User-Centered Design in IT: The Low-Hanging Fruit

Allison Bloodworth, Senior User Interaction Designer, Educational Technology Services, University of California - Berkeley
Ian Crew, Supervisor, Collaboration Services, Information Services and Technology, University of California - Berkeley

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Who’s heard of...

- HCI?
- Usability?
- User-Centered Design (UCD)?
- User Experience (UX)?

- Different aspects of a related set of concepts.
What is …

• User-Centered Design (UCD)
  – a design philosophy and a process in which the needs, wants, and limitations of the end user of an interface or document are given extensive attention at each stage of the design process\(^1\)
  – Goal: to make the user's interaction experience as simple and intuitive as possible

• User Experience (UX)
  – the overall experience and satisfaction a user has when using a product or system\(^2\)
  – Goal: meet user goals and tasks while satisfying business and functional requirements

Presentation goals

• Explain why User-Centered Design and User Experience are important

• Introduce a simple set of tools that can be used to improve the usability of your products and services
Why UCD/UX?

From http://www.youtube.com/watch?v=pQHX-SjqQvQ
Why UCD/UX?

- Get end user buy-in and generate excitement as you design a system that meets their needs
- Increased customer satisfaction
- Increased user productivity/efficiency/accuracy
- Increased service/site usage and adoption
- Decreased support and training costs
- Reduced development time and costs
  - Create only the features users need
- Reduced maintenance costs
  - Do it right the first time

Adapted from Usability Professionals’ Association website,
Usability maturity model

- Stage 1: Hostile Toward Usability
- Stage 2: Developer Centered Usability
- Stage 3: Skunkworks Usability
- Stage 4: Dedicated Usability Budget
- Stage 5: Managed Usability
- Stage 6: Systemic Usability Process
- Stage 7: Integrated User-Centered Design
- Stage 8: User-Driven Corporation

Typical User Centered Design activities

- User Interface Design
  - User Research
  - Information Architecture
  - Interaction Design
  - Usability Analysis
  - Visual Design
  - Graphic Design

Figure from Jesse James Garrett
Case study: Fluid Lightbox

- **Fluid Project**: an open, collaborative project to improve the user experience of community source software

- **Fluid Lightbox**
  - JavaScript-based user interface component
  - Allows users to re-order images within a collection
  - Provides fully keyboard-accessible and mouse-based direction manipulation of images on-screen
  - Implemented in Sakai’s Image Gallery tool
  - A physical implementation of Fluid’s “Drag & Drop” design pattern
    (http://wiki.fluidproject.org/display/fluid/Drag+and+Drop)
Case study: Fluid Lightbox
Basic UCD & usability evaluation techniques

1. User needs assessment
2. Competitive/Comparative analysis
3. Heuristic evaluation
4. Personas
5. Task analysis
6. Usability testing
   a. Card sorting
   b. Prototype testing
   c. Lightbox usability testing scenario
1. User needs assessment

- Surveys
- Interviews
- Focus groups
- Advanced observation techniques
  - Field studies
  - Contextual inquiries
  - Ethnography
Interviews

- Structured and/or open-ended
- Talk to actual end users
  - They are usually not the project sponsors
- Encourage the user to speak freely and give you honest answers and feedback
- Determine the user’s needs, goals & tasks
Interview rules

1. Don’t ask questions that can be answered with “yes” or “no.”
2. Don’t ask leading questions.
3. Don’t draw attention to specific issues that you care about.
4. Don’t use jargon.
5. Remain neutral: don’t react.
6. Distance yourself from the product.

2. Competitive/Comparative analysis

- Try using other similar services or products
- What *to* do, what *not* to do
- Interface conventions
- “Must have” standard features
## Lightbox: Competitive analysis example

<table>
<thead>
<tr>
<th>Interesting Moment</th>
<th>Picasso Web</th>
<th>Flickr Photo Organizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page Loaded</td>
<td>Images are shown as small thumbnails drop shadows indicate &quot;you can do something with this&quot;</td>
<td></td>
</tr>
<tr>
<td>Mouse Hover</td>
<td>Cursor changes to pointer</td>
<td>Cursor changes to pointer</td>
</tr>
<tr>
<td>Image Clicked</td>
<td>Border appears indicating &quot;selected state&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Drag Initiated</td>
<td>Half-alpha 'shadow' created</td>
<td>Original image becomes the shadow Dragged object is at full alpha Cursor changes to four-way arrow</td>
</tr>
<tr>
<td>Drag Over Valid</td>
<td>Adjacent images move out the way to indicate a valid drop point</td>
<td>Original image (half alpha) 'follows' cursor to indicate potential new position</td>
</tr>
<tr>
<td>Drag Over Invalid</td>
<td>No change in thumbnails</td>
<td>Snaps to closest 'valid' position</td>
</tr>
<tr>
<td>Drag Over Original</td>
<td>No change in thumbnails</td>
<td>Snaps to closest 'valid' position (in this case the original)</td>
</tr>
<tr>
<td>Drop Accepted</td>
<td>Original object removed, and placed in new position</td>
<td>Dragged Object moves to new position (animation), replacing half-alpha version.</td>
</tr>
<tr>
<td>Drop Rejected</td>
<td>No Change, Dragged object removed</td>
<td>No Change, dragged object removed</td>
</tr>
<tr>
<td>Drop On Original</td>
<td>No Change, dragged object removed</td>
<td>No Change, dragged object removed</td>
</tr>
</tbody>
</table>
3. Heuristic evaluation

- Visibility of system status
- Match between the system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Help and documentation
- One checklist: http://www.stcsig.org/usability/topics/articles/he-checklist.html

4. Personas

- Based on user research
- Each one a profile of one particular “typical” user of your system
- Limit number of personas to one per important user category
- Be specific, make them real
  - Pictures, posters
  - Include details about their life—humanize them
- Helps avoid “the elastic user”
Lightbox persona: Eileen Otrovsky

- 45 years old
- Russian Art Professor, UC Berkeley
- “Resourceful Adapter,” not a techie
- Teaches a sub-discipline, the 19th Century Russian Avant Garde art movement
- Aren’t any textbooks on her subject, so she posts images on-line

Goals
- Spend time on activities that support her research & writing
- Decrease barriers between her students & the content
- Allow her students & TAs to leverage her collection
- Inspire students to consider Art History as an intellectual pursuit
- Easy access to relevant images
- Stay organized

Level of Expertise
- Office products, basic functionality
- Image repository software, email, on-line shopping

Tools
- PowerPoint for images
- Word for “lecture guide”
### 5. Task analysis

- Determine tasks needed to achieve user goals
- Rate tasks on frequency, importance, difficulty
- Tells you what functionality is important

<table>
<thead>
<tr>
<th>Activity</th>
<th>Eileen</th>
<th>Otrovsky</th>
<th>Sara</th>
<th>Chang</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Importance</td>
<td>Frequency</td>
<td>Importance</td>
</tr>
<tr>
<td>Create image collection</td>
<td>Medium</td>
<td>High</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Organize images in a collection (includes sorting)</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Organize collections by category</td>
<td>Low</td>
<td>Medium</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Easily access images categorized for reuse</td>
<td>Medium</td>
<td>High</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Browse collections in the course</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Find a collection &amp; review it</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Find an image and review details</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Manually sequence through collection images</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Auto-play through collection images</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
6. Usability testing

- Test early in the process
- Test with 3-5 users (or less!)
- Ask the user to think aloud
- Same facilitation rules as with interviews, plus:
  - Don’t help
  - Make clear you’re testing the product, not the user
- No need to write down exactly what each user does – trends will emerge
- Main focus of testing is to improve the design, not to come up with metrics
  - One simple metric: % of tasks completed successfully
6a. Card sorting

- Helps figure out how to categorize items
- Each card should have item name and brief explanation
- Provide pre-defined and blank (make-your-own) category cards
- Same facilitation rules as a usability test
6b. Prototype testing

- Scenario-based
- Prototypes
  - Paper
  - Lo-Fi
  - Hi-Fi
6c. Lightbox usability testing scenario

- You are an Art History instructor finalizing the images you want to use for your course "The History of Landscape Painting." You have already uploaded the image files. You are reviewing your images and re-organizing them.

1. Rearrange as many of the images as you wish. Try to rearrange at least 4 images.
2. Now that you are familiar with the application, move an image in the middle of a row to the middle of a different row.
3. Move a middle image to the front of the top row.
4. Move a middle image to the end of the bottom row.
Iterate!

Design

Prototype

Evaluate

Figure courtesy of James Landay
Lightbox evolution

To add a collection, go to the resources tool and create a folder for the collection in your "Gallery Tool Collections" folder.

Sort by: • Instructor defined  ○ Alphabetical order  ○ Random

Click on an image and drag (holding down the mouse button) it to a new location.
Lightbox evolution
7. H: Discount usability - Nielsen

- Create prototypes using scenarios
- Usability test using simplified thinking out loud method
- Do a heuristic evaluation

First steps

- Which tools to use really depends on the context of your site/application & resource constraints
  - Designing a new service?
    - Start with: User needs assessment and/or Comparative analysis
  - Want to improve an existing site?
    - Start with: Heuristic evaluation
  - Lots of information to organize?
    - Start with: Card sorting
End-to-end user experience

- Does the whole system work for the user?
- Standards
- Users’ overall experience with all systems, or even entire organization
- Cross-platform considerations
Recommended books

- “The Inmates are Running the Asylum” – Alan Cooper
- “The Design of Everyday Things” and “Emotional Design” – Don Norman
- “Usability Engineering” – Jakob Nielsen
- “Don’t Make Me Think” – Steve Krug
- Other recommendations?
Recommended websites

• User Interface Engineering Virtual Seminars: http://www.uie.com/events/virtual_seminars/
• Useit.com: http://www.useit.com/
• Usability Professionals Association: http://www.upassoc.org/
• http://www.stcsig.org/usability/
• http://usability.gov/
• http://www.usabilityfirst.com/
• http://www.usableweb.com/
• http://usabilitynet.org/
• ACM SIGCHI: http://acm.org/sigchi
• UC Berkeley’s Technology Program Office Resources: http://tinyurl.com/2cmx88