White Paper Report

Report ID: 98484

Application Number: HD5047308

Project Director: Michael Spalti (mspalti@willamette.edu)

Institution: Willamette University

Reporting Period: 9/1/2008-1/31/2011

Report Due: 4/30/2011

Date Submitted: 5/3/2011

Bridging the Gap: Connecting Authors to Museum and Archival Collections

Level II Digital Humanities Startup Grant
Willamette University

Michael Spalti, Project Director, Mark O. Hatfield Library
Jonathan Bucci, Collections Curator, Hallie Ford Museum of Art
Roger Hull, Senior Faculty Curator, Hallie Ford Museum of Art
Mary McKay, Willamette University Archivist, Mark O. Hatfield Library
Elizabeth Garrison, Curator of Education, Hallie Ford Museum of Art

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I.   Brief Project Summary

This project bridges the gap between authoring software used to create digital scholarship and repository software used for preservation, search and retrieval of digital assets. It is a collaborative effort by software developers, museum curators, archivists and scholars to build one particular kind of bridge between multimedia authorship and digital collections.

Project outcomes include:

- a search and asset retrieval plug-in for a digital repository system widely used in higher education (CONTENTdm);
- integration of this search and retrieval plug-in with an authoring tool (Pachyderm 2.0) and other software applications; and
- a multimedia presentation on Carl Hall, a major artist in the Pacific Northwest, who first attracted national attention as a Magic Realist in the 1940's.

The project originally called for implementing a CONTENTdm plug-in with Pachyderm 2.0, but anticipating a new, updated version of the authoring software soon became a priority. While Pachyderm 2.1 development was underway, we also enjoyed a productive and unexpected collaboration with Cynthia Walters at the University of Virginia. Cynthia was working on an experiment in integrating Pachyderm 2.0 with the Sakai learning management system and had joined the Pachyderm development team as the contributor of updated repository plug-in support.

Although Pachyderm 2.1 was eventually released in October of 2010, repository plug-in support is not included in the public version. We nevertheless achieved project goals and played a modest role in Pachyderm 2.1 development efforts by implementing the University of Virginia Pachyderm 2.1 plug-in support at Willamette University and sharing what we learned with California State University Center for Distributed Learning (CDL), which now leads the Pachyderm development effort.

With assistance from the Willamette University Archives and Mark O. Hatfield Library, Jonathan Bucci, Collection Curator at the Hallie Ford Museum of Art, and Roger Hull, Professor of Art History and Senior Faculty Curator, also completed work on the multimedia project, *Carl Hall: Oregon Master*. This online exhibit combines images of artworks drawn from the Hallie Ford Museum of Art Northwest Art Collection and documents from the University Archives Pacific Northwest Artists Archive. The online exhibit is published on the new museum website and will serve as the model for future multimedia projects that utilize Pachyderm 2.1 authoring and our museum and archival online collections.

Happily, we have also seen meaningful adoption of Pachyderm by students documenting past museum exhibits. Beyond the classroom, two students are working on Willamette University-funded research projects that will culminate in Pachyderm multimedia presentations.

II.   Project Background and Objectives

Beginning in the fall of 2007, staff from the Hallie Ford Museum of Art, Willamette University Archives and Mark O. Hatfield Library met regularly over several months to discuss ways to deepen collaboration on digital asset management. Initially, these conversations focused on strategies to grow digital collections and improve procedures for joint management. However, the team quickly identified the need for an authoring tool that would help art historians, museum staff and archivists craft a variety of online exhibits and other interactive programs.

 We soon discovered that, as a member of the New Media Consortium (NMC), Willamette University had supported the creation of Pachyderm 2.0, an open source multimedia authoring tool developed under the direction of the NMC and the San Francisco Museum of Modern Art and funded in part by an Institute of Museum and Library Services grant. We learned that although Pachyderm 2.0 maintained its own internal database of digital assets, it also supported Open Knowledge Initiative Open Service Interface Definition (OSID) plug-ins. These repository plug-ins make external content accessible from within the Pachyderm authoring environment—for us, a significant advantage. Repository plug-ins already existed for DSpace and Fedora repositories. No repository OSID plug-in existed, however, for CONTENTdm, the primary software used by Willamette University and many other institutions.

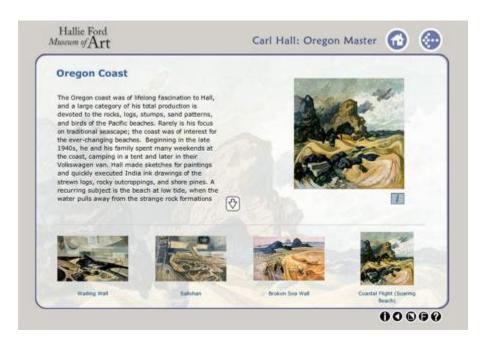These observations lead to the following project goals:

1. develop a plug-in for CONTENTdm using the Open Service Interface Definition and the CONTENTdm PHP programming interface;
2. implement this plug-in in the open source Pachyderm 2.0 authoring environment and a local instance of CONTENTdm;
3. explore the effectiveness of this integration for furthering museum and archives outreach programs and for sharing scholarship on Pacific Northwest regional artists;
4. investigate the potential use of this integrated platform in the humanities curriculum of Willamette University; and
5. explore use of the OSID repository interface with software applications in addition to Pachyderm 2.0, as well as the potential for collaboration with other colleges, universities, and consortia.

III.   Project Outcomes

The highlights are summarized below.

1. **The CONTENTdm OSID:** By January, 2009, the OSID repository plug-in was completed and tested using several OSID-enabled applications. One of our consultants, Jeffrey Kahn of Verbena Consulting, contributed to this effort and facilitated testing with applications other than Pachyderm 2.0. The new repository

service requires both a Java plug-in for OSID-enabled applications like Pachyderm and support code developed using CONTENTdm's PHP API. The PHP support code includes configuration options identified as useful during testing.

2. **Pachyderm 2.0/2.1 Integration:** By June, 2009, the CONTENTdm OSID plug-in was installed and tested in a Pachyderm 2.0 instance at Willamette University. By March, 2011, the plug-in had been installed and tested in Pachyderm 2.1, providing access to both user-uploaded media and assets retrieved directly from CONTENTdm. Although plug-in support is not currently available in the public Pachyderm 2.1 binary release, Willamette University revisions to enable plug-in support are under review by Pachyderm developers at the CDL.

3. **The Carl Hall Exhibit:** Jonathan Bucci, Collection Curator at the Hallie Ford Museum of Art, and Roger Hull, Professor of Art History and Senior Faculty Curator, created an online Flash exhibit on the Pacific Northwest artist, Carl Hall. Entitled *Carl Hall: Oregon Master*, this online exhibit combines images of artwork from the Hallie Ford Museum of Art Northwest Art Collection and documents found in the Pacific Northwest Artists Archive, managed by the Willamette University Archives.
Carl Hall was a prolific Northwest artist whose work was featured in a 1948 issue of *Life Magazine* and shown nationally and regionally for decades. He taught painting, printmaking and composition at Willamette University from 1948 until 1986.   The *Carl Hall: Oregon Master* online exhibit is featured on a newly re-designed museum website.

The collaboration between the Hallie Ford Museum of Art and the Willamette University Archives focuses on the historical record of regional artists and benefits from shared infrastructure for managing collections and producing digital content. Both museum and archives staff use CONTENTdm as their digital repository and will

develop future outreach and educational materials using Pachyderm and content drawn from online collections. It is worth noting that final revisions of the Carl Hall multimedia project used our new ability to access CONTENTdm within the Pachyderm 2.1 authoring tool.

4. **Use in the Curriculum:** In 2010, groups of students under the direction of Professor Rebecca Dobkins were asked to plan and storyboard a Pachyderm-based multimedia presentation for a 2005 museum exhibition, *Toi Maori: The Eternal Thread.* This exhibition of contemporary Maori weaving was important in the history of the museum and in the creation of significant cultural relationships between the Maori and Western Oregon tribes, especially Siletz and Grand Ronde. The student project documented both the *Toi Maori* exhibition and the extensive programming that occurred at the museum during this event. Exhibition images will be organized and available in CONTENTdm and automatically scaled dimensions that Pachyderm can handle gracefully. Automatic image scaling will aid future student-authors of a published *Toi Maori* Pachyderm presentation.

5. **Other Applications:** The CONTENTdm OSID plug-in should work with any OSID-aware application. To date, it has been incorporated into the resource libraries of the Visual Understanding Environment (VUE) and SoftChalk authoring software for teachers.

IV.   Future Directions

CONTENTdm Repository plug-in

As mentioned earlier, the current repository plug-in requires two quite separate components. The first is the Java plug-in itself, which resides with Pachyderm. The second is PHP code that runs on the CONTENTdm server and exposes digital assets to OSID-aware applications. The latest release of CONTENTdm includes changes that will fundamentally alter this approach: a new RESTful architecture should allow us to retool the Java plug-in to interact directly with a native CONTENTdm web service. That work completed, local CONTENTdm sites will no longer need to install the PHP code developed in this project.

Retooling the Java plug-in will effectively allow any OSID-aware application (e.g. VUE, SoftChalk, Pachyderm, etc.) to access virtually any CONTENTdm repository. This is the kind of many-to-many possibility that we hoped to achieve at the outset. We are currently exploring the possibility with OCLC.

Pachyderm

The recent Pachyderm 2.1 release is a significant accomplishment and those involved in the effort are to be congratulated. Pachyderm 2.1 benefits organizations and classroom

settings by providing a simple, template-driven, Flash authoring tool. For those with Flash experience, Pachyderm can be customized to meet local needs.

The development of Pachyderm 2.1 continues, albeit slowly, including experiments with HTML5 versions of Pachyderm templates for non-Flash devices like the iPad. Clearly, from the standpoint of this project, inclusion of OSID support in a future binary distribution of Pachyderm would be most welcome. When and if OSID support becomes a standard feature of Pachyderm 2.1, an intriguing enhancement would be an editing screen for optionally selecting an image detail with consistent, pre-defined height and width dimensions. This cropping feature is currently not part of Pachyderm but might be implemented using the CONTENTdm OSID plug-in and the CONTENTdm image libraries (or other image services like djatoka).

Museum and Archives Collaboration and Outreach

The integration of Pachyderm authoring with Willamette's growing online museum and archival image collections will streamline efforts to create online exhibits like *Carl Hall: Oregon Master*. This initial, positive experience makes it easier to continue down the path of creating multimedia presentations for permanent museum collections and past exhibits like *The Art of Ceremony: Regalia of Native Oregon*, which was selected by the Oregon Arts Commission as the state's 2008 American Masterpieces project and is the subject of a current student Pachyderm project (discussed below).

Automatic image scaling is significant feature for would-be multimedia authors. Not only does the CONTENTdm OSID plug-in bring images and metadata to the author's fingertips, it also converts images from JPEG2000 format to JPEG and scales these images to the optimal size for Pachyderm presentations.   This eliminates a sometimes significant barrier to student and staff use. We believe this will be particularly useful in the case of student projects.

Moreover, the new release of Pachyderm should make it easier to customize and share templates with other museums. For example, the potential for easier collaboration may revive an earlier conversation that the Willamette team had with the Seattle Art Museum regarding their customization of Pachyderm templates.

Finally, on a related front, the PHP code developed in this project has allowed the University Web Development team to feature images from art collections on the new Hallie Ford Museum of Art website. Simply by editing item records in CONTENTdm, images are selected for display by museum staff. This capacity may be offered to other departments as the Willamette University website continues to evolve.

Faculty and Undergraduate Use

We are excited that this project has directly benefited students. As noted, in 2010 a group of students developed Pachyderm storyboards for a past museum exhibit, *Toi Maori: The Eternal Thread.* The student project leader is currently in New Zealand

(funded by an internal University research grant) conducting video interviews with some of the artists who were part of the exhibition. On return, she will include that video, along with photos from the 2005 exhibition, in a finished Pachyderm project that will be completed during a museum internship in fall semester 2011.

In addition, the Willamette University Center for Ancient Studies has provided funding to a student to create a Pachyderm project for *The Art of Ceremony: Regalia of Native Oregon* exhibition. Previously, in a museum studies class, this student organized photos of the exhibit and created a small, on-campus, physical exhibition.

Other Spin-Offs

The PHP support code developed for this grant was extended to support advanced search and other CONTENTdm features. This allowed us to use Google Web Toolkit to develop an AJAX application for CONTENTdm. Initial conversations with OCLC suggest that we will be able to retool the AJAX application to for the new RESTful API.

V.   Evaluation

Thus far, the integration of Pachyderm and CONTENTdm has been useful at Willamette University and we believe it will continue to yield benefits. There may also be benefits from integration with applications like SoftChalk and VUE, although we have not yet seen this in our setting.

Using VUE as the sample application, we earlier shared our project code with two other colleges and tested against their CONTENTdm data. We also presented early results at a Code4Lib meeting, again using VUE. Although there was interest in the novelty of seeing VUE and a local CONTENTdm repository working together, we are not aware of anyone using the CONTENTdm plug-in, which has been available for download for over a year now. It should be noted that we have not advertised Pachyderm integration, which may be the most compelling use case that we can offer to libraries and museums using CONTENTdm.

One reason for limited adoption of the plug-in is certainly the need to install additional PHP code on the CONTENTdm server. If this barrier can be removed, it will be possible for local sites to simply use and evaluate an OSID-aware application against their local data without the need, or the knowledge required, to download and install local PHP support. This will also make it easier to market the solution to the CONTENTdm user community.

A second reason for limited adoption of the plug-in at other campuses may be a lack of compelling and well-known OSID-aware applications. One must consider the possibility that the OSID repository plug-in strategy has failed to gain sufficient traction in the open source developer community, with the result that too few applications use the OSID model as an integration strategy. Integrating data and functionality is a formidable challenge, and OSID's do offer a useful, and reusable, way for developers to meet the challenge. It's not clear, then,

whether the problem, if indeed one exists, is the OSID technology itself, competition from simpler, ad hoc approaches to integrating content and applications, or a general lack of resources committed to the problem of interoperability.

Even so, we believe that the integration we achieved between Pachyderm 2.1 and CONTENTdm has significant benefits. It should be noted that Willamette University is among the liberal arts colleges nationally to have an active and successful art museum. This may in part explain why the Pachyderm 2.1/CONTENTdm combination appears to work here. Sharing the results of our project – particularly if a new release of Pachyderm 2.1 includes OSID plug-in support – should tell us more about the value of this effort to others.

VI.   Impact on the Digital Humanities

The aim of this project is to facilitate new forms of scholarship and learning by seamlessly integrating humanistic tools and data. This is a central problem in advancing the digital humanities. To cite one example, Project Bamboo identified it as a key challenge and located it at the heart of the current Mellon-funded Bamboo Technology Project. Bamboo's proposed research environments "can be used by humanities researchers to store and organize sets of digital content, e.g. text, images, video and audio; to create, maintain, and search rich metadata about this content; to annotate and analyze content; and to accomplish these through collaboration with other scholars."

In contrast to the "Big Humanities" approach pursued in Project Bamboo, the goals of this project are strikingly modest -- and also illustrate the difficulty of this kind of effort. Content interoperability requires multifaceted solutions that draw on a common set of standards and techniques implemented across multiple platforms. This is not easy to do. Many worthy software projects struggle to maintain the basic functionality needed by users. For these projects, support for content interoperability is a daunting hurdle to clear, despite obvious benefits.

Even so, there is a reasonable chance that the tool and content integration realized at Willamette University will be extended to a wider audience. The soon-to-be-released CONTENTdm RESTful API should be an automatic enabler of wider interoperability, since institutions that have local CONTENTdm instances will also have their data exposed through a web service without additional code or configuration on their part (however simple this may be, it remains a barrier). Retooling the CONTENTdm repository OSID for interaction with the new RESTful API would make a wealth of data available to OSID-aware applications.

We have also demonstrated that with few modifications the OSID support code developed at the University of Virginia does work as intended with Pachyderm 2.1. The team responsible for Pachyderm 2.1 development will need to make the final decision on when and how this capacity is enabled in a new Pachyderm release, but the fact that they can use the Willamette Pachyderm site and see repository integration enabled -- and read detailed information on how we made this happen -- should speed their efforts. The work involved is not prohibitively difficult, but it will require a decision to allocate the necessary staff resources. We will gladly provide any assistance we can.

The technical challenges that we encountered are only recently overcome and we have not had the opportunity to share the project results widely. Hopefully, the story will soon include a "you can do this, too" pitch as work progresses on Pachyderm 2.1 and as the CONTENTdm Java plug-in is retooled for the new RESTful API. We are excited that stories of undergraduates and pedagogical outcomes are also a part of what we will share.

VII.   Links

Carl Hall multimedia presentation:
http://libmedia.willamette.edu/MUSEUM/CarlHallOregonMaster3/

Hallie Ford Museum of Art:
http://www.willamette.edu/arts/hfma/

CONTENTdm OSID Source Code:
http://projects.oscelot.org/gf/project/cdmosid/scmsvn/?action=AccessInfo

Project Download and Documentation Page
http://libmedia.willamette.edu/acom/neh/

Pachyderm 2.1:
http://www.pachyforge.org/