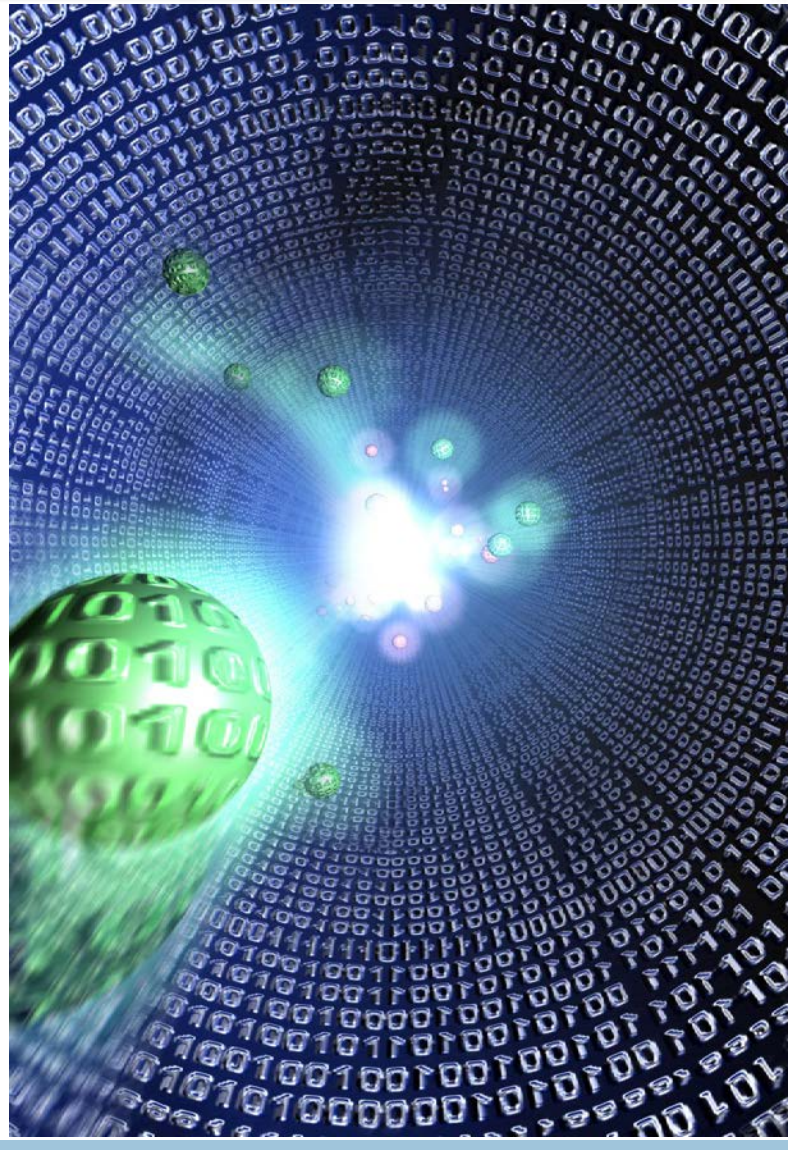
UTRS
THINKING FORWARD

UNIVERSAL TECHNICAL RESOURCE SERVICES, Inc.

Overview of the For the Next Generation TDP IBIF Program

December 1, 2014



Agenda

- Introductions
- Background
- Achievements
- Demonstration
- Questions

The IBIF Program:

- **Title**
  - Technical Data Packages for Advanced Enterprises
  - Technical Area 2: Technical Data Packages Integration and Validation for Government Delivery
- **Problems Addressed:**
  - The DoD is predominantly 2D Document based but has begun acquiring 3D data
  - It has limited infrastructure and processes in place to utilize 3D data
  - Resulting in a significant amount of lost labor due to bad data, one study put this loss at 20% to 50% of an engineers time
  - If these errors make it to production than millions can be wasted in scrap, rework, and program delays
  - Additionally there is no standard way to receive this data from current PLM systems that retain the product structure needed to define the weapon system

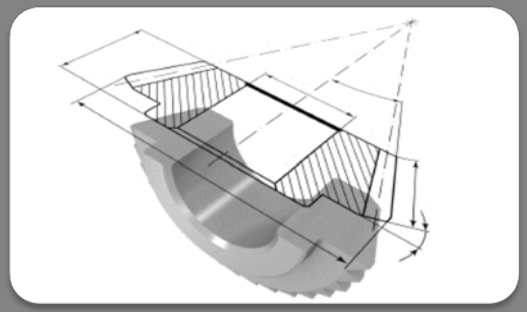
Contractor Team Members

UTRS (Prime)	• *David W. Robinson P.E., (UTRS) Program Manager* • *Pat Napolitano, (UTRS) Project Manager* • *Roy Whittenburg, (UTRS) Tech Lead*
ITI (Subcontractor)	• *Mark Haines, (ITI) Contract POC* • *Doug Cheney, (ITI) Model Validation SME (Project Eng.)*
Jotne (Subcontractor)	• *Jim Martin, (Jotne North America) Contract POC & Standards SME* • *Tim Turner, (Jotne North America) PLCS SME (Project Eng.)*
Recon Services (Subcontractor)	• *Rich Eckenrode, (Recon Services) Requirements and Producability SME* • **Joe Parsi, Project Eng.**

Deliverables

2D to 3D

- Report on 2D to 3D Conversion Verification Best Practices



PMI

- Early Warning Tool
- Modifications to MIL-STD-31000A Apdx C

PLM – PLM

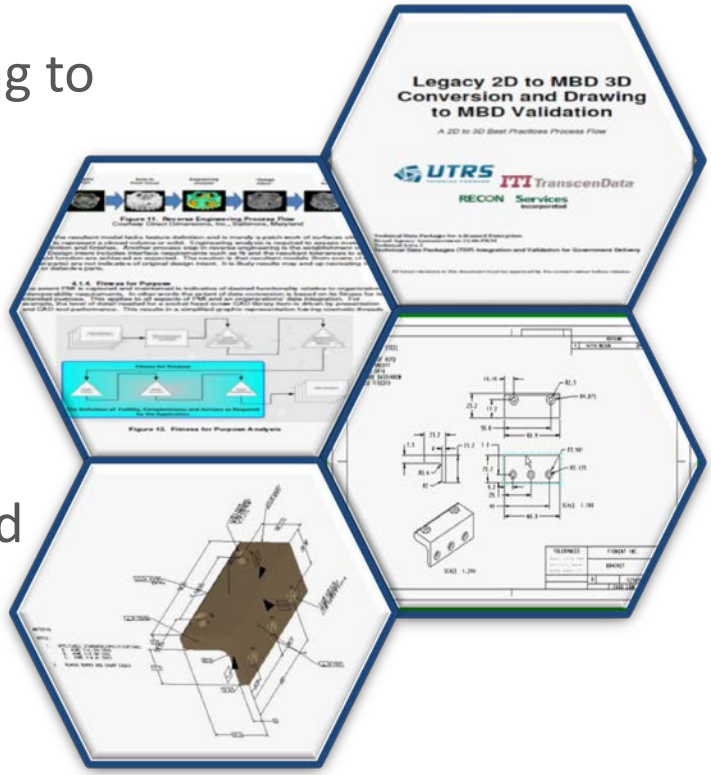
- TDP DEX for DoD Delivery
- Validation Strategy Report
- Demonstration

2D to 3D Conversion Verification

- Even as the industry moves to a 3D Model Based Enterprise there are millions of legacy drawings
- Much of the current DoD systems are defined from drawings and have extended lifespans
- To facilitate updates to legacy designs many of the drawings need to be converted to 3D models
- Currently there is no standard method of verifying that this conversion is done accurately

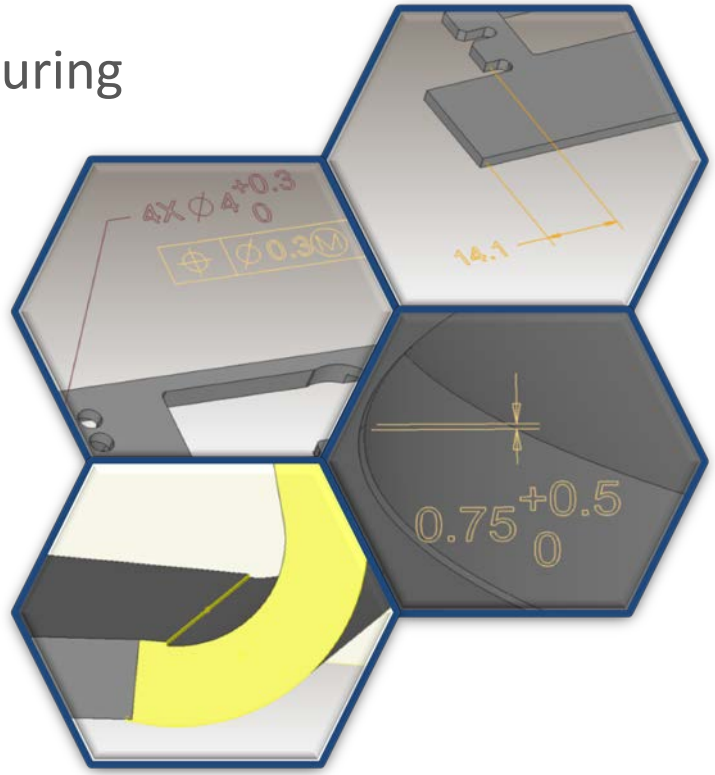
Best Practices Report

- Benchmarks were done at both industry and DoD facilities
- Best practices ranging from manual checking to software checks were documented
- Conclusions show that at best the process can be semi automated but a rigid process must be followed
- If a Model Centric drawing is created the model can also be programmatically verified back to the original drawing
- ITI and RECON Services were the primary performers on this activity

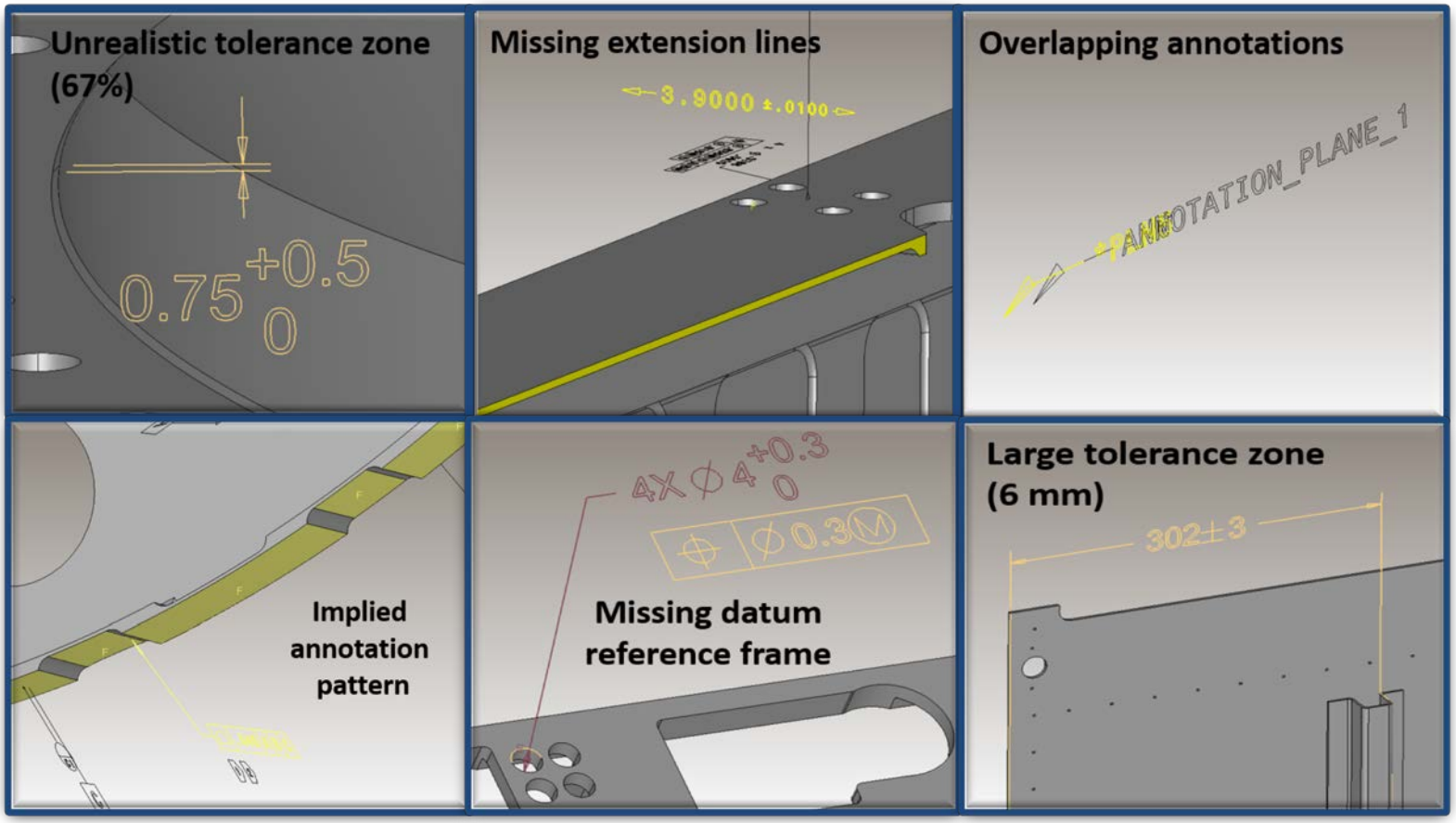


PMI Validation

- The goal is to expand the checks defined in MIL-STD-31000A
- Target development on Product Manufacturing Information such as Annotations and Tolerances
- Works on most CAD models and derivatives such as PRC and STEP
- Builds upon geometry checks already developed
- Tested on Four DoD model sets
- ITI was the primary performer for this activity



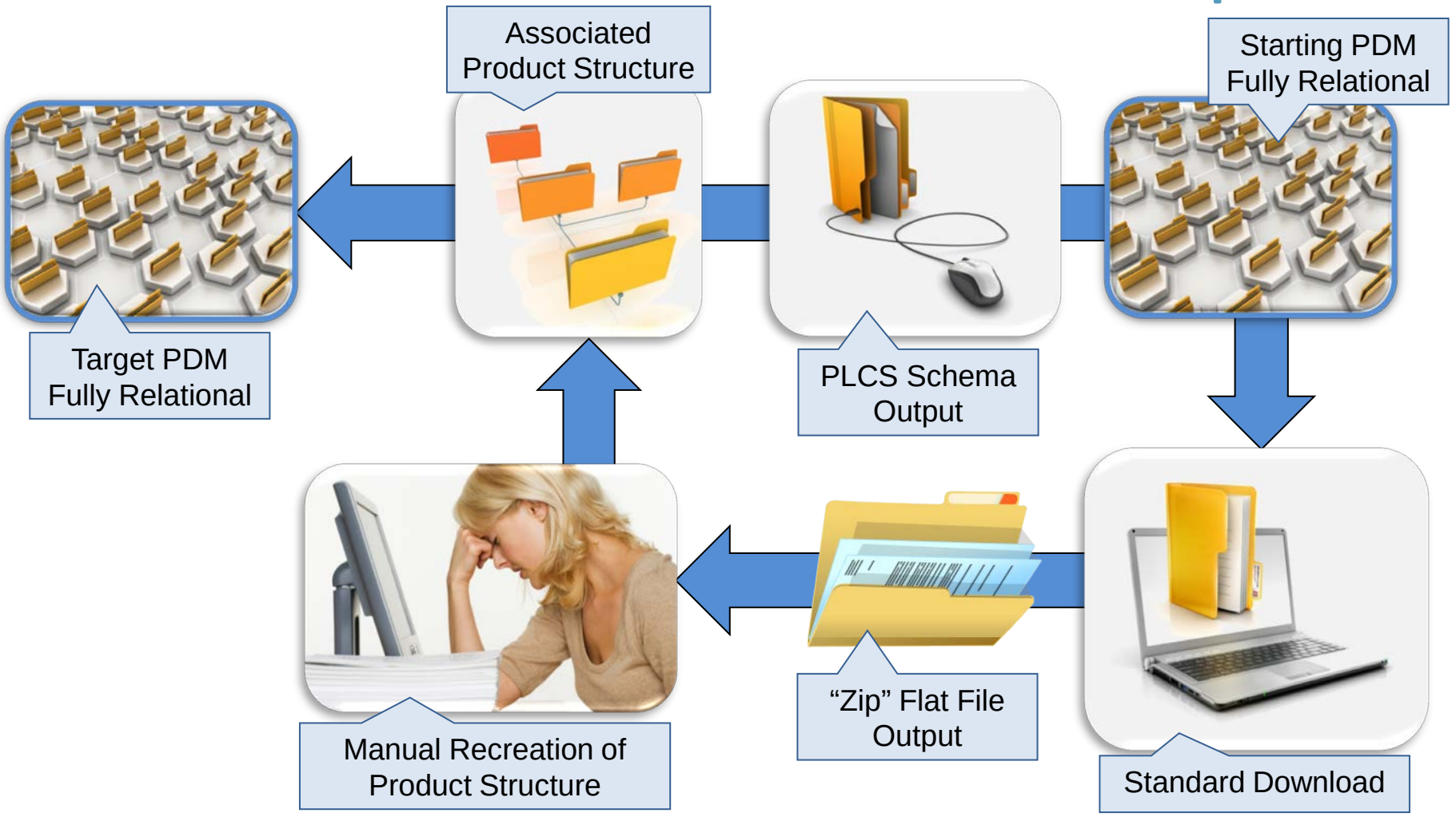
PMI Defect Examples



PLM to PLM Interoperability

- Model Data sets contain complex relationships that are maintained in most PLM systems but lost when delivered via traditional methods
- Each PLM implementation is unique
- By utilizing a standard based approach (PLCS) the relationships can be maintained
- A PLCS definition called a “DEX” which acts as a common point for exchange from one PLM to another
- Working with CH47 to demonstrate this concept
- Jotne North America is the primary performer for this activity

The Core Problem - Relationships

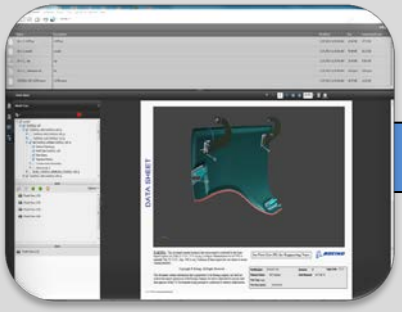


The Real Problem

With Relationships

Without Relationships

Solution Architecture

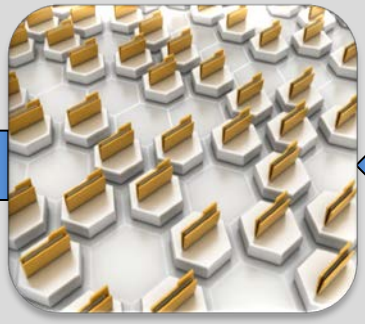


Boeing Provided TDP

Extract the Files from the Portfolio

Use of Jotne's Enterprise Data Manager to Map Schemas or "DEX"

Output PLCS Package

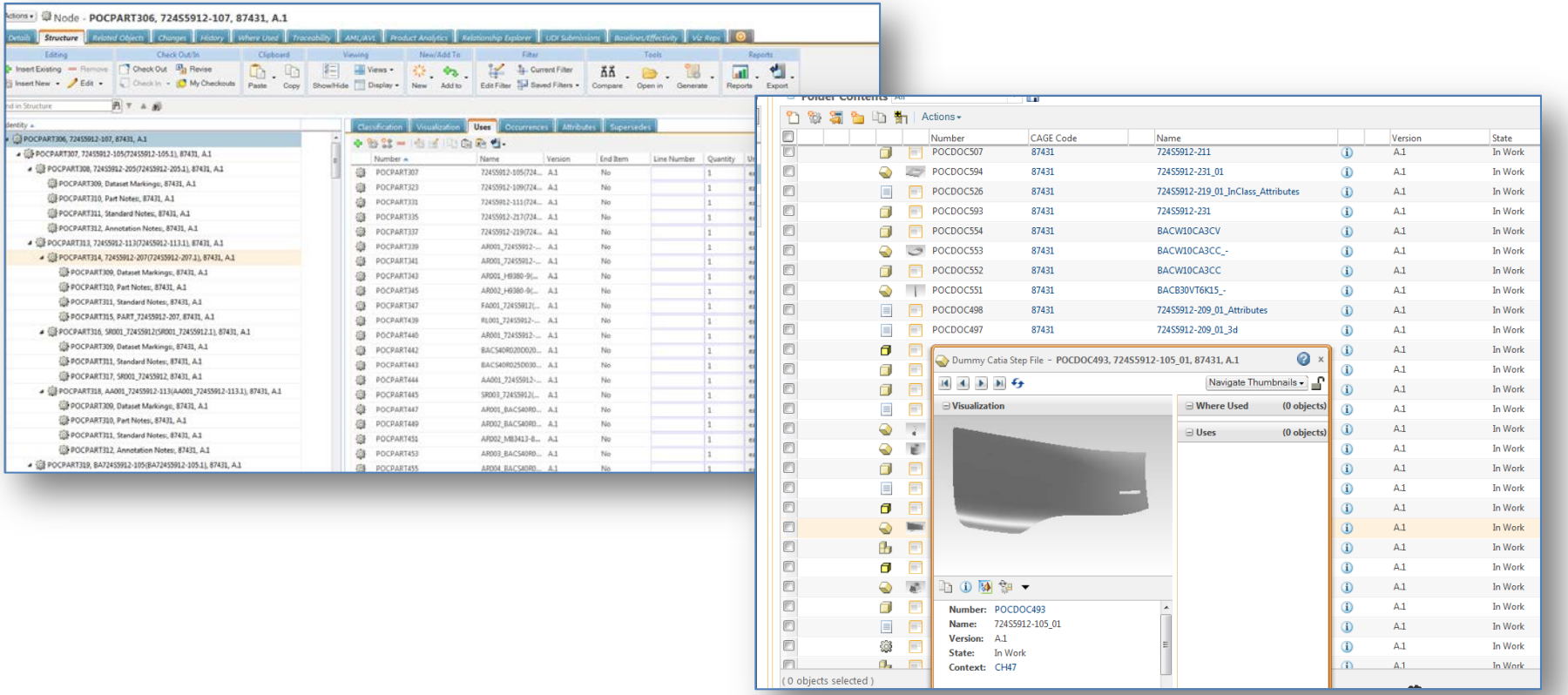


Import Package to Windchill Using PLCS Connector

Final Structured TDP Available To Users

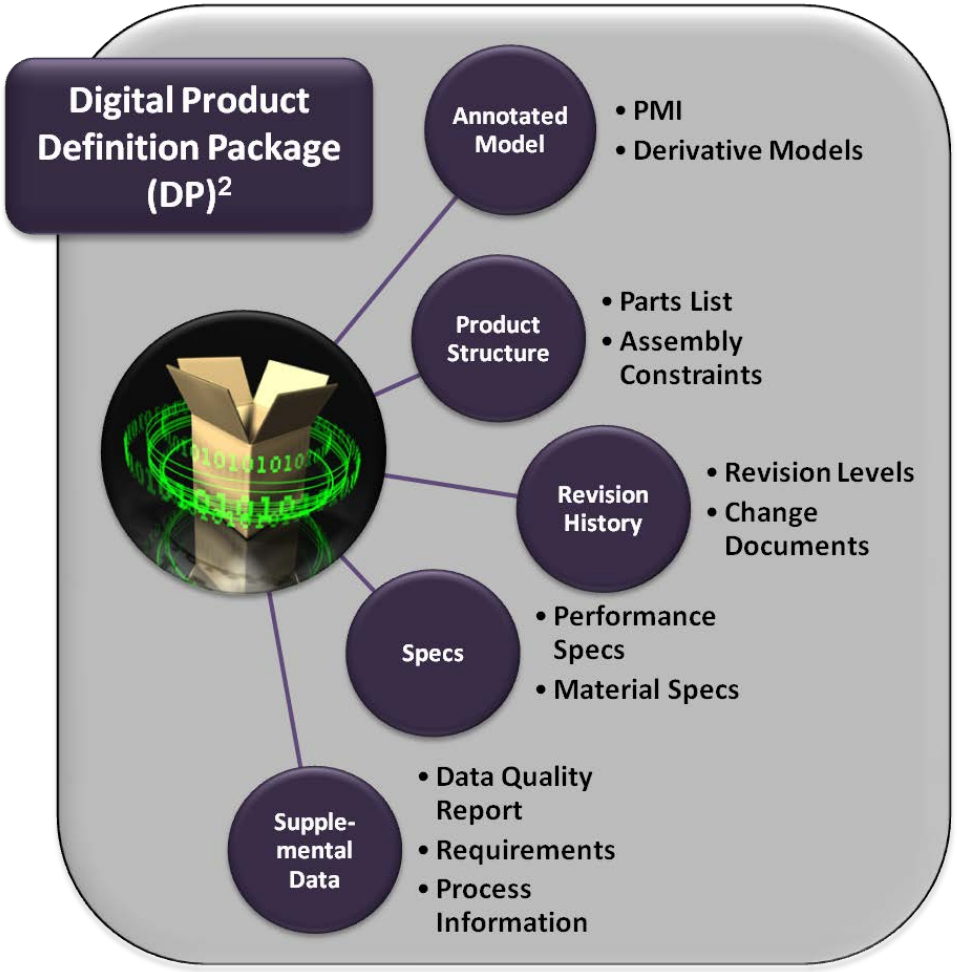
Windchill Import

Utilizing the PLCS Connector in Windchill 10.2 the TDP is imported along with both files and Work Breakdown Structure



One Part In a Bigger Goal

- This effort is the culmination of several ManTech Programs
- It is also a foundational piece for the larger vision of a Digital Definition Data Package that covers more than just the TDP



Demo

Questions?