Lessons Learned in Creating New Digital Libraries Interfaces

The Portal to Texas History and The UNT Digital Library

William Hicks, Mark Phillips - UNT Libraries
Background
Timeline & Milestones

- IMLS National Leadership Grant to research interfaces with the Portal in 08/09
- “Old” designs came online in 2009 (Portal), 2010 (DL)
- Research/Development for updates in 2015, now ongoing.
Portal Growth

- 900K Items
- 9.5M Files

DL Growth

- 450K Items
- 16.5M Files
Types of Objects

Then

1. Photographs: 30,839
2. Reports: 10,186
3. Physical Objects: 3,082
4. Books: 2,620
5. Theses/Dissertations: 2,602
6. Postcards: 911
7. Letters: 764
8. Posters: 720
9. Texts: 637
10. Maps: 597

Now

1. Newspapers: 633,352
2. Photographs: 614,101
3. Reports: 162,267
4. Maps: 85,703
5. Articles: 68,193
6. Text: 52,422
7. Scripts: 24,189
8. Theses/Dissertations: 20,710
9. Letters: 15,917
10. Video: 15,492

Started with 24 resource types, Today 37
Significant Collections

~600 collections of materials from ~375 partners.

- Texas Digital Newspaper Collection
- Texas State Publications
- UNT Scholarly Works
- CRS Reports
- UNT Theses and Dissertations
- NBC5 Collection
Old Design Elements of Note

- Standard design c. 2000s: 1024px desktop.
- Limit scroll, max. “above the fold” content
- Compact text.
- Aging utility libraries
Old Design Elements of Note

- Show limited number of facets
- Limited of results per page
- Smaller images
Old Design Elements of Note

- “Above the fold”
- “Brief Record”
- Single image representation
- Hide full record behind tabs
- Metadata in tables, organized by DC fields.
- Object navigation in right column
- Flash-based A/V player
Towards a New Design

... 

Human Interactions
Sources of Human Interactions

- Outreach Efforts: Talks to genealogical societies, etc.
- Feedback form (over 8,000 to date)
- Surveys, user experience studies/workshops
What People Told Us (before redesign)

- It’s great as is, can’t imagine what you could do to improve it.
- Drop the “Brief Record Tab” from the Metadata display.
- Show me results “inside” an object.
- Searching inside items is your killer feature
- Zooming in on an object is your killer feature
- I need to deep link into the object
What we knew from feedback/interactions

- They identify *correct our records* regarding people, places, things
- They complain *notify us* of about missing content, difficulties in accessing/printing/using materials
- They *ask for permissions* to use the content
- They *tell us stories* about their lives/families, or other anecdotes (a lot!)
- They *ask us reference* questions
- They *request redactions*
- Many don’t seem to understand why the content is on the web, i.e. “I googled my Granny from Maine’s name and here’s this old photo of her.”
Examples (Cont.)

“I have stumbled on your site and found a few maps that I am interested in printing. Is it possible to print them to a large size from the site? I tried saving them to my computer, then printing and the resolution is bad. Thanks for your help!”
Examples (Cont.)

“re: Kennedy Assassination Witness Bonnie Ray Williams Hello. Your page showing an affidavit signed by Bonnie Ray Williams indicates that the TSBD employee and witness was a woman. Bonnie Ray Williams was a man. This is an incredibly BASIC fact of "Texas History" and United States History. Thank you.”
Examples (Cont.)

“Just curious were you got a copy of this picture? The only one i have ever seen is the one i have that is my grandfather __________. just neat to run across a digital copy on the net Thanks. :)

[Image of a person in a factory setting]
“I am completing a book entitled "______________". It is a history and accounting of all fords, crossings and ferries in early Texas. How do I obtain permission to reprint the photo of the Brazos River Crossing? Thank you. ________”
Examples

“Is the church available for weddings?, who can I contact? Thanks.”
User Personas (guesses)

- Genealogists / amateur historians
- Teachers (K-12)
- Students
- Collegiate researchers & professors
- Librarians, archivists
- Partnering institution / stakeholders

User Buckets

- Naive / 1st / one-time users
- Power users / repeat visitors
User Personas (survey data)
User Personas (Site Specific)

Further contextual guesswork

- **Portal:** Interest in Texas-specific content, general interest, family materials, Texas Law, or other materials derived from (especially) newspapers. Statewide-users of all ages.

- **Digital Library:** More academic researchers, musicians, users seeking government documents. More users within the North Texas Region and UNT specific, less for the state, perhaps greater usage across Globe/US.
Users (Accessibility / Universal Access)

Need to anticipate a percentage of users with special needs that must be addressed in content/code.

- Visually Impaired (Blind, Low-contrast, Color Blindness)
- Deaf/Hearing Impairments
- Cognitive & Psychological
- Motor Impairments
- Elderly
- Children
Observing Users & Behaviors

Learning from what people do
Formal Usability Studies

Don’t do these a lot due to:

- Time constraints
- Lack of personnel
- Need to run everything through IRB
- Morae is not fun to use
Analytics Data (Positives)

- Observe real patterns of use
- Extensive data on pages, time on page/site, users and their devices, etc.
- View in-browser ‘events’ that user initiate, search terms, etc.
- Users are largely unaware of tracking thus no ‘artificial’ tasks
Analytics Data (A few negatives)

- Can’t observe frustration, anger, intent, user desires, etc.
- **Undercount actual use:**
  - Direct Access of PDFs and Files - Google Scholar
  - Users clearing cookies will affect some stats
  - Increasingly content blockers will obscure stats
- Is it a person or a robot?
When looking at our analytics data, ask yourself:

- What does this suggest?
- How would / should I accommodate / fix / take advantage of this?
- Is there a design problem, a content problem, user education/expectations, etc.?
- If I address an issue, how would it affect other areas.

Upcoming slides: Side-by-side comparison of graphs can be deceiving. Always note numeric scale.
Traffic

All
Desktop
Mobile
Tablet

Portal

<table>
<thead>
<tr>
<th>Sessions (All Users)</th>
<th>Sessions (Desktop Traffic)</th>
<th>Sessions (Tablet Traffic)</th>
<th>Sessions (Mobile Traffic)</th>
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<tr>
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<tr>
<td>200,000</td>
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<tr>
<td>2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
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UNT DL

<table>
<thead>
<tr>
<th>Sessions (All Users)</th>
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<th>Sessions (Mobile Traffic)</th>
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<td>300,000</td>
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</tr>
<tr>
<td>2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
</tr>
</tbody>
</table>

?
Access Points (Portal)

- 237 Countries
- 31,400 Cities
  - Houston, Dallas, Austin, San Antonio,...
Access Points (UNT DL)

- 241 Countries
- 31,100 Cities
  - Beijing, Denton, Washington D.C., Dallas...
Why does mobile or global access matter?

- Reach as many people as possible
- Smaller real-estate, layout choices matter
- Slow data connections and low cap possible
- Non/low-english speakers
- Google’s index is now “mobile-first” Non-responsive sites pay a penalty.
Demographics

Portal Age Ranges:
- 18-24: 200,553
- 25-34: 110,161
- 35-44: 157,805
- 45-54: 231,469
- 55-64: 170,750
- 65+: 195,954

UNT DL Age Ranges:
- 18-24: 35,826
- 25-34: 11,080
- 35-44: 12,499
- 45-54: 16,688
- 55-64: 27,910
- 65+: 9,155

Chart Area
Navigation Paths

How people arrive at and move through the sites
Acquisition Sources

- Most from Google
  - 20x more than bing
- Referral
  - Inbound links
  - Social
- Unknown
  - Direct,
  - email,
  - and \_\_(ツ)\_/\_
Google Searches (Portal)

90 Days worth of reporting on Top 1,000 query terms/phrases:

- Resulted in 350,000 clicks onto the site
- 25 contain site name / “Portal”
- ~350 phrases contain “Texas”
- 3.5 words per query

Example Queries:

- Texas House Bill
- B12 bomber
- officer tippit autopsy
- delgado vs bastrop
Popular Referral Sites

Portal (14,000 unique referrers)

- Wikipedia
- TSHA Online
- Texas Secretary of State Website
- dp.la
- Ancestry.com
- Texas Almanac

UNT DL (16,000 unique referrers)

- Wikipedia
- UNT Library Website & Catalog
- StumbleUpon
- Google Scholar
Portal Social Media Acquisition

Spikes in top graph are traffic from shares / tweets / likes, etc.
Note no corresponding Social spike in 2015 even though massive traffic spike - Bots
Facebook Acquisition

Landing Pages

- Objects: 82.1%
- Search: 7%
- Explore: 6.1%
- Home: 7%

Average Pages By Page Type

- Objects: 6 Average Pages Visited Per Session
- Search: 24
- Explore: 14
- Home: 12
Portal Reddit Spike
Twitter
Engagement (Portal)

- **New Users**: 75%
- **Returning Users**: 25%

### Page Depth

<table>
<thead>
<tr>
<th>Page Depth</th>
<th>Sessions</th>
<th>Pageviews</th>
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<tr>
<td>2</td>
<td>989,034</td>
<td>1,978,096</td>
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<tr>
<td>3</td>
<td>687,130</td>
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<td>4</td>
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<tr>
<td>20+</td>
<td>895,451</td>
<td>64,576,367</td>
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### Session Duration

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<th>Sessions</th>
<th>Pageviews</th>
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<td>31-60 seconds</td>
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<td>61-180 seconds</td>
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<td>181-600 seconds</td>
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<td>601-1800 seconds</td>
<td>684,307</td>
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<td>1801+ seconds</td>
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</tr>
<tr>
<td>20+</td>
<td>895,451</td>
<td>64,576,367</td>
</tr>
</tbody>
</table>
Engagement (DL)

- **New Users**: 15%
- **Returning Users**: 85%

**Pages / Session**: 3.82
**Avg. Session Duration**: 00:02:21

**Page Depth**

<table>
<thead>
<tr>
<th>Depth</th>
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<td>16,914</td>
<td>287,538</td>
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<tr>
<td>18</td>
<td>14,000</td>
<td>252,000</td>
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<tr>
<td>19</td>
<td>13,722</td>
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<tr>
<td>20+</td>
<td>207,470</td>
<td>10,024,351</td>
</tr>
</tbody>
</table>

- **Session Duration**

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<td>4,177,697</td>
</tr>
<tr>
<td>11-30s</td>
<td>378,961</td>
<td>947,380</td>
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<tr>
<td>31-60s</td>
<td>329,893</td>
<td>1,168,084</td>
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<tr>
<td>61-120s</td>
<td>496,041</td>
<td>2,859,249</td>
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<tr>
<td>121-600s</td>
<td>400,559</td>
<td>4,273,954</td>
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<tr>
<td>601-1800s</td>
<td>254,017</td>
<td>4,716,759</td>
</tr>
<tr>
<td>1801+</td>
<td>94,627</td>
<td>4,677,548</td>
</tr>
</tbody>
</table>
What do people see first?

Or, how important is the homepage?
75-85% of users are “new”
Large numbers may see a very limited number of pages in just a few minutes
Most come from organic search results in Google
Content is King

Real estate of object pages have a heavy burden:

- Allow user to determine what they are viewing
- Allow user to make use of the object
- Prove authoritativeness / inform about the provider / define some scope for site
- Point to navigation aids to other similar items, and further features of the site.
- Ideally, onboard the user to further employ the site as a primary research tool
Understanding our Content

The shape of our metadata and size of objects matters

Or, how to deal with outliers
### Review: Object Types

1. Photographs: 30,839  
2. Reports: 10,186  
3. Physical Objects: 3,082  
4. Books: 2,620  
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### Collection strength changes

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Number of Pages per Object

Previous design:
- Previewed only 1st “page” / side
- Item length difficult to judge

For Planning Purposes
- Is it important to display more than one side?
- Performance implications of long sequences
Creator

- Vast majority have sensible number of creators
- How to display outliers!
Shape of Metadata Fields

Contributor

- Same questions apply.
- Have many of the same role qualifiers.
- Better to just expose the role?
Other Metadata Fields

- Tend to have same shape: Sensible # followed by a long tail
- Some fields have qualifiers that may not make sense to all users
- Should fields always be grouped together visually?
  - Coverage Dates & Coverages Places?

0-1,036 Subjects, 17 Qualifiers
0-58 Relations, 19 Qualifiers
0-99 Coverage Fields
Working with Stakeholders

Involving Staff, Users in Design Thinking
Rethinking IA

- What are the possible actions a user can take
- Find common / odd scenarios
- Identify actions paired to specific content types

Whiteboard out with staff

- User can print a copy of the image
- User can save a copy of the image
- User can search within the object (interactive)
- User can view all of the associated files/images together as a single file
- User has a sense of the size/height of the object
- User knows that the object is part of a larger collection of related items
- Can learn the scope and context of the collection
- User knows who to attribute the file
- User can contextualize an item within a larger scene/project
- User can comprehend the metadata
- User can trust that the display of items will be consistent
- User can see system notices
- User has access to contextual information (preferences, history, etc.)

We should make the interface feel less like a database record.

More like a research object / mining document.
Humanize Metadata

- How rigidly should we stick to formal organization patterns?
- Can we build a sensible object ordering scheme that is repeatable between:
  - Object types
  - Sites
Humanize Metadata Cont.

1. Reminder: Users (except for us!) are seeking to understand / acquire / assess the object, *itself*, not the metadata.
2. The metadata got them to the object via search indexing.
3. It is interpretive and can be fallible, incomplete, etc.
4. **THEORY:** In a fraction of a second users ask questions of the current page, like “What is this?” “Why is my grandpa pictured here?”, etc. Our metadata is part of an conversation that should answers those questions in a human way. Other page elements contribute as well.

**WHO / WHAT / WHEN / WHERE**
Humanize Metadata Cont.

Example “Who” questions...

- Created this object?
- Is the subject of this work?
- Is providing access to / funded this?
- Was this intended to be for?
- Do I contact for corrections, questions, etc.

We brainstormed various questions and eventually did card sorting, grouping, and prioritization exercises with users.
Humanized Metadata

- Consolidate who/what... variants
- Map questions to:
  - Metadata fields
  - Possible interface solutions
- Actions within objects
  - “Read books”
  - “Listen to audio”
  - “Watch video”
Hands on with Stakeholders

Prototyping
Paper Prototypes

- Example objects
- Variant sizes of objects represented
- Secondary filesets
- Metadata fields & other info
- Other fields that might be helpful
- UI elements like buttons, search boxes, etc.
Paper Prototypes (cont)

- Several different object types
- Unique fields / attributes “problems”
  - This example has relationships

Next: put together teams of stakeholders to “design their own” interfaces
Outcomes

- User opinions / thoughts valued
- Team building
- Small group work requires negotiation
- Iterations on new objects allow for re-evaluation when new problems arise
New Designs

Updates and Ongoing Iterations
Realities of Update

- No major changes to application logic (python).
- No changes to storage infrastructure, changes to image/object handling.
- Most changes had to be in templates, CSS, JavaScript, static images (non-content).
Emerging discussions / trends

- Privacy from 3rd party plugins
- Address EU cookie consent laws
- Secure content delivery (HTTPS)
- Licensing / Rights / Permissions
- Google penalty for not being mobile
- Real-world (competing / overlapping) markup for social media.
- Litigation related to accessibility
Better Practices

- Mobile Responsive
- Semantic HTML5 and ARIA
- SASS - CSS - Bootstrap, BEM classes
- Node / Bower / Gulp for JS/CSS management and compilation
- CDN delivery of utility libraries with local fallbacks
- Progressive image loading + SVG and Canvas
- Take cues from Google’s “material design”
From the world of UX Research

Users interact with E-commerce sites far more than library interfaces. Take cues from these:

- Facets
- Search Results
- “Items / Objects”

Extensive literature on best practices:

- Navigation / Exploration / Breadcrumbs
- Error Handling
- IA & Content Strategy
- Eye tracking trends
- Increase whitespace
- Fonts and Color
- Acknowledge people scroll now.
Note on Timelines

- Site on dev server for several months during construction. Inhouse access only.
- Beta subdomains for 1 month
  - linked from old sites
  - Facebook, Twitter, Email Campaigns
  - With inline survey
- PTH switches: June 2016.
- PTH revision March 2017
Header & Navigation: 1st Iteration - Portal

- Allow near universal access to all site features from current location.
- Compact with “mega menu” dropdown.
Header & Navigation - DL

Needed to emulate UNT Branding which used fixed header
Header & Navigation - Rethink Portal, v. 2

Drops mega menu due to visual scanning problems, simplify shared code.
Body & Navigation

- 1st Iteration: Fixed sidebar, regardless of scroll position
- 100% browser window width of content
- Collapsible/pinned sidebar for massive single-column view of content
- Collapsible sections in sidebars possible
Body & Navigation

- User Comments: “Images too big on wide monitors due to infinite expansion
- 2nd iteration: Dropped fixed sidebar, set max-width for body based on common device resolutions
- No real usage of pinned sidebar - dropped
- Sidebars panels now always open.
Objects - Context

Reminder: Top landing page

- Grounding via breadcrumbs
- “Short record” metadata
- Series relationships
- Visually demonstrate size / type / files associated with object
- Context statement about object, UNT, partners
- Navigation Aids
Who

- Creator, Contributor fields grouped by role
- Publishers and Rights Holders when known
- Subject: Named Persons
- Contributing Partner
- If primary source: Note for students
- Pointers to feedback form
What

- Titles
- Descriptions
- Subjects
- Languages
- Item Type
- Identifiers
- Language
- Collections the item is a part of
- Related Items (with embedded info)
When

- Date-related fields
- Added / Updated Record
- Usage Statistics
Where

- Coverage Places
- Geographic Coordinates
- Publication Place
- Rendered to Map with TX county overlays
Performance

- ~1.5MB uncached download
- ~50 Requests
- Progressive load of content below scroll line
Other Metrics

Since switch:

- 325K downloads of images
- 282K clicks on preview thumbnails to object pages
- 96K clicks on breadcrumbs
- 370K “search inside” from sidebar
- 9K social media shares (top level object page)
Inside Objects

- Variants to Page Titles for SEO
- Minimal context for user landing here
- Indicate location in sequence w/ upcoming sequences
- Highlighting
Tools

- Alter Highlighting Color
- Adjust Contrast, etc.
- Download Sizes
- View OCR text

Via Canvas (caman.js), heavy browser penalty
Citations & Reuse

- Provide preferred citation style
- Educate user on copyright restrictions, and licensing.
- Provide examples of acceptable use
Citations & Reuse

- Provide code for embedding on other sites
- Buttons for social sharing
- Info on High-resolution copies and PDFs
Contact Us

Huge surge in feedback / requests.

Copies and Reproductions
Looking for high resolution copies of this newspaper?

High Resolution Copies
In a limited number of cases we may be able to provide a higher resolution image of this newspaper, but in most cases we will put you in contact with the item's contributing partner. Before contacting us, please determine if any of the sizes we offer are sufficient. If these do not meet your specific needs please contact us.

Contact Us
Request High Resolution Copy Questions
Search

- Larger Thumbnails
- More results per page
- Facets open in overlay
  - All values available
  - Single column for easier scanning
  - Sortable by name or count
  - Autocomplete searchable
Search (cont)

- Field-based Advanced Search
- Proximity Search
Search - 2nd Iteration

- Reorganized Facets
- Don’t require users to traverse facet hierarchies (Decade -> Year -> Month -> Day)
- Included check for first names using census data. Steer user to proximity searches
Exploring

- Real-time Searchable Lists / Maps
- Sortable Lists
Exploring Partners / Collections

- Overviews / Stats
- Searchable
- Latest additions
- Browse by item type, titles, etc.
System Stats

● Available at system, collection, partner, and object level
● D3.js
Accessibility

- ARIA roles / states / relationships
- Semantic HTML
- Navigable via keyboard
- Accessibility page ‘talks’ to users rather than checking off legal standards
- Most pages validate WCAG AA - inform users where we fall short
Tours

- Visual overview of site features
- Experiment with inline tutorials
Tour Usage Considered

Users that have interacted with the tour page seem to spend more time on the site.
Homepage

- Search is primary function
- Sample searches for new users
- Set default option for type limiter
- Stakeholders vote on random header images every few months
Homepage (cont)

- Highlight Digital Newspapers Program
- Content from this day / month in history
- Random partners and collections
Homepage (cont)

- Share news from our blog
- Sign up users to email newsletter, facebook page
- Share to social networks
- Note educational outreach and rescuing history grants
- Inform institutions on how to become a partner
- Solicit donations
The Future

What comes next?

- A/B testing of site features / page elements
- Interviews, testing with real users on their devices. Eye tracking!?
- Saved / favorited: searches / objects
- Captioning and transcriptions for A/V materials
- Improve page load response times
- Integrating IIIF based interfaces into sites
Questions