



ptc

LIVEWORX

A NEW ERA IN PRODUCT LIFECYCLE INNOVATION

SESSION ID: **PL1125B**

ACCELERATING INNOVATION AND SUSTAINABILITY THROUGH DIGITAL DESIGN ENGINEERING

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ON STAGE:



Ruediger Scholz



Senior Product Manager, PTC



Joerg Thomsen



Senior Director Product Management, PTC

WHAT IS “SUSTAINABILITY”? WHERE DOES PTC PLAY?

- Big picture
 - Sustainability strives to meet our needs without compromising needs of future generations
 - The United Nations' [17 Goals for Sustainable Development](#) is the most recognized playbook
 - Companies track sustainability through “ESG” (Environmental, Social, Governance) reporting
- Customers expect PTC’s help on specific **Environmental** goals:

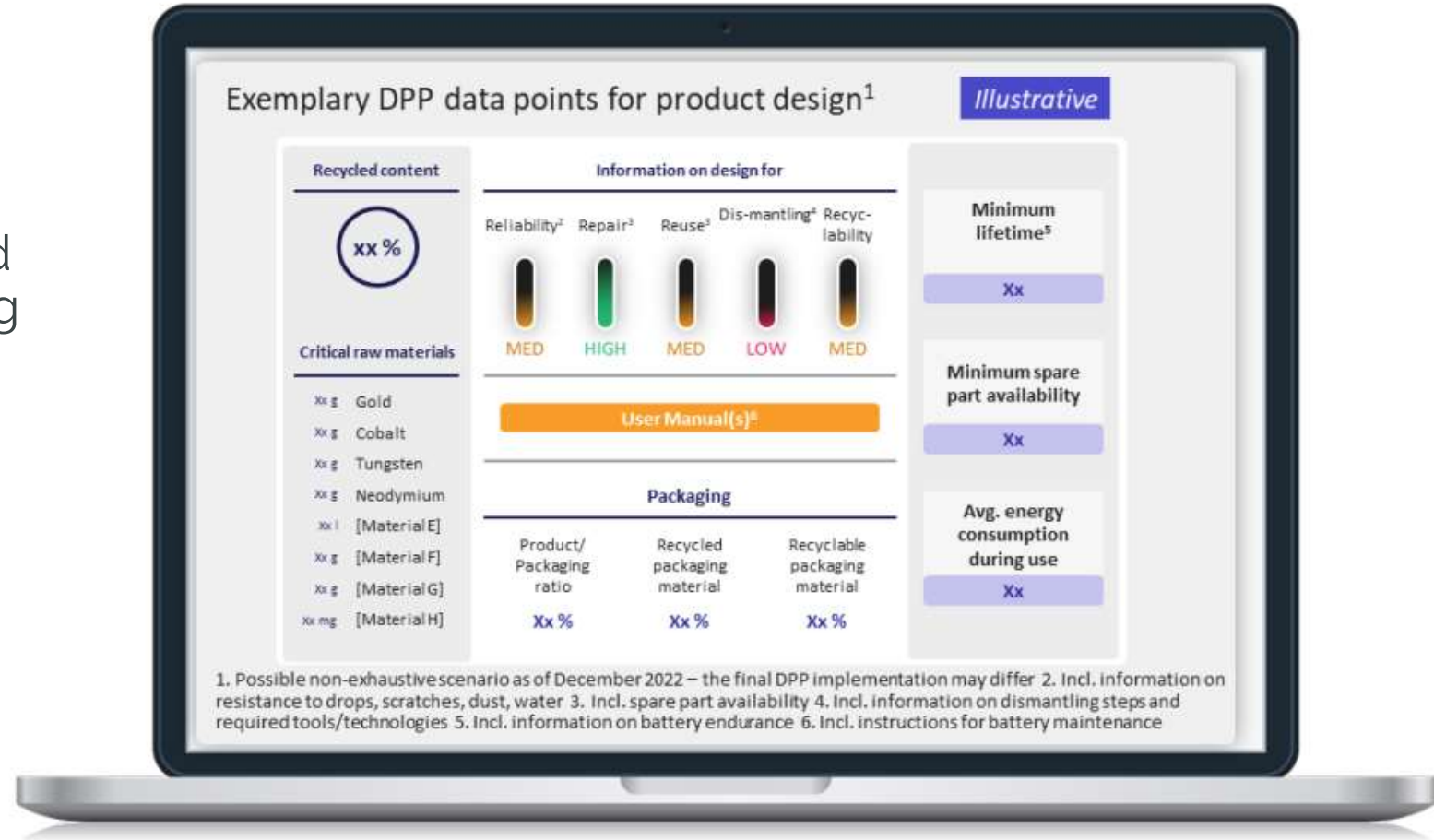
Customer Goal	Description	Where PTC helps
Paradigm shift towards clean energy	Rapidly move off fossil fuel energy towards 100% renewable sources. Supports UN Goal#7 and the Paris Accord's 1.5C target warming limit	PTC's aligned commitment toward using 100% renewable energy (forecasted to commit in FY23)
Improve product sustainability	Design, manufacture, and service products towards dematerialization, energy efficiency and waste reduction . Supports UN Goal #9 and UN Goal #12	PTC and partner software offerings



PRODUCT FOOTPRINT TRANSPARENCY

Product footprint disclosures are rapidly becoming mandatory across product verticals

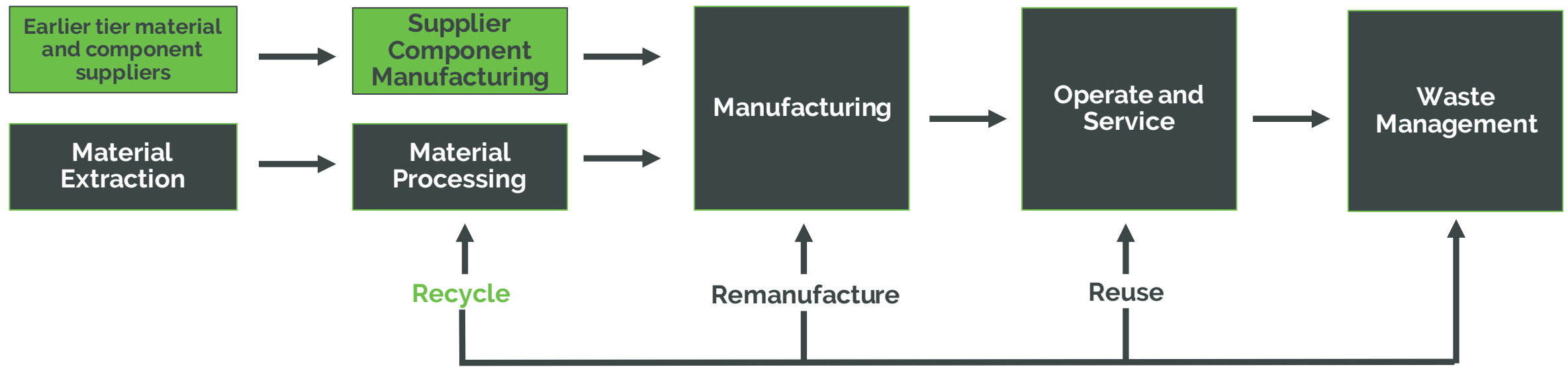
- The 'M' is necessary in 'BOM' to compute these disclosures
- Investors and customers reward manufacturers that have leading product-specific footprint transparency



PRODUCT FOOTPRINT – SUPPLIER COMPONENTS

Key questions design engineers answer for component & supplier selection:

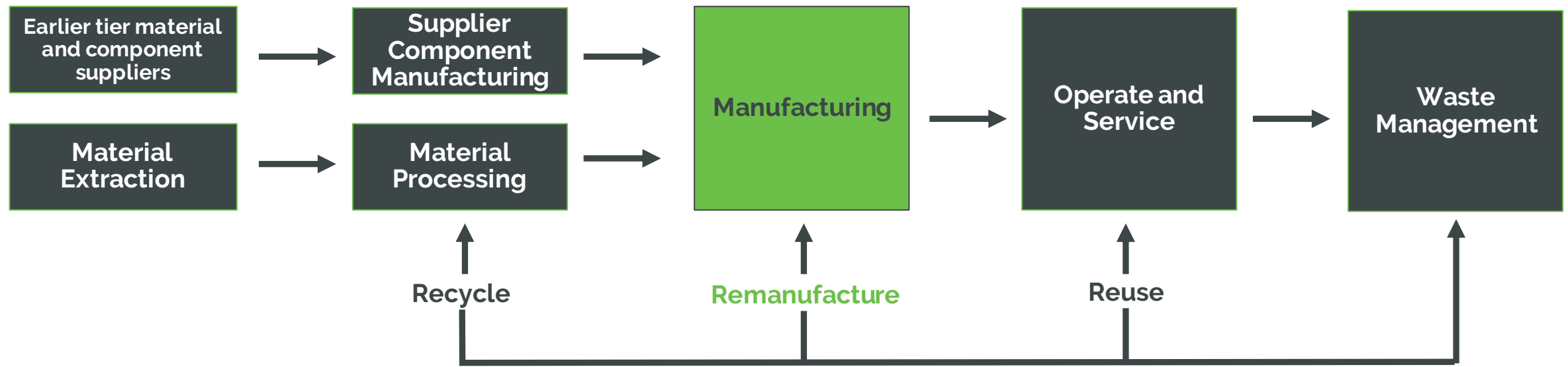
- What is the form, fit, function of the component (mechanical, thermal, electrical, optical, durability)?
- What are the commercials for the component (supplier name, supplier location, cost)?
- What is the estimated footprint of the component (recycling, hazmat compliance, embodied carbon)?
- What is the risk of the selected material-supplier (supplier rating, inventory reliability, geopolitical sourcing issues)?



PRODUCT FOOTPRINT - MANUFACTURABILITY

Key questions design engineers answer for producing “make” parts:

- Is my part design manufacturable to its specifications?
- What should it cost to manufacture a given lot size of this part?
- What is the estimated manufacturing footprint of the part (waste, energy used, GHG)?
- Which of my parts have the best opportunity for manufacturability improvement?

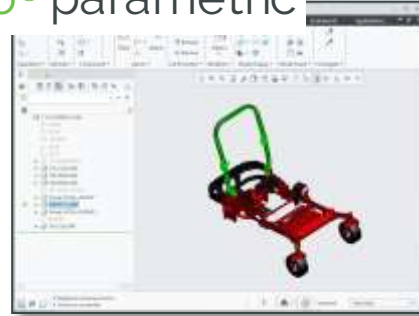


MULTI-CAD DATA MANAGEMENT AND VISUALIZATION

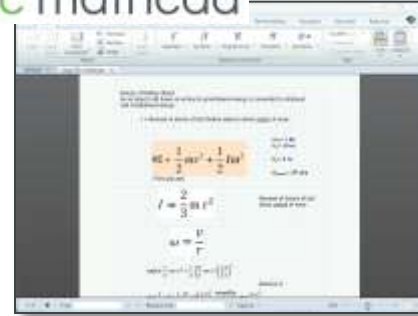
CATIA



creo® parametric



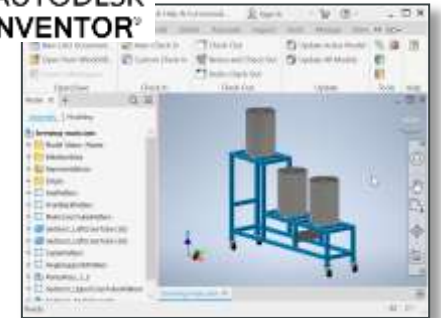
ptc mathcad®



AUTODESK
AUTOCAD



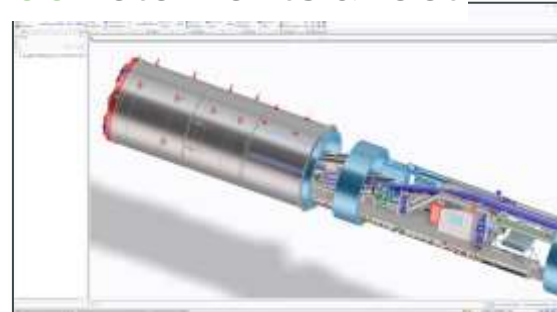
AUTODESK
INVENTOR®



SOLIDWORKS



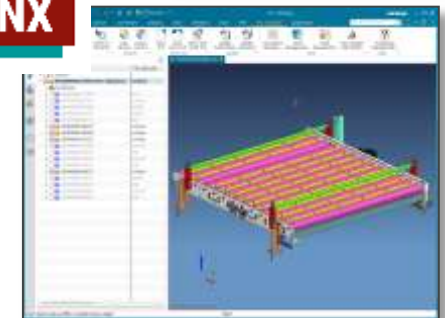
creo® elements direct



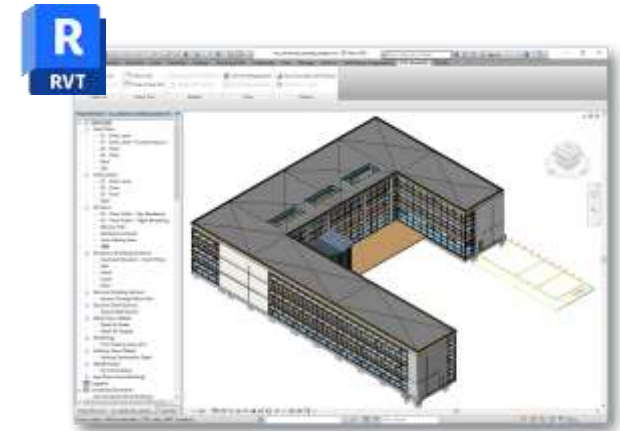
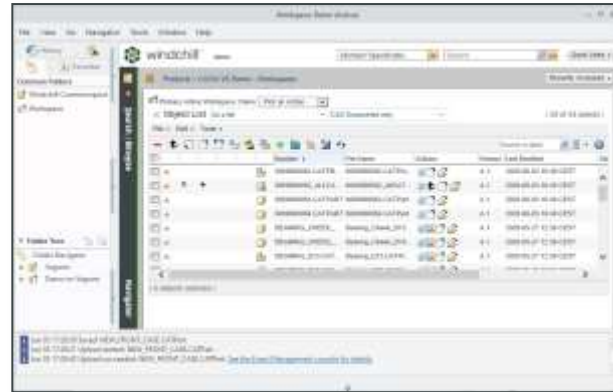
creo® illustrate



NX



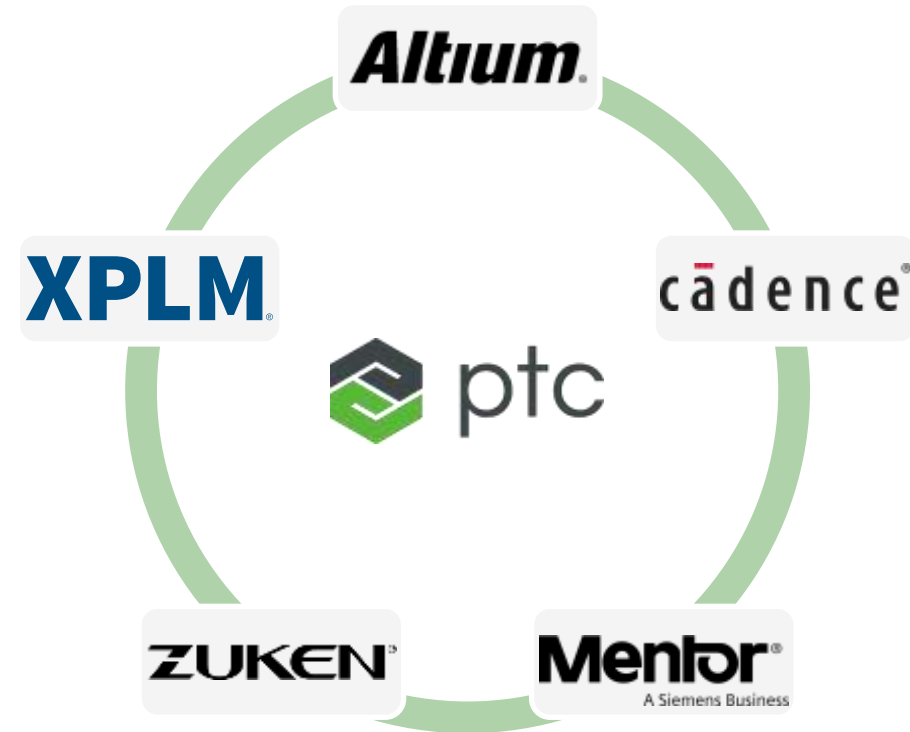
PARTNER-BASED INTEGRATIONS



PARTNER-BASED INTEGRATIONS FOR ECAD

Capabilities

- Developed by ECAD partners using industry standard RESTful API's (Windchill Rest Services)
- Tightly integrated products
- Part metadata synchronization and design data management
- Different integration approaches available



Benefits

Ability to perform data management activities directly within the preferred ECAD environment

Minimize user interaction/exposure to Windchill

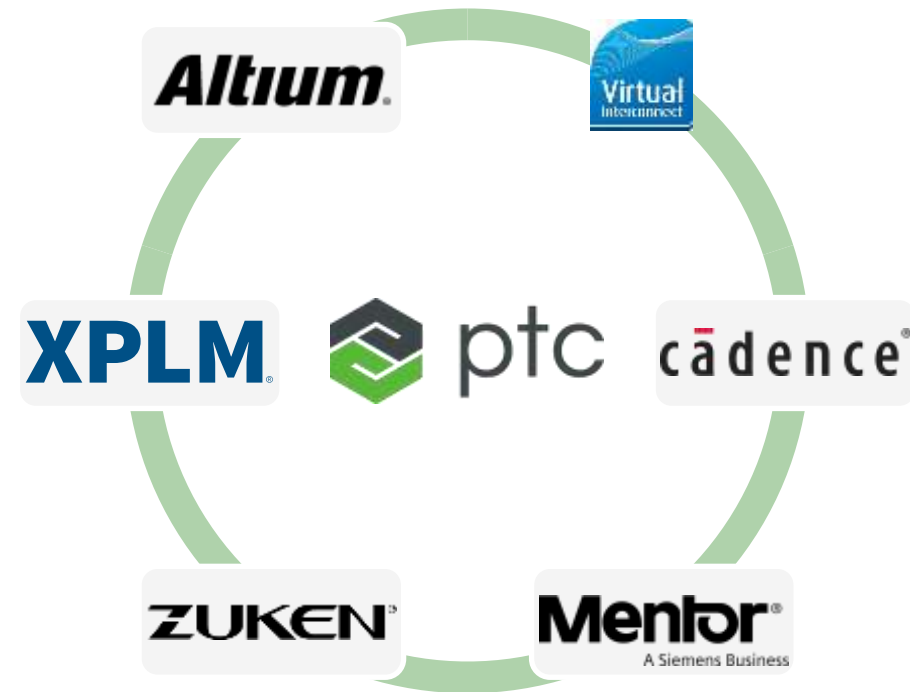
Synchronize part meta data between ECAD and Windchill

Stay up-to-date on ECAD releases when they are available

'NEW' MEMBER

Capabilities

- Following partner-based approach of ECAD integrations (electronic & electrical)
- Virtual Interconnect has deep knowledge
 - Offers add-ons for Creo schematics
 - 'Trusted advisor' in the community
- Provide existing and value-added functionalities to customers through a single integration



Benefits

Ability to perform data management activities directly within the preferred ECAD environment

Minimize user interaction/exposure to Windchill

Synchronize part meta data between ECAD and Windchill

Stay up-to-date on ECAD releases when they are available



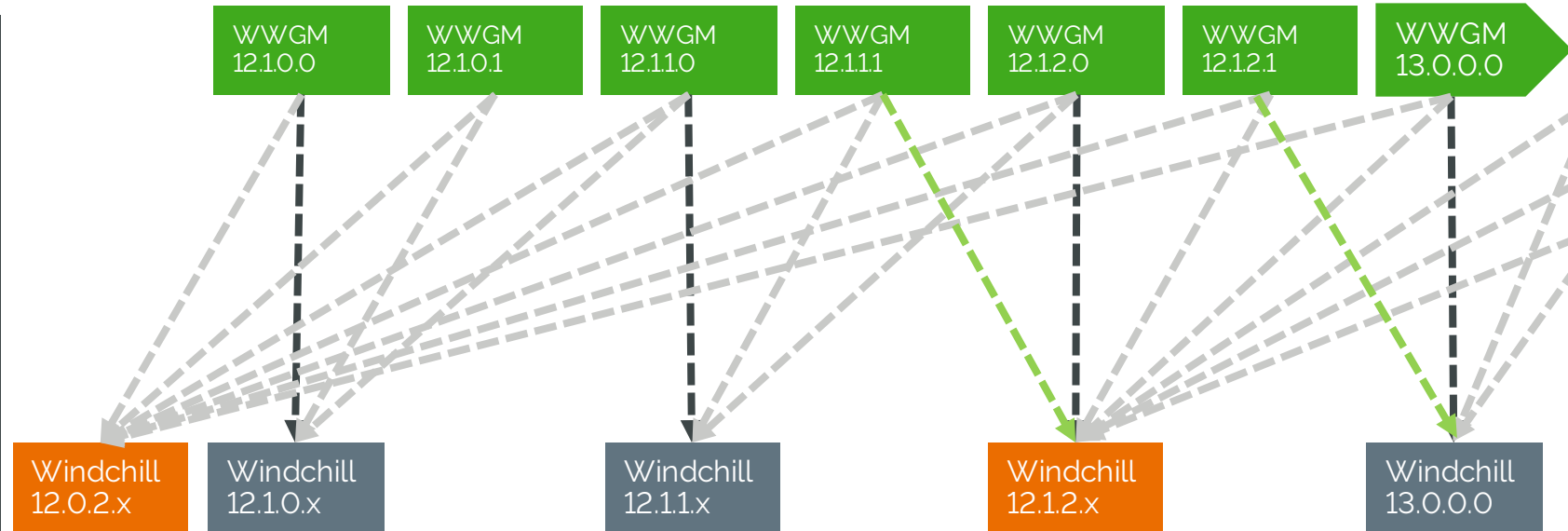
(SELECTION OF) UPDATES ON INTEGRATIONS

ENHANCED ADMINISTRATIVE EXPERIENCE

Dec 2021 Mar 2022 Jun 2022 Sep 2022 Dec 2022 Mar 2023 Jun 2023 →

Capabilities

- Single release stream supporting multiple releases of Windchill
- Backward compatible with earlier Windchill releases starting with 12.0.2.0
- Starting with 12.1.1.1, Workgroup Manager is forward compatible with later Windchill release
- Forward compatibility is limited WGM X.Y.Z.1 to next following Windchill version only



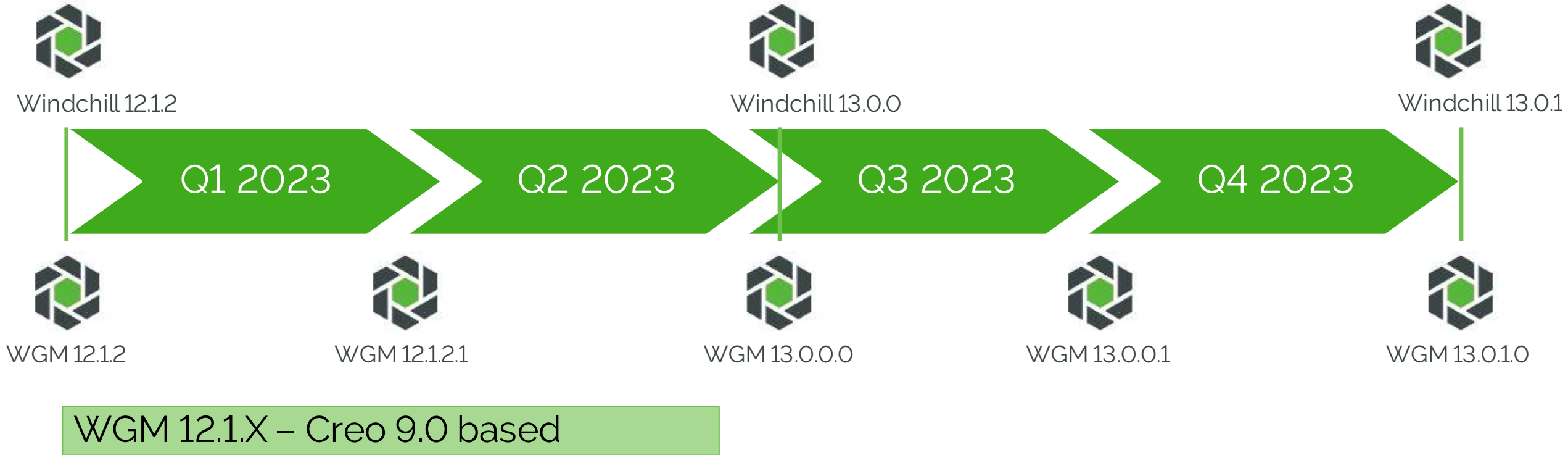
Benefits

Independent client updates – get the latest Windchill server updates without the need to upgrade W/WGM

Streamlined upgrade process – upgrade W/WGM in advanced of planned server upgrades

Improved IT planning – predictable quarterly release cycle to improve IT client deployment and upgrade plans

WORKGROUP MANAGER INDEPENDENT RELEASE STREAM



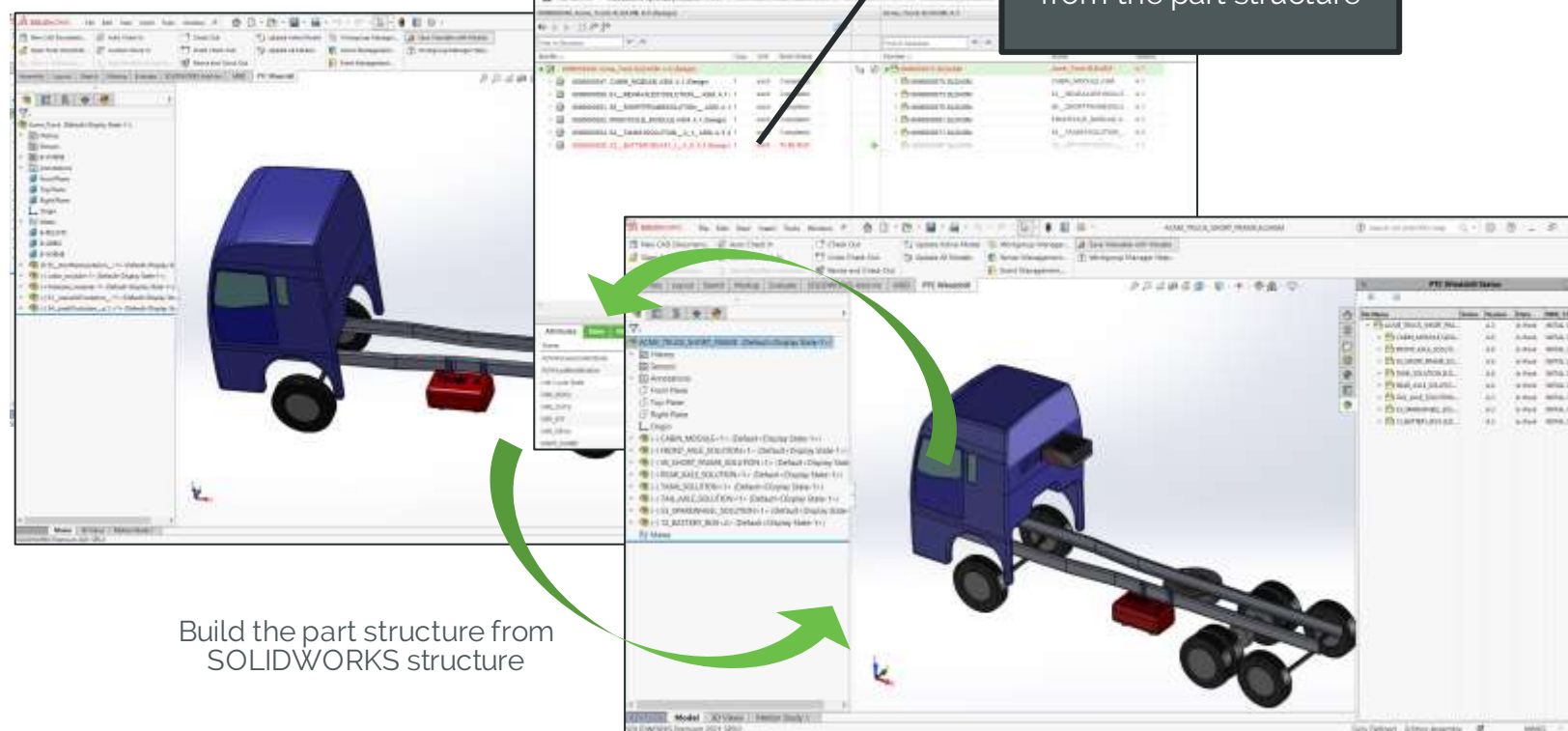


NEW / EXTENDED FUNCTIONALITY

TOP-DOWN DESIGN WITH SOLIDWORKS

Capabilities

- Simultaneously create or reuse existing parts and associated SOLIDWORKS structures
- Edit part structure and position, indicate changes to be reflected in SOLIDWORKS
- Concurrently design subassemblies in CAD and synchronize updates with associated product structures



Benefits

Enable a concurrent design process – Shorten time to develop complex products

Communicate design intent – distribute concurrent design tasks across multi-discipline teams

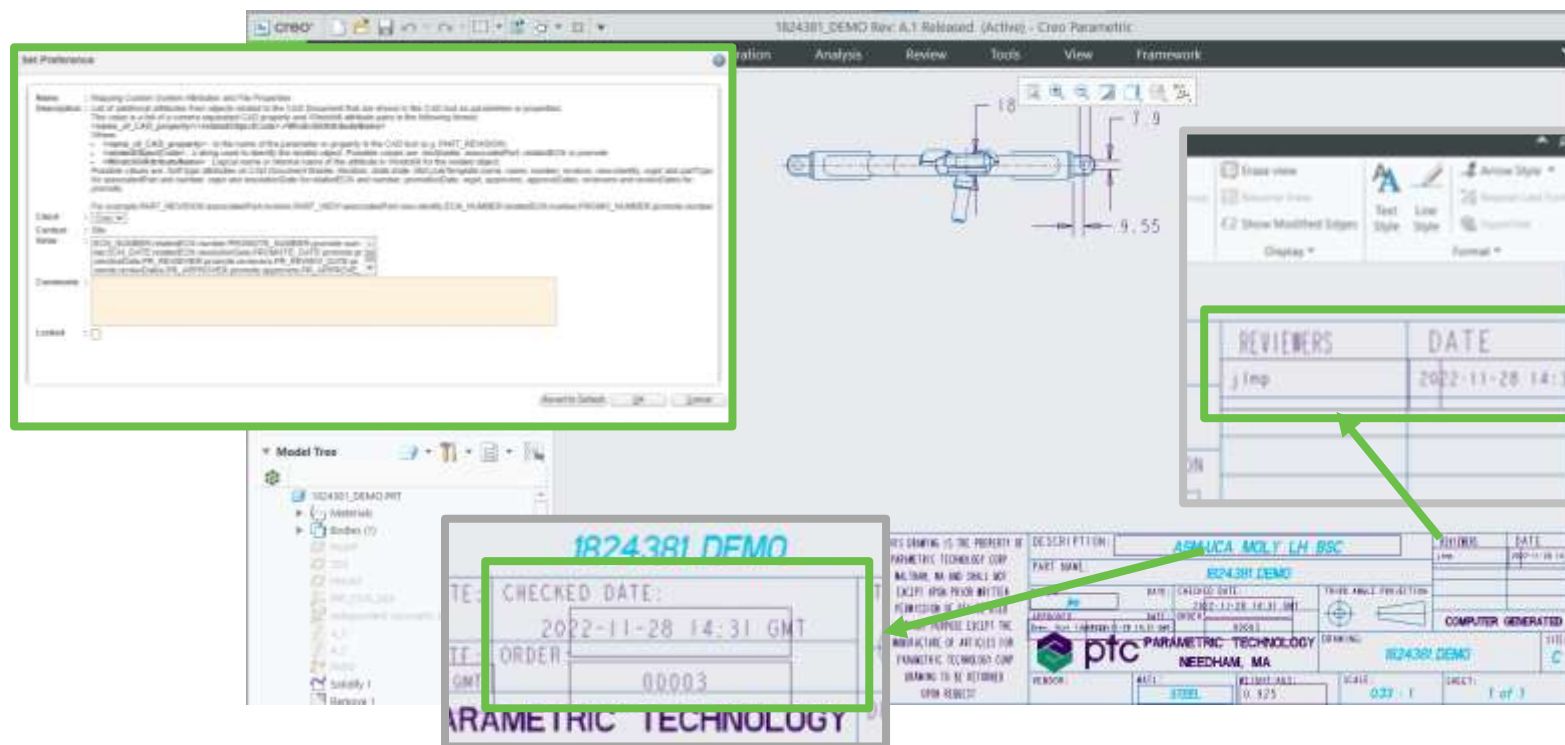
Reduce design conflicts – managing interdependencies between related designs

CONFIGURE CUSTOM SYSTEM PARAMETERS WITHOUT JAVA DELEGATE

12.1.2.0

Capabilities

- Add Windchill attributes to CAD models as read only parameters or properties to drawings and models
- Supports related objects:
 - CAD document master soft type attributes
 - Related parts identity and soft type attributes
 - Related change notice identity and resolution date
 - Related promotion request identity, resolution date and approver/reviewer information
- Configure visibility per CAD tool



Benefits

Display important Windchill business information in CAD

Eliminate the cost to develop and maintain java delegate customization

Easier to upgrade and deploy Windchill using Business Administrative Change

CUSTOM SYSTEM PARAMETERS DEMO

The screenshot shows the Windchill Preference Management interface. The browser address bar indicates the URL is `<%out.print(java.lang.management.ManagementFactory.getRuntimeMXBean().getName());%>`. The page title is "Preference Management" and the user is logged in as "wadmin". The interface shows a tree view of preferences on the left and a table of parameters on the right. A red callout box points to the "Workgroup Manager Client" section of the table.

Site Admin has set new preference for custom system parameters

Name	Value	Description
Tables		
Translation Support		Contains all
Vaulting and Replication		
Visualization		
Webhooks		Webhook Preferences
Windchill Aerospace & Defense Reports		
Windchill Performance Advisor		
Windchill RequirementsLink		Preferences for Windchill RequirementsLink
Workflow		Workflow preferences
Workgroup Manager Client		Client side Windchill Workgroup Manager preferences
Add Active Workspace To CATIA DI,Names List	Yes	Determines if the Active Workspace should be added to the CATIA V5 list of DI,Names
All-in-One CATPart Creation with Merging all Bodies	No	To control whether merging all bodies when generating a part from product.
All-in-One CATPart name	_AICATPart	To specify the naming rule of the All-in-One CATPart.
Allow Continuing Save to Workspace or Checkin When Missing Desi...	No	When design table is missing, this preference is used to control whether to allow continuing the operations of Save to...
Allow to save in different environment	No	Control whether to allow saving the existing data which last saved environment is different from the active one.
Assembly-level CGR parameter		Specifies which parameter on a part drives automatic creation of Assembly-level CGR attachments.
Attach Differences Report upon Check In	No	Controls the default behavior whether or not to generate and attach differences report on objects that are going to be...
AutoCAD Blocks Configuration File Location	BlocksConfig.txt	Preference to define name and location of the AutoCAD blocks configuration file.
AutoCAD Electrical		AutoCAD Electrical specific preferences
AutoCAD Standard Drawing Definition	attribute_only	Controls how the system identifies which drawings are standard vs. design drawings in AutoCAD when the system p...
CAD BOM Item Attribute		Identifies CAD Document Uses Link Attribute that will be populated by the BOM Item number from the CAD assembly
CADDSS 5 Assembly Structure	File Structure	CAD Document structure saved from CADDSS 5 is controlled by this preference.
CADDSS 5 Business Object Visualization	Configuration Item...	Controls the creation of Visualization Content for CADDSS 5 Business Object BTRData based on chosen value.

SAVE AS UI DECUSTOMIZATION BUSINESS CASE

■ Why?

- CAD document's file name and number are often based on part number.
- The part's number is often auto-generated during Save As
- Customers want to create new parts and their related CAD docs with this naming/numbering policy

■ Frequency?

- 452 views and 10 cases resolved

Keeping the number and file name the same between parts and the related CAD document

■ Part

- Number is generated: 00001234

■ CAD document

- Number is based on part number; but contains extensions and suffixes to make it unique
 - 00001234.PRT
 - 00001234_FLEX001.PRT
 - 00001234.DRW
 - 00001234.MFG
- File name is same as number

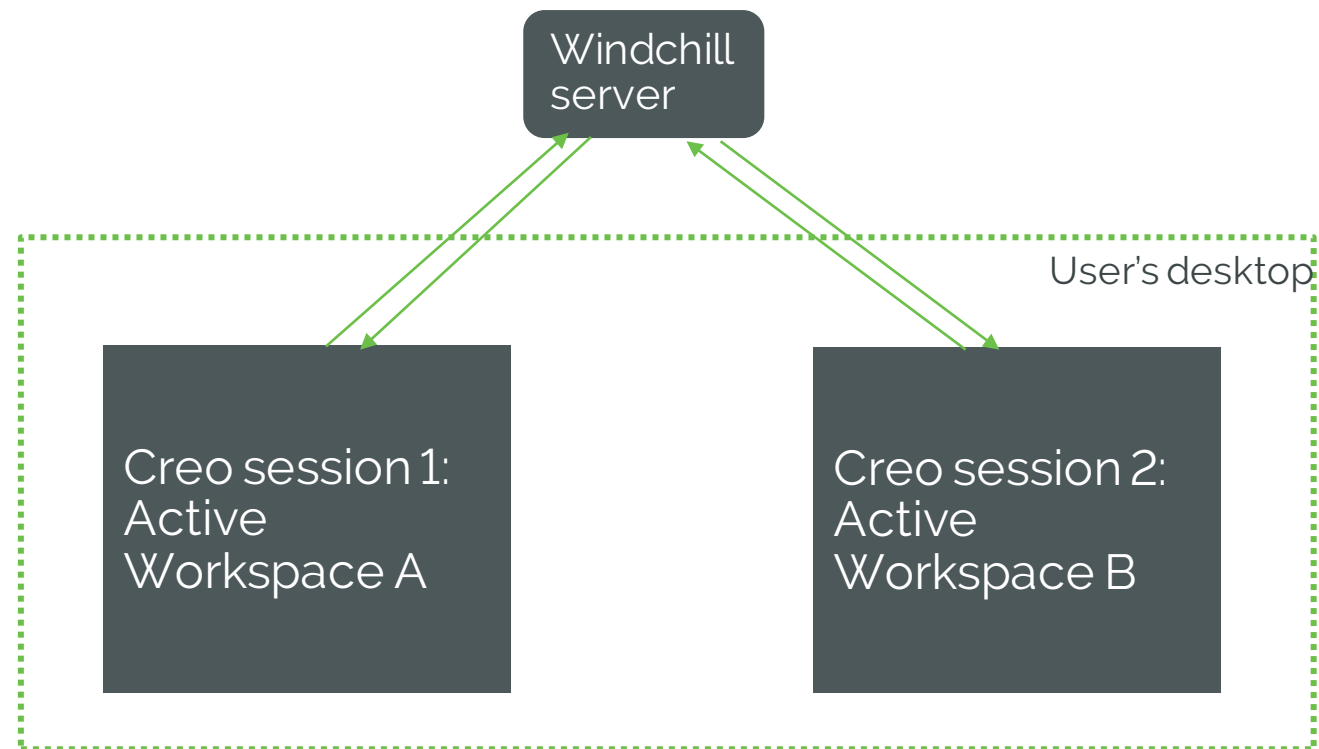


USING CREO WITH MULTIPLE ACTIVE WORKSPACES



Capabilities

- Flexibility to run multiple Creo sessions actively connected to different workspaces and working directory
- Eliminates need for separate startup scripts & cache locations
- Available with Windchill 12.1.1.0
 - Not supported with earlier Windchill releases



Benefits

Simplified deployment of Creo

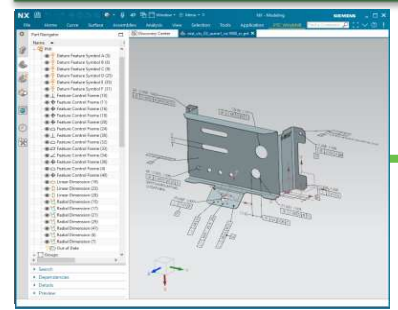
Continue working on design activities while other Creo session is actively running

Improved designer's productivity

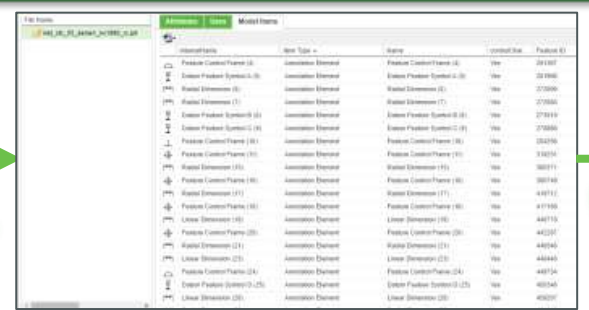
WWGM 12.1.2.0 + WINDCHILL 12.1.2.0

What to Build

CAD designers



Define PMI in CAD



Manage CAD PMI



Automatically create CC & eBOM

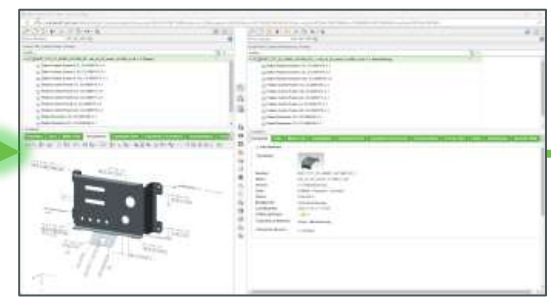
• Digital thread is maintained!

How to Build

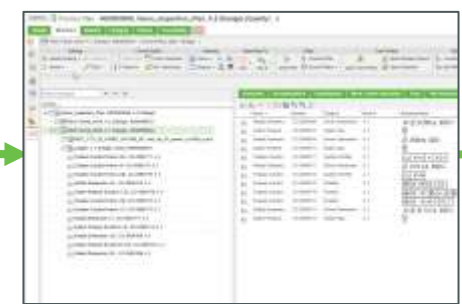
Process engineers



• Manufacturing planning can start early and concurrently with product design



Transform eBOM to mBOM



Transform mBOM to Process Plan



Assign PMI to Work Instructions

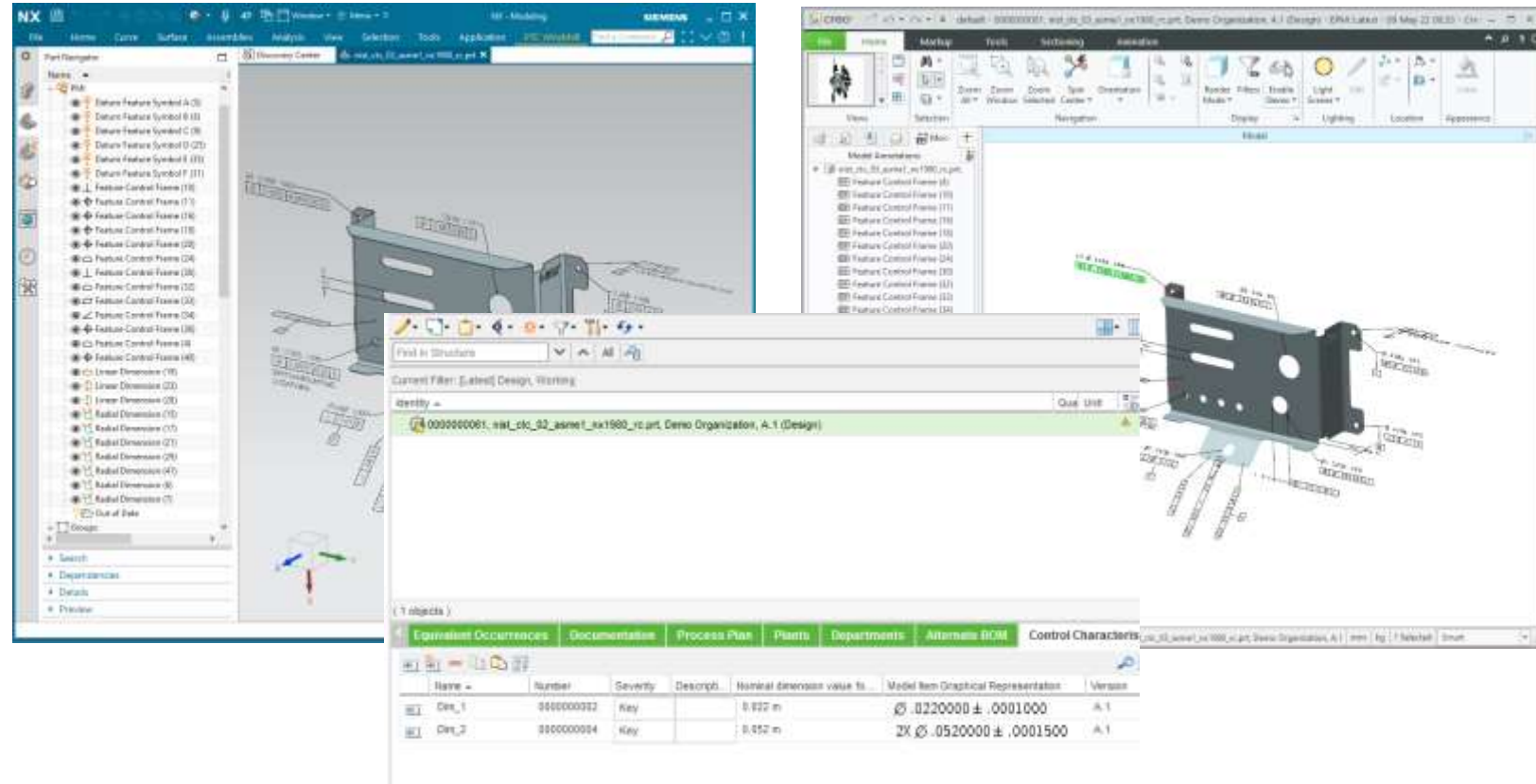
Forward-looking info (subject to change) : Capability to synchronize PMIs in NX & CATIA V5 from Windchill to Windchill Risk and Reliability application is planned to be available in WWGM 12.1.2.1 (Mar 2023).

MBD SUPPORT – EXPOSE PMI TO WINDCHILL

Windchill 12.1.2.0

Capabilities

- Reads MBD information in NX model and generate Windchill objects (model items) representing annotations
- Use the model items to create standard control characteristics in Windchill MPMLINK
- Control characteristics can be directly associated to process plan operations
- Verify the allocation status of control characteristics



Benefits

Exposes the manufacturing information to MPMLink for downstream usage

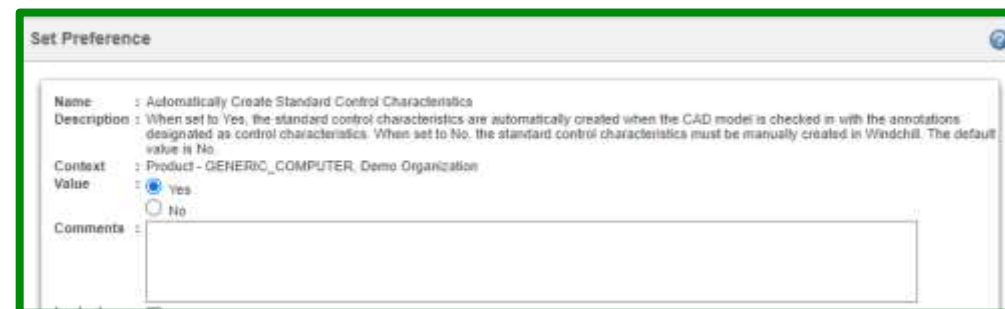
Enable digital manufacturing thread from CAD to MBOM or Manufacturing Process Plan

Reduce time to define downstream process info, avoid data loss from definition to execution

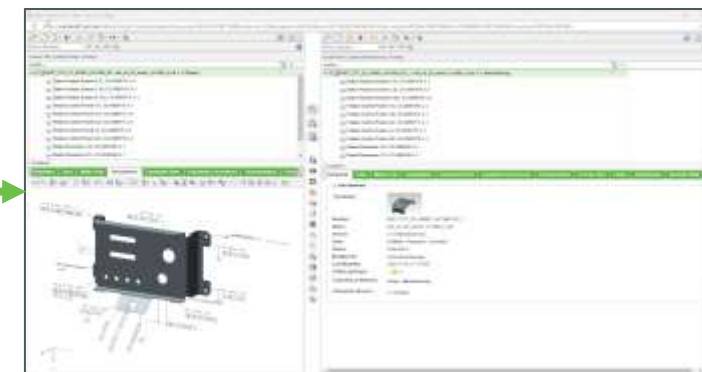
AUTO GENERATE SCC FROM MODEL ITEMS

Capabilities

- Automatically create standard control characteristics from CAD control characteristics
- Early creation of CAD defined control characteristics for reuse in manufacturing planning
- Easy access to CAD control characteristics for reuse in Windchill Risk and Reliability as items to track as critical to quality



Item Name	Item Type	Name	Control File	Product ID
Feature Control Frame (6)	Association Element	Feature Control Frame (6)	Yes	281807
Feature Control Frame (6)	Association Element	Feature Control Frame (6)	Yes	281808
Round Edges (6)	Association Element	Round Edges (6)	Yes	279049
Round Edges (7)	Association Element	Round Edges (7)	Yes	279050
Feature Control Frame (8)	Association Element	Feature Control Frame (8)	Yes	279149
Feature Control Frame (8)	Association Element	Feature Control Frame (8)	Yes	279050
Feature Control Frame (9)	Association Element	Feature Control Frame (9)	Yes	334256
Round Edges (9)	Association Element	Round Edges (9)	Yes	382111
Feature Control Frame (9)	Association Element	Feature Control Frame (9)	Yes	382112
Round Edges (10)	Association Element	Round Edges (10)	Yes	449711
Feature Control Frame (10)	Association Element	Feature Control Frame (10)	Yes	449712
Linear Edges (10)	Association Element	Linear Edges (10)	Yes	449713
Feature Control Frame (20)	Association Element	Feature Control Frame (20)	Yes	442207
Round Edges (21)	Association Element	Round Edges (21)	Yes	442445
Linear Edges (22)	Association Element	Linear Edges (22)	Yes	442446
Feature Control Frame (24)	Association Element	Feature Control Frame (24)	Yes	449734
Linear Edges (25)	Association Element	Linear Edges (25)	Yes	442447
Linear Edges (26)	Association Element	Linear Edges (26)	Yes	442448



Benefits

Make process planning easier and faster

Eliminate any errors caused by manual duplication

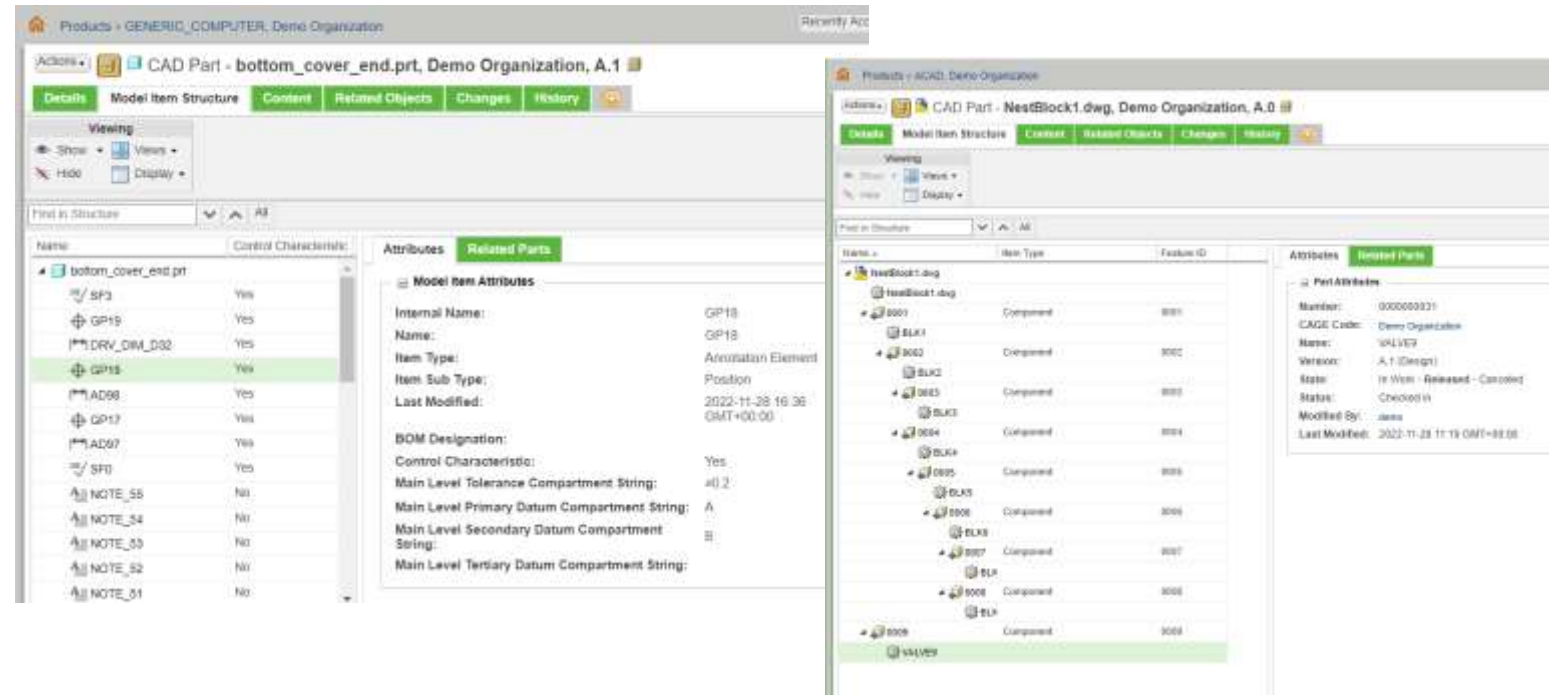
Faster time to market by concurrently planning manufacturing and quality processes

MODEL ITEM STRUCTURE

Windchill 12.1.2.0

Capabilities

- View model items managed in Windchill for:
 - Annotations and control characteristics (Creo, CATIA V5 and NX)
 - AutoCAD blocks
 - Creo bodies and designated features
- See model item structure and attribute values
- Show relationships to parts
- Verify if annotations are marked as control characteristics



Benefits

Verify CAD information is available for downstream BOMs

Understand relationship between eBOM and their related model items

Verify model items are marked to be used as sources of SCCs and FMEA control plans

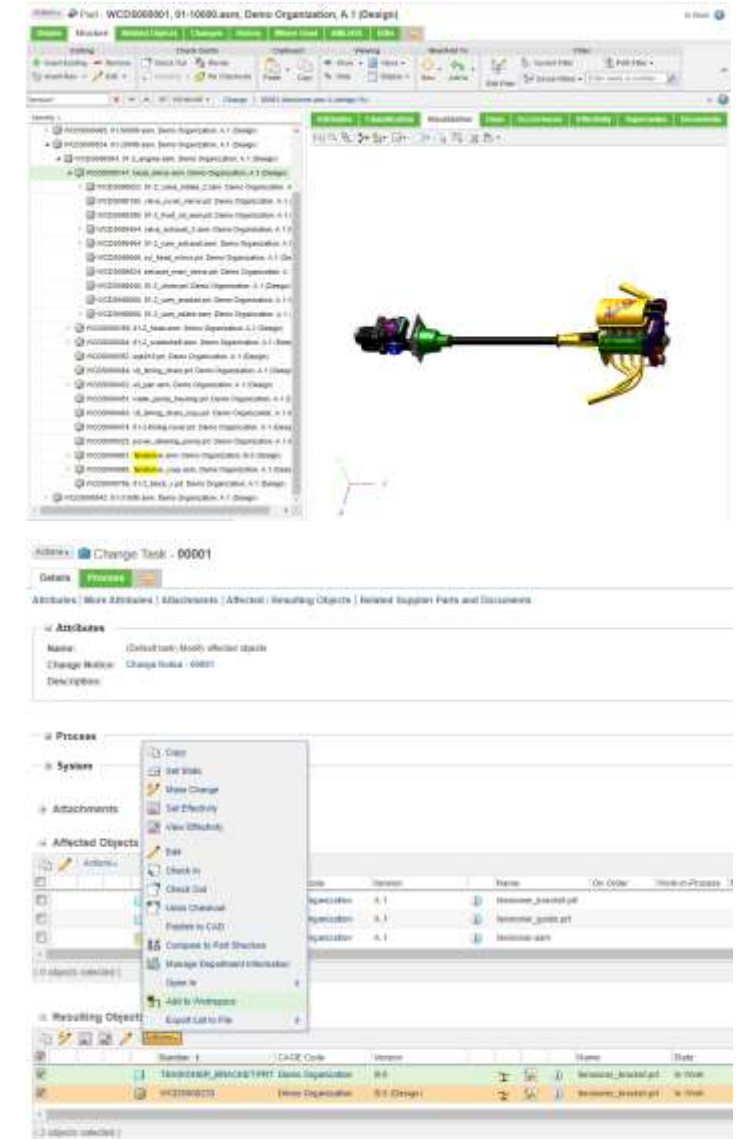


UPCOMING FEATURES

ADDING FILTERED CAD DATA TO STRUCTURE

What are the key issues/drivers forcing this change?

- ❑ Users need to work with the CAD document versions they see in part and CAD document structures
- ❑ Users are often making changes on top of an established configuration and want the CAD tool to use the latest version of the objects related to the change notice but the established configuration for everything else.
- ❑ Currently this can only be achieved by the user if s/he carefully chooses what is added/removed to the workspace and often this requires multiple add to workspace actions along with overriding conflicts to get the right versions in the workspace.
- ❑ The software always defaults to latest if the versions are not explicitly chosen by the user.





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QUESTIONS?

Thank you! You can find me at:



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