Variant Management in the 3DEXPERIENCE Plattform

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Why Variant Management is Key in the Experience Economy
From One Product for Everyone…

Market
to One Product for Every “One”
Major Trend in many industries

Volume / Product

TMHG Product range

Europe | USA / Canada | Mexico | Japan | China

Standard Product | Special / Individual Products

POWERING PERFORMANCE

The “lot size one trap”

Product cost / price (€)

Standard Product

Special / Individual Products

Product cost

Product price
The “lot size one trap” – and how to overcome it

Product cost / price (€)

- Modularization & Standardization & Part Reuse
  with Model based Engineering & Variant Management

Standard Product

Special / Individual Products
Going Modular – Bicycle
Going Modular – Bicycle
A Modular Architecture Approach

- Configuration Management
- Rules & Options
- Model-based Configuration
- Design in a Configured Context
3DEXPERIENCE for Model Based Enterprise

Model-Based Program/Project Management

- Model-Based Sales and Operations planning
  - Supply vs demand
  - Resources optimization
  - Production plans
- Model-Based Product Architecture
  - Modularity
  - Interfaces
  - Technical configuration
- Model-Based System Engineering (MBSE)
  - System modeling
  - Simulation
- Model-Based Materials and Formulations
  - Material
  - Formulation
- Model-Based Engineering
  - Physical mock-up
  - Design in configured context
  - Knowledge
- Model-Based Testing
  - Virtual and physical test plan
  - Physical samples to be tested
- Model-Based Manufacturing Engineering
  - Process modeling
  - Resources/robots
  - Routings/work instructions
  - Scheduling
  - Work orders
- Model-Based Service Engineering
  - Service BOM
  - Resources
  - Routings/work instructions

Model-Based Simulation/Optimization (FEM/CFD/Behavior/Ergonomics/Load balancing/Scheduling/What if scenarios)

Model-Based Change Management

Model-Based Configuration Management
Engineering Item

Unified Product Engineering Definition incl. multi-discipline design information

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3D Model (Assembly and components)

Engineering Definition attributes (Part number etc…)

Drawing

Reference Document (MS Excel, MS Word …)
Main objects in Modular Architecture

- **Modules**

- **Modules Variants**

- **Products**
To be, with product configuration management

- Offer more product choices
- Create faster, more accurate customer proposals
- Reduce product development cost: maximize upfront multidiscipline engineering and minimize customer specific customizations
- Unique data world - wide, easy propagation of changes
Engineering to Manufacturing Digital Continuity

**Engineering Item Definition**

- **Product Structure**
  - Electrical
  - ECAD
  - Mechanical
  - MCAD (3DXP)
  - MCAD (NX)
  - MCAD (CV5)
  - MCAD
  - Non-CAD

- **Geometry**
  - MCAD

- **Engineering Information**

**Manufacturing BOM Report**

- **“MBOM” Structure**
  - Controls
  - ECAD
  - Non-CAD
  - Structure
  - ECAD
  - MCAD (NX)
  - MCAD (CV5)
  - MCAD
  - Service
  - Non-CAD
  - MCAD (3DXP)

- **Manufacturing Information**

**Plant Specific Process**

- Allocation to Mfg Items

- Allocated to Process

- MRP Integration
Manufacturing BOM Manager - Overview

• Centralized Manufacturing Site Planning
  • Site-specific definition managed in central product structure
  • One, consolidated, up to date, Global BOM Provides dynamic engineering and manufacturing views
  • One version of the truth for all BOM authors and consumers

• Centralized Manufacturing Part Planning
  • Supplier alternates, substitutes are authorized for use by GEO / Site to optimize global supplier pricing, part re-use, and reducing risk to customer satisfaction
  • Definition and tracking of product units and unit build structure is provided for unit based manufacturing

• Automated Change Process
  • Engineering changes are automatically propagated to the affected manufacturing sites
  • Sites can skip interchangeable part revision changes from engineering for production flexibility
  • Initial MBOMs and delta changes are sent to ERP via available ENOVIA ERP connectors providing Zero BOM errors business value.
One Source for Options and Rules

Create the Product Dictionary from a library of Options/Rules, to define all possible variants.
Model-Based Configuration Management

Variants

Feature

Options

Rules

AND, OR, NOT, =>, ↔

Product Configurations

Configuration: PC003_2920_Black_16GB_NoWifi
Top level Part Number: Assy003-2920-001

Configuration: PC003_2920_Aqua_16GB_NoWifi
Top level Part Number: Assy002-2920-001

Configuration: PC003_2920_Print_Brown_32GB_Wifi
Top level Part Number: Assy004-2920-001
Maintains all variations within a single configured structure

- Single configured structure containing all variations
  - Managing unresolved structures with effectivities enables to optimize engineering effort and perform the minimal modification corresponding to the authors' intent

- Multi Model Configuration context
  - A single configured structure can be shared across multiple models and optimizes configured product structure reuse.

- Access and analyze the configured product structure directly from 3D (or any other authoring environment) for project tracking and decision making.
  - Advanced analysis tools can be used whether authoring or navigating configurations, to optimize commonality, reuse engineering IP.
  - B.I.Essentials and the property panel enable users to quickly visualize the effectivity of each product component and available pre-defined configurations.
Navigating on Configured Structures

Ability to navigate on each configuration enables engineers to quickly retrieve the context they need.

Configured structure can be navigated (resolved) using either Predefined Configurations or On-the-fly configuration criteria selection.

- Engineers can then build the context they need to perform their work
  - Design in context, Review, Simulation, Analysis,....
- Predefined Configuration can be stored in authoring session for later use

Direct access to all predefined configurations

![Predefined configuration selection](image1)

Western Europe Saleable configuration

Great Britain Saleable configuration

Dummy configuration with both LHD and RHD for advanced simulation scenario
Bumper Designer is modifying the **bumper skirt** to make it stronger while ensuring it is compatible with both CAR variants - **Fog light and Non-fog light**
Search across the enterprise

Unique filtering to find what you need faster.

Search across all apps
Search for both meta-data as well as unstructured data in files, posts etc.

6WTags
Content in collaborative spaces and communities is tagged automatically when saved using one or more tags describing the content in terms of “Who, What, When, Why, Where, and How”.

Users can also add their own tags and use them to filter the search results.

In-context Analytics for quick analysis of search content.

Launch and open 3DPlay directly from the search results.
Offer more diversity
Ensuring Business Agility

“...which accelerates the process and leads to better product quality. In particular we were able to **reduce change management by half** by redesigning processes and the digital workflow.”

Blaise Metzker
Head of CAD/PDM