Multimedia Visualization and Interactive Systems – Drawing Board Possibilities and Server Realities

Dr. Ray Uzwyshyn
University of Miami, Digital Library Initiatives
Presented For Sparking Synergies: Bringing Research and Practice Together
University of Miami Libraries
UM Digital Library Initiatives

http://www.library.miami.edu
10 Servers
500,000 visits/month

http://digital.library.miami.edu
3 Servers

Work with a range of research academics from Anthropology and Architecture to Cell Biology, Marine Science, Physics and Sociology building Digital Libraries
Paradigm Shift Case Study
Cuban Rafter Phenomenon: A Unique Sea Exodus (2005)
http://balseros.miami.edu

The Cuban Rafter
Phenomenon
A Unique Sea Exodus

Introduction
Main Site

Technical & Conceptual Deconstruction
What makes a Paradigm Shift Digital Library?

- Fertile new territory to debate Conceptual Theory vs. Digital Implementation (Drawing Board Possibilities and Server Realities)

- Application brings hopes of research and challenges of praxis together in fundamentally different remix than before

- Site acts as a fulcrum for larger shift ground to a new emphasis and balance

In our case a traditional open source text heavy (PhP/MySql/database silo shop to one that has begun to think seriously about new media/multimedia interactive digital library possibilities

Problem: How do you build a New Millennia Digital Library?
Background

**Spring 2003** Dr. Holly Ackerman, Latin American Studies Specialist and Fulbright Scholar Approaches Dept.

**Ford Foundation Grant** between University of Miami, St. Thomas Centre for Human Rights, Florida International University Cuban American Studies Program

**Three Goals**

1) Produce Conference on 10th Anniversary of Cuban Rafter Phenomenon
   Assembling existing global experts on transatlantic Migration
   (Between 1959 - 2005 approximately 100,000 citizens left Cuba by sea in small vessels and reached the states alive.)

2) Produce New Media Digital Library to codify this recent history expanding the range of academic research possibilities (Experimental with Capital “E”)

3) Codify, aggregate and present current state of this body of knowledge (aid to Disaster Preparedness, Next Ten Years, Lessons Learned)
What are the characteristics of this digital library?

- Should contain a wide range of existing documents pertaining to this history
- Traverse an expanded range of academically non-traditional media types (i.e. audio interviews, video footage, maps, statistical data, images, video, archivally intact gov. documents)
- Expand notion of traditional academic text/database search retrieval information system
- Maintain Ph.D. level historiographic depth structure and integrity of archival sources (unedited interviews, footage)
Transgressing Traditional Digital Library Boundaries

- Dr. Ackerman was very open to expanding digital library boundaries (experimentation).
- Did not want to use grant to produce traditional front end text box search/backend Database (PhP/MySql, Content DM, DSpace) Digital library that department previously specialized in producing Google type lists.
Long Scrolling List Syndrome

Increasingly our ‘academic clients and users’ were unhappy with these types of applications.

Variety of Reasons

even though this was robust and exhaustive, policy decision makers and others coming to this body of information could not see woods from trees to begin to see and make decisions regarding larger pictures
Human Users, Scrolling Lists, Server Possibilities

- Application being largely used to make policy decisions regarding Cuba
- Search Results were pulling up accurate but overly long picture (old problem of precision/recall)
- Remixed the metadata did not cut it?

Is there a more elegant way of solving this problem?
Online Site Comparison
New Media Expression vs. Substance

Increasing Online Media Richness

Text

Increasing Academic Depth Structure/Substance

100
interactivity
video
audio
images

High Online Expressiveness (Design/Style)
(Rich Media Possibilities, Video, Audio, Interactivity)
Advertising, Fashion, Games Sites
Generally Little Substance,
Points Well Made to "Sell Product"

Rafters Site Goals
Robust Academic Structure
High Degree of New Media Expressiveness

Traditional Online Academic Digital Libraries
Text Heavy/ Database Search + Text, Images, etc.

Research Academic
Generally R&D, Serious Science, Engineering
Virginia Tech, Content DM
Serious Focus on Visual Narratology, Multimedia and Visual Metaphor for Information Architecture

- What does this create?
  - Interactive Information System
  - Interactive Multimedia Digital Archive
  - New Media Digital Library
  - Interactive Flash Based Multimedia Website
  - Streaming Video Interactive 2D Online Educational Resource
  - Rich Media Online Historiographical Archive

Is this a digital library or do semantic debates regarding terminology herald something new?
This was recent history and the cognitive coordinates (histories) were still largely fluid and uncodified.

Old idea: Use Metadata Specialist and construct ontology/taxonomy (Proved impracticable as contents/material was coming in on a rolling basis in various formats (video, audio text) LCSH and Getty Image Taxonomies seemed ossified and out of date
Back to the Drawing Board: Folksonomy and the Dictatorship of the Proletariat for Information Architecture

- 2nd Idea) Use Existing experts to organically produce ‘folksonomy’ based on collaborative feedback among experts

- Proved overly long and produced another long scrolling list taxonomy that made the principal investigator unhappy
The Big Experiment: Overarching Visual Metaphor and a Cognitive Map to Guide Information Architecture

Solved Problem of Taxonomy and also provided intuitive mode of Navigation

Navigation on left, Map on Right

More than simple map, the interface provides a cognitive cartography and Humanly intuitive way to navigate
New Visual HCI Interface Possibilities
Zoomable Fly-Through Humanly Intuitive Navigation and Cognitive Landmarks

Problem Solved: Context Preserved (Upper Left)/ Humanly Intuitive Map

Link to Image, Document and Video Libraries
Physical/Cognitive Cartographies
Information Visualization, Interactivity, Multimedia

Zoomable Interface (1.800 Gig Map) – Front End (Zoomify)
Links to Digital Video, databases, document and Image Libraries – Streaming and other Server Back ends (Real Media Streaming Server).

Context
Preserved
In Map in Upper Left Corner

High Zoomable Resolution

Cognitive Landmarks
Emphasized through annotated clickable Iconology
superimposed On Map
Web Development Technical Background

- DreamweaverMX used to quickly build pages (integrate different media types, Real video, audio datasets, keep track of changing translations (allowed major sections of website to be done easily both in Spanish and English)) CSS, Frames and templates were used to build larger site structure.

- Adobe Acrobat used to maintain archival integrity of source documents (press releases, news articles, gov documents).
Other Technical Possibilities

- New Interactive Possibilities of Macromedia Flash heavily used to provide more robust interactivity and human engagement
- Visual horizontal timelines
- Visual metaphors for navigation and condensed structure to present large amounts of information in single screen spaces

(Possibilities in Studio 8 largely untapped)
Visualization and Progressive Incremental Iterations

- Still Image Slideshows (Javascript application) – archival images delineating history of period.
- Entire Site Context Preserved in larger visual narratology.
- Once big picture is worked out the thousand pages of details fall into a natural place.

Introduction

Map

Part I Balseros: What is the Rafters Crisis?
A. Overview and Definition
B. Rafters and Rafts
C. Timeline of Key Events/Related Policy Documents
D. US Coast Guard
E. Bibliography of Existing Literature

Part II Interdicted: The Rafters Go to Guantánamo
A. Overview
B. Living Conditions
C. Creative Expression - Children
D. Creative Expression - Adults
E. Religious Expression
F. Communication - Rafters
G. Daily Life in the Camps

Part III Crisis in the Wider Caribbean - The Case of the Cayman Islands
A. Overview
B. Timeline of Key Events/Related Policy Documents
C. Cayman Island Photos

2004 Conference

Credits & Acknowledgments

Although the Cuban rafts look simple, many rafters spend months or even years obtaining the materials to construct their fragile vessels. Access to every sort of construction material is restricted in Cuba. The materials are evidence of intent to leave the country and it is illegal to own items such as motors, inner tubes and compasses unless you can prove that they belonged to your family prior to 1959 or were acquired for state-sanctioned purposes after 1959. Until Fidel Castro called back the border guard on August 12, 1994 all evidence of a raft had to be carefully hidden. Photo courtesy of the Public Affairs Office, 7th Coast Guard District, Miami, Florida.
Academic Video/Audio Possibilities

- Video Files – Copyright easily obtained for robust amount of news footage of rafter phenomenon (educational usage, footage digitized, converted to Real Media Files, Served from Real Media Streaming Server, (Adobe Premiere)

- Spanish/English Audio Interviews digitized, converted to MP3: Plentiful OpenSource Software Buzzsaw Audio Ripper, Lame, served via Flash

New Flash Video (fvp.) possibilities, Quick streaming + very robust interactivity possibilities (Actionscript 2.0) + New Database Components (Adobe/Macromedia Recent Merger)

Sixties, Course Video Archive
http://scholar.library.miami.edu/Sixties

Cuban Theatre Archive
http://scholar.library.miami.edu/archivoteatral
Digital Library Interactivity
Technology and New Conceptual Paradigms

(Actionscript 2.0/ Flash Schneiderman’s Leonardo’s Laptop, Manovich, Language of New Media,
(The visual timeline here contains a spectrum of media types: real video archival footage of the rafters, image and PDF archival document links, links to US Coast guard statistics and outside links to ancillary databases)
Keywords

Cognitive Cartography  
Visual Metaphor  
Visual Narratology

All media types can be attached to the skeleton of a Humanly centered visual metaphor (text, audio, video, datasets, images) which contains the databases.
Paradigm Shift to New Visual Cognitive Cartography

- The rafters application heralded a gradual and synergistic methodological paradigm shift for our department.

Old Paradigm ‘Digital Library’
Emphasis on “Container”, “Silo”
Passivity,,Repository,Textbased

New Paradigm Academic Digital Resource, emphasis on Fluidity,
Hybridity of Media, Synthesis, Action

TextBox HTML Search
Metadata attached to Text, Images, Video Material
(Backend PhP/MySQL Or other Database)

Organically generated visual Metaphor, cognitive cartography
Visual narrative, HCI,Flash, Actionscript, Zoomify Possibilities
Technical Specifications

Rafters Model

- Digital Assets (Documents, Images, Audio, Video, Databases)
- Visual Map (Zoomify: Streamable, Tiling Algorithm Technology)
- Flash (compiled swf file)
- HTML (Frames Based Casing)

Advantages

- (fully customizable Map can be chosen, imported, Human Genome, Stars, Cuba, size unlimited)
- Zoomify Enterprise Provides Higher Annotative Possibilities
- (Used by U.S. Government, Raytheon in lieu of Java Runtime API, less development time, less clunky)
- Rich Interactivity Possibilities Provided by Flash and Actionscript 2.0
- Studio 8 (Macromedia RIA Rich Internet Application Platform + Merger with Adobe Provides New Possibilities)
Google Maps Mashup Model

www.housingmaps.com  Paul Rademacher
Mashup Technology and Lightweight Developer Models

Two Existing Databases Remixed: Craigs List + Google Maps
Google has opened their API (Navteq, Multimillion dollar Map database open, Up to 50,000 hits/day
http://www.google.com/apis/maps/

**AJAX Model**
presentation, XHTML, CSS;
dynamic display/interaction, Document Object Model;
data interchange/manipulation: XML, XSLT;
asynchronous data retrieval, XMLHttpRequest;
JavaScript binding everything together."

**Advantages**
Anyone can use this with a little Javascript knowledge, not as much programming needed (no Flash.)
Not strictly true: different set of tools

**Disadvantages**
limited to Google Map specified annotation features
Final Questions: Are these Methodologies strictly for Humanities/Social Sciences?

- National Cancer Institute, UC Davis Center for Comparative Medicine Using more robust form of Zoomify (Enterprise) for medical research). Other areas: GIS, semiconductor inspection, materials science, Chemistry and Biotech, Security, Astronomy, Bioinformatics, Human Genome
- Zoomify sits on top of Flash
- Any process where humans make ‘models’
- Current state of research: exploring limit cases and synthesis with databases

http://www.zoomify.com/enterprise/
Lessons Learned:
Synergies and Humanly Usable Digital Libraries

- After a year and a half of use, our Webtrends Weblog Statistics show that this is our most widely used Digital Library (approx. 47,000 hits per month compared to 3000-5000 of other MySQL/PHP Digital Libraries)
- Cognitive map and focus on visual narratology and interactivity sucks users in for second/third viewings (same IP addresses)
- 2-3 viewings prefer mixture of map + text centric taxonomy to explore site
- New Synergistic Effects with other MySQL/PHP database’digital image/video libraries’
Conclusions

- The Balseros site was successfully used as a large screen kiosk during the Cuban Rafters Conference. It continues permanently at [http://balseros.miami.edu](http://balseros.miami.edu).

- It acted as a paradigm case study for our department and is currently used largely as a living library, continuously updated as a learning and policy resource. Future plans include turning the entire structure into an open weblog format.

- Currently, this is the next frontier as academic ‘digital library’ boundary walls are still in place (organically living digital libraries).
Select Bibliography

Articles


Books

Websites

- Human Computer Interaction Laboratory . (Shneiderman et al., College Park Maryland) http://www.cs.umd.edu/hcil/ (click Visualization)

Flashforward http://www.flashforward2003.com (Click on past winners for excellent examples)
- Macromedia. http://www.macromedia.com (Click on Sites of the month for technical deconstructions)


- University of Miami Digital Initiatives. http://digital.library.miami.edu
- Xerox Parc Research Group http://www.parc.xerox.com/research
Thank You for Coming

Questions?

http://balseros.miami.edu
http://digital.library.miami.edu

Presentation Available at:
http://www.library.miami.edu/Presentations/Rafters.ppt

Contact Information: Ray Uzwyshyn
ruzwysyhn@miami.edu