



Designing software
that works - for everyone

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

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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.
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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 process¹
 - 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 system²
 - Goal: meet user goals and tasks while satisfying business and functional requirements

¹From Wikipedia, http://en.wikipedia.org/wiki/User_centered_design

²From Wikipedia, http://en.wikipedia.org/wiki/User_experience

Presentation goals

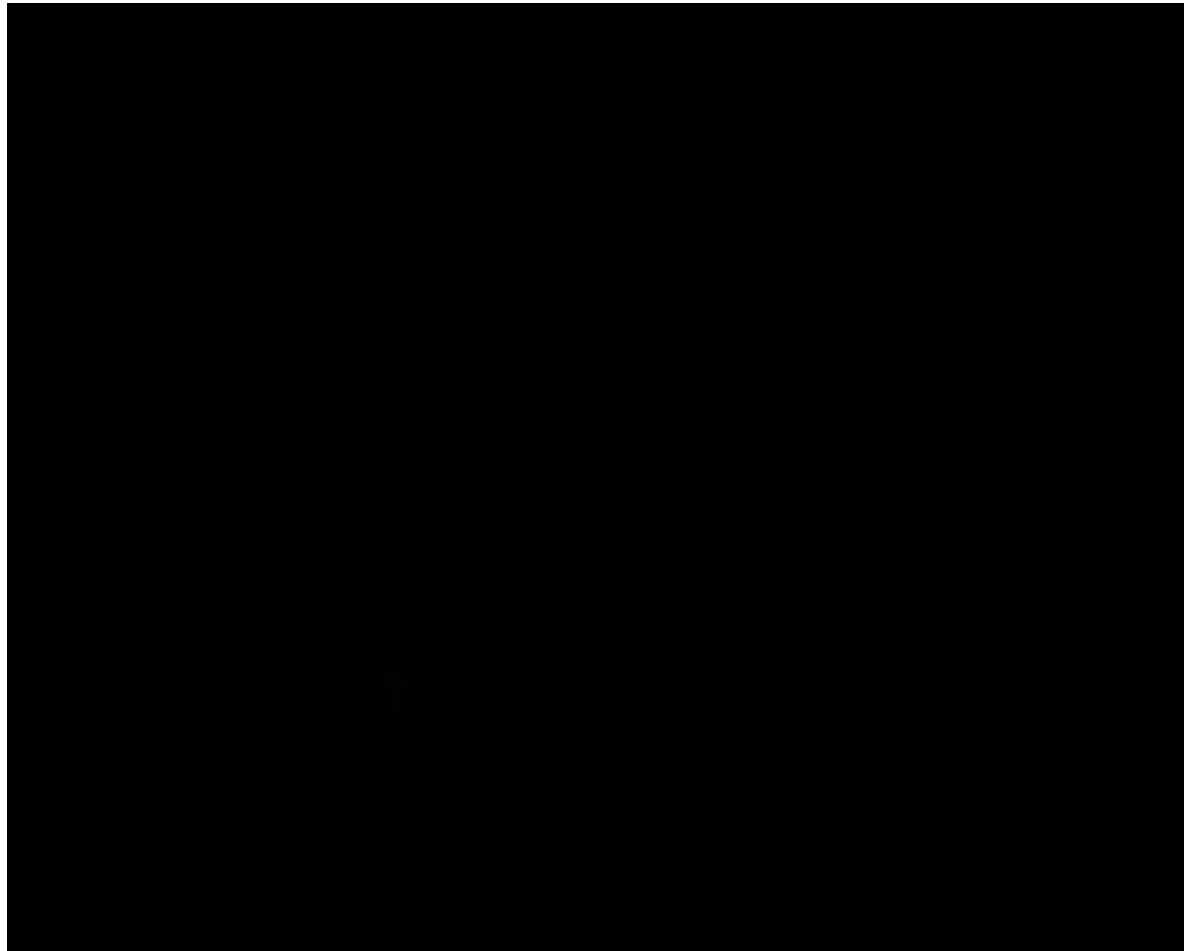


- Explain why User-Centered Design and User Experience are important
 - Introduce a simple set of tools that can be used to improve the usability of your products and services
-

Why UCD/UX?



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From <http://www.youtube.com/watch?v=pQHx-SjgQvQ>

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

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



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

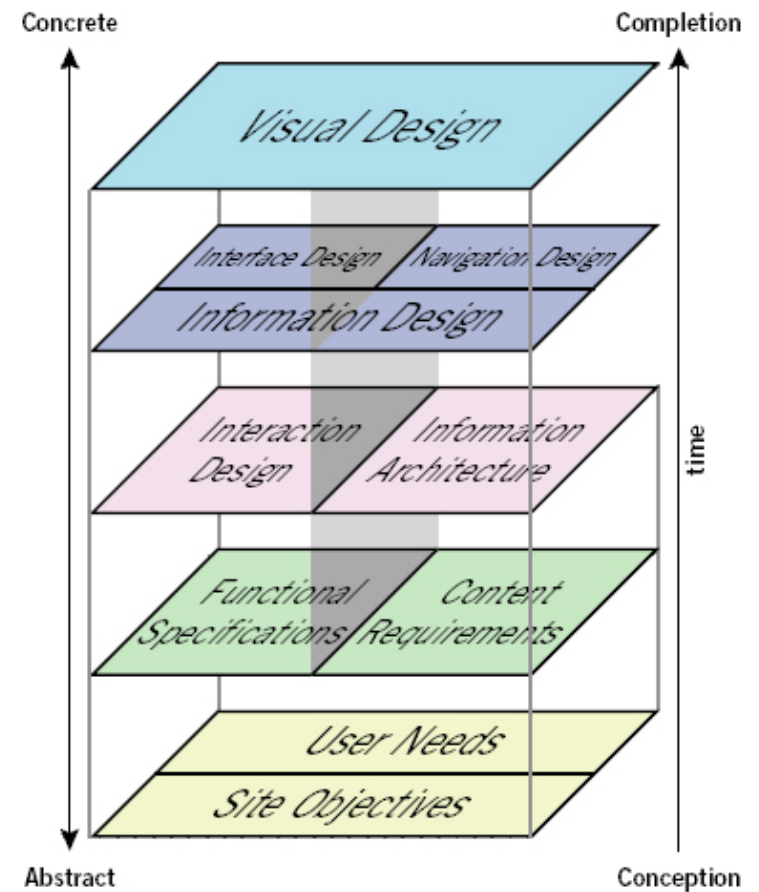


Figure from Jesse James Garrett

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



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The image displays a grid of six thumbnails, each showing a different city street scene. The thumbnails are arranged in two rows and three columns. The top-left thumbnail is faded. The top-right thumbnail is labeled "wall street.jpg". The bottom-left thumbnail is labeled "lower manhattan.jpg". The bottom-middle thumbnail is labeled "manhattan sunday.jpg". The bottom-right thumbnail is labeled "woolwich bldg.jpg". A central grey box highlights the middle-left thumbnail, which is labeled "approaching wall street.jpg". A vertical orange line is positioned to the right of the bottom-middle and bottom-right thumbnails.

[approaching wall street.jpg](#)

[wall street.jpg](#)

[lower manhattan.jpg](#)

[approaching wall street.jpg](#)

[manhattan sunday.jpg](#)

[woolwich bldg.jpg](#)

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



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

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



Level of Expertise

- Office products, basic functionality image repository software, email, on-line shopping

Tools

- PowerPoint for images
- Word for "lecture guide"

- 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

5. Task analysis



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

	Eileen	Otrovsky	Sara	Chang
	Frequency	Importance	Frequency	Importance
Create image collection	Medium	High	None	None
Organize images in a collection (includes sorting)	Medium	High	Low	Medium
Organize collections by category	Low	Medium	None	None
Easily access images categorized for reuse	Medium	High	None	None
Browse collections in the course	Low	Medium	Medium	Medium
Find a collection & review it	Low	Medium	High	High
Find an image and review details	Medium	High	High	High
Manually sequence through collection images	Medium	High	High	High
Auto-play through collection images	Medium	High	High	High

6. Usability testing

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- 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



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- Scenario-based
- Prototypes
 - Paper
 - Lo-Fi
 - Hi-Fi



6c. Lightbox usability testing scenario

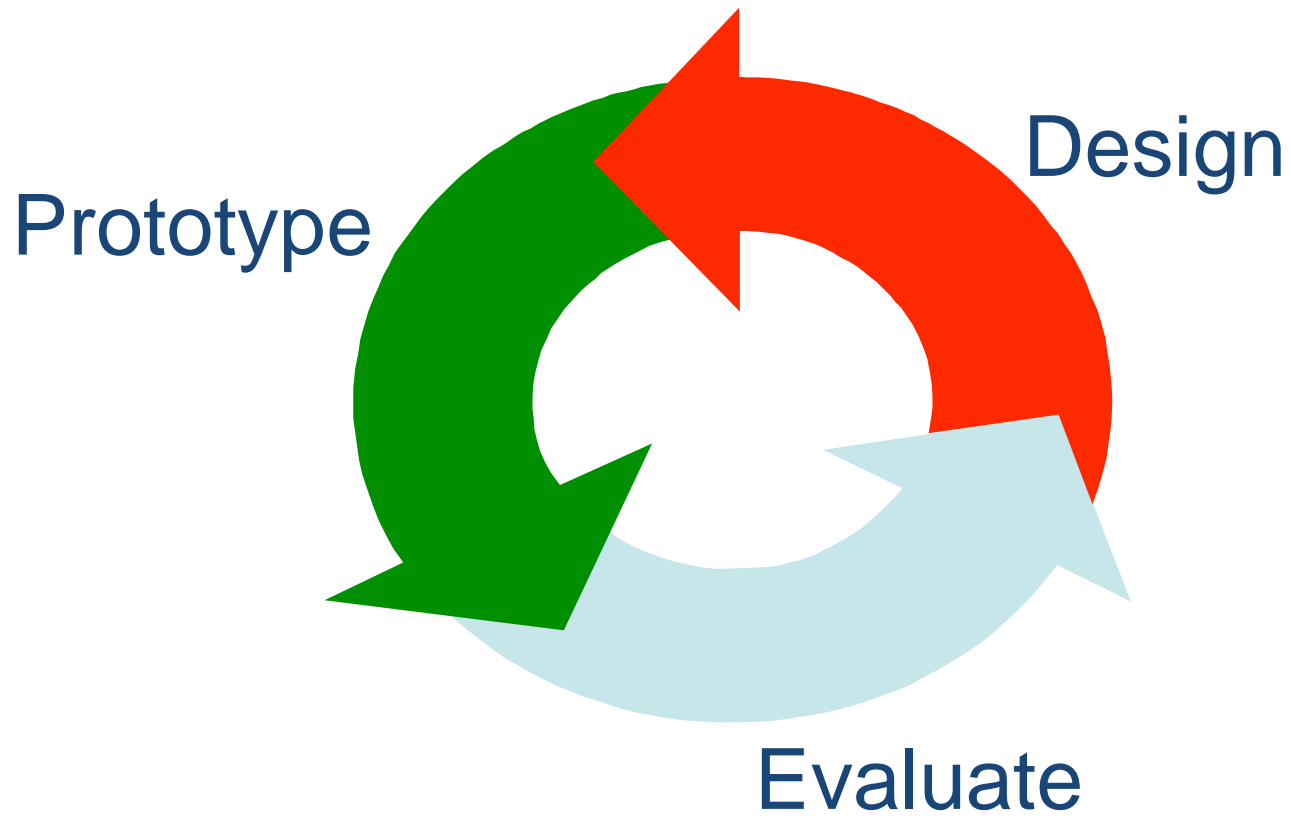


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- You are an Art History instructor finalizing the images you want to use for your course "The History of Landscape Painting." You have already uploaded the image files. You are reviewing your images and re-organizing them.
 1. Rearrange as many of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



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Lightbox evolution



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The screenshot shows the Fluid gallery interface. On the left is a sidebar titled "Gallery Collections" with four folder icons, each labeled "Collection Name". The main area is titled "<Collection Name> Collection" and includes a "View Slide Show" link. Below this is a "Sort by:" section with three radio buttons: "Instructor defined" (selected), "Alphabetical order", and "Random". A text instruction reads: "Click on an image and drag (holding down the mouse button) it to a new location." The main content is a grid of 16 items, each consisting of a "Thumbnail" box with a blue "Drag Me!" label on top and a "Title" label below. A vertical line separates the grid into two columns of eight items each. The thumbnail in the second row, second column is highlighted with a yellow border.

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

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My Workspace

Gallery

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- [Preferences](#)
- [Account](#)
- [Evaluation System](#)
- [Evaluations](#)
- [Site Info](#)
- [Gallery](#)
- [Help](#)

- Gallery Collections
- Test

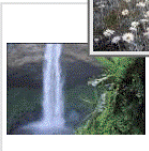
Test Collection

Sort by: Instructor Defined

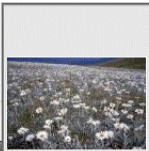
[View Slide Show](#)



[Image Title](#)



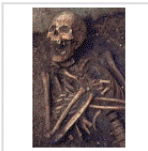
[Image Title](#)



[Image Title](#)



[Image Title](#)



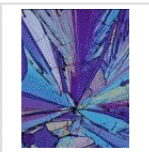
[Image Title](#)



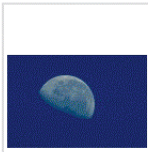
[Image Title](#)



[Image Title](#)



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My Workspace | Art on Film | Contemporary Art | Exhibition Project | **Fluid Demo** | My Active Sites ▼

Gallery

Gallery

[Resources](#)

[Site Info](#)

[Help](#)

Image Gallery Collections

- [NYC Parks \(5\)](#)
- [Greenwich Village \(6\)](#)
- [NYC Skyscrapers \(9\)](#)
- [New York City \(all\) \(27\)](#)
- [Lower Manhattan \(11\)](#)

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

NYC Parks Collection

[Start Slide Show](#)

Sort order Instructor default Alphabetical



View an image by pressing Enter. Move an image using CTRL+Arrow Key.

| Gateway | The Sakai Project |

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Sakai Fluid Demonstration Site - dev - Sakai dev - Server localhost

7. H: Discount usability - Nielsen



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- 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



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- 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>
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