The Open Video Project: Redesigning a Digital Video Digital Library

Gary Geisler, Simmons College
ASIST Information Architecture Summit
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Introduction

- Background of the Open Video Project
- Redesigning the Open Video digital library
- Results of the redesign process
- Future work
Background

History of the Open Video digital library

- Expected primary audience: Digital video researchers needing content for research
- Late 1999: Web site offered 120 videos in MPEG-1 format
  - Segments from 8 different video programs
  - Sources: U.S. government agencies - National Archives and NASA
  - About 12 hours of content
Background

- History of the Open Video digital library
  - 2000: Substantial contributions build content to 222 videos, 40 hours
    - CMU’s Informedia Project
    - Rick Prelinger’s ephemeral film collection
  - 2001: More contributions from previous and new contributors build collection
    - 1500 videos
    - MPEG-1, MPEG-2, and MPEG-4 formats
Background

Current status of the Open Video digital library

- 2004: Broad range of topics, format, style, time periods
- Currently 2039 videos, half a terabyte
- Target audience: Researchers, educators, multimedia artists, students, general Web users looking for entertainment

<table>
<thead>
<tr>
<th>Genre</th>
<th>Duration</th>
<th>Color</th>
<th>Sound</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentary: 494</td>
<td>Less than 1 min. 182</td>
<td>Color 988</td>
<td>With sound 1643</td>
<td>MPEG-1 1403</td>
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<tr>
<td>Educational: 186</td>
<td>1 to 2 minutes 249</td>
<td>B&amp;W 1040</td>
<td>Silent 385</td>
<td>MPEG-2 1067</td>
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<tr>
<td>Ephemeral: 1140</td>
<td>2 to 5 minutes 340</td>
<td></td>
<td></td>
<td>MPEG-4 409</td>
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<tr>
<td>Historical: 187</td>
<td>5 to 10 minutes 320</td>
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<td></td>
<td>QuickTime 34</td>
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<tr>
<td>Lecture: 16</td>
<td>More than 10 mins. 918</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Background

Open Video research thread

- 2001 to 2004: Three-year National Science Foundation grant (Interactive Systems Program - NSF Grant IIS 0099638)

- Focus of grant work: Create and evaluate highly interactive user interfaces for digital video
Background

- Open Video research thread
  - Completed user studies include:
    - Comparison of storyboards, slideshows, fastforwards
    - Comparison of four different fastforward speeds
    - Text versus visual surrogates
    - Feature metadata versus text transcript metadata

open-video.org/project_publications.php
Background

- Project goals include both:
  - Conducting research on range of issues associated with information seeking interfaces and digital libraries
  - Developing and managing a publicly accessible digital library of digital video

Open Video Research
- Interfaces for digital video
- Issues in shared DLs
- DL info-seeking interfaces
- Multimedia indexing issues
- Training ground for students

Open Video Web Site
- Service for contributors
- Service for end users
- Proving ground for research
- Publicize OV research
- Testbed for OV user studies

Research findings, ideas, etc.

Data from transactions, surveys, etc.
Redesigning Open Video

Motivation for the redesign

- Recognized limitations of current site
- Desire to make site more standards-compliant
  - Use CSS for layout instead of nested HTML tables
  - Use CSS for style instead of embedded HTML
- Generally, integrate ideas of information architecture community to improve usability, performance, extensibility of site
Redesigning Open Video

Stages in the redesign process

1. Brainstorm and develop prioritized list of user requirements
2. Generate user personas
3. Design conceptual models
4. Implement redesigned site
# Redesigning Open Video

## Prioritized list of user requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Priority</th>
<th>Comments/Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access a basic, free text search at any time</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Capability to perform an advanced search with multiple attributes:</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>o Free text terms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Genre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Format (MPEG-1, MPEG-2, etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Production date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Sound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Controlled vocabulary subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prioritize and customize display of returned data (sort by attribute; select number of hits to view by page)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Gather video based on visual features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Superimposition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Brightness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>View relevant, bubbled-up content (e.g., 5 most popular searches)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preview number of hits during search formulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gather video by browsing, using various categories:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Genre</td>
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<td></td>
</tr>
<tr>
<td>o Sound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prioritize and customize display of returned data (sort by attribute; select number of hits to view by page)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>&quot;Browse within&quot; a displayed browse section by other attribute categories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gather video using Special Collections</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

- Integrated with masthead or global navigation?
- Choose default number based on design of results page
- Color and Brightness depend on generating data for all segments; visual color vectors
- Technical challenge – need to cache hits by attribute values
- If you browse on “Documentary” section would let you browse by Documentary and the other non-Genre categories
Redesigning Open Video

- OV site users vary widely in individual characteristics:
  - Age
    - Young, media-savvy to older people finding video with nostalgia value
  - Technology experience
    - No experience with multimedia to video editors
  - Individual goals
    - Learning, work, research, entertainment
  - Specific tasks
    - Finding a known video, finding a specific type of scene or visual style, browsing for something fun to watch
Create representative user personas that embody range of characteristics

### The Educator
**Meredith Cantelupo**

**Personal Profile**
Meredith grew up in a *very* Italian family in a suburb of Chicago. From an early age, she decided that she was not going to follow the traditional path for a female in her family. She was the only girl among all of her siblings and cousins to go to college. However, her Italian roots are very important to her and she still holds many values in common with her family. She has only recently ventured onto the internet but is excited to find a way to make it useful to her students.

**Goals**
Meredith wants to find video clips that will help make the countries and events come alive for her social studies students. She’s hoping to show at least one new video clip a day for the rest of the year. However, she doesn’t have time to go looking for clips every day so she’d really like to find them a bunch at a time.

**Background**
- 41, female, married, Boston, MA
- 8th grade Social Studies teacher

**Quote**
“The amount of content on the Open Video site is amazing. I know there must be some way for me to make it useful for my kids.”

**Scenario**
For class discussion on issues related to the Middle East, Meredith wants 2 or 3 video clips showing how people live in Middle Eastern countries.

**Behavior**
- Searches using "Middle East" as free text term
- Reads descriptions of videos in search results
- Looks at visual preview for videos that seem like good candidates.
## The Casual Browser

### Brendan Dykstra

### Personal Profile
Brendan grew up in Lincoln, NE where his father was a mechanical engineer and his mother had an administrative job at the University of Nebraska. Though he doesn’t consider himself an artist per se, Brendan has always liked having creative projects to keep him busy. He got a communications degree from the Univ. of NE where he had a part-time job doing technical support for the computer lab. He decided to move to Omaha so he could get out of Lincoln. He enjoys the diversity of people and entertainment in the city.

### Goals
Brendan is looking for entertainment. He wants to find interesting/entertaining clips to help him pass the time at work. Since he has access to all the necessary hardware and software, he’s also been playing with video editing. He’s especially interested in finding clips that he can splice together to make entertaining collages that he emails to all his friends.

### Background
- 26, male, single, Omaha, NE
- Assistant Systems Administrator, Mutual of Omaha

### Quote
“I’d really like to find some cool video clips that’ll give me and my friends a good laugh.”

### Scenario
On a slow day at work, Brendan decides he’d like to create a spoof advertisement for a fictitious product by splicing together pieces of old advertisements and other videos.

Brendan’s friend April just started dating a new guy. Brendan remembers seeing a “teen film” on the site that talks about the “dangers” of physical/sexual liaisons between teens. He thinks it would be funny to send it to April as advice for her new relationship. He can’t remember the title but he knows he’ll recognize it if he sees it.

### Behavior
- Searches “advertisement” as free text term
- Reads descriptions of videos in search results
- Looks at visual preview for videos that seem like good candidates.
- Searches “social” as free text term.
- Scans results list to find a video with a posterframe he recognizes.
Redesigning Open Video

Silvia Furnó

The Non-American Novice

Personal Profile
Silvia has spent her whole life in Buenos Aires. Her father was a professor of Literature at the Universidad Nacional de la Plata and her mother owned a small art gallery. Silvia grew up with a great appreciation for the arts and decided at a very young age to pursue that path. She is in a committed relationship (but not married to) Gabriel Perosino, owner of a small art supply store. They have two children. She has used many mediums but has recently become interested in digital art, especially video. She knows very little about computers, the internet, or digital video. Because much of her time is devoted to raising her two children, she has only a few hours a week to explore computers and digital video. She has just found the Open Video site but hasn’t had time to look through it at all.

Goals
Silvia wants to learn about digital video and eventually try to make her own digital video art. She doesn’t have much time or attention to devote to the task so most of her time on the site will be idly browsing. However, when she does get a block of time, she is very focused and needs to make the most of it.

Scenario
For class discussion on issues related to the Middle East, Meredith wants 2 or 3 video clips showing how people live in Middle Eastern countries.

Behavior
• Searches using “Middle East” as free text term
• Reads descriptions of videos in search results
• Looks at visual preview for videos that seem like good candidates.

Background
• 31, female, committed, Buenos Aires, Argentina
• Artist and adjunct art professor at Universidad de Buenos Aires

Quote
“The amount of content on the Open Video site is amazing. I know there must be some way for me to make it useful for my kids.”
Redesigning Open Video

Conceptual model
Redesigning Open Video

Conceptual model

Public Open Video Web Site

- Global Elements
  - Gather Video
  - Sift Video
  - Evaluate Video
  - Use Video
  - Contribute Video

Supplementary Content

- Experimental Features
- Project Administration Features
Redesigning Open Video

Conceptual model

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Redesigning Open Video

Conceptual model

Public Open Video Web Site

Global Elements

Gather Video
Sift Video
Evaluate Video
Use Video
Contribute Video

Supplementary Content

Experimental Features
Project Administration Features
Redesigning Open Video

**GATHER**
- Specify criteria
- Hunt
- Explore

**SIFT**
- Get overview
- Reduce active set
- Refine criteria
- Narrow field

**EVALUATE**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

**USE**
- Download
- Watch
- Save
Redesigning Open Video

- Gather
  - Specify criteria
  - Hunt
  - Explore

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- Choose

**USE**
- Download
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- Save
Redesigning Open Video Video

**Gather**
- Specify criteria
- Hunt
- Explore

**Sift**
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**Evaluate**
- Preview
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- Choose

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**EVALUATE**
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- Examine detail
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- Compare
- Choose

**USE**
- Download
- Watch
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Redesigning Open Video

**Gather**
- Specify criteria
- Hunt
- Explore

**Sift**
- Get overview
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- Narrow field

**Evaluate**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

**Use**
- Download
- Watch
- Save
Redesigning Open Video

**Gather**
- Specify criteria
- Hunt
- Explore
- Orientation to what is available
- Understanding of how to find video
- Quick access to video details -- no more than two clicks away

**Sift**
- Get overview
- Reduce active set
- Refine criteria
- Narrow field

**Evaluate**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

**Use**
- Download
- Watch
- Save
Redesigning Open Video

GATHER
- Specify criteria
- Hunt
- Explore

SIFT
- Get overview
- Reduce active set
- Refine criteria
- Narrow field
- Manipulate set of returned video while looking at it
- Adjust size, ordering of visible set
- Focus on selection criteria most meaningful to user
- Immediately see full details of selected video

EVALUATE
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

USE
- Download
- Watch
- Save
Redesigning Open Video

**GATHER**
- Specify criteria
- Hunt
- Explore

**SIFT**
- Get overview
- Reduce active set
- Refine criteria
- Narrow field

**EVALUATE**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose
- Evaluate "quality" and content of video
- Find similar video
- Understand where they are in collection, where they can go
- Easily return to sift or re-gather
- Immediately use video

**USE**
- Download
- Watch
- Save
Redesigning Open Video

**Gather**
- Specify criteria
- Hunt
- Explore

**Sift**
- Get overview
- Reduce active set
- Refine criteria
- Narrow field

**Evaluate**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

**Use**
- Download
- Watch
- Save

- Select best format for needs
- Easily return to sift or re-gather more video
Redesigning Open Video

**Implementation**

1. Created wireframes and generic functional pages to finalize layout

2. Developed visual style

3. Created CSS files to layout and style pages

4. Tweaked CSS for best compromise appearance and functionality in supported browsers

**Gather**
- Specify criteria
- Hunt
- Explore

**Sift**
- Get overview
- Reduce active set
- Refine criteria
- Narrow field

**Evaluate**
- Preview
- Examine detail
- Evaluate against criteria
- Compare
- Choose

**Use**
- Download
- Watch
- Save
Results of the Redesign

Quick search or browse

Quick access to special collections

Rotating highlighted special collection

News headlines reflecting latest site changes

Direct access to newest and most popular video

Main Page - Gathering Video
Results of the Redesign

Easy modification of current search criteria

Visual preview and most important metadata

Customize visual format of results

Change ordering of results and size of result display

Search Results - Sifting Video
Results of the Redesign

Quick access to re-gather video

Direct access to video related by keywords

Link to view or download

Choice of preview surrogates

Link to other video from same title

Textual metadata

Details - Evaluating Video
Evaluating the Redesign

- Formal usability evaluation not yet done, but is in planning stage

- Informal data:
  - Positive reviews from variety of sources (NY Times Circuits, Yahoo Spotlight, Sydney Herald, etc.)
  - Significant increase in user traffic - at least 70,000 unique visitors since redesign
  - Logged user activity showing use of new features
Evaluating the Redesign

- User activity in 4 months after redesign
  - Activity from 9.05.2003 to 1.13.2004
  - Total of 69,589 ‘unique’ visitors
  - Total of 140,135 downloads

<table>
<thead>
<tr>
<th>Page</th>
<th>Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Details</td>
<td>348,974</td>
</tr>
<tr>
<td>Search Results</td>
<td>276,745</td>
</tr>
<tr>
<td>Main</td>
<td>150,622</td>
</tr>
<tr>
<td>Popular Video</td>
<td>61,429</td>
</tr>
<tr>
<td>Special Collection Details</td>
<td>12,227</td>
</tr>
<tr>
<td>New Video</td>
<td>4,133</td>
</tr>
<tr>
<td>Project Information</td>
<td>4004</td>
</tr>
<tr>
<td>Detailed Search</td>
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<td>1503</td>
</tr>
<tr>
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<td>1465</td>
</tr>
<tr>
<td>Project Publications</td>
<td>521</td>
</tr>
<tr>
<td>Browser Compatibility</td>
<td>390</td>
</tr>
<tr>
<td>Project Contacts</td>
<td>334</td>
</tr>
</tbody>
</table>
Evaluating the Redesign

- User activity in 4 months after redesign
- Most activity occurs on three pages that support the gather, sift, and evaluate activities

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Evaluating the Redesign

- User activity in 4 months after redesign
- Finding video by popularity much more common than by lists of new or random video

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Evaluating the Redesign

Which options do users use to sift search results?

Visual layout of results

Ordering criteria

Size of visible set
Evaluating the Redesign

- Sifting options - User choice of visual layout of results options

*Default choice

- Large thumbnails: 221,540
- Text: 13,223
- Small thumbnails: 16,029
- Thumbnails only: 12,730

City Water Supply (1941)
How New York City gets its water and how that water is protected from pollution.

Genre: Ephemeral
Keywords: Infrastructure: Water; Environment; Health and hygiene;
Duration: 10:24
Popularity (downloads): 71
Evaluating the Redesign

- Sifting options - User choice of ordering criteria of results

<table>
<thead>
<tr>
<th>Option</th>
<th># of Selections</th>
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<tbody>
<tr>
<td>Relevance</td>
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</tr>
<tr>
<td>Title</td>
<td>3,700</td>
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<tr>
<td>Year</td>
<td>6,735</td>
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<td>Duration</td>
<td>1,320</td>
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<tr>
<td>Popularity</td>
<td>6,604</td>
</tr>
</tbody>
</table>

* Default choice
Evaluating the Redesign

- Sifting options - User choice of size of visible set of results

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<tr>
<td>100</td>
<td>7,350</td>
</tr>
<tr>
<td>All</td>
<td>10,430</td>
</tr>
</tbody>
</table>

* Default choice
Future Work

- Redesign only incorporated our top priorities
- Provides foundation for adding relatively easily:
  - User profiles - stored results display preferences, history of videos evaluated and downloaded, personal collections
  - Recommended related videos on video details page
  - More preview surrogate alternatives
  - Shared views of specific video or virtual collections of videos
  - More advanced search choices - feature-based attributes
Project Team

Past and current Open Video team members contributing to the redesign work discussed in this presentation:

- Anthony Hughes
- Todd Wilkens
- Gary Marchionini
- Barbara Wildemuth
- Meng Yang
- Xiangming Mu
- Richard Gruss
- April Edlin
- Tom Tolleson
More Information

- Open Video Web Site: www.open-video.org
- Research publications: www.open-video.org/project_publications.php

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