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# CORAL: USF Libraries Digital Collections White Paper

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# USF Libraries Digital Collections Prospectus

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## I. A Brief History of Digital Collections Building at the USF Libraries

### A. The Past

- The special and digital collections units had an informal relationship, with Special Collections Department materials informing digital collections building
- Florida history served as the basis for most digital collection building
- Technology and administrative leadership was decentralized
- An increasing focus on commercial digital asset management system (DAMS) solutions led to growing expense but also continuing frustration
- The SiteDirector USF Tampa Library web site was incompatible with DAMS integration
- Staffing was insufficient and/or unqualified to build and/or provide intellectual access to digital collections of distinction
- Space was inadequate for growth and greater efficiency
- Growing disillusion with FCLA and statewide collection building led to increasing USF autonomy

### B. The Present

- Special & Digital Collections (SDC) Department formally established and charged with creating access to special/distinct collections regardless of format
- Digital Collections Task Force created to assess and report on the state of the Libraries' digital collections, processes, and accessibility
- New space found to accommodate expansion and workflow efficiencies
- Shift away from primary focus on Floridiana to develop digital collections with a global impact, particularly in Karst, Holocaust and genocide, and disaster mental health
- Greater focus on collaborative digital collections projects outside of FCLA and Florida SUS (dLOC, MVI)

- Professional staff hired and/or reassigned to SDC to increase quality and productivity (coordinator and two catalogers)
- Operations staff reassigned from Access Services to SDC to increase productivity
- Shift to LibGuides permitted Library web site and DAMS integration
- Growing emphasis on creating and sharing value-added IT solutions (Bull-OH-Base project management system, synchronized oral history audio and transcript functionality), in addition to ongoing efforts to identify and create unique digital collections

## II. Existing Digital Collections Infrastructure at USF Libraries (DigiTool)

### A. Management: IT Experience

DigiTool has served Digital Collections adequately since implementation. Ex Libris is now devoting much of its attention on next generation products, and enhancement and support of DigiTool is suffering. Issues with the software and Ex Libris include:

- Vendor license fees – approx. \$23,000 /year for 80,000 objects
- Time difference – Ex Libris only provides technical support from Israel
- Lack of responsiveness to technical issues – experience indicates that Ex Libris currently has one staff person in “first-line support” for DigiTool
- Minimal development of new functionality – service packs are primarily bug fixes
- Lack of transparency and effective communication from Ex Libris regarding software development activities
- Weak written product documentation
- Growing reticence on Ex Libris’s part to share technical information with Library IT personnel, thus hindering problem resolution self sufficiency
- Limited (shrinking?) DigiTool user community with whom to share experience and ideas
- Some core DigiTool programs have not been updated and rely on legacy code (ex. COBAL)
- Periodic DigiTool updates adversely effect USF technical metadata (ex. Digital Entity)
- Lack of robust, standards-based API – limited ability to integrate with other user interfaces
- Unable to extract technical metadata from or generate thumbnails for MS files
- Convoluted/overly complicated process for ingesting, harvesting, indexing, and presenting metadata – multiple configuration files and conversions of data required
- Limited ability to create customized page styles
- After an initial period of significant collaboration between USF and Ex Libris, the company has demonstrated an increasing level of disinterest in USF and no longer engages USF in the improvement and advancement of its DigiTool product
- Ex Libris, through its actions, inactions, pricing, licensing, and minimal level of support, provides much of the threat to the growth and success of USF’s digital collections initiatives

### B. User Experience

As identified in the November 2008 Digital Collections Task Force Report (<http://scholarcommons.usf.edu/tlsdc/1>), DigiTool does not provide desired functionality without extensive staff time for customization, as per the following:

- Patrons cannot search multiple selected collections – can only search one or all collections
- Metadata (e.g., subject headings) not indexed/hyperlinked
- Collection data not consistent between DigiTool and web pages

- Limited image download functionality
- Image viewers do not allow draw zooming
- Viewer functionality not intuitive, especially for records with multiple objects
- Basic page look and feel not visually appealing
- Absence of a persistent object identifier in URL prevents users from bookmarking objects for future reference and linking

The Special & Digital Collections staff determined that DigiTool was no longer a viable DAMS solution and endeavored to explore other opportunities.

### **III. Elements of an Effective New DAMS**

To address the issues identified above and to move USF Libraries DAMS into the future (2-3 years), the Digital Collections Task Force Report and subsequent discussions among Special & Digital Collections staff identified general principles for improved access to and management of digital collections.

#### A. Management: IT Experience

- Use open source solutions
- Minimize operating cost and maintenance requirements
- Select solutions with dynamic user communities with whom to share and learn
- Take a leadership position in the digital collections community
- Manage digital collections within existing Library FTE and expertise
- Leverage centralization of USF IT
- Reuse existing hardware and software where feasible
- Establish robust test server for ongoing project development

#### B. Access: User Experience

- Integrate each collection's content regardless of format/media
- Contextualize each collection's research value
- Provide value-added materials, such as bibliographies, scholarly essays, etc.
- Promote self-sufficiency (e.g., provide users the ability to download digital objects without library staff intervention)
- Develop user interface that provides access to all of the above within the same window(s)
- Create a uniform user experience regardless of web browser
- Minimize browser plug-ins and/or add-ons

### **IV. The Next Generation USF Libraries DAMS: CORAL (COLlections for Research And Learning)**

CORAL combines open-source software products, including in-house-developed components, for the management and presentation of USF Libraries digital collections. CORAL is currently the only known solution within the Fedora Commons community that supports contextual integration of Fedora, a

pluggable web user interface (Flash), and a web content management system (LibGuides) that keeps patrons within a single URL.<sup>1</sup> The primary CORAL components comprise:

## A. Technology Used

### *i. Management: IT Experience*

- Data repository – Fedora Commons Repository Service (open source)
- Integrated development environment – Eclipse (open source)
- User interface development tool -- Adobe Flex Builder 3 plug-in (education priced, proprietary)
- Metadata cataloging – OCLC Connexion client (proprietary)
- Collection administration – SWORD (Simple Web-service Offering Repository Deposit) framework (open source)<sup>2</sup>

### *ii. User Experience*

- Web interface – Adobe Flash (.swf files)
- Advanced content viewers
  - JAVA Servlet technology (open source)
  - Djatoka JPEG 2000 server (open source)
  - Adobe Flash (proprietary, freeware)
  - IIPImage IIPMooViewer (open source)
  - Google Maps API (freeware)

## B. CORAL Strengths

- Developed using open source and open standards software
  - Fedora users and developers include OhioLink, National Science Digital Library, National Library of Medicine, Northwestern University, Duke, Purdue, Library of Congress, New York Public Library (see <https://fedora-commons.org/confluence/display/FCCommReg/Fedora+Commons+Registry>)
  - Access and management APIs allow USF to leverage free software and build upon it with additional value-added software components
  - Vibrant and growing user communities for open-source products enable USF to learn from and contribute to software development activities
  - Flash is installed on 98% of all browsers; 30-40% of all web pages contain flash files (see [http://www.flashmagazine.com/news/detail/how\\_many\\_sites\\_use\\_flash/](http://www.flashmagazine.com/news/detail/how_many_sites_use_flash/))<sup>3</sup>
    - Flash-based web sites include YouTube, MySpace, Fedex, Reuters, Business Week, LA Times (see <http://trends.builtwith.com/framework/Shockwave-Flash-Embed>)
    - 4 of 5 major browsers (Firefox, Opera, Safari, Chrome) assist users in obtaining and updating the Flash plug-in by way of notification, guidance, or automation

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<sup>1</sup> The Fedora Commons Community Software Registry lists no Flex/Flash technology-based projects implemented or in development.

<sup>2</sup> SWORD is an emerging open standard for depositing content in repositories. It reduces software development requirements for the staff/admin software components.

<sup>3</sup> Flash installations far exceed the JAVA runtime environment on user PCs and Macs. Therefore USF rejected building a JAVA-applet-based interface.

- No third-party software licensing or support fees
- Supports PURLS maintained by the FCLA PURL server, a flexible and intuitive persistent identifier schema<sup>4</sup>
- Utilizes the Web 2.0 application hybrid --“Mashup” -- concept (see [http://en.wikipedia.org/wiki/Mashup\\_\(digital\)](http://en.wikipedia.org/wiki/Mashup_(digital)))
- Maximizes faculty and staff involvement in digital collections curation by permitting multiple avenues for collaboration (LibGuides, exhibition software)
- Robust user communities exist for Fedora Commons, Flash, and Flex Builder
- Reuses existing tools (e.g., OCLC Connexion), where feasible
- Increases staff efficiencies by integrating into one location (the LibGuide) collection information heretofore maintained in several locations (DAMS, multiple collection pages)
- Resides on USF IT virtual servers, thereby reducing Library cost and staff responsibilities for operating system administration
- Use of a standards-based, open-source software repository system effectively positions USF for future platform migrations
- Supports METS as a dissemination information package (DIP) for ebooks<sup>5</sup>
- Enhances XML support, a universal standard for metadata creation<sup>6</sup>
- Permits use of a test server to continue development activities
- Improves user experience by enabling all collection information, regardless of format, to be collocated in a single LibGuide that:
  - Provides access to digital objects
  - Identifies the research value, provenance, etc. of the collection(s)
  - Includes supporting materials that contextualize the collection(s)
  - Provides access to and consistent information about the collection(s)
  - Allows patrons to locate all content at a single URL<sup>7</sup>
- Offers more robust access and management APIs to support external interfaces than DSpace<sup>8</sup>
- Permits social/collaborative tagging to increase intellectual access<sup>9</sup>
- Permits assessment and patron feedback through integrated survey tools (LibGuides and RightNow)

### C. Weaknesses

- Requires a browser plug-in<sup>10</sup>

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<sup>4</sup> DSpace uses CNRI Handle system rather than PURLS.

<sup>5</sup> DSpace does not support METS as a DIP.

<sup>6</sup> CORAL enables the manipulation, transformation, and extraction of digital object metadata (including MARCXML) for inclusion in a wide variety of other applications. CORAL metadata may be seamlessly transferred to proprietary or open-source search engines intended to create a federated search of all USF resources.

<sup>7</sup> Available DSpace web user interfaces will not integrate with USF’s desire for a format-neutral/integrated collection page, accessible from a single URL.

<sup>8</sup> Adoption of DSpace would require development of JAVA servlet-based components to support the CORAL interface. Fedora Commons includes the APIs required.

<sup>9</sup> See <http://en.wikipedia.org/wiki/Folksonomy>.

<sup>10</sup> Flash player is near universally installed and is widely considered ubiquitous on Internet-enabled PCs, Macs, and handheld devices (see Strengths, above).

- Flash installation and updates not seamless in Internet Explorer browser<sup>11</sup>
- No PDF plug-in for Mac computers (universal issue)
- Lengthy learning curve for USF Libraries IT staff during initial development phase<sup>12</sup>
- Limited vendor support
- No other known implementation of Fedora/Flash/LibGuides

#### D. Opportunities

- Cost savings:
  - No annual maintenance contract or per-object loaded license fees
  - Reduced hardware costs – migration to university virtual servers
- Without object loaded license fees and with large server capacity, USF enjoys a virtually limitless ability to add content to the DAMS and increase digital collection partnerships
- Greater flexibility for future migration to new platforms
- Leadership within DuraSpace/Fedora Commons and LibGuides user communities
  - Add the CORAL user interface to the Fedora Commons Community Software Registry and offer it as an open-source solution to Fedora users
  - Create CORAL user community
  - Share DigiTool-to-Fedora migration tool
  - Publish and present CORAL internationally
  - Showcase CORAL to LibGuide users
- Participate within Flash user community
- Adopt “Gordon” (an alternative Flash player) in order to create access to CORAL on the iPhone (see <http://apcmag.com/Content.aspx?id=5078>)<sup>13</sup>
- Increased librarian involvement and input during the development phase should increase collection familiarity and interface proficiency, thereby translating into greater digital collections use during reference transactions and instruction
- Increased patron satisfaction and collection use
- Enable patrons through social/collaborative tagging to improve collection description and access
- Use patron feedback and assessment to improve CORAL functionality

#### E. Threats

- Limited succession planning for Library IT staff  
Solution:
  - Partner with USF IT to identify personnel succession plan
  - Document IT coding and processes
- Lack of control over external software products  
Solution:

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<sup>11</sup> The Safari, Firefox, Chrome, and Opera browsers do assist users with obtaining and updating the Flash plug-in. The USF Libraries will recommend these browsers to patrons viewing digital content.

<sup>12</sup> Knowledge gained in developing CORAL has advanced development of other Libraries applications (e.g. Bull-OH-Base).

<sup>13</sup> Adoption of Gordon is predicated on Apple’s continued refusal to support Adobe’s Flash Player. Recent reports suggest that Apple and Adobe are working to resolve this impasse. USF Libraries IT staff has begun work to make digital assets available on the iPhone.

- Monitor Flex/Flash Builder product lifecycle plans and participate in user community<sup>14</sup>
- Monitor DuraSpace product plans for Fedora and DSpace and participate in user community
- Prepare plan to utilize alternative Flash development tool<sup>15</sup>
- Prepare plan to convert LibGuide XML backups to new content management system (USF Library-wide issue)
- CORAL DAMS resides on non-Library-owned servers  
Solution:
  - Maintain a Library-owned test server that can be utilized as the live server

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<sup>14</sup> Given the staggering amount of video content offered on sites such as YouTube, it is nearly impossible that Adobe product lifecycle activities affecting its Flash player would occur without extensive publicity and lengthy advance warning. USF would have considerable time to select a Flash alternative (e.g. Microsoft SilverLight, see <http://www.microsoft.com/SILVERLIGHT/>).

<sup>15</sup> With the release of Adobe's Flash Builder 4, the company has solidified its commitment to the Flash brand and its development environment. In the highly unlikely event that Adobe withdraws its Flash development tool, USF could adopt an open-source Flex software development kit (SDK), which has command-line tools to compile Flash applications. Further, USF could adopt DSpace as a digital asset management system, adopt just the user interface, or use just the object deposit module.