

Topics abstract: Workflow Modelling and Enactment for Work Process Support on the Web

Rune Molden

Norwegian University of Science and Technology (NTNU),
Department of Computer and Information Science,
Sem Sælands vei 7-9, N-7491 Trondheim, Norway
rune.molden@idi.ntnu.no

Evolution of networked organisations [4] and project organised work [2] requires more advanced features for work process modelling than the current approaches offer. Utilisation of Semantic Web resources [6] in work process environments offers several advantages for adaptation and adoption of information and services. The models representing these processes should be the foundation of the real life executing processes and should be synchronised at any given time [2], even though needed resources for the processes are located outside the organisation. The resources may even be at an unavailable state at the time of usage. By utilising Semantic Web technologies such as RDF and OWL/OWL-S for enrichment of the information and service resources to use in work processes [7], a substitute service or information source can be utilised automatically by employing techniques such as ontology mapping and other criteria data for asymptotic exact mapping. Rating of services and information can also be of great value, e.g. to filter dubious information sources and services [1].

The Web Information Service Modelling (WISEMOD) project funded by the Research Council of Norway (NRF), in which this work is part of, has as one of its objectives to come up with a new and improved approach to workflow modelling, specifically tailored for the needs of Semantic Web application engineering [5]. This encompasses an approach for workflow modelling utilising Semantic Web applications which is to be used for both analysis and enactment of inter-organisational solutions [5]. Further, a methodology for employing the modelling approach is required and, finally, a modelling tool prototype is to be developed and evaluated [5].

The improvement of workflow modelling tailored for the needs of Semantic Web services, requests to be concerned with the different aspects in the nature of inter-organisational processes. Introductorily, it is essential to get a thorough overview and knowledge of the existing approaches for workflow modelling for utilising Web resources. Process modelling approaches like BPEL4WS, ebXML, BPML, BPMN, and WSCI will be thoroughly inspected and evaluated, and lessons should be learnt concerning strengths and weaknesses of these approaches. Further, the evaluation of the

current process model standards should lead to a solid knowledge of the state of the art within this area of research. In addition, an investigation of the current Semantic Web technologies, standards and research within this area will be performed. These efforts will give a good basis for improvements and enlargement of the state of the art. More detailed, the approach will constitute the following aspects:

- Development of a new workflow modelling language and notation as an extension of existing languages and related technologies based on the state of the art approach and requirements elicitation/surveys in industry.
- Make a meta-model of the extended language and implement this through an existing meta-modelling, to experiment with the new modelling notation.
- Extend a current workflow enactment environment to meet the requirements of the modelling language and notation approach.
- The semiotic framework for quality of models and modelling languages [8] will be employed to analytically evaluate the extended workflow modelling language and model enactment environment.
- The modelling language, notation and the tool will be empirically evaluated using case studies in the industry utilising the new approach for workflow modelling.

The research work concerning the workflow modelling approach has currently not been started, but some initial state of the art work has been done. However, several contributions are anticipated in the project plan. Initially, the state of the art work aims to yield an evaluation framework to evaluate existing modelling approaches and tools based on current work on quality of models and modelling languages. Surveys of existing methodologies and tools for workflow modelling, and Web services with advanced properties will be performed by utilising the evaluation framework. The workflow modelling approach will yield an approach for workflow modelling in connection with Semantic Web applications utilised both for analysis and enactment of inter-organizational solutions, a methodology for using the modelling approach, e.g. in terms of guidelines, and, a modelling tool prototype.

References

1. Cardoso, J.: Quality of Service and Semantic Composition of Workflows. Ph.D. Dissertation. Department of Computer Science, University of Georgia, Athens, GA, USA (2002)
2. Jørgensen, H.D.: Interactive Process Models. Ph.D. thesis. Norwegian University of Science and Technology, Trondheim, Norway (2004)
3. Cardoso, J., Sheth, A.: Semantic e-Workflow Composition. *Journal of Intelligent Information Systems*. Volume 21, Issue 3 (2003) 191-225
4. ATHENA Public Web Site: What is ATHENA. <http://www.athena-ip.org/> (2005)
5. The WISEMOD Project Web: <http://www.idi.ntnu.no/~guttors/wisemod/> (2005)
6. Berners-Lee, T., Hendler, J., Lassila, O.: The Semantic Web. *Scientific American* (2001)
7. Peer, J.: Bringing Together Semantic Web and Web Services. *Lecture Notes in Computer Science*, Vol. 2342. Springer-Verlag, Berlin Heidelberg (2002) 279-291
8. Krogstie, J., Sølvberg, A.: Information Systems Engineering: Conceptual Modeling in a Quality Perspective. *Kompediumforlaget*, Trondheim, Norway (2003)