

Stephen F. Austin State University

SFA ScholarWorks

---

Library Faculty and Staff Presentations

Ralph W. Steen Library

---

4-28-2014

## Content Management Systems and 3D Models: Creation, Interaction and Display

Dillon Wackerman

*Stephen F. Austin State University*, [wackermad@sfasu.edu](mailto:wackermad@sfasu.edu)

Ashley Thompson

*Stephen F. Austin State University*, [thompsonashle3@sfasu.edu](mailto:thompsonashle3@sfasu.edu)

Follow this and additional works at: <https://scholarworks.sfasu.edu/libfacpres>



Part of the [Archival Science Commons](#), [Historic Preservation and Conservation Commons](#), and the [Scholarly Communication Commons](#)

Tell us how this article helped you.

---

### Repository Citation

Wackerman, Dillon and Thompson, Ashley, "Content Management Systems and 3D Models: Creation, Interaction and Display" (2014). *Library Faculty and Staff Presentations*. 10.

<https://scholarworks.sfasu.edu/libfacpres/10>

This Presentation is brought to you for free and open access by the Ralph W. Steen Library at SFA ScholarWorks. It has been accepted for inclusion in Library Faculty and Staff Presentations by an authorized administrator of SFA ScholarWorks. For more information, please contact [cdsscholarworks@sfasu.edu](mailto:cdsscholarworks@sfasu.edu).

# Content Management Systems and 3D Models

Dillon Wackerman, Ashley Thompson

Stephen F. Austin State University

wackermad@sfasu.edu

## Project – Beginning

- Approached by Dr. Zack Selden of the Center for Regional Heritage Research (CRHR) in October 2013
- Dr. Selden is an archaeologist with a specialization in East Texas Native American cultural objects, specifically Caddo ceramics
- Part of his work with Caddo ceramics involves morphometrics, a project attempting to track the changes of particular shapes, designs and features of ceramics



Kasi Dickerson, 2014

## Project – Beginning

- To gather the information for the morphometric analysis, Dr. Selden made 3D scans at the item level
- A 3D scanning lab had been setup in the CRHR for several years
- The setup
  - Zscanner 700CX
  - VX Elements
  - Geomagic
- The process ...



Robert Z. Selden, 2014

## CRHR: Archaeology

- Initially, the main file format he was outputting for display was .icf, which caused several difficulties in that IE, or another Microsoft product, was necessary
- This format was one of potentially many that could be used, and it was soon revealed that we were going to need to find more compatible formats

- .blend
- .dae (Collada)
- .obj (Wavefront - open)
- .vrml, .wrl (VRML - open)
- .icf
- .mesh
- .prc, .u3d (Adobe/PDF)
- .x (Direct X)
- .lwo, .lws (Light Wave)
- .3ds
- .max (3DS Max)
- .xgl
- .x3d (post VRML)
- .skp (SketchUp)
- .ply
- .ai (Illustrator)
- .3dm, .3dmf (Apple)
- .w3d
- .dxf (AutoCAD)
- .stl (stereolithography CAD)
  
- *Often treated as import/export formats*
- *And, of course, data for a given model can be divided across several formats, considering color mapping and other functions*

## Initial Goals – CONTENTdm

- Dr. Selden wanted a layout similar to that found for individual items in tDAR
- His goal was to combine in a single location the 3D model, metadata and all accompanying files
- Dr. Selden was familiar with CONTENTdm, which he wanted to use for his project, feeling that the display was approximate to that found in tDAR
- My response as to the possibility should have been “no”, but it wasn’t

## Record (tDAR): Preservation for


goal is to expand dramatically  
g., archives and collections;  
theoretical studies (Digital  
for digital archaeological data.

through a web interface users  
and organizations may  
documents and creating  
to adhere to a set of conditions  
documents and data sets. The  
develop interpretations and  
broader access also enhances the



### Downloads

1

 2010-csa-newsletter\_-  
digital-antiquity-  
and-tdar.pdf  
(243.84kb)

### Basic Information

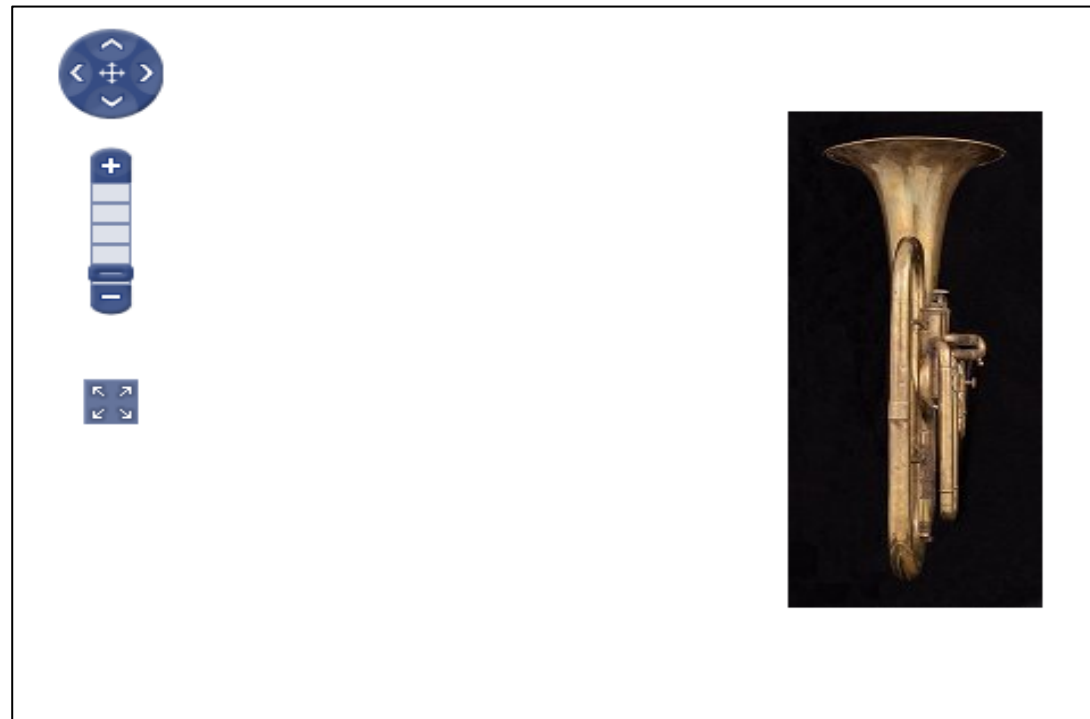
**RESOURCE PROVIDER**  
Center for Digital Antiquity

**SERIES NAME**  
The CSA Newsletter

**VOLUME**

## CONTENTdm & Existing 3D Collections

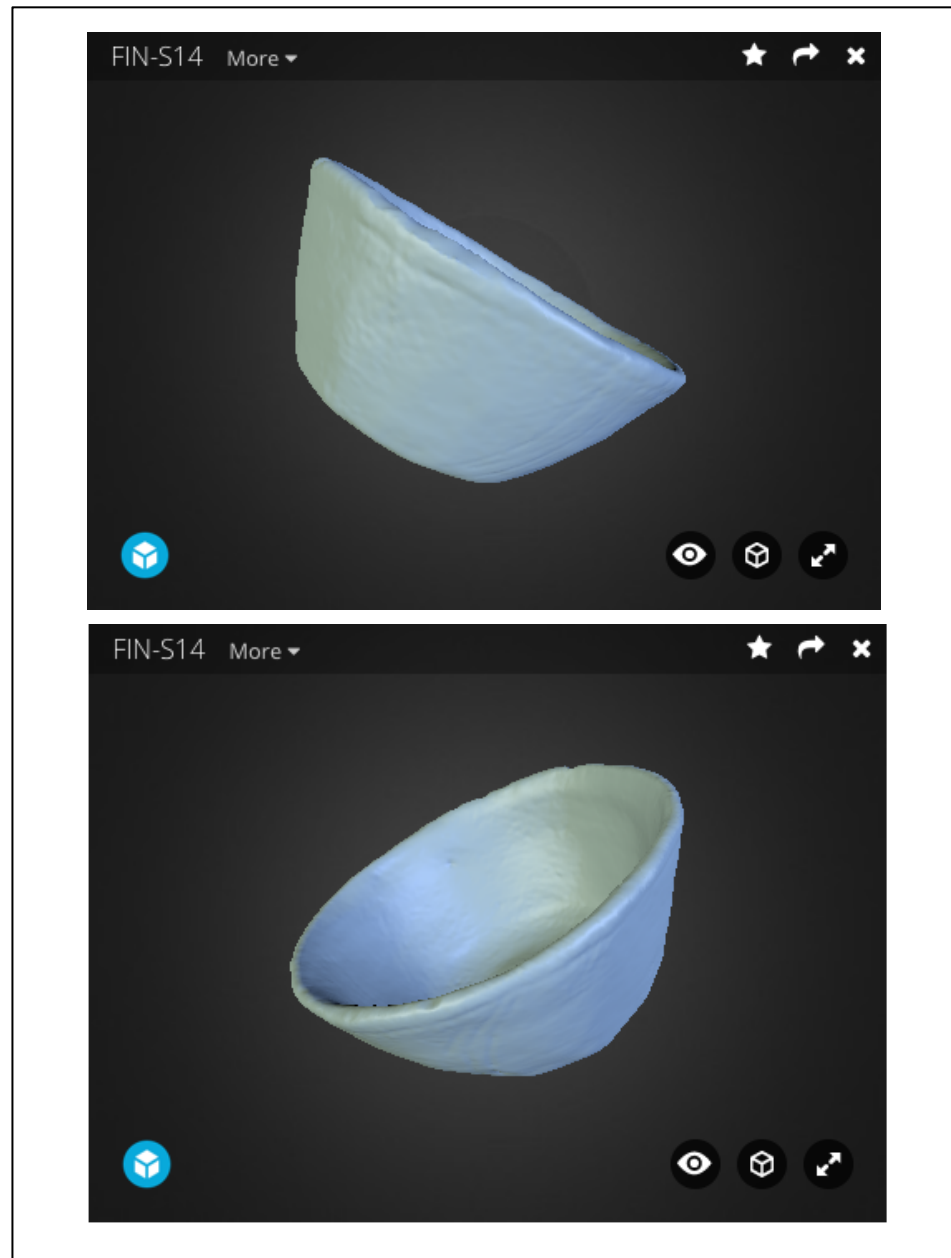
- Knowing that Dr. Selden wanted to use CONTENTdm – and thinking at the time of it being the only option then available – I did a search for related collections
- I did find a CONTENTdm collection advertising 3D images, yet what I found was really 2D representations of 3D objects



University of Illinois at Urbana-Champaign. Sousa Archives and Center for American Music. Reference URL: <http://imagesearch.library.illinois.edu/u/?sousa,1829>

## 2D Representation vs. 3D Model

- The 2D representation does possess shading and lighting effects which give it representative features of a 3D object
- Yet, a 3D model, displayed online, should (or must) exist alongside a set of tools or functions
- The main for us being rotational (made possible through build up of polygons/triangles), which allows the possibility of any viewpoint of the model – additional: zoom, color mapping, lighting/shading





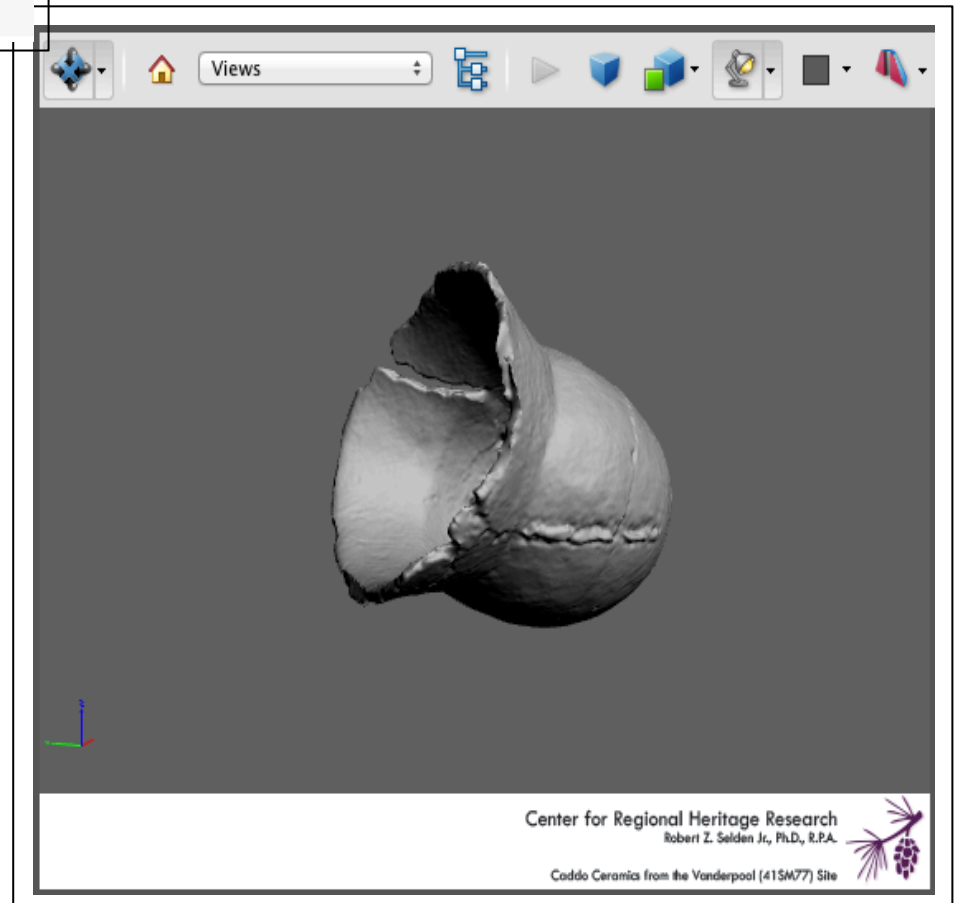
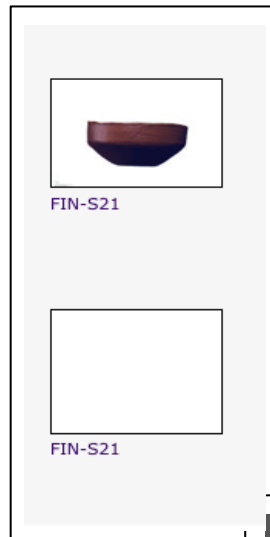
## CONTENTdm – PDFs

- While most file formats can be uploaded to CONTENTdm, this of course does not guarantee display
- Yet, as seen earlier, PDF can be associated with 3D models – really the embedding of a format – and PDFs can be uploaded to CONTENTdm
- We were able to successfully upload PDFs with embedded 3D models, yet some issues were presented: in every instance, the rotational tools did not transfer, only displaying a 2D representation



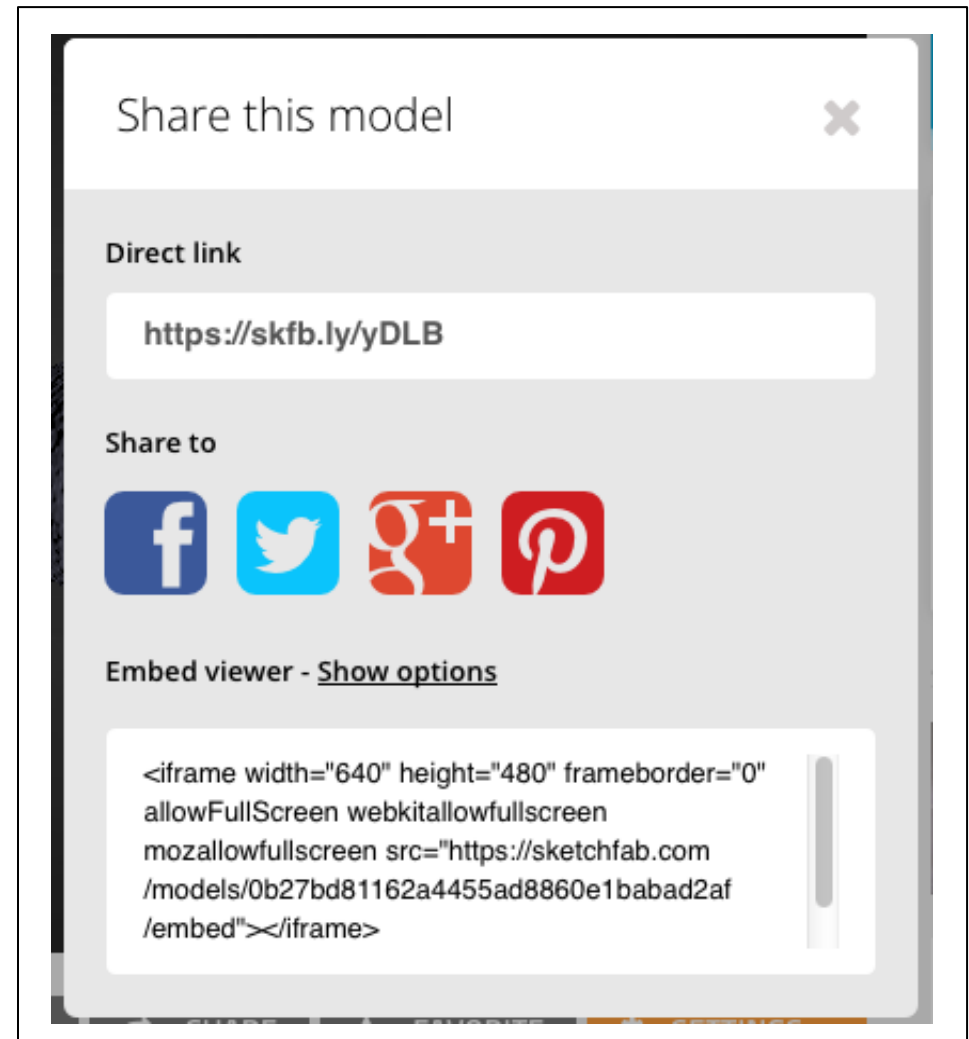
## CONTENTdm – PDFs

- In most instances, due to browser versions or types, the 2D representation would not even display
- Nevertheless, in some instances, the PDF could be downloaded from CONTENTdm, opened in Acrobat and the rotational tools would transfer
- This method was used for two to three weeks, with a tutorial being posted on the CRHR: Archaeology blog
- Ultimately, though, the inefficient and cumbersome means to access prompted us to move on
- We have however not taken down the 3D PDFs, and are still working on issues of display



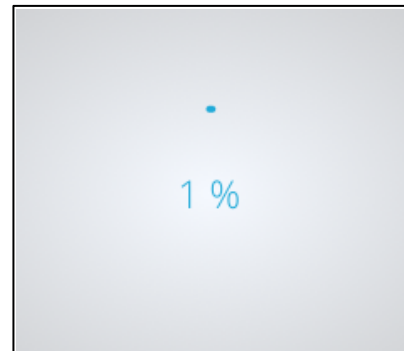
## External Viewer(s) – SketchFab

- We turned next to using an external viewer
- Options: flash, java applet, browser plugin (vrmf), Blender, Unity3D, sculpteo, others
- Ultimately chose SketchFab
- Other projects might require other applications, but we chose this for ease of use, upload and compatibility
- SketchFab process is relatively simple and an account is free; supports over 25 formats, including OBJ and VRML
- Easily embedded via iframes/direct link



## CONTENTdm – SketchFab – Embed/Load Time Issues

- Dr. Selden had, at the time, around 35 models to upload, with an expectation of at least doubling that number
- Even with embedding 2 or 3 models per page, we were still expecting 20+ custom pages in CONTENTdm – with embedding 2 to 3 models per page being a compromise that had yet to be raised with Dr. Selden (diverging from the tDAR ideal)
- Also, in test runs, with the inclusion of just 5 custom pages, each with an individual model embedded, a lag load times were significant
- Another drawback, for Dr. Selden and likely any other researcher, is that the files are hosted on SketchFab’s server – the company does state that all files are private, but potential issues remain



## ScholarWorks

- Streaming Media field (not activated out of the box), located in the user/admin submission page
- Through this field, a variety of formats/platforms are supported for embedding into documents, series and community pages – via embedly
- There is an additional option for “Other rich media”, supporting a SketchFab “direct link” – here: <https://skfb.ly.yDLB>
- Iframes are not supported in ScholarWorks (the list of supported tags being fairly minimal)

### Streaming Media

To display streaming audio or video with your submission, **enter the link to the file** below and **select the format** of the file from the drop-down list.

Enter the link to your remote media file:

<https://skfb.ly.yDLB>

Select media format:

Flash/HTML5 Audio (m4a,mp3)

Flash/HTML5 Video (flv,mp4,RTMP)

QuickTime Audio (aac,aif,mid,midi,mov,wav)

QuickTime Video (3g2,3gp,mov,mpg,mpeg)

RealAudio (ra,ram)

RealVideo (ram,smi,smil)

SWF Format (swf)

Windows Media Audio (wma)

Windows Media Video (avi,wmv)

Vimeo

YouTube

Other rich media


## ScholarWorks

- We were still confronted with the issue of file security – including in this instance the addition of Bepress/Digital Commons as a host, along with SketchFab
- Yet, page load times were not affected by the number of models upload (around 20+) as of this presentation
- Additionally, ScholarWorks gives Dr. Selden stats specific to these models and provides other tools already in place
- Perhaps more important, the SketchFab/ScholarWorks workflow can be entirely user-directed

### Vanderpool Vessel FIN-S14

[Robert Z. Selden Jr.](#) [Follow](#) [Link to Full Text](#)

SHARE [f](#) [t](#) [in](#) [8+1](#) [e](#) [+](#)



FIN-S14 More ▾ ☆ ↻ ×

**Document Type**  
Article

**Publication Date**  
2014

**Abstract**  
3D model of Vanderpool vessel FIN-S14 (Caddo). More information on this vessel can be found [here](#) or by accessing the "Full Text" link above.

**Recommended Citation**  
<http://digital.sfasu.edu/cdm/ref/collection/CRHR/id/2610>

## ScholarWorks + CONTENTdm

- Currently all original metadata, numbering about 55 fields, is in CONTENTdm along with various images and reports
- One of the 55 fields links to ScholarWorks and individual 3D models
- The good:
  - Distributed workload
  - User-friendly/Set workflow/submission form
- The bad:
  - Distributed workload
  - Access
  - File security

The screenshot shows the ScholarWorks interface for the Center for Regional Heritage Research. The main content area displays a 3D model of a vessel with a play button overlay. Below the model, a metadata table is visible. The left sidebar contains navigation options like 'Browse', 'Search', and 'Authors Corner'.

<b>Document Type</b>	Article
<b>Publication Date</b>	2014
<b>Abstract</b>	3D model of Vanderpool vessel be found <a href="#">here</a> or by accessing th
<b>Recommended Citation</b>	<a href="http://digital.sfasu.edu/cdm/ref/coll">http://digital.sfasu.edu/cdm/ref/coll</a>

<b>Identifier</b>	Vanderpool_FIN-S21
<b>3D Imagery</b>	<a href="http://scholarworks.sfasu.edu/crhr/21">http://scholarworks.sfasu.edu/crhr/21</a>
<b>Site Name</b>	Vanderpool
<b>Trinomial</b>	41SM77
<b>Vessel</b>	2003.08.701/FIN-S21

## Solutions – Developments/Justifications

- We will have a staged instance of DSpace up sometime soon, and on this we will run through various templates for CRHR: Archaeology
- DSpace, or similarly open source repository, will likely bring us closer to the ideal that Dr. Selden – approximating the tDAR layout – originally intended
- Mobile Workflows
  - Project Tango
- Plugins/Support
  - Photoshop
  - Blender
  - Behance
  - deviantART
  - Unity
  - Portfolium/ALLYOU
- Direct Service
- Indirect Preservation (inclusion of 3D printer)
- Marketing
  - Visual content strategy
  - The dynamic online experience (3D approximation) demanded in product research – carryover