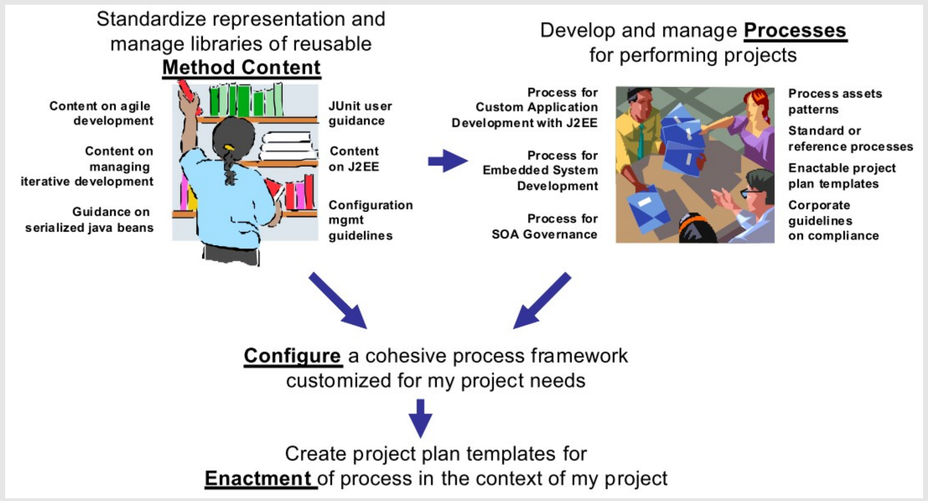
Using Formal Model Integrity Checks to Improve the Software Engineering Processes

SPEM 2.0

Standard Meta Model for Software Engineering Processes



SPEM 2.0's conceptual usage framework (OMG, 2008, p. 10)

Research Contribution

Proposal of Formal Model Integrity Checks to Improve the Software Engineering Processes

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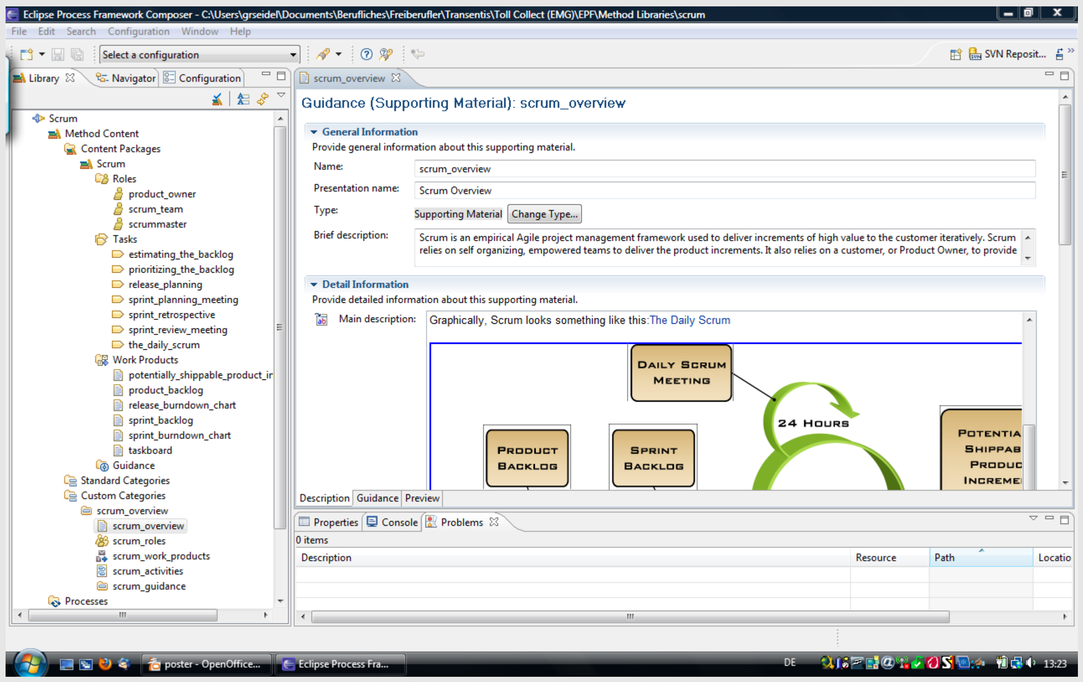
- Tasks with no output
- Tasks with none or more than one primary performer
- Work product which is not output of any task
- Work product with none or more than one responsible
- Roles which perform no task
- Roles responsible for a work product without being involved in a task to generate it
- Verification of belonging to at least one standard category
- Verification of belonging to custom categories

EPF Composer

Free Tool to Design and Publish Software Engineering Processes

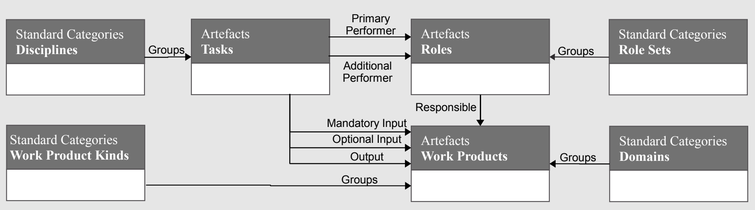


Screenshot of Scrum Implementation in the Eclipse Process Framework (Eclipse Foundation, 2006)

Screenshot of Scrum Process as Published by the Eclipse Process Framework as Website (Eclipse Foundation, 2006)

XML Export

SPEM 2.0 Conform Process Description as Exported by EPF Composer



Aspects of the EPF Composer meta model to be verified via formal model integrity checks

Custom Java Tool

Analyses XML Export of EPF Composer According to Integrity Rules

The tool generated the following output, numbered for better subsequent reference:

1. Role 'product_owner' is responsible for Workproduct 'product_backlog' without being involved in Task to generate it.
2. Role 'scrum_team' is responsible for Workproduct 'potentially_shippable_product_incremement' without being involved in Task to generate it.
3. Task 'sprint_retrospective' does not have any Output.
4. Task 'release_planning' does not have any Output.
5. Task 'prioritizing_the_backlog' has no Primary Performer.
6. Workproduct 'potentially_shippable_product_incremement' is not Output of any Task.
7. Workproduct 'taskboard' has no Responsible.
8. Workproduct 'sprint_burndown_chart' has no Responsible.

Results

Improvements Suggested for the Scrum Implementation

The outputs 2 and 6 indicate, that the actual 'development work' has not been modelled so far. Given this activity comprises all detailed software engineering it likely was a planned omission. Nonetheless in an enacted model this must be covered.

The output 3 indicates, that there is no formal result of the improvement activity at the end of each Sprint. As many software engineering maturity assessments require formal process improvement, it would be advisable to document the output of each 'sprint_retrospective' and use it for further process improvement. This may again be considered out of scope for the Scrum overview.

The outputs 1 and 5 identify an error in the model. Looking into the actual description of 'prioritizing_the_backlog' the 'product_owner' is mentioned but not formally modelled as responsible. Would he be added than both outputs disappear. As one of the advantages of these models of software engineering processes is a role based reading, a 'product_owner' could miss this responsibility of his.

The output 4 indicates again an omission: in the description of the task 'release_planning' a release plan is mentioned, but not modelled. For the sake of completeness it could be added.

The outputs 7 and 8 indicate a missing responsibility for two work products. As both are outputs of tasks involving the roles 'scrum_team', 'scrummaster' and 'product_owner' one of them should be made responsible for these results.

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