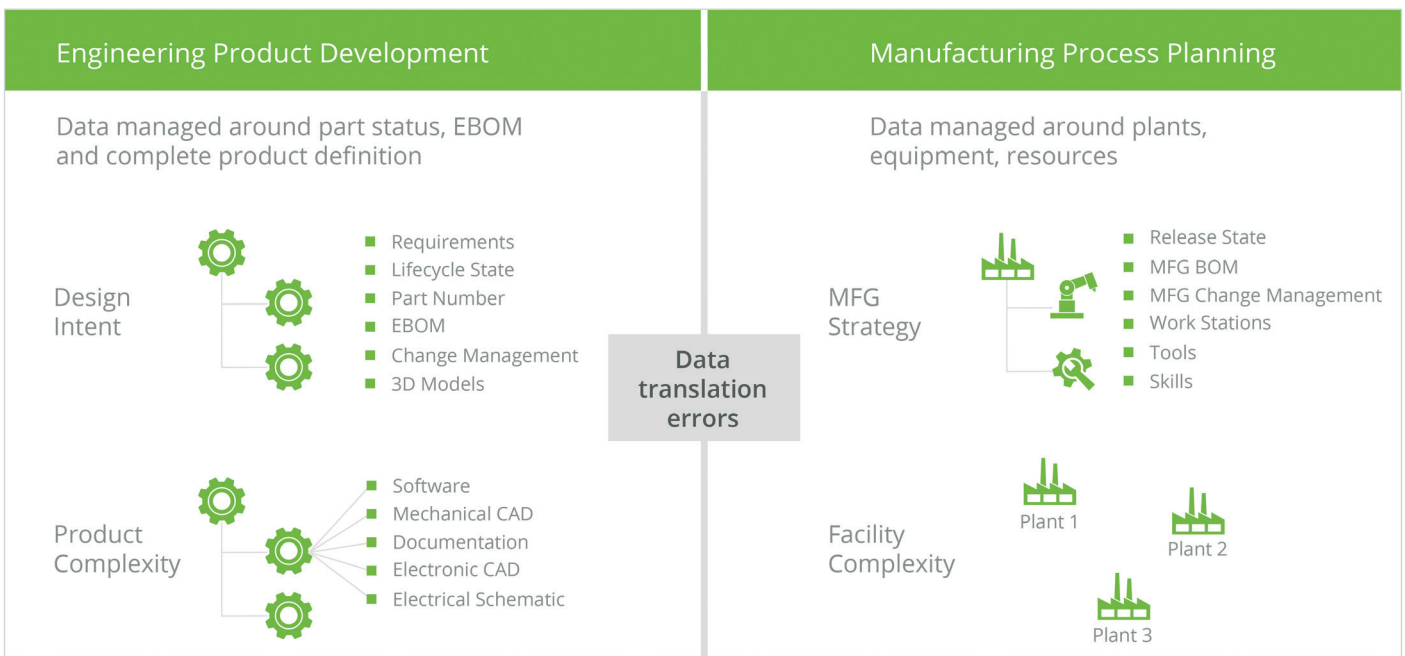# Windchill Manufacturing Process Plans and Instructions

Agile manufacturing hinges on a seamless flow of information. To ensure that each product developed and manufactured satisfies all requirements and is of the highest quality, each stakeholder must be able to access the most up-to-date product information. Yet, digital data created by Engineering and Manufacturing is rich, varied, and rapidly evolves over time.

In most organizations, this information is captured in a product's Bill of Materials (BOM). The BOM is used and adapted by many different stakeholders throughout the product's lifecycle. Moreover, these multiple variations or views of the same BOM information are frequently managed in different systems. There are many factors further complicating this matter:

- Manufacturing planning information is not often well controlled due to a reliance on spreadsheets/paper documents to aggregate information from different systems

- Production planning for even a single product may take place in multiple plants, in varying locations, with varying resources, machines and skills

Engineering Product Development	Manufacturing Process Planning
Data managed around part status, EBOM and complete product definition	Data managed around plants, equipment, resources

Design Intent
- Requirements
- Lifecycle State
- Part Number
- EBOM
- Change Management
- 3D Models

Product Complexity
- Software
- Mechanical CAD
- Documentation
- Electronic CAD
- Electrical Schematic

Data translation errors

MFG Strategy
- Release State
- MFG BOM
- MFG Change Management
- Work Stations
- Tools
- Skills

Facility Complexity
- Plant 1
- Plant 2
- Plant 3

Different data needs between manufacturing and engineering result in translation errors

Without a standard manufacturing process, the manufacturing planner's job is extremely challenging. And, without access to the most up to date product information, it is even more difficult to plan, validate and optimize ahead of production, particularly in the face of ongoing product changes and configurations.

In a typical manufacturing environment, Engineering and Manufacturing operate almost independently. This can lead to disconnected teams that:

- Use different systems to do their work
- Manage data differently
- Rely on different data models

The Problem with Disconnected Data

Sharing disconnected BOMs across teams is inefficient, and introduces the risk of errors if information is not properly distributed. When Manufacturing stakeholders are forced to work outside the product lifecycle management (PLM) system to access upstream deliverables, they must often wait until the design is finished before they can organize and translate data into the forms and systems needed for manufacturing planning. In fact, this way of working can lead to:

- Delays in dealing with product updates and changes
- Manual updates between groups to keep information and systems in sync
- Additional costs to recreate design information
- Data translation errors and data quality issues
- Delays in the transfer of design information to plants
- Delays in the manufacturing planning process
- Product release delays
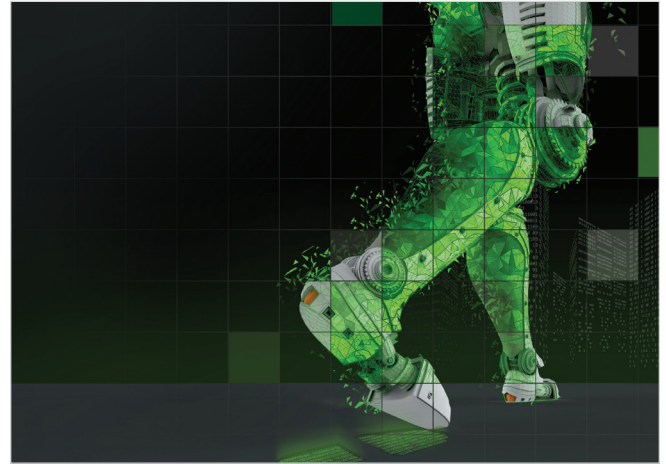
> Through parallel work streams and a consistent digital thread of information running through our product's lifecycle, we have been able to reduce production time and errors – which has resulted in a more competitive market price for our customers. In addition, we have been able to reduce our stock of product components due to the precision introduced into the manufacturing process."

Wilfried Cadiou
PLM & CAD Manager, BENETEAU Group

GROUPE BENETEAU

Windchill Manufacturing Process Plans and Instructions

In order to achieve a competitive advantage, organizations need Engineering and Manufacturing working together to turn virtual designs into physical products. The ideal is for manufacturing processes, quality plans, and work instructions to be defined and delivered digitally so that manufacturing process planning can be done in sync with engineering.

Windchill Manufacturing Process Plans and Instructions—an integral PLM application designed for manufacturing engineers—is manufacturing process planning software that enables product develop-ment and manufacturing process definition to happen concurrently.

This application allows manufacturers to define their engineering BOM (EBOM), manufacturing BOM (MBOM), manufacturing processes, quality plans and work instructions in a single PLM system and delivers them in the form of a digital product definition. A complete digital product definition acts as a consolidated digital representation of all related artifacts of a product(s) (i.e. CAD models, drawings, requirements, part structures, and other relevant information).
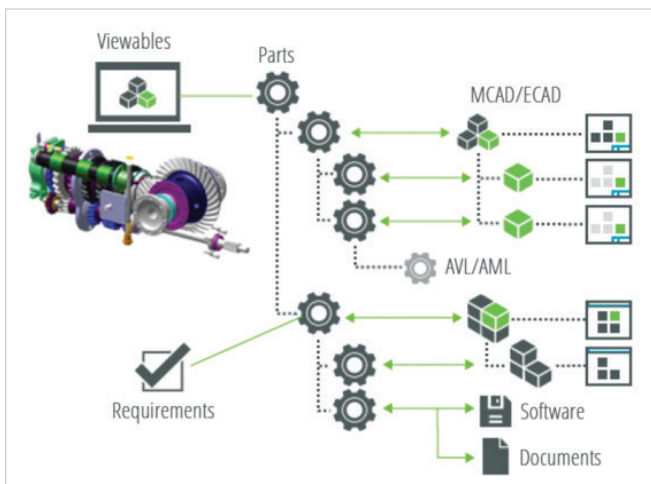

Users can easily access related product information through the PLM system

Benefits

By connecting engineering mockups to the MBOM and work instructions, organizations can ensure design intent is seamlessly made available to the shop floor. The ability to digitally validate manufacturing processes and to execute concurrent design and manufacturing planning accelerates time-to-volume production and time-to-market.

- Integrate data onto a single, integrated PLM system

- Connect your EBOM to MBOM

- Evolve your Manufacturing Process Management capabilities

- Leverage your design investment throughout your business
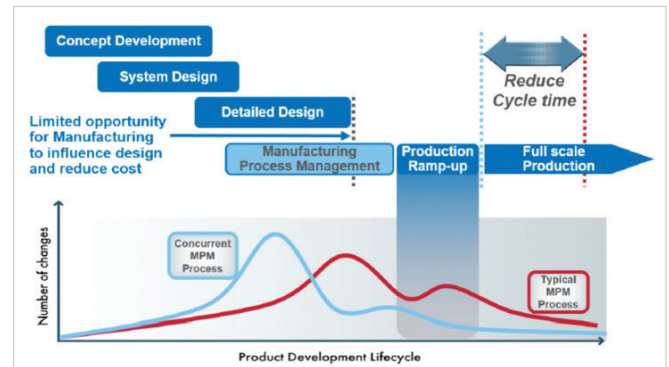
Working concurrently allows Manufacturing to reduce prod-uction cycle times, which in turn reduces manufacturing costs
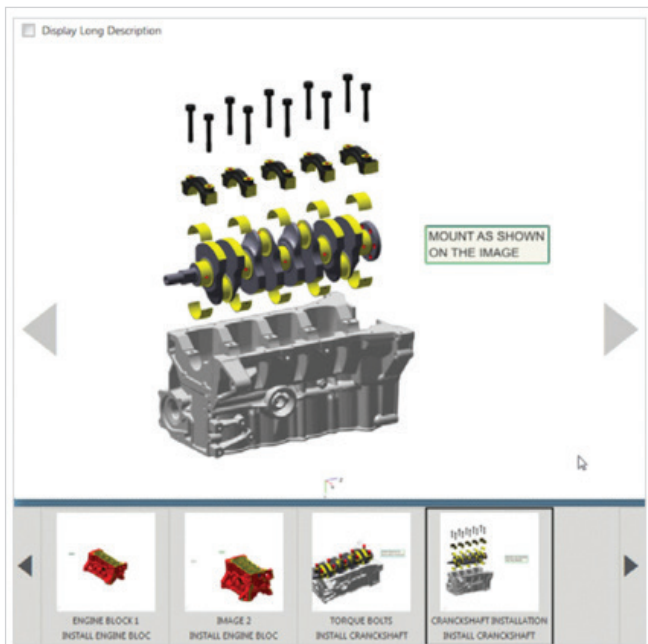
DATA SHEET

Features

- Associative EBOM-MBOM: Easily transform an EBOM into multiple MBOMs using traceability links
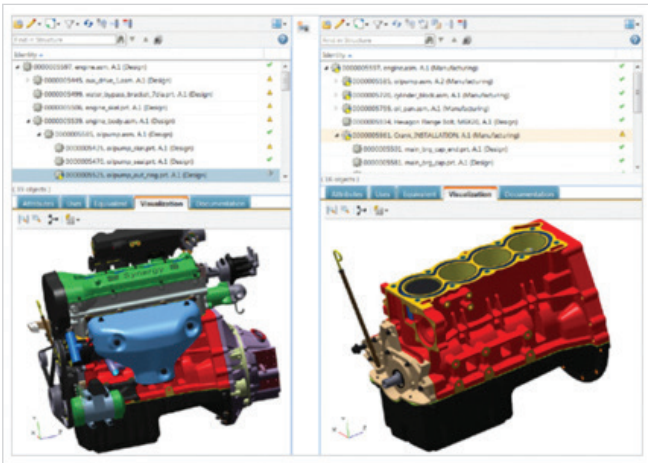
Associative EBOM-MBOM relationships can be configured

- Digital process plans: Define plant-specific process plans in terms of sequences and operations to describe how a part is manufactured, assembled, reworked, repaired and/or inspected

Associative EBOM-MBOM relationships can be configured

- Pre-defined integrations: Electronically share manufacturing deliverables with ERP using an out-of-the-box integration to SAP® and Oracle® Manufacturing

  - Integration with 3D Dynamic Analysis Virtual Tools to allow production feasibility analysis in a virtual environment

  - Bi-directional interaction with MES applications to enable a closed loop with the production floor

Ready to get started? Visit: PTC.com/en/products/plm/functions/manufacturing-process today.

Windchill, the industry-leading PLM application suite by PTC, makes it easier than ever to leverage a consolidated, up-to-date digital thread of product information, including connected data. Windchill's highly configurable out-of-the-box applications enable users to work faster and more accurately – reducing time-to-market, cutting costs and improving quality. With Windchill, users across the value chain are able to interact with data dynamically in 3D — both on a screen and through augmented reality. With deployment options including cloud and on-premises, Windchill has the flexibility, performance and scale that you need to be an industry leader.

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