ADE Formats Primer

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Designing the Future Landscape: Digital Architecture, Design & Engineering Assets

Library of Congress, Architect of the Capitol, National Gallery of Art

November 16th, 2017
1960s-1980s
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1990s-2000s
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2010s
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1960s

Experimental
Collaborative
Academic
1960s
1970s

Beginning of commercial program availability

- create 2D drawings and 3D models,
- to store and reuse a library of design applications,
- and to produce proposals and presentations
Preservation challenges: 1960s - 1970s

- Documenting what was tried, debated, and presented to various audiences
- What had and has value for the history of computer technology
- Experimentation and adaptation to new markets
1980s

Applicon
Arrigoni Technology
AutoDesk
Autotrol technology
Bausch & Lomb
Bentley Systems, Inc.
BruningCAD
CADAM
CalComp
Calma Company
Carrier Corporation
Cascade Graphics
Computervision
Dassault Systèmes
Digital Equipment Corporation
Formtek

Graph/Net
Holquin
HOK
IBM Corp.
Interactive Computer Systems
Intergraph
McAuto
MiCAD
Prime Computer
RUCAPS
Sigma Design
SKOK
Summagraphics
T & W Systems
TRICAD
1980s

AutoDesk
AutoCAD

T & W Systems
VersaCAD

Dassault Systèmes
CATIA
Preservation challenges: 1980s

- Hardware/software bundles
- Software development or adaptation across fields
- Proprietary systems
- Documenting the context
- Vendor success, mergers, and failures
1990s

Standardization in aerospace, automotive, engineering industries

BOEING

PTC

GM

Using CATIA V5
Fred Karam & Charles Kleismit

Unigraphics NX
Solid Modelling

Create robust features and models!
32-bit OSes and desktop 3D: Windows NT and SGI
3D modeling: architecture & engineering

3D modeling: film, games & SFX
<table>
<thead>
<tr>
<th>Software</th>
<th>Format</th>
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<td>AutoCAD</td>
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<td>.ma, .mb</td>
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<tr>
<td>Vellum/Vellum Solids</td>
<td>.vlm, .vc6</td>
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</table>
New preservation challenges: 1990s

- Explosion in number of CAD applications
- Application of software across disciplines
- Experimentation in practice
- Protective market - expensive licenses, hardware keys
- Proprietary hardware platforms (e.g., SGI)
- Lack of fully interoperable vendor-neutral file formats
2000s

Further development and mass adoption of 3D modeling

Adoption of 3D printing and automated fabrication
Experimentation/adoption in scripting and generative design
Building Information Modeling (BIM)
New preservation challenges: 2000s

- Increasing use of scripting and parametricism = increased number of dependencies, more data potentially lost in migration to other formats
- More complex workflows involving increasing numbers of chained software platforms
- Vast increase in number of project files and file size
- Commonly used backup storage media from period ("archival" gold CD-Rs, LTO tape) have shorter reliable lifespans than advertised, are no substitute for active management
2010s

Parametric design

Rhinoceros

Computational Design and Visual Scripting

SketchUp

SOLIDWORKS
Parametric design

**Rhinoceros**: versatile and light 3D modeler, works well with curves and draping fluid surfaces.

**SketchUp**: light and low learning curve 3D modeler, builds off a push-pull workflow

**Kangaroo Physics**: an app for Rhino for interactive simulation and optimization.

**Ladybug, Honeybee, Butterfly, Dragonfly**: each is an energy modeling tool that links data sources and simulation programs.

**SolidWorks**: a solid modeling CAD/CAE program that serves a wide variety of industries.

**Revit**: leading Building Information Modeling software in the USA, heavy data component and supports collaborative work-sharing amongst multiple disciplines in real-time.
2010s

Computational Design and Visual Scripting

**Grasshopper:** graphical algorithm and script editor intended to integrate with Rhino.

**Dynamo:** an open source computational design tool intended to integrate with Revit.
2010s

Parametric design

Computational Design and Visual Scripting

Rhinoceros

SketchUp

SolidWorks

Grasshopper
2010s

Evolutionary Solvers

Physics Engine

Grasshopper

Rhino

Daylight Analysis

Radiance

Daysim

Energy Analysis

EnergyPlus

OpenStudio

Python Source

Iterative Solver

Fluids Solver
2010s

**GreenBIM**: provides live project sharing for geographically separated teams at reliable speeds.

**A360**: Autodesk cloud-based Revit platform for disparately located teams of architects, engineers and designers to collaborate within a centralized workspace.

**Adobe Creative Cloud**: web-based versions the entire collection of 20+ Adobe desktop and mobile applications; including: InDesign, Photoshop, and Illustrator.
2010s

Augmented Reality
A live view of the physical, real-world environment with computer-generated sensory input

Virtual Reality
An immersive multimedia/computer-simulated reality

Revit + Enscape
New preservation challenges: 2010s

- Increasing use of scripting and parametricism = increased number of dependencies, more data potentially lost in migration to other formats
  - More experimentation
- More complex workflows involving increasing numbers of chained software platforms
  - Difficult to identify or follow the evolution of a file through multiple software.
  - More collaboration, web-based platforms, cloud storage
- Vast increase in number of project files and file size
  - Tera and Petabytes
- Digital deliverables
Thank you!

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