blue not as good

(NASA/Goddard Code 520 human-computer interface guidelines)
Strategies for design problems

- Navigate in large sets of data
  - When the system has page-bound information, allow for navigation by pages

The *generative* enhancement of a design (Thimbleby, 1984)
Standards for design?

- Standards are guidelines that have formal status. They have been judged as important and are widely used.

- Think about:
  - Why standards for design?
  - 1 minute
Reasons for standards in design

- Easier - education
- Safety - maintenance
- Cheaper – common technology
- Higher quality
- International
Standards

- ISO/IEC 11581 - **Icon** symbols and functions
- ISO/IEC 11741 - **Dialogue** interaction - cursor control
- ISO/IEC 14915 - **Multimedia** user interface design - ergonomics requirements for multimedia interfaces
- ISO 13407 - **Human centered design** process for interactive systems
- ISO 9241 - **Ergonomic requirements** for office work with visual display terminals, parts 1 - 17
  - Part 11: Guidance on usability
  - Part 12: Presentation of information
- Web Accessibility Initiative (WAI), http://www.w3.org/WAI/
Components in a GUI
Apple’s style
Guidelines don’t work

- Are only understood by those who don’t need to read guidelines
- Not suited for the context
- What guidelines to choose?
- What does the guideline mean? Sun’s guidelines about the order in menus:
  - Use a logical order (if one exists) to help guide users through the process
  - Put most important or most frequently used functions at the top of the menu
Guidelines support evaluation

- Evaluating a menu design in terms of a guideline
  - “Facilitate backwards navigation”

Before

![Before image]

After

![After image]
General guidelines

- Make the system easy to use
- Do what the user expects
- Make the system consistent
- Design for efficiency
- Clear navigation, show where you are
- Always show what’s going on
- Use icons with care
Exercise

- Are the previous guidelines useful/usable?
- Why?/Why not?
  - Discuss in groups of three…
  - 2 minutes
Consistent

- "Moreover, consistency in itself doesn’t ensure usability. It is a mistake to think that consistency in the surface properties of the interface will lead to good design.” (Microsoft)

Interface design heuristics

- In earlier HCI courses you should have learned examples of interface design heuristics.
- See separate document for a summary with examples!
An example of design

- One task, one work area
- The interface should be ready to use immediately
- Details and overview at the same time
- Simple navigation
- Pattern recognition
Patterns
Simplicity

- Do not waste space on things that are not needed. For experienced users content and position is enough. (Shneiderman)
Simplicity

- Do not waste space on things that are not needed. For experienced users content and position is enough. (Shneiderman)

- More on simplicity later! It can be quite complex!
Clear context

- Give users information about structure and context
  - Only a small part of a web site is visible at a time

(Yale C/AIM Web Style Guide)
Interaction styles

- Direct manipulation is (usually) simple
  - Simple icons and images are better than complex or blank (Byrne, 1993)
  - Use few colors
  - Test icons with users
    - Sorting cards in piles

![Example icons](image.png)
March 1997

Mon 24

9 am
1:1 w/ Harry

Hi meeting
Awakenings

10 am
1:1 w/ Fowler

Drawer I-Team
Bldg: CUP01 2nd

11 am
Switcher w/ Hinkm

12 pm

JavaONE pre-sho
Blue Moon, Lunch

Thu 27

1 pm
Plan Away
Awakening

JavaHi Staff
Blue Jeans

2 pm
IC Staff
Bldg: CUP01 2nd
Room: Blue Sue

3 pm
Speech Coach
Annie Hall

4 pm
Java Couchfest
Blue Moon Cafe

Binder – Sara

5 pm

Music lesson

Fri 28

9 am

10 am

11 am

12 pm

1 pm

2 pm

3 pm

4 pm

5 pm

Date: Mar 28, 1997
Start: 1:00 pm
End: 2:30 pm

Occurred:

Weekly

Occurs:

Forever

Others see:

Time & Text

Reminder:

5 minutes before
This brings us back to type and newspapers. What might look quite obvious and normal to you when you read your daily paper is the result of careful planning and applied craft. Even newspapers with pages that look messy are laid out following complex grids and strict hierarchies.

The artistry comes in offering the information in such a way that the reader doesn’t get sidetracked into thinking about the fact that someone had to carefully prepare every line, paragraph, and column into structured pages. Design – in this case at least – has to be invisible. Typefaces used for these hardworking tasks are therefore by definition “invisible.” They have to look so normal that you don’t even notice you’re reading them. And this is exactly why designing type is such an unknown profession; who thinks about people who produce invisible things? Nevertheless, every walk of life is defined by, expressed with, and indeed, dependent on type and typography.

Just as the newspaper on the opposite page is laid out according to an underlying structure of some intricacy, this book is designed within its own constraints.

The page is divided into equal parts, each of which has the same proportion as the whole page, i.e., 2:3. The page is made up of 144 rectangles, each one measuring 12 by 18 millimeters, 12 rectangles across and 12 down. This makes the page 144 by 216 millimeters, or roughly 5 ⅛ by 8 ½ inches. The columns are multiples of the 12-millimeter unit. Because there has to be some distance between columns, 1 mm (or more for wider columns) have to be subtracted from these multiples of 12 to arrive at the proper column width.

The distance between lines of type (still archaically referred to as leading (more about that later in the book)) is measured in multiples of 1.5 mm. All typographic elements are positioned on this baseline grid of 1.5 mm, which is fine enough to be all but invisible to the reader, but which helps layout and production. The discipline offered by a fine grid like this one gives the same sort of coherence to a page as bricks do to a building. They are small enough to allow for all styles of architecture, while serving as the common denominator for all other proportions.
Alignment

- Careful alignment makes it possible to scan and read faster (Java Look and Feel Design Guidelines)
- Alignment can make the GUI look neat and well-balanced
### March 1997

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<thead>
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<th>Tue 25</th>
<th>Wed 26</th>
<th>Thu 27</th>
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<td>1:1 w/ Harry</td>
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**Date:** Mar 28, 1997  
**Start:** 1:00 pm  
**End:** 2:30 pm  
**Occurrences:** Weekly  
**Reminder:** 5 minutes before
### Grouping

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<th>Modell</th>
<th>Volt/W</th>
<th>Chuck</th>
<th>Pris kr</th>
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<td>665,00</td>
</tr>
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</table>
And Guidelines for...

- Satisfaction
- Fun
- Happiness
- Contentedness
Piano stairs...