



GREEN LIGHT FOR PROCESSES

Early Validation Avoids Unnecessary Process Cycles



Processes



Methods



Tools



1. Challenges in product development

In product development, companies face many challenges. Their products are becoming more and more complex due to the growing share of software and electronics. The variety explodes as customers have more and more specific requirements. Furthermore, the legal regulations for security and environmental protection are becoming stricter.

At the same time, the complexity of the processes increases. On one hand, companies must integrate diverse locations

and external suppliers in distributed development projects. On the other hand, product development requires a closer collaboration of several disciplines.

In order to manage the product development complexity, many companies use PLM systems (Product Lifecycle Management). Integrations to ERP systems ensure the consistency of master data and documents throughout the whole product lifecycle.

PLM systems allow to design processes for e.g. release,

and change management in electronic workflows and thus encourage consistent working methods and processes in the company. In regulated industries, they also facilitate the proof of compliance. Their consistent use however requires a great deal of discipline from the users.

2. Obstacles in the optimization of PLM processes

In spite of using PLM, consistency and quality of data is often still far from satisfactory. Incorrect or incomplete information repeatedly lead to abortions of automated workflows e.g. in release workflows, and the processes must be restarted after troubleshooting.

Troubleshooting and fixings cause a lot of time effort for system administrators and users. Workflow abortions also lead to delays in processes, which adversely affect project terms and delivery times.

Missing or incorrect product information can furthermore cause the following problems, which involve high quality costs:

- Articles are created as duplicates, which unnecessarily swells the inventory;
- Parts are ordered or manufactured based on obsolete revision;
- Compliance requirements (RoHS, REACH etc.) are not met.

Consistency problems can also occur during transfers of data to ERP systems or other applications and cause difficulties in downstream processes.

When transferring data to customers, suppliers are facing stronger requirements. The compliance with these guidelines is necessary to ensure an optimal cross-company process flow.

3. Rule-based validation of PLM data

An early validation of data and documents improves not only data quality, but guarantees abortion-free PLM processes. Software tools integrated into the PLM system can help. The appropriate software solution should be flexibly configurable and provide the combination of modular rules for different use cases. The sets of rules can cover manifold use cases in the context of PLM.

Prior to the start of the release workflow it can be verified e.g. whether components

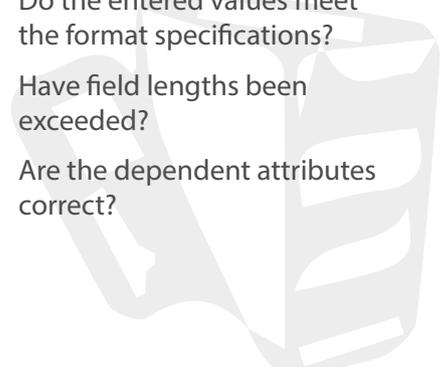
are checked out by a user or currently used in another process. In addition, all the components of the entire bill of materials (BOM) are checked.

The definition of corresponding mandatory attributes ensures better classification and reuse. During a release or a status change, the system checks automatically if all the necessary attribute fields are completed.

When transferring data to ERP or other systems a validity and compatibility check of the BOM

information is performed. The verification can cover various criteria, e.g.:

- Are all mandatory fields filled out?
- Do the measurement units correspond to the specific location?
- Do the entered values meet the format specifications?
- Have field lengths been exceeded?
- Are the dependent attributes correct?



In other use cases, such as the generation of spare part catalogs, the system checks if all required data is available for all localizations. It also ensures the availability of relevant documents and drawings.

To check the quality of CAD data and the compliance with specific design rules, special geometry checkers are available (NX CheckMate). They can be integrated into check routines in order to guarantee and document their systematic use.

Corresponding rules ensure that the material quantities are within the allowed range. Base for compliance checks are policies for prohibited substances (RoHS), the registration of specific chemicals (REACH) or similar environmental requirements.



4. Result-based automation of PLM workflows

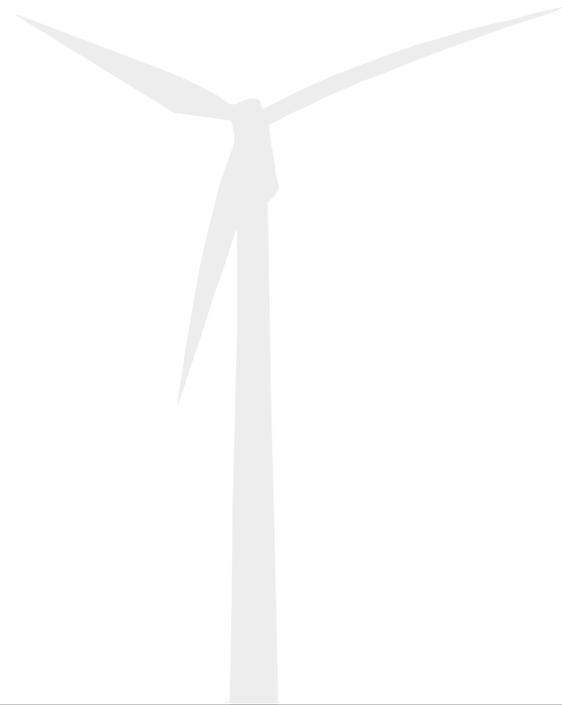
The seamless integration of data validation into the PLM system is prerequisite for error-free and interruption-free PLM workflows. Data validation can be both, integrated into workflows or prior to the workflow start.

Experience indicates that it is best to initially provide the users with the check functionality and trigger the workflow automatically after a successful data validation.

Events such as the start of (sub-) workflows or data synchronization with the

ERP system can be triggered automatically depending on the check results. Checks automated in workflows can be combined with other workflow handling capabilities. In case of an error, the user automatically receives a notification.

Comprehensive validation reports for complete assemblies with configurable error messages facilitate troubleshooting. Interactive check results allow a faster data processing and correction in the PLM system.



5. More flexible and efficient PLM processes

Rule-based validation leads to more efficient and more flexible PLM processes.

Users do not need to supply all mandatory attributes, e.g. for classification from the start, but only when the PLM dataset reaches a specific maturity level.

A simple graphical user interface provides users with only the checks they need. Thanks to a clear error detection and appropriate understandable description, users can control the quality and completeness of the data without having detailed knowledge of the PLM functionality.

The integration of check routines into workflows avoids abortions grounded on faulty or inconsistent data, which leads to less support calls. Configurable error messages and reports facilitate the handling for administrators. The check rules logic is XML-based and can be configured and managed in the PLM system.

Users especially appreciate

- the simple user guidance and interactive validation reports,
- the reduction of effort for error analysis and manual checks.

From the company perspective, rule-based validation of PLM data generates the following benefits:

- assurance of company-wide data quality,
- provision of high quality data for downstream processes,
- acceleration of processes through early error detection,
- flexible customization of workflows according to company requirements.

6. BCT solution portfolio

BCT Technology AG is a recognized expert in the field of data and document validation in PLM context. As a Siemens PLM Partner, we help our customers to design secure and efficient PLM processes. Our solution BCT CheckIt that is completely integrated into Siemens PLM software, complements the functionality of Teamcenter and NX CheckMate and enables companies particularly to

- Check the quality and completeness of their PLM data prior to release workflows,
- Perform CAD data quality checks and control them,
- Ensure the consistency of their BOM data for the transfer to ERP systems.



Due to the close cooperation with Siemens PLM software, BCT solutions are used worldwide by many companies that have implemented complex processes and want to improve the efficiency and security of their workflows.

At Bausch + Ströbel, a worldwide leading manufacturer of packaging systems for the pharmaceutical industry, all parts and assemblies are checked prior to release with BCT CheckIt on comprehensiveness and validity.

One of the biggest user of the BCT CheckIt is the Bosch group, which has reduced significantly the number of support inquiries to the system administrator that were caused by workflow abortions.



BCTTechnology AG
Im Lossenfeld 9, 77731 Willstaett, Germany
+49 7852 996-0, info@bct-technology.com
www.bct-technology.com

 facebook.com/bct.technology
 twitter.com/bcttechnology
 linkedin.com/company/bct-technology-ag
 youtube.com/bctugs
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