

Realize LIVE Americas 2023

Las Vegas, Nevada | June 12-15, 2023

Presentation title: Workflow Optimization
Made Easy

Presentation date: 2023-06-13 4:15 pm

Presenter name: Oliver Yalcintepe

Contact: **oyalcintepe@cadnorg.eu**

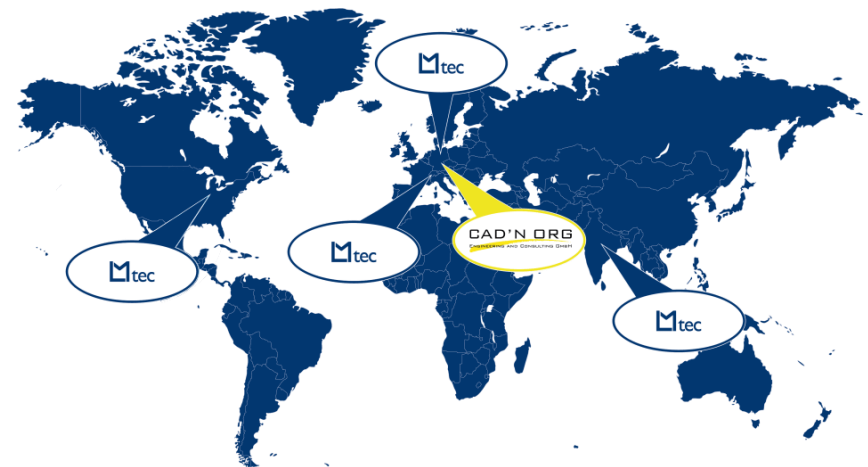
Our Company



- Focus: PLM Consulting, Administration and Helpdesk
- Founded 1998
- Own software development to optimize Teamcenter
- Partner of Siemens Digital Industry Software



Member of the global LMtec Group with locations in Germany, Switzerland, India, Canada and United States.

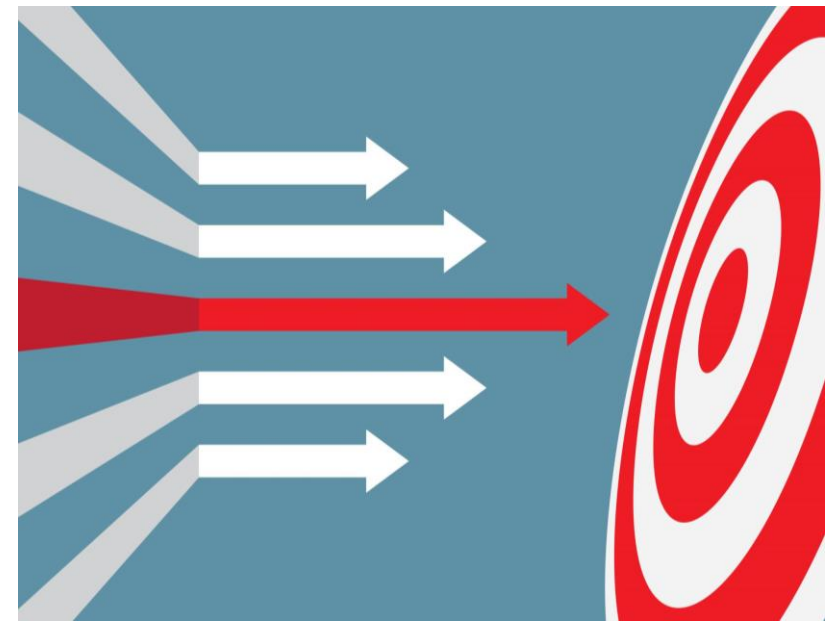


Teamcenter – Workflow Optimization

Goal: Simplify processes and improve data quality

Additional Benefits:

- Clear and transparent processes
- Higher user acceptance
- Reduced support effort



Agenda: Workflow Optimization Made Easy

Part 1: Key points

- Reason for workflow complexity
- Best Practices
- Why automated data validation

Part 2: Case studies

- How to simplify a release process
- User experience with simplified process



Reason for workflow complexity

- Extensive process automation
- Highly customized workflows
- Complex data models
- Not reliable data
- Integration with other systems



Best Practices



Splitting
Workflows =>
No Master



Good
understanding
of the workflow
functions



Testing



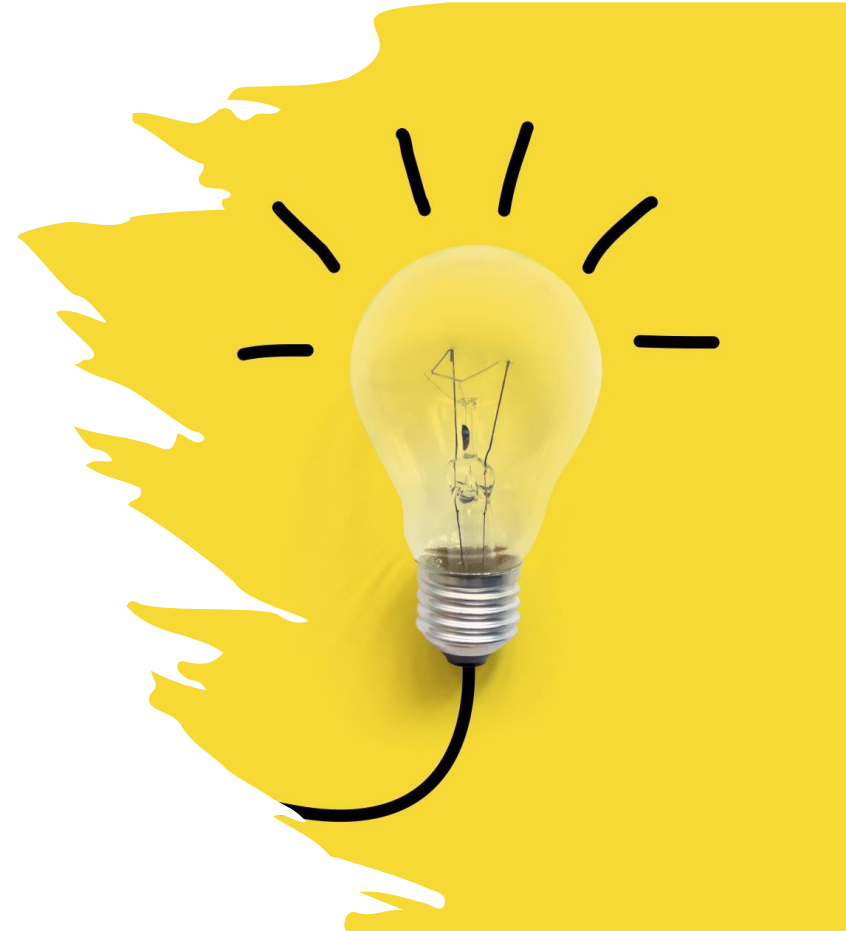
Avoid delays:
Resource Pool



Documentation:
Logic, Order, ...

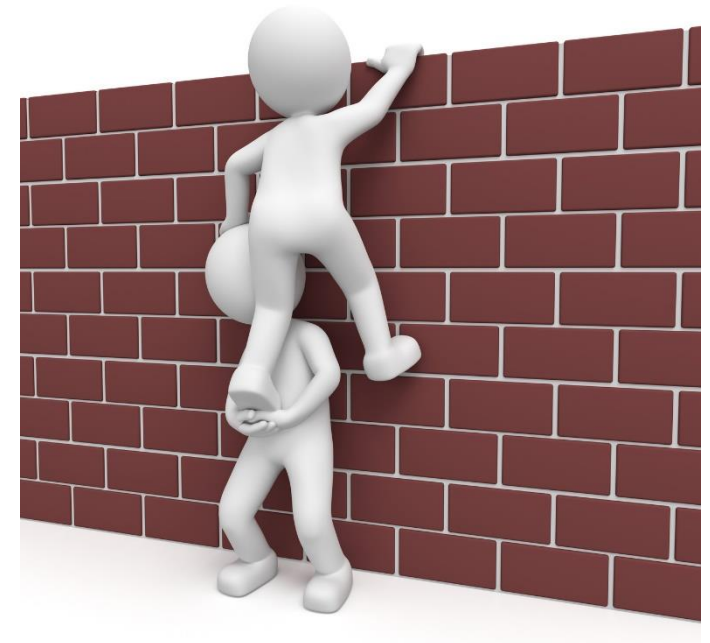


Versioning and
Backups



Challenges on Process Automation with Workflows

- Incomplete data / data validation
- Error handling / lack of user training
- Performance
- Maintenance



Challenge: Invalid data – Causes of poor data quality

- Incomplete work instructions
- No use of naming conventions
- Insufficient automation
- Incorrect use of object types
(complex structures)
- Different templates for documents
- Missing guidelines
- Migrated data
- Software errors
- ...

00050000/001:1-TRUCK ASSEMBLY

Element Name	ID	Revision	Sequence	Quantity	Release Status
CARRIAGE ASSEMBLY	00050004	001	30		Approved
HOPPER	00050032	001	10		Approved
FENDER ASSEMBLY x2	00050036	001	80	2	Approved
RUBBER	00050038	001	30		Approved
FENDER	00050037	001	40		Approved
LAMP REAR ASSEMBLY x2	00050039	001	100		Approved
LAMP REAR SHELL	00050040	001	100		Approved
LAMP REAR GLASS	00050041	001	100		Approved
BOOTH ASSEMBLY	00050042	001	100		Approved
GRILL	00050043	001	100		Approved
ENGINE HOOD	00050044	001	100		Approved
DOOR x2	00050045	001	100		Approved
CHAIR x2	00050046	001	100		Approved
STEP RIGHT	00050027	001	80		Approved
STEP LEFT	00050026	001	90		Approved
LAMP FRONT ASSEMBLY	00050025	001	120		Approved
LAMP FRONT GLASS	00050024	001	120		Approved
LAMP FRONT SHELL	00050023	001	120		Approved
BUMPER	00050022	001	140		Approved
BUMPERS	00050021	001	140		Approved

Annotations:

- Mismatch of release status on sub assemblies
- Missing data for ERP transfer
- Use of obsolete Vendor parts
- 0 Byte PDF for Archiving
- Missing description for documentation

Challenge: Invalid data – Solution: Automated data validation

To overcome the situation we have to validate data quality and integrity along all process steps of product development

- Identify errors as soon as possible
- Guide users with relevant information at each process step
- Help users to improve collecting of data during creation and modification
- Overview of material, documents, BOMs and dependencies
- Speed up correction of wrong data as early as possible
- a.s.o.

CNO Validation: Solution for data validation in Teamcenter

- Data quality:



- Improved trust in data & meta-data
- Much better user acceptance
- Flexibility



Agenda

Goal: Simplify processes and improve data quality

Part 1: Key points

- Reason for workflow complexity
- Best Practices
- Impact of poor data quality
- Why automated data validation

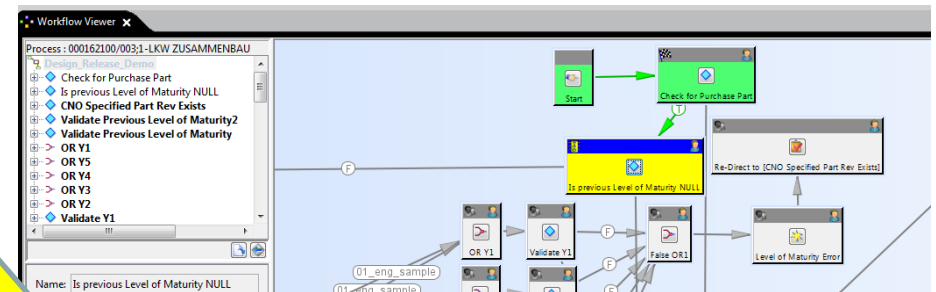
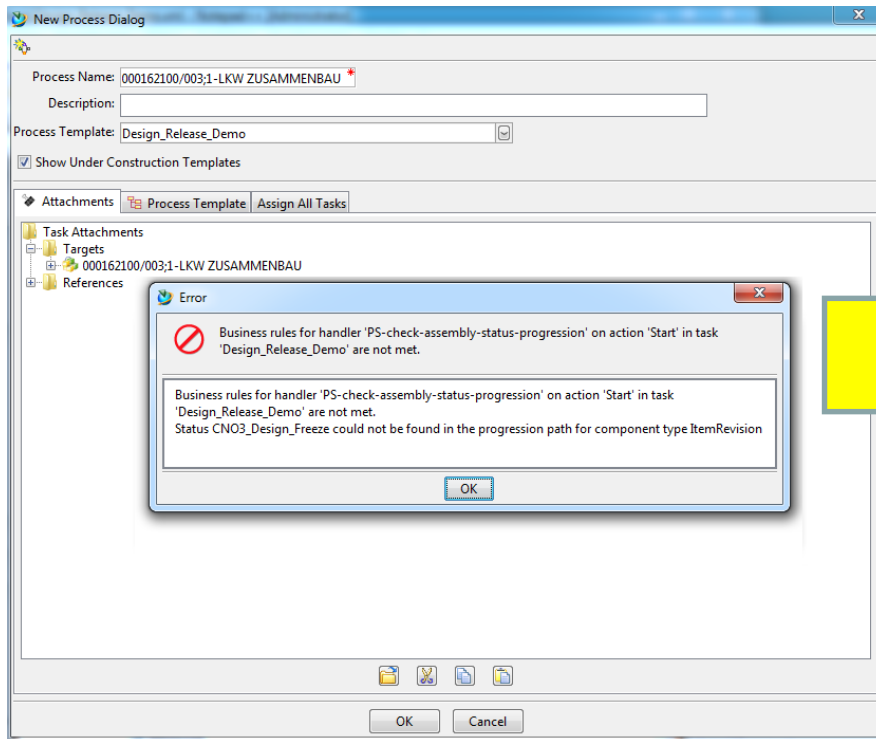
Part 2: Case studies

- How to simplify a release process
- User experience with simplified process



User Story: Design Release

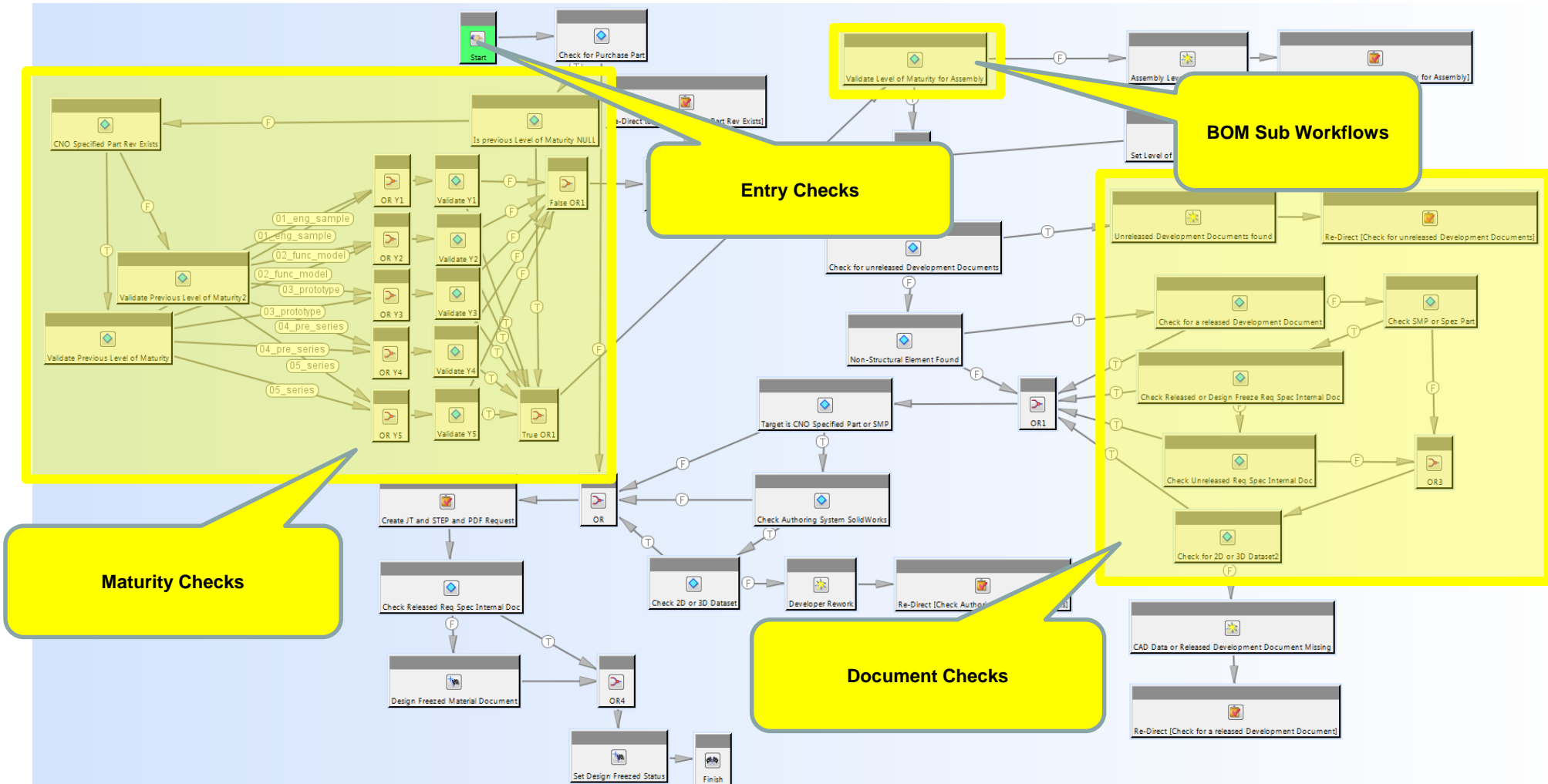
Workflow Check



Workflow Issues based on data problems

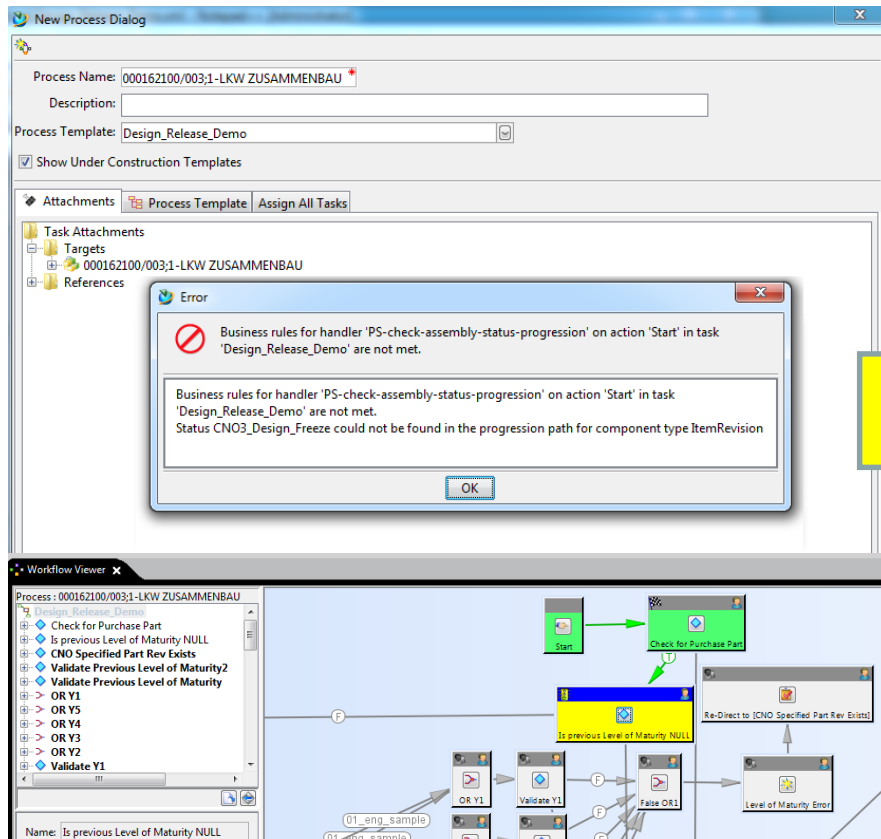
- No use of naming conventions
- Different templates for documents
- Missing work instructions / guidelines
- Migrated data
- Incorrect use of object types (complex structures)
- Insufficient automation
- Lack of integration with third-party systems

User Story: Design Release Workflow Template (original)



Goal: Simplify the existing Design Release

Workflow Check (original):



CNO Validation:

Validation Result: TRUCK ASSEMBLY

Filter status: All Results

Search:

Target	Message	Property Name
00050000/001 (TRUCK ...)	Multiple checks failed ...	
00050004/003 (CARRIA...	Multiple checks failed ...	
00050003/003 (CHASSI...	Multiple checks failed ...	
00050032/003 (HOPPER)	Multiple checks failed ...	
00050036/003 (FENDER...	Multiple checks failed ...	
00050040/003 (LAMP R...	Multiple checks failed ...	
00050021/003 (BOOTH ...)	OK	
00050038/003 (RUBBER)	OK	
00050037/003 (FENDER)	OK	
00050041/003 (LAMP R...	Multiple checks failed ...	
00050042/003 (LAMP R...	OK	

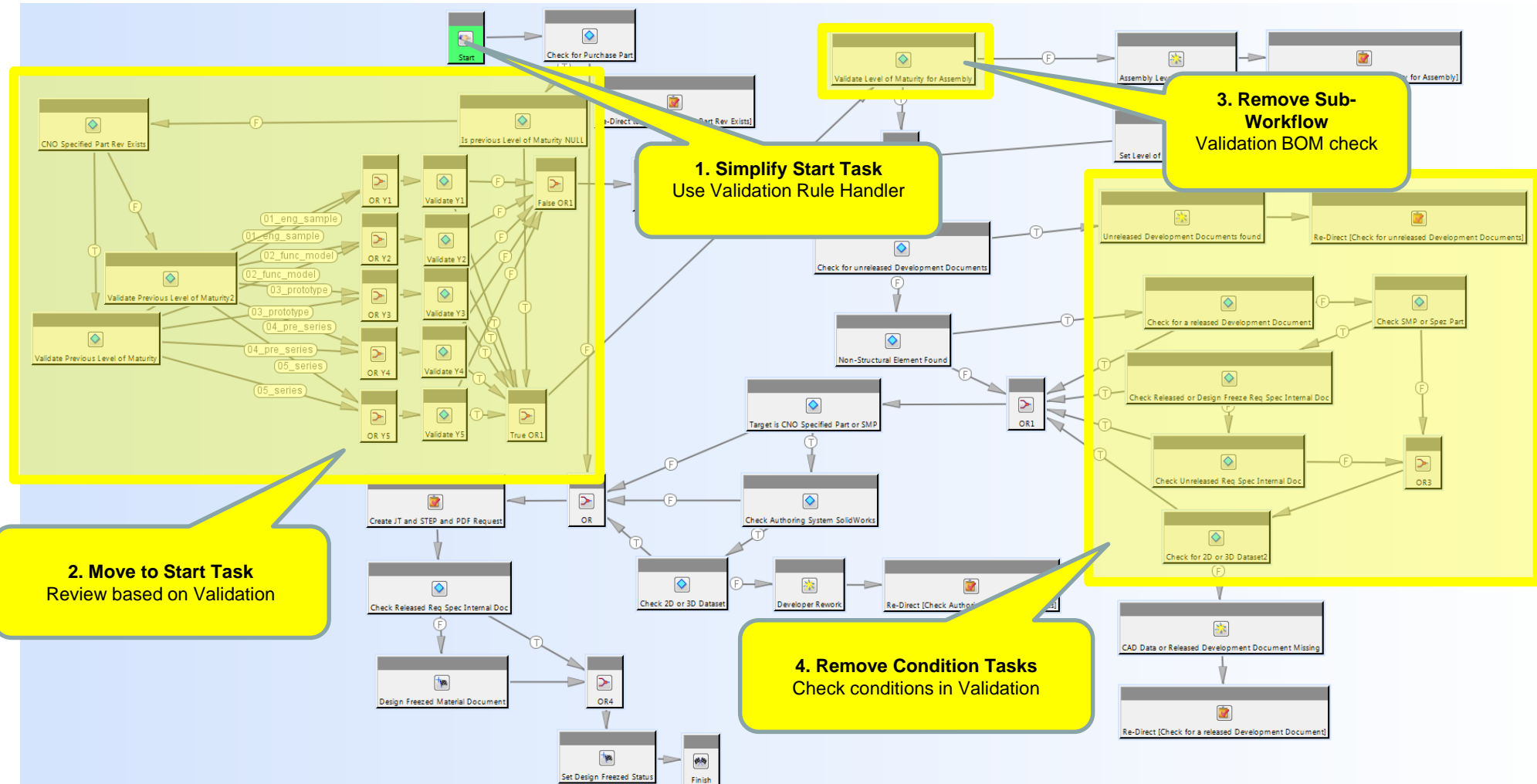
Transfer of all workflow checks to the pre-validation

Triggers the design approval workflow if all checks are successful.

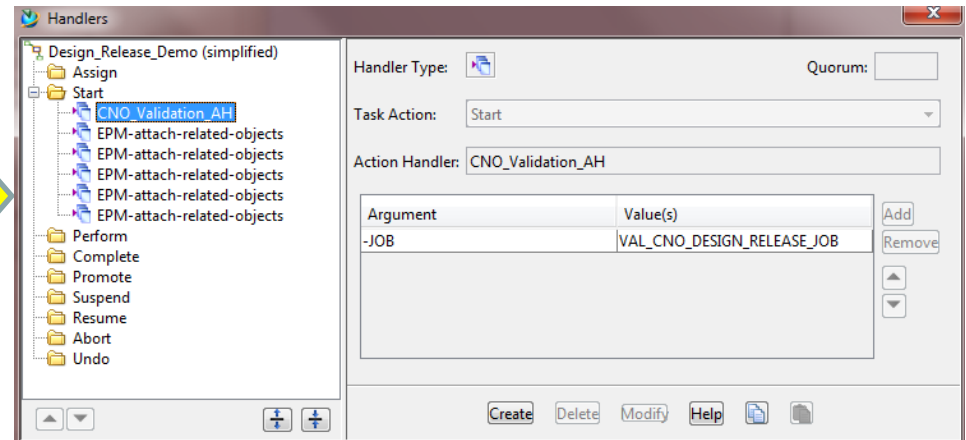
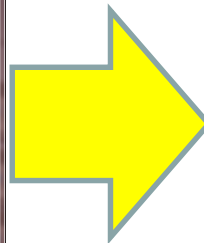
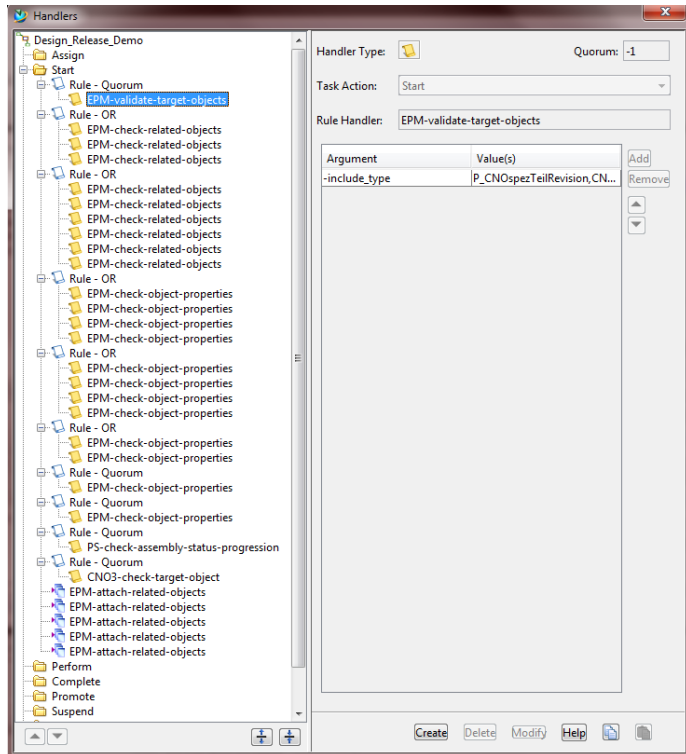
Additional Pre-Validation

- Check assembly components
- Change and material descriptions
- Category, ...

User Story: Design Release Workflow Template (original)



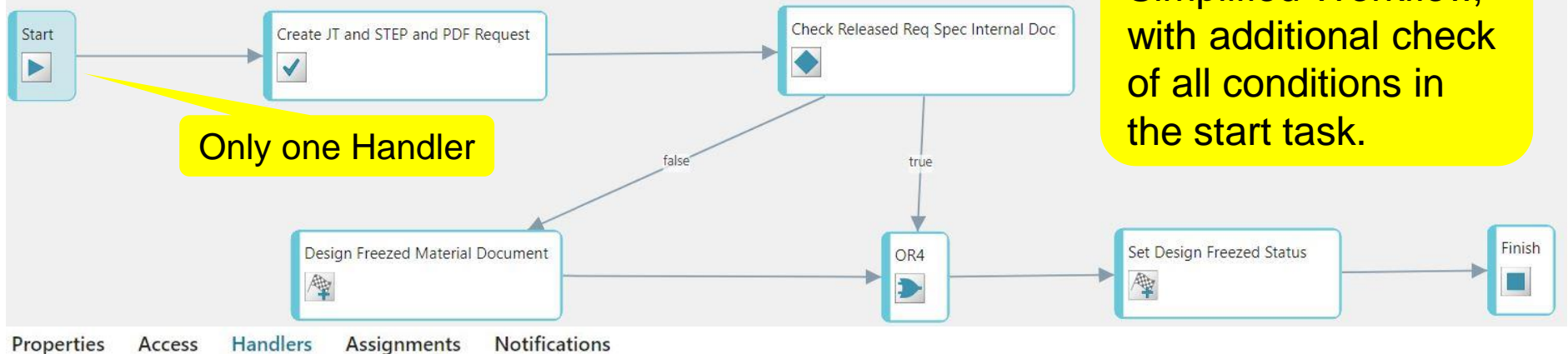
1. Simplify the existing process



- Mapping of the individual checks in a reusable check configuration
- Simplification by avoiding own WF handlers and saved queries
- Better feedback to end users

2. Simplify the existing process

Workflow Check (simplified) with CNO Validation:



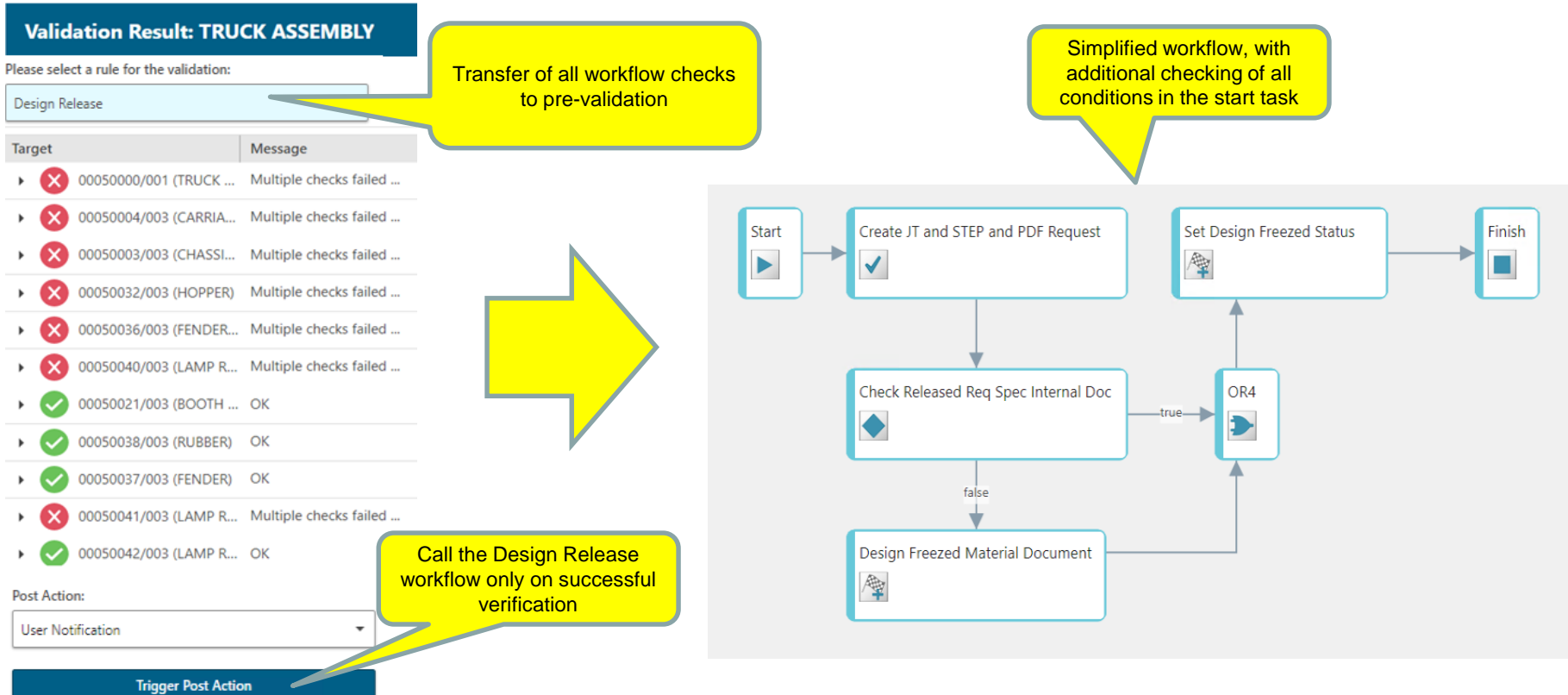
ACTION HANDLERS

Information Copy

Trigger	Handler	Arguments
Started	CNO_Validation_AH	-JOB=VAL_DESIGN_FREEZE_WF_JOB

- Mapping maturity validation in a reusable check configuration
- Simplification by avoiding sub workflow for every BOM component
- Better performance with the lighter workflow

Simplified Process using data validation



Benefit:

- Users get a simple overview of all validation steps before the part is sent to a workflow.
- Direct correction capability by accessing the referenced objects via user interface.

Another User Story: Release an Assembly for manufacturing

00050000/001:1-TRUCK ASSEMBLY

Revision: Latest by Creation Date | Effectivity: Today | Units: All Units (00050000/001:1-TRUCK ASSEMBLY) | Variant: No Variant Rule (00050000/001:1-TRUCK ASSEMBLY) | Owner: user01 (user01) | Date Modified: 11-Oct-2018 16:48

Element Name	ID	Revision	Sequence	Quantity	Release Status
CARRIAGE ASSEMBLY	00050004	001	30		
HOPPER	00050032	001	10		Approved
FENDER ASSEMBLY x2	00050036	001	80	2	
RUBBER	00050038	001	30		Approved
FENDER	00050037	001	40		Approved
LAMP REAR ASSEMBLY x2					
LAMP REAR SHELL					
LAMP REAR GLASS					
BOOTH ASSEMBLY					
GRILL					
ENGINE HOOD					
DOOR x2					
CHAIR x2					
STEP RIGHT	00050027	001	80		Approved
STEP LEFT	00050026	001	90		Approved
LAMP FRONT ASSEMBLY					
LAMP FRONT GLASS					Approved
LAMP FRONT SHELL					Approved
BUMPER	00050025	001	130		Approved
	00050022	001	140		Approved

3D Overview Where Used Attachments History

Attachments:

- 00050000/001 (00050004) Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48
- 00050000/001 PDF Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48
- 00050000/001 drawing001 LAMP REAR SHELL Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48
- 00050000/001 005 FrontPanel Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48
- 00050000/001 005 Board Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48
- 00050000/001 005 Board Release Status Approved Owner: user01 (user01) Date Modified: 11-Oct-2018 16:48

0 Byte PDF for Manufacturing

Missing description for documentation

- Check multiple bill of materials (e-bom, m-bom)
- Control all required documents and certificates
- Avoid usage of obsolete materials
- All technical documents are up-to-date
- Correct descriptions in sub components
- Check firmware information (Polarion)
- Schedule and Milestones
- ...

User Story: Release an Assembly for manufacturing

Ad-Hoc Validation

- Pre-Validation before starting the release process
- Direct integration and validation in any processing step
- Optional post processing based on the result of the verification

Open your assembly in Active Workspace

Element Name	ID	Revision	Sequence	Quantity	Release Status...	Last I...
CARRIAGE ASSEMBLY	00050004	001	30			
HOPPER	00050032	001	10		Approved	user01
FENDER ASSEMBLY v2	00050036	001	80	2		
RUBBER	00050038	001	30		Approved	user01
FENDER	00050037	001	40		Approved	user01
LAMP REAR ASSEMBLY v2	00050040	001	100	2		
LAMP REAR SHELL	00050041	001	10		Approved	user01
LAMP REAR GLASS	00050042	001	20		Approved	user01
BOOTH ASSEMBLY	00050021	001	120		Approved	user01
GRILL	00050024	001	20		Approved	user01
ENGINE HOOD	00050023	001	30		Approved	user01
DOOR v2	00050028	001	40	2		
CHAIR v2	00050029	001	50	2		
STEP RIGHT	00050027	001	80		Approved	user01
STEP LEFT	00050026	001	90		Approved	user01
LAMP FRONT ASSEMBLY v2	00050030	001				
LAMP FRONT GLASS	00050034	001				
LAMP FRONT SHELL	00050033	001				
BUMPER	00050025	001				

Recursive: Components will be checked too

PROPERTIES
ID: 00050000
Revision: 001
Revision Name: TRUCK ASSEMBLY
Description:
Occurrence Name:
Reference Designator:
Sequence:
Quantity:
Unit Of Measure:
Release Status:
Date Released:
Release Effectivity:
Element Effectivity ID:
Element Effectivity:
Owner: user01 (user01)
Group ID: Engineering
Last Modifying User: user01 (user01)
Precise: False

GLOBAL ALTERNATES

PREVIEW
Image of a green truck assembly.

Demo: Assembly validation

- Check a complete bill of material (all levels)
- Checks dependent attributes or related objects
- Check properties of sub components

[Video](https://youtu.be/rT028Gk61PE)

<https://youtu.be/rT028Gk61PE>



CNO Validation Framework: Automated Data Validation

✓ Creation...

Validate input data for objects and relations in any application

✓ Reports...

Data analysis and reporting of incomplete or missing data

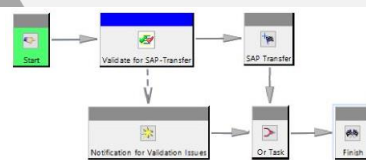


✓ User Interface...

Pre-validation to avoid process errors

✓ Workflows...

Extends existing workflows with validation functionalities



✓ Stylesheet...

Overview without a single click

Conclusion: Automated data validation in workflows

Enablers of better performances and competitiveness:

- **Speed up** the process
- **100%** reliable quality checks
- **Much better** usability
- **More** validation capacity
- User needs **less** intensive training
- Flexibility and agility to adapt to new needs
- Every information in **one location**
- Every thing in **one application**
- **Avoid** costly mistakes
- **Data quality:**



Teamcenter: Workflow Optimization – Questions?

CAD 'N ORG GmbH

Eisenstrasse 2-4
DE-65428 Ruesselsheim

www.cadnorg.com

info@cadnorg.eu



Oliver Yalcintepe

Head of Development
CAD 'N ORG GmbH

Contact:
oyalcintepe@cadnorg.eu