AUTODESK UNIVERSITY

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How to Automate Release Process with Upchain

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Learning Objectives

- Benefits of automated release process
- Automate release process in Upchain
  - Electrical design workflow and data checks
  - Mechanical design workflow and data checks
  - Item attributes and categorization attribute checks
  - Quorum decision workflow
- Merge multiple processes for different data types into one release workflow
- Audit trail information of data checks and user decisions made in Upchain

Description

While most of us can recognize the benefits of automated release processes, some may not know how to take advantage of those available within Upchain. We will demonstrate how to create automated data checks based on different data types and how to incorporate them into the release process. We will also show how one process workflow can be used for multiple data types and how the automated data checks follow different workflow paths based on the detected data type submitted into a release. In the end, we will show where within Upchain you can find audit trail information related to the release process.

Speaker(s)

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A product manager within Autodesk, with over 10 years of experience involved within Upchain product (various roles in supporting both customers and the product, involved with all product areas). Specialized in Upchain's bill of material (cBOM, mechanical and electrical BOM handling, service BOM), business processes (investigation requests, change requests, change notices), document management (DMS), administration, and supplier portal.

Tomislav Horvat
Product Manager for Upchain located in Croatia.
As a passionate mechatronic engineer who likes to work on electronic, mechanical, and robotic systems projects I always try to see engineering's point of view on the problem. I worked for many years as a mechanical designer in different industries before coming to Upchain. That experience helped me to see ahead what needs to be improved so users can get the best experience with our system.

Lesson 1 Benefits of the automated release process

Automation saves time, effort, money and leaves an audit trail of each data check or user-required process change.

Lesson 2 Automation benefits found in Upchain

Workflow processes that are supported in Upchain contain the following benefits:

- Adjustable workflows that can be tailored to suit specific industry or standard need
- Tenant and system-based workflows
- The size of the workflow depends on the organization's need
- Associating workflow with a division to expose it for a specific division/project within the organization
- Exportable/importable workflows
- Workflow can be versioned and contain many variants

Generic vs. custom release workflow

We will show different kinds of workflows associated with the release process. Please note that the workflows we are demonstrating will be shared with you and if you have access to Upchain administration, you can try them out the same way we are going to show them in this class.

Lesson 3 Upchain OOTB release workflow (example *OOTB Upchain release workflow*)

Just to note, we will not show how to build a workflow from beginning to end but instead focus on essential aspects of the workflow and the possibility of including data checks.
A system workflow that can be found in Upchain related to the release process is called *ECR workflow*. This is the release workflow provided out of the box for Upchain tenants.

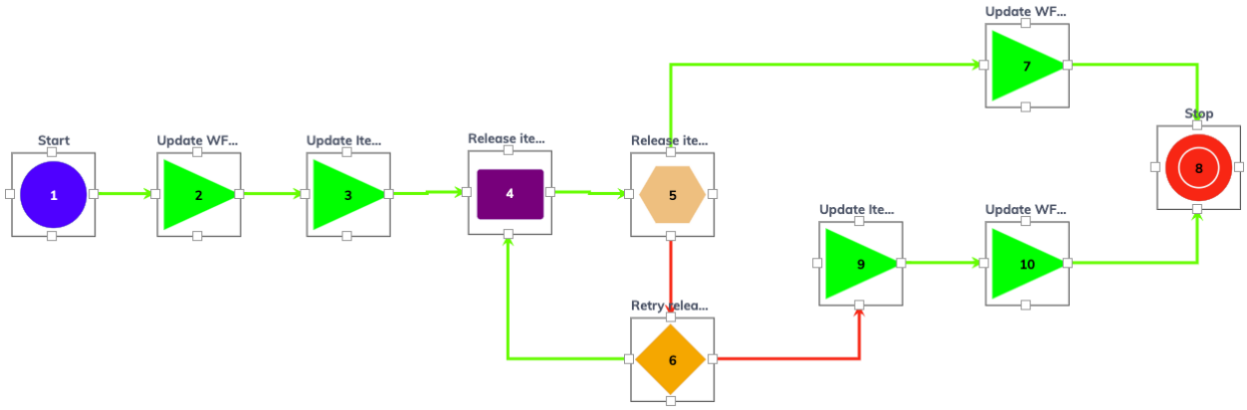

FIGURE 1 OUT-OF-THE-BOX UPCHAIN RELEASE WORKFLOW

Workflow explanation:

- Primitive 1 Start is used for starting a workflow
- Primitive 2 updates CR (change release) status from *Draft* to *Work In Progress*
- Update number 3 is updating the Item status to *Approval Pending*
- Primitive 4 is a task for the Project Manager role to *Release* or *Reject* the CR

- If the Project Manager approves release, workflow is updating Items and files to released status in primitive 5
- If anything goes wrong with the release, there is a retry mechanism in primitive 6 which can be used to repeat the Project manager's approval and release process
- If the release passes successfully, the CR is updated to the Completed status (Primitive 7), and the workflow is stopped

Lesson 4 Electrical design data workflow (example *Electrical design workflow v3*)

If there is a need, the workflow can determine if the correct set of data has been submitted into the release process.
Here we created an example with which we can determine whether there is a mix of yet unapproved electrical and mechanical assemblies submitted into one release process.

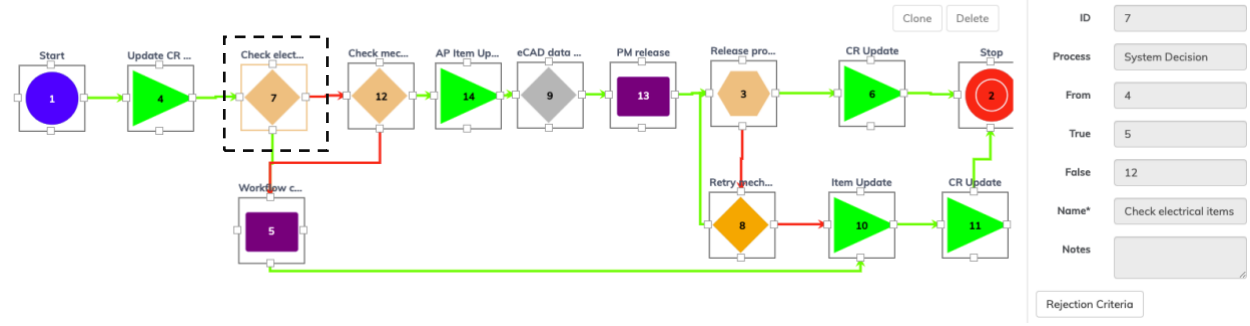

FIGURE 2 SYSTEM DECISION FOR CHECKING ELECTRICAL ITEM TYPES

FIGURE 3 REJECTION CRITERIA FOR SYSTEM DECISION PRIMITIVE 7

Primitive 7 checks for either the Purchased Electrical Part or Electrical package, and if found, it passes to primitive 12. However, if such is not found, it passes to primitive number 5.
The task in number 5 notifies the Project Manager that required item types have not been found, and the user is instructed to cancel the CR.
Primitive 12 is then checking for mechanical item types.

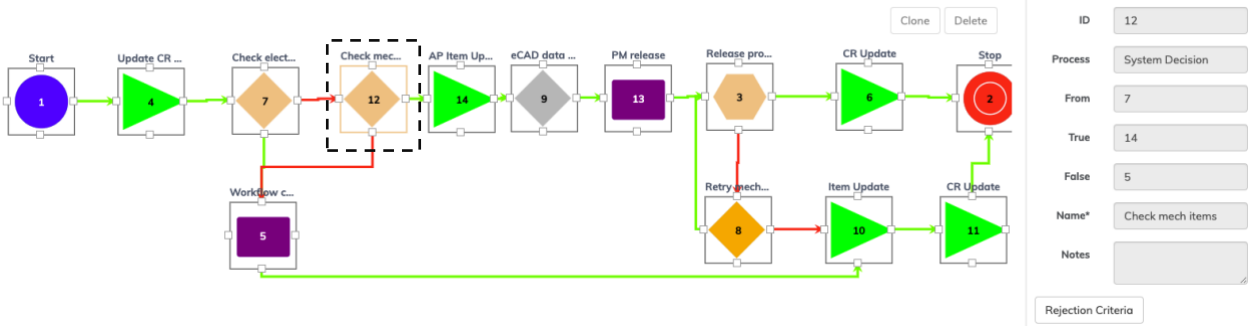

FIGURE 4 SYSTEM DECISION FOR CHECKING MECHANICAL ITEM TYPES

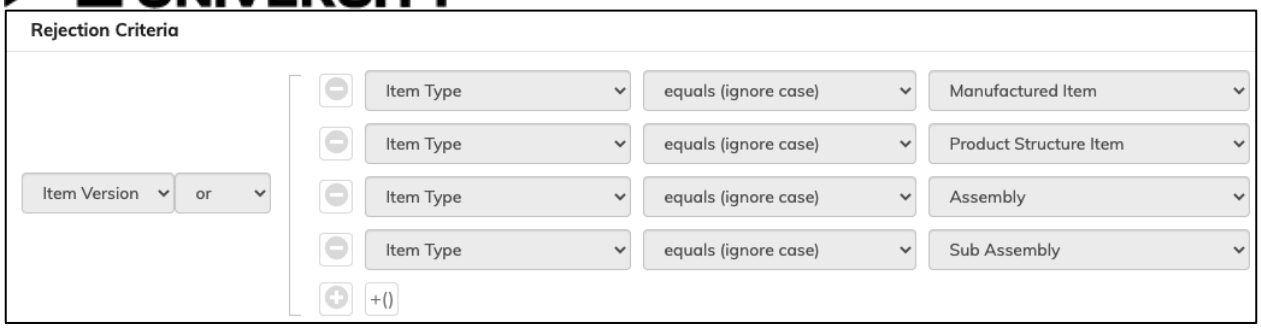

FIGURE 5 REJECTION CRITERIA – CHECKING FOR MECHANICAL ITEMS SUBMITTED IN THE CR

When we ensured only an electrical design type was present within the CR, we started with the required file check.
Primitive 9 checks that any found electrical package item needs to have both pdf and Excel file types associated. File type check can be configured to fit specific organization needs.

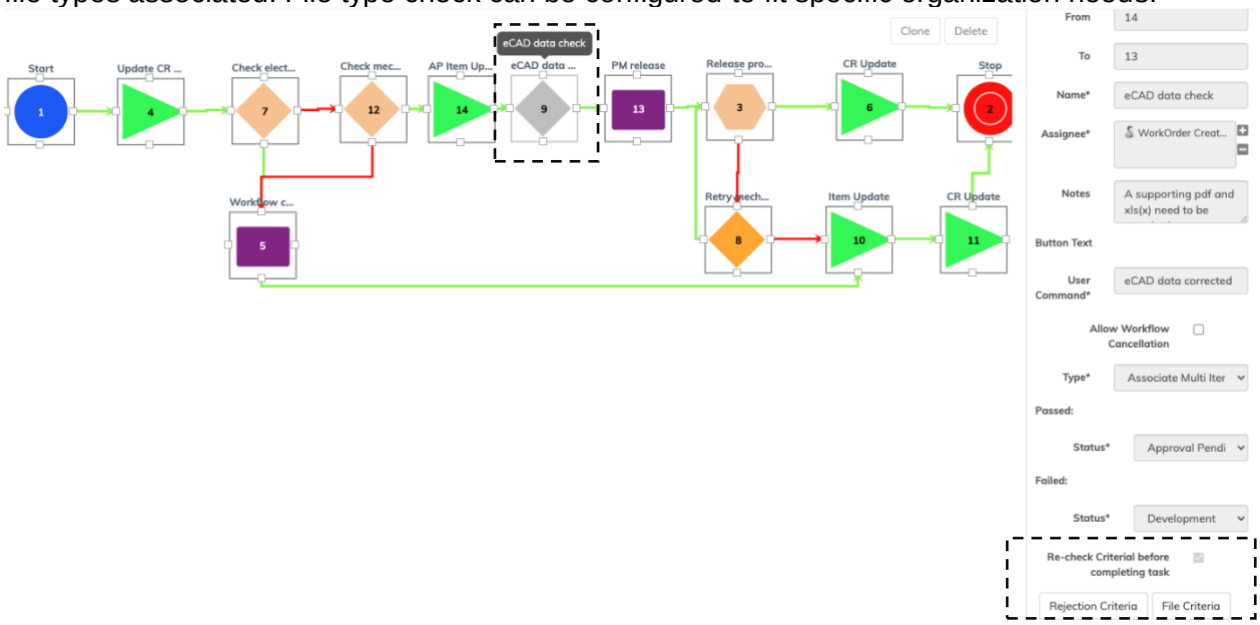

FIGURE 6 ECAD DATA CHECK - OBJECT DECISION

FIGURE 7 REJECTION CRITERIA - ITEM TYPE CHECK

FIGURE 8 CHECK FOR REQUIRED FILES IN COMBINATION WITH REJECTION CRITERIA

Re-checking criteria before completing the task makes sure the user cannot proceed with workflow without uploading missing files.

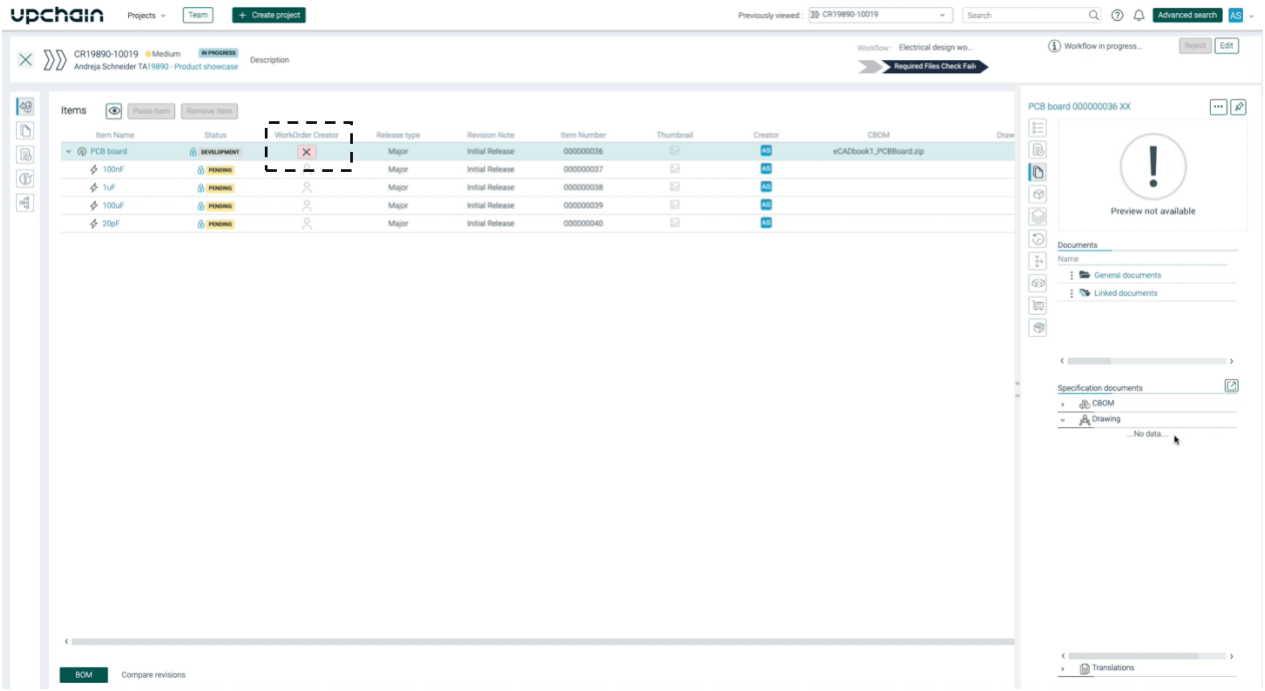

FIGURE 9 DEMO: ELECTRICAL DESIGN WORKFLOW CREATED TASK FOR MANDATORY FILES UPLOAD

Lesson 5 Mechanical design data workflow (example *Mechanical design workflow v6*)

We have created an automated design workflow that, similarly to the abovementioned workflow, first checks that only mechanical design type items are submitted, and only in such case will the workflow continue.

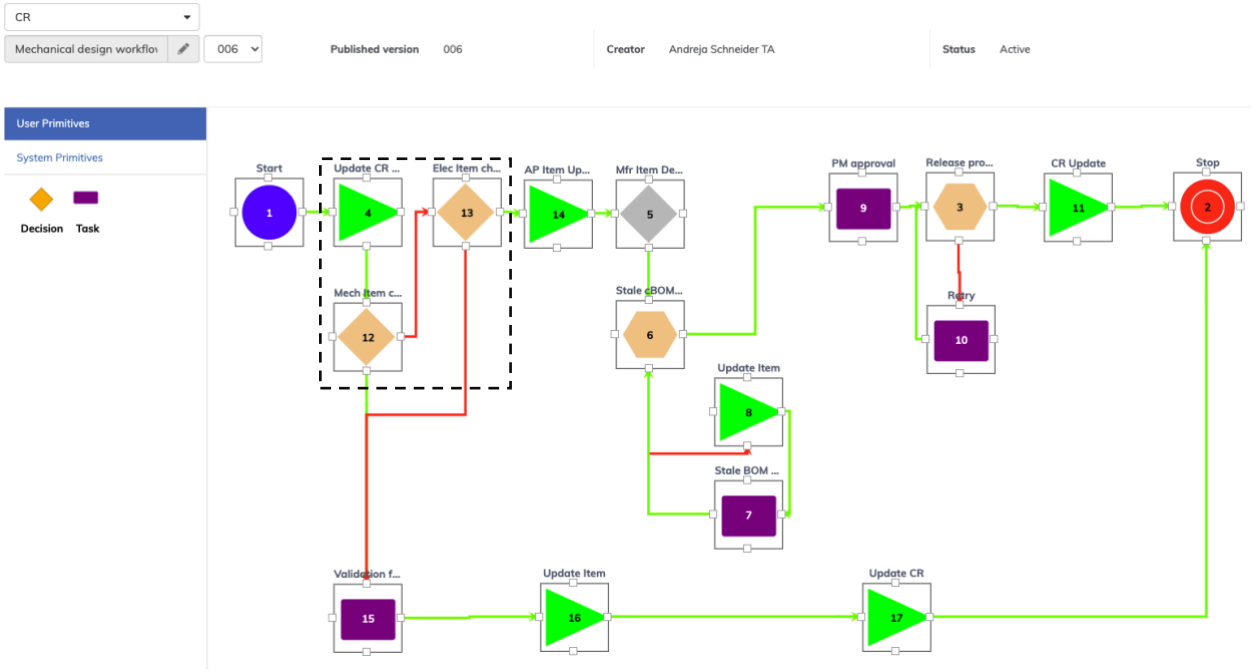

FIGURE 10 MECHANICAL DESIGN WORKFLOW WITH CHECK FOR MECHANICAL ITEMS

Object decision primitive, number 5, checks for proper files associated with mechanical type items.

The Rejection criteria are looking for Product structure, assembly, or manufactured item types; if any are found, they will be checked for a drawing file. If drawing with extension dwg or pdf is not found, the workflow will create a task for the user to update the required files on specified items.

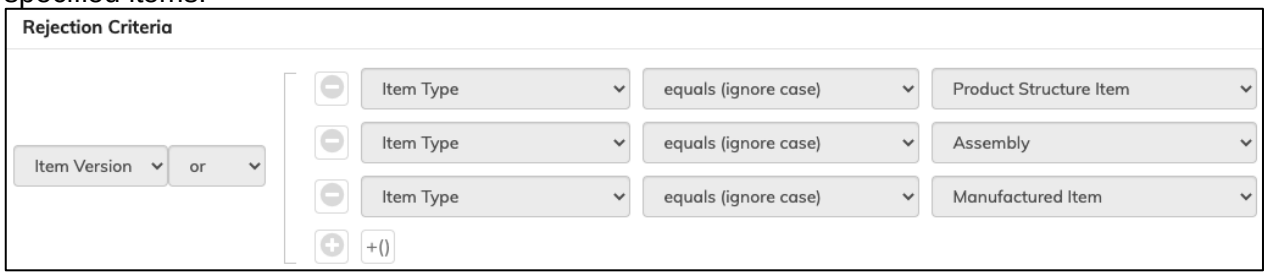

FIGURE 11 OBJECT DECISION IS CHECKING REQUIRED ITEM TYPES

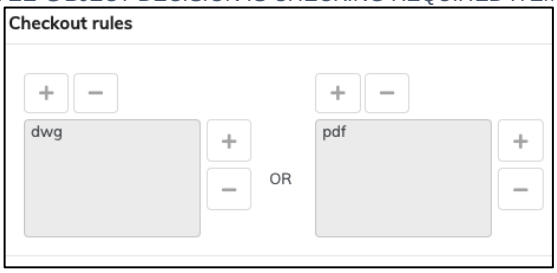

FIGURE 12 FOUND ITEM TYPES NEED TO HAVE SPECIFIED FILE TYPES

When correct files have been submitted and checked, the workflow checks for a stale design BOM (cBOM), with a mechanism for a designer to correct the design if needed. This is to make sure the assembly does not contain outdated design files. In addition, any child design that has been updated outside the assembly design must also be incorporated into the assembly design.

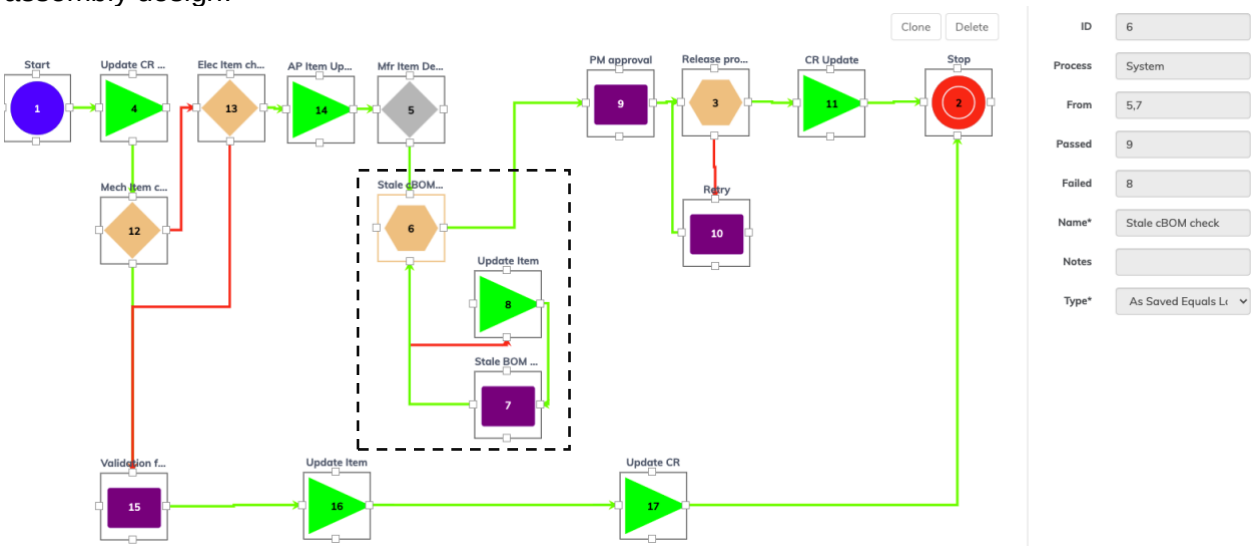

FIGURE 13 CHECK FOR STALE CBOM AND A TASK FOR CORRECTION

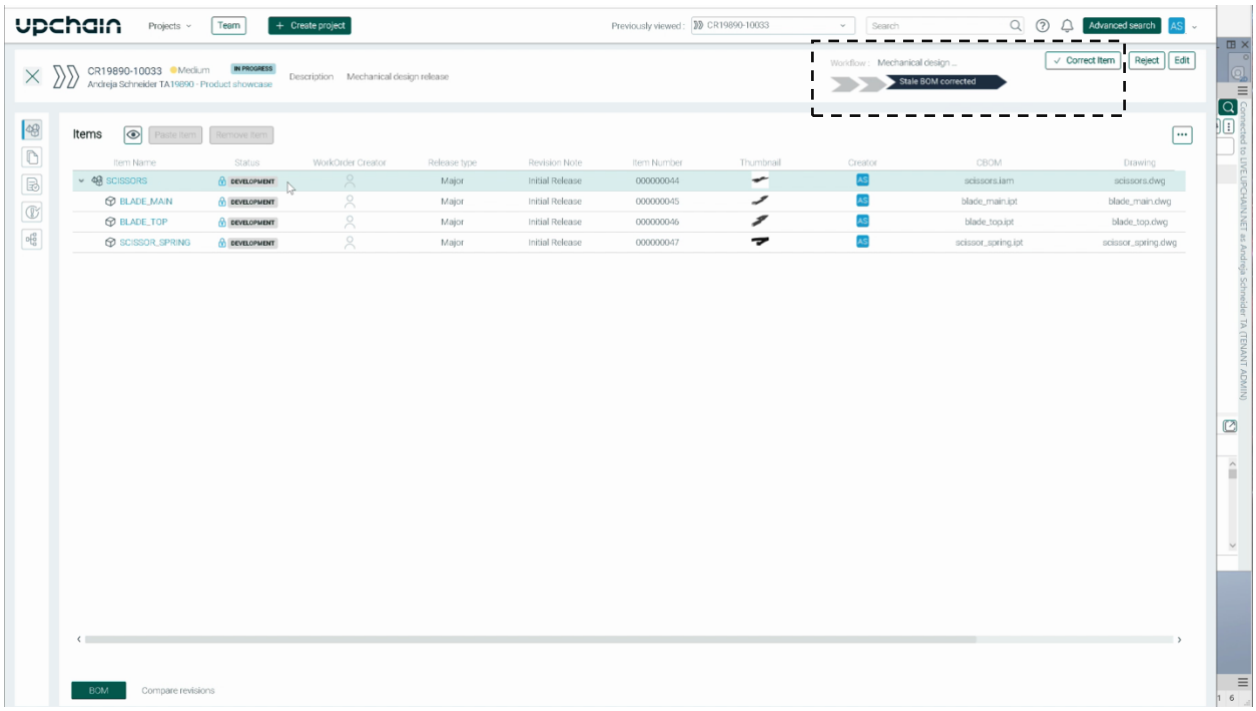

FIGURE 14 DEMO: STALE CBOM DETECTED AND USER IS ASKED TO CORRECT THE DESIGN

Lesson 6 Adding item attributes and categorization checks to mechanical release workflow (example *Mechanical design workflow v7*)

Additionally, we can model item attribute checks for files and design checks in the Upchain release workflow.

As a pre-requisite to testing this workflow example, it is required to add both custom and categorization attributes in Upchain. The custom attribute to be added and used in this example is named *Standard*.

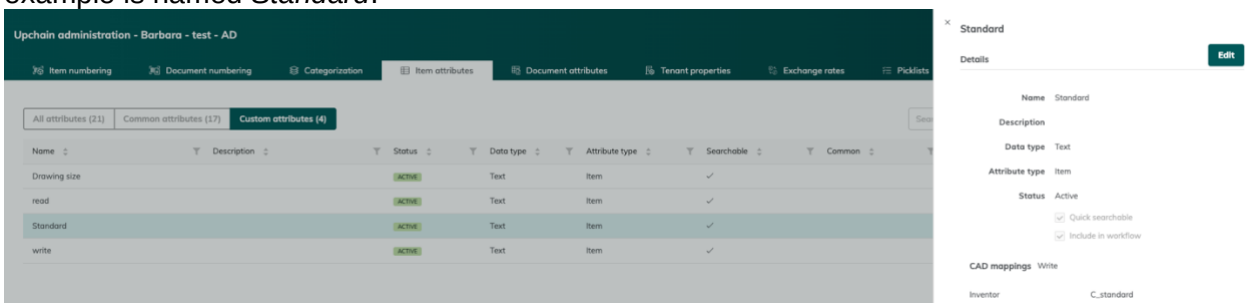

FIGURE 15 CUSTOM ATTRIBUTE EXAMPLE AS MODELED IN UPCHAIN

The category attribute that has been added is named *Clamp*. In addition, we have modeled a category attribute named *Style* under the category *Clamp*.

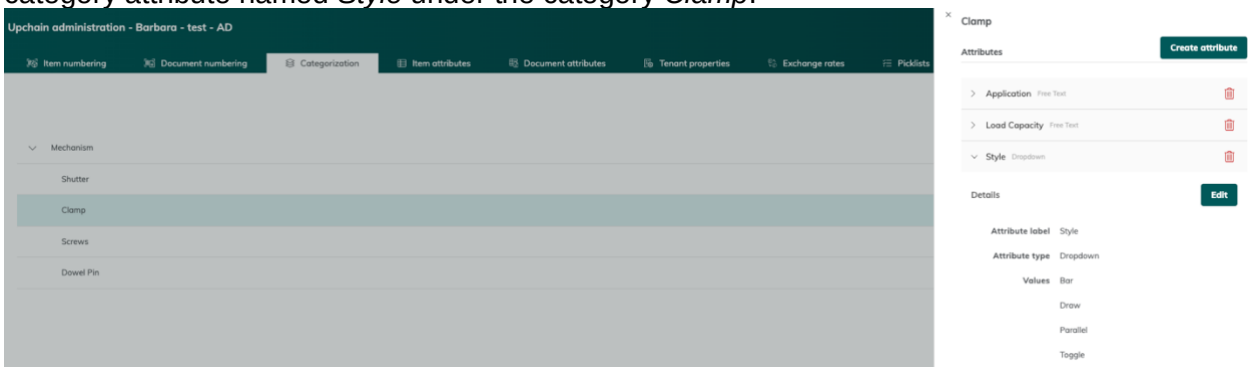

FIGURE 16 CATEGORIZATION ATTRIBUTE EXAMPLE AS MODELED IN UPCHAIN

We have incorporated an object decision primitive in the workflow to ensure that specific custom and common attributes are filled in.

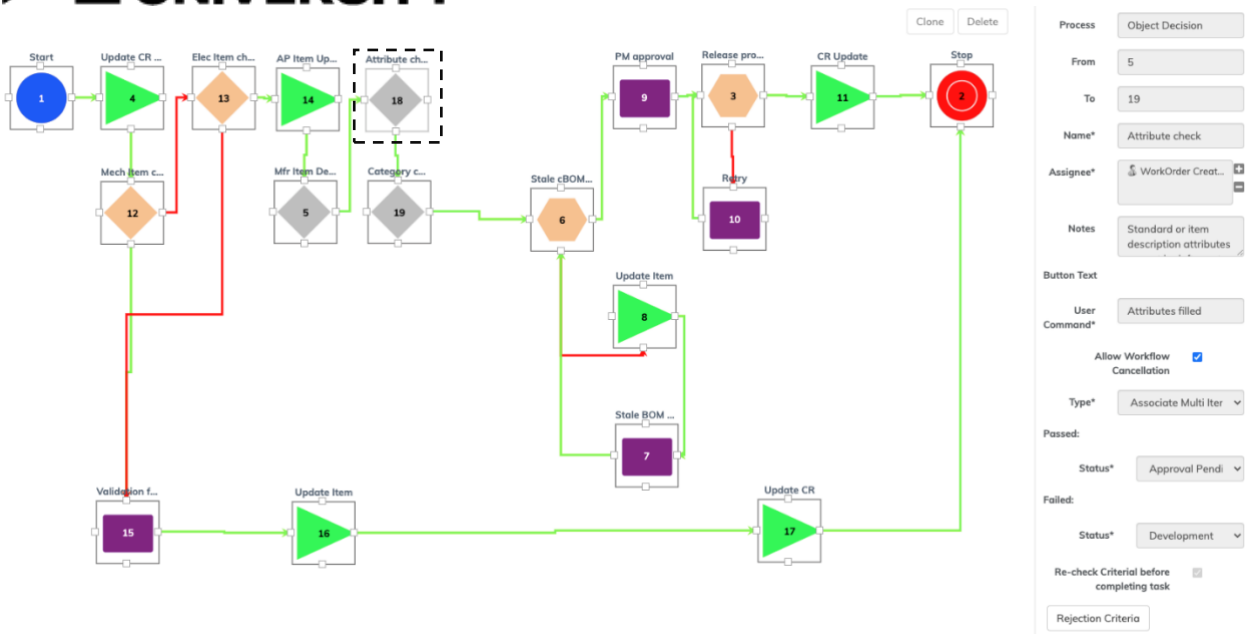

FIGURE 17 MECHANICAL DESIGN ATTRIBUTE CHECK - OBJECT DECISION PRIMITIVE

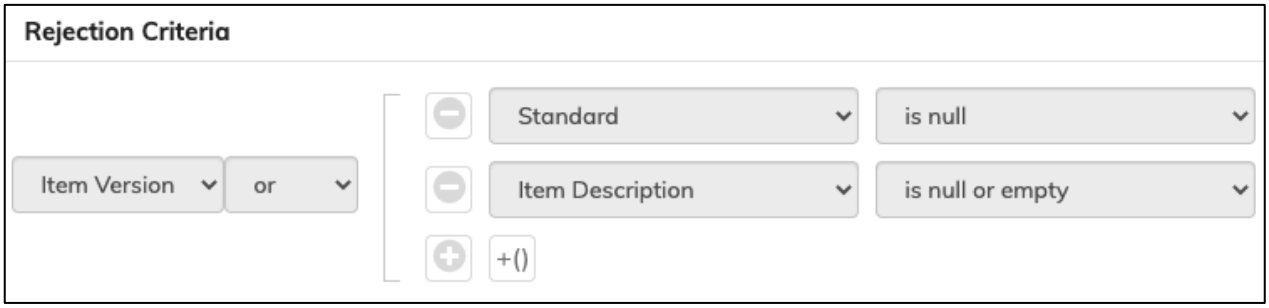

FIGURE 18 THIS REJECTION CRITERIA CHECKS THAT THE ATTRIBUTES STANDARD AND ITEM DESCRIPTION ARE FILLED IN

Another requirement is that the categorization attribute is not left unpopulated.

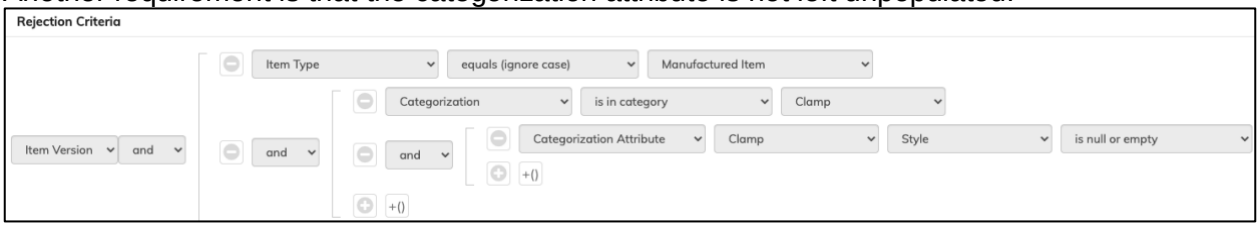

FIGURE 19 THIS CHECKS THAT CATEGORIZATION ATTRIBUTE STYLE, UNDER THE CLAMP CATEGORY AND MANUFACTURED ITEM, CANNOT BE LEFT UNPOPULATED

The workflow will stop and create a task for the user to populate mandatory attributes if such are missing. Users must enter all the required attributes to complete the task and continue with the workflow.

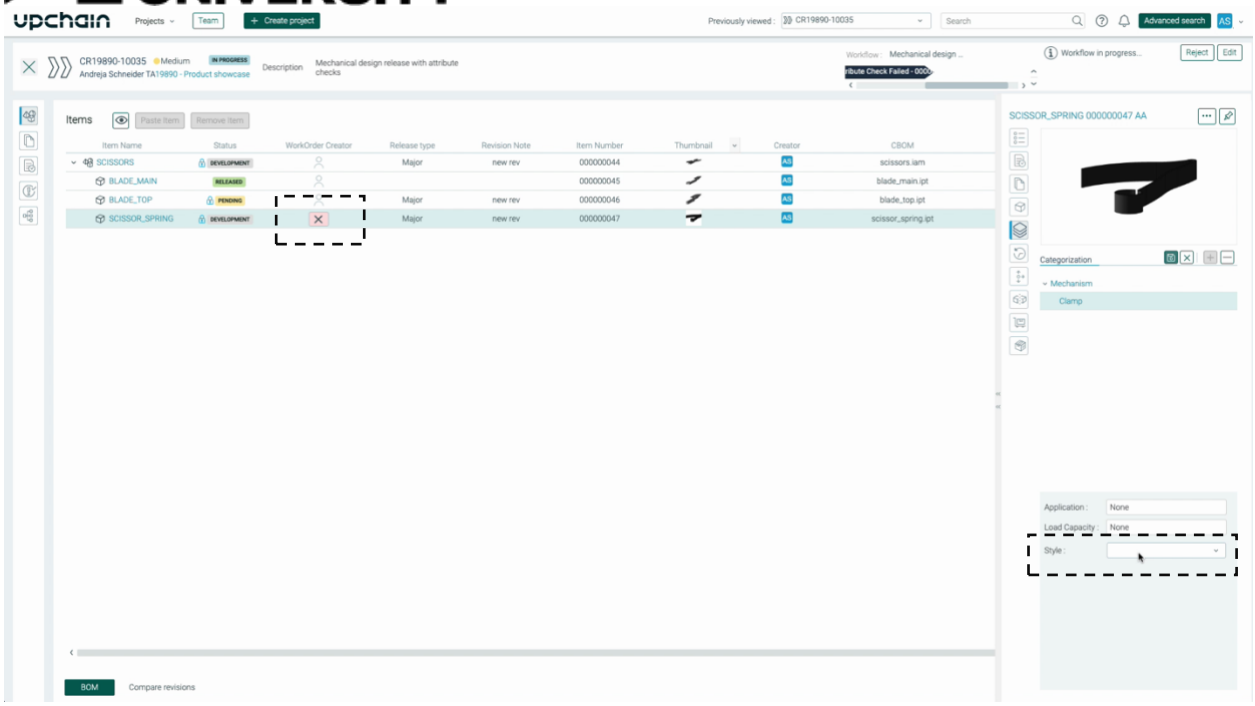

FIGURE 20 DEMO: USER IS REQUIRED TO INSERT MISSING ITEM CATEGORY ATTRIBUTE

Lesson 7 Combining workflows (example *General CAD workflow*)

Instead of having separate workflows for different design requirements, it is possible to incorporate those into one workflow, which, depending on the detected design, will follow the required process flow.

We have created one workflow for the above examples, containing all the mechanical and electrical design and data checks. In this example, we are calling it *General CAD workflow*. Depending on the detected item type, the workflow will continue with file and attribute checks. Below is the marked path the workflow will follow if the mechanical design is detected. We have explained this path in mechanical design data workflow and attribute and categorization checks workflow.

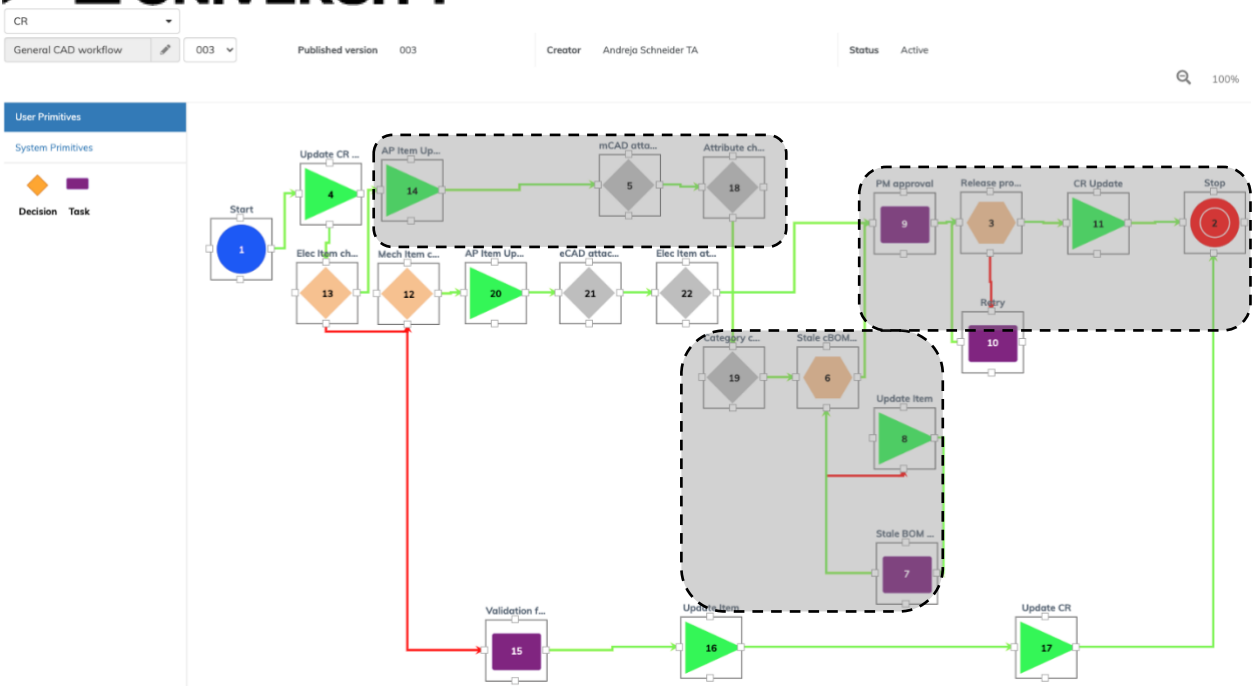

FIGURE 21 GENERAL WORKFLOW AND MECHANICAL DESIGN RELEASE FLOW

In other cases, when the electrical design is detected, the workflow will follow a different workflow path.

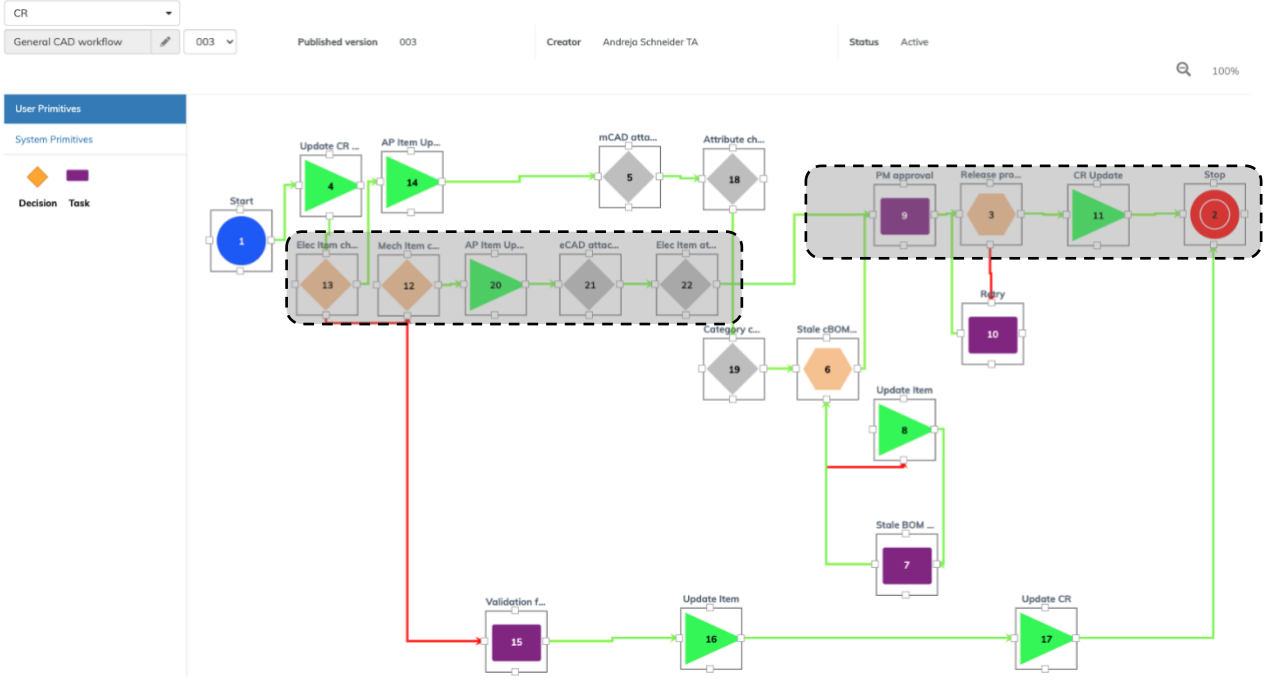

FIGURE 22 GENERAL WORKFLOW AND ELECTRICAL DESIGN RELEASE FLOW

After the required associated CAD files check (where electrical package item type must contain Excel and pdf files associated) is done in primitive 21, the workflow will check for attributes under purchased items in object decision primitive number 22.

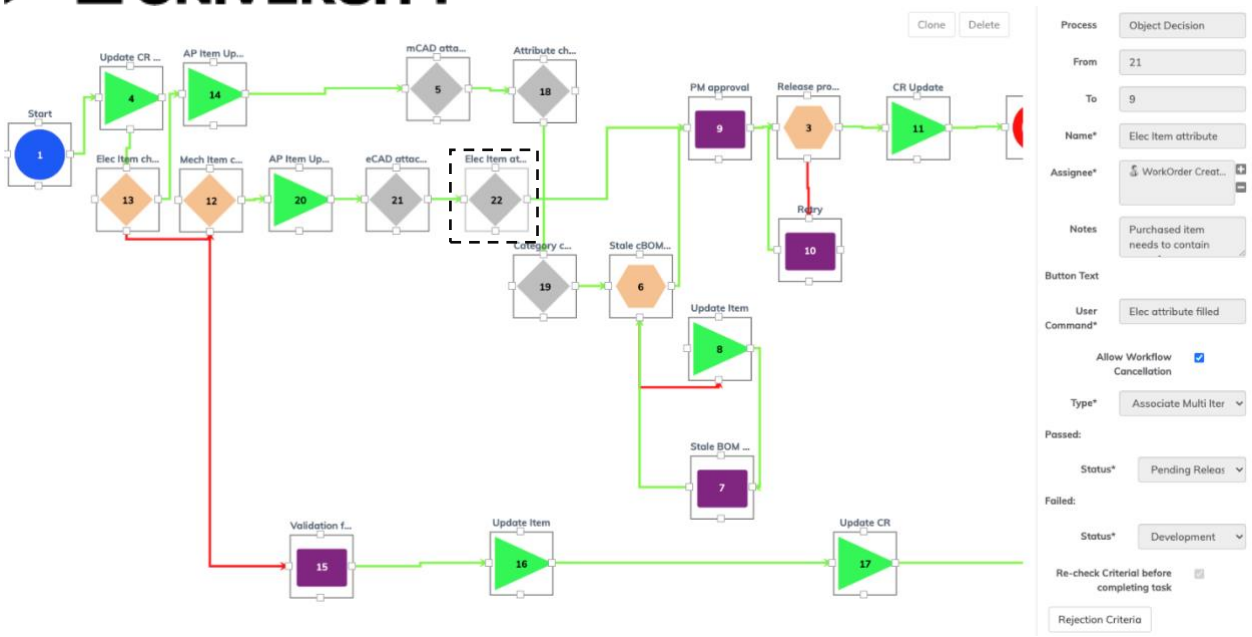

FIGURE 23 OBJECT DECISION FOR PURCHASED ITEMS ATTRIBUTE CHECK

The criteria we modeled require *Manufacturer, Manufacturer Item Number,* and *ERP Item Number* attributes to be filled in when a *Purchased Electrical Part* is being sent to the release process.

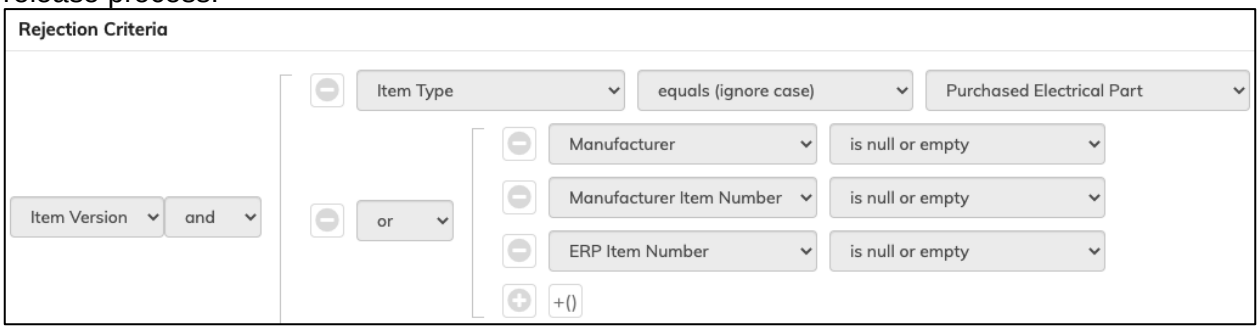

FIGURE 24 CRITERIA WHICH CHECKS FOR PURCHASED ATTRIBUTES UNDER PURCHASED ELECTRICAL PART TYPE OF AN ITEM

The workflow will stop and create a task for the user to populate mandatory attributes if such are missing. The user must enter all the required attributes to complete the task and continue with the workflow.

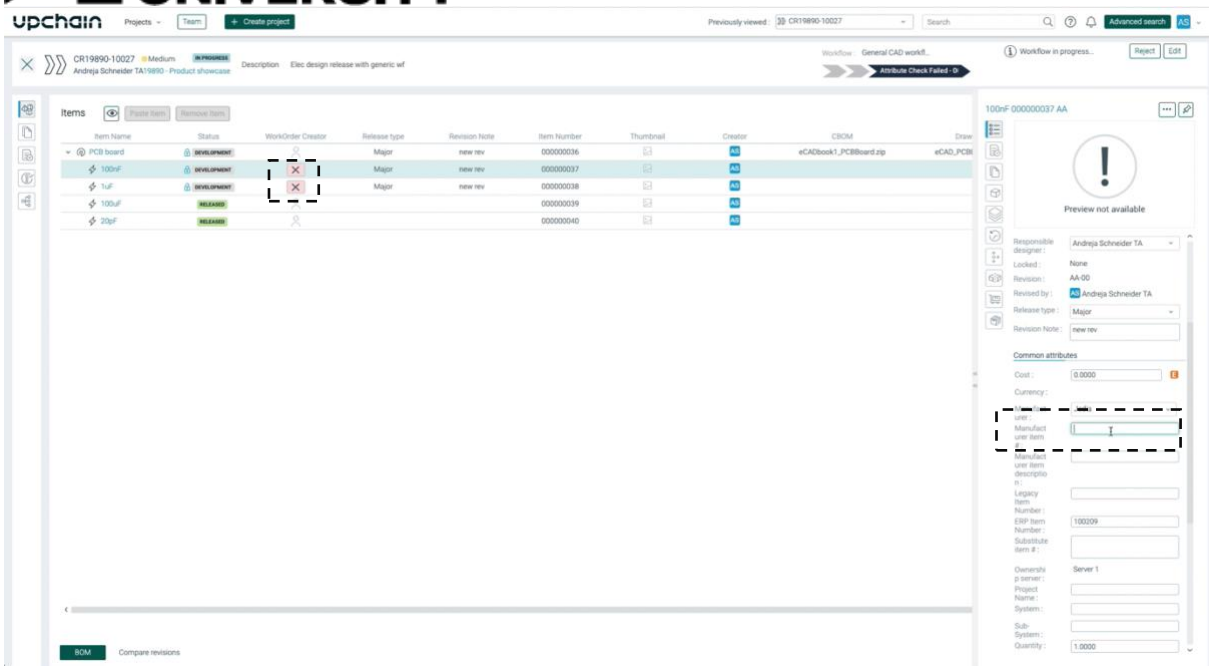

FIGURE 25 DEMO: USER IS REQUIRED TO INSERT MISSING PURCHASED ITEM ATTRIBUTE

Release process audit trail

This lesson will review where and how a release process leaves an audit trail within Upchain but first, we will build a workflow that will incorporate a quorum decision for multiple assignees.

Lesson 8 Quorum decision workflow (example *General wf with approvals*)

Instead of just one person deciding that the design is good and can be approved for release, you can incorporate a voting mechanism into the release process where a custom number of multiple users can provide their vote. The voting mechanism can be associated with specific users by name, specific user roles assigned to the project under which CR resides, or user groups. It can also be adjusted for the percentage of votes required for the workflow to continue. This is achieved by quorum decision primitive.

In the following example, any project manager role associated with the project under which CR resides has a chance to vote for design approval or to reject the design. 60% of users must vote for either approval or rejection for this workflow to continue.

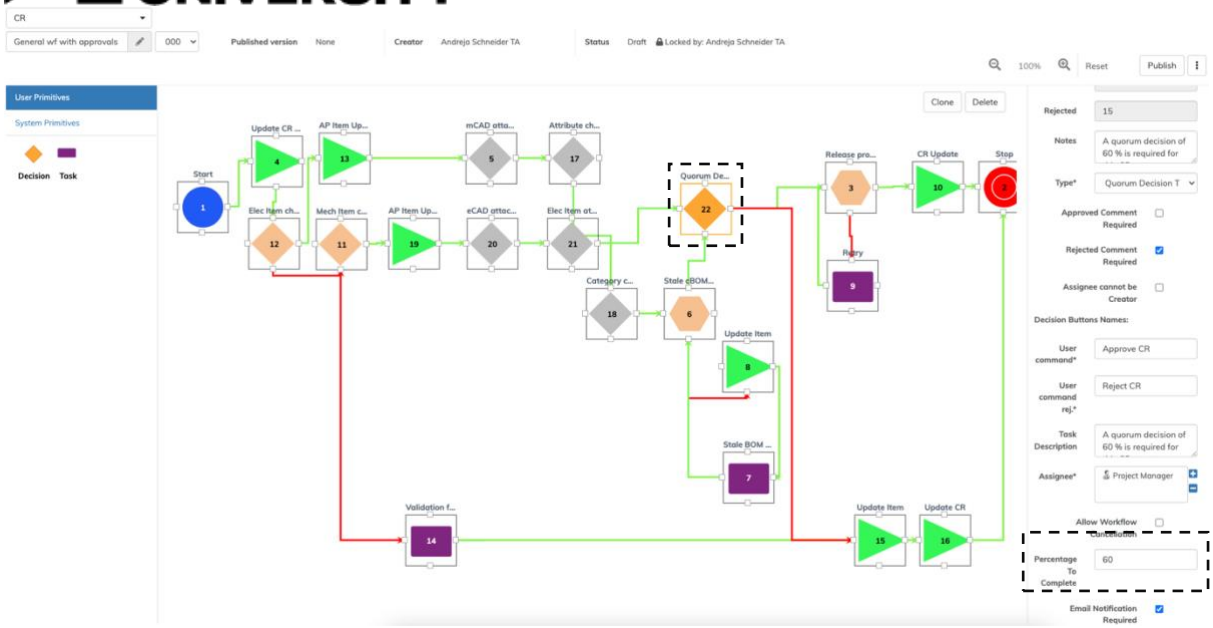

FIGURE 26 QUORUM DECISION HAS CUSTOM PERCENTAGE FOR COMPETITION

By reviewing the task in the *Activities* tab of the CR, we can see how many users can place a vote, and the task description help users know what the rules for the workflow to continue are.

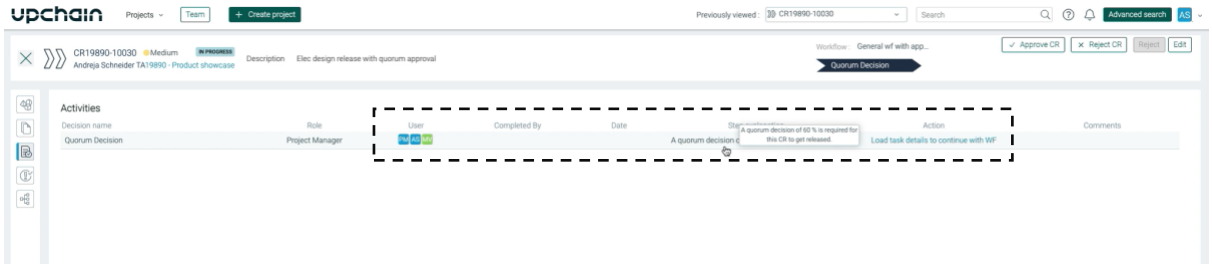

FIGURE 27 DEMO: TASK IS SHOWING WHICH USERS CAN PLACE A VOTE FOR QUORUM DECISION

Workflow audit trail information in Upchain

The path that workflow took while reviewing the submitted data can be tracked and reviewed in the *Workflow Actions* tab of the CR. Here you can find information on which task or decision has been created and who was the owner of it. In addition, the *Sign-off* information shows the timestamp when this task was completed or when it passed through a certain workflow primitive.

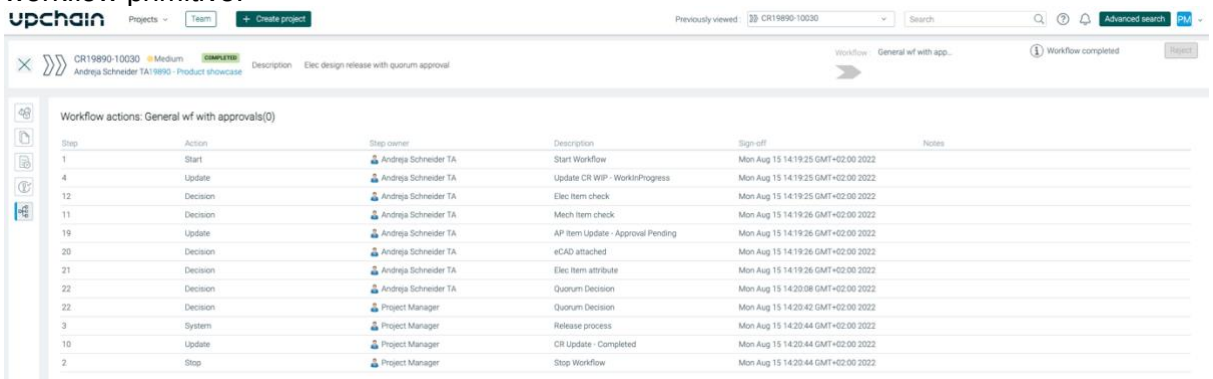

FIGURE 28 WORKFLOW AND CR AUDIT TRAIL IN THE CR

Another possibility of reviewing completed and pending workflow tasks is over a CR dashboard. By expanding specific CR, you can check which users were assigned to the task but also which one completed the task and at which timeframe.

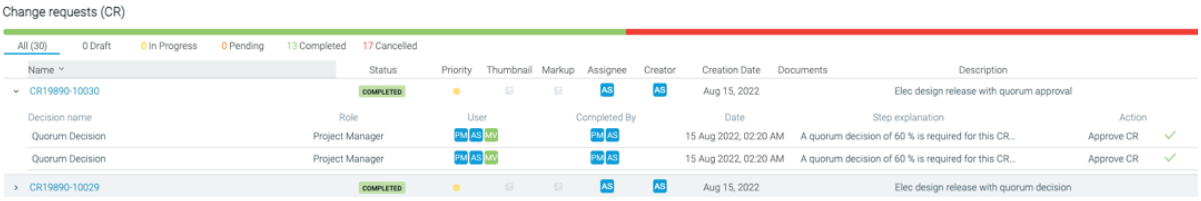

FIGURE 29 CR DASHBOARD SHOWS USEFUL AUDIT INFORMATION FOR PENDING AND COMPLETED TASKS

CR information is also obtainable under the history of a released item. For example, you can review which was the last user that approved the release and when.

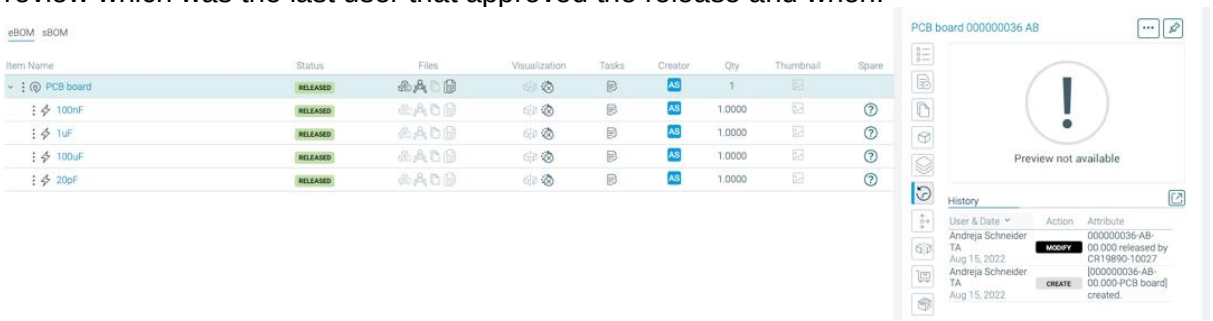

FIGURE 30 RELEASE INFORMATION IN ITEM HISTORY

Learning Objectives - summary

Let us review once again the topics and lessons we learned today:

- We reviewed the benefits of the automated release process both in general terms but also significantly within Upchain
- We went over examples of automated release processes in Upchain
  - OOTB Upchain workflow – lesson 3
  - Electrical design checks – lesson 4
  - Mechanical design checks – lesson 5
  - Item attributes and categorization checks – lesson 6
  - Quorum decision workflow – lesson 8
- We showed the potential of merging multiple processes for different data types into one release workflow – lesson 7
- We showed where you could find available audit trail information of data checks and user decisions - lesson 8