



**3DEXPERIENCE**

# Comply with The NIST PMI Test Requirements Using SOLIDWORKS

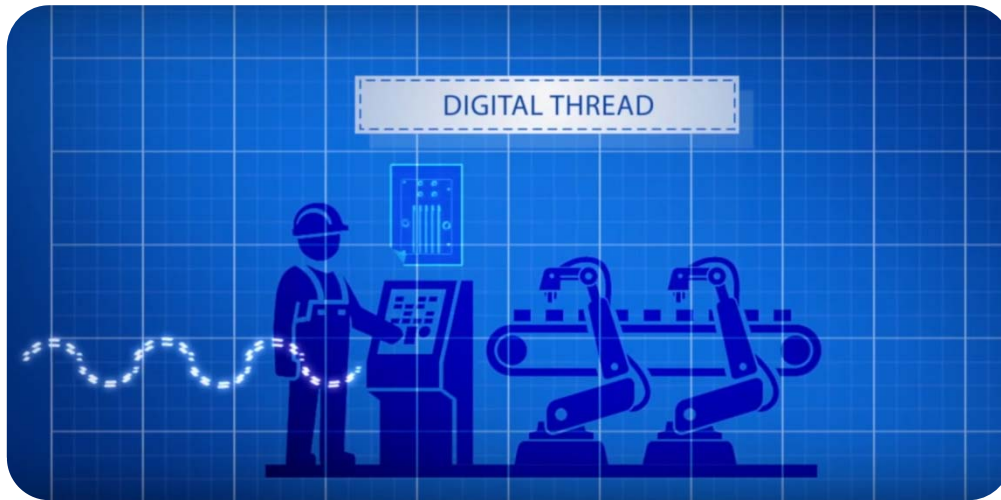
Oboe Wu

Christopher Pagliarini

DS SOLIDWORKS

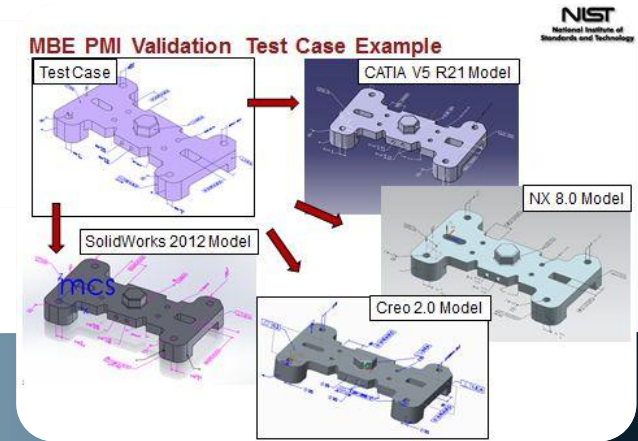
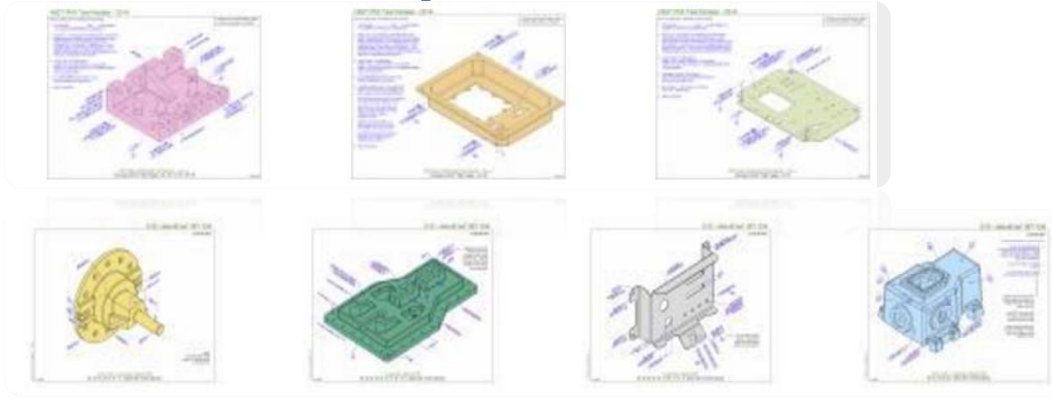
# Benefits of the NIST PMI Test Project

- ▶ Encourage CAD systems to improve
- ▶ Provide model-based manufacturers with better PMI capabilities
- ▶ Facilitate the digital thread in the industry



# Methodology

- ▶ Eight models with 297 annotations
- ▶ Focused on ASME GD&T definitions
- ▶ Tested four CAD systems in 2012 and 2015 versions

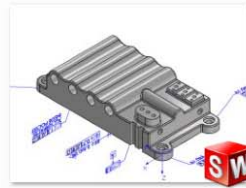


# Upgrade to SOLIDWORKS MBD 2017

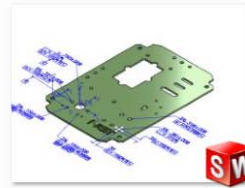
- ▶ Upgraded existing eight models to SOLIDWORKS MBD 2017
- ▶ Built three more models
- ▶ Resolved 65% of the issues found in versions 2012 and 2015



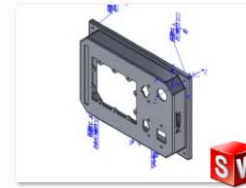
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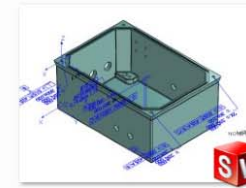
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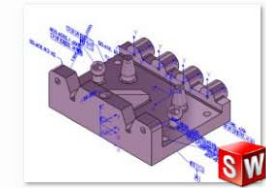
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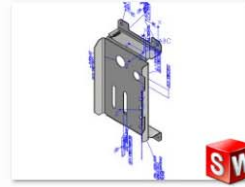
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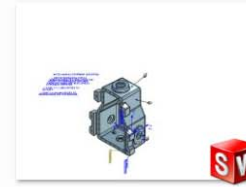
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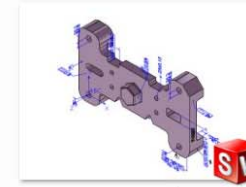
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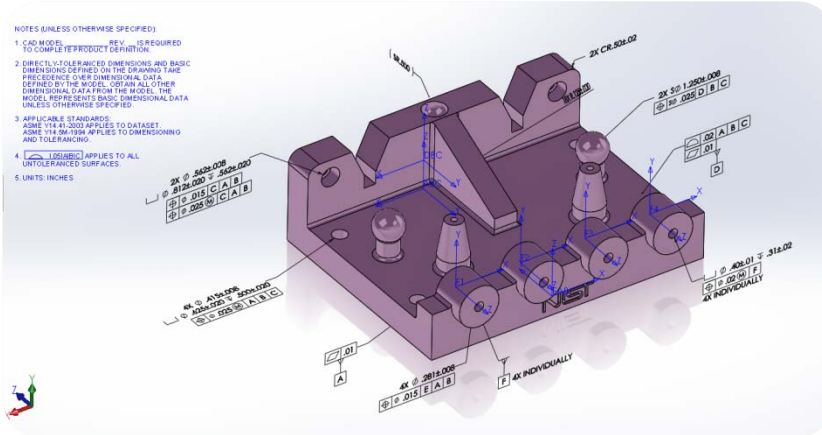


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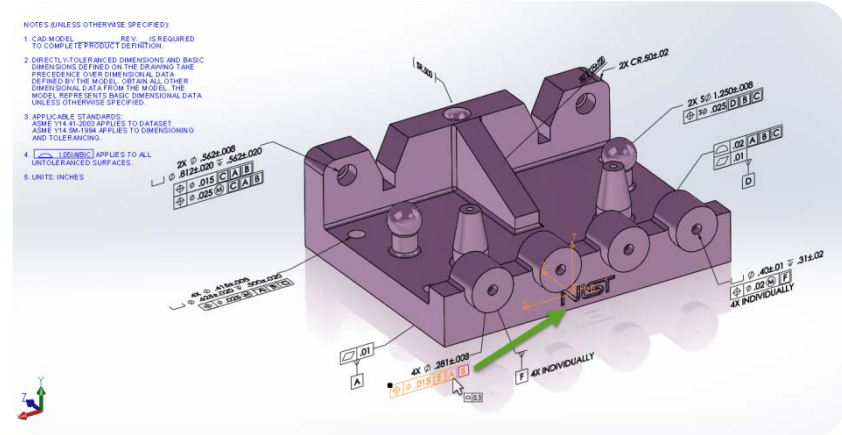
# Automatic Coordinate Systems

- ▶ Resolved 40 issues
- ▶ More intelligent
- ▶ Reusable by manufacturing software

Before

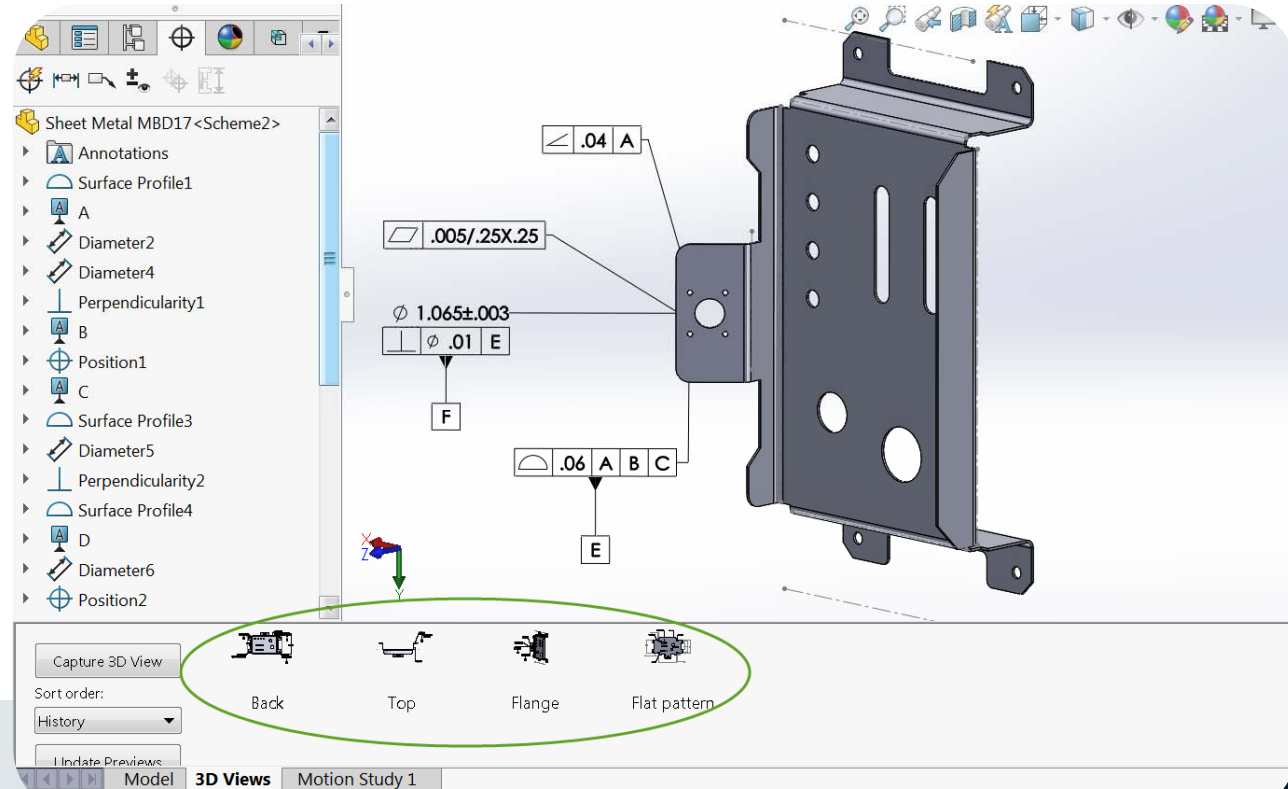


After



# 3D Views

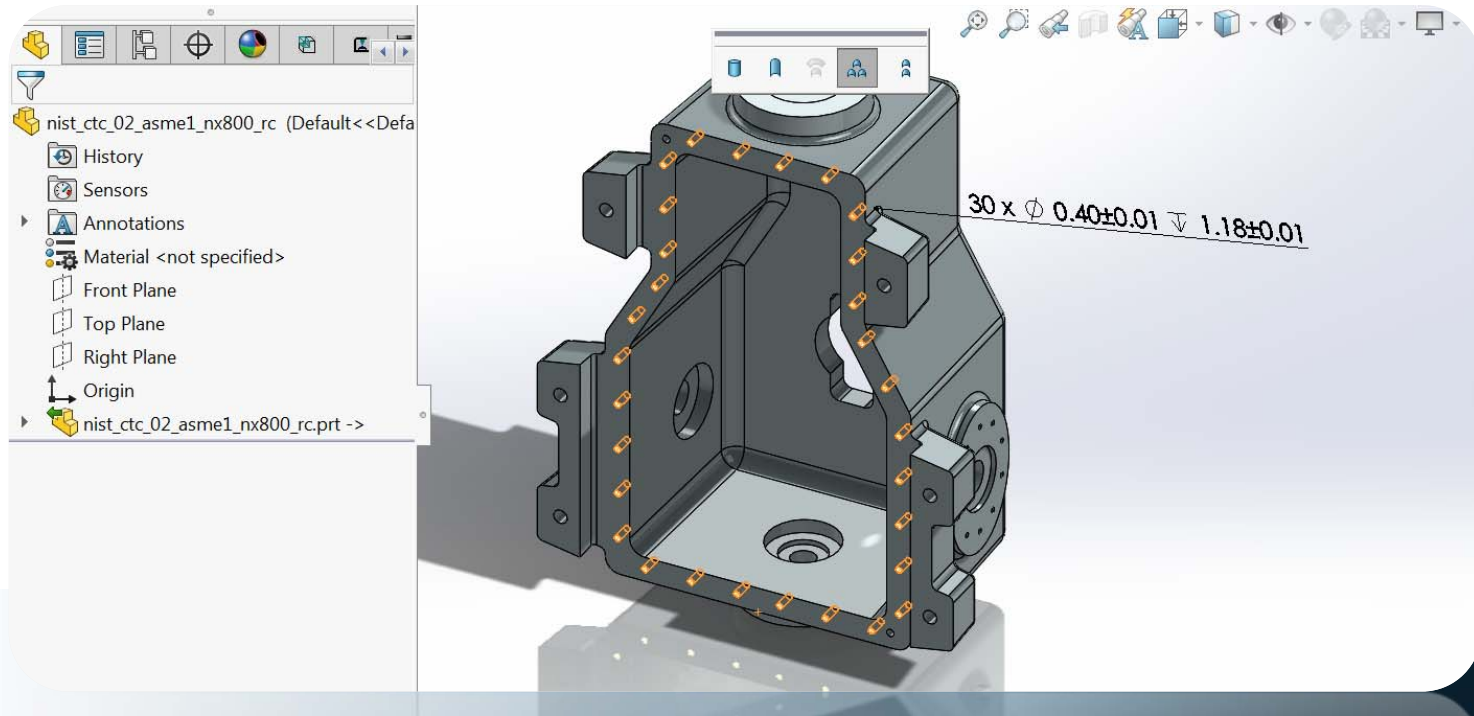
- ▶ Resolved 59 issues
- ▶ Visual
- ▶ Comprehensive
- ▶ Flexible

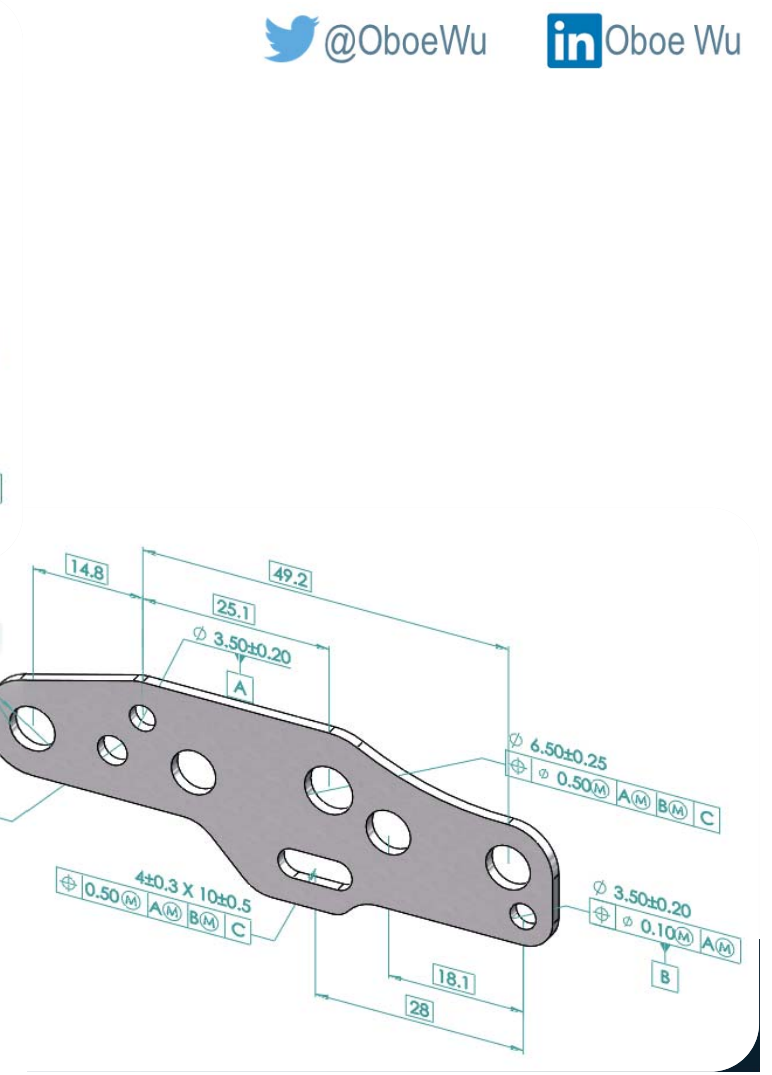
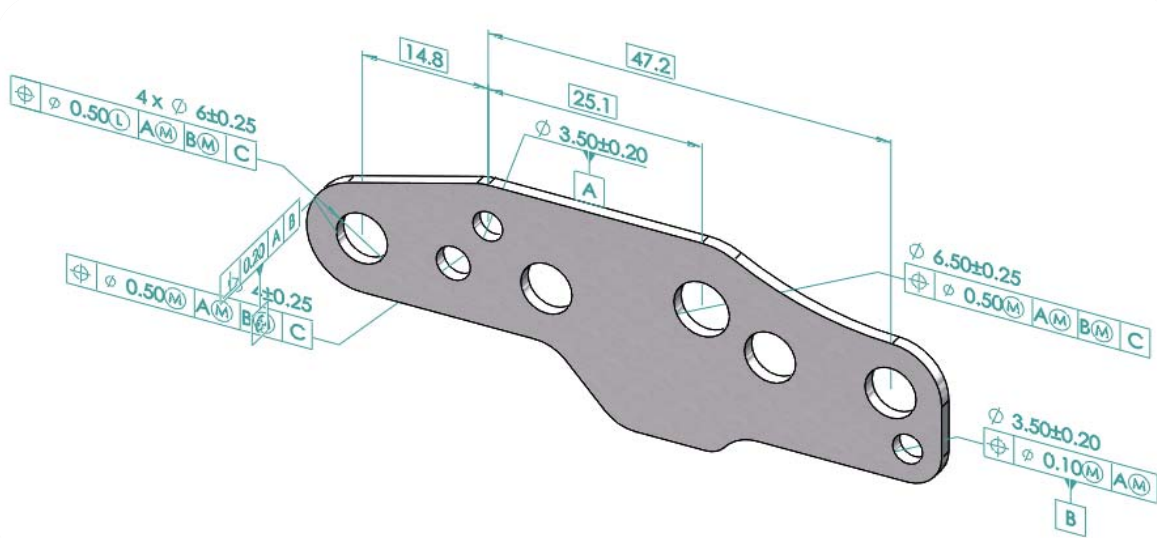




# Ease of Use

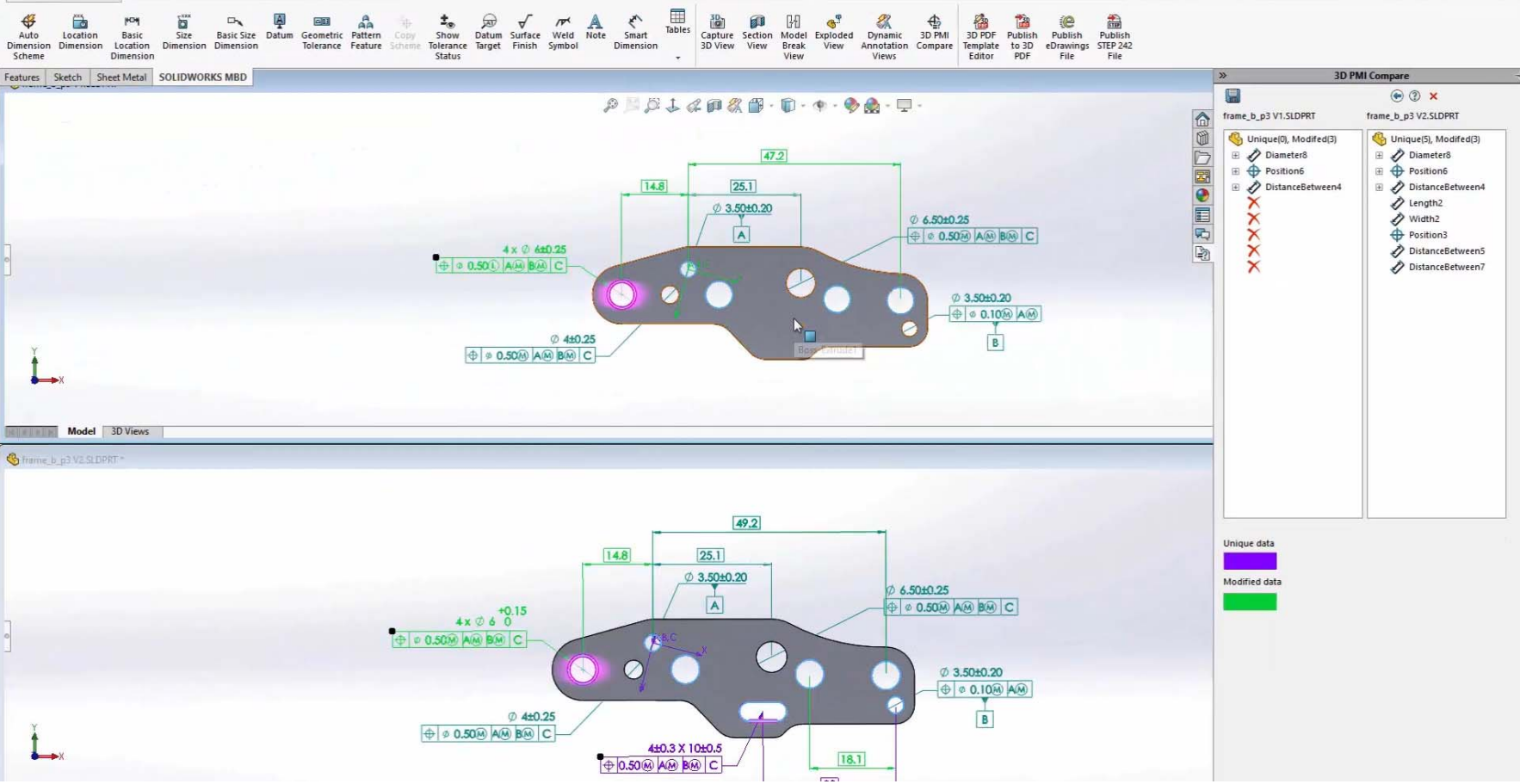
- ▶ Read non-native CAD data
- ▶ Select a hole edge to define the entire pattern







# 3D PMI Compare



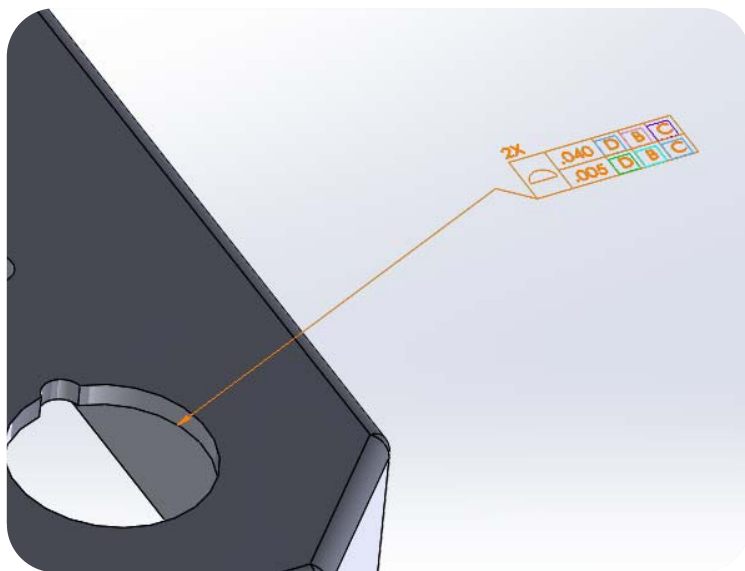
The screenshot displays the SolidWorks 3D PMI Compare interface. The main workspace shows two versions of a part, 'frame\_b\_p3 V1.SLDPRT' and 'frame\_b\_p3 V2.SLDPRT', overlaid. The V1 model is shown in a semi-transparent grey, and the V2 model is shown in a solid grey. Dimensions and features are highlighted in green (unique) or purple (modified). The top ribbon contains various toolbars including Auto Dimension Scheme, Location Dimension, Basic Location Dimension, Size Dimension, Basic Size Dimension, Datum, Geometric Tolerance, Pattern Feature, Copy Scheme, Show Tolerance Status, Datum Target, Surface Finish, Weld Symbol, Note, Smart Dimension, Tables, Capture 3D View, Section View, Model Break View, Exploded View, Dynamic Annotation Views, 3D PMI Compare, 3D PDF Template Editor, Publish to 3D PDF, eDrawings File, and Publish STEP 242 File. The right-hand panel, titled '3D PMI Compare', lists unique and modified data for both versions. The V1 list includes Diameter8, Position6, DistanceBetween4, Length2, Width2, Position3, DistanceBetween5, and DistanceBetween7. The V2 list includes Diameter8, Position6, DistanceBetween4, Length2, Width2, Position3, DistanceBetween5, and DistanceBetween7. A legend at the bottom right indicates that unique data is shown in green and modified data is shown in purple.

Version	Unique Data	Modified Data
frame_b_p3 V1.SLDPRT	Diameter8, Position6, DistanceBetween4, Length2, Width2, Position3, DistanceBetween5, DistanceBetween7	
frame_b_p3 V2.SLDPRT	Diameter8, Position6, DistanceBetween4, Length2, Width2, Position3, DistanceBetween5, DistanceBetween7	

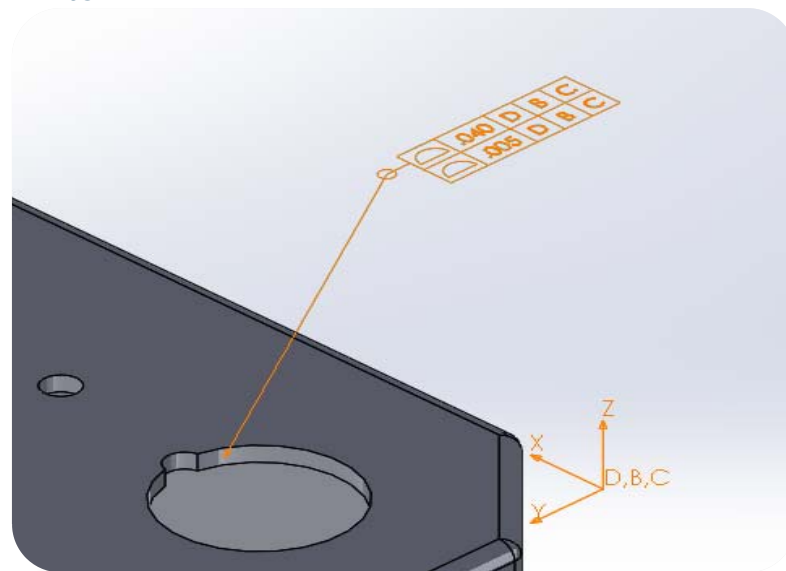
# More Enhancements per NIST Requirements

# All-Around Profile Tolerance

Before

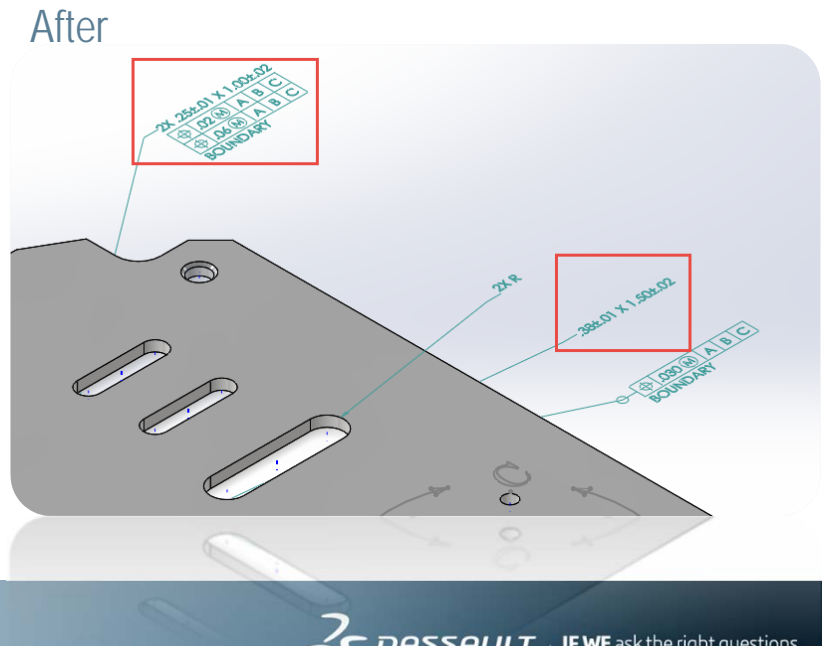
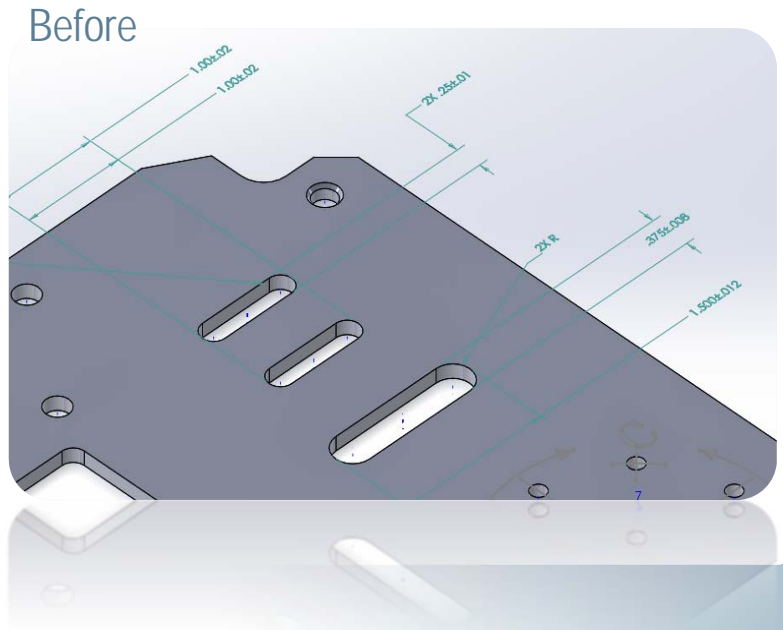


After



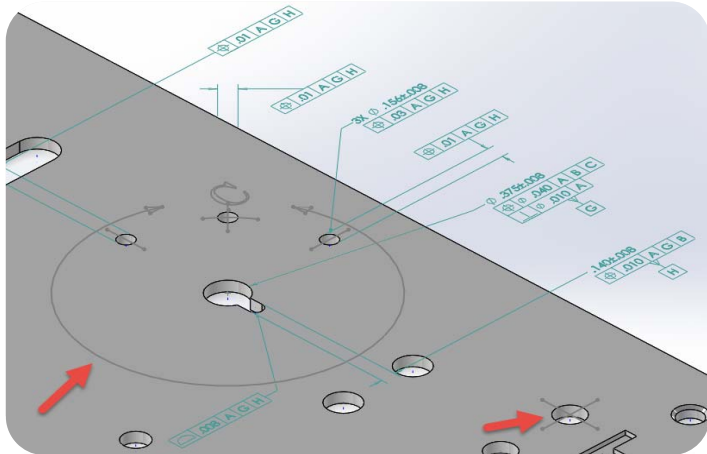
# Combined Slot Callouts

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# Control Supplemental Geometry Visibilities per Views

Before



After

