Vorlesung
Advanced Topics in HCI
(Mensch-Maschine-Interaktion 2)

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Structure

- Chapter 1:
  HCI and the WWW

- Chapter 2:
  Information Visualization

- Chapter 3:
  Mobile and Ubiquitous User Interfaces

Chapter 1: HCI and the WWW

Table of Content

What is web usability?

- Web usability is not a single issue
- Main characteristics of web usability:
  - Effort for learning
  - Effectiveness and efficiency of use
  - Memorability
  - Error frequency and severity
  - Satisfaction
- Web usability is concerned with
  - Functionality
  - Operation and control
  - Navigation
  - Language
  - Feedback
  - Consistency
  - Error prevention
  - Visual clarity

What are potential problems? (1)
From http://www.siteusability.com/mistakes.html

- **Downright errors:**
  - Broken links or missing images.
  - Firewall errors, server cannot be contacted, directory browsing not allowed (or allowed?).
  - Scripting errors that pop up an error message, make the page unusable, or write strings of gibberish amongst the text.
  - HTML coding errors that mean the page doesn't display properly, or at all.

What are potential problems? (2)
From http://www.siteusability.com/mistakes.html

- **Annoying or inaccessible page design:**
  - An "entrance tunnel" or splash screen - lots of flashy imagery but no real content that requires a click to get to the real home page.
  - Pages with such poor contrast between background and text they are hard to read.
  - Text in tiny or illegible fonts.
  - Pages that take minutes to download (even worse if when they have finished, you weren't interested in the content anyway).
  - Content that requires a specialised plug-in to read it.
  - Pages that require a specific browser to display nicely.
  - Links that lead to "under construction" pages.
  - Link colour schemes where you can't tell which ones you have already visited.
  - Links with badly-chosen targets that display numerous hidden windows on the desktop, break the Back button, or display pages without the necessary menus to use them properly.
  - Forms where you don't know what the site owners want to do with the information you are asked to supply.
  - Forms that don't explain properly what you need to enter, or don't let you go back and amend any errors.
  - Pages with typographical or grammatical errors, confusing and poorly-written text, or inconsistent terminology.

What are potential problems? (3)

- **Search engine problems:**
  - Pages with no links to other pages in the site.
  - Pages called "No title", "Untitled", "Insert document title here", and/or with a meaningless abstract, so the user has no idea if the link is relevant or not.
  - Pages that no longer exist on your site because you moved or renamed them.
  - Pages so poorly designed they will never even appear in a search engine listing.

What are potential problems? (4)

- **Information architecture problems:**
  - Pages with different layouts and appearance for the same kind of information.
  - Very long pages with no quick way to skip about them.
  - Forms that don't work in a comprehensible way, and shopping cart systems that confuse in their complexity.
  - Links that lead to mystery destinations (e.g. "click here"), or to other sites without warning.
  - Overwhelming numbers of links on the home (or other) page.
  - Menu options or navigation bar icons that mean little to the average visitor.
  - No consistent way to move around the site on every page.
  - No clear distinction between different kinds of information.
  - Confusing site structure so the visitor cannot guess where to go for information.

What are potential problems? (5)

- **E-commerce problems:**
  - Potential buyers can't find the product they want because they don't understand the categories you have chosen.
  - Visitors leave without purchasing because they don't want to register.
  - Visitors can't find your returns policy or how their privacy is protected if they buy from you.
  - Buyers have to work out the shipping and handling charges for themselves when viewing an item in your online catalogue.
  - Visitors from overseas don't understand the measurement system you use for sizes or weights.
  - ... the list of potential problems is endless - this just skims the surface for sites selling to the consumer.

How to avoid potential errors?

- Understanding the web (technology and phenomenon)
- Understanding the purpose of a specific web site
- Following a structured design and development process
- Use of web style guides

- Create web sites that are:
  - useful
  - compelling
  - attractive
  - easy to use
  - satisfying

Understanding the Web

- Why are people using the Web
  - Information
  - Entertainment
  - Shopping
  - Communication
  - …
- Why do people chose one site over another
  - Where do you buy books?
  - Which auctions platform are you using?
  - What search engine is your favorite?
  - …
- How do people access web pages
  - Technology
  - Context (e.g. social situation, environment)
  - …

Nielsen Usability Engineering Life Cycle

- Pre-design Phase:
  - Conduct a field study on how users work in their environment.
  - Run a small user test analysis on the old design
  - Make a comparative user test on competing web sites.
- Design Phase:
  - Use parallel design to make simple prototypes of different design approaches.
  - Select the best design from the previous step and develop it further, then do more user testing.
  - Iterate this design as many times as your time and budget allows.
  - Almost finish site and do one market test.
- Post-Design Phase:
  - Get statistics and feedbacks about real use of the web site.
  - Refresh your web site (minor changes).
  - Start planning for the next redesign of the web site

Planning a Web site

- Identifying goals, objectives, users,…

- Target **audience**
  - Usually multiple groups
- Describe briefly the main **purpose** of the site
  - About one paragraph
- Outline the main **objectives** of the site
  - If possible 5 or less
- Specify the **information** that will be provided on the site
- Define **success criteria** for the web site

Structure the Web site

- Structure the information that will be available
  - Categorize information
  - Identify dependencies in the information

- Relate navigation to the structure of the information

SWOT Analysis
general approach – not just for the web presentations

- Access factors in a competitive environment
  - external factor
  - Internal factors

- Find out about
  - Strengths
  - Weaknesses
  - Opportunities
  - Threats

SWOT Analysis
in the web context

- Strengths
  - What strength does a web presence have?
- Weaknesses
  - What disadvantages are created by a web presence?
  - Which information can not be mapped to the web?
- Opportunities
  - What new opportunities are there for the company because of the web?
- Threats
  - What risks will the company face due to the web presence?

SWOT / TOWS Matrix

	Strengths	Weaknesses
Opportunities	S-O strategies use strengths and take advantages of opportunities	W-O strategies overcome weaknesses and take advantage of opportunities
Threats	S-T strategies identify ways to use strengths to reduce the risks by external threats.	W-T strategies Defensive tactics to prevent the risk of external threads which are due to weaknesses

Web Concept (1)

- Identify starting point
  - As-is analysis
  - SWOT
  - benchmark
- Define goals
  - Short term, medium term, long term
  - target group
- Specify the main message
  - Main purpose of the site
  - Benefit for users in the target group
- Creative design brief
  - Storyboard, structure, visitors path
  - Layout basics, sample screen designs
  - Text concept, text samples

Web Concept (2)

- Content creation and update
  - How is content created and updated (or is the site fix)
  - What interfaces are available
- Technical requirements and infrastructure
  - Server, programming, database
  - network
  - End user side
- Marketing issues
  - Search engine strategy
  - advertisement
- Success measure
  - E.g. number of users, sales, reducing support requests
- Project management issues
  - Project plan, timing, milestones, dependencies
  - Budget
  - Migration strategy (from development to operation)

Post-It-Method for the Structural Design

- designing the information & navigational structure of large web site
- with non-technical staff and decision makers
- Post-It Notes with important keywords
- making a "Concept Map" - not a diagram representing the organization!
- designing the structure of the web on a blackboard
- create list of keywords

Card sorting

- Article to read…

Evolutionary Method

- „all at one table" (authors, editors, programmer, designer, manager, decision maker, ...)
- each participant (or teams of 2) make suggestions on paper for the following topics:
  - structure and scale of the web
  - navigation
  - basic design issues and interaction elements
  - technical realization
- short presentation of the ideas
  - up to 5min per participant (everyone the same time)
  - display the ideas on the wall or on a board
  - discussion and evaluation of aspects of the suggestions based on a checklist
- iteration
  - revision of the suggestions
  - Border condition; 30% of the concept must be changes and taken from one of the other suggestions

Is the result acceptable and feasible?

No ←   → Yes ———→ detailed concept

Creating a Basic Design

- Identifying the main categories of pages
- Creating a design for each of these categories
  - What is on the page (content, navigation, adverts, …)
  - Where are elements on the page

- Considering
  - the information architecture
  - The navigational structure

- Example: www.google.com

- Web Search

- Navigation

- Search form pages

- Result pages

- Advanced search pages

- Information pages

Web Design

- Many books available,
  - E.g. Mutz et al. Web Creative
  - E.g. Götz, Raster für das Webdesign

Structuring Information

- linear
- hierarchical
- grid
- graph / web

- For the overall site
- For parts of a site
  (e.g. user registration)

> If a web is dynamically generated a structure is still needed!
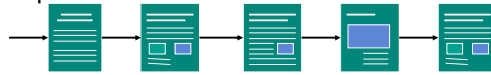>
> Structure is then not fix in the html pages but in the navigation generated.

Linear Structures I

- pure linear

- strict guidance (directed)
- little choices for the user
- pre-caching possible

Linear Structures II

- pure linear

- strict guidance
- little choices for the user
- pre-caching possible

Linear Structures III

- linear with options
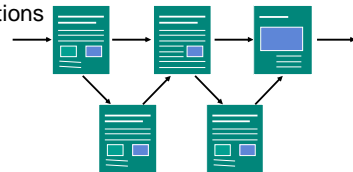
- guidance
- some choices for the user
  active interaction
- different levels of detail
- scenarios: different level of expertise, profiles

Linear Structures IV

- linear with alternatives
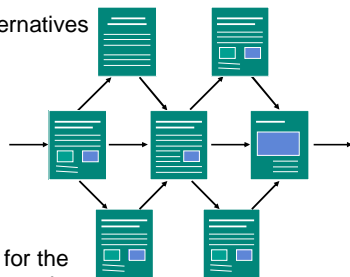
- guidance
- some choices for the
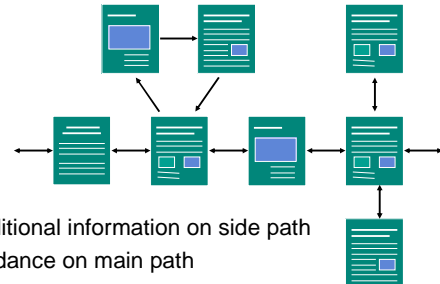 user active interaction
- scenarios: questionnaires

Linear Structures V

- linear with side branches

- additional information on side path
- guidance on main path

Circular Structure

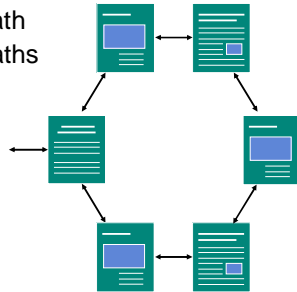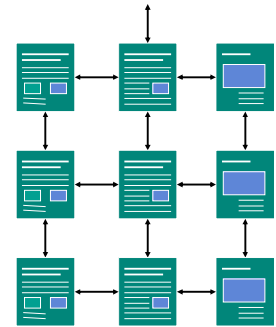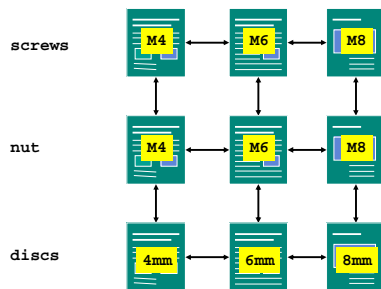- closed guided path
- variants / side paths
- entry

Information Grid

- ordered on two orthogonal criteria
- user get a „feeling of space"
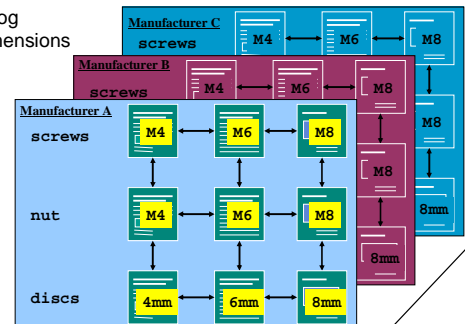- e.g. product catalog
- possible for more dimensions

Example
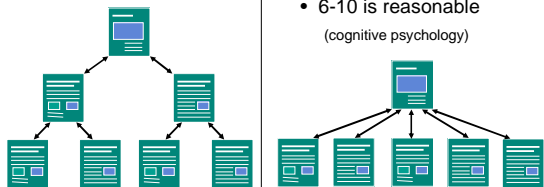## Grid Information Structure I

- catalog 2 dimensions

```
screws    M4    M6    M8

nut       M4    M6    M8

discs     4mm   6mm   8mm
```

Example
Grid Information Structure II

- catalog 3 dimensions

```
Manufacturer C
screws          M4    M6    M8
Manufacturer B
screws          M4    M6    M8          M8
Manufacturer A
screws    M4    M6    M8                M8
                                        8mm
nut       M4    M6    M8
                            8mm
discs     4mm   6mm   8mm
```
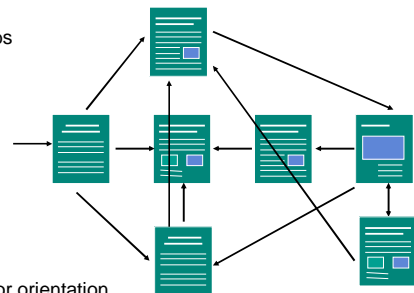
Hierarchical Information Structure

- deep hierarchy

- flat hierarchy
  - Lookup table (A-Z)
  - 6-10 is reasonable
  - (cognitive psychology)

Linked Information Structures

- pure webs

- difficult for orientation
- extremely expressive

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More on methods…

- Participatory Design Workshop
  http://www.infodesign.com.au/ftp/ParticipatoryDesign.pdf

- Card Sorting
  http://www.infodesign.com.au/ftp/CardSort.pdf

- Common mistakes
  http://www.infodesign.com.au/ftp/usabilitytestingmistakes.pdf

Usability

- Analyses of use (log files)
- Expert evaluation
- Heuristic evaluation
- User studies

References

- ACM SIGCHI Curricula for Human-Computer Interaction
  http://www.acm.org/sigchi/cdg/
- Blockvorlesung "Web-Technologien"
  http://www.medien.ifi.lmu.de/lehre/ws0506/pwt.html
  (login and password on request)