ProjectWise Workflow Rules Engine & BS1192 Business Process Template

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ProjectWise Rules Engine

• ProjectWise V8i (SELECTseries 4) introduces a new capability for helping organizations enforce document lifecycle-based work processes.

• The ProjectWise Rules Engine provides a flexible set of actions that can be applied to documents during workflow state changes.

• Widely used in the UK Rail and Transportation Industry and other key users such as URS, Trafikverket (Sweden), and Buhler (Switzerland)

• Previously known as Document Action Manager
ProjectWise Rules Engine

- Mechanism for enforcing business processes
- Uses and extends existing workflow capabilities
- Examples: Automatically set a Document Attribute prior to Approval; Check an attribute has been set
- Non-linear Workflows
ProjectWise Rules Engine

- Replaces Standard Workflow commands with Rules Engine Operations
- Each Operation triggers a Rule with a confirmation dialog
- Each Rule consists of one or more sequential Actions
- A Rule is not run unless one or more optional Conditions are satisfied
ProjectWise Rules Engine

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Enabling the Rules Engine

- Installed automatically with ProjectWise Administrator
- Install option for ProjectWise Explorer.
  - If not selected, the Rules Engine will NOT be enabled for that client
- Required database objects are updated with the schema update when logging into Administrator after upgrading to ProjectWise V8i (SELECTseries 4) Update
Draft and Pending Approval Documents may be Approved or Revised

Approved Documents may only be Revised

Revised Documents are move to Obsolete State before New Version is created

Obsolete Documents cannot be Approved or Revised
Rules Engine in Action

- Standard State Change commands are replaced by Rules Engine Operations e.g. Approve or Revise.

- Each combination of Workflow, State and Operation defines one unique Rule.

- Each Rule consists of more or more Actions that are run in a defined order.

- Each Rule can be assigned one or more Condition checks that can be run before the Rule’s Actions are started.
Rules Engine in Action – Rule 1

- **Workflow:** Rules Engine Workflow
- **State:** Draft
- **Operation:** Approve
  - Action 1: Set Attribute `TRIG_SUBMITTED` to 1
  - Action 2: Clear Attribute `RejectedBy`
  - Action 3: Clear Attribute `DateRejected`
  - Action 4: Clear Attribute `Remarks`
  - Action 5: Set Attribute `PercentComplete` to 50
  - Action 6: Change State to `Pending Approval`
There are no views registered that are able to display current selection.
Rules Engine in Action – Rule 2

- Workflow: Rules Engine Workflow
- State: Pending Approval
- Operation: Revise
  - Action 1: Set Attribute TRIG_REJECTED to 1
  - Action 2: Change State to Obsolete
  - Action 3: Create New Version
  - Action 4: Change State to Draft
  - Action 5: Increase Minor Version e.g. P01.1 to P01.2
  - Actions 6 – 15: Clear Attributes
# Rules Engine – Rules Configuration

| Workflow     | State          | Operation   | Prompt                  | ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 12 | 13 | 14 | 20 | 21 | 24 | 27 | 28 | 29 | 30 | 31 | 1 | 2 | 5 |
|--------------|----------------|-------------|-------------------------|----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Rules Engine | Draft          | APPROVE     | Submit Document for Rev |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Rules Engine | Draft          | REVISE      | Create New Minor Ver    | 2  |   |   |   |   |   |   |   |    | 4  |    | 2  | 5  | 3  | 1  |    |    |    |    |    |    |    |    |    |
| Rules Engine | Pending Approval | APPROVE       | Approve Document        | 3  | 4 |   |   |   |   |   |   |    |    |    |    |    | 1  |    |   |    | 2  |    |    |    |    |    |    |    |    |
| Rules Engine | Pending Approval | REVISE       | Not Approved. Reject    | 4  | 4 |   |   |   |   | 5  | 3  |    | 1  | 9  |    | 12 |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Rules Engine | Approved       | APPROVE     | Already Approved        | 5  |   |   |   |   |   |   |   | 4  | 2  | 5  | 3  | 1  | 9  | 12 |   |    |    |    |    |    |    |    |    |    |    |    |
| Rules Engine | Approved       | REVISE      | Change Approved Rej     | 6  | 4 | 2 | 5  | 3  | 1  | 10 | 13 |   |    |    |    |    |    |    | 14 | 15 |    |    |    |    |    |    |    |    |
| Rules Engine | Obsolete       | APPROVE     | Obsolete - Cannot Rev   | 7  |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Rules Engine | Obsolete       | REVISE     | Obsolete - Cannot Rev   | 8  |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Note:** Some columns hidden for display purposes.
A Workflow and its States have to be enabled for the Rules Engine. This is done on the **Operation Types** sheet of the Rules Configuration Spreadsheet.
Rules Engine – Action Types

- **CHANGE_STATE** - Used to change the workflow state of the selected document. Non-linear workflows are supported where States may be ‘jumped’.

- **SET_ATTR** - Used to set the static value of an attribute of the selected document.

- **CLEAR_ATTRIBUTE** - Used to clear the value of an attribute of the selected document.

- **CREATE_VER** - Used to create a new version of the selected document. The default ProjectWise New > Version command is disabled.
Rules Engine – Action Types

- **SET_FINAL_STATUS** – Locks the document down with Final Status. There is no action to remove Final Status as all actions or operations are disabled by Final Status.

- **UPDATE_TB** – Used for CAD Files to update title blocks. Opens the file in the background in MicroStation or equivalent and uses standard Attribute Exchange Rules.
Rules Engine – Action Types

- CHANGE_REV_NO - Used to change the Revision attribute of the selected document.
  - Supported revision format is XYY.ZZ where X is prefix letter, YY is the Major Version and ZZ is the Minor Version.
  - Parameter 1 is the target attribute
  - Parameter 2 is the change action
    - INC_MAJ – Used to increment YY by 1, and resets ZZ to 1, e.g. P01.2 > P02.1
    - INC_MIN – Used to increment ZZ by 1, e.g. P02.3 > P02.4
    - REMOVE_MIN – Used to remove the Minor version from the Attribute. Used for Issued documents in BS1192, e.g. P02.4 > P02
Rules Engine – Action Types

• **SHIFT_REV_HIST** – Shift Revision History.
Rules Engine – Condition Checks

- **EMPTY** – The Attribute defined in Parameter 1 must be empty

- **NOT_EMPTY** - The Attribute defined in Parameter 1 must NOT be empty

- **REFS_VALID** – The Attribute defined in Parameter 1 will be checked in all Reference files and is any of them contain the value or one of the values defined in Parameter 2, the Condition will fail, and the Master document cannot have its State changed. E.g. If any references are marked as UNAPPROVED, you cannot approve the Master.
BS1192 Business Process
Template for ProjectWise
BS1192 Template - Details

• Delivered as an AAM file import

• Provides BS1192 Best Practices for:
  – Project Properties
  – Folder structure
  – Environment and Document Coding
  – Access Control
  – Rules Definition

• Several BS1192 Template specific Stored Procedures are deployed when BS1192 Rules Definition file is imported
BS1192 Template – Template Folder Structure

- ProjectWise Explorer Datasources
  - BS1192 Template (SQL) (pwadmin)
    - Documents
      - Application Data
      - dmsSystem
    - Projects
    - System Admin
  - Components
  - Saved Searches
  - Rules Engine Example Dataset (CRA)

- Projects
  - Project Example 1
    - Location 1
      - Architect
        - 2D Drawing
      - 2D Model
      - 3D Model
      - Correspondence
      - Model Revision
      - Report
    - Building Surveyor
    - Civil Engineer
    - Client
    - Contractor
    - Drainage & Highway Engineer
    - Electrical Engineer
    - Facilities Manager
    - General (Non-Disciplinary)
    - Geographical & Land Surveyor
    - Heating & Ventilation Engineer
    - Interior Designer
    - Landscape Engineer
    - Mechanical
    - Public Health Engineer
    - Quantity Surveyor
    - Railway – General
    - Specialist Designer
    - Structural Engineer
    - Sub-Contractor
    - Town & Country Planning
  - Saved Searches
BS1192 Template – Access Rights

• Users are assigned to a Discipline (Role) User List
• Project access is enabled through membership of a Project User Group
• Users can access their own discipline’s WIP data in their own Projects.
• Users can view all other discipline’s Shared data in the same Project
BS1192 Template – Environment

Document environment configured to support automatic BS1192 file naming and metadata with Document Creation Wizard.
# BS1192 Template – Lookup Tables

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>model</th>
<th>drawing</th>
<th>document</th>
<th>Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTS</td>
<td>Not To Scale</td>
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<td>1</td>
<td>0</td>
<td>Scale</td>
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<tr>
<td>N/A</td>
<td>Not Applicable</td>
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<td>0</td>
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<td>Scale</td>
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<td>1:1</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>Scale</td>
</tr>
</tbody>
</table>

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<th>model</th>
<th>drawing</th>
<th>document</th>
<th>Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>Initial Status or WIP</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
<td>S1</td>
<td>Fit for Coordination</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Status</td>
</tr>
<tr>
<td>S2</td>
<td>Fit for Information</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
<td>S3</td>
<td>Fit for Internal Review and Comment</td>
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<td>1</td>
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<tr>
<td>S4</td>
<td>Fit for Construction Approval</td>
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<td>0</td>
<td>1</td>
<td>Status</td>
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<tr>
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<td>Fit for Costing</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
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<td>Status</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
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<td>Fit for Manufacture or Procurement</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
<td>A</td>
<td>Fit for Construction</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
<td>B</td>
<td>Partially Signed-off</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
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<tr>
<td>AB</td>
<td>As Built</td>
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<td>1</td>
<td>1</td>
<td>Status</td>
</tr>
<tr>
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<td>Animation File...</td>
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<td>0</td>
<td>0</td>
<td>Type</td>
</tr>
<tr>
<td>VF</td>
<td>Visualization File...</td>
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<td>0</td>
<td>0</td>
<td>Type</td>
</tr>
<tr>
<td>CO</td>
<td>Correspondence</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Type</td>
</tr>
<tr>
<td>RD</td>
<td>Reports</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Type</td>
</tr>
</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Contractor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Subcontractor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>Specialist Designer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>General (Non-Disciplinary)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BS1192 Template – Workflow

Configurable Workflow & Dynamic Access Control

WIP
- Work in Progress
- Content Check
- Approve for Sharing

SHARED
- Shared
- Approve for Publication

PUBLISHED
- Shared

- Set
- Send To
- Copy List To
- Attributes
- Change State

- Approve...
- Revise...
- Next
- Previous
- Change...
- Set Final Status
- Remove Final Status

Rev. Ver: P01
Status: S0

Rev. Ver: P01
Status: S1-S4
• Documents may be Approved or Revised apart from Published Documents that may only be Revised

• Revised Documents are move to Superseded State before New Version is created
WRE in Action – Document Creation

• Create Model using Document Creation Wizard
• Approve Model
• Reject Model
• Approve Model to Shared State
• Create Drawing using iCS. See filtered Lookup Tables
WRE in Action – BS1192 Rule 1

• Workflow: Models
• State: Work in Progress
• Operation: Approve
  – Action 1: Set Attribute TRIG_DRAWN to 1
  – Action 2: Set Attribute TRIG_REJECTED to 0
  – Action 3: Clear Attribute PW_REJECTED_REASON
  – Action 4: Change State to Content Check
Summary

• ProjectWise Workflow Rules Engine Overview
• Operations, Rules, Actions, & Conditions
• Rules Configuration
• BS1192 Business Process Template Overview
• Template installation & import
• Example Workflow & Rules in Action
• Document Creation & moving through workflow
ProjectWise Workflow Rules Engine & BS1192 Business Process Template