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

Ludwig-Maximilians-Universität München

LFE Medieninformatik
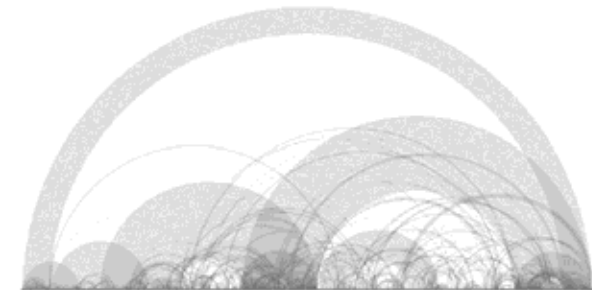Albrecht Schmidt & Andreas Butz
SS2006
http://www.medien.ifi.lmu.de/

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

1.1 Human Computer Interaction (HCI)
    - a quick reminder

1.2 Web Usability
    Web Technology
    Web Design
    Management of Web projects
    Usability evaluation of Web sites and applications

1.3 Web Accessibility, Universal Access to Information

1.4 Usability Report

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)

From http://www.siteusability.com/mistakes.html

- **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)

From http://www.siteusability.com/mistakes.html

- **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)

From http://www.siteusability.com/mistakes.html

- **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
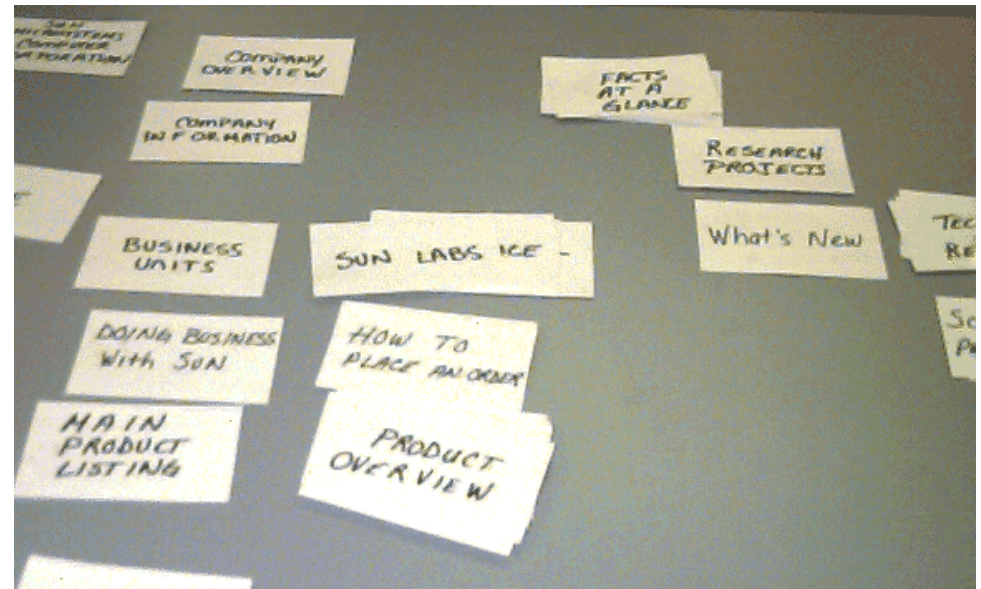
Card sorting

- 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
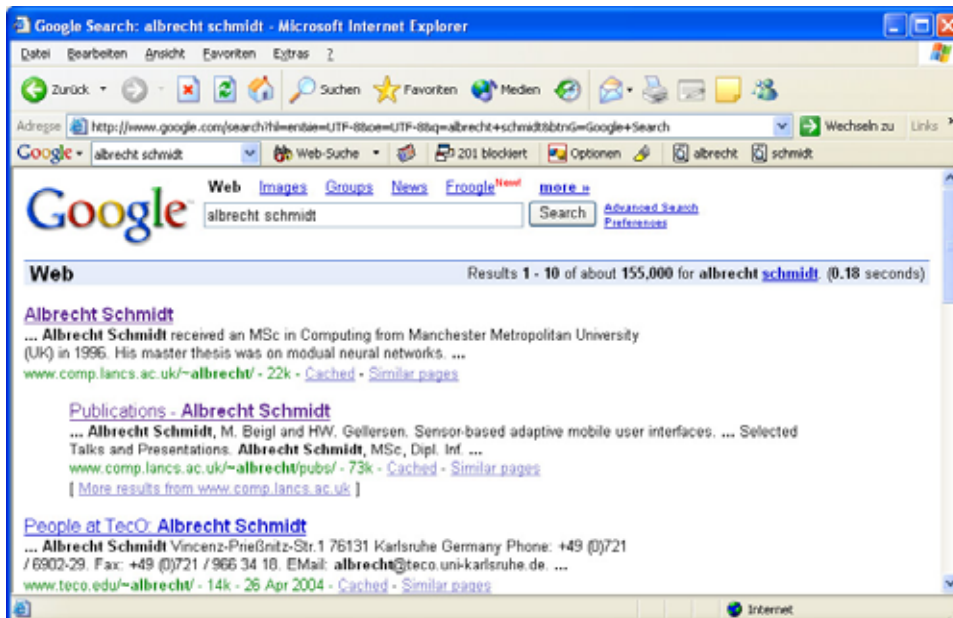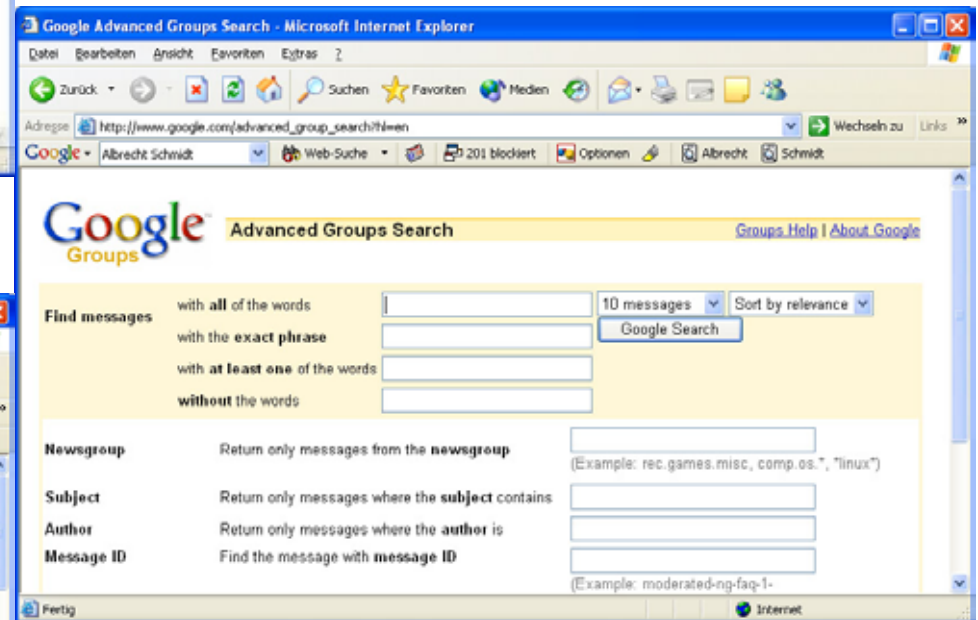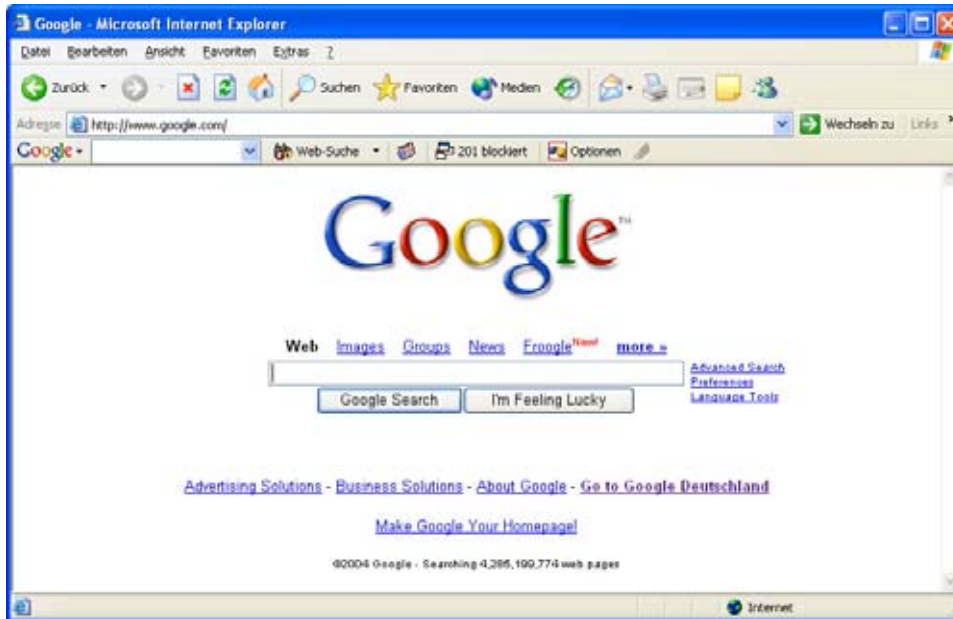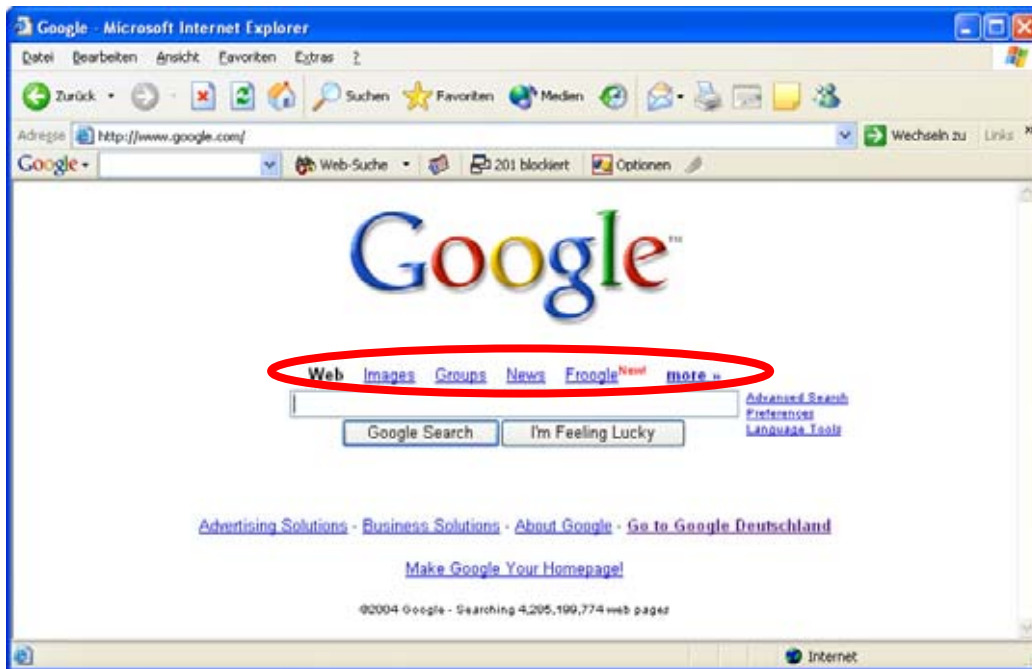
- Navigation
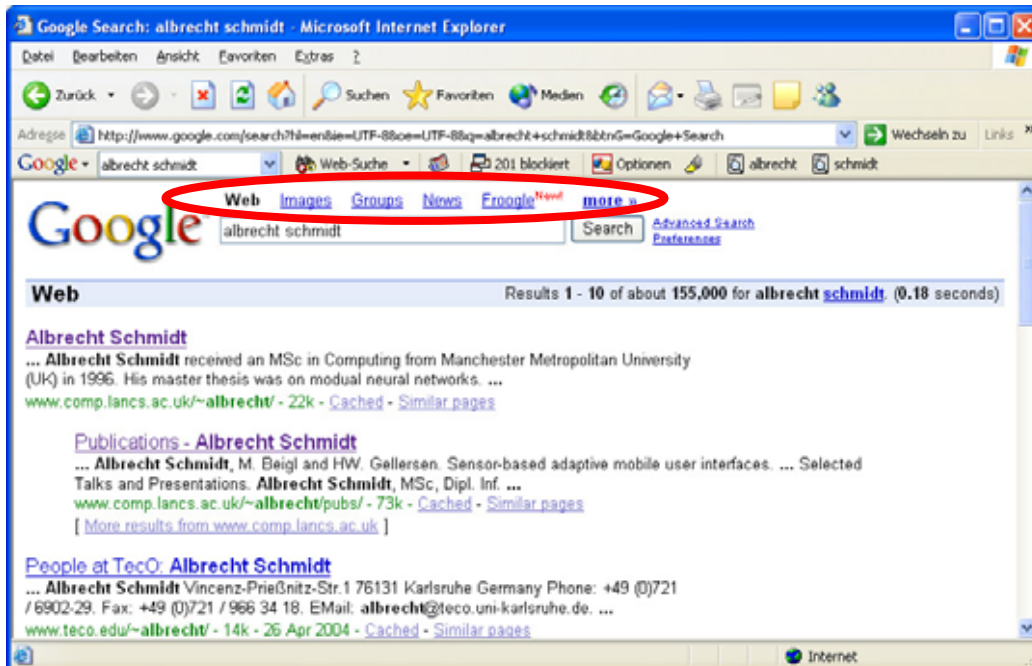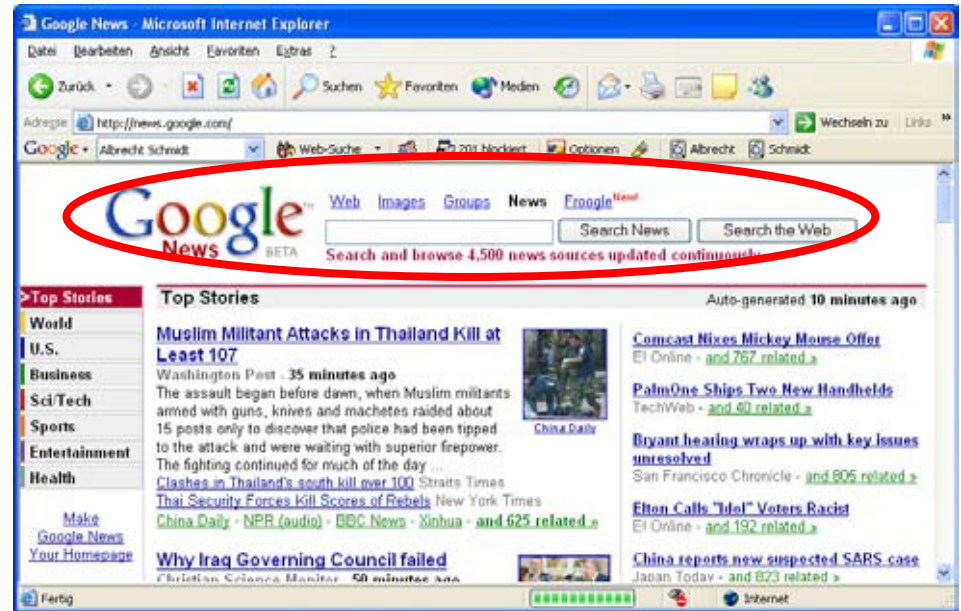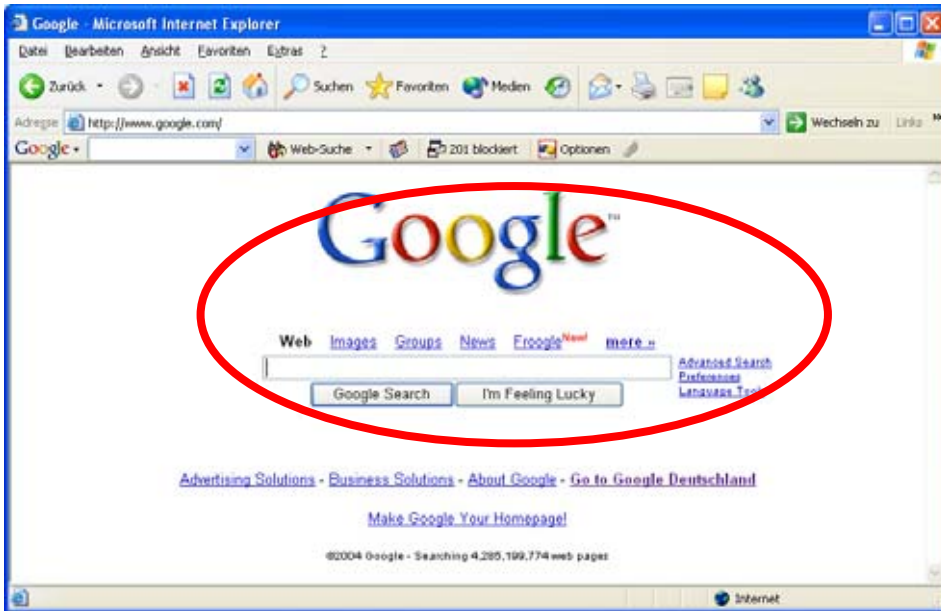
■ Search form pages
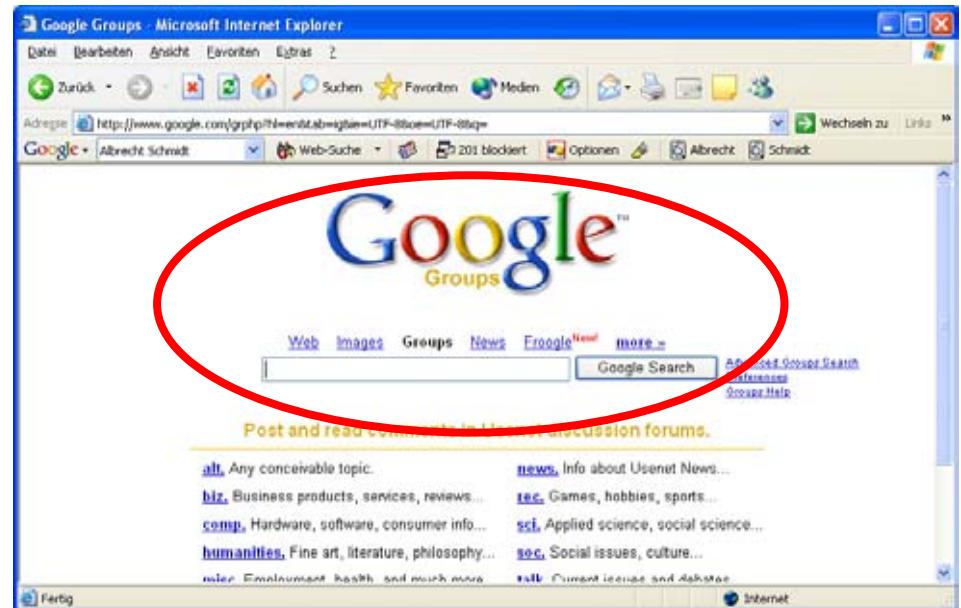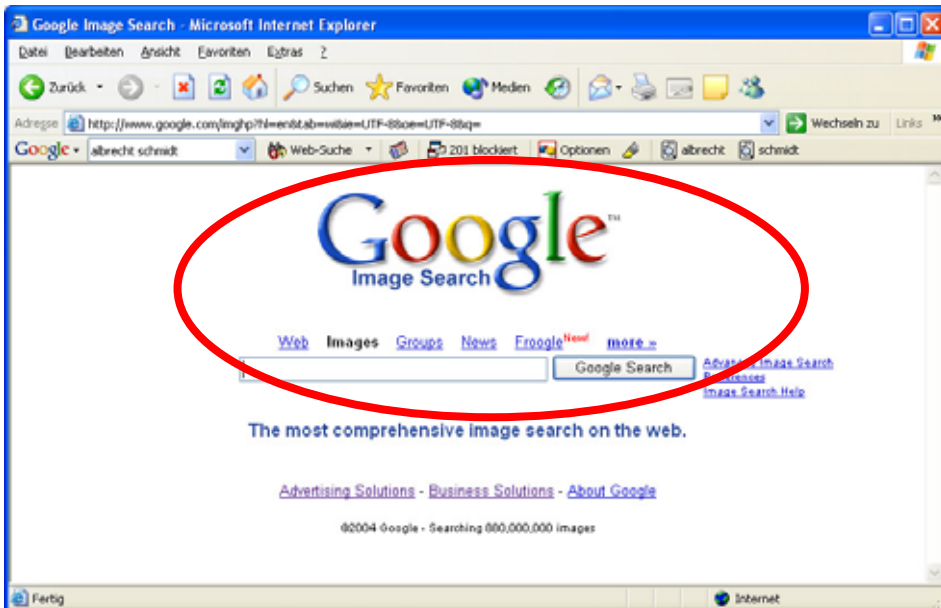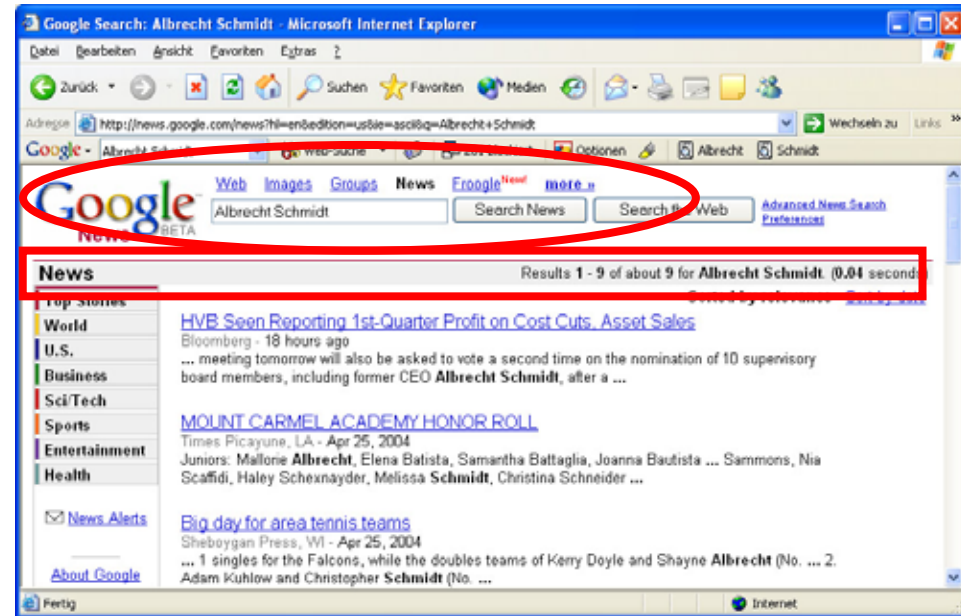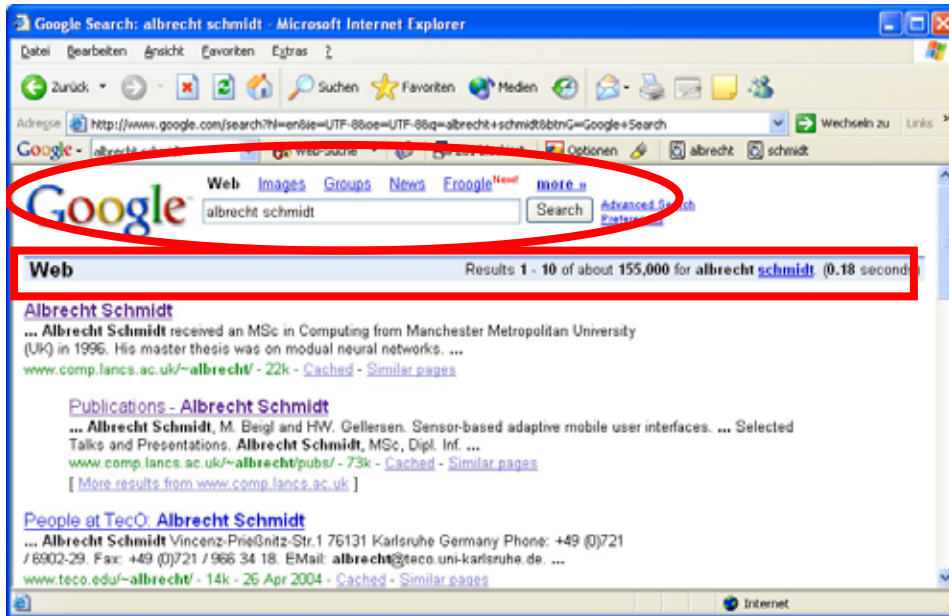
Result pages
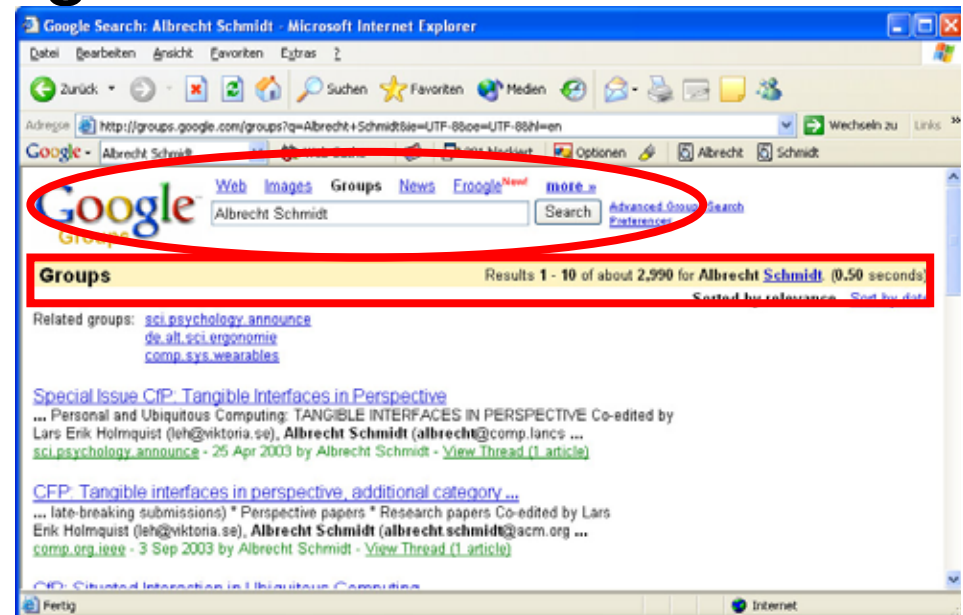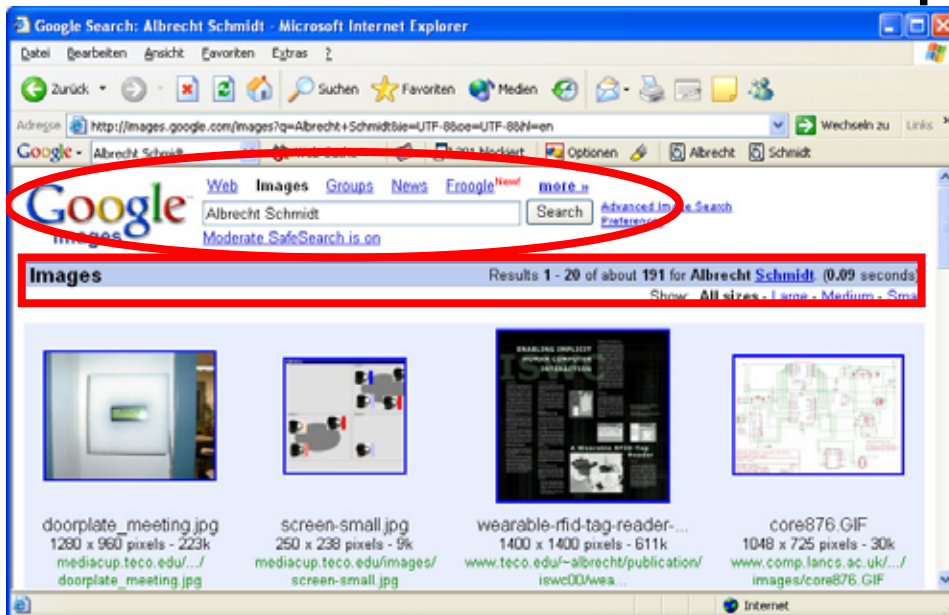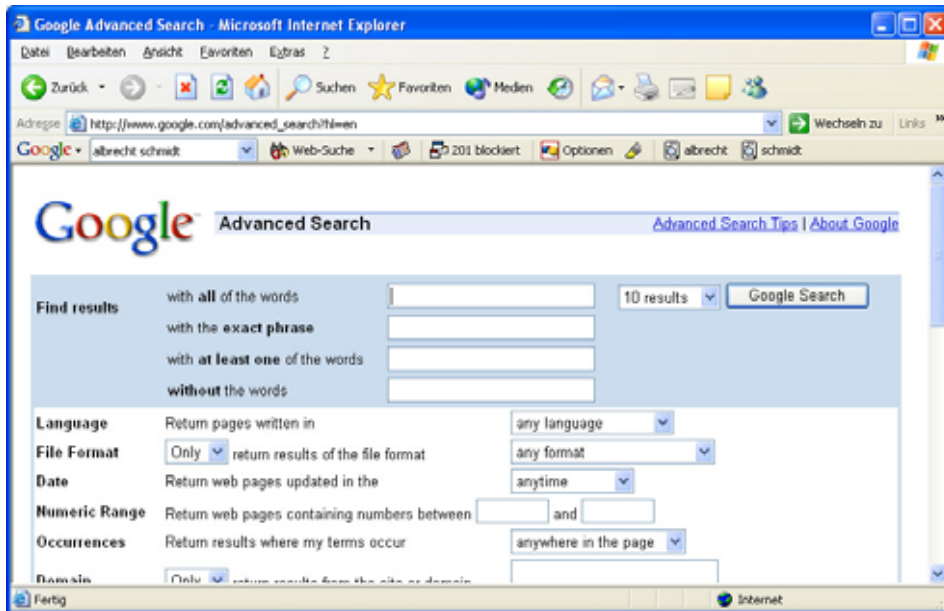
- Advanced search pages
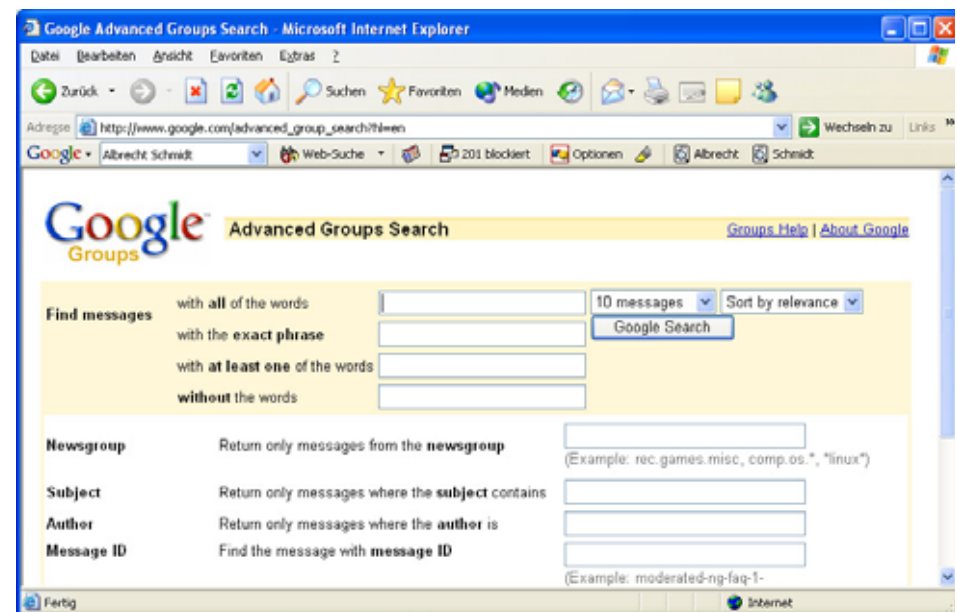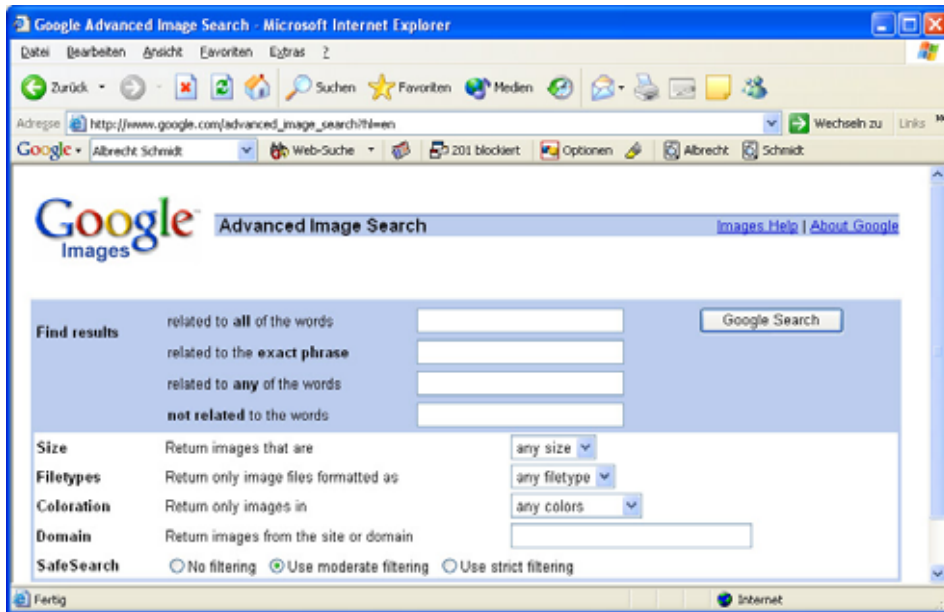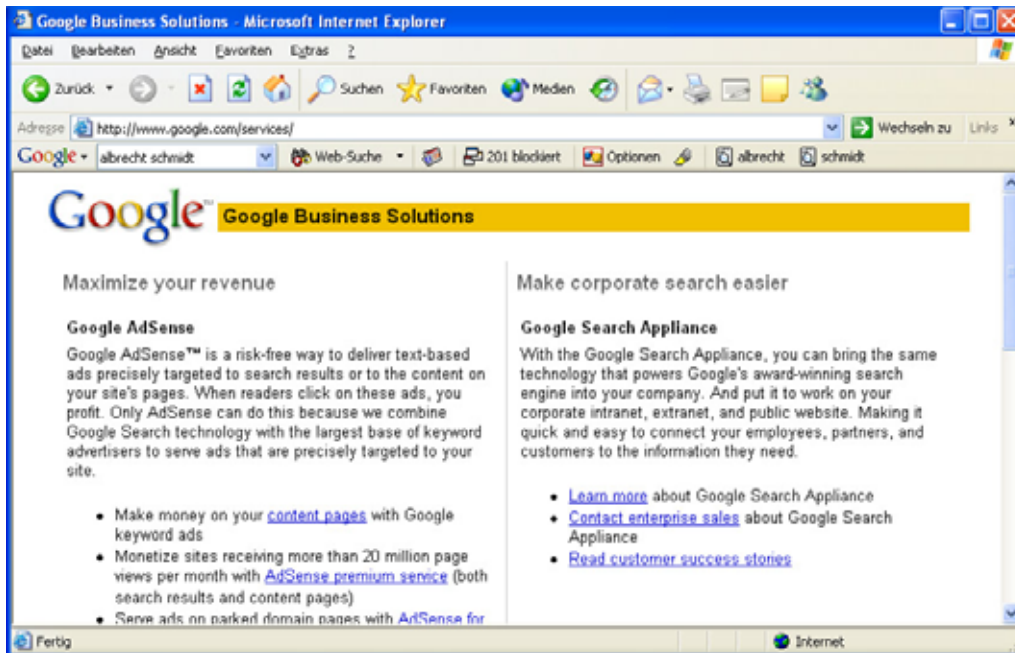
- Information pages
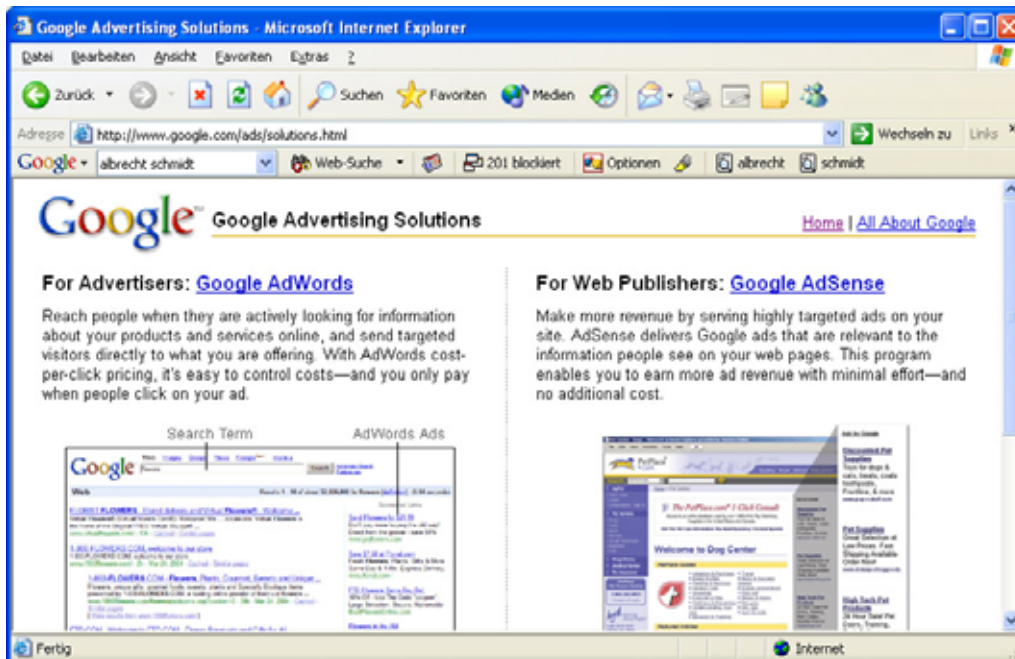
Web Design

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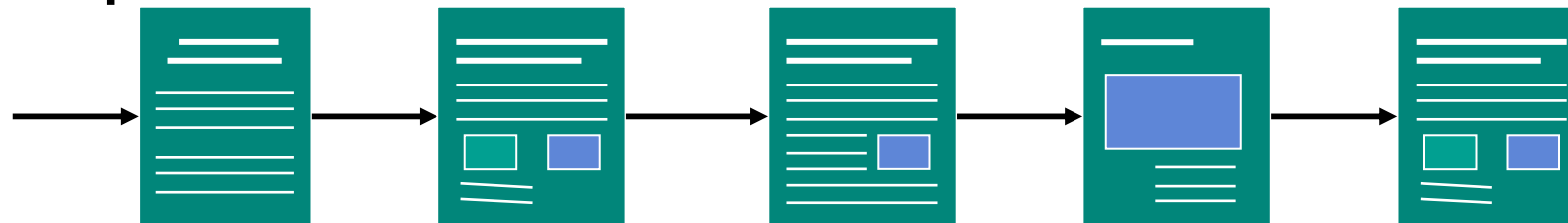
- strict guidance (directed)
- little choices for the user
- pre-caching possible

Linear Structures II

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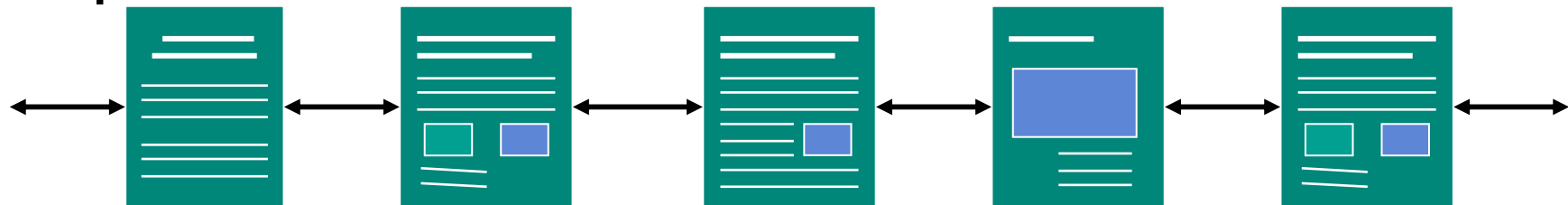
- strict guidance
- little choices for the user
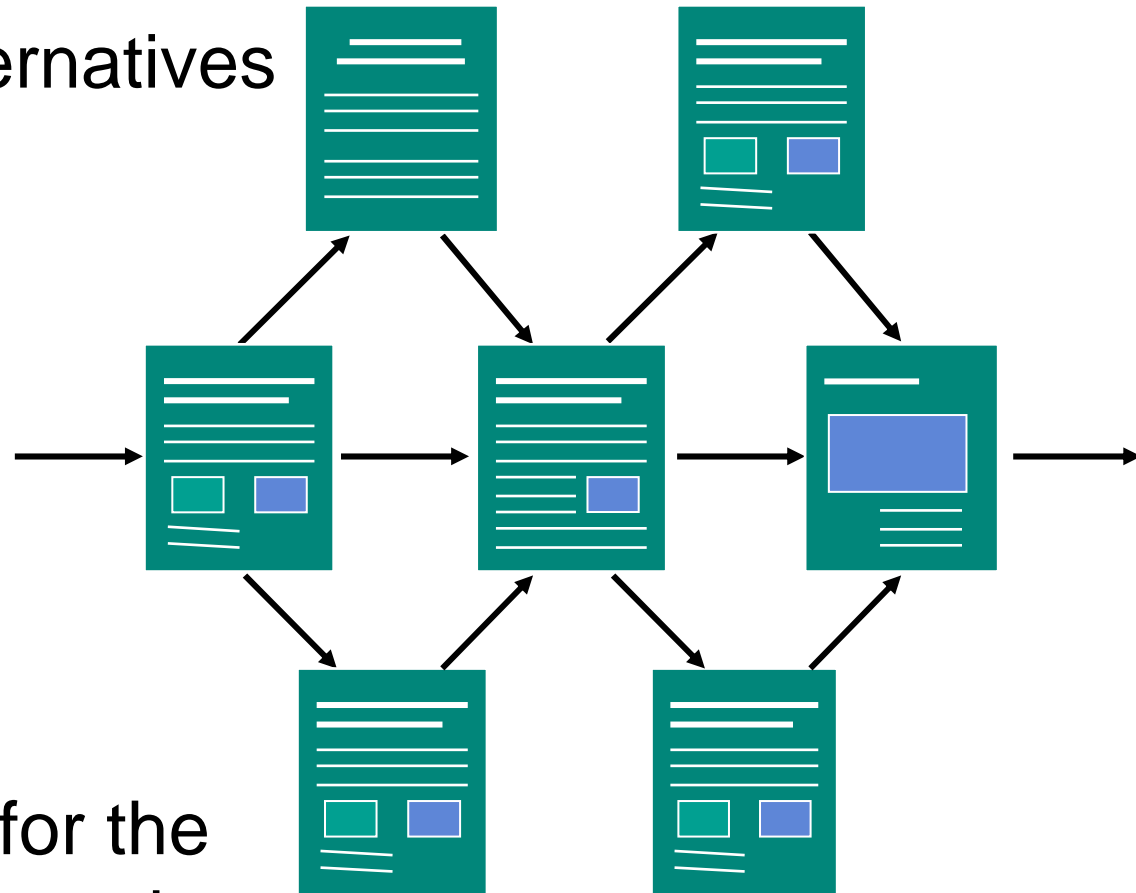- pre-caching possible

Linear Structures III

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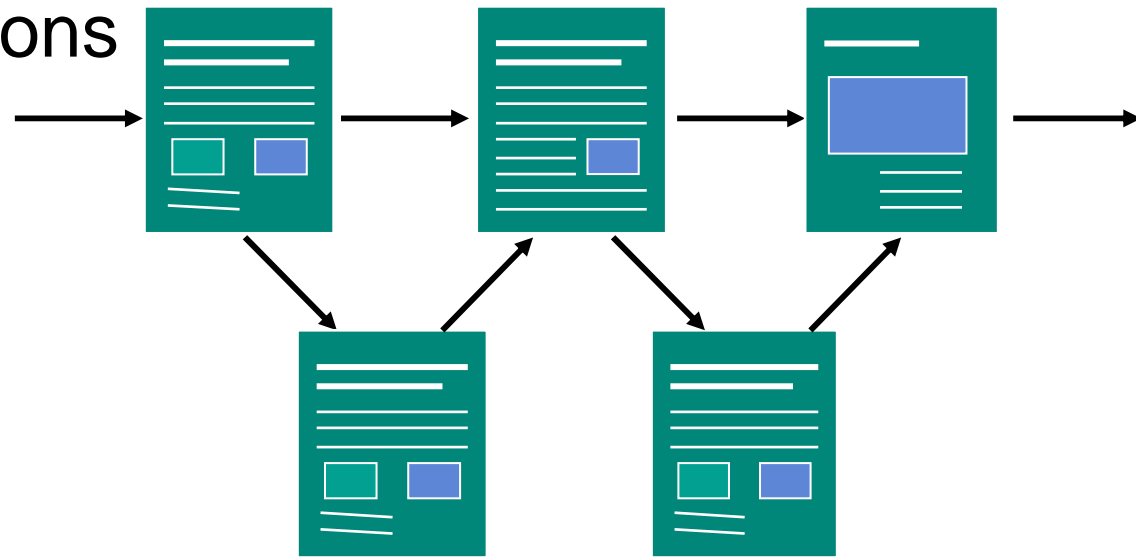
- guidance
- some choices for the user
  active interaction
- different levels of detail
- scenarios: different level of expertise, profiles
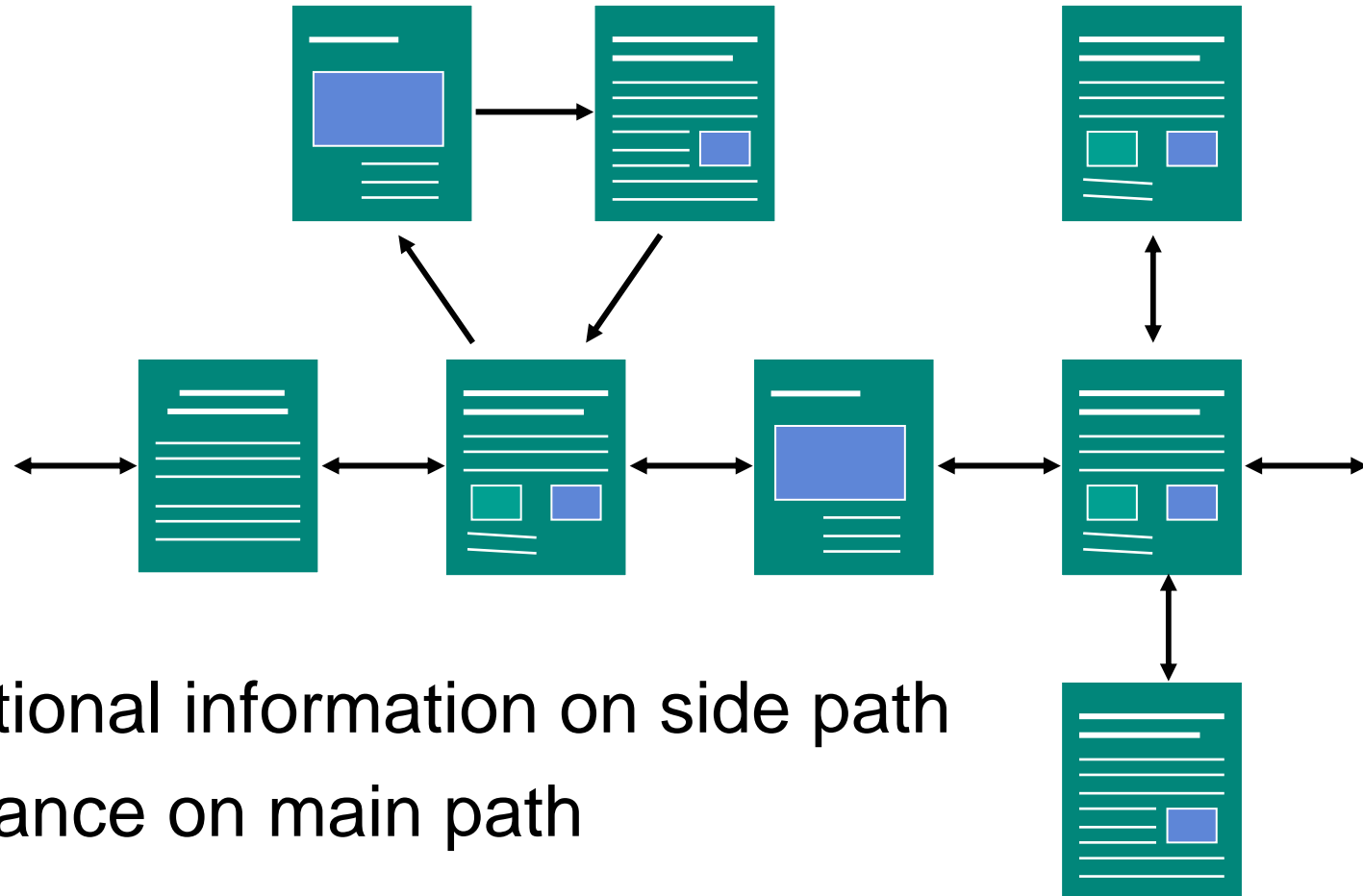
Linear Structures IV

- linear with alternatives

- guidance
- some choices for the user active interaction
- scenarios: questionnaires
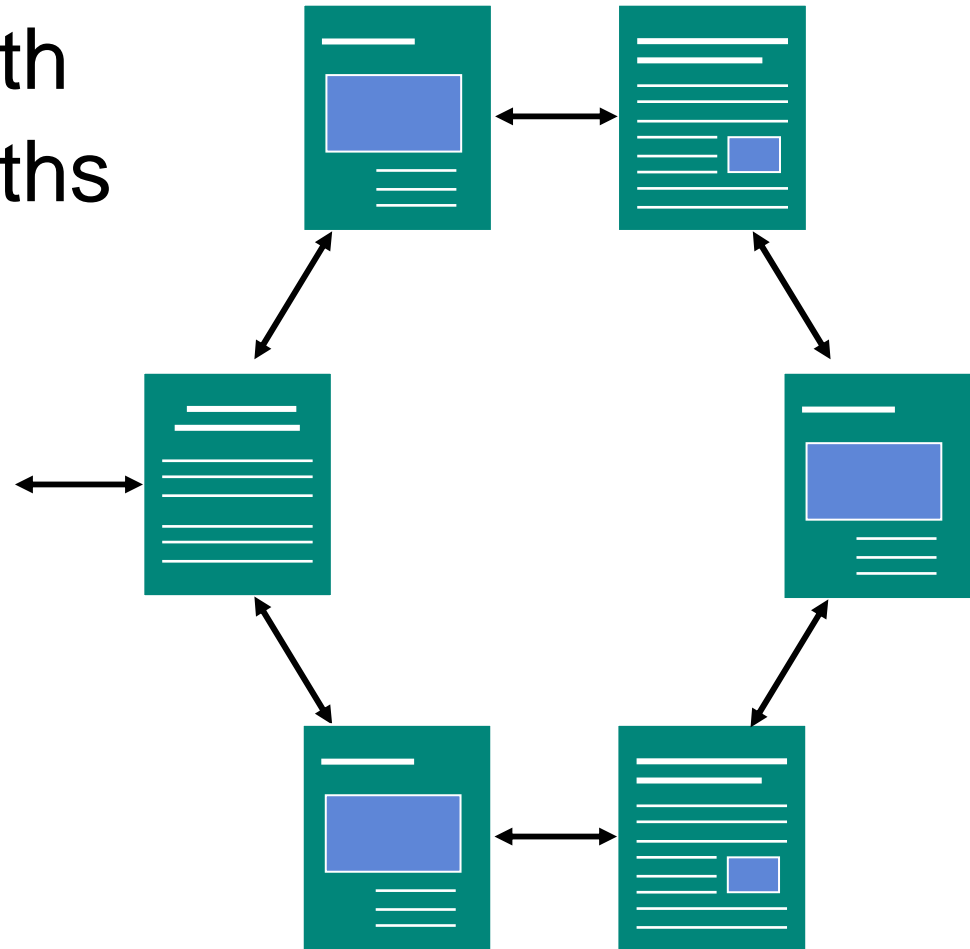
Linear Structures V

- linear with side branches

- additional information on side path
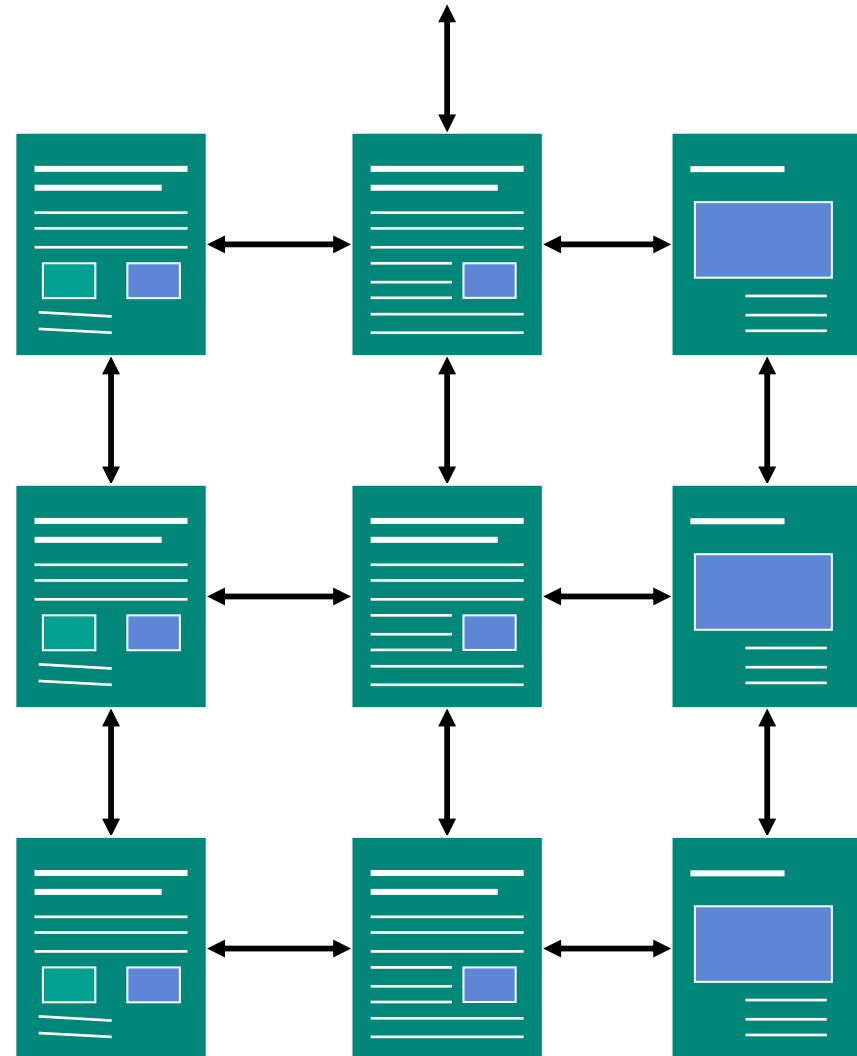- guidance on main path

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

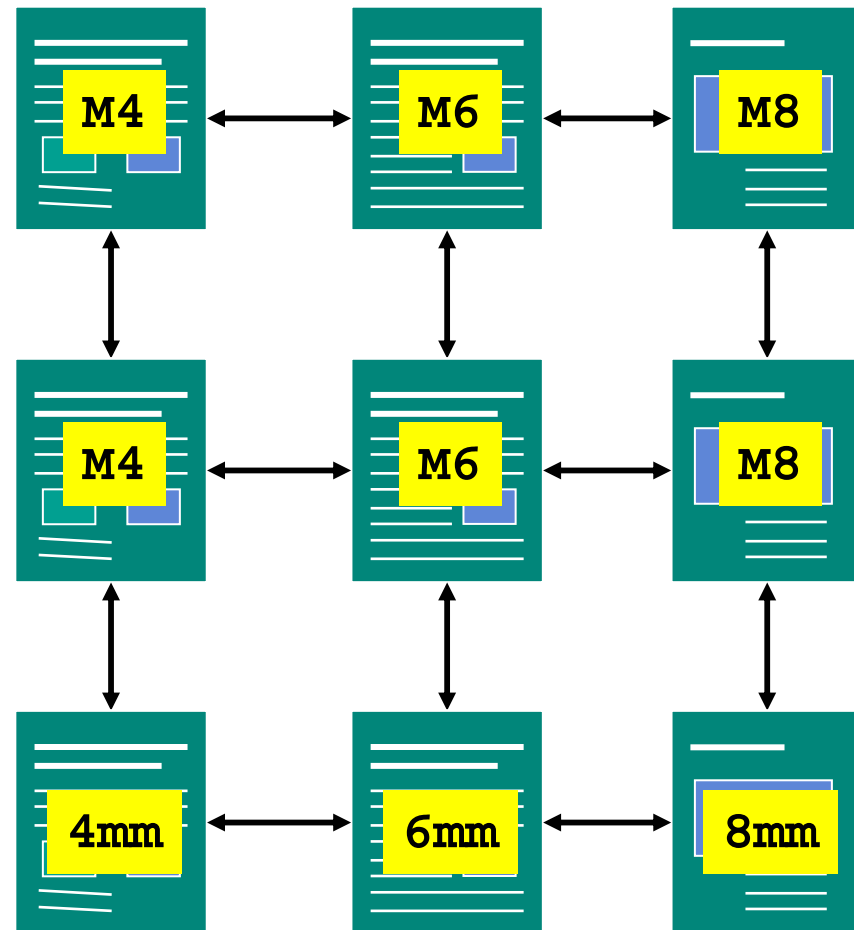- possible for more dimensions

Example
Grid Information Structure I

- catalog
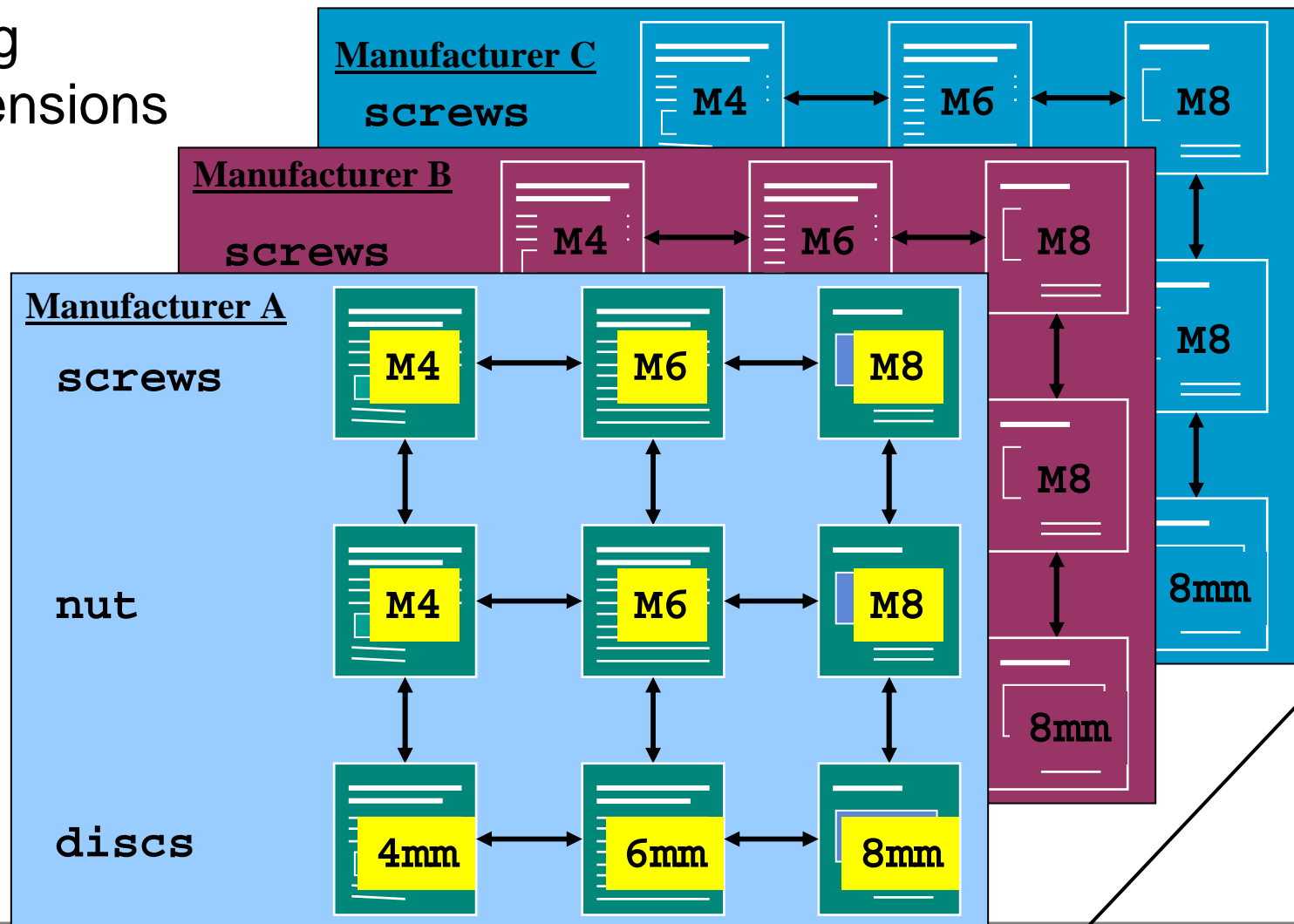 2 dimensions

screws

nut

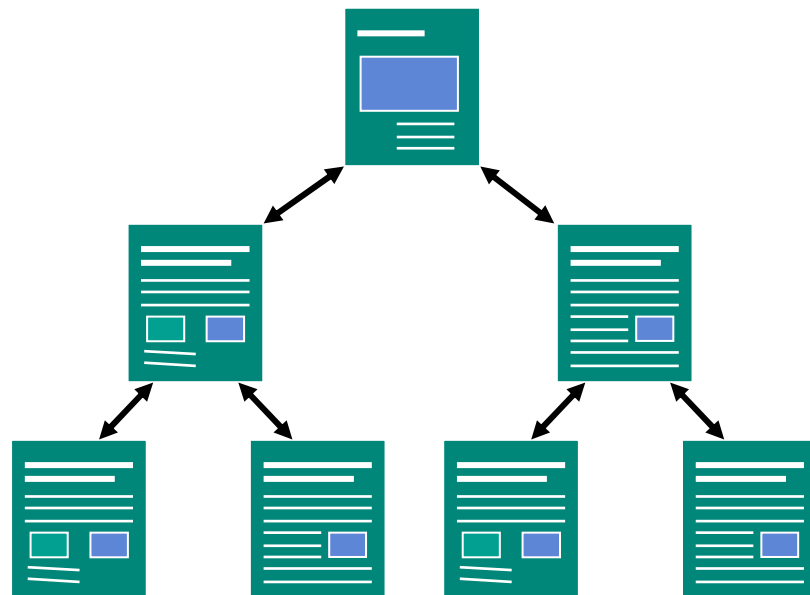**discs**

Example
Grid Information Structure II
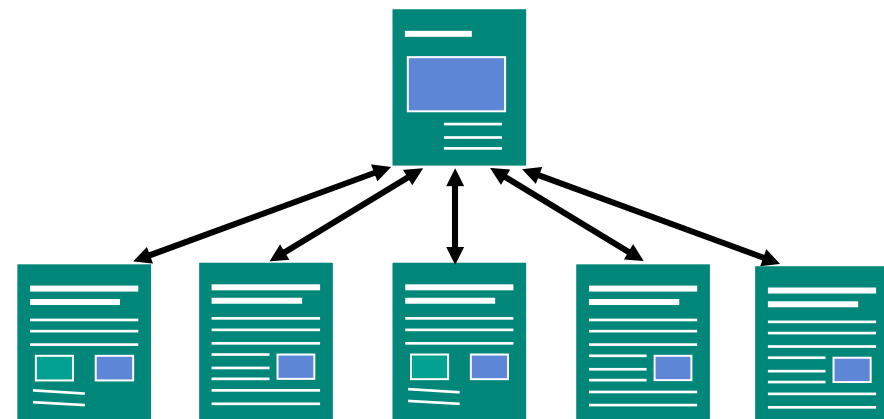
- catalog
  3 dimensions

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

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)