KISS – Knowledge-intensive Service Support for Agile Process Management

Daniela Feldkamp, Knut Hinkelmann, Barbara Thönssen

University of Applied Science Northwestern Switzerland, School of Business
Riggenbachstr. 16, 4600 Olten, Switzerland
{daniela.feldkamp, knut.hinkelmann, barbara.thoenssen}@fhwn.ch

Abstract. Automating business processes especially in the tertiary sector is still a challenge as they are normally knowledge intensive, little automated but compliance relevant. To meet these requirements the paper at hand introduces the KISS approach: modeling knowledge intensive services by enriching business rules semantically and linking rules to processes.

Keywords: Variable Process, Business process management, Business rules.

1 Introduction

Business process management has been very successful for structured processes with the objectives of process optimization, quality management, implementation of business information systems, or workflow management. In actual applications, however, we still face various problems: Often process documentations are not in line with the real work in the organization, e.g. because the processes are not implemented as documented or because processes have changed and the documentation is not adjusted. Also, process definition often lack the right level of granularity, i.e. they are very detailed forcing participants to follow a rigid regime and prohibiting flexibility in process execution. The situation is even worse for knowledge-intensive or dynamic processes as they have to deal with exceptional situations, unforeseeable events, unpredictable situations, high variability and highly complex tasks.

As a consequence, knowledge intensive processes are weakly structured and do not match at least the one crucial condition for process automation: A high repeatability rate, i.e. doing the same thing in the same way many times. Consider for example approving a building application, it may be necessary to conduct several checks including inspection on location, approval of application by historical preservation agency, and assessment of environmental compatibility. All tasks depend on each other. However the outcome of one task also may be that the application will fail; then no further tests are required. Dietz [2] states, that some modeling approaches treat 'information processes' like 'real business processes' (as Dietz calls it) therefore failing to meet the requirements. If possible at all such a process model, covering all possible cases, would be highly complex and difficult to manage. Because, of this

In: M. Hepp, K. Hinkelmann, D. Karagiannis, R. Klein, N. Stojanovic (eds.): Semantic Business Process and Product Lifecycle Management. Proceedings of the Workshop SBPM 2007, Innsbruck, April 7, 2007, CEUR Workshop Proceedings, ISSN 1613-0073, online CEUR-WS.org/Vol-251/

knowledge intensive processes are normally not automated and often not even documented in detail. The disadvantages of that situation are lack of transparency and traceability of work, inconsistent decisions and neglected company's regulations. Especially the increasing demands on governance and compliance have been forcing companies as well as public administrations in the last few years to review these kinds of processes for improvement.

That brings the subject of 'Business Rules' into the picture. Business rules allow for an explicit and consistent specification of regulations [5]. They provide an excellent means of encapsulating knowledge about the intentions of business and their implementation in business processes and information systems [4].

2 The KISS Approach

The KISS approach combines business rules and process models in order to automate knowledge intensive services by taking advantage of both fields:

- process models are used for
  - explicit documentation and visualization
  - execution automation.
- rules are used for
  - variable process execution: determine activities and processes to be executed taking into account for dependencies between activities
  - Intelligent resource allocation at run time: selection of employees based on special skills and selection of particular web services adequate for the actual circumstances
  - Intelligent branching and decision making: deriving workflow-relevant data using inferences and computing values
  - Consistency checking: avoiding violation of integrity constraints and guidelines.

This means, that an activity of a process can have relations to four different rule sets, one rule set for each of the above mentioned relation types. To allow for flexible process execution we introduced a new modelling construct that we call *variable activity*. A variable activity is closely related to a knowledge-intensive task as introduced by Abecker et al. [1]. It corresponds to a subprocess with the particularity that the activities of this kind of subprocess are determined at run-time instead of strictly modelled at build time. At run-time rules select the activities that have to be executed depending on the actual context of the process instance, allowing for resource allocation and supporting the user in decision making, while integrity checking based on constraints and guidelines (in combination with inference rules) ensure consistency and compliance.

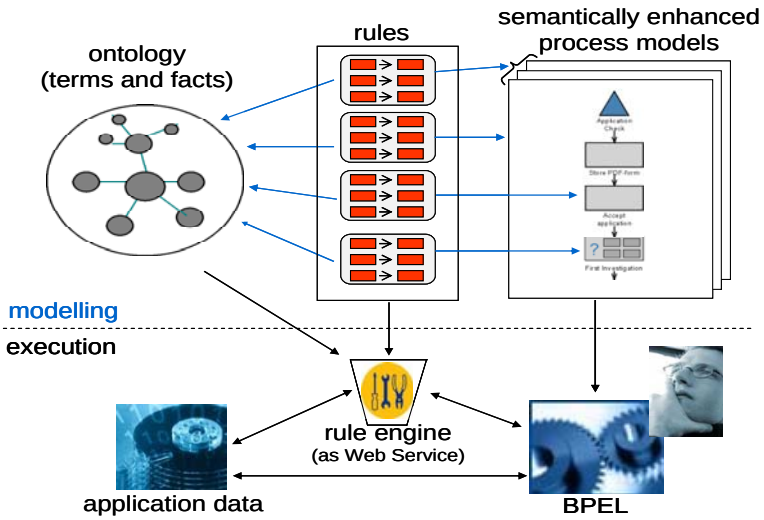

Fig. 1 Extension of traditional process modeling and execution

Therefore, we partly agree to Hepp and Roman [3] stating that explicitly modelling the process flow has several disadvantages hence preferring a declarative process description instead. However, as certain business constraints *do* cause 'fixed' dependencies on activities (e.g. sequence: a claim must always be verified before it can be decided on), the KISS approach suggests to model these parts as a flow in a process model as it is much better to visualize and to understand as purely declarative descriptions.

The KISS approach has been developed in the FIT project[1] and is applied for e-government services of the Austrian city of Voecklabruck. Although there are binding legal rules and regulations every administration has to obey, dealing with people's concerns means dealing with different circumstances every time. In this sense, e-government services are often knowledge intensive processes, where the actual process execution and the involved participants and administrations depend on various factors.

Ontologies build the basis for modelling and executing semantically enriched processes and business rules. The vocabulary of rules is represented in an OWL ontology, which can base on existing ontologies, like ontologies for the modelling of commercial and public enterprises provided by the TOVE project[2]. The rules are represented using SWRL. Semantically enhanced process models (represented in OWL-S) allow for context-dependent invocation of the business rules. Using ontologies for the representation of facts and terms has the advantage of higher expressiveness and the chance to use inferences like inheritance and consistency checking.

---

[1] FIT (Fostering self-adaptive e-government service improvement using semantic Technologies) is a project funded by the European Commission within the IST programme, IST-2004-27090

[2] http://www.eil.utoronto.ca/enterprise-modelling/tove/index.html.

3 Conclusion

The KISS approach for agile process management leads to more flexible and agile business processes by integrating business process management and business rules in four different ways. With the KISS approach, process models can be kept small and simple (following the slogan “KISS = Keep It Simple and Small”) representing only the mandatory process flow while the knowledge is separated in the business rules. This has the advantages, that rules can be modified independently from the business logic. Additionally, one rule can relate to several activities, so the business logic is more reusable.

References

1. Abecker, A.; Bernardi, A.; Hinkelmann, K.; Kühn, O.; Sintek, M. (1998): Toward a Well-Founded Technology for Organizational Memories. IEEE Intelligent Systems and their Applications, Vol. 13, No 3, p. 40 - 48, May/June 1998.
2. Dietz, J.L.G., The deep structure of business processes, Communications of the ACM, Volume 49 , Issue 5 (May 2006), pp. 58 – 64.
3. Hepp, M. and Roman, D. (2007): An Ontology Framework for Semantic Business Process Management, Proceedings of Wirtschaftsinformatik 2007, February 28 – March 2, , Karlsruhe.
4. Morgan, T. (2002): Business Rules and Information Systems: Aligning IT with Business Goals. Addison-Wesley, Boston.
5. Ross, R. G. (1998): Business Rules Concepts - Getting to the Point of Knowledge. Business Rule Solutions, LLC, Houston.