Overview

- What is usability?
- Why is usability evaluation important?
- What are the standard usability evaluation methods?
- What decisions have to be made to use these evaluation methods?
- Case study
Defining usability

- Measurable characteristic
  - Ease of learning, use, and remembering
  - Effectiveness
  - Satisfaction

- Practice
  - Learn about your users: Who are they and what are their goals?
  - Observe users interacting with the system
Why usability is important

- Good user experience depends on good usability
- Financial implications
  - Repeat users
  - Cost of redesigning late in development
  - Support/Help desk use
- “If the user can’t use it, it doesn’t work!”
  - Susan Dray
Usability Methods

- Heuristic Evaluation
- Online Survey
- Focus Groups
- Card-Sorting
- Link-Naming
- Contextual Inquiry
- Scenario-Based Think-Aloud Tests

**Heuristic evaluation:** Compare the site to established guidelines, e.g. consistency, clarity, simplicity. Doesn’t involve end user, but most methods do.

**Online survey and focus groups:** Learn how people currently work by asking them questions; Ask what they would like to see changed and what they like. Don’t plan to talk much about these methods here, since this course covers user needs (interviews) and user satisfaction (surveys) in other sessions.

**Card-sorting:** To structure and group items. Ask participants to group link names or page descriptions.

**Link-naming:** Terminology - ask people what they expect. Then, ask what they would call the link to that page.

**Contextual Inquiry:** Watch real users doing what they’re doing. (AKA field observation or naturalistic observation)

**Scenario-based think-aloud tests:** Watch actual users using site, but in controlled setting, with specified tasks.
Iterative testing: mock-up site, test, re-design site, test, re-design site, etc.

Institutional Review Board approval needed for any “research” with “human subjects”. Not many risks, but still need a good consent form.

Recruitment: Posters, list mail, announcements in class. Link on web site.

Timing: Hold while classes are in session, not near exams.

Incentives: $10-$15 gift certificates for library coffee shop or online bookstore - enough to recruit students, but not particularly effective for recruiting faculty. If sessions are short, offer a chance at a gift certificate or another prize in a drawing.

Demographic information: pre- or post-test survey to collect information about how frequently they use the web and the resource we’re testing, what is their area of study, what is their home library.

How many participants are needed? “It depends”

Discount approach: because trying to make usability testing a realistic goal for libraries, don’t invest in expensive equipment. But, don’t buy into Nielsen’s “5 users is enough” school of thought. (We have too many diverse user groups for most of our tests)
Heuristic Evaluation

- Which heuristics to use?
- Which pages to evaluate?
- Who will evaluate?
- How will results be collected and organized?

Which heuristics: Jakob Nielsen’s 10 usability heuristics and Keith Instone’s adaptation of them for the Web. A good place to start, but these are rather general. Usability.gov is more specific. (Will provide references two slides from now.)

Which pages: How many levels of the site will be evaluated? Will you just evaluate one section of the site? If so, what are the implications for other sections if you find out that the global navigation bar violates a usability heuristic?

Who will evaluate: Should have several people learn about usability heuristics and conduct heuristic evaluations individually, then compare results. Good for designer to learn about usability and to employ usability principles in design, but probably will have a hard time evaluating own designs.

How to collect and organize results: Individual looks at a page, checks off which heuristics are violated, and writes a description of the problem and what could be done to fix it. Agree on a reporting format - by page or by heuristic. Prioritize problems by “severity” - how many times does this problem occur across the site, how problematic would it be for users each time it is encountered? Try to fix “severe” problems first.
Sample Heuristics

- Be Consistent
- Be Concise
- Minimize Memory Load

Consistent: Page titles, page headings, and link names. Use of terminology. Locations of features on the page.

Concise: Short sentences are better than long sentences. Short paragraphs are better than long paragraphs. “Chunk” information but also allow user to choose to see a lot of information at the same time (if they would prefer to scroll rather than hit ‘next,’ or if they would prefer to print out a whole article/chapter instead of one page at a time). Being concise is especially important for instructions. Many people do not read paragraphs of instructions - bulleted points or numbered steps for a process are better.

Minimize memory load: Make options visible where user needs to make a choice.
Heuristics Resources

- Instone, Keith. “Site Usability Heuristics for the Web.” [user-experience.org/uefiles/writings/heuristics.html](http://user-experience.org/uefiles/writings/heuristics.html)
Card-Sorting

- Where, how long?
- Which links to include?
- Require naming of groups?
- How to collect the data?
- How to do a cluster analysis?

Where, how long: Need a big table unless collecting data online. Length of sessions varies greatly among participants, and according to how many links are included.

Which links: Number of links has great effect on how long the sessions take. Generally, all links on 1 page that you want to reorganize is a good set of links for one round of card-sorting.

Require naming? Outside of the cluster analysis data, but an interesting addition. Extra clue to why participant grouped those links together.

How to collect data: Physical cards - ask participants to arrange in piles, secure the piles (rubber bands vs. paper clips). Write group names on sticky notes. Then have to enter the data. Online sorting - participants move link names to different ‘bins’ on screen. Data entry is automatic.

How to do cluster analysis: Do the math by hand or use a card-sorting tool - which one? (see next slide)
Card-Sorting Tools

- **EZSort** (USort and EZCalc from IBM)
- **WebCAT** (NIST Web Metrics Testbed)
- **WebSort** (tool can be licensed from [www.websort.net](http://www.websort.net))
- **uzCardSort** (Mozilla-based open source tool)

EZSort: we had trouble getting this to run.

We’ve had the most success with WebCAT, but even that has taken some wrangling, and we’ve found bugs.

WebSort seems nifty, but it’s expensive.

uzCardSort for Mozilla browser.
This tree structure is the result of a cluster analysis performed on a demo card-sort of menu items. The tree structure and the colors show that many participants put apple pie and brownie sundae in the same group, more than put chef salad or french fries with apple pie or brownie sundae. However, these four were put in the same group more often than any of these four items were put in the same group as a grilled cheese sandwich. Items that were put in the same group most frequently are the same color, and they are "closer" in the tree structure. (A close look reveals a WebCAT bug: hotdog and hamburger are close in the tree structure and therefore should be the same color. Veggie burrito is not very close to hotdog and hamburger, and therefore should not be the same color.)
Where, how long: Don’t need big space, but need access to the site.

Which links: Affects how long the session will be. Can be the same as card-sorting (all one page), or can focus on “problem links” from across the site.

How to collect data: Write down notes.

Random order of presentation of links - ideal but hard to do.

On paper vs. on screen (links with and without context of rest of page): we haven’t seen a difference so far.

Two phases: (1) What would you expect if you clicked on this link? (2) Was this what you expected, and what would you call the link to this page?
Contextual Inquiry

- When, where, how long?
- What data to collect and how?

When, where, how long: Whenever it’s convenient for the participant. Whenever they’ll be using your site. In their office, or in the computer lab. Plan on 30-60 minutes of observation plus some time for follow-up questions.

What data to collect and how: Take good notes on what they’re doing. Consider audio-taping comments.
Scenario-Based Think-Aloud Tests

- Where, how long?
- How to design the tasks?
- What data to collect and how?

Where, how long: Quiet room with access to site & space for facilitator and note-taker/observer. Plan on 60 to 90 minutes.

How to design the tasks: What are users known to have problems doing? (Consult help desk.) What tasks do you want people to be able to do? Scenario and request to do something in that situation. Avoid naming the key links they’ll need to follow in the task.

What data to collect and how:
- pen & paper/laptop note-taking
- audiotapes for comments (Some people do more thinking aloud than others)
- videotapes for facial expressions
- screen-capture for mouse movements/link selection/search terms
- eye-tracking to see where participants look

- time - how long did it take participants to complete each task?
- task success - how many participants successfully completed each task? (Need to define what constitutes task success!)
Case Study: ARTstor

- www.artstor.org
- 300,000 images of art, architecture, archaeology in charter collection
- Mission: “To enable the use of digital technology to enhance scholarship, teaching and learning in the arts and associated fields.”
- Core audience: scholars, students, educators, libraries, museums
Scenario-based, think-aloud testing of ARTstor

- 30 Participants:
  - Faculty, graduate students, undergraduate students, museum staff from six institutions
  - Art history and other fields of study
- Scenarios to evaluate usability of search, browse, and user-defined collection functions

ARTstor is growing all the time as collections are added; 150,000 images at the time of the testing and goal is 500,000 in 2005.

An example of the use of ARTstor is for faculty to be able to project images using ARTstor during class, and give students access to those images throughout the semester.
Logistics

- Multiple locations
- Various institutional review board processes
- Arrangement of testing rooms
- Participant recruitment and incentives
- Instructions
- Recording test sessions

Locations: Johns Hopkins University, James Madison University, Princeton University, Williams College, JHU - local museum staff

IRB: filed with each institutional IRB; each institution had a different process, varying levels of work and approval required.

Rooms: PC with Internet access and access to ARTstor, quiet, room for note-taker & facilitator & participant

Recruitment: mass e-mails to students; references from art history librarian, slide librarians, art history contacts

Incentives: $15 Amazon.com gift certificate (the “going rate” for an hour of students’ time has gone from approx. $10 to $20 over the last 5 years.)

Instructions: Think aloud. Can’t answer questions until after the session. Consent form. Test of ARTstor, not of participant.

Recording: Audiotape captures comments. Note-taker also focuses on comments. Use notes as primary source and audiotape as backup. Facilitator takes notes on actions.
ARTstor had basic tasks in mind: navigation, searching/browsing, viewing image details and data, comparing 2 images side-by-side, saving groups, viewing groups, registering, using help.

Scenarios: E.g., “You are an anthropology professor teaching a course on Native American culture. You use slides in teaching and would like to refer some of your students to ARTstor for independent study after class, so you are seeking images of pottery. You choose to search in the Carnegie collection. Create an image group of Native American Pottery.”

Wording: E.g., “Indian Art” is a category in the Carnegie collection. We asked participants to find “Native American pottery” so as to avoid leading the participants.
Analysis

- Added number of successful participants for each key aspect of a task, e.g. Did participants find images of pottery? Were they Native American? Were they from the Carnegie collection?
- Calculated average number of links followed on some tasks, e.g. Getting from the ARTstor homepage to the library homepage
- Quantified use of features not expected to be used during tasks

Qualitative and quantitative data (comments and spreadsheet)

We created an Excel spreadsheet that recorded 1’s and 0’s for “yes” and “no” answers to questions that we asked while looking at how participants completed each task. For example, for the task that asked participants to find images of Native American pottery from the Carnegie collection, we looked at our transcripts to tally how many participants found images of pottery, how many found images of Native American art, and how many found images from the Carnegie collection.

For some tasks, we counted the number of links participants followed, and we calculated the average. For example, for the first task, we counted how many links participants clicked on before they clicked on the “Enter the Library” link.

We also tallied participants’ success in using features that were not specifically dealt with in the tasks, but that some participants happened to use in the course of the session. For example, we counted how many participants tried the List Images and Sort features, how many participants discovered that the ARTstor logo is a link to the library homepage, and, of those who tried, how many were successful in deleting an image from an image group that they had created.
Want to show before and after screenshots to illustrate some of the challenges that participants encountered during the sessions and how some of the changes that we recommended have been implemented.
ARTstor Homepage

- We found that many participants had a hard time navigating to where they could search for images.
Many users went to “Collections” link, thinking they could search the database there. The “Enter the Library” link, which is the entry point to searching and browsing for images, was cited as not prominent enough on the page.
On the revised homepage, “Search and Browse for Images” replaces the link “Enter the Library.”

In addition, “Search and Browse for Images” links have been added in many places on the ARTstor web site. Thus, even if users miss the “Search and Browse for Images” link on the ARTstor homepage and select the “Collections” link, they will find links to searching and browsing next to and below all of the collection descriptions.
A few minor changes were made to the arrangement of collections and the items on the navigation bar.

Many users were asked to find an image of a teapot as their first search task.

This is where users wanted to return to initiate a new search.
Grayed out “My Image Groups” - good because not logged in yet and can’t use it until logged in

“Utilities” changed to “Tools”

Added “Back” link will help users access prior searches

Added “Exit” link

“General Collection” and “Specialized Collections” are clearer categories of collections than geographic categories (more in line with academic coursework - e.g. General Collection for survey courses)
Navigation bar changes
- Back button on bar instead of hidden under “Go To” button
- Home button
- Removed inactive Save button

Search could be changed to another collection with added drop-down list of collections
Navigation bar changes

Back link on navigation bar instead of hidden under “Go To” link

Home link should be more obvious than ARTstor logo as a way to return to Library Homepage

Inactive Save button has been removed; participants thought they could save groups or download images using “Save,” but they could not.

Search could be changed to another collection with added drop-down list of collections, giving the thumbnail page the full functionality of the Library Homepage.
Advanced Search

- Combination text box/drop-down list of prior search terms confused users who thought they need to limit their search terms to the items on the list.
- Type of search is not prompted, which allows greater perceived freedom in search.
- Filtered Search button changed to Search.
This is the original advanced search dialog box. Note the filtered search button. This was a source of confusion to participants because they didn’t necessarily know it would initiate the search. Note also the many field options. Some participants thought that they had to fill in as many fields as possible, which led them to perhaps too narrowly limit their search. Most critically, the combination text box/dropdown menus which listed previous search terms, not necessarily those of the current user, proved rather confusing. Participants did not realize that they could type in new terms.
In the new advanced search dialog box, the search button is just ‘search’ not ‘filtered search.’

The type of search is not prompted, which allows greater perceived freedom in search to users.

The combination text box/dropdown menus are gone, along with previous search terms, leaving only text boxes for users to enter their own search terms.

The And/Or/Not dropdown menus are new, enabling users to include and exclude terms.
Help

- Task asked participants to print a help page about truncating a search term.
- Print button added to top navigation.
- Many additional questions and answers added.
Troubleshooting

The Image Viewer does not open when I double-click a thumbnail. The option to save images to a group is grayed out. My Personal Folder is not appearing in the Open Image Group page. I cannot drag and drop to sort thumbnails.
Print button added to top navigation.

Many additional questions and answers added. While some of these can be attributed to the usability evaluation, many were added as ARTstor received feedback from beta-test institutions, and, since ARTstor’s launch this past summer, ARTstor subscribers.
Resources

Bonus Example: Library Catalog

JHU Libraries
JHU Catalog Search
Search History
Reserves
Borrower Info/Book Renewals
Interlibrary Loan Doc Delivery
JHU Library Locations

Basic Keyword | Advanced Keyword | Alphabetical | Help

Search for keyword(s):

General Keyword

Limited to:
- All Libraries
- All Eisenhower Location
- Medical Libraries
- SAH Library
- Friedheim Music Library

Questions or comments to: catalog@library.jhu.edu
Welcome to the Johns Hopkins University Libraries Catalog

Please select an option:

Alphabetical: Find items for known author, title, journal/newspaper title, call number, ISBN, ISSN or other fields.

Basic Keyword: Find items that have your keywords in the author, title, journal/newspaper title, subject heading, etc.

Advanced Keyword: Find items that have your keywords in the author, title, subject heading, etc. Also limit the search by language, location, date, material type, etc.

Reserves: Locate course reserves for Eisenhower, SAIS, and the School of Medicine by instructor or course.

Borrower Info/Book Renewals: See a list of your borrowed materials, renew books, register for email notices, view fines, etc.

Inside the catalog, you will find Help screens and additional information on ILLI/Document Delivery, JHU Libraries, etc.

Comments to: catalog@library.jhu.edu

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