3D Printing for Scientific & Cultural Heritage Collections

Richard J. Urban, Ph.D.
rurban@fsu.edu
http://chi.cci.fsu.edu
@musebrarian
Background
Ridgway Brothers: Explorers, Scientists, and Illustrators

The artwork, correspondence, and research of the Ridgway brothers, John and Robert, late nineteenth century naturalists and illustrators of the American West.

Stats
- Items: 1,231,917
- Collections: 1,739
- Institutions: 1,494

Find us on Flickr

From the Sowing Culture blog
A Wealth of Knowledge
explore 7,701,227 items from libraries, archives, and museums

Search the Library

Exhibitions

Explore by Place

Explore by Date

Timeline

Apps

The DPLA is a platform. Developers make apps that use the library’s data in many different ways. Here are just a few. App Library

FindDPLA
Eric Phetteplace and Jake Orlowitz

DPLA Search Widget
Dean Farrell and Josh Wilson

News

Community Reps: A Handy Guide to Who They Are and What They Are Doing
Apr 28

Meet a Community Rep: Lavanda Wagenheim
Apr 25

All News

@dplaa on Twitter

Happening now: #IMLSFocus
http://goo.gl/ap6M8E

http://dp.la
1852 results for museum: Things

New Museum Cookie Cutter by NewMuseumChallenge
Sep 21, 2011
8 likes, 1 follower

Trilobite (P149623) by MuseumVictoria
May 20, 2013
43 likes, 31 followers, 0 comments

New Museum Maracas by beekeeper
Oct 31, 2011
2 likes, 1 follower, 0 comments

Cookie Cutter: Frida und ... by nischii
Dec 1, 2012
3 likes, 3 followers

TinyTaddy by AMNHeducation
Mar 17, 2014
21 likes, 17 followers, 6 comments

Art Museum by President909
May 16, 2012
0 likes, 0 followers, 0 comments
3D Printing Expectations

Innovation Trigger

Peak of Inflated Expectations

Trough of Disillusionment

Slope of Enlightenment

Plateau of Productivity

Plateau will be reached in:
- less than 2 years
- 2 to 5 years
- 5 to 10 years
- more than 10 years
- obsolete before plateau
“One of the most significant aspects of 3D printing for education is that it enables more authentic exploration of objects that may not be readily available to universities.”
3D Basics

- Plastic
- Powders
- Paper
- Ceramics
- Sugar
Consumer Level ($1200 – 3000)
Professional ($5000-20,000)
Library Makerspaces
Museums - Education
Museums - Education
Museums - Education
"Making" as Citizen Science

The Serious Leisure Perspective
(version February 2013)

Leisure

Casual Leisure

Project-Based Leisure

One-shot Projects

Occasional Projects

Serious Pursuits

Serious Leisure

Amateur

Volunteer

Hobbyist

Devotee Work

play

relaxation

passive entertainment

active entertainment

sociable conversation

sensory stimulation

casual volunteering

pleasurable aerobic activity

making/tinkering

liberal arts

activity participation

volunteering

arts projects

serious leisure

art

science

idea-based

making & tinkering

popular

material

activity participation

entertainment

floral

sports & games

faunal

liberal arts pursuits

environmental

Diagram formulated by Jenna Hartel
Serious Leisure Scale of Involvement

SLP Involvement Scale
(version February 2014)

Project-Based Leisure
Project participant

Neophyte || Participant || Moderate Devotee || Core devotee || Devotee Worker

Dabbler        Serious        Serious        Devotee
Casual Leisure Leisure Leisure Work

Notes:
• Level of involvement may peak at any point on this scale.
• Some dabblers and project participants never become neophytes.
• Some neophytes before their involvement neither dabbled nor participated in a project.
3D Printing Limitations

Ya canna change the laws of physics!
From 2D to 3D

What lessons from the last 20 years of 2D repository development are relevant for 3D?
- Need to build curriculum not just provide “resources.”
- Accommodating local contexts
- Need to build bridges across technology divides
- Need for user-centered research

How will we integrate 3D into 2D repositories?
- Motivations for integration?
- Already building new 3D silos.
- Interface requirements, etc. (human-computer interaction)

How do combined iDigBio collections fit into cross-domain public resources, like the Digital Public Library of America.
2D to 3D

- More than just a new file format
- Representation models
- Making relationships between views explicit
- Linking new 3D to previous 2D representations
- Linking imaging resources to publications
- Different models for different audiences
Credits

“DIG photographer Stephanie Mitchell at the digital camera workstation. An array of the technical targets we used to characterize our systems are evident in the foreground.” RLG DigiNews 4(6) http://goo.gl/4xHntE

Met Museum 3D Hackathon
http://goo.gl/n3YYvq

Pieta Reproduction by Rober Pahre
https://www.flickr.com/photos/rpahre/7196999710/in/photostream/

International Open Data Day Hackathon at Edmonton Public Library Makerspace https://flic.kr/p/kmYQnF

NY MakerFaire – Capturing Dinosaurs
http://makerfaire.com/makers/capturing-dinosaurs/

Art Mashup with Meshmaker
http://goo.gl/Z3G3QQ

These slides are available on Slideshare http://goo.gl/Vc6JBy

Smithsonian X3D – Lincoln Life Mask