

Class 2, November 9th 1999

Tuesday, November 9th 1999

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Human-Computer Interface Design: Novel Interaction Techniques

First trimester, second module, 1999

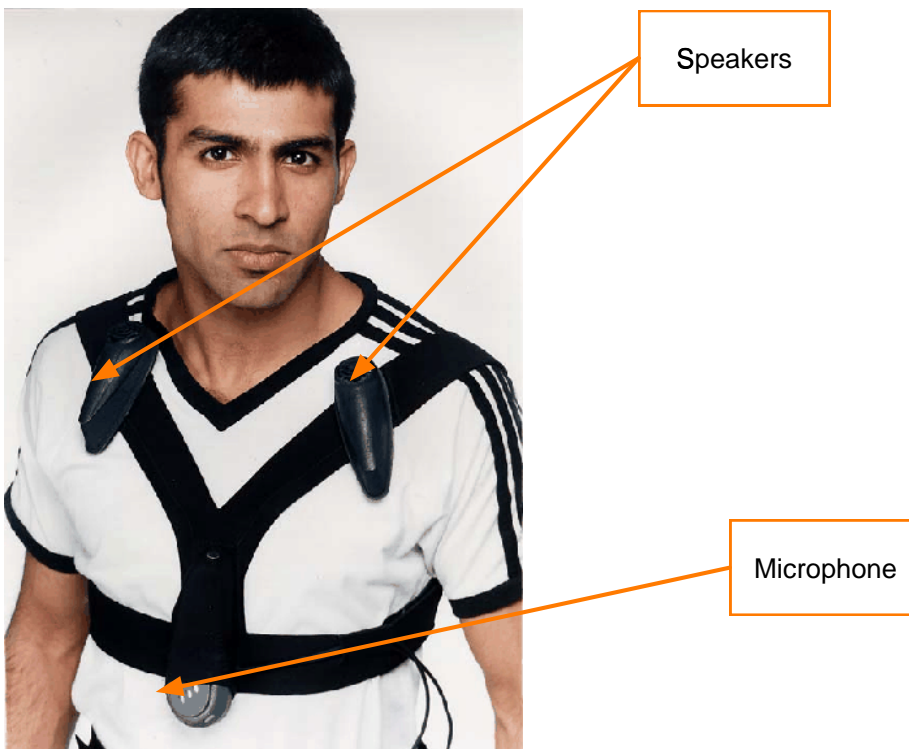
1. Plans for Design Briefings
2. User-Adaptive Systems: An Introduction (continued)
(Slides 51–69)
3. Nomadic Radio: Context-Aware Notification
4. Textual IBIS Notation for Design Rationale
5. A Socially Acceptable Handset
6. Ten Leading Web Design Errors
7. Making History Visible in Web Pages
8. Visualizing the Structure of a Web Site
9. Work for the Coming Week

Course Web page: <http://www.cs.uni-sb.de/users/jameson/hcidn/>

Nomadic Radio

Wearing the Nomadic Radio

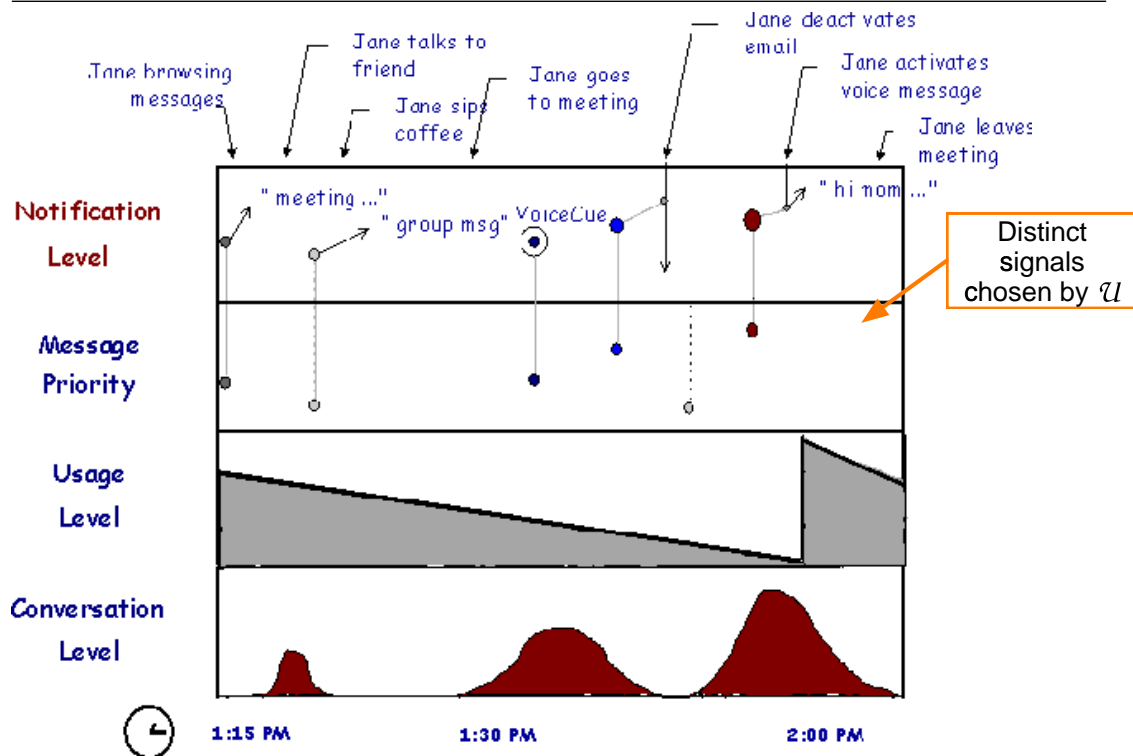
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Nitin Sawhney and Chris Schmandt (1999). Nomadic Radio: Scalable and Contextual Notification for Wearable Audio Messaging. *CHI99*, 96-103.

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Notification Scenario



Nomadic Radio: Issues (1)

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- ? How can \mathcal{S} notify \mathcal{U} of incoming messages?
- ? How can notification be made differentiated?
- ? How can notification take into account \mathcal{U} 's current situation?
- ? How can \mathcal{S} learn from previous interactions with \mathcal{U} ?
- ? How can notifications be coordinated?
- ? How can distracting interruptions be minimized?

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Nomadic Radio: Issues (2)

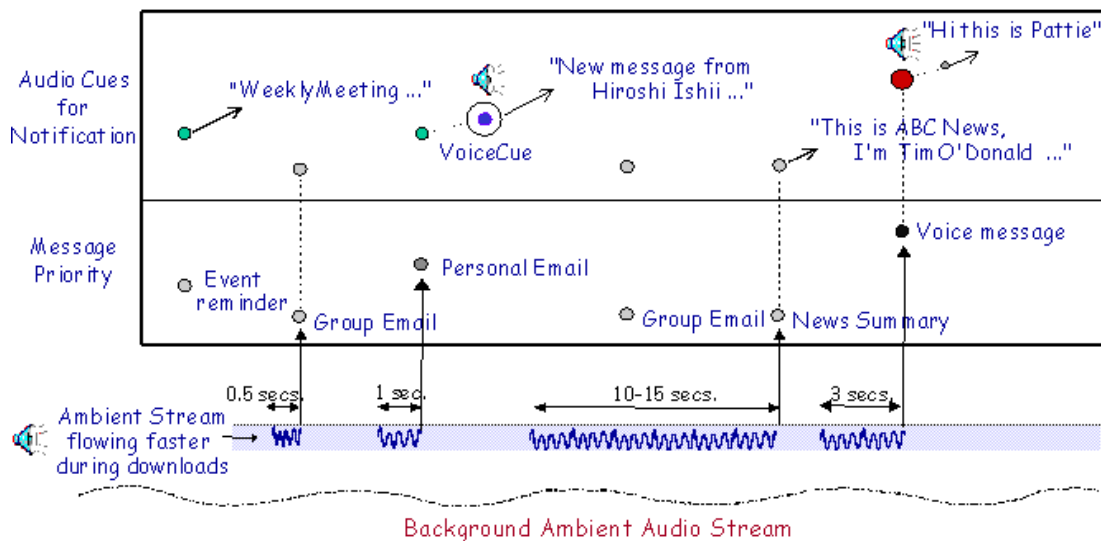
- ? How can auditory feedback be effective?
 - ? How can an incoming message be summarized?
 - # Voice cues
 - # First few words
 - # Speeding up of playback

- ? How can disruption be minimized?
 - # Increase latency for less important messages
 - # ...

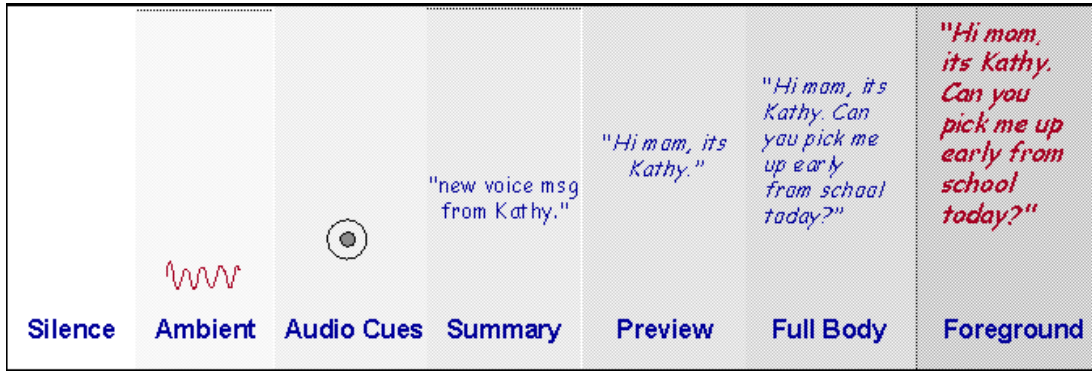
Overview of Auditory Output

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- Feedback
- Priority
- Identification
- Awareness



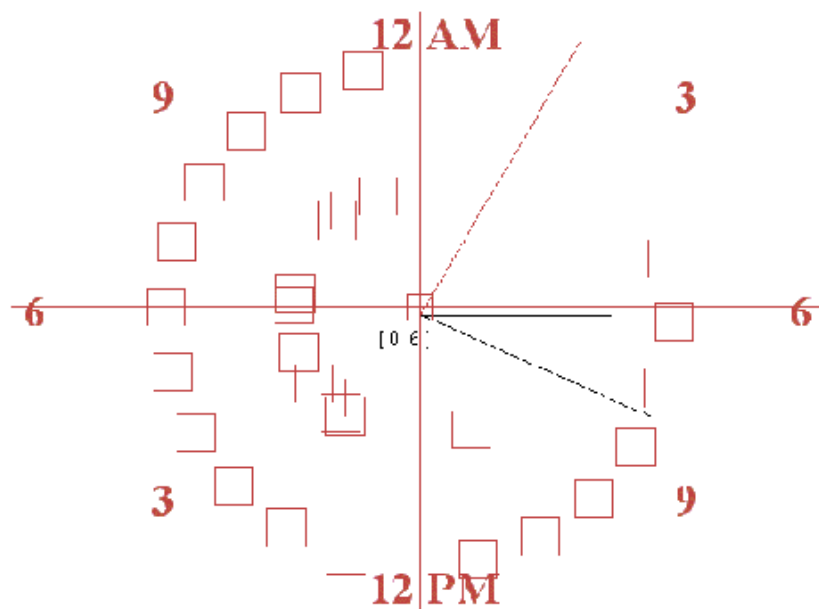
Scaling of Incoming Messages



Progressive Scaling of Incoming Messages

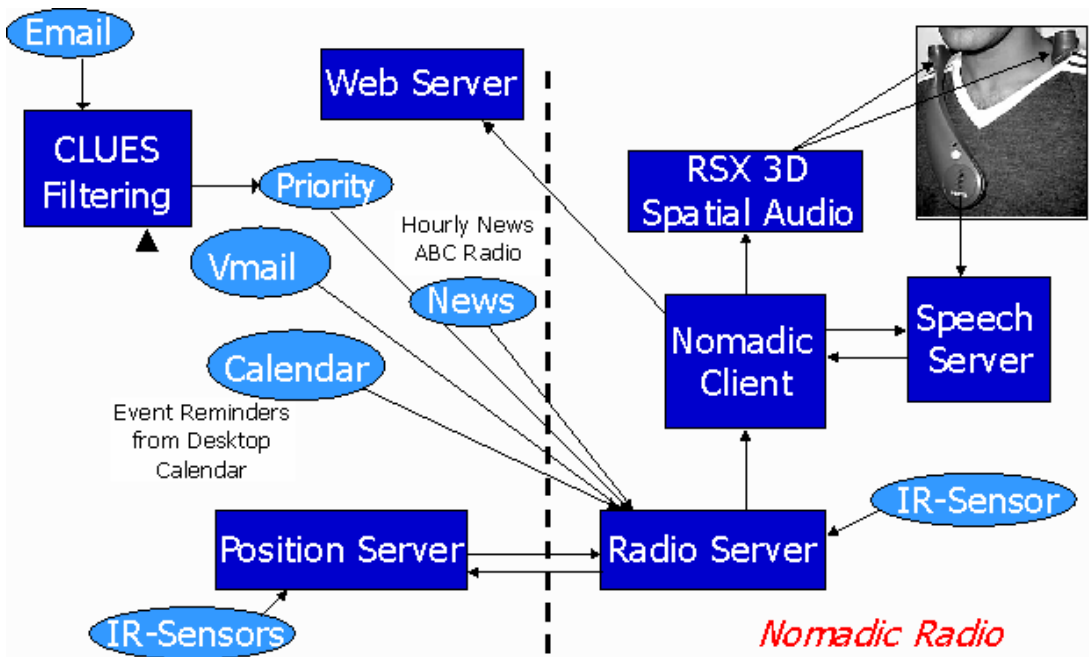
The conspicuousness of a message depends on \mathcal{U} 's assumed interruptability

Spatial Arrangement of Sounds

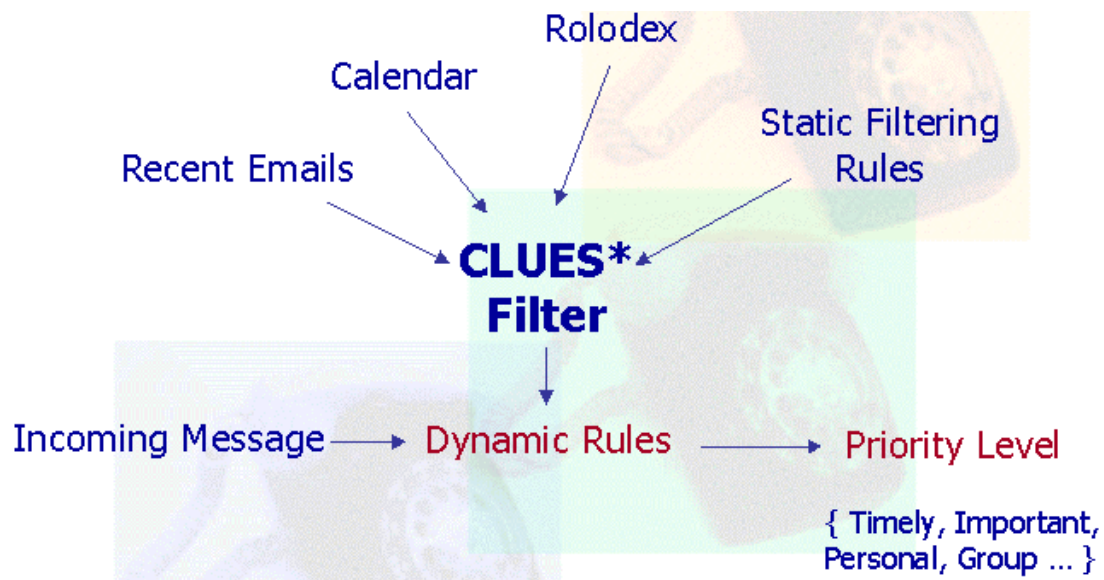


The direction from which a sound seems to come reflects its priority

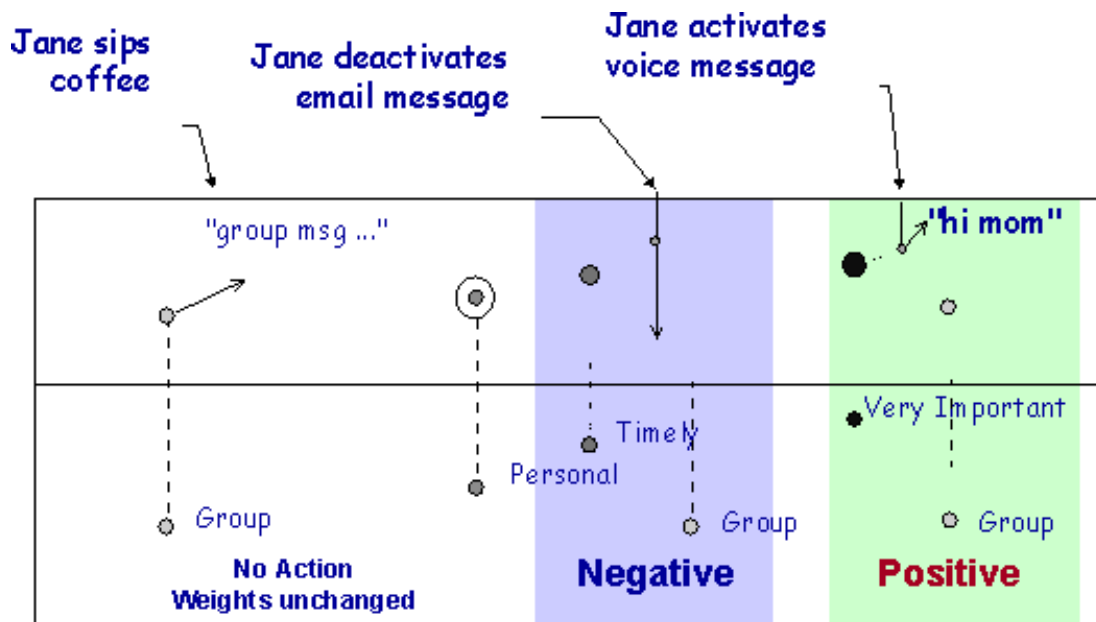
Architecture



Determinants of Message Priority



Dynamic Adaptation



Adaptation is based on \mathcal{U} 's actions in response to messages

Evaluation Results

Nature of study

One user, 2 days

Feedback from \mathcal{U}

- Auditory feedback was distracting to others
But it did cue them to wait
- Indication of priority through distinct signals wasn't found very useful
Suggestion: Integrate priority information into continuous ambient noise
- Voice Cues were appreciated
- The overall auditory scheme was found too complex

Textual IBIS Notation

Textual IBIS: Basic Schema

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- ? Question
- # Possible Answer 1
 - ...
 - # Possible Answer 2
 - + Argument that supports Possible Answer 2
 - > Reference to literature in which this argument is presented
 - Argument that speaks against Possible Answer 2
 - Argument that speaks against the above argument
 - ? More specific question that is raised by this argument
 - # Possible answer to this specific question
 - ...
 - *# Possible Answer 3 ["*" = "ultimately accepted as best answer"]
 - ...
 - ? Another question
 - ...

Textual IBIS: Usage Hints

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Degrees of Freedom

The various elements can be combined freely
Creative extensions are permitted

Minimal requirements for a convincing argument

- For each question, at least two possible answers
- For each possible answer, at least one argument

How to avoid redundancy

An argument *for* Possible Answer 1 is often an argument *against* Possible Answer 2

Such an argument should normally be mentioned only once – at the place at which it can be formulated most naturally

Top Ten Mistakes in Web Design

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1. Using Frames (1)

1996

Splitting a page into frames is very confusing for users since frames break the fundamental user model of the web page. All of a sudden, you cannot bookmark the current page and return to it (the bookmark points to another version of the frameset), URLs stop working, and printouts become difficult. Even worse, the predictability of user actions goes out the door: who knows what information will appear where when you click on a link?

These widely read guidelines were written by Jacob Nielsen in 1996 and updated in 1999. See <http://www.useit.com/alertbox/9605.html> (1996) and [990502.html](http://www.useit.com/alertbox/990502.html) (1999).

1. Using Frames (2)

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1999 (Medium)

Frames are no longer the disaster they were in 1995 and early 1996 due to some advances in browser technology: Netscape fixed the Back button with version 3, and since virtually nobody uses version 1 and 2 any more, this means that users can now navigate through frames with fewer problems. Version 4 reduced the problems printing frames (though users still often get a different printout than they expected), and Internet Explorer 5 has finally regained the ability to bookmark pages despite the use of frames. Frames still prevent users from emailing a recommended URL to other users and they also make the page more clumsy to interact with.

2. Bleeding-Edge Technology (1)

Gratuitous Use of Bleeding-Edge Technology:

1996

Don't try to attract users to your site by bragging about use of the latest web technology. You may attract a few nerds, but mainstream users will care more about useful content and your ability to offer good customer service. Using the latest and greatest before it is even out of beta is a sure way to discourage users: if their system crashes while visiting your site, you can bet that many of them will not be back. Unless you are in the business of selling Internet products or services, it is better to wait until some experience has been gained with respect to the appropriate ways of using new techniques. When desktop publishing was young, people put twenty fonts in their documents: let's avoid similar design bloat on the Web.

2. Bleeding-Edge Technology (2)

1996 (continued)

As an example: Use VRML if you actually have information that maps naturally onto a three-dimensional space (e.g., architectural design, shoot-them-up games, surgery planning). Don't use VRML if your data is N-dimensional since it is usually better to produce 2-dimensional overviews that fit with the actual display and input hardware available to the user.

1999 (Very severe)

If anything, users have less patience for bleeding-edge technology these days as the Web gets dominated by later adopters and the upgrade speeds for new browsers and plug-ins slow down. Users who encounter as much as a single JavaScript error usually leave a site immediately. It's just not worth the time to figure out how to make something work when there are 5 million other sites to go to.

3. Scrolling Text, etc.

Scrolling Text, Marquees, and Constantly Running Animations:

1996

Never include page elements that move incessantly. Moving images have an overpowering effect on the human peripheral vision. A web page should not emulate Times Square in New York City in its constant attack on the human senses: give your user some peace and quiet to actually read the text!

Of course, <BLINK> is simply evil. Enough said.

1999 (Very severe)

It is as hard as ever to read scrolling text, but aggressive use of distracting animation now causes even more problems than in 1996: users have started equating such designs with advertising which they routinely ignore. These days, it is extremely important for any content and navigation elements to look very different than prevailing advertising designs since users tune out anything that they don't think will be relevant to their task.

4. Complex URLs

1996

Even though machine-level addressing like the URL should never have been exposed in the user interface, it is there and we have found that users actually try to decode the URLs of pages to infer the structure of web sites. Users do this because of the horrifying lack of support for navigation and sense of location in current web browsers. Thus, a URL should contain human-readable directory and file names that reflect the nature of the information space.

Also, users sometimes need to type in a URL, so try to minimize the risk of typos by using short names with all lower-case characters and no special characters (many people don't know how to type a ~).

1999 (Severe)

Users pay less attention to URLs these days than they did in the early days of the Web. Since most sites now have navigation support, users are also relying less on the URL to tell them about their location on the site. But long URLs still cause problems when users email page recommendations to each other.

5. Orphan Pages

1996

Make sure that all pages include a clear indication of what web site they belong to since users may access pages directly without coming in through your home page. For the same reason, every page should have a link up to your home page as well as some indication of where they fit within the structure of your information space.

1999 (Medium)

Less likely to make users stuck since most people have learned the trick to get to the home page of a site by "hacking" the end off the URL. Still a disaster for novice users; still annoying for experienced users.

6. Long Scrolling Pages

1996

Only 10% of users scroll beyond the information that is visible on the screen when a page comes up. All critical content and navigation options should be on the top part of the page. Note added December 1997: More recent studies show that users are more willing to scroll now than they were in the early years of the Web. I still recommend minimizing scrolling on navigation pages, but it is no longer an absolute ban.

1999 (Smaller problem)

90% of users used not to scroll navigation pages but simply pick from the visible options. This has changed since most Web users now know that pages scroll and that important links sometimes are not visible "above the fold." Even so, the visible options still dominate and users sometimes overlook alternatives lower down the page. This is particularly bad if the visible part of the page seems to clearly communicate a certain purpose or a certain best approach: users may then happily conclude that they know what to do and not bother spending time on the rest of the page.

7. Lack of Navigation Support

1996

Don't assume that users know as much about your site as you do. They always have difficulty finding information, so they need support in the form of a strong sense of structure and place. Start your design with a good understanding of the structure of the information space and communicate this structure explicitly to the user. Provide a site map and let users know where they are and where they can go. Also, you will need a good search feature since even the best navigation support will never be enough.

1999 (Severe)

Rarely seen, but a problem when it occurs. People are now getting used to certain canonical navigation elements such as a site logo in the upper left corner (linked to the home page) or a clear indication of what part of the site the current page belongs to (linked to the main page for that section). So if these elements are missing, users feel lost.

8. Non-Standard Link Colors

1996

Links to pages that have not been seen by the user are blue; links to previously seen pages are purple or red. Don't mess with these colors since the ability to understand what links have been followed is one of the few navigational aides that is standard in most web browsers. Consistency is key to teaching users what the link colors mean.

1999 (Severe)

Continues to be a problem since users rely on the link colors to understand what parts of the site they have visited. I often see users bounce repeatedly among a small set of pages, not knowing that they are going back to the same page again and again. (Also, because non-standard link colors are unpleasantly frequent, users are now getting confused by any underlining of text that is not a link.)

9. Outdated Information

1996

Budget to hire a web gardener as part of your team. You need somebody to root out the weeds and replant the flowers as the website changes but most people would rather spend their time creating new content than on maintenance. In practice, maintenance is a cheap way of enhancing the content on your website since many old pages keep their relevance and should be linked into the new pages. Of course, some pages are better off being removed completely from the server after their expiration date.

1999 (Very severe)

Worse now since so many other sites on the Web are continuously updated. Also, with the growth in e-commerce, trust is getting increasingly important, and outdated content is a sure way to lose credibility. (Note that archival information and information about old products are plusses and very different from outdated information.)

10. Overly Long Download Times

1996

Traditional human factors guidelines indicate 10 seconds as the maximum response time before users lose interest. On the web, users have been trained to endure so much suffering that it may be acceptable to increase this limit to 15 seconds for a few pages.

Even websites with high-end users need to consider download times: we have found that many of our customers access Sun's website from home computers in the evening because they are too busy to surf the web during working hours. Bandwidth is getting worse, not better, as the Internet adds users faster than the infrastructure can keep up.

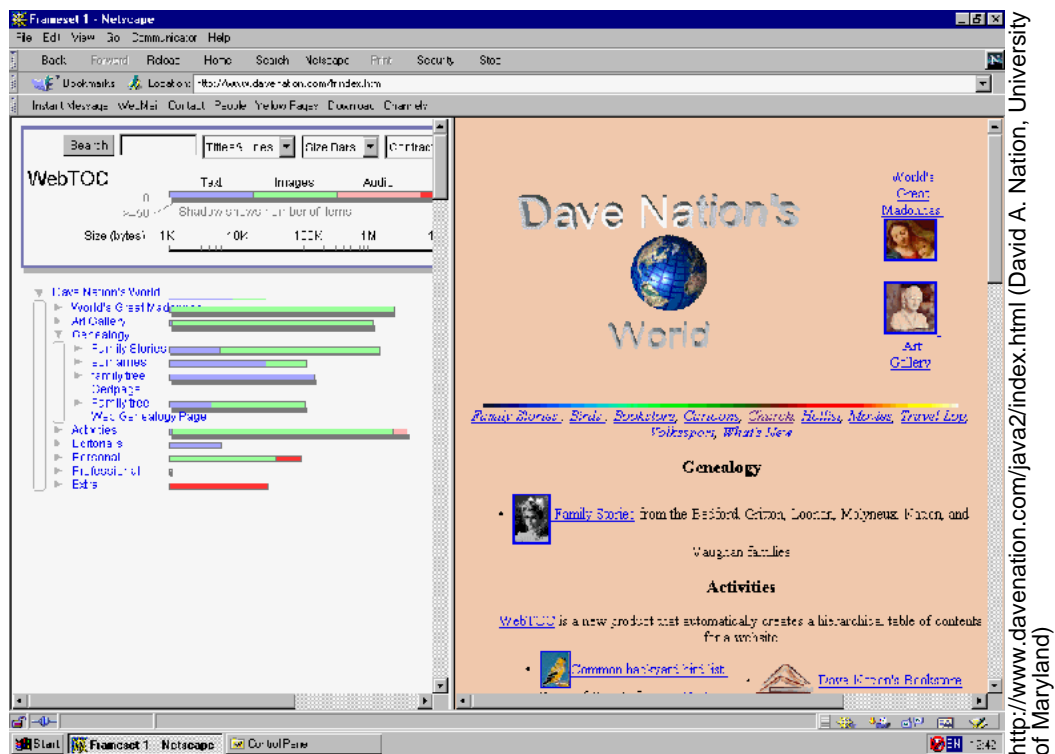
1999 (Very severe)

Contrary to many Internet pundits' pronouncements, the bandwidth problem has not been solved during the last three years; nor will it be solved during the next three years. Not until 2003 will high-end users have sufficient bandwidth for acceptable Web response times. Low-end users have to wait until about 2008.

WebToc: Visualizing Web Sites

WebToc Screen Shot

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http://www.davenation.com/java2/index.html (David A. Nation, University of Maryland)

Questions About WebToc Video

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1. What decisions that Web surfers need to make are facilitated by WebToc?
2. What general Web design issues are addressed by WebToc?
3. Could similar functions also be served by more conventional Web design techniques? Work for Class 3

Work for Class 3

For those who attended Class 1

Locate and read at least two new articles that are relevant to your design briefing

Expand the design briefing in accordance with the comments given during class

For those who did not attend Class 1

Do the work assigned for Class 1

But try to get a bit farther on the design briefing than the first two students did, benefiting from their experience and feedback