This is not a test: Preserving AutoCAD Files at The University of Montana

Sam Meister
Maureen and Mike Mansfield Library

Digital Preservation Interest Group
ALA Midwinter 2013

January 27, 2013
Context
Born-Digital Workflow

Acquisition → Accession

Discovery & Access

Arrangement & Description
Acquisition Process

Donor Survey

Feasibility Assessment

Transfer Agreement
Date: 09/07/12
Donor Name: Joe Crabtree – Art & Architecture Studio
Location: Donor’s Residence – Missoula, MT
Accession #: 2012-061

Creation

Are you the only creator of your digital files? (e.g. does your collection contain email, documents, or other materials produced by others?)

Crabtree Leigland Arch. / Art & Architecture Studio / Crabtree Architecture

If not, who else is involved and what are their roles?

What are the earliest dates of file creation?

1996

What are the latest dates of file creation?

2011
Feasibility Assessment

Do we have resources to feasibly acquire, preserve, and provide access to the digital materials?

YES*

Size of collection (~1.4 GB)

Opportunity to explore preservation strategies for complex digital objects
Accession Process

1. Disk Image Donor Hard Drive
2. Package Disk Image and Documentation
3. Transfer to Secure Storage
AutoCAD Drawings - Characteristics

Proprietary

Undocumented*

2D drawings

3D models (simple)
AutoCAD Drawings - Formats

.dwg

Drawing
- Vector file
- Interoperable with other major CAD software

.dwf

Design Web Format
- Web-specific export for viewing files over the internet

.dxf

Drawing Interchange Format
- ASCII file
- Primary format for interoperability and exchange
Best Practices

Standards

Recommendations
FACADE
Future-proofing Architectural Computer-Aided Design
MIT Libraries
2006-2009
FACADE

CAD is Problematic

Highly volatile

Relies on proprietary mathematical algorithms

Packaged in complex, proprietary, rapidly evolving software products

Software is expensive, encrypted, and quickly obsolete
FACADE – Recommendations

Preservation Strategy

Generate derivative versions with greater long-term preservation potential than native formats
FACADE – Recommendations

Original = originally submitted version of CAD model

Display = easily viewable format for presentation (3D PDF)

Standard = Full representation in preservable standard format (IFC, STEP)

Dessicated = Simple geometry in preservable standard Format (IGES)
IFC = Industry Foundation Classes

STEP = Standard for Exchange of Product Model Data

IGES = Initial Graphics Exchange Specification
FACADE – Recommendations

AutoCAD Files

Original = AutoCAD DWG

Display = DWF, PDF

Standard = DWF

Dessicated = IGES
FACADE – Recommendations

Emulation is “a viable technical approach for preserving modern CAD software and data, but the issue of legal access to the software via license keys is a significant barrier”
Digital Archive for Architecture System (DAArch)
Art Institute Chicago
2003 – 2007
DAArch – Recommendations

Preservation Strategy

1. Bit-stream preservation of native CAD files
2. Generate derivative PDF / TIFF files
<table>
<thead>
<tr>
<th>First Tier</th>
<th>Second Tier</th>
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<tr>
<td>3ds Max (max)</td>
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<td>Surfware SURFCAM (.dsm)</td>
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AHDS – Recommendations

Suitable Preservation Formats:

DXF
IGES
STEP
Digital Preservation Coalition Workshop
Designed to Last: Preserving Computer Aided Design
2010

Participants:

Royal Commission on the Ancient and Historical Monuments of Scotland

Oxford Archaeology

Archaeology Data Service, University of York

DCC/UKOLN University of Bath
DPC Workshop – Recommendations

We need an open preservation format standard
Smithsonian Institution Archives
2010-2011
Digital Dilemma: Preserving Computer Aided Design (CAD) Files

by Greg Palumbo, Electronic Records Intern on December 1, 2011

As the record keepers of the Smithsonian’s past, our responsibilities include archiving information relating to the construction of Smithsonian museums themselves, and other building projects throughout the institution. Architectural plans for these jobs are primarily composed digitally using Computer Aided Design, or CAD, software. These born digital materials are eventually transferred to the Archives where the Digital Services Division is working on preserving them for long term use.

The Archives receives the majority of its CAD files in accessions from the Smithsonian’s Office of Facilities, Engineering, and Operations (OFEO). OFEO is in charge of building, operating, and maintaining all the Smithsonian facilities.
Smithsonian – Recommendations

Convert 2D drawings to PDF/E
Recommendations

1. Keep original native formats

2. Generate PDF format

3. Generate industry standards-based neutral formats (IFC, IGES, STEP)
Local Strategies
Local Strategies

MIGRATION

EMULATION
MIGRATION
MIGRATION

with Adobe Acrobat Pro

TESTED
MIGRATION

with AutoCAD*

NOT TESTED
MIGRATION

with AutoCAD*

NOT TESTED
MIGRATION

with AutoCAD*

NOT TESTED

DWG \rightarrow IGES
*AutoCAD may not be only option for migration
The development platform for engineering solutions

Introducing the ODA
Founded in 1998 as the OpenDWG Alliance, the Open Design Alliance (ODA) empowers its 1200 members worldwide to build engineering applications to effectively address the demands of their customers.

ODA members can quickly design, build and deliver specialist engineering applications using Teigha®, ODA's software development platform. Read more »

Introducing Teigha
 Designed by the ODA, Teigha® is available on all major operating systems. It supports the use of C++, .NET, and ActiveX interfaces and allows the exchange of data through .dwg, .dgn, .stl and .pdf files.

The ODA's expertise and its relationships with well-known third party component vendors enable it to continue enhancing Teigha for the benefit of its members. Read more »

Member Showcases using Teigha

- ZWSoft
- Informative Graphics
- Gräbert CAD Anywhere

News
ODA Announces Teigha® Version 3.8
Phoenix, AZ: December 19, 2012
Open Design Alliance (ODA) today announced the release of version 3.8 of Teigha, its software...
Read more

Spatial Corp and Open Design Alliance Announce Partnership
Phoenix, AZ, Broomfield, CO – December 12, 2012
Spatial Corp., the leading provider of 3D development components for design, manufacturing and...
Read more

ODA Announces Teigha Version 3.6
Phoenix, AZ: July 16, 2012
Open Design Alliance (ODA) today announced the release of version 3.6 of Teigha®, its software...
Read more

ODA consolidates support for .dgn and .dwg file formats in Teigha
EMULATION

Donor Hard Drive

with VMWare / QEMU / KEEP

NOT TESTED
Next Steps

Test and determine feasibility of additional migration strategies

Test and determine feasibility of emulation strategy


References


Thank You!

Sam Meister
sam.meister@mso.umt.edu
@samalanmeister