Open Source Components, Standards Conformance, & UCD:
Managing & Enhancing an Established Digital Archive

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THE PORTAL TO TEXAS HISTORY

Digital gateway to cultural heritage collections throughout Texas

- Maps
- Photographs
- Books, Diaries
- Letters, Postcards
- Yearbooks
- City directories
- Newspapers

<table>
<thead>
<tr>
<th></th>
<th>GROWTH</th>
<th>2004</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partners</td>
<td></td>
<td>5</td>
<td>100+</td>
</tr>
<tr>
<td>Items</td>
<td></td>
<td>489</td>
<td>71,000+</td>
</tr>
<tr>
<td>Visits per month</td>
<td></td>
<td>1,000</td>
<td>34,500+</td>
</tr>
</tbody>
</table>
IOGENE PROJECT: 2008-2009
Objectives

• To implement a rapid development framework for our digital library
• To employ user-centered design to redesign the Portal’s user interface
• To create an application development process model for digital libraries
Genealogists

- Increasing interest in genealogical research
  - 73% (2005, USA)
- Increasing number of seniors
  - 2011 – 2031: +10,000 per day
- Increasing use of Internet for genealogical research
  - 24% of all users; 36% of seniors (2004)

<table>
<thead>
<tr>
<th></th>
<th>Other Studies</th>
<th>IOGENE Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>73%</td>
<td>88%</td>
</tr>
<tr>
<td>Age (&gt;51 years)</td>
<td>87%</td>
<td>92%</td>
</tr>
<tr>
<td>Experience (average)</td>
<td>14 years</td>
<td>20 years</td>
</tr>
</tbody>
</table>
Rapid Development Framework

- Open-source components
  - Django
  - Solr

- De-coupled user interface & technical infrastructure

- More closely coupled development & quality assurance
USER CENTERED DESIGN

Analysis → Design

Deployment

Evaluation ← Implementation
**Initial Application Development Model**

- System Development → Interface Design → User Studies
  - Infrastructure Requirements
  - Interface Requirements
  - Development & Quality Assurance
  - Development & Quality Assurance
  - Functional Requirements
  - Quality Assurance
  - Usability Testing

  Project Teams
  - Requirements Definition
  - Application Development
  - Usability Testing
IOGENE Project - University of North Texas

The Internet

External System

Administrative
Metadata Editor

Archival Storage
CODA

Internal System

Load Balancer
PeriBal

Application Servers
Django

Metadata Storage
METS/UNTL
SQL DB

Static Content
File Server

Indexer
Soir (UNTL)
Soir (IDS)

Core Infrastructure

http://iogene.library.unt.edu

http://texashistory.unt.edu
## Open Source Components & Tools

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>Server software</td>
</tr>
<tr>
<td>jQuery</td>
<td>JavaScript library</td>
</tr>
<tr>
<td>Memcached</td>
<td>Distributed memory object caching system</td>
</tr>
<tr>
<td>Python</td>
<td>Programming language</td>
</tr>
<tr>
<td>mod_python</td>
<td>Apache module: embeds the Python interpreter within the server</td>
</tr>
<tr>
<td>Subversion</td>
<td>Version control system</td>
</tr>
<tr>
<td>Ubuntu</td>
<td>Operating system</td>
</tr>
<tr>
<td>Trac</td>
<td>Issue tracking system for software development projects</td>
</tr>
</tbody>
</table>
User Studies: Genealogists

Key Informant Interviews \((N=10)\)
Focus Groups Discussions \((N=19)\)
Usability Testing:
- Baseline \((N=5)\)
- Release 1 \((N=7)\)
- Release 2 \((N=6)\)

**Functional Requirements**
User Interface Requirements

Paper Prototype for an Object Navigation Page
Application Development Cycles

Legacy System
- Conversion & Implementation
- CSS Framework & Design Templates

Beta Release 1
- Quality Assurance Testing
- Modification & Documentation

Public Release 1
- Usability Testing
- Requirements Modification

Release 1
- Application Development
- Feature Implementation

Beta Release 2
- Quality Assurance Testing
- Modification & Documentation

Public Release 2
- Usability Testing
- Requirements Modification
Key Lessons Learned

• Involve stakeholders at all stages
• Schedule adequate time & resources for conversion of legacy systems
• Conduct QA with external users prior to public release

FRAMEWORK BENEFITS:
• Efficiency of user interface design separated from system development
• Specialization of team members
Final Application Development Model
Outcome: User Satisfaction

<table>
<thead>
<tr>
<th>Satisfaction Indicators</th>
<th>N=618</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely likely or fairly likely to return</td>
<td>89%</td>
</tr>
<tr>
<td>Satisfied or very satisfied overall</td>
<td>88%</td>
</tr>
<tr>
<td>Easy or very easy to use</td>
<td>86%</td>
</tr>
<tr>
<td>Information discovered useful or extremely useful</td>
<td>79%</td>
</tr>
</tbody>
</table>

Highly Satisfied Overall

<table>
<thead>
<tr>
<th>Portal Release</th>
<th>Median Satisfaction Index Scores (range=1-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>3.25</td>
</tr>
<tr>
<td>Release 2</td>
<td>3.50</td>
</tr>
</tbody>
</table>

Moderate but Significant Increase

\[ U = 19597.5 \]
\[ p = .017 \]
Outcome: Portal Visits

- 59% Increase

Baseline Jun 2009: 5,444
Impact Jan 2010: 34,680

- Weekly Average
- Monthly Total
THANK YOU!