

# Product variation and derivative management

## Increasing top-line revenues by fostering variation and derivatives across the entire product lifecycle

### Benefits

- Enables derivative programs to cut development costs by re-using product/process knowledge created for a product platform
- Increases product marketability by delivering more product options for individual product offerings
- Increases market share and product revenues by facilitating mass customization
- Extends your product lifecycle by allowing you to quickly refresh your products with new technology/design content
- Provides post-sales support groups with fully configured product information they can leverage to keep user manuals, maintenance documents, and in-service specifications aligned, up to date and correct
- Improves marketing and sales analysis by allowing you to align your product requirements with evolving configurations that can be traced and evaluated across your product lifecycle

### Summary

To increase your product lifecycle's revenue-generating capability, you can establish product platforms that facilitate more frequent product enhancements, derivatives, niche offerings and add-ons. Teamcenter® software enables you to create a generic product structure that you can use to manage all of the configurations that apply to a product platform – including definitions for the product families, variants and options that facilitate an affordable approach to mass customization.

### Leveraging product platforms

Companies that value long-term financial success understand the importance of developing product offerings whose top-line revenues can be systematically grown and extended.

Today's most innovative product makers want to find the best way to deliver new product offerings and derivatives from a single platform of common product structures, technologies and automated processes.

Teamcenter enables you to create product platforms that you can use to accelerate your startup processes, minimize your take to market cost, and maximize the revenue generated by a product's initial release – as well as by its successors and derivatives.

Teamcenter combines the advantages of configuration management with option and variant management. These capabilities allow you to synchronize your portfolio planning initiatives with initiatives to digitize product development, manufacturing and in-service support.

To define a platform that supports an entire range of product offerings, you create a generic product structure with variant conditions and option definitions/values.

In essence, the generic product structure reflects an all-inclusive BOM that contains all possible options (150 percent BOM) from which you can make all possible variants (100 percent BOMs). The product structure also allows you to rapidly create product derivatives (e.g., new products derived from an existing product offering).

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## Product variation and derivative management

### Features

- Generic product structures with specified variants
- Option definitions including discrete option values
- Inclusive/exclusive variant conditions
- Option dependencies defined by simple/complex logical expressions
- Selected option sets with fixed/derived defaults
- Friendly BOM viewing, enabling both engineers and non-engineers to easily view valid product configurations

### Definitions

- *Generic product structure*: Single generic definition for an entire range of product offerings
- *Variant*: Specific product configuration that includes an appropriate set of option selections
- *Option*: Parameter that determines how the content of a given product can be varied

This overarching product structure lets you manage all of the product configurations and product/process knowledge that applies to the platform's related product families, variants and options.

Typically, product configurations identify the relationships that exist between the product requirements, ideas, concept designs, prototypes, parts, bills of material, process models and in-service product definitions that describe a platform as it evolves across your product lifecycle.

By managing these product configurations on a fine-grain basis, Teamcenter enables participants in your extended enterprise to easily locate, access, and re-use product knowledge pertaining to your entire product family – including information about all of the options and variants that support your target markets' numerous requirements and preferences.

### Key features

Teamcenter enables you to define a single generic product structure from which an entire range of product variants can be derived.

Teamcenter surpasses conventional configuration management solutions by enabling you to extend the generic product structure with variant conditions and enumerated constraints.

Variant conditions enable you to define what components and subsystems can be configured in combination to create specific product variants. You can use both simple and complex logical expressions to indicate that a specific component (e.g., a particular model of a particular brand) should be configured in the product variant.

In addition, Teamcenter enables you to establish both soft and hard constraints to reduce the number of variants that your platform can support on either a temporary or permanent basis. Teamcenter also lets you establish an option compatibility constraint to specify that certain combinations of option values are not offered.

### Use case

A high tech company offers personal computers by enabling customers to choose:

- 8 processor options
- 2 bay options
- 2 audio options
- 4 video options
- 3 chassis options
- 4 memory options

In this hypothetical scenario, the company has 1,536 possible product variations. An example of a variant condition would be the configuration of Chip Set 1 as a "fast processor" and Chip Set 2 as a "standard processor." An example of a hard constraint would be the company's decision not to offer a "premium" audio system on any of its low end PCs.

### Business context

Historically, when product managers needed information about product options and variants, they had to access many different application systems dispersed across a diverse enterprise environment. Teamcenter enables you to streamline this task at multiple stages in your product lifecycle by letting users access a single source of product knowledge for all of the option and variant information they require.

**Business issues**

- How can you meet customer demands for more variety without driving up development costs?
- How can you manage multiple product families while maximizing information re-use?
- How can everyone in your enterprise fully understand the dependencies, options and constraints that impact all of your valid product configurations?

**Teamcenter products**

- Enterprise knowledge foundation
- Engineering process management

Teamcenter's ability to manage product variation and derivatives enables you to improve numerous business processes, including:

**Product and portfolio planning** Allows you to maximize, re-use, and define a product portfolio that satisfies a complete range of planned product variations

**Product development** Enables you to make certain that your product designs satisfy the complete range of market requirements defined by your product planning process.

**Digital manufacturing** Enables you to optimize process/planning development and minimize your tooling costs by providing manufacturing engineers with a better understanding of product variation.

**In-service** Decreases maintenance and repair turnaround by providing service teams with quick access to product configurations.

Contact  
 Siemens PLM Software  
 Americas 800 498 5351  
 Europe 44 (0) 1276 702000  
 Asia-Pacific 852 2230 3333

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