

Business Process Management Seminar 2007/2008

22. Oktober 2007

Process

- Today
 - Presentation of topics
- Deadline 29.10.2007 9:00
 - Rank up to 3 topics - send to hagen.overdick@hpi.uni-potsdam.de
- 3.12.2007
 - 5 min presentation of your outline (graded)
- 14.1.2008
 - Submission of "review draft" (required) by email
- 21.1.2008
 - Return reviews (graded) by email
- 28.1. & 4.2.2008
 - 20 min presentation + 10 min discussion (graded)
- 11.2.2008
 - Submission of final paper (graded) by email

Context

- Theory of Business Process Management
- Evaluation of different OR-Join semantics in transition systems

Task

- The student should investigate different approaches (incl. heuristics) and implement two of them prototypically.
- The prototypes should be used to analyze a set of process models regarding the implemented algorithms.

Literature

- Wil van der Aalst et al.: Design and Implementation of the YAWL system.

Context

- Theory of Business Process Management
- Using Bisimulations for Soundness Checks

Task

- The student should investigate how different kinds of bisimulation can be used to prove soundness of business processes.

Literature

- Robin Milner. A calculus of communicating systems.
- Twan Basten: In Terms of Nets.

Context

- Application of Business Process Management

Task

- The student should investigate how business processes could be spread across open systems. Technically, this means that all the different activities of a business process might be executed at different servers. In contrast to orchestration languages with a single engine, the execution logic should also be distributed. The task is to theoretical foundations, compare the approaches in contrast to orchestration engines, and provide a simple prototype.

Literature

- Mathias Weske: Workflow Management Systems: Formal Foundation, Conceptual Design, Implementation Aspects
- Frank Puhlmann: Using the Pi-Calculus for Formalizing Workflow Patterns

Context

- Towards Petri Net / BPMN Roundtripping: Transforming Petri Nets to BPMN

Task

- Investigate challenges of translating Petri nets back to BPMN. Define different classes of Petri nets that be more or less easily be translated. A prototypical implementation of such a translation would be desirable.

Literatur

- BPMN to Petri Net mapping by Dumas and Dijkman

Context

- Decidability of Petri net properties and their computational complexity

Task

- Survey properties and verification techniques for different classes of Petri nets (place/transition nets, free choice nets, high level Petri nets, ...).
- Explore Turing completeness, decidability and computational complexity.

Literatur

- Javier Esparza, Mogens Nielsen: Decidability Issues for Petri Nets (http://folk.uio.no/andersmo/petrinet/papers/complexity/brics_98_8.pdf)

Context

- Compliance Checking of Business Processes with Rules

Task

- Make a comparative study between different approaches that address so-called compliance checking. Criteria of comparison should include (but may extend) focus of checking ordering of activities, resources involved, timing of checking (at design time, runtime, or both), formalism behind each approach, explanation mechanism they provide to explain the violation of rules, approaches they follow to compose rules or to identify conflicts of the rules, complexity of the approach (how many transformations from notation to notation or formalism to another).

Literatur

- Ghose A., Koliadis G., Auditing Business Processes
- Lu R., Sadiq S., Governatori G., Compliance Aware Business Process Design

Context

- Information Retrieval, System Architecture

Task

- Analyse and propose improvements to the described in literature Framework Architecture (or define your own) for implementing Information Retrieval models and conducting their evaluations under different configuration settings.
- Define system components, their APIs, reflect improvements in system implementation (or implement your own).
- Conduct Information Retrieval evaluations.

Literature

- Chapter 6 of the technical report "A quantitative evaluation of the enhanced Topic-based Vector Space Model".

Context

- Business Process Management, Semantic Technology, Adaptive Processes

Task

- Overview of the approach for process semantic correctness check based on execution logs constraints.
- Proposals on semantic correctness checks based on process schema structure

Literature

- Starting point is the paper from Linh Thao Ly, Stefanie Rinderle and Peter Dadam - "Semantic Correctness in Adaptive Process Management Systems".

Context

- Data Handling in Business Processes

Task

- Real life systems expose high demand for flexible business processes. Especially this situation is typical for knowledge intensive business processes. Introduction of data objects in the business process models aids to achieve flexibility of models. Analyze the existing approaches to modelling knowledge intensive business processes from the perspective of data employment. Compare the approaches from theoretical and practical perspective.

Literature

- W.M.P. van der Aalst, M. Weske and D. Grunbauer. Case Handling, 2005
- J. Wang and A. Kumar. A Framework for Document-Driven Workflow Systems, 2005

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Context

- Redesign of the B3MN-Infrastructure

Task

- Analyse and describe the relationship of resources to exposed behavior on their various URIs.
- Design and implement an execution environment for such a design
- Outline an ATOM-Server based on such a design

Assigned To

- Ole Eckerman

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Context

- Redesign of the B3MN-Infrastructure

Task

- Design a browser-based ATOM-Client capable of retrieving, editing, updating, and deleting of feeds.
- Analyse the requirements of extending this core into a full-featured editor and design a plugin infrastructure for it.

Assigned To

- Martin Czuchra

Context

- From service operation to service semantics

Task

- How a service operates, can be captured in the semantics of the service (precondition + effect). But how can the semantics of the service be deduced automatically from the description of the service operation. Investigate how service operation can be captured (e.g. graph transformation, (see work by Lohmann et al), compositions of REST operations, or program analysis) and composed. Develop an algorithm to use these compositions to deduce preconditions and effects. A prototypical implementation can use tools from the CrossVision suite.

Literature

- Jan Hendrik Hausmann, Reiko Heckel, Marc Lohmann: Model-based Discovery of Web Services

Context

- Semantic correctness of processes

Task

- A lot of research has been conducted to verify syntactical properties like soundness of processes. But given the additional information about preconditions and effects of services, it is possible to check additional properties. For example, conflicts between services invoked in parallel can be detected. The task is to investigate what kind of properties can be detected and provide an implementation for checking them.

Literature

- Meyer, H.: Calculating the Semantic Conformance of Processes
- Meyer, H.: On the Semantics of Service Compositions

Context

- Plugins for CentraSite

Task

- CentraSite is SOA registry provided by Software AG. The task can either be to develop a plugin for the storage and query of semantic web services or work on the actual plugin mechanism to provide better development support. For both tasks, knowledge of J2EE servlet containers and Web services is required.

Literature

- <http://soaworks.com>
- <http://documentation.softwareag.com/crossvision/inm/overview.htm>

Questions?

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- Any questions regarding the topics - contact the supervisor directly
- Any questions regarding the seminar - Hagen Overdick, C2.5
- These slide are at <https://bpt.hpi.uni-potsdam.de/pub/Public/Teaching/BPT-Themen.pdf>