



# Human-Computer Interaction IS4300

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# Designing for the Web

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## 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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- Dix Chapter
- Stone Chapter
- J. Lazar et al, HCI Handbook
- Testing tools & surveys
- Nielsen's 'Top 10 Mistakes'
- Credibility in Web sites



ALAN DIX, JANET FINLAY,  
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**HUMAN-COMPUTER  
INTERACTION**  
THIRD EDITION

## 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



## 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



## design implications

- 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

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# WAP - web on the phone still in use!

- very small screen
  - scrolling painful ⇒ small 'pages'
  - GSM connection slow ⇒ big chunks
- WML (wireless mark-up language)
  - content delivered in 'stacks' of 'cards'
  - cards are the 'pages' the user views
  - but navigation within the stack fast

server sends whole stack using WAP protocol

navigation within stack fast

server stores 'stacks' of cards

errata: book says stacks of 'notes', cards is correct

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# Website Design

MORGAN KAUFMANN SERIES IN INTERACTIVE TECHNOLOGIES

**User Interface Design and Evaluation**

Debbie Stone  
 Caroline Jarrett  
 Mark Woodroffe  
 Shalley Minocha

MK



## Design Principles for Web Sites

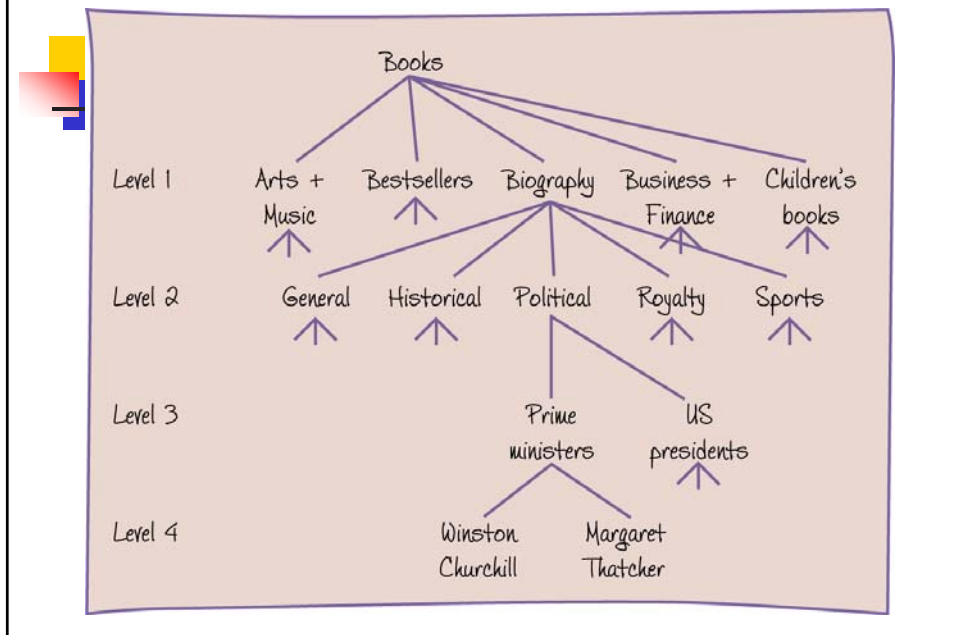
- Homerun (Nielsen 2000)
  - High-Quality Content
  - Often Updated
  - Minimal Download Time
  - Ease of Use
  - Relevant to User's Needs
  - Unique to the Online Medium
  - Net-centric Corporate Culture



## Designing Web Site Structure

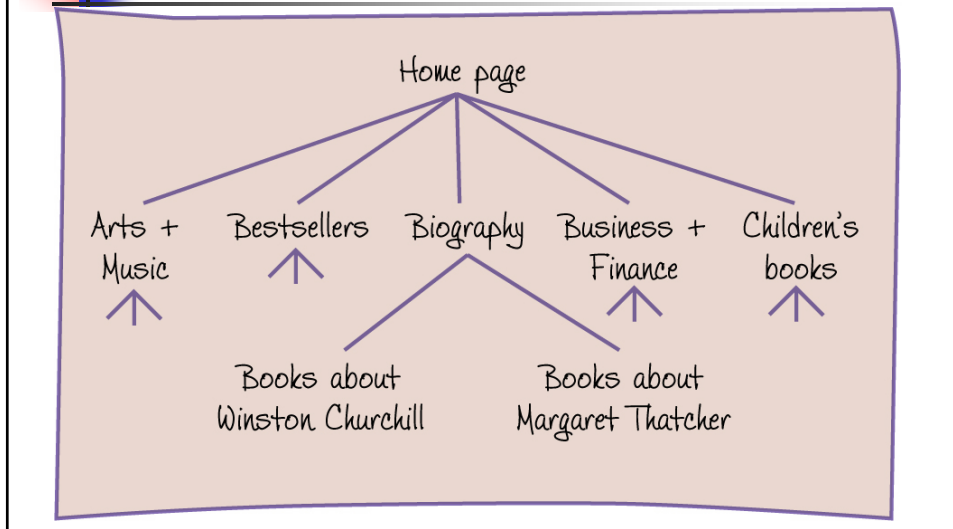
- Start with Information Structure
- How deep & wide? (wider is better)
- Long vs. short pages? (<2 print pages ok)
- Structure of site should support tasks.
  - Generally follows information structure
  - Can use card sort to determine organization
  - Primary tasks for information sites:
    - Search for something specific
    - Browse

## Sample information structure



## Web structure

Broad & shallow minimizes page loads





# Designing Web Sites

- Helping the 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 like kmart, mycarfer, CRAFTSMAN, Kenmore, PartsDirect, LANDS'END, Sears Home Services, and Sears Outlet. Below these is a search bar with the text 'Enter keyword or item number' and a 'Search' button. A navigation bar includes 'Departments', 'LocalAd', 'Deals Center', 'Parts & Services', 'Gifts', 'Gift Cards', and 'Gift Registry'. A promotional banner reads 'get it today with FREE store pick up'. The breadcrumb path is highlighted with a red circle: 'Health & Wellness > Bathroom Safety > Bath Safety Accessories'. The main product listing is for 'Jobar Jobar Plaid Dust Mop Slippers', priced at \$8.10. It includes a description, marketplace information, shipping details, and availability status.

Health & Wellness > Bathroom Safety > Bath Safety Accessories

**Jobar Jobar Plaid Dust Mop Slippers**  
SearsItem# SPM6072346308 | Model# JOBAR-mopslipper  
0 Reviews | Write a review

**\$8.10**

Marketplace Item | learn more  
Sold and shipped by Abco Deals  
Also sold by 10 other seller starting from \$13.57

Quantity | 1

Ship  
Starts at \$6.25

In Stock from Abco Deals

Description	Mor
Also Available From These Sellers:	
Discount-items	\$13.57 ship \$12.0

Availability & Rewards  
Earn 81 SHOP YOUR WAY REWARDS®  
Special pricing for Hawaii, Alaska and F



## Designing Web Sites

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- Helping the Users Navigate around the Site
  - Structural navigation – other pages within the same site
  - Associative links – same page links
  - “See Also” links – to other web sites
- Navigation Aids
  - Site map
  - Breadcrumbs
  - Maps (geographical or other visual index)



## 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



## Design Issues for Web Pages

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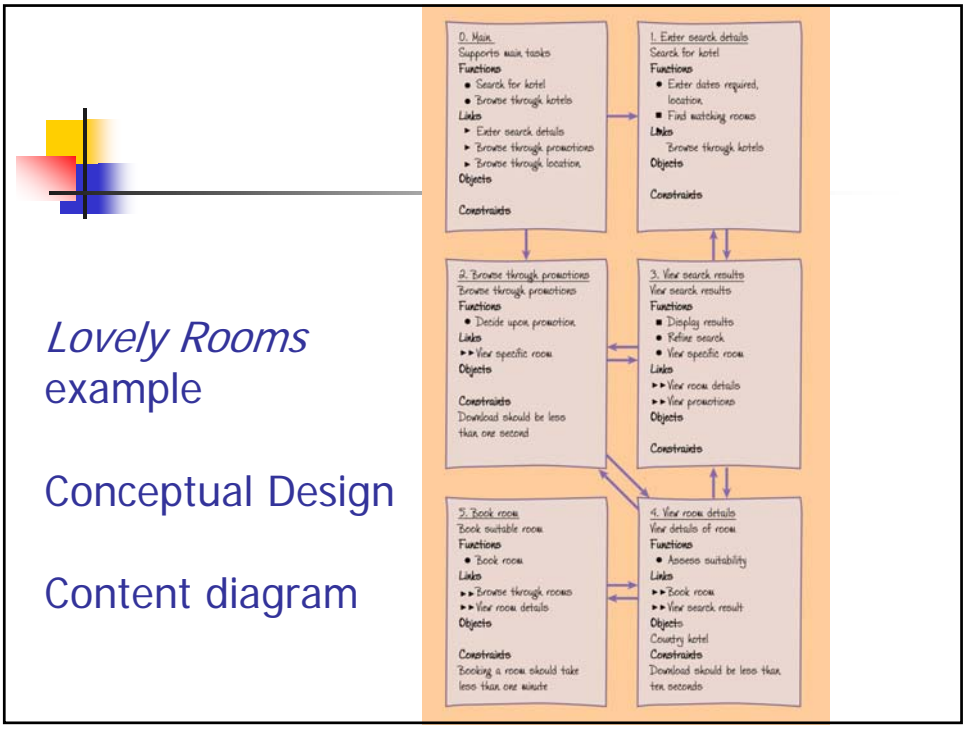
- Widgets on Web Pages
- Scrolling
  - Info “above the fold” important
  - Users now used to scrolling web pages *vertically* (but not horizontally)
- Designing for Different Screens and Platforms
  - *Image safe* area at upper-left; assume most users will see
- Using the Screen Area Effectively
  - Content should fill at least 50% of screen
- Pay attention to download time
  - Nielsen: page download <1s is ideal, 10s max
- Using style sheets



## Writing the Content of Web Pages

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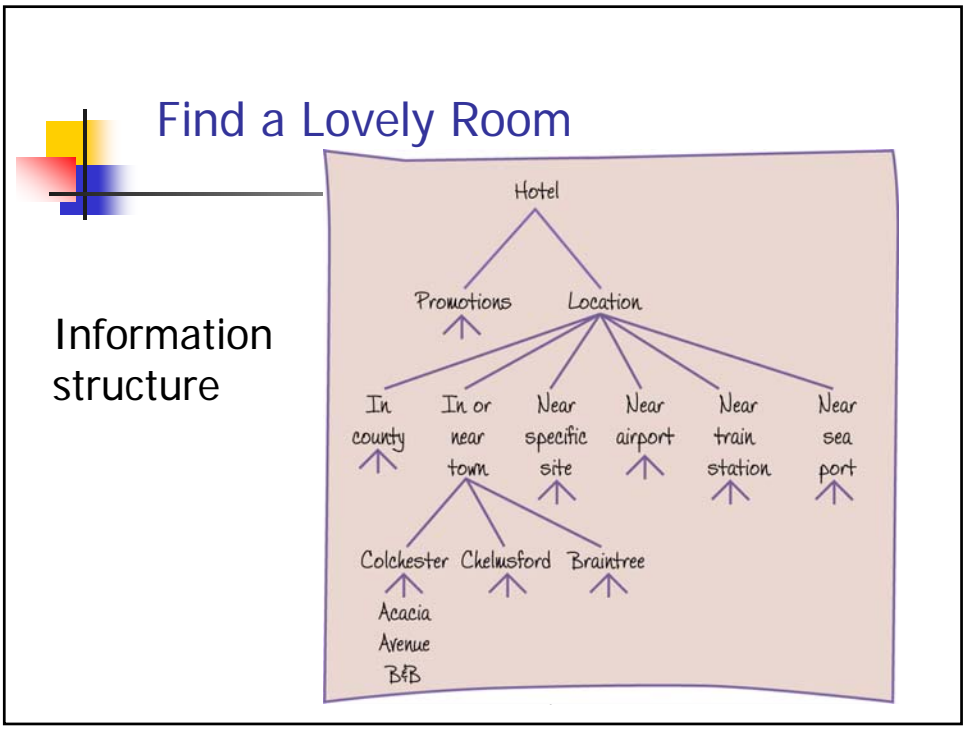
- Keep Text to a Minimum
  - Less than half the text of print equivalent
- Help Users to Scan – use headings and subheadings, bulleted and numbered lists, highlight
- Divide Long Blocks of Text into Separate Sections



*Lovely Rooms*  
example

Conceptual Design

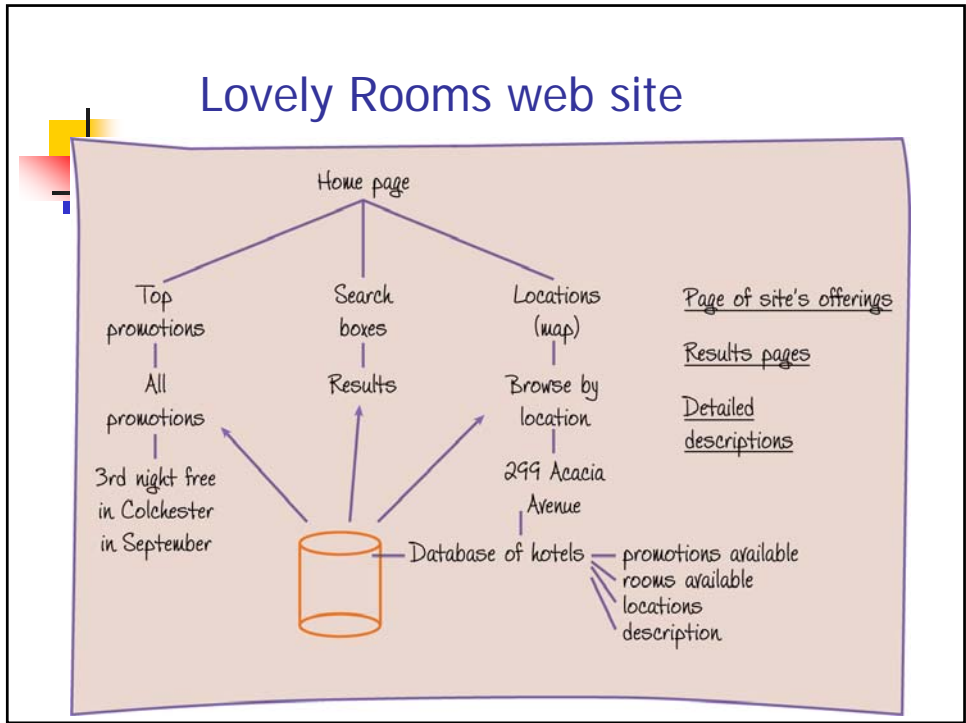
Content diagram



Information structure

## Find a Lovely Room


# Lovely Rooms web site



## Lovely Rooms


Traditional Small Hotels

- [Essex](#)
- [Suffolk](#)
- [Norfolk](#)
- [Cambridgeshire](#)
- [Bedfordshire](#)
- [Hertfordshire](#)






Room finder

Acacia Avenue  
Colchester, Essex £ 59.99 per night



Acacia Avenue is a charming hotel in a quiet area in the outskirts of Colchester. Good access to public transport. Backing onto the river.

- Location (Map)
- Accommodation
- Gardens
- Nearby attractions

◀ Previous hotel    Next hotel ▶



## Jonathan Lazar Handbook of HCI

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



## Navigation design

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- Important to provide navigation
  - Let users know where they are and where they can go
  - Users may not enter from home page
- Infeasible to link from every page to every other, so must organize site into sections
  - “sectional navigation” – section links in sidebar (eg)
- “audience-splitting”
  - Parts of site optimized to different user groups
- site maps
  - Reduces user disorientation



## Navigation

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- breadcrumbs
  - Hierarchical info about current location in site
- Text navigation (in addition to images) important
  - For users with images turned off
  - For blind users
  - For users to navigate before all images download
- Navigation widgets should be at top or left of page
  - First places users look at
- Methods should be constant throughout entire site



## Tips – things to think about

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- Download times
  - 10 sec max (Nielsen)
- Accessibility
- Internationalization
  
- Animation – can be distracting
- Mouseovers
  - Nielsen: most have no value to users

## Development Methodology for Web

- First, determine overall mission and users
- User involvement
  - Requirements gathering
  - Usability testing
  - Best: participatory design
- But, typically very short development times

## Exercise

- Design the site structure and home page for the eyeglass frame sales web site

- Sketch solution







## Usability testing

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- Easier to do remotely, since web site can be accessed over net
  - Many Tools
    - Morae (\$1500), UserVue (\$150/mo), Usertesting.com (\$39/user), Intuition HQ, Usabilla, Loop11, etc., etc.
- Crowdsourced usability testing
  - Mechanical Turk, FeedbackArmy, FiveSecondTest, etc
- <http://www.usefulusability.com/24-usability-testing-tools/>



## 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 heuristics & severity scale to evaluate web sites
- Both found it was as applicable as for GUIs

## “Automatic” Usability Testing Tools (checklists)

- NIST WEBSAT
  - 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, plainframe.com, navflow.com)
- Load speed (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"/>

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- 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



## Trust in websites

- Fogg, CHI 2001, What Makes Web Sites Credible?
- 1400 people evaluated 51 websites
- *credibility* can be defined as *believability*
- When is this important?



## Positive influence

**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

**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

**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

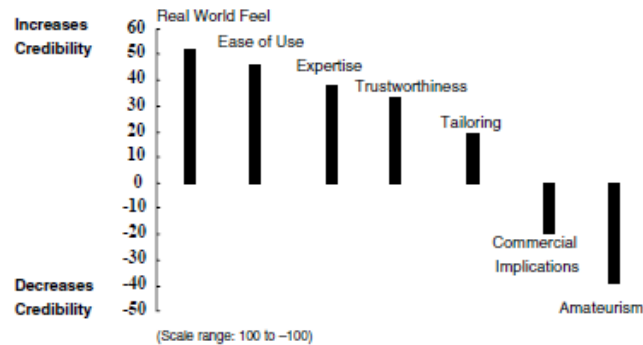


Figure 2: The seven scales and their effects on perceived credibility.

## 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
  - Motivation for Usability (Nielsen Ch 1).
  - Case study (Gould).
- Work on P8, P9
  
- We will review for final