



# Human-Computer Interaction IS4300

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## T5b – Paper Prototyping *due!*

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- Recruit 3-5 users who are as close as possible to your target demographic.
- Be sure to record demographic information (age, gender, education, occupation, etc.) for your report.
- **Testing Users** When you run your prototype on a user, you should do the following things:
  - Obtain verbal consent for participation.
  - Brief the user.
  - Present one task.
  - Watch the user do the task. Take notes of your observations.
  - Repeat with the other tasks.
  - Interview users, take any measures you think are important.

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## P6 – Software Prototyping

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- First computer-based implementation of your team project.
- Your computer prototype should be:
  - High fidelity in look.
  - Medium fidelity in feel. It's OK if your prototype does not support some advanced interactions, such as drag & drop. You can simulate these with animation, or a popup that describes in English what would happen.
  - Medium fidelity in breadth. Your prototype should be able to handle at least the 3 scenarios you described in your task analysis.
  - Low fidelity in depth. Don't implement any backend. Where system responses are needed, make them canned (i.e., always the same) or random. Write minimal code.



## P6 – Software Prototyping

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- DUE IN 2 WEEKS (11/18):
- IMPORTANT:
  - Your system ***must actually run*** and support your 3+ tasks to some level of fidelity.
  - Other students in the class must be able to download your software on any readily available (e.g. lab) computer and walk through the 3 tasks with little or no help from you.
  - If you must develop for a unique device (e.g. iPhone) you must be prepared to loan 3-5 other students a device for a day each so they can do heuristic evaluation.



## Designing for the Web

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- Relative to Designing for GUIs...
  - What's different?
  - What's the same?



## Today

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- Focus on overall website structure..
  - Benyan Chapter
  - Tips from other texts & sources
  - Testing tools & surveys
  - Nielsen's 'Top 10 Mistakes'
  - Credibility in Web sites
- NOT website development tools or technologies.



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**HUMAN-COMPUTER  
INTERACTION**  
THIRD EDITION

## What's different about web? Hypertext - not just linear

- non-linear structure
  - blocks of text (pages)
  - links between pages create a mesh or network
  - users follow their own path through information

## lost in hyperspace

- non-linear structure
  - very powerful ...
  - but potentially confusing
- two aspects of lostness
  - cognition and content
    - fragmentary information – no integration ... confusion
  - navigation and structure
    - hyperlinks move across structure – where am I?
- no easy solutions
  - but good design helps!

## making navigation easier

- maps
  - give an overview of the structure
  - show current location – you are here!
- recommended routes
  - guided tour or bus tour metaphor
  - linear path through non-linear structure
- levels of access
  - summary then progressive depth
- segment site per user type or task



## history, bookmarks, etc.

- revisiting
  - 'hub and spoke' access – click-back-click-back
  - lots of revisiting of pages
  - 'back' is 30% of all browser navigation
  - but multi-step back and history used less
  - bookmarks and favourites for longer term revisiting
- deep links
  - bookmarks and external links – into heart of site
  - are pages self explanatory? what site? where in it?
    - e.g. breadcrumbs for context



## Other differences

- bandwidth  $\Rightarrow$  think about download time
  - e.g. 100K image: 1 sec – broadband, 18 secs – 56K modem
  - save graphics in appropriate format and size
  - reuse the same graphics
    - in the browser cache after first load
- connection time
  - one big file may be better than several small ones
    - beware of 'fit on one screen' rule – scrolling is fast!
    - think before breaking big graphic into bits
- latency  $\Rightarrow$  think about feedback



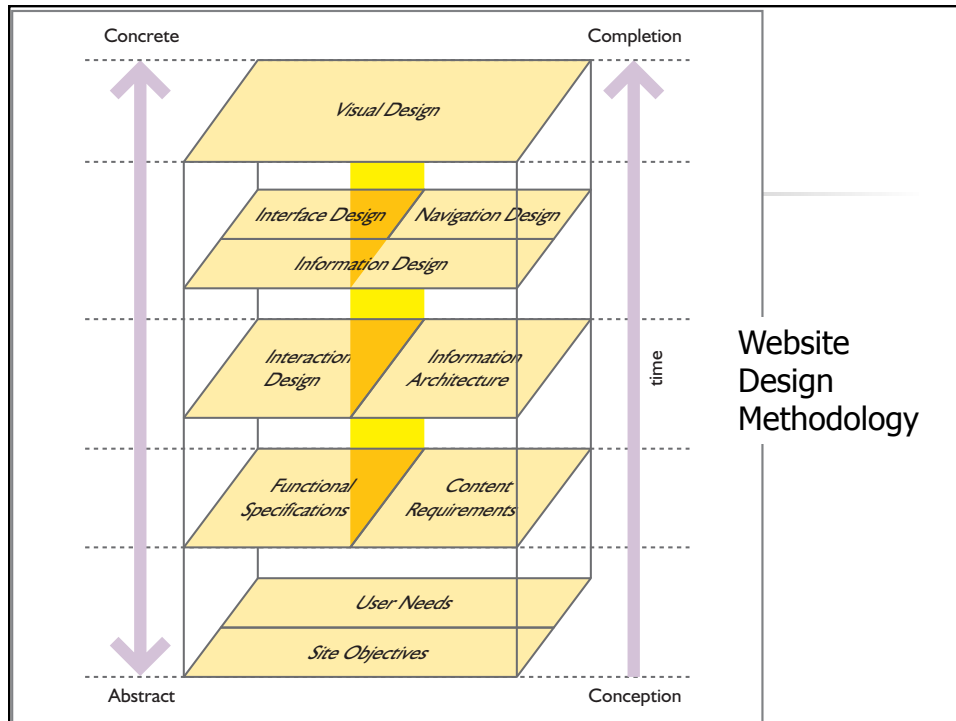
## Jonathan Lazar Handbook of HCI

- Unique Challenges in Designing for Web?
  - Unreliability of internet (delays, outages)
  - Browser incompatibility & versions
  - Range of displays and devices used
  - Standards (w3) rarely followed exactly
  - Absence of user training

## Benyon Case Study

### Robert Louis Stevenson web site

- Development of personas (10!) & scenarios
  - Used to design information architecture
- Designed site structure
- Mood board
- Logo, banner, color scheme
- Settled on top-level navigation
- Card sort to organize second-level info
- “three-click” rule
- Online, remote testing by scholars
- Developed “style guide” for written content



## First!

- Purpose
- Tasks to be supported
- Personas & Scenarios
  
- Then determine content required for these



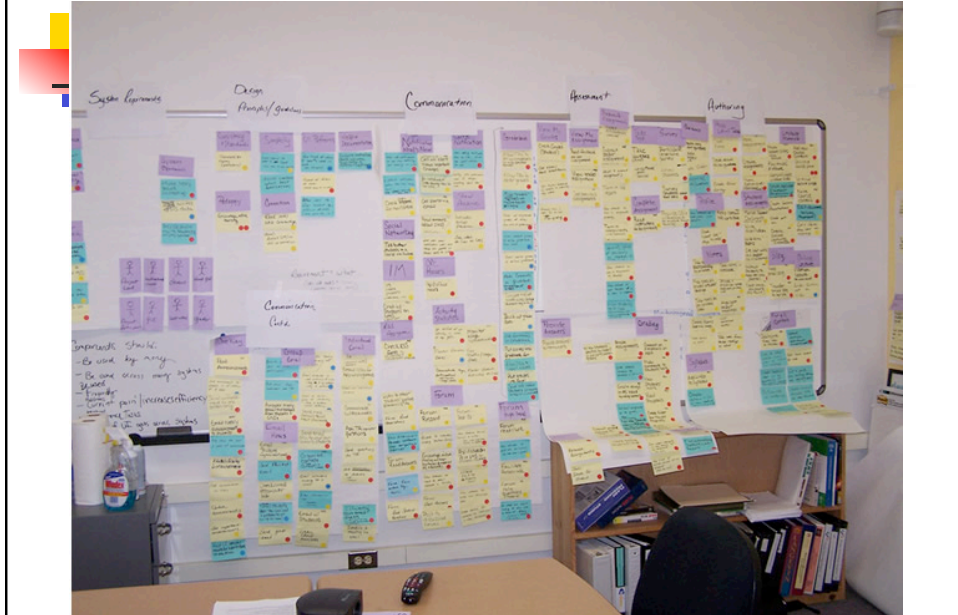
## Example: Culinary Delights Groups! ID 1 task per persona



## Second! Information architecture

- Natural organization of the content
  - Taxonomy or Ontology
- E.g.,
  - Alphabetical
  - Geographical
  - Chronological
  - By Task
  - By Topic
  - By Audience
  - etc

# Affinity Diagramming



## Example: Culinary Delights Groups! Affinity diagram content!

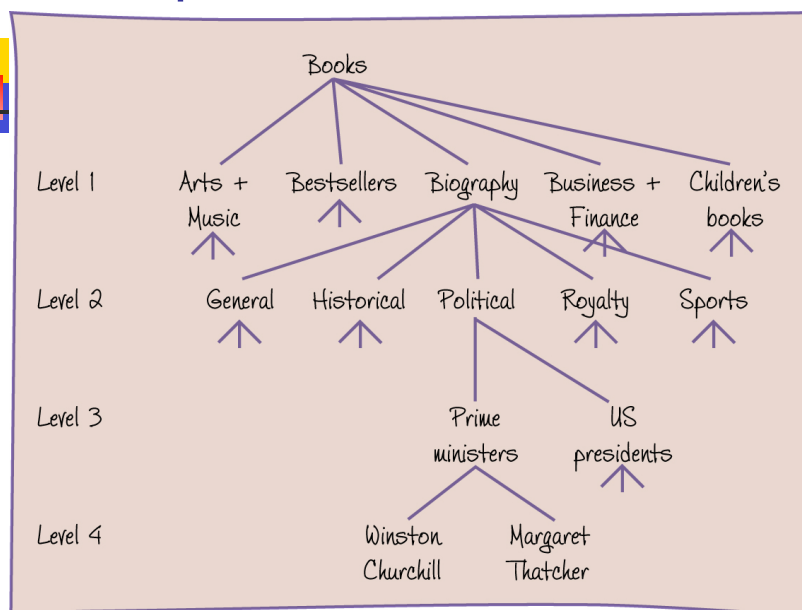


## Third!

# Web Site Structure & Navigation

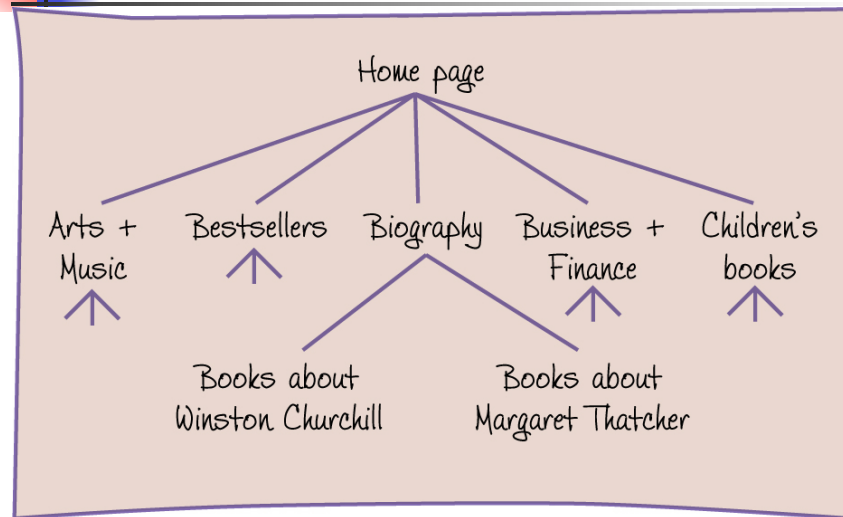
- Start with Information Structure
- How deep & wide?
  - Wider is better
  - Minimize need for scrolling
- Long vs. short pages?
  - <2 print pages ok
  - But, keep info together important for a task

## Sample information structure



## Web structure


Broad & shallow minimizes page loads



## Third!

### Web Site Structure & Navigation


- Structure of site should support tasks.
  - Generally follows information structure
  - Primary tasks for information sites:
    - Search for something specific
    - Browse
  - 50% of all site visitors are 'search dominant'
  - 20% 'link dominant' and the rest mixed
- Try to minimize number of clicks per task



## People use many strategies to navigate – each requires different information

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- **Omniscience**
  - Users have perfect knowledge and make no mistakes
  - Provide short, efficient paths.
- **Optimal rationality:**
  - Users reason perfectly, but only know what they have seen
  - make sure links provide adequate cues to the content they lead to.
- **Satisficing:**
  - Users avoid remembering and planning and make decisions on what is immediately perceptible
  - organize the page to make the most important content and links available immediately.



## People use many strategies to navigate – each requires different information

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- **Mental maps:**
  - Users actively use the cues available to try to infer the structure of a website
  - organize the site simply so that users can easily conceptualize it. Design the navigation bar and site maps to reinforce this mental map.
- **Rote memorization:**
  - When users find a path that works, they tend to remember and repeat it –
  - make sure the most obvious solution is also efficient. Use distinctive landmarks and orientation cues to help people recognize where they have been before.
- **Information foraging:**
  - Users try to get as much as possible at one location –
  - enable spontaneous discovery by providing context, structure and related topics.
- **Information costs:**
  - Users have limited knowledge and reasoning ability –
  - minimize the mental costs of sense making, decision making, remembering and planning.

# Third!

## Web Site Structure & Navigation

- Help Users Know Where They Are
  - Orient users who hypertext into the middle of your site.
  - What site am I on?
    - Logo, consistent look & feel
  - What page am I on?
    - Breadcrumbs

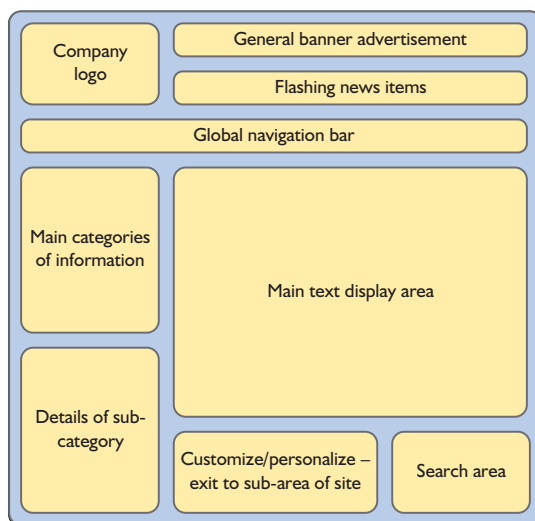
### Breadcrumbs

The screenshot shows the Sears website interface. At the top, there are logos for various brands including SHOP YOUR WAY, kmart, myefer, CRAFTSMAN, Kenmore, PartsDirect, LANDS'END, Sears Home Services, and Sears Outlet. Below the logos is a search bar with the text 'Enter keyword or item number' and a 'Search' button. The main navigation bar includes 'Departments', 'LocalAd', 'Deals Center', 'Parts & Services', 'Gifts', 'Gift Cards', and 'Gift Registry'. Below the navigation bar, there are promotional banners for 'get it today with FREE store pick up', 'Deal of the Day', 'layaway', and 'SHOP YOUR WAY REWARDS mem'. The breadcrumb trail is highlighted with a red circle: [Health & Wellness](#) > [Bathroom Safety](#) > [Bath Safety Accessories](#). The product page for 'Jobar Jobar Plaid Dust Mop Slippers' is displayed, showing a price of \$8.10, a quantity selector set to 1, and shipping information. The product image shows a person's feet wearing the slippers.

## Example: Culinary Delights Site structure & Navigation



## Fourth! Sketch page layouts



Example  
Wireframe  
for one type  
of page



## Designing Home Pages and Interior Pages

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- Designing the Home Page
  - Tells the users where they are
  - Tells the users what the site does
  - Logo, tagline, intro, key content, search, etc
- Designing Interior Pages
  - More content, less introductory info
  - User still needs to know where they are
    - Logo, link to homepage



## Writing the Content of Web Pages

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- Keep Text to a Minimum
  - Less than half the text of print equivalent
- Help Users to Scan – use headings and subheadings, bulleted and numbered lists, highlight
- Divide Long Blocks of Text into Separate Sections



Sketch: 1) home page 2)  
representative content page for each  
task



## Usability Engineering of Web Sites Users are still the final authority!

- UIE study of clothes shopping sites – 5 design patterns
  - Departments on left navigation panel
    - Most common, e.g., Macy's
  - Product Descriptions + Departments
    - Land's end
- Testing with N=44 users, shopping for 687 a-priori products
- Only 22% used search engine
- Most common design performed worst
- Number of pages that a user visited before they put something into their cart was inversely proportional to purchasing



## Usability testing

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- Easier to do remotely, since web site can be accessed over net
  - Many Tools
    - Morae (\$1500), UserTesting.com (\$39/user), Intuition HQ, Usabilla, Loop11, etc., etc.
- Crowdsourced usability testing
  - Mechanical Turk, FeedbackArmy, FiveSecondTest, etc

<http://www.usefulusability.com/14-usability-testing-tools-matrix-and-comprehensive-reviews/>



## Usability testing Heuristic Evaluation

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- Levi & Conrad, 1996 – Interactions Magazine 3(4), “A heuristic evaluation of a world wide web prototype”
- Karoulis & Pombortsis, 2004 – Informatics in Education 3(1), “The Heuristic Evaluation of Web-Sites Concerning the Evaluators’ Expertise and the Appropriate Criteria List”
- Both Used Nielsen’s 10 heuristics & severity scale to evaluate web sites
- Both found it was as applicable as for GUIs

## “Automatic” Usability Testing Tools (checklists)

- NIST WEBSAT (static analyzer tool)
  - Very old
  - Example rule,
    - Forms must have Submit and Reset/Clear buttons
- Readability checks (Word, wordscount.info, etc)
- Color contrast (checkmycolours.com)
- Navigation (optimalworkshop.com, writemaps.com, navflow.com)
- Load speed, uptime, etc (pingdom.com)
- UX (feedbackarmy.com, 10 reviews for \$20)

## Standard Survey Instruments

- QUIS - \$750!
  - Questionnaire for User Interaction Satisfaction
- WAMMI – web analysis and measurement inventory – wammi.com

### Website Analysis and Measurement Inventory (WAMMI)

#### Demo Survey - Company Z



Thank you for helping us evaluate the Company Z web site. If you have not yet used this site, please go back to it now and fill out this questionnaire after you've used it.

The information you provide is kept completely confidential, and no information is stored on computer media that could identify you as a person. You are not in any way obliged to participate and you may freely withdraw at any time.

What is your age?


choose ...

What is your gender?

- Male  
 Female

Which of these browsers do you have experience with?(select all that apply)


- Safari  
 Google Chrome  
 Opera Browser  
 Mozilla Firefox  
 Internet Explorer  
 something else



**WAMMI**

Statements 11 - 20 of 20

	Strongly Agree	Strongly Disagree
I don't like using this web site.	<input type="radio"/>	<input type="radio"/>
I can easily contact the people I want to on this web site.	<input type="radio"/>	<input type="radio"/>
I feel efficient when I'm using this web site.	<input type="radio"/>	<input type="radio"/>
It is difficult to tell if this web site has what I want.	<input type="radio"/>	<input type="radio"/>
Using this web site for the first time is easy.	<input type="radio"/>	<input type="radio"/>
This web site has some annoying features.	<input type="radio"/>	<input type="radio"/>
Remembering where I am on this web site is difficult.	<input type="radio"/>	<input type="radio"/>
Using this web site is a waste of time.	<input type="radio"/>	<input type="radio"/>
I get what I expect when I click on things on this web site.	<input type="radio"/>	<input type="radio"/>
Everything on this web site is easy to understand.	<input type="radio"/>	<input type="radio"/>



**WEBMAC – Website Motivational Analysis Checklist**

**4 aspects assessed**

- **Engaging/Stimulating**
  - offers eye-catching visuals, attractive screen layout, humor, varied activities, novelty, and diverse and well-written content;
- **Meaningful**
  - offers a statement of the purpose and importance of the site, accurate and updated information, meaningful examples and analogies, and quick and easy links to other relevant sites;
- **Organized**
  - offers a site overview, summaries of key points, a help interface, and definitions of terms;
- **Enjoyable for both the extrinsically and intrinsically motivated user**
  - positive feedback on progress, user-controlled external rewards (such as animation), and quick response speed.

## WEBMAC

### Example "Stimulating" Questions

1. The home page of this Web site is eye-catching and visually interesting.
5. There are incentives at this site that motivate me to explore it
9. The screen layout of this Web site is attractive.

## Nielsen: Top 10 Mistakes in Web Design

- #1. Bad Search
- #2. PDFs
- #3. Not indicating visited links.
- #4. Non-Scannable Text
- #5. Fixed Font Size



## Nielsen: Top 10 Mistakes in Web Design

#6. Page Titles With Low Search Engine Visibility

#7. Avoid Anything that looks like an Advertisement

#8. Violating Design Conventions

Jakob's Law of the Web User Experience:  
"users spend most of their time on other websites."

#9. Opening New Browser Windows

#10. Not answering users' questions



See also...

<http://webpagesthatsuck.com>



## Trust in websites

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- Fogg, CHI 2001, What Makes Web Sites Credible?
- 1400 people evaluated 51 websites
- When is this important?



## Positive influence

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**Table 2: Real-World Feel Scale** (Cronbach's alpha = 0.66)

Items in the <b>REAL-WORLD FEEL</b> scale	Mean
The site provides a quick response to your customer service questions.	2.02
The site lists the organization's physical address.	1.86
The site gives a contact phone number.	1.71
The site gives a contact email address.	1.53
The site shows photos of the organization's members.	0.69



## Positive influence

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**Table 3: Ease of Use Scale** (Cronbach's alpha = 0.67)

Items in the <b>EASE OF USE</b> scale	Mean
The site lets you search past content (i.e. archives).	1.57
The site looks professionally designed.	1.55
The site is arranged in a way that makes sense to you.	1.48
The site takes a long time to download.	-0.94
The site is difficult to navigate.	-1.30



## Positive influence

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**Table 4: Expertise Scale** (Cronbach's alpha = 0.63)

Items in the <b>EXPERTISE</b> scale	Mean
The site is by a news organization that is well respected outside of the Internet.	1.91
The site lists authors' credentials for each article.	1.49
The site has articles that list citations and references.	1.49
The site has few news stories but gives detailed information for each.	1.10
The site says it is the official site for a specific topic	0.85
The site has ratings or reviews of its content.	0.79
The site displays an award it has won.	0.45





## Positive influence

**Table 5: Trustworthiness Scale** (Cronbach's alpha = 0.57)

Items in the <b>TRUSTWORTHINESS</b> scale	Mean
The site is linked to by a site you think is believable.	1.29
The site states its policy on content.	1.26
The site links to outside materials and sources.	1.25
The site provides links to its competitors sites.	1.11
The site was recommended to you by a friend.	1.07
The site represents a nonprofit organization.	0.93
The site lists well-known corporate customers.	0.62
The URL for the site ends with ".org"	0.58



## Negative influence

**Table 7: Commercial Implications** (Cronbach's alpha = 0.65)

Items in the <b>COMMERCIAL IMPLICATIONS</b> scale	Mean
The site is advertised on the radio or on billboards.	0.57
The site has ads that match the topic you are reading about.	0.21
The site is designed for e-commerce transactions.	0.17
The site has a commercial purpose (as opposed to academic purpose).	-0.63
The site requires a paid subscription to gain access.	-0.71
The site has one or more ads on each page.	-0.77
The site automatically pops up new windows with ads.	-1.56
The site makes it hard to distinguish ads from content.	-2.08



## Negative influence

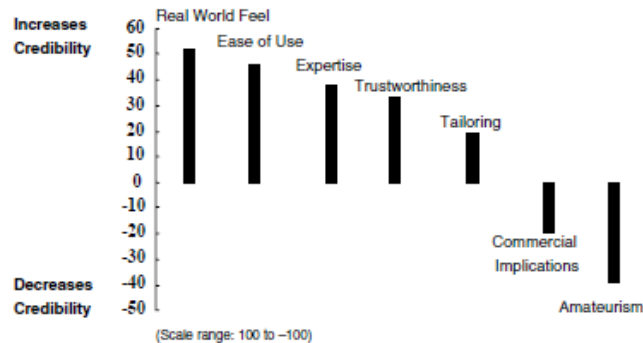
**Table 8: The Amateurism Scale** (Cronbach's alpha = 0.64)

Items in the <b>AMATEURISM</b> scale	Mean
The site has been updated since your last visit.	1.55
The site offers information in more than one language.	1.04
The site is small (e.g. less than 5 pages).	-0.28
The site is hosted by a third party (e.g. AOL, Geocities).	-0.44
The site's domain name does not match the company's name.	-1.06
The site has a typographical error.	-1.28
The site is sometimes unexpectedly unavailable.	-1.28
The site has a link that doesn't work.	-1.45
The site links to a site you think is not credible.	-1.53
The site is rarely updated with new content.	-1.67



## Trust

### How the Factors Impact Web Credibility



**Figure 2: The seven scales and their effects on perceived credibility.**

Also..



## P8 – Finish Project & Do User Testing – due 12/2

- Complete enough of your implementation to support user testing
  - Should be fully functional unless you have a compelling rationale
- Complete user testing
  - Exactly as you did in Paper Prototyping, but with your software prototype
  - 3+ users, 3+ tasks
  - Briefing
  - Can demo system on additional task first
- Redesign
  - Sort severity problems by severity
  - Address as many as possible
- Document everything
- Post
  - Final software prototype
  - Report



## To do

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- Read
  - Design for Mobile (HCI Encyclopedia chapter).
- Start on P6