3D Standards; a Continuous Journey of Best Practices

Kevin Smedley
CAD/BIM Manager
SPC Mechanical

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Kevin Smedley (Speaker)

- Cad/BIM Manager for SPC Mechanical headquartered in Wilson, NC.
- Over 28 years of CAD and Management experience with multiple Autodesk products in the manufacturing and AEC environments.
- Specialties include:
  - CAD Management / Administrator
  - Inventor 3D parametric modeling application
  - Vault Professional software data management
  - Revit & BIM
### Your Instructor’s Schedule

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<th>Time</th>
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<tr>
<td>Wednesday 9:15 am</td>
<td>3D Standards – A Continuing Journey of Best Practices</td>
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<tr>
<td>Wednesday 3:45 pm</td>
<td>Adding Intellect to Inventor with Intelligent Modeling</td>
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Kevin Smedley
This lecture is about Standards from a 3D perspective with the 2D Standards riding along. Standards eco a companies organization and efficiencies. Sustaining an environment with Standards becomes a journey that adding or improving Standards is in step with technology.

If you think of standardization as the best that you know today, but which is to be improved tomorrow; you get somewhere.

(Henry Ford)
Key learning objectives

At the end of this class, you will be able to:

- Gain understanding of why standards in the modeling environment are important to establish and grow
- Grasp the magnitude of 3D tools needed to produce work effectively, no matter who is completing the work
- Understand how design styles and templates can escalate the creation of models, assemblies, and drawings
- Learn how to maintain consistency throughout a project’s lifecycle

Limit human error…
First, a Story…

This continuing journey started six (6) years ago as “3D Standards; New Thinking” (CM3844 - 2011)

My colleague Allan Chalmers, who works at Lend Lease out of Australia

The intent of this conversation is to have you think (continuously) in a manner that brings both freedom to designs and efficiencies to production.
Communication

Consistency

Standards
CAD Standards

Definition:

“CAD Standards are a set of guidelines for the way Computer-aided Drafting (CAD), or (CADD) Computer Aided Design and Drawing, drawings should appear, to improve productivity and interchange of CAD documents between different offices and CAD programs, especially in architecture and engineering.”
Striving for the best

Build your Cad standards with consistency

Integrate 3D standards with sketches, solids, surfaces, features and tools for part and assembly modeling

3D Cad Standards are imperative to a company’s processes and procedures

Cad Committee
Benefits

When you leave today, we hope that you will have a better understanding of what 3D standards can provide your users and your company.

If you are new to leading your Cad Standards, look to apply "a New Journey of Thinking" to your organization.

If you are a veteran and/or old hat at Cad Standards, look to apply “a continuous Journey for your company.”
Let’s talk 3D… Autodesk Inventor has a powerful set of tools that begins from basic solids and surfaces to complex mathematical components iterating multiple shapes and sizes.
Parts
Part Components

With 3D modeling, let’s look at Parts first

Standardizing Parts files for efficiency brings in the methodology of DFM (Design for Manufacturing)
Part Components

- iProperties
- iLogic Form
- iLogic Rules

Materials

Colors

Parameters

Work Features

iMates

Sheet Metal k Factors
Part Components

Considerations when modeling…

There are no Layers or Colors to worry about

Base your settings around a certain global standard such as ASME, ISO, DIN, etc.

Set your default units to imperial or metric

The Bill of Materials
**Part Components**

Data information:
- iProperties
- Title Boxes
- BOM’s Configurations

Parameters:
Whether using…
- Parameters dialog
- Standard excel spreadsheet format
Assembly Component(s)

This environment has many complexities and variations in 3D standards in which your company methodologies play a factor.
Assembly Component(s)

The BOM...

Structure the properties that your company deems important. The standardization of BOM properties not only effects the drawing and parts list, but also can and will have effects moving the data through the channels to ERP.
Assembly Component(s)

3D Assemblies are more than just a bucket; They are a source of distributed information within a design that can be shared in many ways.

Level of Detail (LOD) or View Representations (VR)
Assembly Component(s)

- Basic 3D modeling is all about parts and assemblies, but what other aspects of design are there to utilize

  - Plastics
  - Sheet Metal
  - Electromechanical
  - Frame Generator
  - Multi body parts
  - Non-native solids
Communication

Assembly Component(s)

MBD (Model Based Definition)

Standardizing MBD is more than just looking at it from an ASME Y14.41 aspect, but also the deliverable of the 3D PDF
Assembly Component(s)

3D Methodologies

There is a method to everything we do, whether it is walking; running or drawing.

Methods and techniques are not one in the same, but correlate together.

- DFM
- DFA

What Where When Why
What do I derive
Where do I derive
When do I derive
Why do I derive
Understanding the Options, Settings and Templates
Understanding the Options, Settings and Templates

This over the years has been the cornerstone of standards based on drawings for 2D flat designs.

The deliverables (Paper drawings) today need to be produced quicker than ever before, so we need to look at the tools that are used to produce views, details, sections, etc.
Understanding the Options, Settings and Templates

Application Options

First step to consistent standards are the options

80% of these options can be set across the board and exported/imported at configurations time

The options do not tie into any specific file and contain settings for files.
Understanding the Options, Settings and Templates

Settings & Styles

Document settings contain standards for the specific types of files that is to be generated.

Design Data Styles are controlled through the Styles and most of the settings are for drawings.
Understanding the Options, Settings and Templates

Templates

Templates can be created on a minimal level such as one per file type
- Part
- Assembly
- Drawing
- Presentation
- Sheet Metal, etc.

Multiple Templates containing pre-set model and/or drawing information
Maintaining Consistency
Maintaining Consistency

Design projects consist of a lot of information and there are many ways to maintain Cad Data Standards. A department, office(s) and even global facilities can share Standards. Cad Manager/Administrator strategizes to capture the Standards. Typical everyday processes and workflows can be sustained through SOP’s.
Maintaining Consistency

Strategize Cad Standards

Look at it first as an improvement project, which begins to influence others and eventually becomes change.

Work closely with your I.T.

Set configurations for deployment with the UNC structure (\\) rather than a drive letter.
Maintaining Consistency

Document

Documentation is the front door key for Cad Administration

Store the document in a central managed folder typically under your server location

Document all deployment configurations, licensing, processes and workflows

SOP (Standard Operating Procedures) format
Maintaining Consistency

Updating and Distributing

All the software deployments, standards and documents should be sustainable

Centralize the Standards
Conclusion

Point of View

The intent of this conversation is to have you think in a manner that brings both freedom to designs and efficiencies to production.

Methods of administrating strategies and standards has served numerous companies sustaining benefits.
Conclusion

Consistent Action

As you leave today, do the following:

- Think of ways to improve the Cad environment
- Remove repetitive steps of modeling
- Look at adding intelligence to models and drawings
- Add more data to templates both 3D & 2D
Conclusion

Benefits

As you leave today, do the following:

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Closing Statement

3D standards is a journey of:

- Improvements
- Changes
- Efficiencies

Standard processes and feature usage for creating models will allow your thinking and actions to be clearer.

“Everything that other guy said is a bunch of lies. Thank you very much.”
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