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Implementierungskonzepte für prozessorientierte Informationssysteme

Seminarthemen

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Topic Overview

Cluster 1: POIS foundation

- A1+A2: ATOM Publishing Protocol
- C1+C2: RESTful process engine
- B: Petri net stencil set
- D: Analysis integration

Cluster 2: BPMN-based POIS

- E: BPMN to PN mapping
- G: OR-join mappings
- F: BPMN restrictions

Cluster 3: Process Editor Extensions

- H:Diagram layouting
- I: EPC support

Cluster 1
A1+A2: ATOM Publishing Protocol

- ATOM Publishing Protocol (APP) as standard format for working with feeds / entries

- Task
  - Implementation of RFC 4287, RFC 5023, and RFC 5005

Cluster 1
B: Petri Net Stencil Set

- Petri nets as typical formalism for processes
- Oryx as generic graphical editing framework

- Task
  - Implement Oryx stencil set for REST-enabled Petri nets

- Integration with engine (C1+C2), usage of APP (A1+A2)
- Roundtrip with (extended) PNML

Cluster 1
C1+C2: RESTful Process Engine

- Once Petri nets are defined they should be executed
- Task
  - Develop a Petri net execution engine
- Use APP (A1+A2) implementation as realization of places
- Use (extended) PNML as XML interchange format for Petri nets
- Integration with Petri net stencil set (B)

Cluster 1
D: Petri net analysis integration

- Efficient analysis techniques for Petri nets are available
- Corresponding implementations are open source

- Task
  - Provide web-based access to existing implementations
  - Integrate existing implementations into Oryx

- Use PNML as XML interchange format for Petri nets
- Integration with the Petri net stencil set (B) for giving feedback on analysis results

Cluster 2
E: BPMN to Petri net mapping

- BPMN as de-facto process modeling standard
- Full BPMN support in Oryx, mapping algorithms available

- Task
  - Integrate existing BPMN 2 PN mapping into Oryx

- Use PNML as XML interchange format for Petri nets
- Integration with Petri net tasks (B+C1+C2)

Cluster 2
F: BPMN Restrictions

- Often only subsets of BPMN are used
  - Because engines / tools have limited BPMN support
  - E.g. only simple gateways / no subprocesses / no OR-joins / no data objects / … are allowed
- Task
  - Identify common constraints for BPMN
  - Implement a constraints checker
  - Implement BPMN pre-processing: macro resolving
- Integration with mapping (E)

Cluster 2
G: OR-Join Mappings

- OR-join as widely-used control flow construct
- Challenging in terms of semantics

- Task
  - Implement OR-join pre-processing for BPMN
  - Implement Petri net mappings for OR-joins

- Extend the BPMN 2 PN mapping (E)

Cluster 3
H: Automatic Layouting of Diagrams

- Automatically generated / modified Petri nets need proper layouting
- Task
  - Provide automatic layouting for Oryx diagrams
- Reuse of graphviz
- Integration with Petri net stencil set (B)

Cluster 3
I: EPC Support for Oryx

- EPC as widely-used process modeling language
- Task
  - Extend Oryx with an EPC stencil set
- Integrate with Petri net stencil set (B)