Harvard Geospatial Library

Usability & HGL

DLF Fall Forum 2008: Providence, RI
David Siegel, Janet Taylor - Harvard University Library
Today’s Agenda

• What is The Harvard Geospatial Library?
• Project History
• Why Redesign HGL?
• Usability Issues
• The New HGL User Interface
• Technologies Used
• Conclusion
What Is HGL?

- Infrastructure for cataloging, storing and distributing geospatial data
- A searchable metadata catalog (FGDC metadata)
- A web mapping interface

Search ➔ Save ➔ View ➔ Download
What HGL Does
Search Results Screen

Click on the search parameters.
Saving Data Sets

[Image of a webpage showing search results and options to download, select, and map saved data.]
Mapping
Data Download
What Makes HGL Unique

• Supports numerous data formats
• All data are georeferenced with dozens of supported map projections
• Data clipping
• Not a file-based system
Georeferenced Data

1797 Street Map of Boston

2001 MassGIS Digital Orthophoto
Georeferenced Data

- Useful for tracing the historical development of:
  - Streets
  - Districts & wards
  - Shoreline
  - Town boundaries
  - Monuments
  - Churches
  - Schools

1797 - 2001 shoreline change
Data Clipping
Project History

• Grew from a need to provide more access to geospatial data
• First proposal 1998
• LDI Funding received 1999
  – LDI Grant: System developer, two year appt.
  – HUL: DBA, project & system management
  – HMC: GIS Specialist, data ingest, metadata
• V. Kann Rasmussen Foundation Grant 2003
  – Extended Developer position
  – Added functionality for raster data
  – Improved interface – no plug-in required
• 2005 – HGL went from a project to a program
Why Redesign HGL?

- Use of GIS has become more widespread
- Evolving audience
  - Naïve users
  - Students
  - Googlers
- Goal of Harvard libraries to make Discovery easier across the board
  - It is now standard procedure at HUL to conduct a usability study when designing or redesigning user interfaces for public applications
Usability issues are a constant struggle because technology evolves rapidly

Users expect map displays to work in familiar ways (AJAX)

Data clipping and other GIS concepts are difficult for naïve users to understand

Sometimes difficult to understand the hybrid approach of combining mapping with textual data searching (searching for a data set, not an address)
Usability Study Objectives

- Identify usability issues specific to HGL:
  - Finding GIS Data
  - Determining if the data is useful
  - Accessing the data

- Use this information to:
  - Target areas where the system needed improvement to make it more functional
  - Guide redesign decisions with project team and consultant
Usability Study Methodology

• Usability testing methods
  – Cognitive walkthrough w/ thinking aloud protocol (5-7)
  – Focus groups – targeted or committee (e.g., DCSWG)
  – Survey
  – Card sorting

• What we are measuring
  – Specific tasks
  – Subjective response
  – Organization structure
Usability Study Tasks

• **Tasks**
  – **From easy**
    • Can you please name two cities -- any in the world -- that you could find on a map?
    • Can you make the map display the name of [the first city]?
  – **To more complex**
    • Does HGL have geospatial data that includes the Back Bay section of Boston?
    • If so, what is the oldest data you can find?
    • Can you show the oldest data layer and one new data layer (within the past 20 years) on the map?
    • Please try to download the older layer.
Usability Study Results

- **Report**
  - Narrative account
    - Methods
    - Test population
    - Common and unusual results
    - Anecdotes
  - Graphs of data
    - Demographics
    - Rates of success and failure for specific tasks

- **Recommendations**
  - Less than 1 page
  - Geared toward stakeholders, developers, UI designers
  - Addresses specifics of organization, structure, look and feel, functions, efficiency

- **Usability data**
  - Comprehensive listing of all data collected
Study Recommendations

17 Specific recommendations

From global

- The purpose of HGL was not clear to users. Need a simple, concise statement of purpose and content on the home page.
- The palette on the home page is too limited.
- Develop more consistency in the use of fonts

To more complex

- Redesign the existing zoom and positioning controls making them immediately obvious to the first time user.
- Users expressed interest in sorting results when asked for early or newer data sets.
- Users mistook index terms for actual data sets. By using a “GO” button, users thought they would go to the data set. To be more explicit, the button should be changed to “Search.”
17 RECOMMENDATIONS

1. Redesign the existing zoom and positioning controls making them immediately obvious to the first time user. Some participants scanned the home page at length before making use of the controls.

2. Users think and act much faster than the system. Look for ways to shave time off of the processing of data or rendering.

3. There is a competition between the list of layers and searching. If search were the first to be visible, it might be more obvious that you can add layers to the existing list of layers.

4. Users mistook index terms for actual data sets. By using a "GO" button, users thought they would go to the data set. To be more explicit, the button should be changed to "Search." Also, offer users a cue for locating where they would find data sets by changing the title "Search for GIS data" to "Search for GIS data sets."

5. While it may make sense that you save a data set, then you download the saved set, and finally you extract that data, the terms are not linked as such in the interface. It reads like this: save, saved, download selected data, extract. Continuity may be too space intensive, so it may be better to lessen the distinction between each step. Maybe: save, download saved data, download.

6. Remove references to e-basket, as it confused users and appears only sparingly in the interface.

7. If possible, have the publication of choice float to the top of the page or appear on its own. Participants could not find publications which required scrolling to reach.

8. Consider creating a bread crumb trail or some other mechanism for navigating the web site. The browser’s back button was the main navigation tool during the test and it did not always work.

9. Users expressed interest in sorting results when asked for early or newer data sets.

10. "Map saved data" does not sufficiently communicate its function. The phrase "make a map with these layers" that appears on the subsequent page is more clear. The link on the results page could read similarly. Possibly, "Make a map with saved data sets."

11. A simple, concise statement of purpose and content on the home page would clarify both these issues for users.
The New HGL User Interface

- AJAX based map display and control
- Tabbed page navigation
- Simplified search screen
- Categorical browsing
- Innovative spatial (geographic) browsing
Advanced Search

Use the map to the left to zoom into your area of interest and enter your search term(s). You can also limit your search below:

Keywords: 

And: 

Title: 

Topic: All

Data creator: any

Date of content: to 

(Enter four-digit years)

Include these data types:
- Raster
- Vector
- Scanned Maps

- Include only data completely within current map
- Include restricted data in search results
- Include off-site data in search results

Search
• Collection highlights and most popular data sets are easy to find
As users drag the map, HGL layers with **features** in the map frame are presented.
Search Results Screen
Map These Data Sets Screen

Check the box next to one or more data sets, then click on "add selected layers to map". Layers can easily be turned on and off by using the layers menu on the map. To change a layer's symbology, click on its Filename.

Layers lower in the list are drawn before those above them. To change a layer's draw order, use the arrows in the ORDER column.

The remove link will delete the data set from your list of saved data sets. Do not remove the data set if you plan to download & later.

<table>
<thead>
<tr>
<th>REMOVE</th>
<th>SELECT</th>
<th>FILENAME</th>
<th>LAYER</th>
<th>TYPE</th>
<th>ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DOW_DUPOLY</td>
<td>Digital Chart of the World Drainage Potholes</td>
<td>VECTOR</td>
<td>▲▼</td>
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<tr>
<td></td>
<td></td>
<td>DOW_HILINE</td>
<td>Digital Chart of the World Hypsography Lines</td>
<td>VECTOR</td>
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</tbody>
</table>
Data Download

Data processing can take upwards of 10 minutes. Please enter your email below and you will be sent a link to download your saved data sets when they are ready.

If desired, you may clip your vector data to the map extent shown by checking the CLIP check box. Be sure to remove any data sets you don’t need before starting the download process.

Help with downloading data sets from HGL:

<table>
<thead>
<tr>
<th>REMOVE</th>
<th>CLIP</th>
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<th>FILENAME</th>
<th>TYPE</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital Chart of the World Drainage Polygons</td>
<td>VECTOR</td>
<td>123 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital Chart of the World Topography Lines</td>
<td>VECTOR</td>
<td>123 GB</td>
</tr>
</tbody>
</table>

Privacy policy
ESRI Data & Maps, 2004 – World Rivers, Vector Data

Traditional Search by Map Extent
Save Selected Index Grids to DBMS
Then in web application, user pans map and system searches database for any data sets with indices within user’s pan window.
Positive hit when map window overlays C-Squares Index
Conclusions

• Rough Edges
  – HGL Cartography
  – Difficulties matching map projections from proprietary software with Google Maps
  – Increase speed of geographic browsing

• End of year release

• Re-test usability to close the loop
Questions?

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• THE FOLLOWING SLIDES ARE TEMP
New HGL homepage prototype

A collection of over 5000 worldwide and regional geographic data layers, scanned historic maps and associated descriptive information that can be searched, mapped and downloaded for use with your GIS software.

Use the map to the left to zoom into your area of interest and enter your search term below:

Enter search term

Include only data completely within current map

Search
Metadata

Points were derived from Defense Mapping Agency (DMA) DASIF files, with the exception of airport 1 or south), a local registration interval of 2 degrees was used. Following recomposition, the locati

Feature coincidence
All point locations do not have explicit coincidence with other features in the database.

Database design issues
Data derived from lithographic sources have an attribute of ARPTYPE = 5. DASIF-derived data have a completed 100 percent of features depicted on the DMC source materials have been captured.

Airport features were derived from the DMA Digital Aeronautical Flight Information File (DASIF).
NOT NEEDED
A georeferenced digital image is composed of pixels that have geographic coordinates.
Technologies Used

- Openlayers
- Tilecache
- ArcIMS, Oracle and ArcSDE
- Open GIS Consortium Web Map Services (WMS)
- OAI-CAT