



ptc



REDEFINING PLM: THE POLARIS EXPERIENCE

Mark Lobo
Senior Director, PLM Solutions

November 2018



AGENDA

- Polaris and Technology Innovation
- Enterprise PLM Definition @ Polaris
 - Lifecycle and Process Management
 - Connecting Engineering and the Enterprise
 - Connecting People and Devices
- Business Impacts – Internal and Customer
- Q&A

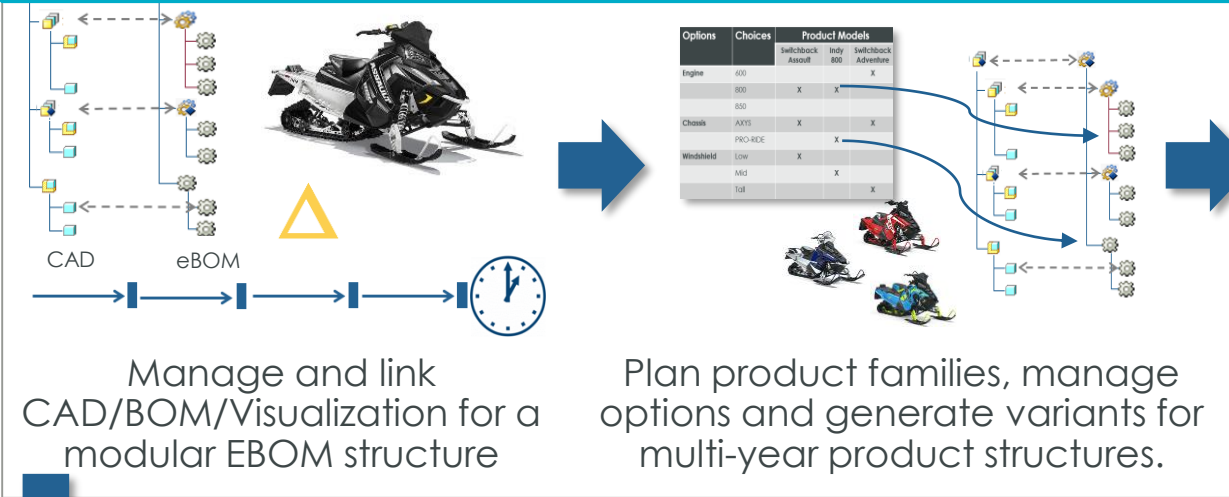
Fuel the passion of workers and outdoor enthusiasts around the globe by delivering innovative, high-quality vehicles, products, services and experiences that enrich their lives.

- Give customers **a great end to end experience**, from customized purchase options to service to end-of-life
- Unlock the power of Polaris employees through **PLM tools/processes to make faster, better decisions**
- Adopt **a step by step approach to digital transformation** ensuring the highest quality for consumers

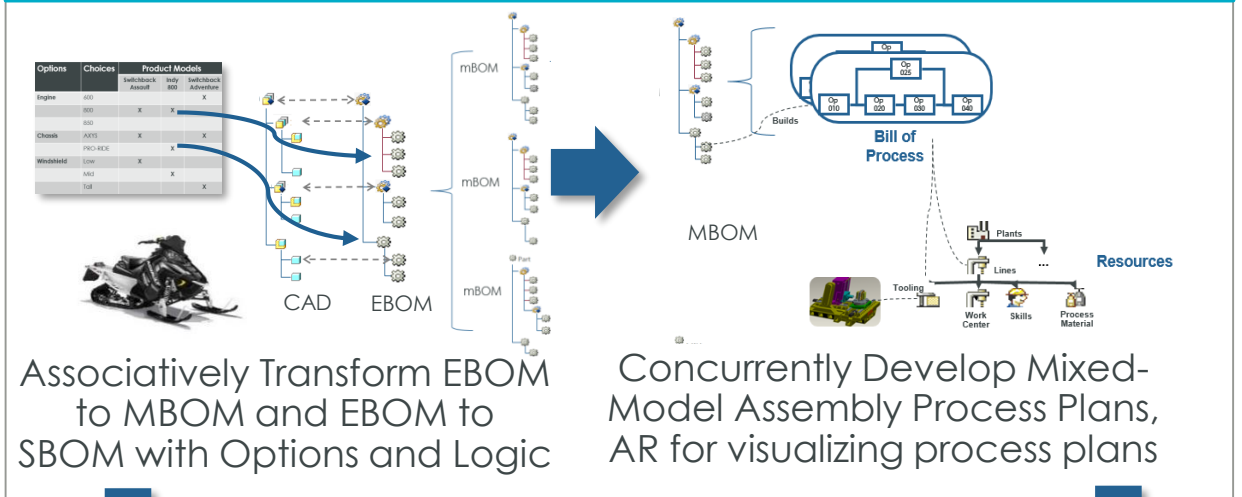
ENTERPRISE PLM DEFINITION @ POLARIS



PLM: BOM Management, Global Platforms, Family Management



PLM: BOM Transformation, Digital Process Planning, Change Mgmt



PLM: Role-Based Apps & AR

Role-Based Apps, Variant-Specific AR Design Review and Visualization

CAD

Topology Optimization, Additive Manufacturing

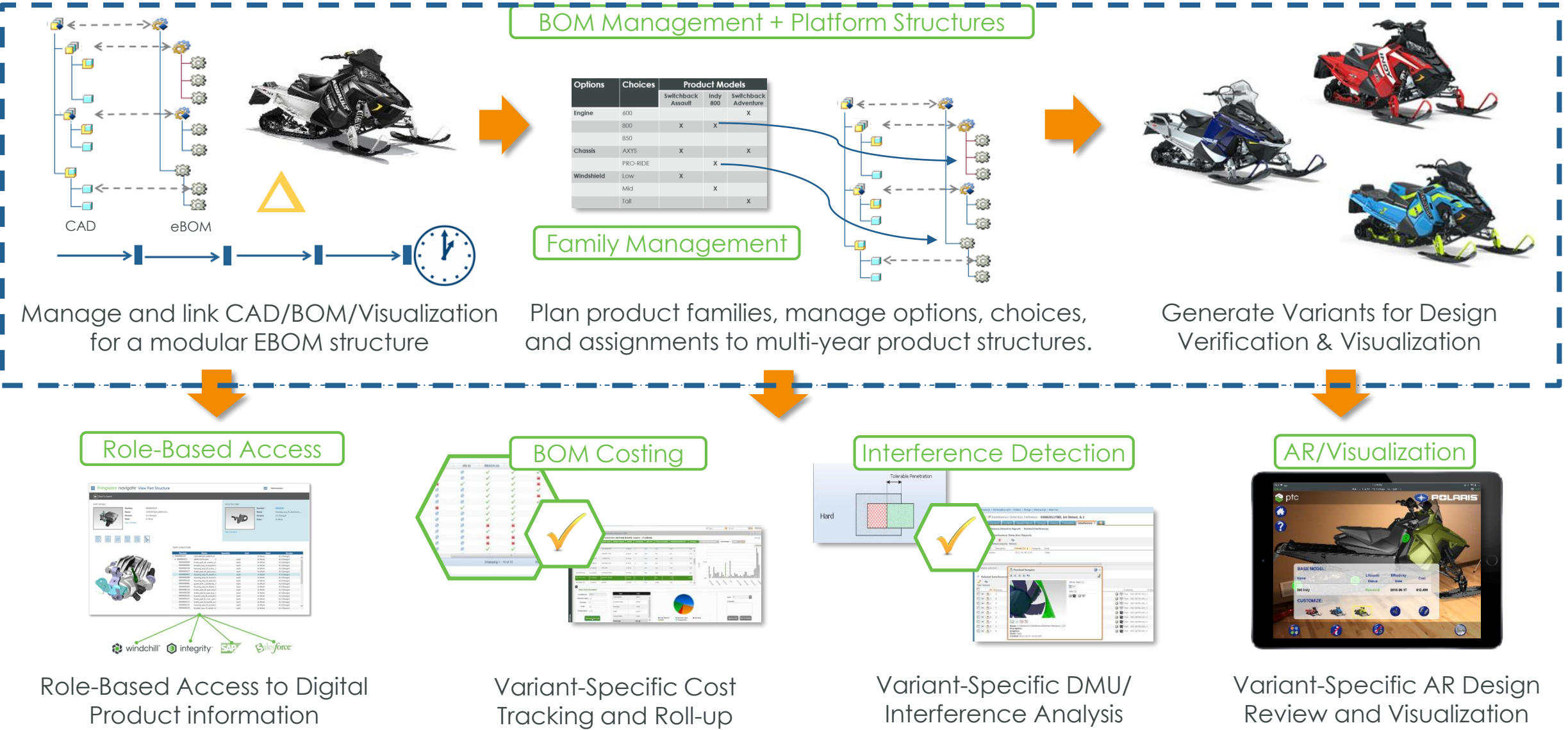
Service

Service & Parts Information, Authoring and AR for Service

Manufacturing

Digital Assembly Instructions, Smart Tool Integrations, Paperless Operations, AR for Instruction Authoring

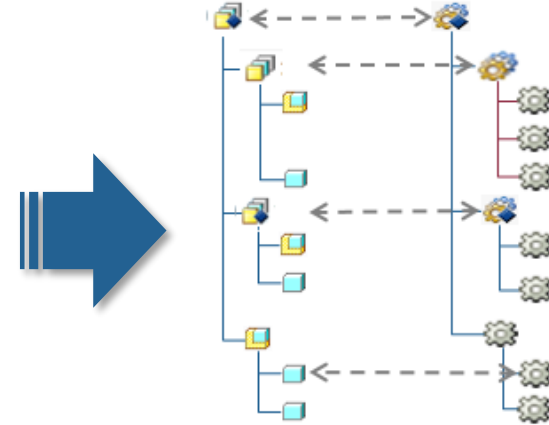
REDEFINING PLM – LIFECYCLE AND PROCESS MANAGEMENT



BOM MANAGEMENT + GLOBAL PLATFORMS

- Modular Architecture
 - Hierarchical Structure
 - Configurable Product Platform Design
 - Flexibility in Platform Creation
 - Interface Definition and Management
- Controls
 - Options, Choices, Rules
 - Assignment to Modular Structure
 - Logic sharing to the enterprise
- Configurations
 - Complete definition of specific configurations
 - Manage a family of configurations for Sales, Eng, Mfg

Options	Choices	Product Models		
		Switchback Assault	Indy 800	Switchback Adventure
Engine	600			X
	800	X	X	
	850			
Chassis	AXYS	X		X
	PRO-RIDE		X	
Windshield	Low	X		
	Mid		X	
	Tall			X



Change
Management

Validation &
Analysis

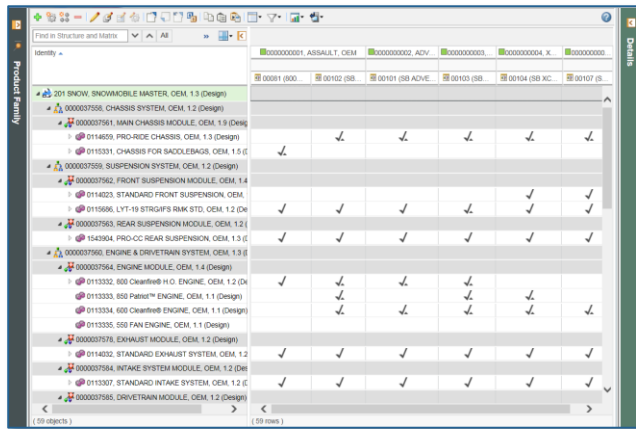
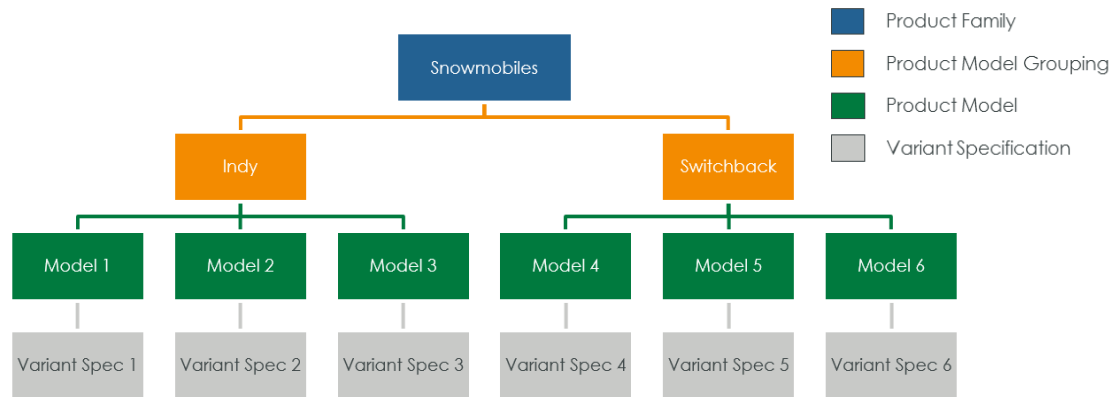
BENEFITS

Support re-use within
and across families

Modular product families
for increasing complexity

Validate product
platforms to meet your
business objectives

PRODUCT FAMILY MANAGEMENT



- Product Family Definition
 - Windchill objects for defining Digital Families
 - Enables intuitive navigation
- Product Family Matrix View
 - Simplified view and management
 - Configurations using Assigned Expression/Manual Selection
 - Side-by-side view of many configurations
- Foundation for Configurable Family BOMs
 - Side-by-side view & define features for a family

BENEFITS

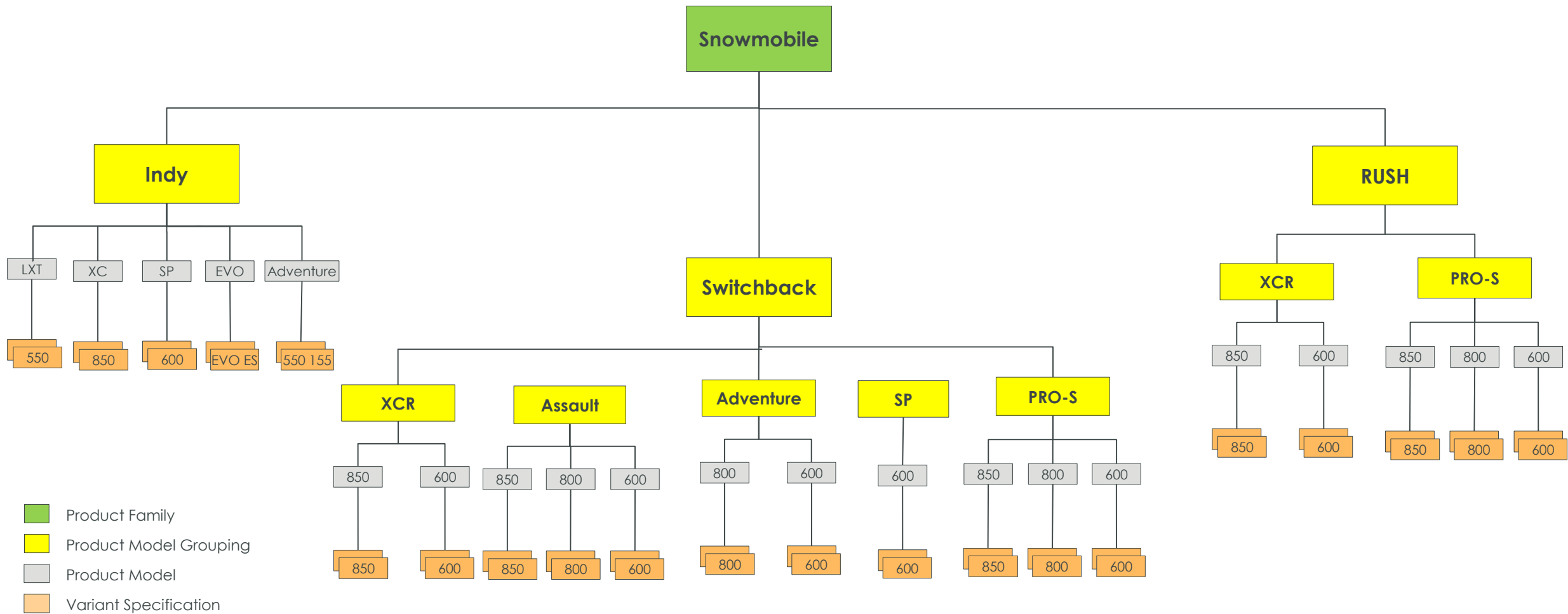
Streamline access to a Family of products

See a range of Products together

Understand how changes to structure and logic impact a Product Family

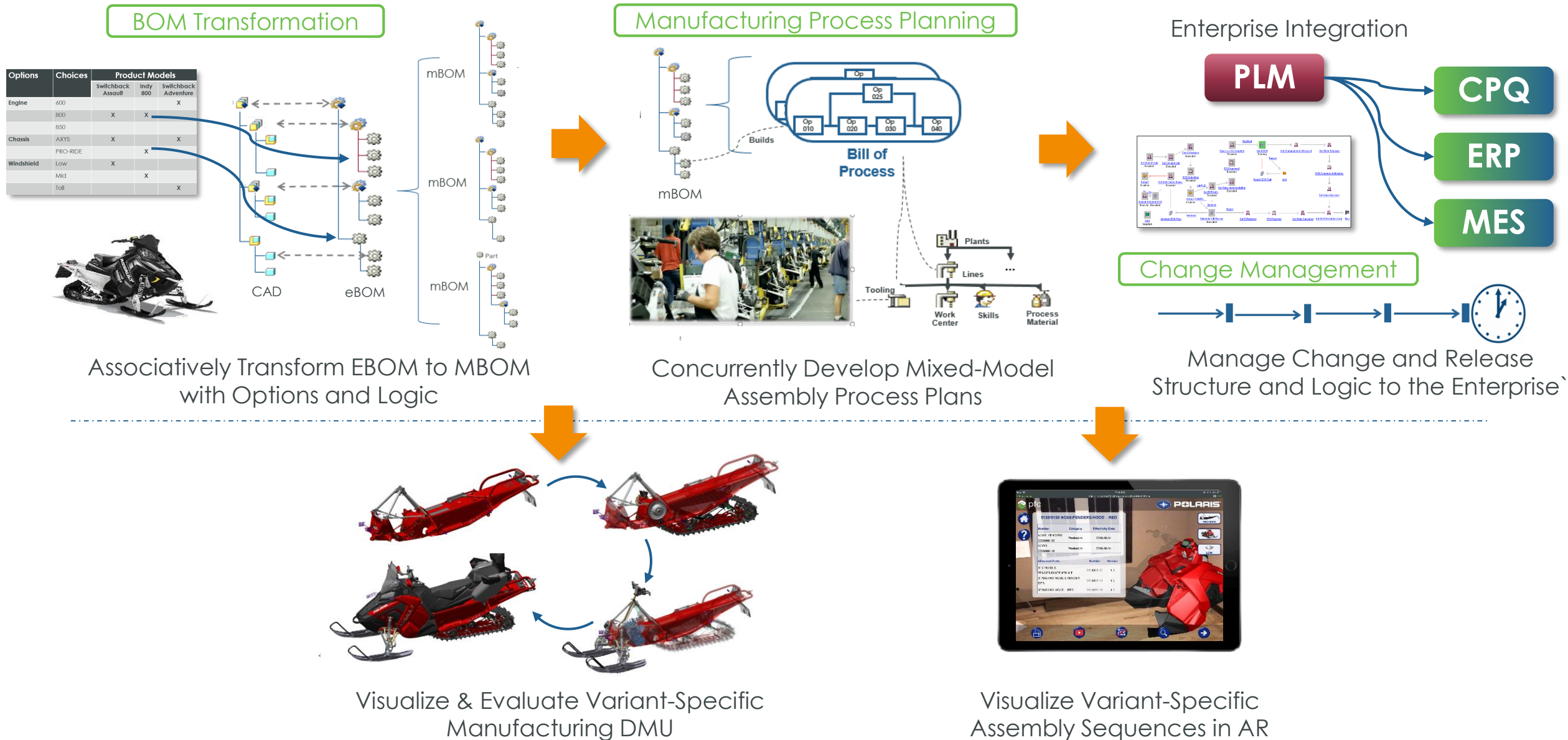
PRODUCT FAMILY – POLARIS SNOWMOBILES

GLOBAL DEFINITION TO SUPPORT MANY MARKETS

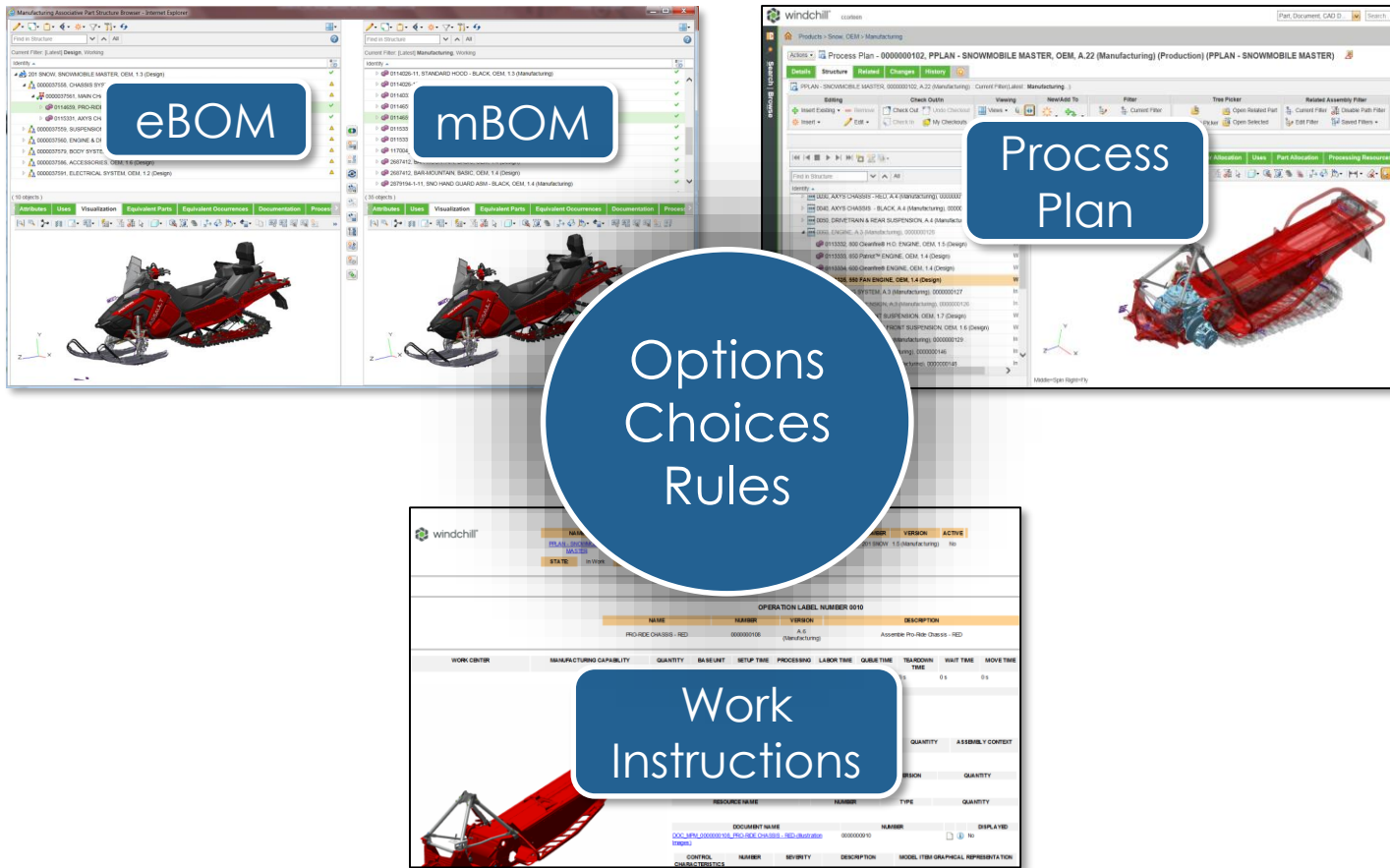




REDEFINING PLM – CONNECTING ENGINEERING AND THE ENTERPRISE



MANUFACTURING PROCESS PLANNING



- Configure Process Plan with Options and Rules
- Plan Manufacturability of each Configuration
- Leverage Options and Rules

BENEFITS

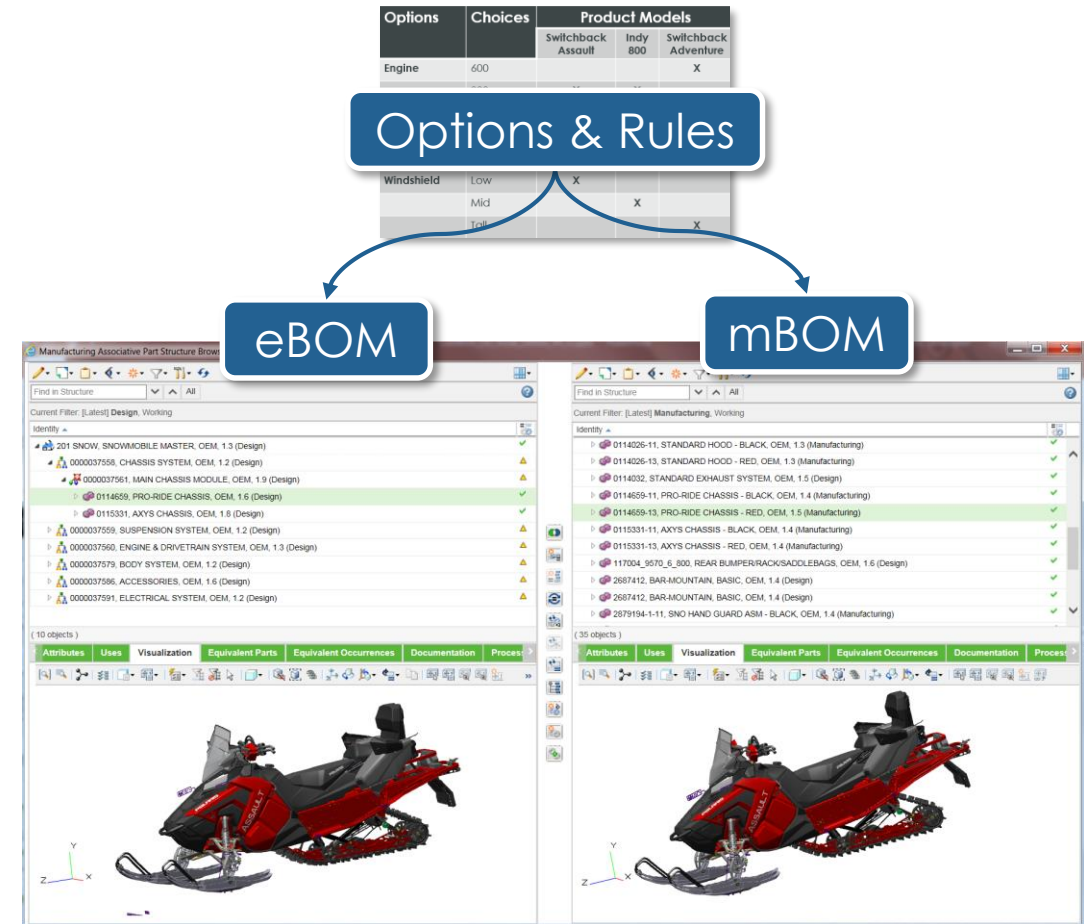
Improve Product Data quality with less manual input

Reduce NPI with better configuration change management

Less scrap by allowing manufacturability validation of each configuration

BOM TRANSFORMATION

- Manage Plant-Specific MBOMs
- Visualize MBOM in 3D
- Synchronize EBOM and MBOM
- Leverage Options and Rules



BENEFITS

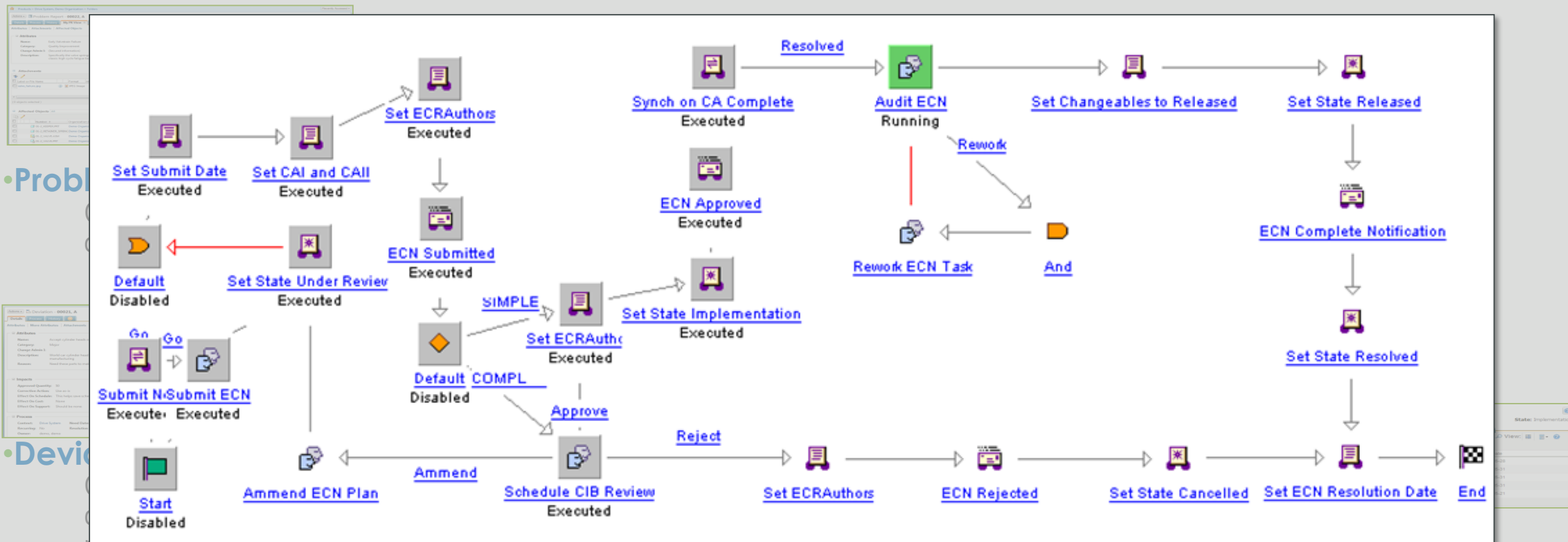
Improve Product Data
quality with less
manual input

Reduce NPI with better
configuration change
management

Less scrap by allowing
manufacturability validation
of each configuration

STANDARDIZED, AUTOMATED CHANGE PROCESS

Two processes: FAST (simplified oversight) and FULL (full CRB / CIB review)



BENEFITS

Elimination of costly errors with reduced scrap and rework

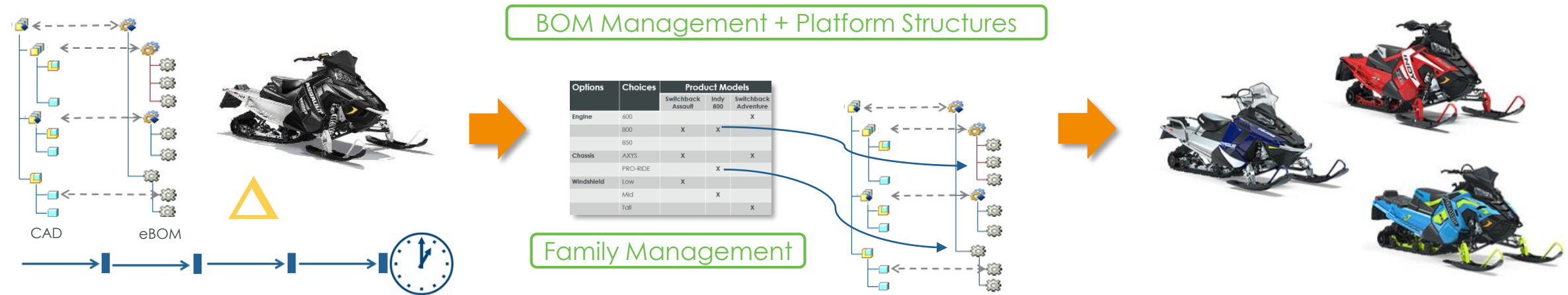
Improved product quality and safety

Provide an audit trail and traceability of design decisions

Synchronize support information and eliminate confusion in manufacturing



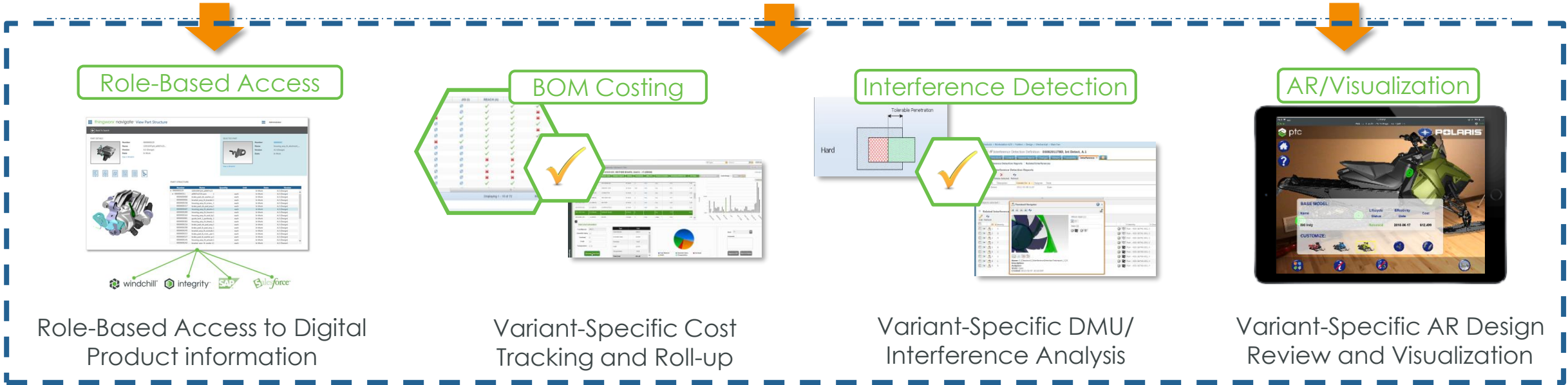
REDEFINING PLM – CONNECTING PEOPLE AND DEVICES



Manage and link CAD/BOM/Visualization for a modular EBOM structure

Plan product families, manage options, choices, and assignments to multi-year product structures.

Generate Variants for Design Verification & Visualization



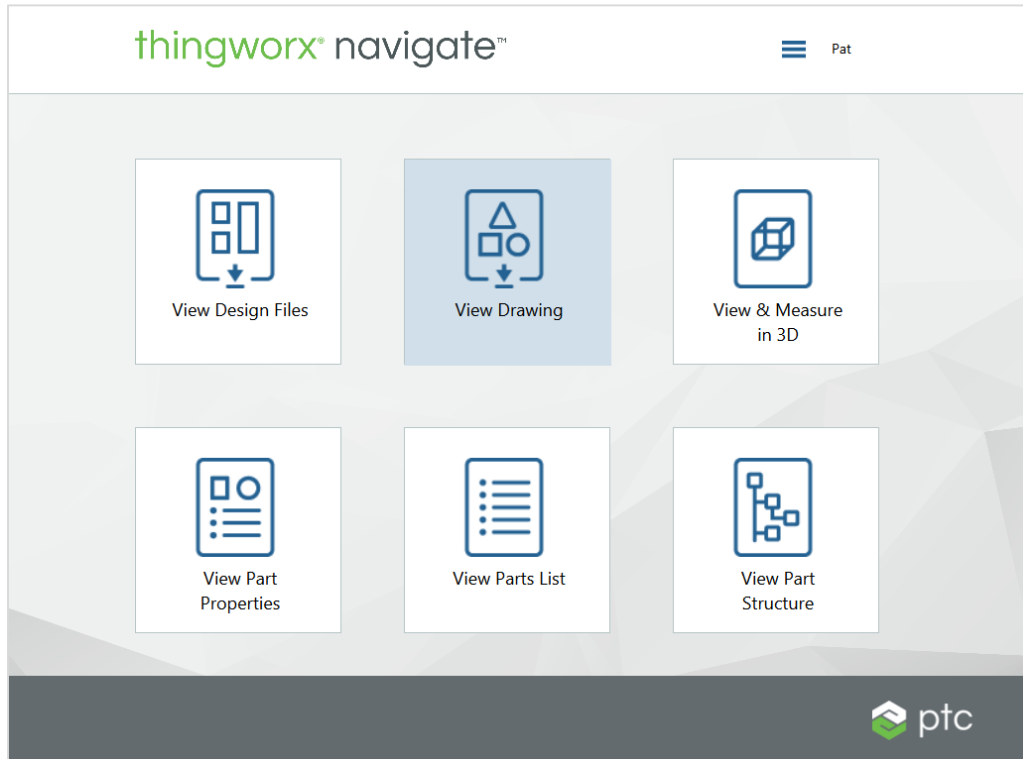
Role-Based Access to Digital Product information

Variant-Specific Cost Tracking and Roll-up

Variant-Specific DMU/ Interference Analysis

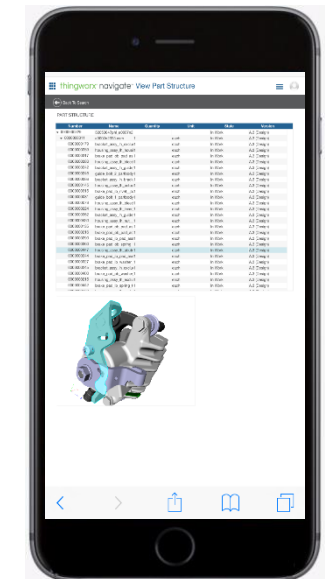
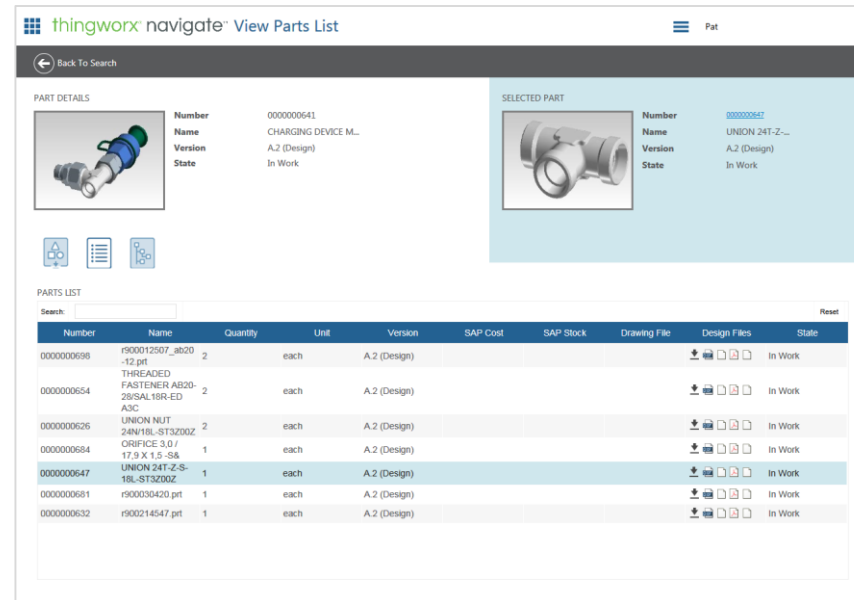
Variant-Specific AR Design Review and Visualization

Description: Self-serve access to enterprise information needed from all the source systems in a role-based view that is easy to consume without training




Purchasing Role


Manager



BENEFITS

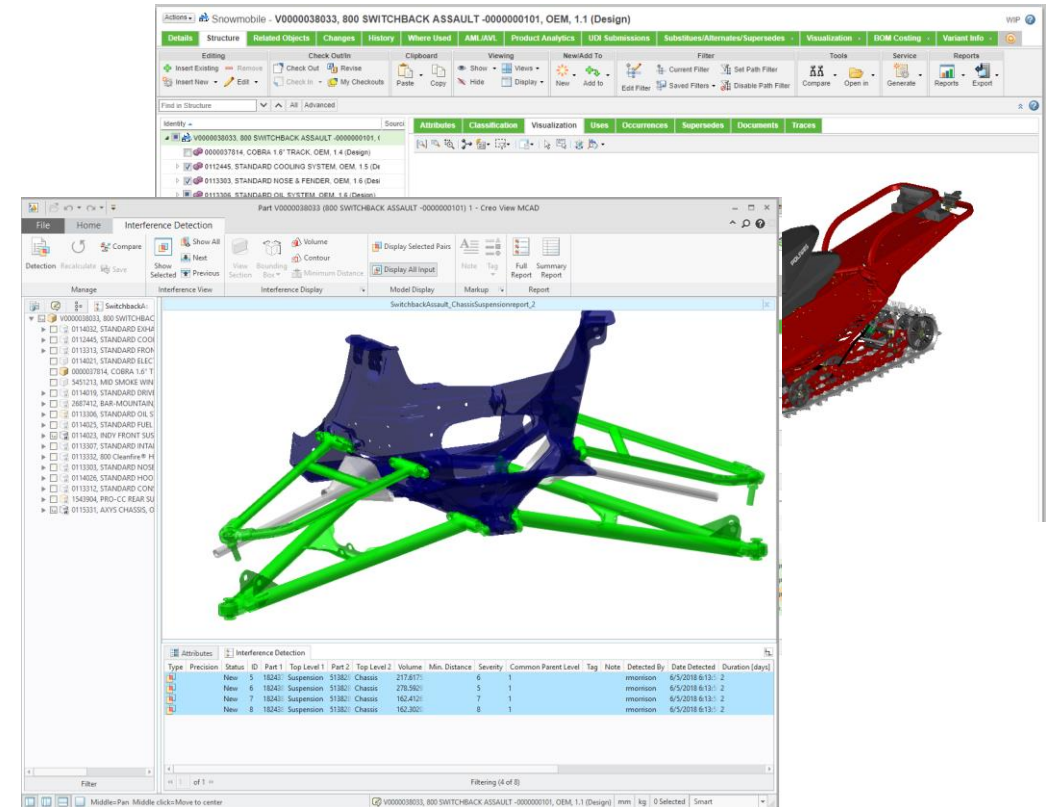
Improved visibility and collaboration

Enable better decisions faster

Increase efficiency and improve time to market

INTERFERENCE DETECTION

- Interference Detection Definition
 - Windchill objects for defining Interference Definitions
 - Batch analysis performed on scheduled basis
 - Linked interference definitions help:
 - Breakdown analysis into consumable chunks (ex. Chassis & Suspension)
 - Reduce duplication of interferences detected
- Collaborate and Resolve Interferences
 - Visual Analysis of Interferences through Creo View
 - Create meaningful Augmented Reality Experiences to demonstrate fitment issues with variant configurations
- Lifecycle Managed Interferences
 - Set Severity and Priority of interferences
 - Assign interferences for resolution
 - Create problem reports directly from interferences









BENEFITS

Automate product
variant validation
through DMU analysis

Accelerate interference
resolutions with integrated
change management

Shorten Cycle
time for variant
validation

VALUE OF AR ACROSS THE ENTERPRISE

 DESIGN	 MANUFACTURE	 SELL	 SERVICE	 TRAIN	 OPERATE
Collaborative Design Review	Maintenance Work Instructions	Virtual Product Demonstration	Service Manual & Instructions	Job-specific Training	Head-up Display
Digital Design Review	Performance Dashboards	Augmented Brand Experience	Service Inspection & Verification	Safety & Security Training	Augmented Operator Manual
Augmented Interface	Operator & Assembly Work Instructions	Retail Space Optimization	Remote Expertise	Expert Coaching	Augmented Interface



Internal Impacts

- PLM tools and processes will be used to increase predictability and make faster, better decisions
- Value realized: reduced costs/increased customer and channel value, faster NPD/TTM, higher product safety and quality



Consumer Impacts

- Extreme product testing and validation to ensure utmost product safety, reliability and durability
- Real-time analysis of consumer data to increase product quality with less need for repair
- Configurator tool extended through AR lets consumers experience features prior to buying
- Rapid and seamless product repair through AR service experience
- Data analytics to better understand how and what vehicle features are most used



BOSTON CONVENTION & EXHIBITION CENTER

June 10 – 13, 2019

REGISTER FOR YOUR ALL ACCESS PASS:
FOR ONLY \$500!

USE CODE: **FORUM19**

** Offer only valid until January 9th, 2019*

liveworx.com

#LIVEXORX

THE WORLD'S MOST
RESPECTED DIGITAL
TRANSFORMATION
CONFERENCE

7000+
Technologists

240+
Breakout Sessions

300+
Industry Experts

100+
Product Demos

